entergy

2022 Entergy Corporate GHG Emissions breakdown by category

All numbers in the table below represent CO2 equivalents (CO2e)

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
Scope 1 Direct Emission Sources	Stationary Combustion	**Power generating units** (includes emergency and backup generators)	CO2	43,136,254	39,132,551	58.42%	Stationary Combustion CEM
			CH4	18,302	16,603	0.02%	
			N2O	68,536	62,175	0.09%	
		Small stationary combustion sources & generators (2022 updated methodology; co-located at generation stations, service stations and Power Through)	CO2	147,225	133,560	0.20%	All small stat cbn totals
			CH4	59	53	0.00%	
			N2O	88	80	0.00%	
		Biomass power generation	Not applicable				
	Mobile Combustion	**Corporate fleet**	CO2	54,298	49,259	0.07%	Mobile Combustion
			CH4	80	72	0.00%	
			N2O	423	384	0.00%	
		Biomass fleet	Not applicable				
	Fugitive Emissions	**Natural gas transmission and distribution**	CH4	53,547	48,577	0.07%	Fugitive CH4-NG T&D
		Electricity transmission and distribution	SF6	113,097	102,599	0.15%	Fugitive SF6
		Cooling/air-conditioning (building, mobile and nuclear cooling eqpt)	HFCs	6,160	5,589	0.01%	Fugitive HFCs
	Process emissions	none applicable	Not applicable				
Total Emissions from Direct Sources				**43,598,069**	**39,551,503**	**59.04%**	
Scope 2 Indirect Emission Sources	Purchased Electricity	**Power purchased for business operations outside Entergy service territory**	CO2	2,813	2,552	0.00%	Purchased power
			CH4	6	5	0.00%	
			N2O	12	11	0.00%	
	T&D losses & Company Usage	**Entergy generated & purchased power consumed on Entergy T&D system and company location energy consumption**	CO2	335,401	304,271	Note: these emissions are calculated for information only - they are NOT included in the subtotal or the grand total shown below because any T&D losses are accounted for by the scope 1 emissions necessary to make up for these losses.	
			CH4	437	397		
			N2O	782	709		
Total Emissions from Indirect Sources				**2,830**	**2,568**	**0.00%**	
Scope 3 Optional Emissions Sources	Purchased power	**Controllable Purchased Power** (contracted power where the source is known sold to customers)	CO2	2,965,840	2,690,565	4.02%	Purchased power
			CH4	3,866	3,508	0.01%	
			N2O	6,913	6,272	0.01%	
		Non-Controllable Power (market purchases with exact source being unknown sold to customers)	CO2	6,573,102	5,963,018	8.90%	
			CH4	8,506	7,717	0.01%	
			N2O	15,209	13,797	0.02%	
	Purchased goods and services & Capital goods	**Supply chain emissions** (Spend-based approach; new 2022 category)	CO2	8,935,489	8,106,139	12.10%	Purchased and capital
			CH4	19,089	17,317	0.03%	
			N20	23	21	0.00%	
			Other GHGs	56,239	51,019	0.08%	
	Delivered Gas	**Gas supplier emissions - gas delivery** (primarily CH4, but does include other GHGs)	CH4	8,267,033	7,499,726	11.20%	Delivered gas
	Gas Customer Combustion	**Product combustion by LDC customers**	CO2	1,042,906	946,109	1.41%	Product Combustion
			CH4	417	378	0.00%	
			N2O	626	568	0.00%	
	Business Travel	**Travel by air, rental car, hotel stays and personal vehicles**	CO2	6,924	6,281	0.01%	Business Travel
			CH4	6	5	0.00%	
			N2O	15	13	0.00%	
	Employee Commuting	**Travel by employees to and from normal work locations** (2022 updated methodology)	CO2	28,331	25,701	0.04%	Employee Commuting
			CH4	51	46	0.00%	
			N2O	770	699	0.00%	
	Leased Assets	**Entergy facility leased for sole use of third party** (new 2022 category)	CO2	2,309,285	2,094,948	3.13%	Leased Assets
			CH4	1,085	985	0.00%	
			N2O	1,293	1,173	0.00%	
Total Emissions from Optional Sources				**30,243,018**	**27,436,005**	**40.96%**	
Total Corporate emissions				**73,843,918**	**66,990,075**	**100.00%**	

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

2022						CO2 from CEM		CH4	N2O	Total Facility CO2e in short tons	Total CO2e in metric tons
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)		
						short tons CO2	short tons CO2	short tons CO2e	short tons CO2e		
Acadia (Unit 2)	CT3	580	LA	100%	Natural Gas	565,612.00	565,612	265.84	316.74		
Acadia (Unit 2)	CT4		LA	100%	Natural Gas	565,612.00	565,612	265.84	316.74		
Totals							1,131,224	531.68	633.49	1,132,389.16	1,027,286.17
Attala	A01	480	MS	100%	Natural Gas	707,167.00	707,167	332.37	396.01		
Attala	A02		MS	100%	Natural Gas	707,167.00	707,167	332.37	396.01		
Totals		480					1,414,334	664.74	792.03	1,415,790.76	1,284,383.78
Baxter Wilson	1	550	MS	100%	Gas/Oil	202,458.00	202,458	95.16	113.38		
Baxter Wilson	2	771	MS	100%	Gas/Oil	0.00	0	0.00	0.00		
Totals		1321					202,458	95.16	113.38	202,666.53	183,855.98
Big Cajun 2[5]	2B3 (3)	257	LA	42%[5]	Coal	3,130,902.38	1,314,979	355.04	6,653.79		
Totals		257					1,314,979	355.04	6,653.79	1,321,987.84	1,199,287.19
Calcasieu Plant	GTG1	322	LA	100%	Natural gas	52,494.00	52,494	24.67	29.40		
Calcasieu Plant	GTG2		LA	100%	Natural gas	56,527.00	56,527	26.57	31.66		
Totals		322					109,021	51.24	61.05	109,133.29	99,004.06
Choctaw County	CTG1		MS	100%	Natural gas	486,408.00	486,408	228.61	272.39		
Choctaw County	CTG2		MS	100%	Natural gas	486,408.00	486,408	228.61	272.39		
Choctaw County	CTG3		MS	100%	Natural gas	486,408.00	486,408	228.61	272.39		
Totals							1,459,224	685.84	817.17	1,460,727.00	1,325,149.24
Gerald Andrus	1	761	MS	100%	Gas/Oil	523,073.00	523,073	245.84	292.92		
Totals		761					523,073	245.84	292.92	523,611.77	475,012.60
Hardin County Peaking Facility		146	TX	100%	Natural Gas	46,039.38	46,039	21.64	25.78		
Hardin County Peaking Facility			TX	100%	Natural Gas	43,467.36	43,467	20.43	24.34		
Totals							89,507	42.07	50.12	89,598.93	81,282.78
Hinds Energy Facility	H01	456	MS	100%	Gas CT	627,337.24	627,337	294.85	351.31		
Hinds Energy Facility	H02		MS	100%	Gas CT	627,337.24	627,337	294.85	351.31		
Hinds Energy Facility	Unit 2	29	MS	100%	Gas CT	20,991.27	20,991	9.87	11.76		
Totals		485					1,275,666	599.56	714.37	1,276,979.68	1,158,456.48
Hot Spring Energy Facility	CT-1	620	AR	100%	Gas CT	1,471,261.00	1,471,261	691.49	823.91		
Hot Spring Energy Facility	CT-2		AR	100%	Gas CT		0	0.00	0.00		
Totals		620					1,471,261	691.49	823.91	1,472,776.40	1,336,080.27
Independence	1	472	AR	56.5%	Coal	3,609,636.00	2,039,444	550.65	10,319.59		
Independence	2	332	AR	39.37%	Coal	2,045,674.00	805,382	217.45	4,075.23		
Totals		804					2,844,826	768.10	14,394.82	2,859,989.12	2,594,538.48
Lake Catherine	4	547	AR	100%	Gas/Oil	145,033.00	145,033	68.17	81.22		
Totals		547					145,033	68.17	81.22	145,182.38	131,707.24
Lake Charles Power Station	1A	877	LA	100%	Natural Gas	1,233,427.00	1,233,427	579.71	690.72		
Lake Charles Power Station	1B		LA	100%	Natural Gas	1,233,427.00	1,233,427	579.71	690.72		
Totals		877					2,466,854	1,159.42	1,381.44	2,469,394.86	2,240,197.33
Lewis Creek	1	260	TX	100%	Gas/Oil	502,770.55	502,771	236.30	281.55		
Lewis Creek	2	260	TX	100%	Gas/Oil	663,712.57	663,713	311.94	371.68		
Totals		520					1,166,483	548.25	653.23	1,167,684.60	1,059,305.65
Little Gypsy	1	244	LA	100%	Gas/Oil	0.00	0	0.00	0.00		
Little Gypsy	2	436	LA	100%	Gas/Oil	383,076.00	383,076	180.05	214.52		
Little Gypsy	3	573	LA	100%	Gas/Oil	194,449.00	194,449	91.39	108.89		

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		1253					577,525	271.44	323.41	578,119.85	524,461.51
Montgomery County Power Station	CT1		TX	100%	CCGT	1,227,161.50	1,227,162	576.77	687.21		
Montgomery County Power Station	CT2		TX	100%	CCGT	1,227,161.50	1,227,162	576.77	687.21		
Totals		0					2,454,323	1,153.53	1,374.42	2,456,850.95	2,228,817.69
Ninemile Point	3	135	LA	100%	Gas/Oil	0.00	0	0.00	0.00		
Ninemile Point	4	748	LA	100%	Gas/Oil	1,229,288.00	1,229,288	577.77	688.40		
Ninemile Point	5	763	LA	100%	Gas/Oil	1,606,360.00	1,606,360	754.99	899.56		
Ninemile Point	6A	280	LA	100%	CCGT	801,894.50	801,895	376.89	449.06		
Ninemile Point	6B	280	LA	100%	CCGT	801,894.50	801,895	376.89	449.06		
Totals		1646					4,439,437	2,086.54	2,486.08	4,444,009.62	4,031,537.71
New Orleans Power Station	1	132	LA	100%	Natural Gas	199,204.00	199,204	93.63	111.55		
Totals		132					199,204	93.63	111.55	199,409.18	180,900.97
Ouachita Power	CTGEN1	242	LA	100%	Natural gas	719,512.63	719,513	338.17	402.93		
Ouachita Power	CTGEN2	244	LA	100%	Natural gas	602,942.23	602,942	283.38	337.65		
Ouachita Power	CTGEN3	241	LA	100%	Natural gas	616,120.57	616,121	289.58	345.03		
Totals		727					1,938,575	911.13	1,085.60	1,940,572.16	1,760,457.45
Perryville	1-1		LA	100%	Gas/Oil	531,054.00	531,054	249.60	297.39		
Perryville	1-2	718	LA	100%	Gas/Oil	531,054.00	531,054	249.60	297.39		
Perryville	2-1		LA	100%	Gas/Oil	96,153.00	96,153	45.19	53.85		
Totals		718					1,158,261	544.38	648.63	1,159,454.01	1,051,838.98
R S Cogen[4]	RS-5	425	LA	50%	Natural gas	870,724.03	435,362	204.62	243.80		
R S Cogen[4]	RS-6		LA	50%	Natural gas	835,871.21	417,936	196.43	234.04		
Totals		425					853,298	401.05	477.85	854,176.51	774,895.90
R S Nelson	4	500	LA	100%	Gas/Oil	0.00	0	0.00	0.00		
R S Nelson[6]	6	385	LA	80.9%	Coal	2,650,639.00	2,144,367	578.98	10,850.50		
Totals		885					2,144,367	578.98	10,850.50	2,155,796.43	1,955,705.62
Sabine	1	230	TX	100%	Gas/Oil	176,932.00	176,932	83.16	99.08		
Sabine	2	230	TX	100%	Gas/Oil	0.00	0	0.00	0.00		
Sabine	3	420	TX	100%	Gas/Oil	629,547.00	629,547	295.89	352.55		
Sabine	4	530	TX	100%	Gas/Oil	425,595.00	425,595	200.03	238.33		
Sabine	5	480	TX	100%	Gas/Oil	642,375.00	642,375	301.92	359.73		
Totals		1890					1,874,449	880.99	1,049.69	1,876,379.68	1,702,223.01
Sterlington	7AB	102	LA	100%	Gas/Oil	1,715.00	1,715	0.81	0.96		
Sterlington	7C	101	LA	100%	Gas/Oil	1,715.00	1,715	0.81	0.96		
Totals		203					3,430	1.61	1.92	3,433.53	3,114.85
St Charles Power Station	1A	926	LA	100%	CCGT	1,172,284.00	1,172,284	550.97	656.48		
St Charles Power Station	1B		LA	100%	CCGT	1,172,284.00	1,172,284	550.97	656.48		
Totals		926					2,344,568	1,101.95	1,312.96	2,346,982.91	2,129,147.08
Union Power Station[7]	CT 1	495	AR	100%	Gas	669,714.00	669,714	314.77	375.04		
Union Power Station	CT 2		AR	100%	Gas	669,714.00	669,714	314.77	375.04		
Union Power Station	CT 3	495	AR	100%	Gas	673,456.00	673,456	316.52	377.14		
Union Power Station	CT 4		AR	100%	Gas	673,456.00	673,456	316.52	377.14		
Union Power Station	CT 5	495	AR	100%	Gas	674,117.50	674,118	316.84	377.51		
Union Power Station	CT 6		AR	100%	Gas	674,117.50	674,118	316.84	377.51		
Union Power Station	CT 7	495	AR	100%	Gas	745,918.00	745,918	350.58	417.71		
Union Power Station	CT 8		AR	100%	Gas	745,918.00	745,918	350.58	417.71		
Totals		1980					5,526,411	2,597.41	3,094.79	5,532,103.20	5,018,639.61
Washington Parish Energy Center	1	361	LA	100%	Gas	207,218.00	207,218	97.39	116.04		
Totals		361					207,218	97.39	116.04	207,431.43	188,178.63

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
Waterford	1	411	LA	100%	Gas/Oil	0.00	0	0.00	0.00		
Waterford	2	411	LA	100%	Gas/Oil	233,778.00	233,778	109.88	130.92		
Waterford	4		LA	100%	Oil	9,487.00	9,487	4.46	5.31		
Totals		822					243,265	114.33	136.23	243,515.56	220,913.60
White Bluff	1	465	AR	57%	Coal	3,318,644.55	1,891,627	510.74	9,571.63		
White Bluff	2	481	AR	57%	Coal	2,923,425.69	1,666,353	449.92	8,431.74		
Totals		946					3,557,980	960.65	18,003.38	3,576,944.07	3,244,949.08
Totals						**51,806,320.89**	**43,136,254**	**18,302**	**68,536**	**43,223,091.43**	**39,211,328.96**
						short tons CO2	**short tons CO2**	**short tons CO2e**	**short tons CO2e**		
						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**
						CO2 from CEM		**CH4**	**N2O**		

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

(5) 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.

(6) 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%

Additional Notes

- 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.

- The following units were removed from the Inventory in 2014 - Lynch 2&3, Couch 1&2, Lake Catherine 1-3, Louisiana Station 2 (units 10-12), Ninemile 1&2, Nelson 3, Richie 1&2, and Sterlington 10. These units are either permanently retired (decommissioned in some cases) or are in extended reserve shutdown and are not expected to return to service.

- The following units were ADDED to the inventory in 2014 - Ninemile 6A and 6B - these units came online during December of 2014.

- The Acadia power plant has two units - Unit 1 (CT1 & CT2) is owned by CLECO, while Unit 2 (CT3 & CT4 as shown above) is owned by Entergy.

- Michoud Plant units removed from inventory in 2018 Inventory - the units were permanently retired in January 2016 and scheduled for demolition

- Removed Rex Brown from 2022 Inventory

Small combustion sources at all generation stations - Updated for 2022

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.

Starting in 2013, Entergy reported the previous year's GHG (CO2e) emissions from small sources co-located at Fossil plants in compliance with the EPA Mandatory Reporting Rule (General Stationary Fuel Combustion - Subpart C).

These updated values are substituted for the older, 2005 calculations in order to be consistent with mandatory GHG reporting. Nuclear estimates continue to rely on the 2005 calculations unless otherwise noted. The Thermal assets were divested in late 2013, so these assets and emission are removed from the inventory.

More detail on each of these facilities, the specific data collection methods, and the calculation methodology, can be found in the GHG Monitoring Plan required by the EPA Mandatory Reporting Rule.

Plant	CO2e Emissions reported under Mandatory Reporting Rule (short tons of all gases in 2020) [obtained from Power Generation unless otherwise noted]	CO2e Emissions reported under Mandatory Reporting Rule (metric tons of all gases in 2021) [obtained from Power Generation unless otherwise noted]	Comments
Fossil fuel generating stations			
Attalla	0.0	0.0	No Subpart C affected sources
Baxter Wilson	8,667.3	7,865.1	
Calcasieu	0.0	0.0	No Subpart C affected sources
Choctaw	1,951.7	1,771.0	
Gerald Andrus	158.7	144.0	
Hinds County	693.1	628.9	
Hot Spring	0.0	0.0	No Subpart C affected sources
Independence	2,066.2	1,875.0	(~50% ownership share)
Lake Catherine	7,687.2	6,975.6	
Lewis Creek	104,148.4	94,508.6	
Little Gypsy	1,493.7	1,355.4	
RS Nelson	0.0	0.0	No Subpart C affected sources (80.9% ownership share)
Ninemile Point	3,603.4	3,269.9	
Ouachita	2,993.8	2,716.7	
Perryville	2,816.6	2,555.9	
Rex Brown	0.0	0.0	Retired in 2011
Sabine	0.0	0.0	
St Charles	0.0	0.0	No Subpart C affected sources
Union	0.0	0.0	No Subpart C affected sources
Waterford	0.0	0.0	No Subpart C affected sources
White Bluff	753.8	684.0	(57% ownership share)
Power Gen TOTAL	137,033.7		

Generator Data				
Source	**lbs CO2e**	**short tons CO2e**	**metric tons CO2e**	**Description**
Power Through	1,627,781.3	813.89	738.35	Power Through is a backup power option for customers
Power Delivery	6,744,635.2	3,372.32	3,059.32	Power Delivery & Service Centers backup generators
Total	**8,372,416.5**	**4,186.21**	**3,797.67**	

Nuclear generating stations[2][3]	Plant total small sources CO2e (short tons using 2005 estimate calculations)
River Bend	301.6
Indian Point 2	0.0
Indian Point 3	0.0
Palisades [1]	534.7
Waterford 3	1,222.9
Grand Gulf	427.4
Arkansas Nuclear 1&2	3,665.8
Nuclear TOTAL (short tons)	**6,152.3**

All small source totals	**147,372.3**

(1) Estimated based on average of other units
(2) Vermont Yankee entered decommission status and did not operate beginning in 2016. Has been removed.
(3) James Fitzpatrick was sold in 2017 and has been removed
(4) Mablevale, Michoud, and Willow Glenn removed from inventory in 2018 since units have been retired, demolished, or scheduled for demolition.
(5) Harrsion County and NISCO removed from inventory in 2018 since Entergy has no equitiy share in ownership. Entergy only operates these units.
(6) Pilgrim ownership was transferred to Holdtec on 8/26/2019. Pilgrim has been removed for the 2020 inventory.

Estimate of individual GHG breakdown (short tons)	
CO2	147224.88
CH4	58.89
N2O	88.33

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

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**	3,030,691	**Based on 2017 Entergy data provided by Carolanne Nichols**, 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. Green Plug-In (JEMS) units run on diesel on the highway and electricity on the job site.
Gasoline	**G**	1,020,149	
BiFuel-Gasoline/Ethanol	**S**	840,718	
BiFuel-Gasoline/CNG	**A**	0	
BiFuel-Gasoline/LPG	**B**	0	
BiFuel-Diesel/Electricity	**F**	0	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.
Propane	**P**	57	
CNG	**C**	31	
LPG	**L**	311	
Green Plug-In JEMS	**J**	12,016	"Unknown" split evenly (50/50) between diesel and gasoline.
BiFuel-Gasoline/Electricity	**H**	903	
Unknown	-	0	**Total 2022 Fuel purchases**
Jet fuel		234,560	**Total 2022 Fuel Purchase**
Total gallons consumed		**5,139,436**	

Total units of each fuel type

Fuel	Total units consumed (GALLONS) - from inputs above	conversion to energy content (MMBtu/gallon)	Total MMBtu consumed	CO2 using EPA Climate Leaders Efs: Emissions Factor (lbs CO2/MMBtu)	CO2 using EPA Climate Leaders Efs: Total CO2 Emissions (short tons)	CO2 using WRI/WBCSD Protocol Efs: Emissions Factor (kg CO2/Gallon)	CO2 using WRI/WBCSD Protocol Efs: Total CO2 Emissions (short tons)
Diesel	3,042,707	0.1387	422,023	159.68	33,694	10.15	34,043
Gasoline	1,777,698	0.1251	222,390	156.44	17,395	8.81	17,264
Ethanol (E85)	84,072	0.0843	7,087	149.59	530	5.56	515
CNG	31	0.1251	4	116.41	0	See note	0
LPG	311	0.092	29	138.76	2	5.79	2
Propane	57	0.092	5	138.32	0	5.79	0
Jet fuel	234,560	0.135	31,666	154.72	2,450	9.57	2,474
Totals	**5,139,436**		**683,204**		**54,072**		**54,298**

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.

NOTE - Emission factors for these gases were not available for all fuel types - a conservative approach was used by using the emission factor for diesel.

N2O from mobile sources

N2O	gallons consumed	g N2O/gal fuel	total kg N2O	short tons	CO2e short tons
Gasoline	1,777,698	0.22	391.09	0.439	130.88
Diesel	3,042,707	0.26	791.10	0.888	264.75
Jet Fuel	234,560	0.26	60.99	0.068	20.41
Propane	57	0.26	0.01	0.000	0.00
CNG	31	0.26	0.01	0.000	0.00
LPG	311	0.26	0.08	0.000	0.03
Ethanol	84,072	0.26	21.86	0.025	7.32
total					**423.39**

CH4 from mobile sources

CH4	gallons consumed	g CH4 /gal fuel	total kg CH4	short tons	CO2e short tons
Gasoline	1,777,698	0.50	888.85	0.998	24.95
Diesel	3,042,707	0.58	1,764.77	1.982	49.55
Jet Fuel	234,560	0.58	136.04	0.153	3.82
Propane	57	0.58	0.03	0.000	0.00
CNG	31	0.58	0.02	0.000	0.00
LPG	311	0.58	0.18	0.000	0.01
Ethanol	84,071.80	0.58	48.76	0.055	1.37
total					**79.70**

Total N2O and CH4 CO2e	**503.08**

Total Estimated Emissions from Mobile Sources (short tons CO2e)	**54,801**

Emissions from natural gas from T&D operations

The calculation for Gas Operations below is based on as reported data from the GHG Summary Report for 2021. The Spindletop Gas Storage facility emissions are calculated using GRI emission factors (see notes below).

Gas Operations	CO2 equivalent emissions from facility subparts C-II, SS, and TT (metric tons) Subpart W, Fugitive	Total C02 equivalent emissions (short tons)
Entergy Louisiana, L.L.C. Gas Business	10,133.1	11,169.8
Entergy New Orleans, Inc. Gas Business	15,727.7	17,336.8
SUB-TOTAL		**28,506.6**

Reported Natural Gas Release	Short tons natural gas	CO2 Equivalent Emissions
Tolando Release 9-24-22	17.593	439.8175
SUB-TOTAL		**439.8175**

Spindletop Storage 3					
Storage facilities	# storage facilities	Emissions factor (metric ton CH4/station-yr)	Total metric tons CH4	Total short tons CH4	Total short tons CO2e (Cell E x 25)
Fugitive Emissions from Storage Facilities 4	1	675.4	675.40	744.50	18,612.50
Vented Emissions from Storage Facilities 5	1	217.3	217.30	239.53	5,988.30
				SUB-TOTAL	**24,600.80**

TOTALS FROM FUGITIVE NATURAL GAS	**53,547**	**short tons CO2e**

GENERAL NOTES:

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

SPECIFIC NOTES:

(1) Compressors are assumed to be for natural gas
(2) general emissions factor used for vented gas; GRI provides emissions factors for specific equipment venting.
(3) This category carried over from previous years
(3) EF from API Table 6-1, Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry. February 2004).
(4) EF from GRI

Direct Emissions of Escaped SF6 in Electricity T&D System ("Fugitive Emissions")

Note: The information below was as reported to the EPA under Subpart DD of the Mandatory GHG Reporting Rule.

More detail on the specific data collection methods, and the calculation methdology, can be found in the GHG Monitoring Plan required by the EPA Mandatory Reporting Rule.

2021 Fugitive SF6 Emissions Estimate			
SF6 Emissions (short tons) (1)	Global Warming Potential (GWP) (2)	Total CO2 Equivalent Emissions (short tons)	Total CO2 Equivalent Emissions metric tons)
4.96	22,800	**113,096.6**	**102,599.4**

(1) Converted 1,3565.8 pounds to short tons - the amount of emissions reported for RY 2021

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 by Real Estate as of December 31, 2016, 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.
2014 Update - removed the Thermal Operations facilities, as these were sold in late-2013.
2015 Update - No changes made
2016 Update - Values updated as of December 31, 2016
2017 Update - No changes made
2018 Update - No changes made
2019 Update - No changes made
2020 Update - No changes made
2021 Update - Updated Entergy owned space & capital lease space
2022 Update - Updated Entergy owned space & capital lease space

From Entergy Real Estate	square footage air-conditioned	EF: fugitive HFCs (short tons CO2e/sq ft) *	Facility fugitive HFC (short tons CO2e)
Entergy owned space	2,824,039	**0.00078**	2,201
Entergy capital lease space	1,218,318	**0.00078**	950
Generation plant space	1,400,000	**0.00078**	1,091
Total Fugitive HFCs	5,442,357		4,242

Generation plant space assumes 50,000 sq. ft. per plant; 28 plants assumed.

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	54,801	3.50%	1,918

Total CO2 from all mobile source fuels are included

Total fugitive HFC emissions **6,160** 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) 2	HFCs in chiller (kg HFC/tons of cooling) 3	Annual HFC loss factor (percent) 4	Total Annual HFC losses (MT HFC/1000 ft2)	Total Annual HFC losses (MT CO2e)/1000 ft2 5	Total Annual HFC losses (**MT CO2e**)/ ft2 6	Total Annual HFC losses (**short tons** CO2e)/ ft2 7
	280	1.2	15%	0.000642857	0.71	0.00071	**0.00078**

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=1100	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%	176	20	15,000	8.87	6,653	2.6%
light truck	1.2	20%	264	15	15,000	8.87	8,870	3.0%

1) ETRFossilRenewablePortfolio_6.9.2021.xlsx (entergy.com)
2) ASHRAE http://www.themcdermottgroup.com/Newsworthy/HVAC%20Issues/Rule%20of%20Thumb%20Sizing.htm
3) http://www.usgbc.org/LEED/tsac/energy.asp
4) 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%
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 (1,100)
6) Emissions factor for MT CO2e per ft2.
7) Emissions factor for short tons CO2e per ft2; conversion factor 1.1023

Power purchased to serve utility customers

Controllable Power Purchases					2022	
Code	Plant description	State	Total Entergy purchased from plant (MWh)	Unit/Plant-Specific Emission Factor (lbs CO2/MWh), Based on Total Output [from eGRID2021 data, accessed 01/31/2023, unless otherwise noted]	CO2 emissions from puchased power (short tons) [using eGRID Unit-Specific Factors (when available)]	
		LA	64,512.60	85.9	2,772.1	
		LA	2,391,839.20	744.1	889,910.1	
		TX	10,080.00	879.7	4,433.7	
		LA	10,743.60		-	
		TX	26,280.00	-	-	
		AR	171,789.70	-	-	
		LA	120,774.0	-		
		LA	1,215,680.00	1,356.56	824,568.4	
		LA	3,227,478.20	755.811	1,219,681.8	
		LA	234,399.40	-	-	
		AR	237,997.35			
		AR	21,360.00	2,291.55	24,473.7	
Totals			**7,732,934.05**		**2,965,839.8**	**short tons CO2**
N2O emissions from controlled purchases (SERC MS Valley Total Output Rate, eGRID2021)			0.006	lbs/MWh	**6,913.2**	**short tons CO2e**
CH4 emissions from controlled purchases (SERC MS Valley Total Output Rate, eGRID2021)			0.040	lbs/MWh	**3,866.5**	**short tons CO2e**

* - 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

TOTAL	**2,976,619.5**	**short tons CO2e**

Download Data | US EPA

Indirect Emissions associated with purchased power	Totalpchsd power		Loss factor	Total power lost		
	MWh		**%**	**MWh**		
CO2 emissions from T&D losses of purchased power on Entergy system	**24,745,389**		3.534%	874,503	335,401.2	short tons CO2
CH4 emissions from T&D losses of purchased power on Entergy system					437.3	short tons CO2e
N2O emissions from T&D losses of purchased power on Entergy system					781.8	short tons CO2e
				TOTAL	**336,620.3**	**short tons CO2e**

Purchase Type	Percentage of Utility Supply (10-k pages 251-252, Fuel Supply Section)	MWh	CO2 Emissions (ST)	CH4 Emissions (ST CO2e)	N2O Emissions (ST CO2e)	Total CO2e (ST)	Total CO2e (MT)
Controllable Purchases	5%	7,732,934	2,965,840	3,866.5	6,913	2,976,619.52	2,700,344.58
Uncontrollable (Market) Purchases	11%	17,012,455	6,573,102	8,506.2	15,209	6,596,817.57	5,984,533.94
	TOTALS	**24,745,389**	**9,538,942**	**12,373**	**22,122**	**9,573,437.08**	**8,684,878.52**

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

Plant and associated facilities[1,2,3]	2020 Electricity Usage (kwh)	eGRID Subregion	eGRID2019 Emission Factor (lb CO2/MWh)	2014 eGRID Emission Factor (lb CH4 per MWh)	2014 eGRID Emission Factor (lb N2O per MWh)	Estimated CO2 Emissions (short tons)	Estimated CH4 Emissions (short tons CO2e)	Estimated N2O Emissions (short tons CO2e)	Estimated Emissions (short tons CO2e)
Indian Point Energy Center (IPEC) Unit 2 (4)	-	NYCW	553.80	0.021	0.002	0.00	0.00	0.00	**0**
Indian Point Energy Center (IPEC) Unit 3 [5]	-	NYCW	556.06	0.021	0.002	0.00	0.00	0.00	**0**
Palisades (PAL)	4730075.00	RFCM	1,189.34	0.114	0.016	2,812.83	5.66	11.73	**2,830**
TOTAL	**4,730,075**								

TOTAL	**2,812.83**	**5.66**	**11.73**	**2,830.23**

(1) Provided by Anthony Dichman based on Station Service Purchases from ISOs. Calculations on file.

(2) Vermont Yankee entered decommission status and did not operate beginning in 2016 - according to Nuclear, their power usage is negligible; so this was removed beginning in 2016.

(3) There were no purchases for Fitzpatrick or Pilgrim in 2020, as these plants were sold prior to 2020. They have been remoed from the inventory beginning in 2020.

(4) Indian Point 2 was shut down in April 2020

(5) Indian Point 3 was shut down in April 30 2021

(6) Palisades was shut down in May and sold to a third-party in June of 2022

Operating Company	Generation GWh	Purchases GWh	Total Power	Losses & Company Usage	% Lost
EAI	26,157	5,619	31,776	1,280	**0.040281974**
ELL	49,566	14,676	64,242	1,933	**3.008934965**
EMI	11,782	5,925	17,707	701	**3.958886316**
ENOI	2,565	5,278	7,843	128	**1.63202856**

Controllable Power Purchases				2022		
Code	Plant description	State	Total Entergy purchased from plant (MWh)	Unit/Plant-Specific Emission Factor (lbs CO2/MWh), Based on Total Output [from eGRID2021 data, accessed 01/31/2023, unless otherwise noted]	CO2 emissions from puchased power (short tons) [Using eGRID Unit-Specific Factors (when available)]	
ETI	10,423	12,371	22,794	786	3.448275862	
SERI	10,593		10,593	(29)	-0.273765694	
ELIM		(19,160)	(19,160)			
TOTALS*	111,086	24,709	135,795	4,799	0.035340035	

Source: **2021 Investor Guid pg 36**

4,828.00 **Total Loss**

135,794.00 **Total Power**

0.0353 % Loss

https://cdn.entergy.com/userfiles/content/investor_relations/docs/2021_Investor_Guide.pdf?_gl=1*clm7nv*_ga*MTk1NDEwODI3My4xNjcwNDM5Mjkx*_ga_HK6YSZ6LT0*MTY3NTE5MTQ0NC40NC4xLjE2NzUxOTE1NTMuMC4wLjA.

2022 supply chain spend categorized to EPA commodities

Purchased Goods and Services

Industry/Commodity	2022 Spend	Inflation Adjustment (0.885)	CO2 Emission Factor	CO2 Emissions (kg)	CH4 Emission Factor	CH4 Emissions (kg)	N20 Emission Factor	N20 Emissions (kg)	Other GHGs Emission Factor	Other GHGs Emissions (kg)	CO2e kg	CO2e short tons	CO2e metric tons
Administration and Support Services	$ 86,145,537.58	$ 76,238,800.76	0.088	6,709,014.47	0.001	76,238.80	0	0.00	0.004	304,955.20	8,919,939.69	9,832.39	8,922.31
Chemical Products	$ 203,907,799.39	$ 180,458,402.46	0.282	50,889,269.49	0.001	180,458.40	0	0.00	0.01	1,804,584.02	57,205,313.58	63,057.00	57,220.51
Computer and Electronic Products	$ 686,273,615.32	$ 607,352,149.56	0.043	26,116,142.43	0	0.00	0	0.00	0.004	2,429,408.60	28,545,551.03	31,465.55	28,553.13
Computer systems and design	$ 122,231,245.36	$ 108,174,652.14	0.06	6,490,479.13	0	0.00	0	0.00	0.015	1,622,619.78	8,113,098.91	8,943.01	8,115.25
Construction	$ 119,318,582.97	$ 105,596,945.93	0.259	27,349,609.00	0.002	211,193.89	0	0.00	0.02	2,111,938.92	34,741,395.21	38,295.19	34,750.62
Educational Services	$ 213,239,082.04	$ 188,716,587.61	0.176	33,214,119.42	0.001	188,716.59	0	0.00	0.003	566,149.76	38,498,183.87	42,436.27	38,508.41
Electrical equipment	$ 39,817,779.85	$ 35,238,735.17	0.197	6,942,030.83	0.001	35,238.74	0	0.00	0.011	387,626.09	8,210,625.29	9,050.51	8,212.81
Fabricated Metal Products	$ 13,973,137.61	$ 12,366,226.78	0.225	2,782,401.03	0.001	12,366.23	0	0.00	0.008	98,929.81	3,190,486.51	3,516.85	3,191.33
Food and beverage and tobacco products	$ 23,644,594.02	$ 20,925,465.71	0.317	6,633,372.63	0.008	167,403.73	0.001	20,925.47	0.007	146,478.26	17,200,732.81	18,960.24	17,205.30
Furniture and related products	$ 21,748,880.73	$ 19,247,759.45	0.159	3,060,393.75	0.001	19,247.76	0	0.00	0.021	404,202.95	3,945,790.69	4,349.42	3,946.84
Machinery	$ 176,530,973.53	$ 156,229,911.57	0.167	26,090,395.23	0.001	156,229.91	0	0.00	0.043	6,717,886.20	36,714,029.22	40,469.61	36,723.78
Miscellaneous Manufacturing	$ 67,217,999.51	$ 59,487,929.57	0.158	9,399,092.87	0.001	59,487.93	0	0.00	0.005	297,439.65	11,183,730.76	12,327.75	11,186.70
Miscellaneous professional, scientific and technical services	$ 762,028,605.71	$ 674,395,316.05	0.109	73,509,089.45	0.001	674,395.32	0	0.00	0.004	2,697,581.26	93,066,553.62	102,586.59	93,091.28
Motor vehicles, bodies and trailer	$ 8,234,811.67	$ 7,287,808.33	0.12	874,537.00	0.001	7,287.81	0	0.00	0.002	14,575.62	1,071,307.82	1,180.89	1,071.59
Other services, except government	$ 31,440,655.43	$ 27,824,980.06	0.124	3,450,297.53	0.001	27,824.98	0	0.00	0.004	111,299.92	4,257,221.95	4,692.70	4,258.35
Petroleum coal products	$ 100,029,343.08	$ 88,525,968.63	0.755	66,837,106.31	0.018	1,593,467.44	0	0.00	0.005	442,629.84	107,116,422.04	118,073.66	107,144.88
Truck transportation	$ 70,576,078.57	$ 62,459,829.53	1.318	82,322,055.33	0.002	124,919.66	0	0.00	0.021	1,311,656.42	86,756,703.22	95,631.29	86,779.75
Utilities	$ 2,562,856,735.26	$ 2,268,128,210.71	2.884	6,541,281,759.67	0.005	11,340,641.05	0	0.00	0.01	22,681,282.11	6,847,479,068.12	7,547,926.66	6,849,298.24
Waste and remediation	$ 12,879,337.27	$ 11,398,213.48	0.274	3,123,110.49	0.044	501,521.39	0	0.00	0.013	148,176.78	15,809,322.10	17,426.50	15,813.52
Total	$ 5,322,094,794.90	$ 4,710,053,893.49		6,977,074,276.06		15,376,639.62		20,925.47		44,299,421.19	7,412,025,476.44	8,170,222.09	7,413,994.63

Capital Goods

Category/Sub Cat	2022 Spend	Inflation Adjustment	CO2 Emission Factor	CO2 Emissions	CH4 Emission Factor	CH4 Emissions	N20 Emission Factor	N20 Emissions	Other GHGs Emission Factor	Other GHGs Emissions	CO2e (kg)	CO2e (Short Tons)	CO2e (Metric Tons)
Electrical equipment, appliances, and components	$ 352,690,016.41	$ 312,130,664.52	0.197	69,479,933.23	0.001	312,130.66	0	0.00	0.011	3,433,437.31	80,716,637.16	88,973.37	80,738.08
Fabricated metal products	$ 5,445,051.02	$ 4,818,870.15	0.225	1,225,136.48	0.001	4,818.87	0	0.00	0.008	38,550.96	1,384,159.19	1,525.75	1,384.53
Utilities	$ 367,023,630.96	$ 324,815,913.40	2.884	1,058,496,151.69	0.005	1,624,079.57	0	0.00	0.01	3,248,159.13	1,102,346,300.00	1,215,108.36	1,102,639.16
Total	$ 725,158,698.39	$ 641,765,448.08		1,129,201,221.40		1,941,029.10		0.00		6,720,147.40	1,184,447,096.35	1,305,607.47	1,184,761.77

Total CO2		Total CH4		Total N20		Total Other GHGs		Total Co2e	
8,106,275,497.46	kg	17,317,668.72	kg	20,925.47	kg	51,019,568.60	kg	8,174,633,660.24	kg
8,935,488.86	short tons	19,089.14	short tons	23.07	short tons	56,238.50	short tons	9,010,839.57	short tons
8,106,139.14	metric tons	17,317.38	metric tons	20.93	metric tons	51,018.71	metric tons	8,174,496.15	metric tons

Sources

Emissions Factors: SupplyChainEmissionFactorsforUSIndustriesCommodities.xlsx (live.com)

Spend Category Reference: APPENDIX 3 - INDUSTRY AND COMMODITY REFERENCE LISTS .PDF

Inflation Adjustment: 2022 Conversion Factor of 0.885 was used to adjust 2022 spend to 2018 USD leveraging GDP, CPI and PPI

Other GHGs (from EPA)

Other GHGs	GWP-100 Factors	Unit
butane, perfluorocyclo-, pfc-318	10300	kg CO2 eq.
ethane, 1,1,1-trifluoro-, hfc-143a	4470	kg CO2 eq.
ethane, 1,1,1,2-tetrafluoro-, hfc-134a	1430	kg CO2 eq.
ethane, hexafluoro-, hfc-116	12200	kg CO2 eq.
ethane, pentafluoro-, hfc-125	3500	kg CO2 eq.
methane, difluoro-, hfc-32	675	kg CO2 eq.
methane, tetrafluoro-, r-14	7390	kg CO2 eq.
methane, trifluoro-, hfc-23	14800	kg CO2 eq.
nitrogen fluoride	17200	kg CO2 eq.
propane, 1,1,1,3,3,3-hexafluoro-, hcfc-236fa	9810	kg CO2 eq.
propane, perfluoro-	8830	kg CO2 eq.
sulfur hexafluoride	22800	kg CO2 eq.

Delivered Gas Emissions

This spreadsheet provides an estimate of upstream emissions associated with suppliers of natural gas for electric power generation and distribution to LDC customers. Delivered gas data was provided by System Planning & Operations.

Gas Deliveries (mmBtu)				Estimated Upstream Emissions (g CO2e)					
Electric Utility	Local Distribution Companies (ENO and ELL)	Emission Rate for Delivered Gas[1] (grams of CO2e per MJ)	Conversion of Emission Rate to g CO2e per mmBtu	Electric Utility	LDCs	Total	Conversion to lbs	Conversion to Short Tons	Conversion to Metric Tons
545,150,288	19,726,879	14.1	14875.5	8,109,383,109,144	293,447,188,565	8,402,830,297,709	18,508,436,779	9,254,218	8,395,288

Notes and Sources

1 - NETL Report - Industry Partnerships and their Role in Reducing Natural Gas Supply Chain Greenhouse Gas Emissions (2020); pp 50, Exhibit 6-10

GHGe Breakdown			
6,302,122,723,281	5,624,091	**TOTAL CH4, CO2e**	CH4 ~= 75% of Total Natural Gas Industry CO2e GHG Emissions in the U.S. (Exhibit 6-11, p. 44, NETL report)
2,100,707,574,427	1,874,697	**TOTAL CO2, CO2e**	CO2 ~= 25% of Total Natural Gas Industry CO2e GHG Emissions in the U.S. (Exhibit 6-11, p. 44, NETL report)
0.0000	937	**TOTAL N2O, CO2e**	N2O = 0.0005 lbs CO2e N2O/lb CO2 (ETR GHG Inventory emission factor for Industrial natural gas-fired facilities.)
8,267,033	**7,499,726**	**TOTAL CO2e**	Adjusted TOTAL

Employee Business Travel - GHG Footprint Estimate

This section of the GHG inventory was produced in 2023 using 2022 actual travel numbers from AMEX travel.

Overall Summary	CO2 Emissions (lbs)	CO2 Emissions (short tons)	CO2 Emissions (metric tons)
Airline Flights	4,838,752	2,419	2,195
Rental Cars	595,149	298	270
Hotel Stays	1,652,411	826	750
Personal Vehicle Use	6,761,976	3,381	3,067
TOTAL ESTIMATE	13,848,289	6,924	6,282

Airline GHG Footprint Estimate

Year	Distance Flown (miles)	CO2 Footprint (lbs)	CO2 Footprint (short tons)	CO2 Footprint (metric tons)
2022	11,007,176	4,838,752	2,419	2,195

Note: The AMEX Travel group provided the CO2 footprint estimate calculations - have requested details of assumptions and calculations

Rental Car GHG Footprint Estimate

		Mileage Assumptions and Calculations				
Year	Number of Days/Nights	20% @ 5 mpd	30% @ 10 mpd	30% @ 20 mpd	15% @ 50 mpd	5% @ 100 mpd
2022	29,692	29,692	89,076	178,152	222,690	148,460

GRAND TOTAL	668,070.0	miles
	269,900.3	kg CO2 (@411 grams CO2 per mile)
	595,149.5	lb CO2
	297.6	short tons
	270.0	metric tons

Source of assumptions and calculations: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf

Hotel Nights

Year	Number of Days/Nights	Assumed kwh usage per room per day	Emission Rate Assumption (lbs per MWh)	Natural Gas Usage per room per night (mmBtu)	Total Emissions (lbs)	Total Emissions (short tons)	Total Emissions (metric tons)
2022	55,080						
2022	55,080	30	1,000	0.097	1,652,411	826.2	749.5

Source of assumptions and calculation: https://www.epa.gov/sites/default/files/2018-12/documents/indirectemissions_draft2_12212018_b_508pass_3.pdf

Employee Personal Vehicle Mileage

Employee Personal Car Mileage GHG Footprint Estimate

Year	Miles	kg CO2	lbs CO2	short tons CO2	metric tons CO2
2022	7,590,485	3,066,556	6,761,976	3,381	3,067.18

Source of assumptions and calculations: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf

Product Combustion - Emissions from combustion of Natural Gas distributed to retail customers

Values below represent those reported in the RY 2021 GHG reports submitted by Gas Operations and provided to SEP for each location.

Gas Operation	**CO2 equivalent emissions from supplier subparts LL-QQ (metric tons)** Subpart NN Product Combustion	Total CO2 equivalent emissions (short tons)
Entergy Louisiana, L.L.C. Gas Business	402,838.0	444,052.4
Entergy New Orleans, Inc. Gas Business	544,219.0	599,898.0
TOTAL	**947,057.0**	**1,043,950.4**

Estimate of individual GHG breakdown (short tons)	
CO2	1042906.45
CH4	417.16
N2O	625.74

Employee Commuting Emission Calculations

Note: Updated for 2022; revised methodology

Commuter Travel Calculations

Commuting Emissions Summary

Employee Commuting Total CO2e					
Commuting method (more than 75% of the time)	**Miles travelled per year**	**Total emissions kg CO2e**	**Total emissions short tons CO2e**	**Total Emissions metric tons CO2e**	**% total commuting emissions**
Individual car	68,935,196	25,821,125	28,463	25,821	97.6%
Public Transportation	467,886	64,320	71	64	0.2%
Carpool	1,496,835	560,671	618	561	2.1%
Bikers	-	-	-	-	0.0%
Walkers	-	-	-	-	0.0%
Total	**70,899,916**	**26,446,116**	**29,152**	**26,446**	**100.0%**

Employee Commuting Total GHG Breakdown						
Commuting method (more than 75% of the time)	**Miles travelled per year**	**Greenhouse gas**	**Total emissions kg CO2e**	**Total emissions short tons CO2e**	**Total Emissions metric tons CO2e**	**% total commuting emissions**
Individual car	68,935,196	CO2	25,092,411	27,659	25,093	94.9%
		CH4	44,877	49	45	0.2%
		N2O	683,837	754	684	2.6%
Public Transportation	467,886	CO2	64,077	71	64	0.2%
		CH4	42	0.05	0.04	0.0%
		N2O	201	0.22	0.20	0.0%
Carpool	1,496,835	CO2	544,848	601	545	2.1%
		CH4	974	1.07	0.97	0.0%
		N2O	14,849	16	15	0.1%
Bikers	-	CO2	-	-	-	0.0%
		CH4	-	-	-	0.0%
		N2O	-	-	-	0.0%
Walkers	-	CO2	-	-	-	0.0%
		CH4	-	-	-	0.0%
		N2O	-	-	-	0.0%
Total	**70,899,916**		**26,446,116**	**29,152**	**26,446**	**100.0%**

Commuting Survey Results & Workforce Estimations

Employee Count	
Survey Responses	940
Total Workforce	11700

Commuting Frequency					
# of Commutes (Weekly)	**Responses**	**%**	**Per Year Approx Commute Days (Individual)**	**Estimated Commuters for Full Workforce**	**Estimated Commutes for Full Workforce**
Remote (zero)	31	3	0	386	0
0.5	92	10	24	1145	27483
1	122	13	48	1519	72889
2	153	16	96	1904	182819
3	119	13	144	1481	213289
4	247	26	192	3074	590277
5	176	19	240	2191	525753
TOTAL	**940**	**100**	**744**	**11,700**	**1,612,509**

Annual Commute Weighted Average Multiplier		
Commutes weekly	Commutes annually	# responses (survey)
0	0	123
2	96	394
4.5	216	423
Total responses		**940**
Commute weighted average		137.44

Commuting Method			
Commuting Method	**# Survey Responses**	**estimated employees**	**% of survey respones**
Remote	31	385.85	3.30%
Walkers =	6	74.68	0.64%
Bikers =	6	74.68	0.64%
Carpoolers =	7	87.13	0.74%
Public Transporters =	6	74.68	0.64%
Individual Drivers =	884	11,002.98	94.04%
Total	**940**	**11,700**	**100.00%**

Commuting Distance (miles one-way)						
	Low	**Avg**	**High**	**# Employees Estimated**	**SURVEY RESPONSES (#)**	**SURVEY RESPONSES (%)**
Remote	0	0	0	385.85	31	3.30%
	1.0	2.5	5.0	1,369.15	110	11.70%
	5.0	7.5	10.0	2,389.79	192	20.43%
	10.0	15.0	20.0	2,551.60	205	21.81%
	20.0	25.0	30.0	1,705.21	137	14.57%
	30.0	40.0	50.0	1,854.57	149	15.85%
	50.0	62.5	75.0	1,443.83	116	12.34%
Total	116.0	152.5	190.0	11,700	940	100%

Distribution of Commuting Method by Miles (Workforce Estimation)						
Survey	**Individual Drivers**	**Carpoolers**	**Public**	**Bikers**	**Walkers**	**Remote**
1 to 5 miles	1288	0	9	37.34	75	
5 to 10 miles	2247	0	15	37.34	0	
10-20 miles	2400	0	16	0	0	
20-30 miles	1604	0	11	0	0	
30 to 50 miles	1744	0	12	0	0	
50 to 75 miles	1358	87	9	0	0	
Total	**11003**	**87**	**75**	**75**	**75**	**386**

Estimated Emissions from Mileage and Method of Transport							
Method of Transportation	**one way (workforce)**	**round trip (workforce)**	**annual miles (workforce)**	**annual gallons**	**lbs (workforce)**	**short tons (workforce)**	**metric tons (workforce)**
Walkers =	188	375	51,539	-	-	-	-
Bikers =	373	747	102,640	-	-	-	-
Carpoolers =	5,445	10,891	1,496,835	24,947	498,945	249	226
Public Transporters =	1,702	3,404	467,886	1,872	37,431	19	17
Individual Drivers =	250,786	501,572	68,935,196	2,757,408	55,148,157	27,574	25,022
Total			71,054,096	2,784,227	55,684,532	27,842	25,265

Emissions Calculation for Public Transportation		
Method of Transit	**# of miles**	**Total emissions kg CO2e**
50% Bus	233,943	25,071
5% Intercity Rail	23,394	4,336
5% Commuter Rail	23,394	4,032
40% Transit Rail	187,154	30,638
Total	**467,886**	**64,077**

EPA Methodology

$E = VMT * (EF_{CO2} + EF_{CH4} * 0.021 + EF_{N2O} * 0.310)$

E= total CO2e
VMT= vehicle miles travelled per year
EF_{CO2}= CO2 emissions factor
EF_{CH4}= CH4 emissions factor
EF_{N2O}= N2O emissions factor
0.021= conversion factor
0.310= conversion factor

*used for individual car, carpool and vanpool

Method of travel	EF_{CO2} (kg Co2/vehicle-mile)	EF_{CH4} (g CH4/vehicle-mile)	EF_{N2O}(g N2O/vehicle-mile)
Individual car	0.364	0.031	0.032
Vanpool	0.519	0.036	0.047
Carpool	0.364	0.031	0.032
Bus	0.107	0.0006	0.0005
Short haul airline (domestic)	0.185	0.0104	0.0085
Medium haul airline (continental)	0.229	0.0104	0.0085
Long haul airline (intercontinental)	0.277	0.0104	0.0085
Itercity rail	0.185	0.002	0.001
Commuter rail	0.172	0.002	0.001
Transit rail	0.163	0.004	0.002

$E = PMT * (EF_{CO2} + EF_{CH4} * 0.021 + EF_{N2O} * 0.310)$

E= total CO2e
PMT= passenger miles travelled per year
EF_{CO2}= CO2 emissions factor
EF_{CH4}= CH4 emissions factor
EF_{N2O}= N2O emissions factor
0.021= conversion factor
0.310= conversion factor

*used for bus, air and rail travel

Estimating Fuel Use
Fuel use= DT x FE
DT= Distance travelled activity factor
FE= Fuel economy factor (ie. kgCO2/mile, gCH4/mile, gN2O/mile) *see emissions factors chart above

*used to detrmine the breakdown of CO2, CH4, N20 within total CO2e.

EPA Methodology sourced from EPA website
http://epa.gov/climateleadership/documents/resources/commute_travel_product.pdf
http://www.epa.gov/climateleadership/documents/resources/mobilesource_guidance.pdf

Assumptions
Employees who are either remote or commute every so often were treated as '0' commutes weekly; employees who commute 1-3 times per week were treated as '2' commutes per week; employees who come 4 to 5 times per week were treated as '4.5' commutes weekly
With 2 weeks of vacation, 12 holidays, we assumed an approximate 48 working weeks per year
We assume walkers walk under 5 miles one way, and cyclists/bikers bike up to 10 one-way
Carpoolers and Vanpoolers all put in the over 30 miles category
Used midpoint of mileage ranges surveyed
Assuming 20 pounds of CO2 emitted per gallon of fuel burned
Methodology sourced from *EPA Climate Leaders: Greenhouse Gas Inventory Protocol Core Module Guidance*
Specific sections: "Optional Emissions from Community Business Travel and Product Transport"
"Direct Emissions from Mobile Combustion Sources"
Data sourced from 2023 issued employee survey reflecting 2022 commuting
Public transportation method compiled from percentages estimated from data recording passenger trips in urbanized areas: 50% bus, 5% intercity rail, 5% commuter rail and 40% transit rail.
Source: US Census Bureau, Statistical Abstract of the United States: 2012
Mileage based off of a survey of 940 employees from a pool of 11,700 employees
Data sourced from Employee Commuting Survey 2023

Entergy leases a power facility to a third party for their sole use

Leased Assets

Facility Name	Gross Load	Steam Load	CO2		Heat Input (mmBtu)
	(MWh)	(1000 lb)	short tons	metric tons	
Louisiana 1	3601625.4	7,851,367.74	2,309,285.41	2,094,948.48	38,858,121.96

CH4	
short tons	metric tons
1,085.36	984.63

N20	
short tons	metric tons
1,293.20	1,173.17

Data obtained from EPA Clean Air Markets division: https://campd.epa.gov/data/custom-data-download

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) 2.7 (elect gen)	0.045 0.068	0.099 0.149	0.0006 0.0009	.54 (ind) .54 (elect gen)	0.16092 0.16092	0.355 0.355	0.0022 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) 2.7 (elect gen)	0.045 0.068	0.099 0.149	0.0006 0.0009	1.8 (ind) 2.7 (elect gen)	0.16092 0.16092	0.355 0.355	0.0021 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) 0.95 (elect gen)	0.119 0.025	0.262 0.055	0.00225 0.00047	0.095 (ind) 0.095 (elect gen)	0.028 0.030	0.062 0.066	0.0005 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) 1.0 (elect gen)	0.250 0.025	0.551 0.055	0.00265 0.00027	1.4 (ind) 1.4 (elect gen)	0.42 0.48	0.92 1.05	0.0044 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	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)	3,412 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's Fourth Assessment Report (2007) GWPs.

a using 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.