# 2012 Entergy Corporate GHG Emissions breakdown by category

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 | 37,438,476 | 33,963,614 | 68.7% | Stationary Combustion CEM |
| | | | CH4 | 11,653 | 10,572 | 0.0% | Stationary Combustion CEM |
| | | | N2O | 88,891 | 80,640 | 0.2% | Stationary Combustion CEM |
| | | Small stationary combustion sources (co-located at generation stations and stand alone units) | CO2e | 517,309 | 469,295 | 0.9% | 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 | 63 | 58 | 0.0% | Mobile Combustion |
| | | | N2O | 417 | 378 | 0.0% | Mobile Combustion |
| | | Biomass fleet | CO2 | 0 | 0 | 0.0% | NA |
| | Fugitive Emissions | Natural gas transmission and distribution | CH4 | 105,216 | 95,450 | 0.2% | Fugitive CH4-NG T&D |
| | | Electricity transmission and distribution | SF6 | 160,787 | 145,864 | 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** | | | | **38,390,614** | **34,827,380** | **70.4%** | |
| Indirect Emission Sources | Purchased Electricity | Power purchased for utility business operations outside Entergy service territory | CO2 | 0 | 0 | 0.0% | NA |
| | T&D losses | Entergy purchased power consumed on Entergy T&D system | CO2, CH4, N2O | 895,986 | 812,825 | Note: these emissions are included within the Optional emissions | Purchased power |
| **Total Emissions from Indirect Sources** | | | | **895,986** | **812,825** | | |
| Optional Emissions Sources | Purchased power (controllable) | Controllable purchased power sold to customers | CO2, CH4, N2O | 7,557,728 | 6,856,255 | 13.9% | Purchased power |
| | Purchased power (uncontrollable) | Uncontrollable purchased power sold to customers | CO2, CH4, N2O | 8,548,552 | 7,755,115 | 15.7% | Purchased power |
| **Total Emissions from Optional Sources** | | | | **16,106,279** | **14,611,371** | **29.6%** | |
| **GHG Stabilization Commitment Total (progress toward second GHG commitment)** | | | | **45,513,512** | **41,289,164** | **83.5%** | |
| **Total Corporate emissions** | | | | **54,496,893** | **49,438,750** | **100.0%** | |

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

**2012**

| 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 | 478475 | 478,475 | 191 | 287 | | |
| Acadia | CT4 | | | 100% | Natural Gas | 481795 | 481,795 | 193 | 289 | | |
| Totals | | | | | | | 960,270 | 384 | 576 | 961,231 | 872,014 |
| Attala | A01 | | MS | 100% | Gas/Oil | 359853 | 359,853 | 144 | 216 | | |
| Attala | A02 | | MS | 100% | Gas/Oil | 359392 | 359,392 | 144 | 216 | | |
| Totals | | 0 | | | | | 719,245 | 288 | 432 | 719,964 | 653,140 |
| Baxter Wilson | 1 | 550 | MS | 100% | Gas/Oil | 1109591 | 1,109,591 | 444 | 666 | | |
| Baxter Wilson | 2 | 771 | MS | 100% | Gas/Oil | 763851 | 763,851 | 306 | 458 | | |
| Totals | | 1321 | | | | | 1,873,442 | 749 | 1,124 | 1,875,316 | 1,701,258 |
| Big Cajun 2[6] | 2B3 (3) | 257 | LA | 42%[6] | Coal | 3798680 | 1,430,583 | 286 | 6,581 | | |
| Totals | | 257 | | | | | 1,430,583 | 286 | 6,581 | 1,437,450 | 1,304,033 |
| Calcasieu Plant | GTG1 | | LA | 100% | Natural gas | 63205 | 63,205 | 25 | 38 | | |
| Calcasieu Plant | GTG2 | | LA | 100% | Natural gas | 107943 | 107,943 | 43 | 65 | | |
| Totals | | 0 | | | | | 171,149 | 68 | 103 | 171,320 | 155,419 |
| Cecil Lynch | 2 | 74 | AR | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Cecil Lynch | 3 | 130 | AR | 100% | Gas/Oil | 3235 | 3,235 | 1 | 2 | | |
| Totals | | 204 | | | | | 3,235 | 1 | 2 | 3,238 | 2,937 |
| Delta | 1 | 104 | MS | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Delta | 2 | 103 | MS | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Totals | | 207 | | | | | 0 | 0 | 0 | 0 | 0 |
| Gerald Andrus | 1 | 761 | MS | 100% | Gas/Oil | 889524 | 889,524 | 356 | 534 | | |
| Totals | | 761 | | | | | 889,524 | 356 | 534 | 890,414 | 807,770 |
| Hamilton Moses | 1 | 72 | AR | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Hamilton Moses | 2 | 72 | AR | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Totals | | 144 | | | | | 0 | 0 | 0 | 0 | 0 |
| 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[7] | H01 | 456 | MS | 100% | Gas CT | 14150 | 14,150 | 6 | 8 | | |
| Hinds Energy Facility[7] | H02 | | MS | 100% | Gas CT | 14407 | 14,407 | 6 | 9 | | |
| Totals | | | | | | | 28,557 | 11 | 17 | 28,586 | 25,933 |
| Hot Spring Energy Facility[8] | CT-1 | 620 | AR | 100% | Gas CT | 18166 | 18,166 | 7 | 11 | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hot Spring Energy Facility[8] | CT-2 | 620 | AR | 100% | Gas CT | 27197 | 27,197 | 11 | 16 | | |
| | | | | | | | 45,363 | 18 | 27 | 45,408 | 41,194 |
| Independence | 1 | 472 | AR | 56.5% | Coal | 5804743 | 3,279,680 | 656 | 15,087 | | |
| Independence | 2 | 332 | AR | 39.37% | Coal | 5996078 | 2,360,656 | 472 | 10,859 | | |
| Totals | | 804 | | | | | 5,640,336 | 1,128 | 25,946 | 5,667,409 | 5,141,387 |
| Lake Catherine | 1 | 52 | AR | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Lake Catherine | 2 | 51 | AR | 100% | Gas/Oil | 170 | 170 | 0 | 0 | | |
| Lake Catherine | 3 | 106 | AR | 100% | Gas/Oil | 2253 | 2,253 | 1 | 1 | | |
| Lake Catherine | 4 | 547 | AR | 100% | Gas/Oil | 436567 | 436,567 | 175 | 262 | | |
| Totals | | 756 | | | | | 438,990 | 176 | 263 | 439,429 | 398,643 |
| Lewis Creek | 1 | 260 | TX | 100% | Gas/Oil | 463599 | 463,599 | 185 | 278 | | |
| Lewis Creek | 2 | 260 | TX | 100% | Gas/Oil | 572374 | 572,374 | 229 | 343 | | |
| Totals | | 520 | | | | | 1,035,973 | 414 | 622 | 1,037,009 | 940,758 |
| Little Gypsy | 1 | 244 | LA | 100% | Gas/Oil | 186369 | 186,369 | 75 | 112 | | |
| Little Gypsy | 2 | 436 | LA | 100% | Gas/Oil | 242706 | 242,706 | 97 | 146 | | |
| Little Gypsy | 3 | 573 | LA | 100% | Gas/Oil | 899743 | 899,743 | 360 | 540 | | |
| Totals | | 1253 | | | | | 1,328,818 | 532 | 797 | 1,330,147 | 1,206,689 |
| 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 | 310 | 310 | 0 | 0 | | |
| Michoud | 2 | 244 | LA | 100% | Gas/Oil | 282892 | 282,892 | 113 | 170 | | |
| Michoud | 3 | 561 | LA | 100% | Gas/Oil | 1292723 | 1,292,723 | 517 | 776 | | |
| Totals | | 918 | | | | | 1,575,926 | 630 | 946 | 1,577,502 | 1,431,085 |
| Ninemile Point | 1 | 74 | LA | 100% | Gas/Oil | 2331 | 2,331 | 1 | 1 | | |
| Ninemile Point | 2 | 107 | LA | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Ninemile Point | 3 | 135 | LA | 100% | Gas/Oil | 126642 | 126,642 | 51 | 76 | | |
| Ninemile Point | 4 | 748 | LA | 100% | Gas/Oil | 1306867 | 1,306,867 | 523 | 784 | | |
| Ninemile Point | 5 | 763 | LA | 100% | Gas/Oil | 1453356 | 1,453,356 | 581 | 872 | | |
| Totals | | 1827 | | | | | 2,889,195 | 1,156 | 1,734 | 2,892,084 | 2,623,655 |
| Ouachita Power | CTGEN1 | | LA | 100% | Natural gas | 263822 | 263,822 | 106 | 158 | | |
| Ouachita Power | CTGEN2 | | LA | 100% | Natural gas | 210654 | 210,654 | 84 | 126 | | |
| Ouachita Power | CTGEN3 | | LA | 100% | Natural gas | 198907 | 198,907 | 80 | 119 | | |
| Totals | | 0 | | | | | 673,382 | 269 | 404 | 674,056 | 611,493 |
| Perryville | 1-1 | | LA | 100% | Gas/Oil | 545806 | 545,806 | 218 | 327 | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perryville | 1-2 | | LA | 100% | Gas/Oil | 581917 | 581,917 | 233 | 349 | | |
| Perryville | 2-1 | | LA | 100% | Gas/Oil | 11207 | 11,207 | 4 | 7 | | |
| Totals | | 0 | | | | | 1,138,930 | 456 | 683 | 1,140,069 | 1,034,253 |
| Rhode Island State Energy Ctr | RISEP1 | | RI | 100% | Natural gas | 511930 | 511,930 | 205 | 307 | | |
| Rhode Island State Energy Ctr | RISEP2 | | RI | 100% | Natural gas | 489633 | 489,633 | 196 | 294 | | |
| Totals | | | | | | | 1,001,563 | 401 | 601 | 1,002,564 | 909,511 |
| R S Cogen[5] | RS-5 | | LA | 50% | Natural gas | 808599 | 404,300 | 162 | 243 | | |
| R S Cogen[5] | RS-6 | 425 | LA | 50% | Natural gas | 821199 | 410,600 | 164 | 246 | | |
| Totals | | 425 | | | | | 814,899 | 326 | 489 | 815,714 | 740,003 |
| R S Nelson | 3 | 146 | LA | 100% | Gas/Oil | 142921 | 142,921 | 57 | 86 | | |
| R S Nelson | 4 | 500 | LA | 100% | Gas/Oil | 960913 | 960,913 | 384 | 577 | | |
| R S Nelson[9] | 6 | 385 | LA | 80.9% | Coal | 3887422 | 3,144,924 | 629 | 14,467 | | |
| Totals | | 1031 | | | | | 4,248,758 | 1,071 | 15,129 | 4,264,958 | 3,869,105 |
| Rex Brown | 1A | | MS | 100% | Natural gas | 0 | 0 | 0 | 0 | | |
| Rex Brown | 1B | | MS | 100% | Natural gas | 0 | 0 | 0 | 0 | | |
| Rex Brown | 3 | | MS | 100% | Gas/Oil | 17568 | 17,568 | 7 | 11 | | |
| Rex Brown | 4 | | MS | 100% | Gas/Oil | 170542 | 170,542 | 68 | 102 | | |
| Totals | | 0 | | | | | 188,110 | 75 | 113 | 188,298 | 170,821 |
| 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 | 329778 | 329,778 | 132 | 198 | | |
| Sabine | 2 | 230 | TX | 100% | Gas/Oil | 243251 | 243,251 | 97 | 146 | | |
| Sabine | 3 | 420 | TX | 100% | Gas/Oil | 478581 | 478,581 | 191 | 287 | | |
| Sabine | 4 | 530 | TX | 100% | Gas/Oil | 867480 | 867,480 | 347 | 520 | | |
| Sabine | 5 | 480 | TX | 100% | Gas/Oil | 605785 | 605,785 | 242 | 363 | | |
| Totals | | 1890 | | | | | 2,524,874 | 1,010 | 1,515 | 2,527,399 | 2,292,818 |
| Sterlington | 10 | 224 | LA | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Sterlington | 7AB | 102 | LA | 100% | Gas/Oil | 2486 | 2,486 | 1 | 1 | | |
| Sterlington | 7C | 101 | LA | 100% | Gas/Oil | 2303 | 2,303 | 1 | 1 | | |
| Totals | | 427 | | | | | 4,789 | 2 | 3 | 4,794 | 4,349 |
| Waterford | 1 | 411 | LA | 100% | Gas/Oil | 107881 | 107,881 | 43 | 65 | | |
| Waterford | 2 | 411 | LA | 100% | Gas/Oil | 464868 | 464,868 | 186 | 279 | | |
| Waterford | 4 | | LA | 100% | Gas/Oil | 1485 | 1,485 | 1 | 1 | | |
| Totals | | 822 | | | | | 574,234 | 229 | 344 | 574,807 | 521,456 |
| White Bluff | 1 | 465 | AR | 57% | Coal | 5314862 | 3,029,471 | 606 | 13,936 | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| White Bluff | 2 | 481 | AR | 57% | Coal | 5897951 | 3,361,832 | 672 | 15,464 | | |
| Totals | | 946 | | | | | 6,391,303 | 1,278 | 29,400 | 6,421,982 | 5,825,924 |
| Willow Glen | 1 | 172 | LA | 100% | Gas/Oil | 80476 | 80,476 | 32 | 48 | | |
| Willow Glen | 2 | 224 | LA | 100% | Gas/Oil | 72014 | 72,014 | 29 | 43 | | |
| Willow Glen | 3 | 522 | LA | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Willow Glen | 4 | 568 | LA | 100% | Gas/Oil | 694537 | 694,537 | 278 | 417 | | |
| Willow Glen | 5 | 559 | LA | 100% | Gas/Oil | 0 | 0 | 0 | 0 | | |
| Totals | | 2045 | | | | | 847,027 | 339 | 508 | 847,874 | 769,178 |
| **Totals** | | | | | | **52,345,964** | **37,438,476** | **11,653** | **88,891** | 37,539,020 | 34,054,826 |

(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 for RS Cogen is 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.

## 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 2012, Entergy reported 2011 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 2011) [obtained from Fossil Operations unless otherwise noted] | CO2e Emissions reported under Mandatory Reporting Rule (metric tons of all gases in 2011) [obtained from Fossil Operations unless otherwise noted] |
|---|---|---|---|
| **Fossil fuel generating stations** | | | |
| Buras | 19 | 21,154.9 | 19,191.7 |
| A.B. Paterson | 159 | 0.0 | 0.0 |
| Acadia | 578 | 0.0 | 0.0 |
| Attala | 455 | 0.0 | 0.0 |
| Baxter Wilson | 1321 | 0.0 | 0.0 |
| Big Cajun | 247 | 0.0 | 0.0 |
| Calcasieu | 310 | 0.0 | 0.0 |
| Cecil Lynch | 210 | 86.1 | 78.1 |
| Delta | 207 | 0.0 | 0.0 |
| Gerald Andrus | 761 | 17,469.0 | 15,847.9 |
| Hamilton Moses | 144 | 0.0 | 0.0 |
| Harvey Couch | 161 | 0.0 | 0.0 |
| Independence | 804 | 98.9 | 89.7 |
| Lake Catherine | 756 | 0.0 | 0.0 |
| Lewis Creek | 520 | 0.0 | 0.0 |
| Little Gypsy | 1253 | 4,468.0 | 4,053.4 |
| Louisiana Station | 354 | 242.9 | 220.4 |
| Mablevale | 56 | 31,843.5 | 28,888.4 |
| Michoud | 918 | 0.0 | 0.0 |
| Monroe | 73 | 0.0 | 0.0 |
| Natchez | 73 | 0.0 | 0.0 |
| Ninemile Point | 1827 | 0.0 | 0.0 |
| Ouachita | 770 | 587.1 | 532.6 |
| Perryville | 691 | 0.0 | 0.0 |
| Rex Brown | 354 | 97.1 | 88.1 |
| RISEC | 583 | 0.0 | 0.0 |
| Robert Ritchie | 900 | 0.0 | 0.0 |
| RS Cogen | 213 | 0.0 | 0.0 |
| RS Nelson | 1031 | 22,029.7 | 19,985.4 |
| Sabine | 1890 | 110,518.6 | 100,262.5 |
| Sterlington | 386 | 0.0 | 0.0 |
| Waterford 1&2 | 822 | 663.1 | 601.6 |
| White Bluff | 946 | 189.8 | 172.2 |
| Willow Glen | 1752 | 148,928.8 | 135,108.2 |
| Fossil fuel totals | 21,544 | 358,377.6 | 325,120.2 |

| **Other small plants** | | | |
|---|---|---|---|
| Charity boiler | capacity | total MMBtu | total |
| 3 boilers | 52.9 | 1,390,212 | 81,362 |

| | | 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 | **517,309** |

## 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.**

| 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.<br><br>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.<br><br>"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**

| 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 | 3,082,798 | 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.

**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 | 138.13 |
| diesel | 3,082,798 | 0.26 | 801.53 | 0.900 | 279.04 |
| total | | | | | **417.16** |

| 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 | 21.27 |
| diesel | 3,082,798 | 0.58 | 1,788.02 | 2.008 | 42.17 |
| total | | | | | **63.43** |

| | |
|---|---|
| **total N2O and CH4 CO2e** | **480.60** |

| | |
|---|---|
| **Total Estimated Emissions from Mobile Sources (short tons CO2e)** | **58,400** |

## 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.

**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 | 6 |
| Plastic | 0 | 0.00 | 0.0064 | 0 | 0 | 0 |
| sub-total | 35.6 | 57.28 | | 0 | 0 | 6 |
| **Main pipe - ENO** | | | | | | |
| Steel (protected, coated) | 868 | 1,396.61 | 0.0365 | 51 | 56 | 1,180 |
| 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 | 4,314 |
| sub-total | 1,678 | 2,699.90 | | 1,230 | 1,356 | 28,455 |
| **Main pipe - EGSI** | | | | | | |
| Steel (protected, coated) | 802 | 1,290.42 | 0.0365 | 47 | 52 | 1,090 |
| 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 | 2,645 |
| Plastic | 894 | 1,438.45 | 0.1953 | 281 | 310 | 6,504 |
| sub-total | 1,721 | 2,769.09 | | 2,850 | 3,142 | 10,239 |
| **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 | 2,787 |
| Unprotected (coated steel) | 32,611 | | 0.0326 | 1,062 | 1,171 | 24,587 |
| Plastic | 34,783 | | 0.0002 | 6 | 7 | 145 |
| sub-total | 102,800 | 0.00 | | | | 27,518 |
| **Services - EGSI** | | | | | | |
| Cathodically protected (coated steel) | 44,337 | | 0.0034 | 151 | 166 | 3,490 |
| Unprotected (coated steel) | 0 | | 0.0326 | 0 | 0 | 0 |
| Plastic | 48,586 | | 0.0002 | 9 | 10 | 202 |
| sub-total | 92,923 | 0.00 | | | | 3,692 |

Total CO2e from pipeline system: 69,910

| 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 | 8,499.69 |
| Commercial meters (1) | 7,463 | 0.00092 | 6.87 | 7.57 | 158.94 |
| **Meters - EGSI** | | | | | |
| Residential meters | 95,397 | 0.00265 | 252.80 | 278.66 | 5,851.94 |
| Commercial meters (1) | 5,524 | 0.00092 | 5.08 | 5.60 | 117.64 |
| sub-total | 246,944 | | | 697 | 14,628 |

### 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 | 15,644 | See note 3 |
| vented emissions from storage facilities | 1 | 217.3 | 217.3 | 239.7 | 5,033 | See note 4 |
| sub-total | | | | | **20,678** | |

Totals for fugitive natural gas: **105,216** 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 2012 inventory turnover data. Basically, as Entergy orders SF6, it is assumed that the ordered amount is required to replace SF6 that has been emitted.**

| 2009 fugitive SF6 emissions | | |
|---|---|---|
| SF6 Emissions (lbs.) (1) | **Potential (GWP) (2)** | Equivalent Emissions |
| 13,455 | 23,900 | **160,787** |

1) Assumes 115 lbs per cylinder
2) SF6 GWP from the IPCC Third Assessment Report

## 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, 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.

**2004**

| **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 | 58,400 | 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 cl | 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 | 0.84 | 0.00084 | **0.00092** |
| | 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 (1,300). | 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=1300 | 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% | 208 | 20 | 15,000 | 8.87 | 6,653 | **3.1%** |
| light truck | 1.2 | 20% | 312 | 15 | 15,000 | 8.87 | 8,870 | **3.5%** |

## Power purchased to serve utility customers

**Controllable power purchases**

| Code | Plant description | | State | 2012 Total Entergy purchased from plant (MWh) | 2012 Unit-Specific Emission Factor (lbs CO2/MWh) [from eGRID2012 (v1.0 - 2009 data)] | 2012 CO2 emissions from puchased power (short tons) [using eGRID Unit-Specific Factors (when available)] | Comments/Notes |
|---|---|---|---|---|---|---|---|
| [redacted] | | | AR | 35173 | 983.84 | 17,302.3 | |
| | | | AR | 169223 | 988.06 | 83,601.2 | |
| | | | LA | 152255 | 1,497.19 | 113,977.3 | |
| | | | MS | 167420 | 1,013.16 | 84,811.6 | |
| | | | LA | 86556 | 1,407.10 | 60,896.5 | |
| | | | LA | 407441 | 2,172.93 | 442,670.4 | |
| | | | TX | 39494 | 766.39 | 15,133.9 | |
| | | | LA | 2804195 | 704.05 | 987,146.7 | |
| | | | MS | 24700 | 888.89 | 10,977.8 | |
| | | | LA | 25675 | 920.09 | 11,811.7 | |
| | | | MS | 5758 | 1,371.06 | 3,947.3 | |
| | | | TX | 2617028 | 921.66 | 1,206,005.0 | |
| | | | LA | 152951 | 678.18 | 51,864.2 | |
| | | | MS | 669442 | 813.71 | 272,365.8 | |
| | | | LA | 577 | 605.29 | 174.6 | |
| | | | TX | 1670269 | 874.82 | 730,592.4 | |
| | | | TX | 113376 | 1,585.03 | 89,852.2 | |
| | | | AR | 13515 | 900.27 | 6,083.6 | |
| | | | LA | 1215 | 2,067.12 | 1,255.8 | |
| | | | TX | 150039 | 2,229.79 | 167,277.7 | |
| | | | AR | 12990 | 2,169.30 | 14,089.6 | |
| | | | AR | 140380 | 1,154.77 | 81,053.3 | |
| | | | AR | 59510 | 2,118.99 | 63,050.5 | |
| | | | LA | 25812 | 1,328.28 | 17,142.8 | |
| | | | LA | 14874 | 1,640.83 | 12,202.9 | |
| | | | AR | 967263 | 847.18 | 409,722.9 | |
| | | | LA | 2789576 | 880.31 | 1,227,845.8 | |
| | | | AR | 98714 | 620.95 | 30,648.2 | |
| | | | AR | 19844 | 1,002.41 | 9,945.9 | |
| | | | LA | 14983 | 991.97 | 7,431.3 | |
| | | | AR | 2282251 | 943.67 | 1,076,845.9 | |
| | | | TX | 14115 | 732.68 | 5,170.9 | |
| | | | MS | 6300 | 1,406.84 | 4,431.5 | |
| | | | AL | 182279 | 2,092.50 | 190,709.4 | |
| | | | TX | 54481 | 735.23 | 20,028.0 | |

* - site specific emission factor not available - used SERC MS Valley Factor

| | | | | | |
|---|---|---|---|---|---|
| **Totals** | 15,989,674 | | 7,528,067.1 | **Total DU Power Purchases (from Utility Acctg)** | **32,982,748** |
| CH4 emissions from controlled purchases (SERC MS Valley eGRID 2012 factor*) | 0.01945 | lbs/MWh | | | 3,265 |
| N2O emissions from controlled purchases (SERC MS Valley eGRID 2012 factor*) | 0.01065 | lbs/MWh | | | 26,395 |

* - 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** **7,557,728** 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 2012 factor) | 1002.4119 | lbs/MWh | 16,993,074 | 8,517,030 |
| CH4 emissions from non-controllable purchases (SERC MS Valley eGRID 2012 factor) | 0.01945 | lbs/MWh | | 3,470 |
| N2O emissions from non-controllable purchases (SERC MS Valley eGRID 2012 factor) | 0.01065 | lbs/MWh | | 28,051 |
| | | | | **8,548,552** |

* - 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 | 2009 total pchsd power MWh | % of total | intensity (tons/MWh) |
|---|---|---|---|---|---|
| **Controllable** | 7,557,728 | 46.92% | 15,989,674 | 48.48% | 0.473 |
| **Non-controllable** | 8,548,552 | 53.08% | 16,993,074 | 51.52% | 0.503 |
| | 16,106,279 | | 32,982,748 | | |

| **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 | 32,982,748 | 5.4% | 1,781,068 | 1002.4119 | 892,682 |
| CH4 emissions from T&D losses of purchased power on Entergy system | | | | 0.01945 | 364 |
| N2O emissions from T&D losses of purchased power on Entergy system | | | | 0.01065 | 2,940 |
| Total CO2e from losses from purchased power | | | | | **895,986** |

| **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

## 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.**

| | | | | 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=21 | 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=310 | 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)<br>2.7 (elect gen) | 0.038<br>0.057 | 0.083<br>0.125 | 0.0005<br>0.0008 | .54 (ind)<br>.54 (elect gen) | 0.1674<br>0.1674 | 0.369<br>0.369 | 0.0023<br>0.0023 |
| 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)<br>2.7 (elect gen) | 0.038<br>0.057 | 0.083<br>0.125 | 0.0005<br>0.0007 | 1.8 (ind)<br>2.7 (elect gen) | 0.1674<br>0.1674 | 0.369<br>0.369 | 0.0021<br>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)<br>0.95 (elect gen) | 0.100<br>0.020 | 0.220<br>0.044 | 0.0019<br>0.0004 | 0.095 (ind)<br>.095 (elect gen) | 0.029<br>0.029 | 0.065<br>0.065 | 0.0006<br>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)<br>1.0 (elect gen) | 0.210<br>0.021 | 0.463<br>0.046 | 0.0022<br>0.0002 | 1.4 (ind)<br>1.4 (elect gen) | 0.43<br>0.43 | 0.96<br>0.96 | 0.0046<br>0.0046 |
| 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) | 0.632 | 1.394 | 0.0068 | 4 (ind/elect gen) | 1.24 | 2.74 | 0.0134 |
| 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 | the 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 | 12 +/- 3 | 21 |
| Nitrous oxide (N2O) | 120 | 310 |
| HFC-23 | 264 | 11,700 |
| HFC-125 | 32.6 | 2,800 |
| HFC-134a | 14.6 | 1,300 |
| HFC-143a | 48.3 | 3,800 |
| HFC-152a | 1.5 | 140 |
| HFC-227ea | 36.5 | 2,900 |
| HFC-236fa | 209 | 6,300 |
| HFC-4310mee | 17.1 | 1,300 |
| CF4 | 50,000 | 6,500 |
| C2F6 | 10,000 | 9,200 |
| C4F10 | 2,600 | 7,00 |
| C6F14 | 3,200 | 7,400 |
| SF6 | 3,200 | 23,900 |

Source: 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.

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. |