



# HOLY CROSS ENERGY

## CO<sub>2</sub> Emissions Calculation Methodology

### **System Emissions Factor Calculation:**

Holy Cross Energy gathers data from wholesale suppliers and government entities, including the US Energy Information Administration, the US Environmental Protection Agency, and the Colorado Public Utilities Commission. We look at specific generators and contracts used by our suppliers to provide electricity for customer use and gather data on fuel use, total generation, and transmission and distribution line losses. HCE staff uses the best information that is available in a timely fashion to calculate the annual carbon dioxide emissions associated with electricity used by HCE's members. Assumptions and inaccuracies in source data may introduce errors into the calculation. When more accurate information becomes available, HCE may revise its estimated emissions.

HCE estimates the total emissions from electricity used to serve the full load of each of HCE's wholesale providers and calculates its share of emissions from each supplier based on the quantities of electricity purchased from each (after adjusting for transmission losses). HCE then divides the total emissions tonnage by total customer sales for the year minus Wind Power Pioneer and Local Renewable Energy Pool sales to get a value for the systems emissions factor.

The calculation of total emissions from each supplier is based on reported fuel quantities and estimates of CO<sub>2</sub> associated with contracted and short term purchases. For generators that are owned and operated by HCE's wholesale suppliers, the reported fuel quantities burned by each generating unit are multiplied by the appropriate emission factors from The Climate Registry's General Reporting Protocol (available at [theclimateregistry.org](http://theclimateregistry.org)) to calculate CO<sub>2</sub> emissions from each station. For contract purchases, a similar approach is used when possible. If no specific generating station or fuel type is described in the contract (or the contract is unavailable), an estimate is made of the average emissions for the company providing that electricity, and a share of those emissions are assigned to the wholesale supplier based on their purchases. After accounting for transmission losses and other sales or purchases from specific resources, HCE calculates a purchase level emissions factor for each wholesale supplier and multiplies it by purchases from that supplier to calculate total CO<sub>2</sub> emissions required to serve HCE load.

The last calculation step involves adjusting HCE's sales to account for sales under the Wind Power Pioneers and Local Renewable Energy Pool programs. After subtracting these sales from HCE's total retail sales, this sum is divided into total emissions to calculate an emissions intensity factor in pounds per kilowatt-hour.



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### Personal Calculation:

Here’s a step-by-step method for calculating the emissions associated with your purchases of electricity from HCE.

1. Gather your electricity bills for the past year; you’ll need to find the kWh usage for each month, any charges for Wind Power or Renewable Power Pool, and the meter reading dates (called Service Dates on your bill).
2. Check your first and last month’s bill for the year to make sure that the electric usage doesn’t include kWh from the year before or after the one you’re trying to calculate.
  - The easiest way to adjust for usage outside the calendar year is to take the average usage for the first or last month of the calendar year (usage divided by the number of days in the billing period) and multiply it by the number of days in the calendar year.
3. Add your monthly usage for the year together to get the number of kWh you purchased from HCE for the year.
4. Add the number of dollars (if any) you were billed for Wind Power or the Renewable Power Pool together for the year (adjusting for any days outside the calendar year as you did for kWh purchases).
  - Multiply the number of dollars for Wind Power by 40 to calculate the number of kWh you purchased from the Wind Power Pioneers program.
  - Multiply the number of dollars for the Renewable Power Pool by 30 to calculate the number of kWh you purchased from the Local Renewable Energy Pool.
5. Subtract the renewable kWh you purchased (calculated in 4a and 4b), if any, from the number of kWh you purchased from HCE in total for the year.
6. Multiply the number of kWh you calculated in step 5 by the CO<sub>2</sub> emissions factor for the appropriate year.

| Year | Purchases (MWh) | Sales (MWh) | WPP/LREP Sales (MWh) | Emissions (Short tons) | Emission Factor (lb/kWh) |
|------|-----------------|-------------|----------------------|------------------------|--------------------------|
| 2009 | 1,224,955       | 1,191,298   | 22,344               | 1,036,400              | 1.77                     |
| 2008 | 1,244,183       | 1,183,035   | 19,191               | 1,008,200              | 1.73                     |
| 2007 | 1,173,203       | 1,117,793   | 11,761               | 1,002,300              | 1.81                     |
| 2006 | 1,135,948       | 1,081,922   | 10,457               | 1,049,000              | 1.96                     |
| 2005 | 1,080,417       | 1,032,137   | 10,501               | 955,700                | 1.87                     |



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Example customer emissions calculation for 2008.

| Bill # | Start Date | End Date  | Monthly Usage | Wind Power \$ | Renewable Power Pool \$ | Adjusted Usage    |
|--------|------------|-----------|---------------|---------------|-------------------------|-------------------|
| 1      | 12/4/2008  | 1/7/2008  | 1416          |               |                         | 1,416             |
| 2      | 1/7/2008   | 2/4/2008  | 1149          |               |                         | 1,149             |
| 3      | 2/4/2008   | 3/4/2008  | 1057          |               |                         | 1,057             |
| 4      | 3/4/2008   | 3/31/2008 | 949           |               |                         | 949               |
| 5      | 3/31/2008  | 4/29/2008 | 830           | \$ 5.00       |                         | 630               |
| 6      | 4/29/2008  | 6/2/2008  | 690           | \$ 5.00       |                         | 490               |
| 7      | 6/2/2008   | 7/9/2008  | 733           | \$ 5.00       |                         | 533               |
| 8      | 7/9/2008   | 8/7/2008  | 706           | \$ 5.00       |                         | 506               |
| 9      | 8/7/2008   | 9/4/2008  | 720           |               | \$ 2.50                 | 645               |
| 10     | 9/4/2008   | 10/2/2008 | 764           |               | \$ 2.50                 | 689               |
| 11     | 10/2/2008  | 11/1/2008 | 808           |               | \$ 2.50                 | 733               |
| 12     | 11/1/2008  | 12/4/2008 | 1144          |               | \$ 2.50                 | 1,069             |
| 13     | 12/4/2008  | 1/7/2009  | 1503          |               | \$ 2.50                 | 1,428             |
|        |            |           |               |               |                         | <b>11,294 kWh</b> |

Year: 2008

Emissions Factor: 1.73 lb/kWh

Total Emissions: 19,539 lb

Enter the meter read dates for each bill and the total usage quantity for each month.  
 Enter the dollar amount you were billed for participation in the Wind Power Pioneers or Renewable Power Pool programs (if any).