

Partner Information

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Miller Brewing Company

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- 3. Inventory Manager
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Boundary Conditions

Organizational

- 5. Inclusion of Partially Owned or Controlled Assets
The Control Approach will be used to account for GHG emissions from Miller Brewing Company facilities. Miller Brewing maintains 100% control over its production facilities and will report 100% of the emissions from each facility. The company’s corporate headquarters will also be included. However, leased market area offices, many of which are located in office structures over which the company has little or no control of operations, will be excluded from the inventory.

- 6. Facilities List

Table 1: Facility List

Facility Name	Facility Location	Abbreviation	Control	Production Facility
Albany	Albany, GA	ALB	100%	Yes
Eden	Eden, NC	EDN	100%	Yes
Fort Worth	Fort Worth, TX	FTW	100%	Yes
Irwindale	Irwindale, CA	IRW	100%	Yes
Milwaukee	Milwaukee, WI	MKE	100%	Yes
Trenton	Trenton, OH	TRN	100%	Yes
Tumwater	Tumwater, WA	TUM	100%	Yes
Leinenkugel's Chippewa Falls	Chippewa Falls, WI	LCF	100%	Yes
Leinenkugel's 10th St	Milwaukee, WI	L10	100%	Yes
Corporate Offices	Milwaukee, WI	CRP	100%	No
Watertown Hops	Watertown, WI	WTH	100%	No

Miller Brewing Company holds no international operations. The GHG Inventory does not include emissions from the distributors’ truck and rail fleets used to distribute Miller’s products. The distributors’ are privately owned and Miller has no control over the fleet operations that transport products from breweries to retail markets.

Operational

- 7. GHG List
CO₂, CH₄, and N₂O are included in the GHG Inventory. The primary refrigerant for process cooling is ammonia, which is not a GHG. The secondary refrigerant sources at our facilities are not HFC refrigerants and have no required reporting requirements under the

Climate Leaders guidance for refrigerant emissions. The one exception is the use of R-134a in one corporate office building for comfort cooling which is included in the inventory.

Carbon dioxide generated in the fermentation process is a valuable by-product and is collected and reused in aging and packaging operations at the brewery. In some cases it may be collected and sold off-site. These process emissions are not included in this GHG Inventory. Miller recognizes that there are minor CH₄ emissions from coal piles present at the three plants that burn coal (ALB, EDN, TRN). These minor emissions are calculated using the approved protocol (Section 10.1.2 of Appendix X of the California Climate Action Registry General Reporting Protocol). As mentioned in item 6, greenhouse gas emissions from the rail and truck fleets used to distribute Miller's products will not be included in the GHG Inventory.

8. Emission Source Identification Procedure

Corporate engineers compiled a list of equipment that contributes to direct emission totals and sent the list out to each facility for the staff to review. The list was returned and the necessary updates were made. Each facility had the items associated with its emissions checked and entered into the tables below. Indirect emission sources were identified from purchasing records and consist of electricity import at all facilities, steam import at one facility (L10), and electricity export at another facility (TRN).

9. Direct Sources

Table 2: Emission Sources

	Direct Sources								
	Stationary Combustion								
	Boiler	Backup Generator	Fire Pump	Dock Heater	Biogas Flare	Gas Turbine Generator	Ammonia Compressor	Hot Water Heater	Furnace
ALB	X	X	X						
EDN	X		X						
FTW	X	X	X	X	X				
IRW	X	X	X			X	X		
MKE	X			X				X	
TRN	X		X						
TUM	X	X	X						
LCF	X								X
L10									
CRP	X	X						X	
WTH	X								

- Stationary Sources: See Table 2 above. The biogas flare at FTW is not in regular use due to plant operations, it is only used in emergency situations.
- Mobile Sources: There are no mobile sources included in the inventory (see item 6).
- Fugitive Sources: CH₄ emissions from transportation and storage of coal have been found to be de-minimis and are calculated annually based on fuel purchases. Fugitive emissions from comfort cooling in a corporate building are calculated using the HFCs estimate tool provided by E source (EPA contractor).
- Process Sources: Carbon dioxide generated during the fermentation of malt beverages is not included in this inventory (see item 7).

10. Indirect Sources – Energy Import / Export

Table 3: Emission Sources

	Indirect Sources		
	Electricity Import	Electricity Export	Steam Import
ALB	X		
EDN	X		
FTW	X		
IRW	X		
MKE	X		
TRN	X	X	
TUM	X		
LCF	X		
L10	X		X
CRP	X		
WTH	X		

Electricity generated at TRN may be exported back to the electrical grid. The total amount of electricity exported is tracked and deducted from the company's emission profile in accordance with Section 2 of the Indirect Emissions from Purchases/Sales of Electricity and Steam Guidance (equations 5 and 6).

11. Optional Sources

Optional emissions in the form of a voluntary increase in the purchased electricity emission factor will be reported to account for transmission and distribution (T&D) losses from the utility's power sources to our facilities. This will better show the effect that an increase in on-site generation of electricity for supply reliability in California has had on overall company emissions. The national average T&D loss factor used initially will be 9%; this factor will be updated in subsequent years if any changes are made to the national T&D loss factor or if regional T&D loss factors are published (DOE is proposing regional factors as in an update to the 1605(b) program). The inventory will not contain optional emissions of any other type.

Emissions Quantification

12. Quantification Method

See Appendix 1 for emission factor calculations. The calculations were performed according to the EPA Stationary Source and Indirect Emissions from Purchases/Sales of Electricity and Steam Guidance. Factors not directly linked to the Climate Leaders guidance includes; methane emissions from purchased coal, fugitive emissions of refrigerants and T&D losses.

13. Emission Factors and Other Constants

The emission rates for the fossil fuels used in our operations can be found in Appendix 1. The factors are either Climate Leaders default values from the Stationary Sources Guidance or calculated using accepted Climate Leaders formulae in the Stationary Sources Guidance (as listed in Appendix 1). The factors have the CO₂ equivalent emission factors for CH₄ and N₂O added to the CO₂ emission factor to generate a total CO₂e emission factor for fossil fuel consumption.

Imported electricity emission factors are eGrid Subregion Rates provided by Climate Leaders on pages 20 and 21 of the Indirect Emissions from Purchases/Sales of Electricity and Steam Core Module Guidance. The factors have been calculated to include the CO₂ equivalent emission factors for CH₄ and N₂O. See attached Electricity Emission Factor calculation worksheet for sample calculation and details.

Imported steam emission factor for L10 calculated using equation 5 on page 9 of the Indirect Emissions from Purchases/Sales of Electricity and Steam Guidance. WE Energies, the owner of the CHP plant that supplies the steam, provided the input data for the steam calculation. See Appendix 2 for sample calculation and details.

Data Management

14. Activity Data

Coal burning breweries ALB and EDN maintain large coal piles and report coal usage based on belt scale measurements. TRN maintains only a small coal pile and reported coal usage had been based on monthly purchase records until 2005. In late 2004 a new control system installed in the TRN powerhouse has allowed for coal use to be determined from metered steam production data.

Fuel oil is used as a secondary fuel and because of storage capacity, may or may not be purchased in the month or year that it is consumed. Meters and level gauges in the fuel oil system are used to determine the quantity consumed.

Propane is maintained onsite at WTH as a secondary fuel and is purchased rarely, for this reason a level gauge on the tank is used to determine the quantity consumed during the given year.

Biogas is not purchased; it is produced as a valuable by-product during the anaerobic treatment of brewery wastewater at FTW. A meter in the biogas supply system is used to determine monthly consumption. The biogas flare is not in regular use due to plant operations, it is only used in emergency situations. During normal operation the brewery's boilers consume all biogas produced.

The quantity of natural gas used is obtained from monthly purchase records from the individual facility's natural gas supplier.

Electricity import is obtained from the monthly purchase records from a facility's electric utility. Steam import at L10 is obtained from the monthly purchase records from the steam utility.

Where data is gathered at the facility and reported, the meters are read and recorded by hand or by a control system (where available). Each facility maintains records detailing the usage on an interval basis. These facility records are used to check meters for accuracy and utility bills for errors and are the source for the data in their Energy and Environmental Report (EER).

Purchasing records are maintained in the corporate Operations Performance Report (OPR) and will be compared to fuel consumption records as a check on the figures used for reporting in the GHG Inventory. The OPR includes operations data compiled from sources throughout the company, with fuels and energy consisting of only a portion of the report. The fuel and energy usage data in the OPR are purchasing records, which may differ from each facility's records of actual fuel consumed in cases of fuels that may be stored on-site (i.e. coal, fuel oil). Facility records of fuel consumption are used for a number of data sources where tracking activity data through purchasing records may be inaccurate (ALB and EDN coal piles, see note above). Table 4 details which of the two record sources are used for each item in the company's emissions profile.

Table 4: Activity Level Data Sources

	Coal		Fuel Type				Indirect Source					
	Corporate OPR	Facility Records	Natural Gas	Fuel Oil #2	Fuel Oil #6	Propane	Biogas	Electricity Import	Electricity Export	Steam Import		
	Corporate OPR	Facility Records	Corporate OPR	Facility Records	Corporate OPR	Facility Records	Corporate OPR	Facility Records	Corporate OPR	Facility Records	Corporate OPR	Facility Records
ALB		X			X			X				
EDN		X			X	X		X				
FTW			X					X				
IRW			X					X				
MKE			X		X				X			
TRN	X		X					X		X		
TUM			X						X			
LCF			X		X				X			
L10									X			X
CRP			X		X				X			
WTH			X				X		X			

15. Data Management

The inventory information provider compiles data for each facility’s sources and enters them into the EER. Recording is completed by hand or through the use of automated metering systems and is reported to the inventory information provider. The inventory information providers at each facility check reported data before entering into the EER and forward it to the inventory coordinator at the corporate office. Data points are checked against previous monthly and annual results for the same items at the facility and corporate levels.

The reporting process has been in place since 1997 and its current form since July of 2002 at the major breweries (ALB, EDN, FTW, IRW, MKE, and TRN). The smaller breweries and non-production facilities (CRP, TUM, LCF, L10, and WTH) were integrated in 2004, although information dating to 2001 has been gathered and entered to include the facilities in the base year.

16. Normalization Factor(s) Selection

The normalization factor selected by Miller is a barrel of product. A barrel is equal to 31 gallons and is the accepted measure of production in the malt beverage industry. Barrels are used as the normalization factor for all internal benchmarks and are the independent variable that utility usage is based on within the company. The production of beer is very energy intensive and during a high production year the CO2 emissions for the company could be significantly higher if not normalized.

17. Data Collection Process – Normalization Factor

Production values used for normalization are reported monthly on operations reports to the inventory coordinator at the corporate offices. These values are checked for consistency with values from past months and previous years. The monthly results are summed to provide the annual value used for Climate Leaders reporting.

18. Data Collection Process – Quality Assurance

Data is monitored on a monthly basis by the inventory coordinator when reported to corporate on the Energy and Environmental Reports (WTH and CRP report quarterly). Any significant variations from the established benchmark or from month-to-month are identified and investigated for consistency. Brewery personnel track and compare the monthly normalized utility usages published by corporate (published reports include current targets, previous monthly and annual results) with their on-site results as a second check of the data

retained at the corporate level. The breweries' checks are normally performed by the inventory information provider.

19. Data Collection System Security

Spreadsheets containing greenhouse gas and energy use information are password protected for both read and write privileges at the corporate level. Access to folders where spreadsheets reside is restricted to only those people requiring use of the spreadsheets and is controlled by the inventory manager.

20. Integrated Tools

Corporate energy and environmental reporting system integrates many factors, including water, wastewater, energy, and solid waste figures. Each location's inventory information provider files Energy and Environmental Report (EER) that is the tool used to convey raw energy and environmental data to the inventory coordinator at the corporate level.

21. Frequency

Data is reported to the corporate level on a monthly or quarterly basis and is directed to the inventory coordinator.

Base Year

22. Adjustment – Structural Changes

In the event of an acquisition of a facility that existed during the base year the facility's base year emissions will be added to the company's emissions. If the facility did not exist in the base year no adjustment to the company's baseline will be made.

In the event of a divestiture of a facility that existed during the base year the facility's emissions will be subtracted from the company's emissions. If the facility did not exist in the base year no adjustment to the company's baseline will be made.

In the event of a merger or insourcing/outsourcing the emissions from facilities included in the structural change will be treated as an acquisition if ownership increased or as a divestiture if ownership decreased.

In the event of organic growth (increase in production, opening of new plants, et. al.) or organic decline (decrease in production output, closing of plants, et. al.) no adjustments will be made to the baseline.

Capital projects may also affect the inventory structurally. The capital project authorization process requires a sign-off by a member of the environmental group that will notify the inventory coordinator and manager of any potential impacts to the emissions profile.

23. Adjustment – Methodology Changes

If an adjustment is necessary; a description of the change, the person performing the change and the person authorizing the change will be kept in a log with the inventory.

For a change in calculation methodology the GHG Inventory from the base year forward will be updated.

Changes due to an updated emissions factor will become necessary when the emission factor data becomes available. A change in an emission factor will cause an update to the year the emission factor applies to (i.e. an emission factor based on 2002 data will apply to 2002 inventory and later inventories until emission factor data is updated for later years).

If an error has occurred it will be corrected and the change will be noted in the log.

Changes in calculation methodology will be necessary whenever Climate Leaders notifies partners of a new method or a correction to an existing method. Change due to an error will be necessary in the event of an error and its subsequent discovery.

Management Tools

24. Roles and Responsibilities

Inventory Information Provider – Typically the facility's environmental coordinator, but in some cases may be the utility manager or a staff engineer. This person is responsible for

the collection of data points from that facility, reporting of the data to the corporate office (on the Energy and Environmental Report) and acts as the contact person at the facility level. The inventory information provider is also responsible for notifying the inventory coordinator and manager of any changes at the facility that would affect the inventory.

Inventory Coordinator – Maintains the existing inventory and compiles new annual data as it becomes available. The inventory coordinator is also responsible for tracking, trending, and benchmarking the results. The inventory coordinator will make any adjustments or changes to the GHG Inventory, once approved by the inventory manager and senior management.

Inventory Manager – Supervise preparation of the inventory, provide support for inventory preparation where necessary, and is the company's external contact for the Climate Leaders program.

Senior Management – The corporate director of the environmental engineering group will be responsible for the final review and sign-off of the IMP and GHG Inventory at the end of each annual reporting period.

25. Training

The inventory coordinator and inventory manager have read and reviewed the Climate Leaders Protocol and Draft Guidance available at this point. The inventory development members have also consulted the WRI GHG Protocol for further clarification when necessary.

A read-only copy of Miller's IMP will be available to inventory information providers, the inventory coordinator, inventory manager and senior management through the Documentum system (see 26 below) so that employees with responsibility for portions of the inventory are able to review what is expected of them at any time.

Every year a training session will be held during the annual environmental coordinator's conference to discuss the program, including the goal and current progression towards the goal year. New employees responsible for any part of the reporting framework will be notified by the inventory manager of their responsibilities and instructed on the preparation of the Energy and Environmental Report. Reading and reviewing the IMP will be required of new employees that provide input to the company's GHG Inventory.

26. Document Retention and Control Policy

Climate Leaders documents will be retained indefinitely in electronic form. Hardcopy versions of Climate Leaders documents will be retained until goal year reporting is complete.

The current version of the IMP will be provided to the inventory information provider at each facility through Miller's electronic document management system, Documentum. Documentum allows for version control and access to be set by an administrator (the inventory coordinator) so that any members of the inventory development team do not reference old copies of the IMP.

Auditing & Verification

27. Internal Auditing

The IMP and GHG Inventory reporting mechanism will be audited for compliance with current protocols and guidance annually, before the report is submitted to Climate Leaders. The audit will be performed by the corporate members of the inventory team who will review the IMP to ensure that any new sources of emissions have been included and check the inventory for the just completed year prior to submittal.

28. External Validation and/or Verification

At this time Miller has no plans for an external audit of our inventory management plan or greenhouse gas inventory.

29. Management Review

Senior management will review the inventory IMP and GHG Inventory for consistency with company environmental policies and to maintain an understanding of the direction the company is proceeding in with regard to greenhouse gases.

30. Corrective Action

Actions to correct items noted during an internal or external review will be approached in much the same way as the correction of an error in the inventory. Required changes discovered in an audit and any suggested corrective action will be entered into the Change Log placed with the IMP and GHG Inventory in the Climate Leaders Documentum folder. The inventory coordinator will amend the Change Log to include the reason for the changes and the member of the management team that approved those changes. When the Change Log is updated the indexed file version will be updated to identify the new version. The change log does not include changes made to the Energy and Environmental Report, although if an audit suggests changes they will be listed in the Change Log.

Appendix 1

	Heat Content	Carbon Coefficient	Fraction Oxidized	CO2 Emission Factor	CH4 Emission Factor	CH4 Emission Factor/Unit	N2O Emission Factor	N2O Emission Factor/Unit	Total Emission Factor (Inc. CH4 & N2O)
Coal	Btu/lb	kg C/MMBtu		kg CO2/ton	g/GJ	kg CO2e/ton	g/GJ	kg CO2e/ton	kg CO2/ton
Albany	13,000	25.5	0.99	2,406.7	9.5	5.473	1.33	11.310	2,423.5
Eden	12,800	25.5	0.99	2,369.7	9.5	5.388	1.33	11.136	2,386.2
Trenton	12,500	25.5	0.99	2,314.1	9.5	5.262	1.33	10.875	2,330.3
Natural Gas	Btu/cf	kg C/MMBtu		kg CO2/mcf	g/GJ	kg CO2e/mcf	g/GJ	kg CO2e/mcf	kg CO2/mcf
All	1,027	14.47	0.995	54.22	4.5	0.102	0.09	0.030	54.35
Fuel Oil #2	Btu/gal	kg C/MMBtu		kg CO2/gal	g/GJ	kg CO2e/gal	g/GJ	kg CO2e/gal	kg CO2/gal
Albany	127,000	19.95	0.99	9.20	1.9	0.005	0.57	0.024	9.23
Others	138,000	19.95	0.99	9.99	1.9	0.006	0.57	0.026	10.03
Fuel Oil #6	Btu/gal	kg C/MMBtu		kg CO2/gal	g/GJ	kg CO2e/gal	g/GJ	kg CO2e/gal	kg CO2/gal
Eden	150,000	21.49	0.99	11.70	1.9	0.006	0.57	0.028	11.74
Biogas	Btu/cf	kg C/MMBtu		kg CO2/mcf	g/GJ	kg CO2e/mcf	g/GJ	kg CO2e/mcf	kg CO2/mcf
Fort Worth	800	14.2	0.995	41.45	4.5	0.080	0.09	0.024	41.55
Propane	Btu/gal	kg C/MMBtu		kg CO2/gal	g/GJ	kg CO2e/gal	g/GJ	kg CO2e/gal	kg CO2/gal
Watertown Hops	91,000	17.2	0.995	5.71	1.9	0.004	0.6	0.017	5.73

CO2 Emission Factor = HC X C X FO X (MW CO2/MW C)
 HC= Heat Content of Fuel (Energy/Mass or Volume)
 C= Carbon Content Coefficient of Fuel (Mass C/Energy)
 FO= Fraction Oxidized
 MW CO2= Molecular weight of CO2 (44)
 MW C= Molecular weight of C (12)
 (Equation 1, pp.4 of Stationary Combustion Sources - Guidance)

CH4 and N2O Emission Factors as CO2e = HC X EF X GWP
 HC= Heat Content of Fuel (Energy/Mass or Volume)
 CH4 or N2O EF= Emission Factor (g/GJ)
 GWP= Global Warming Potential (CO2 equivalents)
 (GWP CH4=21 and GWP N2O=310)
 (Equation 2, pp.7 of Stationary Combustion Sources - Guidance)

Appendix 2

Leinenkugel's 10th Street Steam Emission Factor Calculation			
Valley Plant (VP) Heat Output			
Fuel	Quantity (MMBtus)	Emission Factor (kg CO2/MMBtu)	CO2 Emissions (kg)
Coal	2,204,370	92.57	204,058,531
Natural Gas	5,993	52.79	316,370
Propane	29	62.73	1,819
	2,210,392		204,376,721
L10 Heat Input			
Purchase Steam (lbs)	Heat Value (btu/lb)		Total L10 Heat Input (MMBtus)
14,498,000	1,190		17,252.62
L10 Emissions from Steam Input = (Total L10 Heat Input / Total VP Heat Output) X Total VP Emissions			
L10 Emissions	1,595,207	kg CO2	
Emission Factor Calculation			
L10 Steam Import Emission Factor = L10 Emissions / L10 Imported Steam			
Emission Factor	0.1100	kg CO2/lb steam	