Sulzer Group Greenhouse Gas Protocol Report 2019

Reporting Standard

Sulzer's carbon footprint is calculated according to ISO 14064-1 as well as the Greenhouse Gas (GHG) Protocol (Rev. ed. March 2004) published by the World Business Council for Sustainable Development (WBCSD) and the World Resource Institute (WRI).

System Boundaries and Consolidation of Data

The following rules are valid with respect to the system boundary and the consolidation of data:

- Geographical system boundaries:

Site boundaries ("garden fence"); other than air travel for business purposes, outsourced activities such as transport, production of components and parts are not considered.

- Temporary system boundaries:

Sulzer's reporting period is 1 October 2018 – 30 September 2019.

- Consolidation:

Sulzer accounts for GHG emissions using the equity share approach. GHG emissions of sites where Sulzer owns a share of more than 50% are fully consolidated; emissions from other sites are accounted for according to Sulzer's share of ownership. Currently, all sites included in the reporting are fully consolidated.

- Restatements:
  - Data shown represent Sulzer as it was in the respective year;
  - Data are not restated in case of acquisition or divestiture of sites;
  - Inclusion or exclusion of sites is reported accordingly.

For additional information about Sulzer's data collection, data maintenance and report coverage (including a list of all sites assessed), please refer to Sulzer Annual Report 2019 at report.sulzer.com.

Base Year

While Sulzer has previously used 2009 as its baseline, as of 2015, Sulzer updated its GHG reporting procedure to use a rolling baseline, given the frequency of acquisitions and divestments. This means that in each reporting year, performance is compared to the previous year on a rolling basis.

Considered Scopes and Emission Factors Applied

In 2015 Sulzer amended the source of its emission factors to improve the accuracy and consistency of their annual reports going forward. Emission factors for fuels, heat and steam, air travel and global warming potentials (GWPs) [1] come from the UK Government GHG Conversion Factors for Company Reporting. National electricity generation emission factors are derived from the International Energy Agency (IEA) emissions factors[2]. Sulzer reviews and updates the emission factors used on an annual basis.

[1] GWP100 = Global Warming Potential relative to Carbon dioxide for a 100-year time span.
[2] www.iea.org

Scope 1 – Direct Emissions from Operations

Direct emissions from operations are reported from sites if applicable. Direct emissions from energy sources are calculated based on energy consumption reported by sites.

The following tables show the energy sources and related emission factors, as well as the energy sources considered and their GWP.

Table 1: The emission factors of fossil energy sources (UK Government GHG Conversion Factors, 2019)

Energy sources	CO_2-equivalent emissions [kg CO_2e/ kWh]	CO_2-emissions [kg CO_2/ kWh]	CH_4-emissions [kg CH_4/ kWh]	N_2O-emissions [kg N_2O/kWh]
Natural gas	0.18443	0.18409	0.000010	0.000100
Diesel	0.25267	0.24942	0.003220	0.000011
Petrol	0.24099	0.23961	0.000029	0.000002
Kerosene	0.24675	0.24553	0.000024	0.000002
Fuel oil	0.267820	0.266830	0.000350	0.000650
Propane/Butane	0.214470	0.214190	0.000140	0.000140

Table 2: The global warming potentials of relevant substances (UK Government GHG Conversion Factors 2019)

Category	Gas	Global Warming Potential
Diverse	Carbon dioxide (CO_2)	1
Diverse	Methane (CH_4)	28
Diverse	Nitrous oxide (N_2O)	265
HFC	HFC-134a	1,300
HFC	HFC-152a	138

Scope 2 – Indirect Emissions from the Use of Electricity and District Heating

Scope 2 includes indirect emissions from the use of electricity and district heating. The GHG Protocol's states that Scope 2 emissions are reported using two different quantification methods: location-based and market-based. The location-based method reflects the average emissions intensity of grids on which energy consumption occurs, whereas the market-based method reflects emissions from the electricity that companies have chosen in the market (or their lack of choice).

Due to the unavailability of source/supplier-specific emission factors, to calculate market-based emissions from the consumption of electricity, the national emissions factors from the IEA have been used. This means that the location and market-based emissions are identical. The IEA emissions factors are available only through a license from the IEA and therefore are not reproduced here.

Table 3 shows a breakdown of Sulzer's Scope 2 GHG emissions from the purchase of electricity and district heating.

Table 3: Scope 2 GHG emissions from the purchase of electricity and district heating

	Unit	2018	2019
Electricity location-based	t CO_2	54,573	54,886
Electricity market-based	t CO_2	54,573	54,886
District heating	t CO_2	1,425	1,328
Total		55,998	56,214

The district heating emission factor was obtained from the UK Government GHG Conversion Factors for Company Reporting 2019 and are designed for use of companies based within the UK. However, due to a lack of other county-specific factors this factor has been used for Sulzer's plants using district heating in France, Switzerland, China, Sweden, Russia, and Poland. In future, if country-specific district heating factors become available, Sulzer will consider applying these for more accurate calculations.

Table 4: CO_2 emission factors for the generation of district heating (UK Government, 2019)

Category	CO_2-equivalent emissions [kg CO_2e/ kWh]
District heating	0.17606

Scope 3 – Other Indirect GHG Emissions

Scope 3 is limited to indirect well-to-tank (WTT) transmission and distribution (T&D) emissions from fossil fuels, electricity and district heating and air travel and associated WTT emissions.

A brief explanation of Scope 3 emission categories is provided in Table 5.

Table 5: Scope 3 emission categories

Scope 3 emission category	Description
Indirect well-to-tank	Emissions associated with extraction, refining and transportation of the raw fuel sources to an organisation's site (or asset), prior to combustion.
Transmission and distribution	Emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it).
Air travel	Emissions associated with individuals flying for work purposes (aviation fuel combustion).
Well-to-tank air travel	Emissions associated with extraction, refining and transportation of the aviation fuel to the plane before take-off.

The emission factors published by the UK Government (2019) were applied.

Direct and Indirect GHG Emissions for Sulzer Group

Total Scope 1, 2 and 3 Emission CO_2-Equivalents

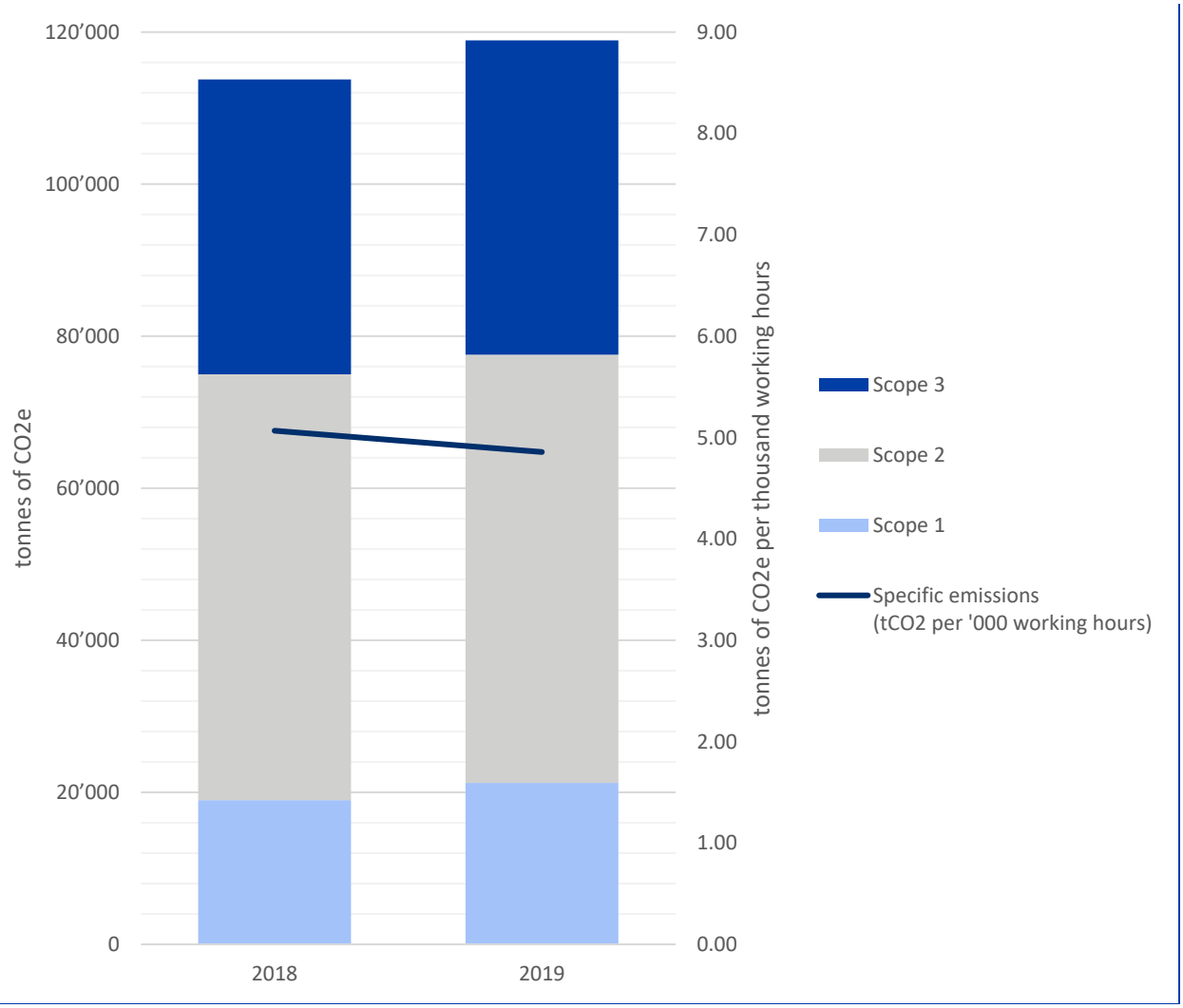
Sulzer reports GHG emissions (Scopes 1, 2, and 3) in its annual and sustainability reports.

In 2019, the total GHG emissions in absolute terms increased by 4.43% to 118,805 tCO_2e (2018: 113,764 tCO_2e). Notably, Scope 1 and Scope 3 emissions differed to a greater extent than Scope 2 emissions, with a 12% increase in Scope 1 emissions and a 7% increase in Scope 3 emissions against the previous year. Contributing factors to the increase in Scope 1 emissions included an increase in CO_2 emissions from petrol (83%), diesel (26%). A small increase in Scope 3 (WTT generation and T&D) emissions (1%) was observed, primarily due to a moderate increase in air travel emissions to 22,902 tCO2e (10%).

It should be noted that overall an increase in electricity consumption in the Sulzer portfolio (1%) was observed. Since emissions from purchased electricity are responsible for almost half of the Sulzer's total emissions, the efficiency gains from the reduction in the district heating emissions (7%) did not significantly affect the overall footprint.

With the overall increase of the GHG footprint, the specific CO_2e per 1,000 working hours (wh) nevertheless decreased by 4% to 4.85tCO2e/1000 wh (2018: 5.07tCO2e/1000wh). Given the overall increased number of working hours and reduced energy consumption, this indicator demonstrates lower energy and GHG emission intensity levels achieved by Sulzer.

Figure 1: Total Scope 1, 2 and 3 emissions CO_2-equivalents



In 2019, the GHG emissions in CO_2e broken down by scope were as follows:

Table 6: GHG emissions performance summary (using a location-based approach)

t CO2e	2018	**2019**	**Difference**
Scope 1	18,979	21,245	12%
Scope 2	55,998	56,214	0.4%
Scope 3	38,787	41,346	7%
Total	**113,764**	**118,805**	**4.43%**

Sulzer's portfolio has undergone some changes, with a further 5 sites being opened in this reporting year. Taken together these 5 sites are responsible for 467 tCO_2e in Scope 1 emissions, 104 tCO_2e in Scope 2 emissions and 2833 tCO_2e of Scope 3 emissions.

Table 7: Scope 1 GHG emissions from the usage of fossil energy sources

	Unit	2018	2019
CO_2	t CO_2	18,873	21,127
CH_4	t CO_2	19.3	25.2
N_2O	t CO_2	76.3	88.4

A lack of available refrigerant data was noted. In order to ensure the accuracy and completeness of GHG emissions from refrigerant gas losses, it is recommended that refrigerant gas losses data is made available in the next reporting year.

Share of Renewable Energy

The share of total energy consumption which comprises renewable energy (i.e. wood) is no longer separately reported, the last figures available are for the year 2011. The share of renewable energy directly used at sites is negligible.

Direct and Indirect GHG Emissions for highlighted GEKA sites

The following section highlights the Scope 1 and Scope 2 GHG emissions for a selection of Sulzer's sites.

Table 8 demonstrates the Scopes 1-3 total CO_2 emissions for the GEKA sites.

Table 8: Total GEKA Scope 1-3 CO_2 emissions

Site ID	Unit	Total Scope 1	Total Scope 2	Total Scope 3	Total
E75111	t CO_2	2,864	3,398	1,383	7,945
E75112	t CO_2	136	2,152	741	3,030
E75211	t CO_2	1	1,788	551	2,340
E75311	t CO_2	0	104	438	542

Figures 2, 3 and 4 (below) demonstrate that the Geka GmbH Germany Bechhofen site was responsible for the largest proportion of emissions: 95% of Scope 1 and 48% of Scope 2 emissions. In contrast, negligible Scope 1 and emissions were reported at the Geka do Brasil and the Geka Manufacturing Corporation Elgin sites. The Geka do Brasil site was responsible for the smallest proportion of Scope 2 emissions (1%). Regarding Scope 3 emissions, the Geka GmbH Germany Bechhofen site was responsible for the largest proportion of emissions (44%), with the remainder (24%) from the Geka GmbH Germany Bamberg site, Geka Manufacturing Corporation site at Elgin (18%) and Geka do Brasil site (14%) .

Figure 2 Scope 1 Direct GHG Emissions: Cross-site comparison

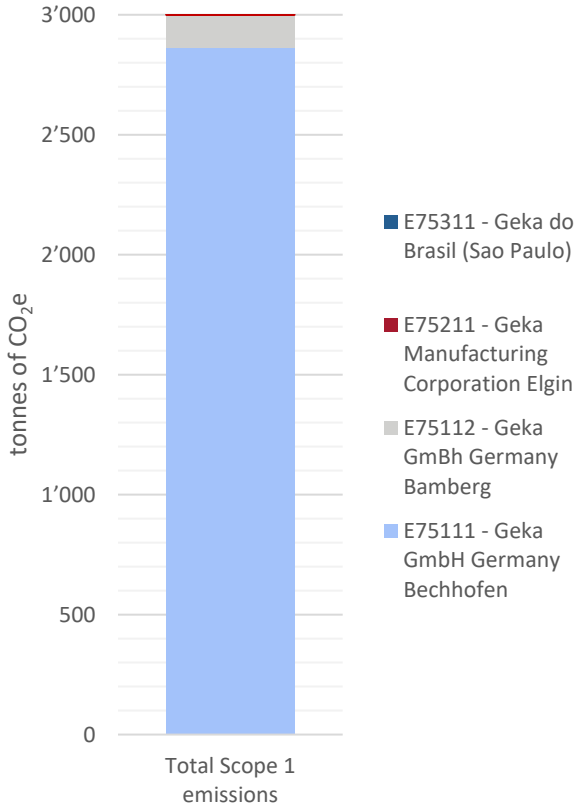


Figure 3 Scope 2 Indirect GHG Emissions: Cross-site comparison

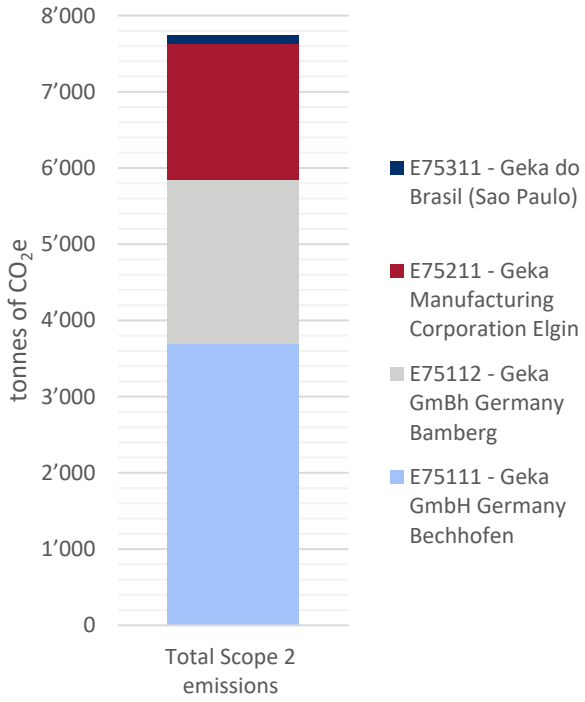
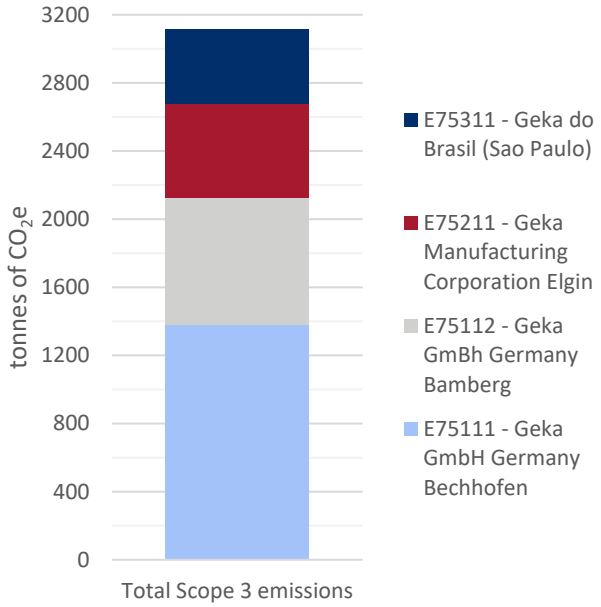


Figure 4 Scope 3 GHG Emissions: Cross-site comparison



Sources of Information

- UK Government: Conversion factors for company reporting; 2019
- IPCC, Geneva, Switzerland. pp 104, World Business Council for Sustainable Development, World Resource Institute; The Greenhous Gas Protocol, Revised Edition; Geneva and Washington; 2004.
- International Energy Agency (IEA) Emission Factors (2019). Paris, France.