Sulzer Group Greenhouse Gas Protocol Report 2017

Reporting Standard

Sulzer reports according to ISO 14064 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 in 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:
  - As of 2012, Sulzer's reporting period is 1 October – 30 September;
  - Until 2012, Sulzer's reporting period was 1 January – 31 December (the fiscal calendar year).

- Consolidation:

Sulzer accounts for greenhouse gas emissions using the equity share approach. Greenhouse gas 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 2017 at www.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, electricity, heat and steam come from the UK Government's Department for Business, Energy & Industrial Strategy (BEIS). National electricity generation emission factors are derived from the IEA emissions factors[1]. The global warming potentials (GWPs)[2] are obtained from the IPCC's fifth assessment report (AR5); the accepted standard for use in national GHG reporting under the UNFCCC. Sulzer reviews and updates the emission factors used on an annual basis.

[1] www.iea.org

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

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 substances considered and their global warming potentials.

Table 1: The emission factors of fossil energy sources (BEIS 2017)

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	0.184164	0.183808	0.000259	0.000097
Diesel	0.245227	0.243181	0.000049	0.001997
Petrol	0.233414	0.232289	0.000736	0.000389
Kerosene	0.246591	0.245364	0.000615	0.000611
Fuel oil	0.267892	0.266953	0.000333	0.000605
Propane/Butane	0.214510	0.214191	0.000155	0.000163

Table 2: The global warming potentials of relevant substances (IPCC AR5)

Category	Substance	Global Warming Potential
Diverse	Carbon dioxide CO2	1
Diverse	Methane CH4	28
Diverse	Nitrous oxide N2O	265
HFC	HFC-134a	1,300
HFC	HFC-152a	124

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

Scope 2 includes indirect emissions from the use of electricity and district heating. It also includes transmission and distribution losses from these sources. To calculate indirect emissions from the consumption of electricity, the national emissions factors from the International Energy Agency (IEA) have been used. These emissions factors are available only through a license from the IEA and therefore are not reproduced here.

The district heating emission factor was obtained from the UK Department for Business, Energy & Industrial Strategy (BEIS) and is for the UK. However, Sulzer has plants using district heating in Finland (closed in 2017), France, Switzerland, China, Sweden, Russia, and Poland. In future, if country specific district heating factors become available, Sulzer will consider applying them for more accurate calculations.

Table 3: CO_2 emission factors for the generation of district heating (BEIS 2017)

Category	CO_2-equivalent emissions [kg CO_2e/ kWh]
District heating	0.0272

Scope 3 – Other Indirect Greenhouse Gas Emissions

Scope 3 is limited to indirect well-to-tank and transmission and distribution emissions from fossil fuels, electricity and district heating. In 2017, air travel and well-to-tank air travel emissions were added to the reporting scope. A brief explanation of Scope 3 emission categories is provided in Table 4.

Table 4: 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 BEIS were applied.

Direct and Indirect GHG Emissions for Sulzer Group

Total Scope 1, 2 and 3 Emission CO_2-Equivalents

Sulzer reports greenhouse gas (GHG) emissions (Scopes 1, 2, and 3) in its annual and sustainability reports. GHG reporting is in accordance with the Greenhouse Gas Protocol.

In 2017, the total GHG emissions in absolute terms increased by 27% to 116,338 tCO_2e (2016: 91,440 tCO_2e). Expansion of the Scope 3 reporting boundary to include air travel emissions became the largest contributor to the GHG footprint increase adding over 21% (19,448 tCO_2e) compared to the last year's emissions. All other factors resulted in a net increase of 6%. Considering it in more detail, newly acquired facilities added almost 15% (16,294 tCO_2e) to the last year's footprint, whilst factors contributing to emission reduction included sites leaving Sulzer's portfolio and energy efficiency improvements.

The like-for-like analysis (excluding Scope 3 air travel emissions), demonstrates that the company's 2017 GHG footprint within the last year's reporting boundaries grew only by 6% primarily due to the new acquisitions. Emissions originating from fossil fuel and electricity consumption grew by 5% and 6% respectively, while district heating emission dropped by 38% as a result to the closure of the largest district heating consuming site.

With the overall increase of the GHG footprint, the specific CO_2e per 1,000 working hours (wh) increased by 33% to 5.38 tCO2e/1000 wh (2016: 4.03 tCO2e/1000wh). Within the last year's reporting boundaries, the increase of this indicator was limited to 11% (4.48 tCO2e/1000 wh).

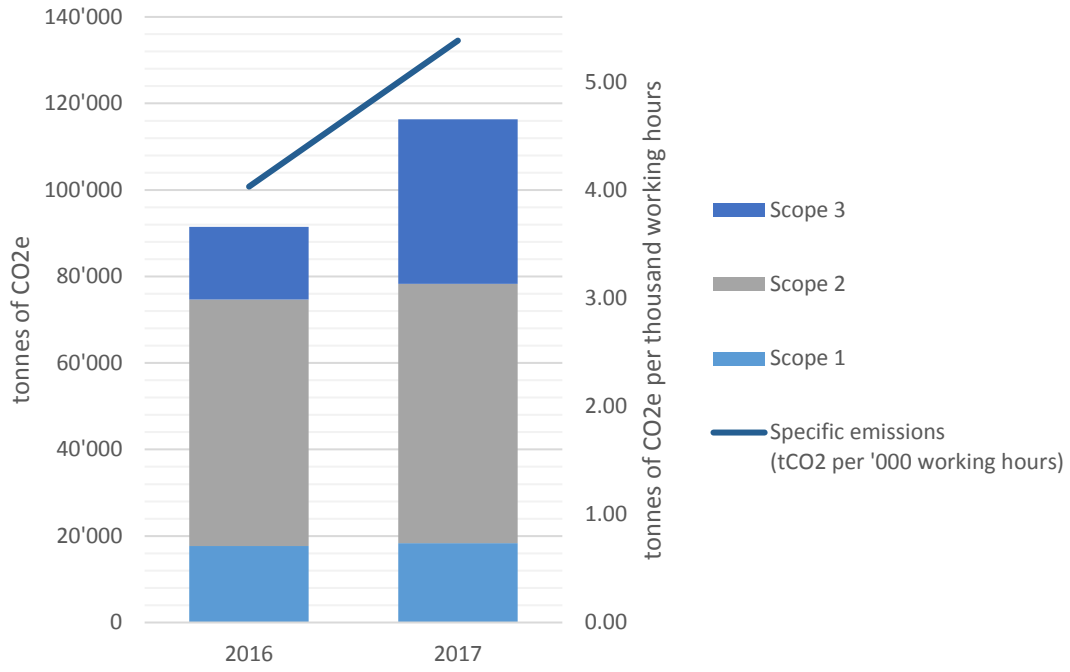
Scope 1 emissions are direct emissions from Sulzer and stem from primary energy sources such as natural gas and fuels used on site, as well as CO_2 and refrigerants used during processes.

Scope 2 emissions represent indirect emissions from secondary (converted) energy sources, such as electricity and district heating.

Scope 3 includes well-to-tank emissions for electricity generation or fossil fuel production, as well as indirect upstream and downstream emissions from electricity and district heating. Additional supply chain emissions from, for instance, business travel, employee commuting, or suppliers are

neither recorded nor published. In 2017, Sulzer has also included its air travel and associated well-to-tank emissions to its Scope 3 reporting.

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



In 2017, the GHG emissions in CO_2e broken down by scope were as follows:

Table 5: GHG emissions performance summary

t CO2e	2016	2017	Difference
Scope 1	17,690	18,366	4%
Scope 2	56,970	59,934	5%
Scope 3	16,780	38,038	127%
Total	**91,440**	**116,338**	**27%**

Sulzer's portfolio has undergone a number of significant changes in 2017, with new acquisitions being responsible for the major share of Scope 1 and Scope 2 emission growth. A significant increase of Scope 3 emissions (127%) occurred primarily due to the reporting boundary extension which now captures air travel emissions.

Table 6: Scope 1 GHG emissions from processes

	Unit	2016	2017
CO_2	t CO_2	6.00	0.08
HFC	t HFC	0.000	0.028
CFC	t CFC	0.000	0.000
HCFC	t HCFC	0.000	0.000

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

	Unit	2016	2017
CO_2	t CO_2	17,614	18,285
CH_4	t CH_4	1.0	0.9
N_2O	t N_2O	0.142	0.149

Table 8: Scope 1 GHG emissions in CO_2-equivalents

	Unit	2016	2017
CO_2	t CO_2e	17,620	18,285
CH_4	t CO_2e	24	23
N_2O	t CO_2e	42	44
HFC*	t CO_2e	0	14[3]
CFC	t CO_2e	0	0
HCFC	t CO_2e	0	0
Total		**17,687**	**18,366**

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.

Sources of Information

- BEIS; Government conversion factors for company reporting; 2017
- IPCC, Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change; Core Writing Team, Pachauri, R.K. and Reisinger, A. (Eds.); 2007.
- IPCC, Geneva, Switzerland. pp 104, World Business Council for Sustainable Development, World Resource Institute; The Greenhouse Gas Protocol, Revised Edition; Geneva and Washington; 2004.

[3] Includes HFC-134a and HFC-152a emissions