Sulzer Group Greenhouse Gas Protocol Report 2018

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 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, please refer to Sulzer Annual Report 2018 at https://report.sulzer.com/ar18.

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 2018)

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	0.183960	0.18362	0.000240	0.000100
Diesel	0.247680	0.244140	0.000040	0.003500
Petrol	0.233770	0.232340	0.000720	0.000700
Kerosene	0.247680	0.245230	0.000130	0.002320
Fuel oil	0.268310	0.267330	0.000340	0.000640
Propane/Butane	0.214480	0.214190	0.000150	0.000140

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	298
HFC	HFC-134a	1'300
HFC	HFC-152a	138

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 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 2018)

Category	CO_2-equivalent emissions [kg CO_2e/ kWh]
District heating	0.18746

Scope 3 – Other Indirect GHG Emissions

Scope 3 is limited to indirect well-to-tank and transmission and distribution emissions from fossil fuels, electricity and district heating. 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 Report. GHG reporting is in accordance with the Greenhouse Gas Protocol.

In 2018, the total GHG emissions in absolute terms decreased by 2% to 113'764 tCO_2e (2017: 116'338 tCO_2e). Notably, Scope 2 emissions differed to a greater extent than Scope 1 and 3 emissions, with a 7% reduction in Scope 2 emissions against the previous year. Contributing factors included a reduction in emissions from purchased electricity (7%) and district heating (18%). It should be noted that a significant decrease in purchased electricity emissions occurred due the combined effect of two factors: a reduction of energy consumption in Sulzer portfolio (2%) and the electricity grid decarbonization (5%) resulting in lower quantities of GHG emissions generated per unit of electricity. Since emissions from purchased electricity are responsible for almost half of the Sulzer's total emissions, these changes had a significant effect of the overall footprint decrease. At the same time, an increase of 2% in Scope 3 emission was observed, primarily due to an increase in air travel emissions.

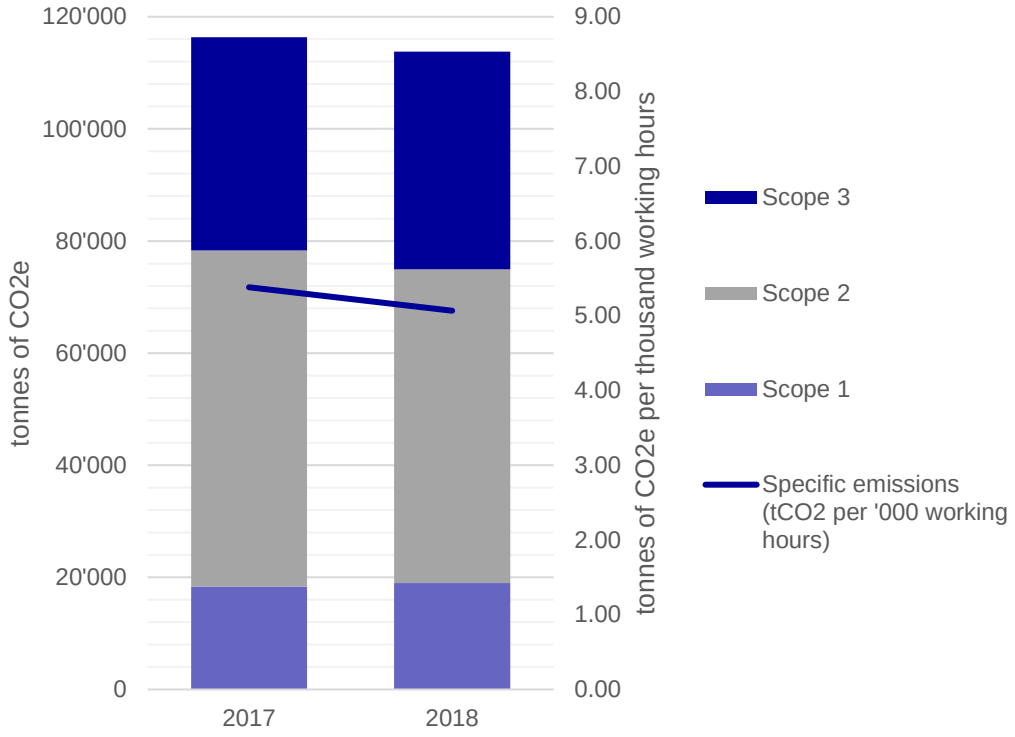
With the overall decrease of the GHG footprint, the specific CO_2e per 1'000 working hours (wh) decreased by 6% to 5.07 tCO2e/1000 wh (2017: 5.38 tCO2e/1000wh). Given the overall increased number of working hours and reduced energy consumption, this indicator demonstrates lower energy and GHG emission intensity levels achieved by Sulzer.

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. Since 2017 Sulzer in also including 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 2018, the GHG emissions in CO_2e broken down by scope were as follows:

Table 5: GHG emissions performance summary

t CO2e	2017	2018	Difference
Scope 1	18'366	18'979	3%
Scope 2	59'934	55'998	-7%
Scope 3	38'038	38'787	2%
Total	**116'138**	**113'764**	**-2%**

Sulzer's portfolio has not undergone major changes in 2018, yet two new acquired sites contributed over 1% to the 2018 total GHG emissions.

Table 6: Scope 1 GHG emissions from processes

	Unit	2017	2018
CO_2	t CO_2	0.08	0.18
HFC	t HFC	0.028	0.024
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	2017	2018
CO_2	t CO_2	18'285	18'873
CH_4	t CH_4	0.9	0.8
N_2O	t N_2O	0.149	0.256[3]

[3] The increase in N_2O emissions observed in 2018 is primarily caused by the application of updated emission factors as published by BEIS (75% increase in diesel N_2O specific emission factor when compared to 2017).

Table 8: Scope 1 GHG emissions in CO_2-equivalents

	Unit	2017	2018
CO_2	t CO_2e	18'285	18'873
CH_4	t CO_2e	23	22
N_2O	t CO_2e	44	76
HFC*	t CO_2e	14	8
CFC	t CO_2e	0	0
HCFC	t CO_2e	0	0
Total		**18'366**	**18'979**

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; 2018
- Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
- IPCC, Geneva, Switzerland. pp 104, World Business Council for Sustainable Development, World Resource Institute; The Greenhous Gas Protocol, Revised Edition; Geneva and Washington; 2004.