

Bluefactory's 2022 CO₂ report

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Summary

The emissions generated by the general operation of the bluefactory site amounted to 229 tCO₂ and increased by 49 tCO₂ (+27%) in 2022, mainly due to a recovery from the health crisis.

Scope of the footprint and quantification

To allow a comparison between the years, the scope of the CO₂ footprint has remained unchanged and the quantification is carried out according to the principles of the Greenhouse Gas Protocol and the ISO 14064 standard. The scope includes the operation of the entire site. Grey emissions from existing buildings are reported separately.

This is the 8th CO₂ assessment of the bluefactory innovation district and the data covers the whole year 2022. This footprint represents the sum of all CO₂ emissions generated by the site over the entire year and minimising it is part of Bluefactory Fribourg-Freiburg (BFF) SA's strategy. It makes it possible to analyse emissions over the years and thus measure the impact of projects implemented with the objective of reducing emissions. The data comes from the various organizations located on the site and from BFF SA, which manages it. The quantification of emissions was made on the basis of recognized emission factors, using Climate Services' CO₂ Platform.

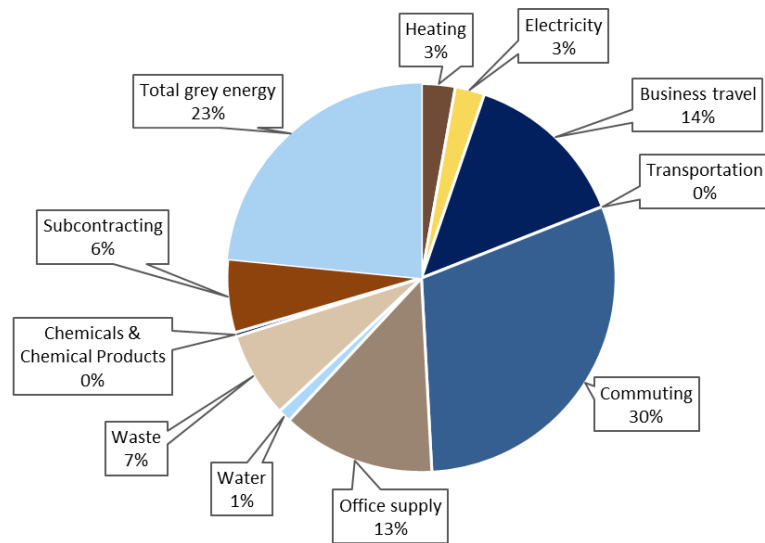
bluefactory CO₂ accounting

Table 1 : Raw data and CO₂ emissions from bluefactory

Category	tCO ₂	%
Heating	8	4%
Electricity	7	3%
Business travel	41	18%
Transportation		
Commuting	90	39%
Office supply	38	17%
Water	3	1%
Waste	21	9%
Chemicals & Chemical Products	1	0%
Subcontracting	18	8%
Total	229	
Grey energy photovoltaic	20	
Grey energy Blue Hall	45	
Grey energy Wood-iD	5	
Total grey energy	70	
Total	299	

Mobility accounts for most of bluefactory's carbon footprint. Indeed, commuting and business trips generate respectively 90 tCO₂ and 41 tCO₂ (or 57% of emissions due to general operation, i.e. the total emissions minus grey energy). It should be noted that the distances travelled for commuting (approx. 1.43 million km) are much higher than those for business trips (approx. 625,000 km), but their CO₂ impact is lower. This is explained by the use of the plane for a certain part of the business trips (221,070 km).

Figure 1 : Distribution of emissions by category



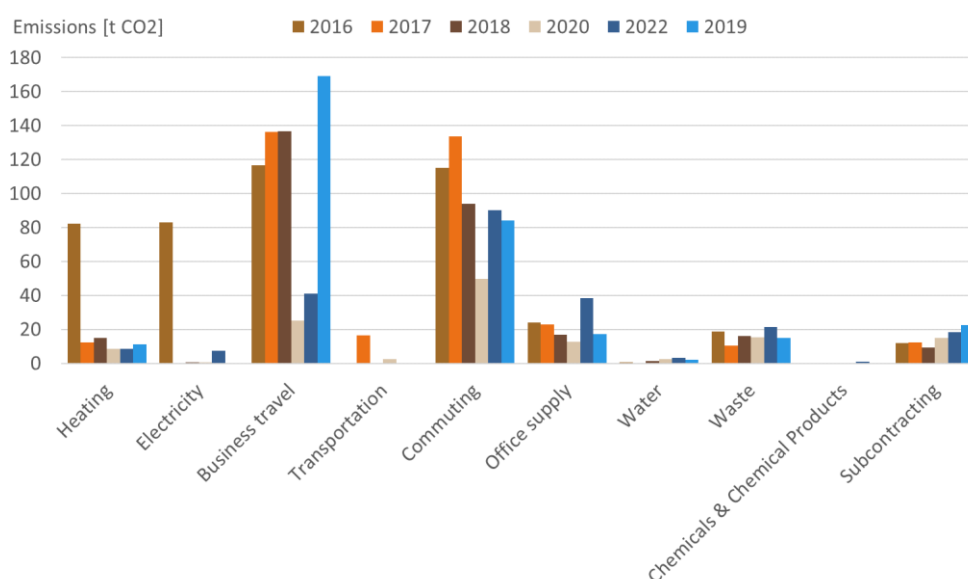
Evolution of emissions

In 2021, there was an increase in emissions of 48 tCO₂ compared to the previous year, mainly due to the resumption of mobility after the lockdown period (Table 2). It can be seen that in 2022, the site's emissions continued to increase, despite a stabilization of business travel. Commuter mobility increased by 22% and thus reached a level close to 2018 values, increasing mobility emissions per FTE to 0.5 tCO₂ (Table 3). Despite a 7% decrease in total electricity consumption, CO₂ emissions in this category have increased. This is due to an update of the emission factor for hydropower, which has been revised upwards in the federal database. This source of electricity represents 72% of the site's consumption, while photovoltaics represents a share of 27%.

Table 2 : Evolution of CO2 emissions between 2016 and 2022 in tCO2

Category	2016 tCO2	2017 tCO2	2018 tCO2	2019 tCO2	2020 tCO2	2022 tCO2	Evolution 2021-2022	Evolution 2016-2022
Heating	82	12	15	11	9	8	31%	-90%
Electricity	83	0	0	0	1	7	1273%	-91%
Business travel	117	136	137	169	25	41	9%	-65%
Transportation	0	16	0	0	2	0		
Commuting	115	133	94	84	50	90	22%	-22%
Office supply	24	23	17	17	13	38	33%	59%
Water	1	0	2	2	3	3	15%	511%
Waste	19	11	16	15	15	21	29%	13%
Chemicals & Chemical Products	0	0	0	0	0	1	1403%	980%
Subcontracting	12	12	9	23	15	18	38%	53%
Total	452	345	290	322	132	229	27%	-49%

Figure 2: Evolution of emissions between 2016-2022



There was also an increase of about 30% in the Office supply and Waste categories, well above the 5% increase in the site's workforce. This increase appears to be evenly distributed across entities and could be due to an improvement in the quality of the data collected through individual interviews with the managers of half of the entities included in this review. The share of subcontracted activities fluctuates variably depending on the activities of the entities present on the site, with an average increase of 38% compared to the previous year.

Table 3: Evolution of emissions key indicators

Key indicators and targets	2018	2019	2020	2021	2022	SBTi 2030	Available budget <1.5°C	Targets 2000W in 2050
Full time equivalents (FTE)	194	222	236	267	281			
Emissions per FTE (tCO2/FTE)	1.49	1.45	0.56	0.67	0.81			
Scope 1+2 (tCO2)	16.3	20.2	4	9	19	8		
Cumulated emissions (tCO2)	290	612	744	924	1153		3476	
Emissions from mobility (tCO2/ETP)	1.2	1.1	0.3	0.4	0.5			0.001
Emissions form energy (tCO2/m2)	0.002	0.001	0.001	0.001	0.001			0.001
Employees (#)	272	324	319	367	403			
Energy reference area (m2)	7997	8406	8406	9071	9071			
Cumulated per FTE (tCO2/FTE)	1.5	2.8	3.2	3.5	4.1		17.92	

The number of FTEs increased from 267 to 281 (+5%) for the entire site between 2021 and 2022. The total number of employees reached 403. Emissions per FTE per year increased from 0.67 tCO₂ to 0.81 tCO₂ (general operating emissions only).

Breakdown by entity

A total of 45 entities were singled out for carrying out this assessment. These are companies, various schools, research centers and clusters, as well as the majority of associations present on bluefactory, as well as BFF SA

which manages all common areas. Emissions per entity range from less than one ton of CO₂ to more than 30 tCO₂ for the largest entities. This upper ceiling has not changed significantly compared to the previous year.

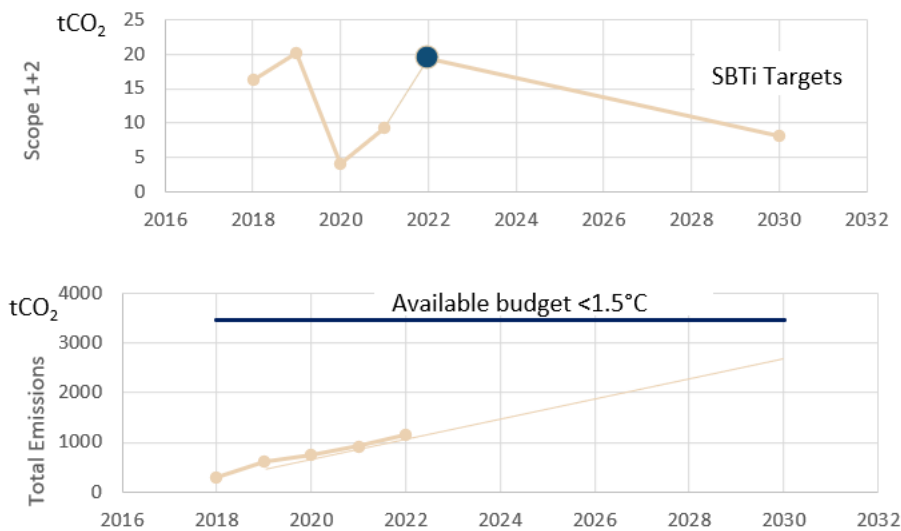
Optimization measures

Since 2022, BFF SA, in collaboration with Climate Services and HEIA, has been carrying out measure E.2.5 of the cantonal climate plan "Support for the approach of an exemplary district towards zero net carbon". The project consists of developing a comprehensive approach to managing CO₂ emissions, from the planning phase to the operation of buildings. The work began with the development of tools for calculating carbon budgets and quantifying grey emissions from buildings. Monitoring the construction site of Building B makes it possible to test these tools and optimize interaction with companies in the collection of the necessary data.

Objectives

The confederation has set a clear target of net-zero CO₂ emissions by 2050, in line with the international targets of the Paris Agreement. This objective implies that an overall CO₂ budget must not be exceeded. The Science Based Target initiative (SBTi) proposes that to meet this budget, Scope 1 and 2 emissions of the Greenhouse Gas Protocol should be halved compared to 2018 for SMEs. For the entire bluefactory site, that target would be 8 tCO₂ (Figure 3). Taking into account all emissions and taking into account the overall emissions targets according to the IPCC (taken over by SBTi for large companies), the cumulative emissions from the operation of the site should not exceed 3476 tCO₂ between 2018 and 2050 (Figure 3).

Figure 3 : Scope 1 and 2 reduction targets according to SBTi, and CO₂ budget available according to IPCC data



By continuing the current trajectory, the CO₂ budget will be exceeded in the course of 2034. To delay this deadline, major efforts must be made, and this implies, in particular, the mobility of companies. These targets are always set in absolute terms and are therefore not adjusted for the expected growth in the number of people on site.