

Bluefactory's Carbon Footprint 2023

Summary

The emissions generated by the general operation of the Bluefactory site in 2023 amount to 277 tCO₂. Compared to 2022, this represents an increase of 48 tCO₂ (+21%). Meanwhile, full-time equivalents (FTE) have increased by 19%. Emissions by FTE have remained stable, at 0.8 tCO₂/FTE.

Scope of the footprint and system boundaries

To allow a comparison between years, the scope of the CO₂ balance has remained unchanged and the balance 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 9th CO₂ assessment of the bluefactory innovation district and the data covers the whole of 2023. This balance represents the sum of the CO₂ emissions generated by the site over the whole year. It makes it possible to analyse emissions over the years and thus measure the impact of the projects implemented with a view to reducing emissions.

The data collection method has been optimized for this assessment compared to previous ones. A neighbourhood assessment was carried out using a top-down approach, as opposed to the previous bottom-up approach, which consisted of going through the balance sheet of each entity present on the site, to consolidate the whole into a neighbourhood assessment. With regard to electricity consumption, waste, and general information (rented space, number of employees), the data comes from the bluefactory site administration. The majority of the data in the consumables category (office automation) comes from data collected for the 2022 report from the various companies located on the site and BFF SA, extrapolated on the number of occupants in 2023. Mobility data, which represents the largest proportion of the balance sheet, was collected via an individual survey sent to all employees of the companies present on the site, with a participation rate of 24% (105 responses out of a population of 430 employees). The degree of uncertainty of the extrapolated results is estimated at 4.1%, with a confidence level of 95%. The quantification of emissions was done on the basis of recognized emission factors, using the Climate Services CO₂ Platform.

Bluefactory's carbon footprint

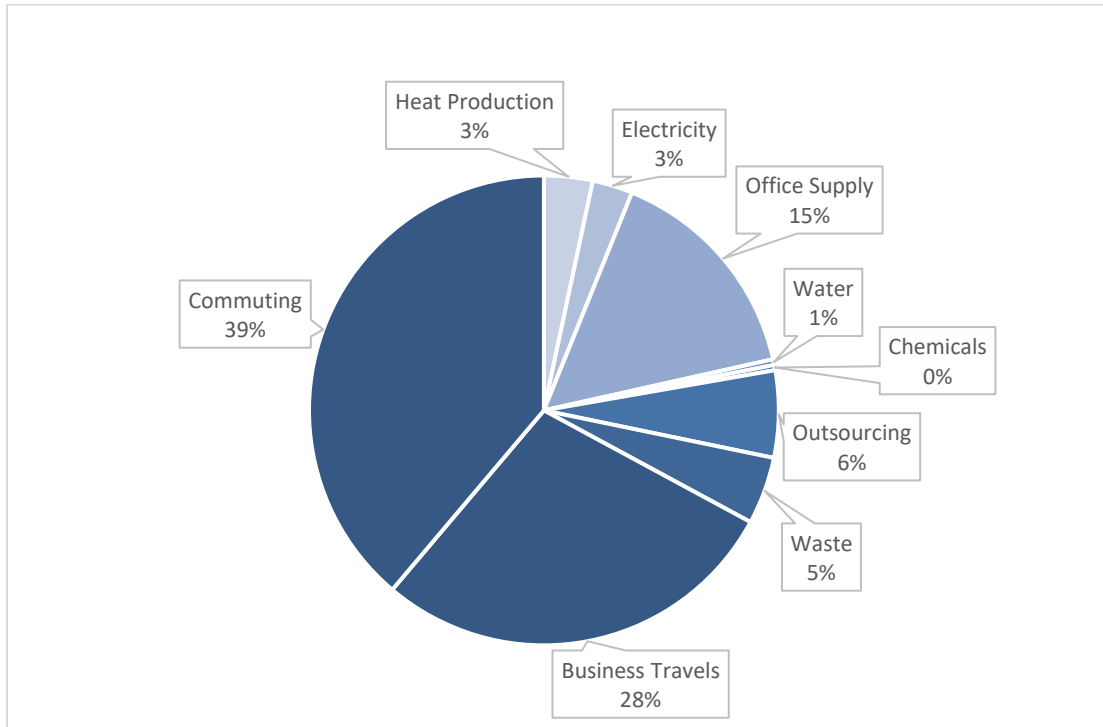
Table 1 : Bluefactory's CO2 emissions by category

Categories	Data	Unit	tCO2	%
Heat Production	35000	kWh	9	4%
Electricity	890651	kWh	8	3%
Office Supply		div.	43	17%
Water	2539737	l	1	0.4%
Chemicals	324	kg	1	0.4%
Outsourcing	5	FTE	17	7%
Waste	3311146	kg	13	5%
Business Travels	1066685	km	67	27%
Commuting	2799730	km	92	37%
Total (operation)			251	100%
Grey energy solar panels			20	
Grey energy Blue Hall			45	
Grey energy woodID			5	
Grey energy Building B			29	
Grey energy total			99	

Mobility accounts for the largest part of bluefactory's site's carbon footprint. Indeed, commuting and business travel generate 108 tCO₂ and 78 tCO₂ respectively (or 67% 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. 3,28 million km) are more than twice as long as those for business trips (approx. 1,25 million km), but their emissions are not twice as high. The CO₂ impact of commuting is lower due to the use of air travel for a certain part of business journeys (396,828 km). Office supplies also represent a significant part of the carbon footprint, and 3/4 of the emissions in this category are due to the purchase of computer equipment (screens, televisions, computers) whose emissions take place during their production.

In addition to the emissions related to the operation of the site, there are also emissions related to the construction of the buildings, also known as grey energy, which are amortised according to the lifetime of each building. In 2023, the majority of the construction of the new Building B has been completed, adding to the existing infrastructure. However, the value given for these grey energies (see Table 1) is partial because part of its construction will be completed in 2024 and the final data will be adjusted.

Figure 1 : Distribution of emissions by category in 2023



Evolution of emissions

Table 2 : Evolution of CO2 emissions between 2018 and 2023 in tCO2

Categories	2018 tCO2	2019 tCO2	2020 tCO2	2021 tCO2	2022 tCO2	2023 tCO2	Evolution 2022-2023	Evolution 2018-2023
Heat Production	15	11	9	6	8	9	16%	-37%
Electricity	0	0	1	1	7	8	5%	1716%
Office Supply	17	17	13	29	38	43	12%	151%
Water	2	2	3	3	3	1	-66%	-28%
Chemicals	0	0	0	0	1	1	-4%	1903%
Outsourcing	9	23	15	13	18	17	-9%	81%
Waste	16	15	15	17	21	13	-39%	-20%
Business Travels	137	169	25	38	41	78	91%	-43%
Communing	94	84	50	74	90	108	20%	15%
Total	290	322	129	180	228	277	21%	-4%

In 2023, the emissions trajectory flattened out compared to previous years. Between 2020 and 2022, the site generated an increase in emissions of 50 tCO2 per year, mainly due to the resumption of mobility after the lockdown period (Table 2). This year, emissions have stabilised, with a smaller increase in the operating balance (+21%). A categorical analysis is used to determine the causes of the evolution of emissions.

The impact of heat production increased by 16%, due to an increase in the volume of fuel oil consumed, from 3,500 liters in 2023 to 3,270 liters in 2022. Electricity emissions have remained relatively stable.

Data for office supplies were directly extrapolated from previous years in proportion to the number of full-time equivalents. The same goes for water and chemicals. It is important to note that for office supplies, the increase of 5 tonnes (Table 2) between 2022 and 2023 is due to the purchase of 15 new televisions used across the bluefactory site.

There is a notable difference between the two years in the waste category. There are several possible justifications; The first being the change in the method of data collection. Indeed, for the 2022 data, each company had estimated the volume of each type of waste, whereas for 2023, the data relating to the number of skips containing all the waste collected on the site were provided directly by BFF SA. Thus, it is possible that the value for 2022 was slightly overestimated. In addition, a detailed analysis shows that 4,331 kg of plastic waste was identified for 2022 and zero for 2023. The amount of urban waste incinerated has increased considerably, suggesting that this plastic waste has been accounted for. As the emission factor is much lower for incinerated municipal waste than for plastic waste, it is likely that this difference in accounting is the cause of this decrease in emissions in the balance sheet.

In terms of mobility, emissions from commuting increased by 20%. In 2022, they amounted to 90 tCO₂, compared with 108 tCO₂ in 2023, for a 20% increase in the number of employees. Over the year, the distances travelled are 9,836 km / FTE, i.e. around 21 km / trip (considering an average of 47 weeks / year at 5 days / week, 2 trips / day). Emissions from business travel have almost doubled. The implementation of the mobility plan during 2024 should enable a reduction in mobility-induced emissions.

Figure 2: Evolution of emissions between 2018-2023

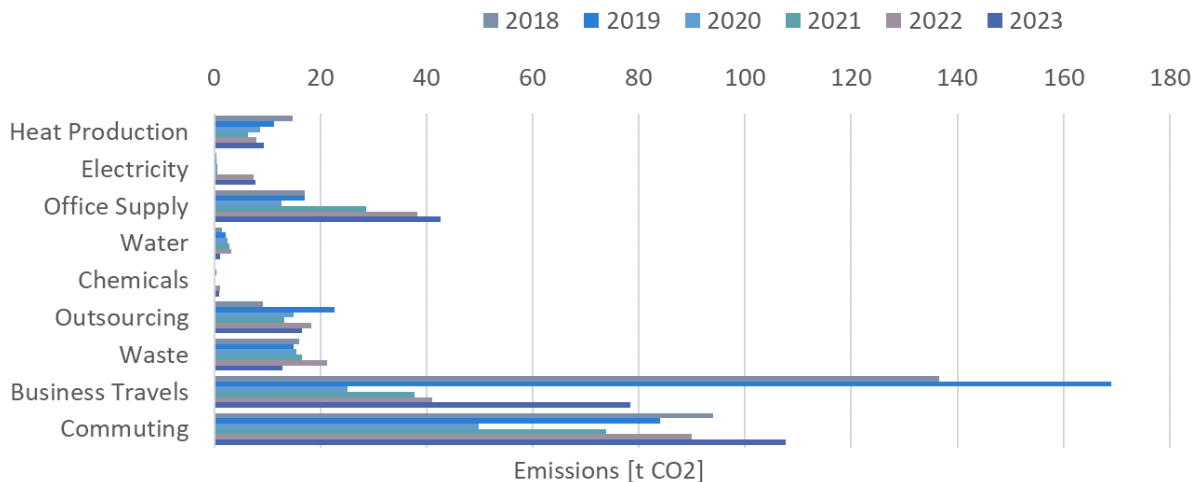


Table 3: Evolution of Key Indicators

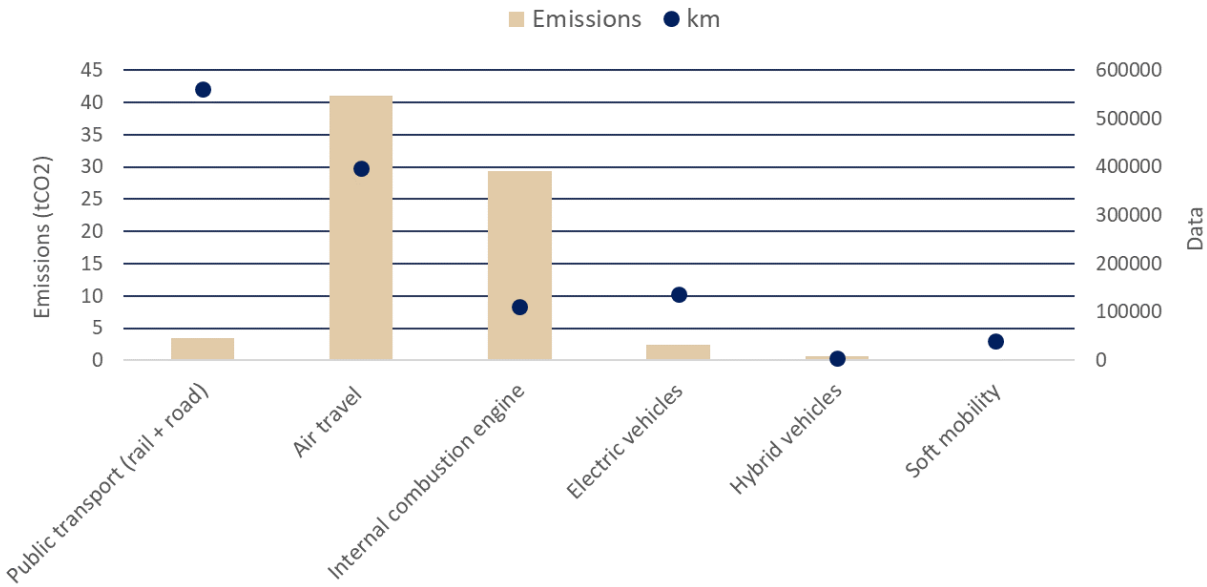
Key indicators	Bluefactory	2023	2022
Employees (nbr)		430	403
Full time equivalent (FTE)		333.5	281
Emissions per employee (tCO ₂ /employee)		0.64	0.57
Emissions per FTE (tCO ₂ /FTE)		0.83	0.81
Emissions from mobility (tCO ₂ /FTE)		0.56	0.47
Emissions from commuting (tCO ₂ /FTE)		0.32	0.32
Emissions from business travel (tCO ₂ /FTE)		0.24	0.15
km/FTE commuting		9836	5103
km/FTE business travel		3748	2224

The number of employees has increased by 6.7%, from 403 to 430, while full-time equivalents (FTE) have risen from 281 to 333.5 (+18.7%) for the site as a whole between 2022 and 2023. Overall, the occupancy rate per employee appears to have increased by around 8 percentage points. Emissions per FTE per year have remained stable at around 0.8 tCO₂ (general operating emissions only).

Emissions per FTE from work-related mobility increased, while those from commuting remained unchanged, despite a sharp increase in distances travelled, suggesting a modal shift in favour of soft mobility and public transport.

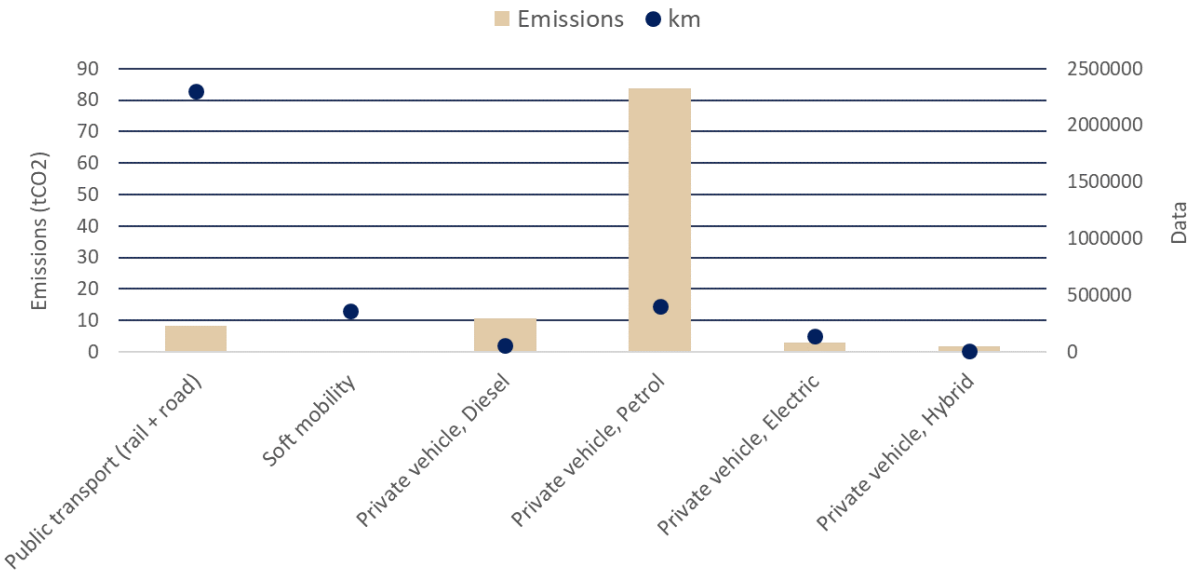
Detailed Analysis and Recommendations

Figure 5: Business Travel Emissions and Distances Travelled, by Mode of Travel



Business travel is responsible for 27% of the site's emissions, with 67 tCO₂. Within this category, air traffic accounts for a 53% share, with 35 tCO₂. This is followed by journeys by petrol or diesel internal combustion vehicle, which account for 38% of the emissions generated by business travel. As an alternative to the companies present on the site, the provision of a shared electric vehicle makes it possible to significantly reduce these emissions. On the other hand, Bluefactory can hardly influence decisions on the use of the aircraft to travel. The allocation of a carbon budget to the site's tenants could theoretically be considered, but would be difficult to implement in practice.

Figure 6: Commuting emissions and distances travelled, by mode of travel



Commuting between home and work accounts for 39% of the site's emissions, with 108 tCO₂. As illustrated in Figure 6, travel by internal combustion engine car is the main cause, with a share of 78% of this emission category. The distance travelled in km, shown by the blue dots, and the emissions generated, corresponding to the vertical bar, show an opposite relationship between public transport (many km, few emissions) and internal combustion vehicles (few km, many emissions). A mobility plan should lead to a significant reduction in the emissions generated by commuting. Bluefactory can have a direct impact on these emissions, and has already put measures in place, in particular by offering attractive solutions for soft mobility and public transport (PubliBike station, proximity to the train station) and by discouraging the use of individual motorised traffic (pricing of parking spaces). The mobility plan developed in collaboration with the HEIA in 2024 should make it possible to identify additional levers for action.