GREENHOUSE GAS BALANCE 2021

Introduction

The MDC has set itself the goal of contributing to climate protection and making the work at the MDC as greenhouse gas neutral as possible by 2038. Since 2019, the greenhouse gas emissions caused by the MDC have been accounted for in accordance with the international Greenhouse Gas (GHG) Protocol (Fig. 1). The GHG Protocol distinguishes between three areas.:

- **Scope 1**: Direct emissions (e. g. combustion of natural gas).
- **Scope 2**: Indirect emissions from externally generated energy sources (e.g., electricity, district heating)
- **Scope 3**: All other emissions caused directly or indirectly

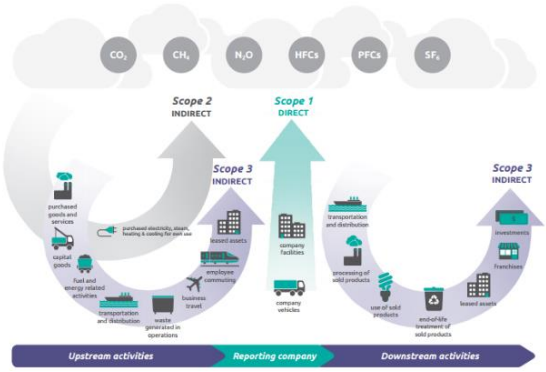

Fig. 1: Greenhouse Gas Protocol

Scope 3 contains various 14 categories. Relevant to the MDC are:

- Purchased goods and services
- Capital goods (major equipment and buildings)
- Fuel and energy-related emissions (upstream chain emissions).
- Transportation and distribution
- Waste
- Business travel
- Commuting of employees

Consumption data from the above-mentioned areas (including electricity, natural gas, purchased goods, and business travel performed) were provided by the responsible departments of the MDC as well as by the CBB. Based on the consumption data of the Buch and Mitte sites, the associated GHG emissions were calculated using specific emission factors (for Scope1, Scope 2 and Scope 3.3) or estimated approximately using common extrapolation methods (for all other categories).

Balance

In 2021, MDC generated 16,559 metric tons of CO2 equivalents. Each employee thus generated an average of 9.68 metric tons at the workplace. For comparison: In Germany, an average of 11.17 tons was emitted per capita in 2021 (Fig. 2).

Accounting approach: :	Operative control
System borders:	Campus Buch, Campus Mitte
Employees*	1711
GHG-emissions total (t):	**16559**
GHG-emission per employee (t):	**9,68**

Fig. 2: GHG emissions at the MDC

If we look at the distribution of GHG emissions across the individual scopes, we see that Scope 2 accounts for the smallest share (Fig. 3). Here, the MDC benefits from the fact that it obtains certified green electricity from a hydropower plant in South Tyrol.

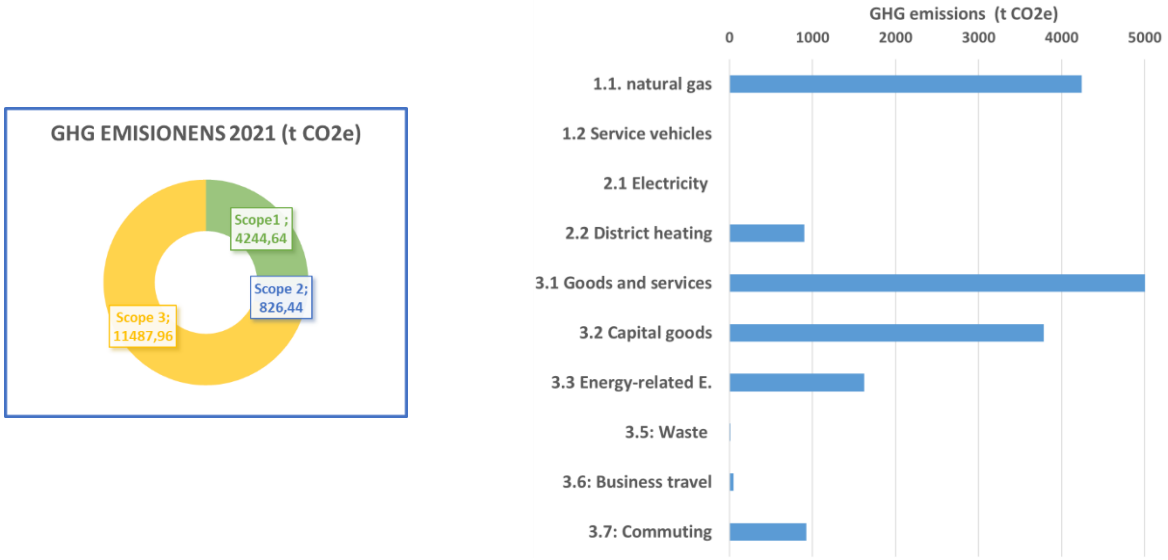

Fig.*3: Distribution of GHG-emissions*

Significant emission sources are caused by the combustion of natural gas (1.1; 3.3), district heating (2.2; 3.3), daily commuting (3.7), as well as goods and services (3.1) and capital goods (3.2) (Fig. 3, right). A closer look at the last two categories shows that the procurement of computers and laboratory equipment (3482 t CO2e), life science products (1761 t CO2e), and plastic products for laboratory use (699 t CO2e) are among the largest sources of emissions.

Development since 2019 and outlook

Compared to 2019, the MDC was able to significantly reduce its emissions (Fig. 4). The main reasons for this development are the conversion of the power supply to green electricity, the reduction in the procurement of computers and large laboratory equipment, the absence of new construction activities, and the pandemic-related reduction in business travel.

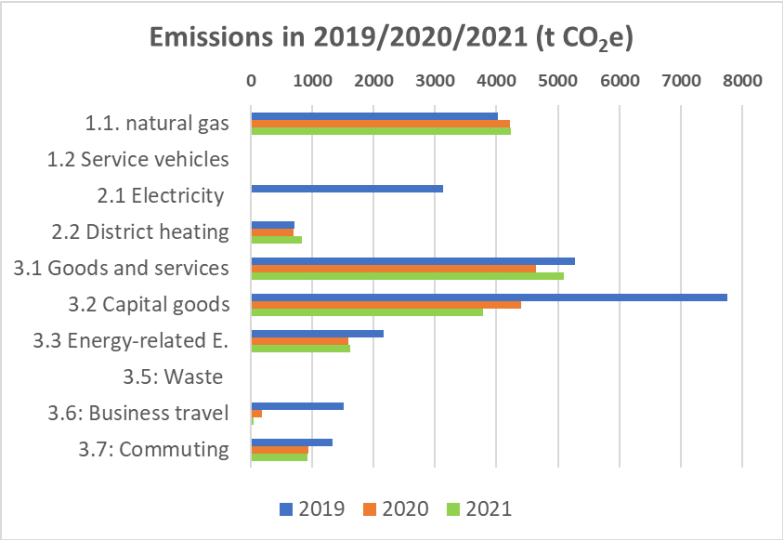

Fig. 4: Comparison of GHG-emissions

In the medium term, the aim is to reduce natural gas consumption. For 2023/24, it is planned to convert the natural gas-fired steam generators in the animal houses to electric steam generation. This would reduce natural gas consumption by approximately 20%. The largest share of natural gas demand is caused by the cogeneration units at the energy center. Due to a lack of alternatives, there is no alternative in sight here in the next few years. The MDC plans to significantly reduce the energy consumption of its research buildings (in particular House 31.1) through extensive refurbishment measures in order to enable a conversion of the energy supply to renewable energies in the medium term (if possible, by 2030).
Some of the major emission sources (including the procurement of laboratory equipment, life science and plastic products; see above) are directly linked to the scientific work of the MDC. A significant reduction of GHG emissions is only conceivable in the context of sustainable further development of biomedical equipment and products. Nevertheless, initial improvements are already possible through responsible use of resources. Here, every employee is called upon to make a contribution.