

CO2 and Energy Report

CO₂ Performance Ladder Certification



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	Name	Function	Signature	Date
Author:	Stijn de Graaf Nienke Wouda	CO ₂ Coordinators		15-11-2022
Reviewed by:	Born Goedkoop	CO ₂ Manager		22-12-2022
Validated by:	José M. Garrido	Project Control Manager		22-12-2022
Approved by:	Raúl Hortal	Project Director		22-12-2022

Table of Content

1	INTRODUCTION	4
1.1	CO ₂ PERFORMANCE LADDER	4
1.2	CO ₂ AND ENERGY ASSESSMENT	4
1.3	REQUIREMENTS CO ₂ PL	4
2	ADDITIONAL COMPANY VERSUS PROJECT	5
2.1	MASS BALANCE (SCOPE OF WORKS)	5
2.2	ENERGY ESTIMATION BASED ON SCOPE OF WORKS (FORECAST DATA)	6
2.3	CO ₂ EMISSIONS FORECAST BASED ON SCOPE OF WORKS (FORECAST DATA)	6
3	ENERGY REPORT (SCOPE 1 AND 2 EMISSIONS)	7
3.1	2020 BASE YEAR	7
3.2	2021	7
3.3	Q1 AND Q2 2022	8
4	CO₂ REPORT – GHG PROTOCOL	9
4.1	2020 BASE YEAR	9
4.2	DATA SPECIFICS	11
5	DATA GAP ANALYSIS	12
6	LIST OF REDUCTION POSSIBILITIES	13
6.1	POSSIBLE REDUCTION MEASURES SCOPE 1: GAS	13
6.2	POSSIBLE REDUCTION MEASURES SCOPE 2: ELECTRICITY & BUSINESS TRAVEL	13
6.3	CHOICE OF MEASURES AND QUANTIFIED OBJECTIVES	13
7	APPENDIX ENERGY INVENTORY 20220927	14

1 Introduction

1.1 CO₂ Performance Ladder

As part of the certification of FCC Construcción S.A. (NL) on the CO₂ performance ladder an CO₂ and energy assessment was conducted. The CO₂ and Energy Report is an inventory of all energy flows and the possibilities to reduce them. The energy audit report was drawn up in accordance with the guidelines in ISO 50001.

1.2 CO₂ and Energy Assessment

An CO₂ and Energy assessment is an environmental audit with the focus on the energy aspects of the company. In order to be able to take targeted measures for reducing energy consumption and the associated costs, it is necessary to gain an insight into the existing energy consumption, its distribution among the various business purposes, the causes of energy loss, etc.

1.3 Requirements CO₂PL

The CO₂ and Energy Report is established to comply to the following CO₂PL requirements:

- 2.A: The organisation knows how much energy is used per type, classified according to the organisation's various activities.
- 2.A.3: The organisation has an up-to-date **energy assessment** for the organisation and the projects for which a CO₂-related award advantage has been obtained.
- 2.B: The organisation has an energy reduction target, described in qualitative terms.
 - 2.B.1. The organisation has an objective described in qualitative terms for reducing energy and has proposed measures for the projects.
 - 2.B.2. The organisation has a specified objective for the use of alternative fuels and/or the use of green energy and has proposed measures for the projects.

2 Additional Company versus Project

Based on the unique situation of the company Scale-up version and project organisation we are fortunate that we can estimate the annual growth of our organisations in the years to come to be basically possible because of the scope of the future works.

Based on the reference of expected execution we have made a calculation in how our company will grow;

See our future forecast below

2.1 Mass balance (Scope of works)

The project started in 2020. Initially, the mass balance was proportionally plotted against the project volume. The book year 2020 and 2021 only consisted of indoor activities (design, consultancy, etc.) Therefore, the associated mass is proportionally distributed over the remaining book years.

Year	Project volume € mio	Chain (s3)	Mass (tonnage)	Corrected_Chain (s3)	Corrected_Mass (tonnage)
2020	52	6%	257397	0%	0
2021	83,69	10%	415144	0%	0
2022	126	15%	625168	18%	745125
2023	151	18%	746909	21%	890226
2024	172	20%	851033	24%	1014329
2025	139	17%	689948	20%	822335
2026	76	9%	376511	11%	448756
2027	33	4%	164616	5%	196203
2028	9	1%	45902	1%	54709
Total	841	100%	4172628	100%	4171684

2.2 FTE estimation based on Scope of works (Forecast DATA)

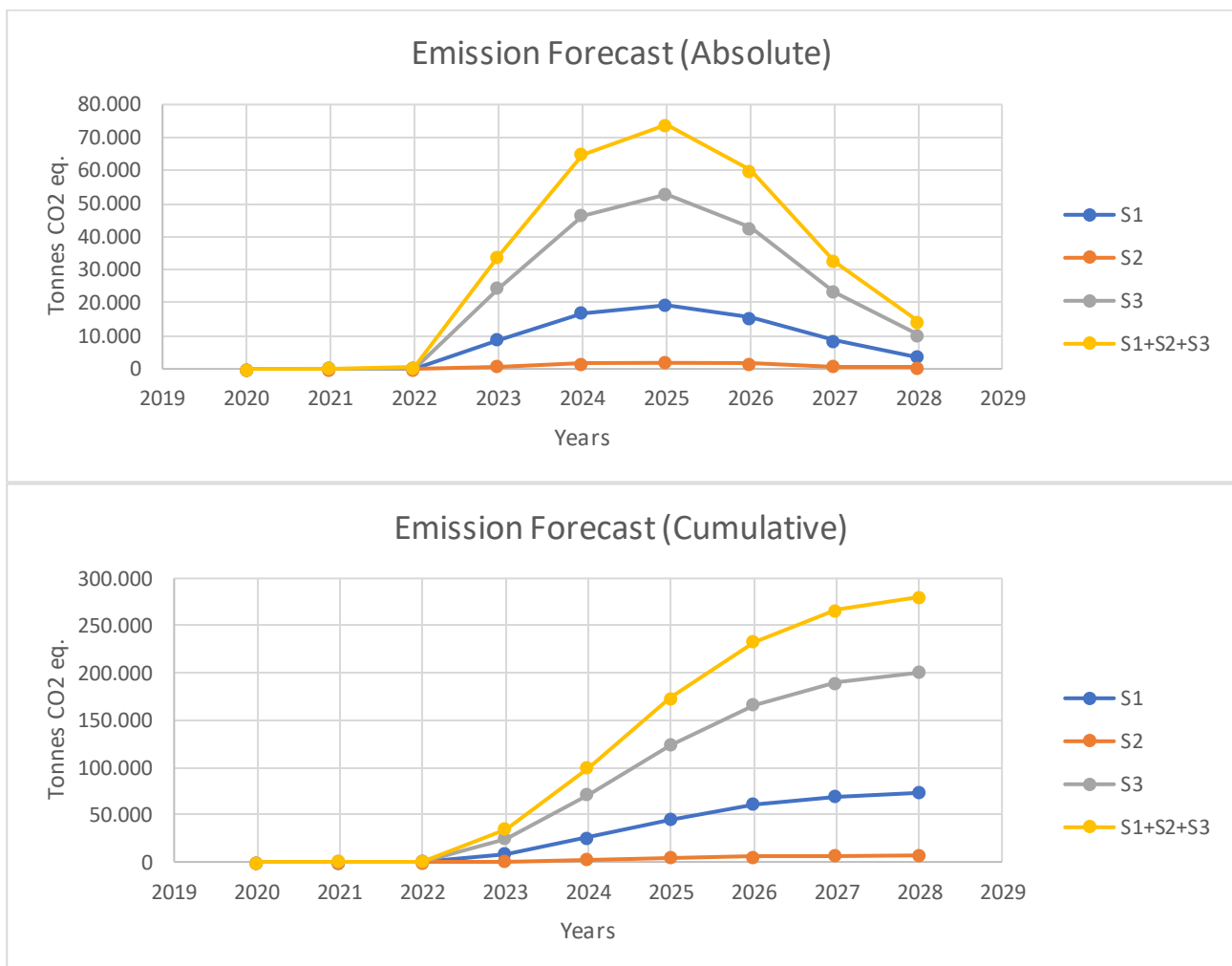
The proportional distribution is based on the assumption that the nature of FTE switches at bookyear 2022. How the FTE are forecasted to switch over the upcoming years is listed in the table below.

Year	Total FTE (Own organization)	Ratio financial, design, consultancy)	FTE financial, design, consultancy (FDC)	Ratio execution	FTE execution
2020	185	100%	185	0%	0
2021	408	100%	408	0%	0
2022	532	50%	266	50%	266
2023	635	20%	127	80%	508
2024	724	20%	145	80%	579
2025	587	20%	117	80%	470
2026	320	20%	64	80%	256
2027	140	20%	28	80%	112
2028	39	20%	8	80%	31
Total	3549,92		1348		2223

2.3 Energy estimation based on Scope of works (Forecast DATA)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Energy kWh Scope 1	26,3	8,1								
Energy kWh Scope 2	24,6	0,6								
Forecast Energy (kWh) Scope 1			566	566	566	566	566	566	283	3713
Forecast Energy (kWh) Scope 2			8,5	11,3	11,3	11,3	11,3	11,3	5,7	96

2.4 CO₂ emissions Forecast based on Scope of works (Forecast DATA)



3 Energy Report (scope 1 and 2 emissions)

3.1 2020 BASE YEAR

Because the company (FCC Construcción S.A. (NL)) has been active since 2019 and any activities have started in 2020 our base year has started in 2020. Because of this our reporting is made in Spain (Corporate location) for years 2020, 2021 (and possible 2022). We want to do our own (basically because of influence) reporting on country in the years to come, this is because of the certification for the CO₂ performance ladder.

Operational boundaries (Scope 1 & 2) – ISO 14064-1:2012. The emissions of the centres within the organisational boundaries of FCC Construcción are quantified, assuming the following scopes:

Scope 1: Direct GHG emissions

These are emissions from sources that are owned or controlled by the company. They include emissions deriving from the burning of fuel used by FCC Construcción. They can be broken down into:

- Emissions associated with fuel used at projects (construction sites).
- Emissions associated with fuel used at premises (offices, warehouses, plant storage /maintenance facilities).

Scope 2: Indirect GHG emissions

Scope 2 emissions are a consequence of the organisation's activities, but they occur at the facility where electricity is generated. They include emissions from the generation of purchased electricity consumed by FCC Construcción. They can be broken down into:

- Emissions associated with electricity used at projects.
- Emissions associated with electricity used at premises.

For the initial assessment of 2020, the CO₂ emission data is used from the database of the Sustainability department of FCC Construcción S. A. International. Below is a visualization of the scope 1 and 2 emissions of FCC Construcción S.A. (NL) in 2020 (see Figure below).

Emissions, classified by scopes (according to ISO 14064-1:2012) 2020						
	t CO ₂ eq					
	AREA I		AREA II			
	Spain	Portugal	Ireland	Belgium	Norway	Netherlands
Scope 1: Direct GHG emissions	8,905.11	1,314.47	0.00	1,010.21	12.30	46.45
Associated with fuel used at projects	8,463.42	799.34	0.00	1,010.21	12.30	46.45
Associated with fuel used at premises	441.69	515.13	0.00	0.00	0.00	0.00
Scope 2: Indirect GHG emissions	1,188.43	340.57	0.00	131.42	0.03	43.41
Associated with electricity used at projects	831.42	327.00	0.00	131.42	0.03	43.41
Associated with electricity used at premises	357.01	13.57	0.00	0.00	0.00	0.00

Figure: Scope 1 & 2 emissions from the FCC Greenhouse Gas Emissions Report 2020

3.2 2021

Emissions classified by Scope (according to UNE-ISO 14064-1:2019) (t CO ₂ e)				
	Spain	Portugal	Bulgaria	Netherlands
Scope 1, Category 1: Direct GHG emissions and removals	7,384.75	1,877.04	3.04	14.35
Emissions associated with fuel used at projects	6,969.85	1,121.63	0.00	14.35
Emissions associated with fuel consumption at premises	414.90	755.41	3.04	0.00
Scope 2, Category 2: Indirect GHG emissions from imported energy	1,039.54	67.63	4.34	0.00
Emissions associated with electricity used at projects	633.56	58.31	0.00	0.00
Emissions associated with electricity consumption at premises	405.98	9.32	4.34	0.00
Associated with the consumption of electrical energy for vehicles	0.00	0.00	0.00	0.00

Figure: Scope 1 & 2 emissions from the FCC Greenhouse Gas Emissions Report 2021

3.3 Q1 and Q2 2022

To be delivered soon.

4 CO₂ Report – GHG protocol

4.1 2020 BASE YEAR

For the initial assessment of 2020, the CO₂ emission data is used from the database of the Sustainability department of FCC Construcción S.A. International. Below is a visualization of the scope 1 and 2 emissions of FCC Construcción S.A. (NL) in 2020 (see Figure below). Most emissions (47%) originate from the use of plane and car for business travel by employees.

Additional, historical information is not available since FCC Construcción S.A. (NL) was founded in bookyear 2020.

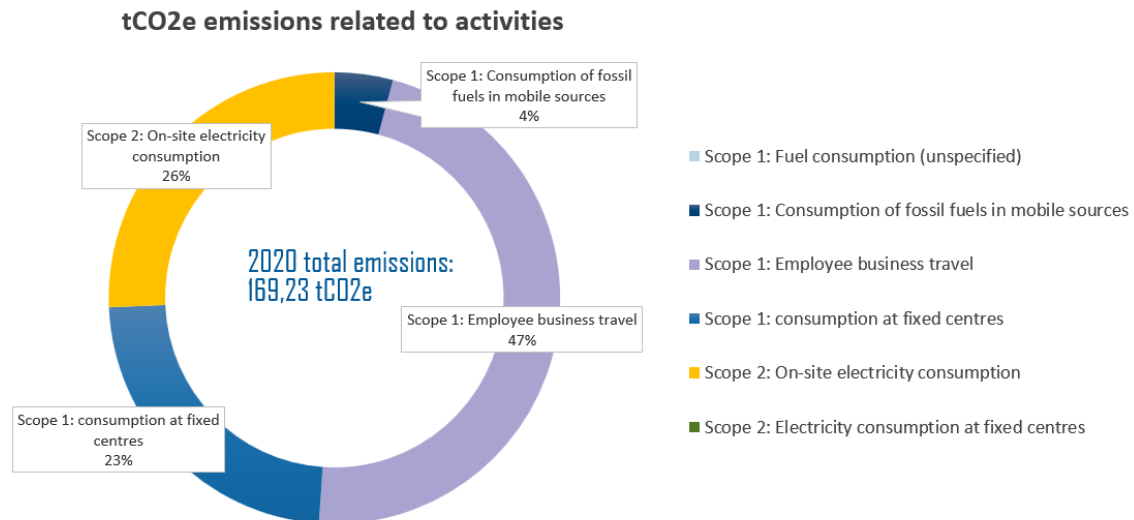


Figure: Energy chart (scope 1 and 2) of total emissions of 2020.

A decision has been made to include the following emissions in scope 1 and 2, according to the GHG protocol:

- Direct emissions:
 - Associated with the consumption of fossil fuels in fixed sources (divided in CO₂, CH₄ and N₂O).
 - Associated with the consumption of fossil fuels in mobile sources (divided in CO₂, CH₄ and N₂O).
 - Associated with fuel consumption (unspecified) (divided in CO₂, CH₄ and N₂O).
- Own indirect emissions:
 - Associated with the consumption of electrical energy
 - Associated with the consumption of electrical energy for vehicles

See the table below with the quantified emissions of scope 1 and 2 accordingly.

Scope 1 and 2 emissions 2020 (according to GHG Protocol)	tCO₂e
Scope 1: Direct emissions	46,45
Associated with the consumption of fossil fuels in fixed sources:	39,35
- CO ₂	39,31
- CH ₄	0,02
- N ₂ O	0,02
Associated with employee business travel:	7,10
- CO ₂	7,08
- CH ₄	0,01
- N ₂ O	0,01
Associated with fuel consumption (unspecified):	0,00
- CO ₂	0,00
- CH ₄	0,00
- N ₂ O	0,00
Scope 2: Own indirect emissions:	43,41
Associated with the consumption of electrical energy	43,41
Associated with the consumption of electrical energy for vehicles	0,00
Total scope 1 emissions	46,45
Total scope 2 emissions	43,41

Table: FCC Construcción S.A. (NL) Scope 1 and 2 emissions according to the GHG protocol (translated from "InformeEmisiones-BPajos-2020_TOT_Junio").

FCC Construcción S.A. (NL) has identified their emissions according to the GHG protocol, as seen in the table above. However, there is a small deviation between the CO₂ performance ladder and the GHG protocol concerning the reporting of scope 1, 2 and 3: for the CO₂PL, the category business travel of scope 3 is included in scope 1 and 2. Below is the emissions table shown according to the CO₂PL.

Scope 1 and 2 emissions 2020 (according to CO₂PL)	tCO₂e
Scope 1: Direct emissions	118,72
Associated with the consumption of fossil fuels in fixed sources:	39,35
- CO ₂	39,31
- CH ₄	0,02
- N ₂ O	0,02
Associated with employee business travel:	79,37
- CO ₂	72,27
- CH ₄	0,01
- N ₂ O	0,01
Associated with fuel consumption (unspecified):	0,00
- CO ₂	0,00
- CH ₄	0,00
- N ₂ O	0,00
Scope 2: Own indirect emissions:	43,41
Associated with the consumption of electrical energy	43,41
Associated with the consumption of electrical energy for vehicles	0,00
Total scope 1 emissions	118,72
Total scope 2 emissions	43,41

Table: FCC Construcción S.A. (NL) Scope 1 and 2 emissions according to the CO₂PL.

4.2 Data specifics

FCC Construcción S.A. International has decided to exclude emissions from its air conditioning equipment, as these have low representativity (<1%) with respect to FCC Construcción S.A. International's total emissions.

This data originates from the Sustainability department of FCC Construcción S.A. International. Raw data concerning kilowatt hours and types of vehicles is not available. For year 2023 on, scope 1 and scope 2 data will be collected using the Energy Audit Report and the Emissions Inventory Scope 1 and 2. This complies to CO₂PL requirement 2.A.3 (see 'Requirements CO₂PL').

5 Data gap analysis

The 2020 energy analysis is based on t CO₂ emission data from the database of the Sustainability department of FCC Construcción Internacional. The Sustainability Report 2020 of FCC Construcción Internacional provides energy data on an international level and does not specify in the energy sources. Invoices related to energy consumption of the year 2020 are not found or collected in the systems of FCC Construcción SA (NL). As the emission data of scope 1 and scope 2 is more specified into sources, these are used for the energy analysis.

For future energy analyses, we would like to specify the energy data into different categories per scope (see below):

Scope 1	
Category:	Data collected: (yes/no)
Natural gas	Yes
Petrol	No
Diesel oil (vehicles)	No
Diesel oil (machinery)	No
Diesel oil (heating)	No
Fuel oil	No
Refrigerant type (A/C)	No

Scope 2	
Category:	Data collected: (yes/no)
Electricity	Yes
Renewable electricity	No
Car (rental)	No
Car (km in payroll)	No
Taxi	No
Train	No
Plane (regional)	No
Plane (European)	No

The invoices for many of these categories are not yet prepared for collection. Only natural gas and electricity invoices of 2022 are collected. The action plan towards filling the energy data gap is handled in the Implementation Plan (see CO₂ Implementation Plan).

6 List of reduction possibilities

In this chapter, we list all potential measures to reduce emissions on scope 1 and scope 2 respectively. The choice for these measures are elaborated on in the Energy Management Plan (see chapter 3.3).

6.1 Possible reduction measures scope 1: gas

- Replace devices that consume a lot of gas with electrical devices at the offices.
- Reducing electricity consumption in the offices through applications such as LED lighting and movement sensors. Do not leave office machines (desktops, laptops, printers, plotters, etc.) on stand-by, but switch them off if they are not used for a longer period.
- Insulating measures to reduce gas consumption.
- Shift from gas heating to electric heaters at the offices.
- Turn down heating temperature by 1 or 2 degrees.
- Turn off the heating in rooms where nobody is present.
- Close intermediate doors to avoid air drafts.

6.2 Possible reduction measures scope 2: electricity & business travel

- Lower electricity consumption by lowering heater temperature 1 or 2 degrees.
- Insulating measures to reduce electricity consumption by electric heaters.
- Buy renewable electricity to cover electricity consumption through PPA(Power Purchase Agreement) contract.
- Generate own renewable electricity for the electricity consumption of all company buildings and on sites (e.g. solar panels, wind turbines).
- Replace high electricity consuming devices with more energy-efficient devices.
- Travel (more) by train instead of by plane.
- More online conferences or meetings and less traveling by car/plane.
- Compensation for the CO₂-emissions of all lease cars.
- Set a maximum on kilometres or CO₂-emissions per lease car.
- All new employee cars are electric or bio-fuel driven.
- Employees switch from current car to electric or bio-fuel driven.
- Provide a budget to employees for public transport.
- Provide employees the option to lease electric bicycles.

Other measures related to materials and water consumption at the office:

- Implement water-saving toilet bowls.
- Implement waterless urinals.
- Use only water-saving taps.
- Purchase environmentally friendly(r) hand soap, etc.
- Use only ECO-toilet paper.
- Everyone uses a washable coffee cup/cup instead of a disposable cup.
- Efficient printing (two-sided, FSC paper, print only what is needed).
- Make sure office waste is recycled as much as possible by waste processors.

More measures related to communication:

- Stimulate employees in thinking "green".

6.3 Choice of measures and quantified objectives

The Energy Management Plan is followed up from this report and proposes quantified energy objectives and measures accordingly. See Energy Plan.

7 Appendix Energy inventory 20220927

The table below shows the results of the energy inventory of the FCC Construcción S.A. (NL) office at the Schurenbergweg 6, 1105 AR Amsterdam. The energy inventory is conducted on the 27th of September of 2022. Consequently, the inventory does not properly reflect the energy usage of the building in 2020.

The facilities, appliances and devices are analysed on electricity and natural gas consumption. Since the inventory is composed out of a mix of fixed and variable energy consumers, we are unable to extrapolate the total number back to a value to would properly reflect the 2020 situation. For the remaining of the research, the 2022 number is kept unchanged.

2022 - Energy report company locations - FCC Construcción								
Building information		Office [name]	2022					
Street	Schurenbergweg 6, 1105AR Amsterdam							
City	Amsterdam							
Volume in m3								
Surface in m2								
Electricity use								
Elevators								
	Nr of levels	Employees	Elevator type	Amount of elevators	kWh/week	kWh/yr (52 wks)	Percentage	Subtotals
			Hours per week					
<i>Lighting (inside & outside)</i>								
	Type (bulbs, TL, led, other)	Watt	Estimate average hours of usage per week per piece	Nr of pieces				
1	TL-lighting 58W/830	58	40	290 *	672800	34.985.600	50,19%	
2	TL-lighting 36W/840 (new b)	36	40	103 *	148320	7.712.640	#####	
3	Ceiling spotlights			54	0	0	#####	
4	Emergency lights	8	120	10	9600	499.200	#####	
					0	0	#####	
					0	0	#####	
<i>verwarming, airco's en keukenapparatuur (oven, koelkast,...)</i>								
	Device type	Watt	Estimate average hours of usage per week per piece	Nr of pieces				
1	Ventilation return air units			19	0	0	#####	
2	A/C unit in garage	14950		1 *	0	0	#####	
3	A/C unit roof?				0	0	#####	
4	CV	2500	30	3	225000	11.700.000	#####	
5	Fridge			4	0	0	#####	
6	Water coolers	1100	20	4	88000	4.576.000	#####	
7	Coffee machines	2400	20	4	192000	9.984.000	#####	
8	Microwave	800	3	2	4800	249.600	#####	
9	Water cooker	2400			0	0	#####	
10	Toaster				0	0	#####	
					0	0	#####	
<i>Topped up coolants for air conditioners, etc.</i>								
	Liquid type	nr of A/C units	kg	liter/year				
	R32	1	3,6					
	R410A	1	8					
<i>Other electrical devices and machinery</i>								
	Device type	Watt	Estimate average hours of usage per week per piece	Nr of pieces				
1	Desktop computers				0	0	#####	
2	Monitors en tv's			8	0	0	#####	
3	Laptops				0	0	#####	
4	Printers			3	0	0	#####	
5	Copy machines			1	0	0	#####	
6	Standby copy machines			3	0	0	#####	
7	Plotter			1	0	0	#####	
					0	0	#####	
Natural gas use								
		list for which natural gas is used						
Heating		Total for office						
Cooking appliances								
					Total kWh/yr	69.707.040		

Table: Energy Inventory 20220927, Schurenbergweg 6 location