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Grexel Systems Ltd. Greenhouse Gas Emissions Inventory 2018

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1. About Grexel

Grexel is the leading energy certificate registry provider in Europe headquartered in Helsinki with an annual transaction volume of over one billion MWhs. The registries are used by over ten thousand active account holders in 15 countries.

As part of EEX Group, Grexel also helps its customers to design new certification schemes and cope with changing requirements set by international legislation and standards.

The European Energy Exchange (EEX) is the leading energy exchange in Europe which develops, operates and connects secure, liquid and transparent markets for energy and related products. As part of EEX Group, a group of companies serving international commodity markets, EEX offers contracts on Power and Emission Allowances as well as Freight and Agricultural Products. EEX is part of Deutsche Börse Group.

2. Introduction

This document sets out to disclose the GHG emissions inventory of Grexel Systems Ltd.

The reported emissions have been compensated by using emission reduction units, already for the seventh consecutive year.

We use the widely accepted GHG Protocol emissions calculation standard to gather and present our GHG inventory. For our energy consumption, we have adopted the updated Scope 2 Guidance - The Corporate Standard. For our value chain emissions calculation, we have similarly adopted Scope 3 Guidance - The Corporate Value Chain. These documents have proven extremely useful in forming a consistent and well-structured basis for our emissions inventory. Our calculations also contain different emission factors for purchased commodities and services.

In 2018, the total emissions dropped 14%. According to the market-based method, the Scope 2 total emissions were null. Also, considering the location-based method, the emissions of Scope 2 decreased 15% mainly due to a lower energy consumption in both office locations.

For Scope 3, the overall drop was 14% including a significant reduction in business travel (-34%) and in employee commuting (-6%). Regarding purchased goods and services, some new acquisitions were made resulting in an increase of 1%.

3. Scope 1 - Direct GHG emissions

As a certification service provider, Grexel Systems does not own or govern any production devices or other facilities directly emitting GHG emissions. Thus, the Scope 1 emissions for Grexel are considered as zero.

4. Scope 2 - Indirect GHG emissions

As required by the Corporate Standard, for year 2018, we report our Scope 2 emissions using both market- and location-based methods.

In both categories, we have included indirect GHG emissions from energy procurements in our home office as well as emissions from remotely done work in India.

In the market-based method calculations, contractual instruments have been used where possible. In the location-based method, in the other hand, we have used country-specific grid average values for emission factors. The used emission factors are presented in Table 1.

Table 1: Emission factors used for Scope 2 calculation

	gCO2/kWh
Electricity (commodity value for market-based method)	0,00
District Heating (commodity value for market-based method)	0,00
Electricity in Finland (grid average for location-based method)	264,04
Electricity in India (grid average for location-based method)	820,00
District Heating (grid average for location-based method)	158,00

For 2018, we got our home office scope 2 consumption figures directly from the building administrator including a share of our office building's non-allocated general electricity consumption, e.g. the office cooling. This share is allocated per surface occupied by Grexel in respect to the overall office surface area of the building.

4.1 Market-based method

The market-based method calculation reflects the GHG emissions associated with the choices a consumer makes regarding its electricity supplier or product.

For our home office in Helsinki, the electricity used is completely renewable. The attributes are disclosed by the supplier¹ using Guarantees of Origin and the overall technology-based distribution is 99% hydro power and 1% wind power. Thus, our home office's scope 2 emissions are zero when using the market-based method.

Table 2: Grexel home office electricity consumption and resulting emissions (market-based method)

	kWh	tCO2
Electricity consumption 2018	6207	0,00
Share of Office Building's general, non-allocated consumption 2016	12999,15	0,00
¹ http://www.nordicgreen.fi		D
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Our home office is heated as part of Helsinki's district heating network. Since 2017, also the energy used for the district heating is renewable.

Table 3: Grexel home office district heating consumption and resulting emissions (market-based method)

	kWh	tCO2
District heating consumption 2018	21766,41	0,00

Grexel also employs a development team in India. As this team is part of a bigger corporation functioning in a larger office complex, we have estimated the consumed electricity for our functions by comparing our team size to the total number of employees. The Indian office complex uses grid electricity and electricity from the company-owned wind turbine. In 2018, the electricity produced was equal to the consumption meaning zero emissions.

Table 4: Remote development team electricity consumption and resulting emissions (market-based method)

Number of dedicated employees	10
Number of employees	2700
Complete electricity consumption (MWh)	3104,80
Production from own wind turbine (MWh)	3212,10
Consumption producing emissions (MWh)	0
Consumption allocated to Grexel (MWh) ²	0
Emissions (tCO2)	0,00

Grexel's Scope 2 emissions as calculated using the market-based method are presented in Table 5.

Table 5: Scope 2 emissions (market-based method)

	tCO2
Grexel home office electricity consumption	0,00
Grexel home office district heating consumption	0,00
Grexel remote development team electricity consumption	0,00
Total	0,00

4.2 Location-based method

The consumption volumes used in the location-based method are the same as in market-based method. However, the location-based calculation emphasizes the connection between collective consumer demand for electricity and the emissions resulting from local electricity production. That is why here the grid average emissions factors are used across the Scope 2 inventory.

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Without contractual instruments, our home office electricity consumption would result in the following emission rates.

Table 6: Grexel home office electricity consumption and resulting emissions (location-based method)

	kWh	tCO2
Total electricity consumption 2018	19206,15	5,07

Also the district heating, without the contractual instruments would result in higher emissions.

Table 7: Grexel home office district heating consumption and resulting emissions (location-based method)

	kWh	tCO2
District heating consumption 2018	21766,41	3,44

For the electricity consumed by the development team in India, in location-based method, the grid average is used for all consumed electricity.

Table 8: Remote development team electricity consumption and resulting emissions (location-based method)

Number of dedicated employees	10
Number of employees	2700
Complete electricity consumption (MWh)	3104,80
Consumption producing emissions (MWh)	3104,80
Consumption allocated to Grexel (MWh)	11,50
Emissions factor (tCO2/MWh)	0,82
Emissions (tCO2)	9,43

The following table summarizes Grexel's Scope 2 emissions when using location-based method.

Table 9: Scope 2 emissions (location-based method)

	tCO2
Grexel home office electricity consumption	5,07
Grexel home office district heating consumption	3,44
Grexel remote development team electricity consumption	9,43
Total	17,94

4.3 Scope 2 assessment

When comparing different Scope 2 methods, the market-based method produces far more positive results than the location-based equivalent.

Grexel Systems Ltd. Greenhouse Gas Emissions Inventory 2018 Page 8 © Grexel Systems ltd. – part of eex group In 2018, the market-based method resulted in zero emissions thanks to the use of renewable energy regarding the home office district heating and electricity. As far as the location-based method is concerned, the decrease was mainly thanks to the reduction in the electricity consumption in both locations, Finland and India.

By using available market instruments, it is possible to maintain our business on a more sustainable level. For the remote development team, the results underline the importance and effect of local investments to renewable energy production.

5. Scope 3 - Corporate value chain

To calculate indirect emissions from our business value chain, we used the GHG Protocol's Scope 3 Corporate value chain standard. This standard introduces multiple categories designed to help companies gather and quantify their value chain emissions, both up and downstream. There are 15 different usable categories. For Grexel, we have identified three categories that are the most applicable to our business functions.

Category 1 Purchased goods and services

- Category 6 Business travel
- Category 7 Employee commuting

Category 1 includes all upstream emissions from manufacturing of purchased products and services during the reporting year. Grexel has decided to allocate the emissions resulting from purchased goods to all product lifespan years equally. In practice this means that Grexel will offset one fifth of emissions for five distinct years from product with a lifespan of five years. This approach allows for a more consistent comparison between consecutive years.

Category 6 includes Grexel-related business travel in means of transportation not owned or operated by Grexel.

Category 7 includes transportation of employees between their homes and their worksites during the reporting year.

5.1 Category 1 - Purchased goods and services

Category 1, as defined in the Corporate value chain standard, contains the upstream procurements made by the company. For Grexel, this includes office appliances and furniture for both home office and the remote development team in India.

Grexel has used the climate calculator (http://www.ilmastolaskuri.fi/en) provided by WWF to calculate our Scope 3 Category 1 emissions.

Emissions from Grexel's office appliances and furniture are presented in the following tables.

	Amount	Emission factor	Product lifespan	Emissions per
	/ inouni	(tCO2)	(years)	year (tCO2)
Mobile phone	0	0,06	5	0,00
Laptop	6	0,16	5	0,19
Desktop computer	5	0,20	5	0,20
LCD monitor	7	0,33	5	0,46
MFP	1	0,41	5	0,08
Server	0	0,20	5	0
LED TV	2	0,21	5	0,08
			Total	1,01

Table 10: Grexel office appliances and resulting emissions

Table 11: Grexel office furniture and resulting emissions

	Amount	Emission factor	Product lifespan	Emissions per
		(tCO2)	(years)	year (tCO2)
Office table	0	0,22	5	0,00
Office desk (electrical)	9	0,25	5	0,46
Office chair	7	0,03	5	0,05
Saddle chair	0	0,02	5	0,00
Other chair	0	0,01	5	0,00
Storage unit (low)	0	0,05	5	0,00
Storage unit (high)	0	0,07	5	0,00
Partition	0	0,05	5	0,00
			Total	0,50

In addition to more permanent procurements, we have included our office paper consumption in Category 1 resulting in 0,005 tCO2 emissions for 2018.

In consistence with previous years, Grexel's emissions inventory also includes the office appliances and furniture used by our remote development team in India. Each employee is estimated to have a standard set of office appliances and furniture in use. Calculation logic is the same as used with Grexel home office procurements.

	Amount	Emission	Product lifespan	Emissions per
		factor (tCO2)	(years)	year (tCO2)
Office desk	1	0,22	5	0,04
Office chair	1	0,03	5	0,01
Storage unit (low)	1	0,05	5	0,01
Partition	2	0,05	5	0,02
Desktop computer	1	0,20	5	0,04
LCD monitor	1	0,33	5	0,07
			Total per person	0,19
			Dedicated	10
			employees	
			Total	1,86

Table 12: Grexel remote development team office procurements and resulting emissions

Additionally, Grexel has used dedicated servers rented from a datacenter provider. In 2018, Grexel moved the location from UK to Germany. In both locations, the service provider uses 100% renewable electricity to power their hardware, and thus no CO2 emissions are allocated to servers' electricity consumption.

By combining the emissions from both Grexel home office and remote development, a total of 3,38 tCO2 emissions is allocated to Scope 3 Category 1 for 2018.

5.2 Category 6 - Business travel

The Scope 3 standard recommends companies to include their business-related travel by means of transport not owned by the company into GHG emissions inventory Scope 3 Category 6. We have added business trips longer than 100 km for which travel is paid by Grexel and the cost is not directly forwarded to a customer. In this category, we have initiated the inventory by gathering all Grexel's business related travels that would qualify for Category 6. Flights that have already been offset by some other party are excluded from the calculation.

Included flights were categorized per their haul length. The emission factors were adopted from UK Government GHG Conversion Factors for Company Reporting³ updated in 2018.

³ https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018 Grexel Systems Ltd. Greenhouse Gas Emissions Inventory 2018 Page 12 © Grexel Systems ltd. – part of eex group

Category	DEFRA category	Distance (km)	Emissions factor (kg/km)
Short haul	Domestic	up to 463	0,298
Medium	Short-haul international	463 - 3700	0,162
haul			
Long haul	Long-haul international	over 3700	0,213

Table 13: Business travel emission factors

To estimate the flight distances of reported flights, we used a web-based calculation tool⁴. The below table contains the overview of Grexel flights for year 2018. For security reasons the complete listing of allocated flights has been removed, and only the category-based sum volumes are presented.

Table 14: Grexel business travel emissions

Category	Quantity	Distance (km)	Emissions factor (kg/km)	Emissions (kgCO2)
Short haul	5	1852	0,298	552,49
Medium haul	22	20333	0,162	3301,27
Long haul	0	0	0,213	0
Total		22185		3853,75

5.3 Category 7 - Employee commuting

Scope 3 Category 7 covers the emissions from employee commuting. We have gathered information about employee commuting for Grexel home office employees in Finland and dedicated workers in the development center in India. For Grexel home office, we used average daily distances per means of transportation multiplied by working days.

The city of Helsinki uses 100% renewable energy for electric public transportation (metro, tram, and train). For emission factors, relevant to combustion-based means of transportation (bus and car) a calculation system for traffic exhaust emissions in Finland⁵ was used.

Table 15: Grexel total distances commuted per means of transportation for Grexel home office employees

	Walking	Bike	Metro	Tram	Train	Bus	Car
km in 2018	2204	1120	11301	0	12690	6695,4	4825,4
gCO2/km	0,00	0,00	0,00	0,00	0,00	52,00	89,00
tCO2	0,00	0,00	0,00	0,00	0,00	0,35	0,43
						Total tCO2	0,78

⁵ http://lipasto.vtt.fi

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⁴ http://www.travelmath.com/

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Like previous years, it was assumed that employees working in the Indian development center commute by bus. A yearly estimation of combined commuting kilometers was multiplied by an emissions factor per passenger km and multiplied by the number of dedicated employees. The average distance travelled in one year was calculated using Indian working days⁶.

Table 16: Indian development team's emissions

Number of dedicated employees	10
Average distance travelled one-way (km)	17
Average distance travelled in one year (km)	85340
Emissions factor (gCO2/km)	89
Emissions due offshore employee commuting (tCO2)	7,60

By combining the emissions from both Grexel home office and remote development team employee commutation, a total of 8,37 tCO2 emissions is allocated to Scope 3 Category 7 for 2018.

5.4 Scope 3 assessment

In Scope 3, our emissions are divided between categories 1 6 and 7. The lifespan concept used for procurements has been useful in making the inventory more stable, and also in enabling the company to lower its Category 1 emissions when a procurement is used longer than its lifespan estimates. The overall emissions per category in Scope 3 are presented in the below table and figure.

Table 17: Grexel Scope 3 emissions

3,38
3,85
8,37
15,61



Figure 1: Grexel Scope 3 emissions

6. Inventory overview and comparison

Our GHG emissions inventory for 2018 is presented in Table . Our emissions in scopes 1 and 2 are zero because of our choice to prefer renewables in our energy procurements. This is also evident when comparing our Scope 2 market-based approach to the location-based equivalent.

Table	18:	GHG	emissions	summar	y for 2017
		00	0	00000000	,

	2018
Scope 1 - Direct GHG emissions	0,00
Scope 2 - Indirect GHG emissions	0,00
Market-based method	0,00
(Location-based method)	17,94
Scope 3 - Corporate value chain	15,61
Category 1 - Purchased goods and services	3,38
Category 6 - Business travel	3,85
Category 7 - Employee commuting	8,37
Total	15,61

6.1 Retrospect

Grexel has disclosed and offset all its emissions since 2012. The following table summarizes the evolution of Grexel-induced emissions during 2012 – 2018.

Table 19: GHG emissions 2012 - 2018

	2012	2013	2014	2015	2016	2017	2018
Scope 1 - Direct GHG emissions	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Scope 2 - Indirect GHG emissions	16,95	17,39	17,50	3,80	2,25	0,00	0,00
Market-based method	16,95	17,39	17,50	3,80	2,25	0,00	0,00
(Location-based method)	-	-	30,13	33,42	26,11	21,21	17,94
Scope 3 - Corporate value chain	13,00	13,28	13,36	20,00	22,45	18,10	15,61
Category 1 - Purchased goods and	7,61	7,98	4,58	4,65	4,57	3,34	3,38
services							
Category 6 - Business travel	4,81	4,32	7,66	7,95	11,16	5,86	3,85
Category 7 - Employee commuting	0,59	0,98	1,12	7,40	6,72	8,90	8,37
Total	29,95	30,67	30,86	23,80	24,71	18,10	15,61

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The below figure illustrates the total emissions by Grexel across the years using the market-based method.

Figure 2: Total GHG emissions 2012 - 2018

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If we look at the Scope 2 in detail with the location-based method, we can see that also applying this approach the emissions in this category have decreased.

Figure 3: Scope 2 Indirect GHG emissions with location-based method

7. Compensation

In order to offset our business-related emissions, we have used both CO2 Removal Certificate (CORC) units and Certified Emission Reduction (CER) units.

The 12 CORC units are from the Puro domain. Puro is the first marketplace in Europe to offer verified CO_2 removals. It's a pioneering initiative to test if CO_2 removals can be made visible and tradable through an open, online platform. The CO2 Removal Certificates represent 1 ton of CO2 factually removed from the atmosphere.

For more info on Puro: https://puro.earth/#section-introduction

The 4 CER units are originally from a Shaanxi Shenmu Hengdong waste gas-based electricity generation project (UNFCCC Project no. 4292) imported to Grexel's GECCO domain certificate bank.

https://cmo.grexel.com/CancellationStatements/CancellationStatement_137057_6f3d15e2-8ed1-497f-b9b3-2cdd26b8e1df.pdf

For more info on this project: https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1293113907.36/view

The cancellation statements are attached in Appendix 1.

8. References

S. Bhawan and R. Puram, "CO2 Baseline Database for the Indian Power Sector User Guide Version 13.0," Government of India Ministry of Power Central Electricity Authority, New Delhi, 2018.

WRI and WBCSD, "Greenhouse Gas Protocol," 2012. [Online]. Available: http://www.ghgprotocol.org/.

Appendix 1 – Cancellation statements



Cancellation Statement

With this cancellation statement the CO2 Removal Certificates (CORC) are retired and cancelled for the use by the beneficiary. There CORCs are no longer tradable and onward sale of the indicated certificate numbers is prohibited.

Transaction details

Transaction Type:	Cancel
Transaction Date:	2019-06-27 11:50:46
Transaction Number:	2019062700011

Message to Receiver:

IG 8
- 1

Total

Total removed:	12
Total cancelled:	12

Type of Beneficiary:

End-consumer

Certificate Number (From - To)	Volume	Production Information	CO2 Removal Method	Country	Issuing Date	Production Period	Production Facility (GSRN, Estimated Annual Production, name)	Trading Schemes	Public Support	Auditor	Audit Stateme nt
64300240655 59086100000 00000669 To 64300240655 59086100000 00000680	12	Production of laminated log wall structures, used buffer -10%	Wooden building elements	FI	2019-05-21	2018-01-01 To 2018-12-31	64300240680100 0022 10000 tnCO2eq. Hirsitaloteoll- HTT1	CORC	No support	Heikki Lahtinen, DNV GL	-

Production Facility public information

Production Facility Name:	Hirsitaloteoll-HTT1
Production Facility GSRN:	643002406801000022
Domain of Production Facility:	Puro CO2 Removal
Estimated Annual Production, tnCO2eq.:	10000
Date of Commissioning:	1976-01-01
Location of Production Facility:	93100 Pudasjärvi, Fl

CO2 Removal Method:

C01000000 - Wooden building elements



Cancellation Statement

This cancellation statement acts as a receipt for the certificates listed below and for the purpose shown. With this Cancellation Statement, released on the Transaction Date, the indicated certificates are no longer tradable. Onward sale of this Cancellation Statement is prohibited. The environmental qualities of the associated energy have been consumed and this Cancellation Statement and these certificates may not be transferred to any party other than the energy supplier or end-consumer specified below.

Transaction details

Transaction Type:		Cancel					
Transaction Date:		2019-06-13 13:48:47					
Transaction Number:		2019061300028					
Transaction status:		Completed					
Public link to cancellation stat	ement:	https://cmo.grexel.com/Cancellation 2cdd26b8e1df.pdf	nStatements/CancellationStateme	ent 137057 6f3d15e2-8ed1-497f-b9b3-			
From			То				
Account Holder:	<u>Grexel A</u>	H GECCO	Cancellation Purpose:	Grexel Systems Ltd.			
Account:	GE- Grexel AH GECCO- 643002406741098875		Cancellation Purpose:	Compensation of scopes 1, 2, and 3 GHG emissions of Grexel Systems Oy according to the GHG Protocol			
Domain:	GECCO		Organization Deviado				
Street: -			Consumption Period:	2018-01-01 to 2018-12-31			
Deptel Code and City EL 00590			Country of Consumption:	Finland			
Postal Code and City: FI-00580 Helsir							
Country: Finland							

Total

Total	4
Total CER-G:	4

Unit Number (From - To)	Volume Host Country	Crediting Period	Project (no, name)	Unit Type
64300240655590701000000000097 To 64300240655590701000000000100	4 CN	2011-04-01 To -	0042925 Shaanxi Shenmu Hengdong Waste Gas Based Electricity Generation Project	CER-G

Project Information

Project Name:	Shaanxi Shenmu Hengdong Waste Gas Based Electricity Generation Project
Project ID:	0042925
Host Country	CN
Total Expected Units:	Information not available
Registration Date:	2015-07-03
External Link:	https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1293113907.36/view