

Grexel Systems Ltd Greenhouse Gas Emissions Inventory 2015





GREXEL SYSTEMS LTD GREENHOUSE GAS EMISSIONS INVENTORY 2015

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About Grexel

Grexel Systems Ltd. (Grexel[®]) is a Finnish company providing core business infrastructure solutions and services for green commodity markets and environmental banking. Founded in 2001, Grexel has over 100 years of cumulative experience with the energy certificate markets and central certificate registries. Grexel is currently providing certificate registry services and support to ten European countries, covering registries for energy disclosure and support purposes, and is the European market leader in energy certification. The company also has a strong position in regulatory and market engineering, helping the relevant authorities in different regions to best design their green energy markets.



Introduction

This document sets out to disclose the GHG emissions inventory of Grexel Systems Ltd. Now, already for the fourth consecutive year, we have reported the emissions as well as compensated them using emission reduction units.

Over these years, we have used 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 order to maintain the possibility to compare our emissions from year to year, we have now added a recommendation to keep the used emission factors as unchanged as possible. These factors have been selected according to relevance to our business functions. Source references for emission factors are attached to relevant places in the calculations.

In 2015, our scope 2 emissions plummeted as a result of acquiring renewable energy guarantees of origin for all our energy procurements, domestic and abroad.

We experienced slight increases in all Scope 3 emission categories. Although not wished for, this development was not due to some specific change in our actions, but rather the opposite – year 2015 was the first full year in our new office. Thus it can be considered as a stabilizing year for us to see the new base level of our emission inventory.



Scope 1 - Direct GHG emissions

As a certification service provider, Grexel[®] 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.

Scope 2 - Indirect GHG emissions

As required by the Corporate Standard, for year 2015, we are reporting 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. Consumed electricity or heat used by remote workers is not considered as there is no reliable method for this available.

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
Electricity in Finland (grid average for location-based method)	225,46
Electricity in India (grid average for location-based method)	810,00
District Heating	190,00
District Cooling	50,00

For 2015, we were able to get our home office scope 2 consumption figures directly from the building administrator without having to allocate a part of the building's overall consumption according to the amount of space occupied by Grexel, as done for previous years. For the remotely done work, the calculation logic remained the same as for 2014, but for 2015 we decided to also cancel guarantees of origin for our electricity consumption in India.

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 scope 2 emissions are zero when using the market-based method.

¹ http://www.nordicgreen.fi

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

	kWh	tCO2
Electricity consumption 2015	7 137,60	0,00

Our home office is heated as part of Helsinki's district heating network. For the year 2015, it was not possible to enforce consumer choice in this category as no instruments guaranteeing the renewability of the energy source were available. We are expecting this status to change during 2016 and look forward promoting emission-free production in district heating as well.

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

	kWh	tCO2
District heating consumption 2015	20 020,00	3,80

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 overall amount of listed employees. The Indian office complex uses grid electricity for the most of the time. However, electricity from the company-owned wind turbine is also used. In market-based calculation, we have distinguished the electricity from the wind turbine from the electricity from the grid, assuming the wind energy to be emission-free. Also for our share of the electricity consumed from the grid, we have decided to cancel an appropriate amount of guarantees of origin in order to further promote generation of electricity from renewable sources and also to further minimize our carbon footprint.

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

Number of dedicated employees	9
Number of employees	850
Complete electricity consumption (MWh)	3 265,50
Production from own wind turbine (MWh)	1 635,36
Consumption producing emissions (MWh)	1 630,14
Consumption allocated to Grexel (MWh) ²	17,26
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	3,80
Grexel remote development team electricity consumption	0,00
Total	3,80

² Allocated consumption disclosed as renewable by cancelling the required amount of GOs.



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.

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

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

	kWh	tCO2
Electricity consumption 2015	7 137,60	1,61

The emission figures for district heating would be the same as with the market-based method.

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

	kWh	tCO2
District heating consumption 2015	20 020,00	3,80

For the electricity consumed by the development team in India, in location-based method, the grid average is used for all consumed electricity, including the production volumes from the on-site windmill.

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

Number of dedicated employees	9
Number of employees	850
Complete electricity consumption (MWh)	3 265,50
Consumption producing emissions (MWh)	3 265,50
Consumption allocated to Grexel (MWh)	34,58
Emissions factor (tCO2/MWh)	0,81
Emissions (tCO2)	28,01

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	1,61
Grexel home office district heating consumption	3,80
Grexel remote development team electricity consumption	28,01
Total	33,42



Scope 2 assessment

When comparing different Scope 2 methods, it is clear that for Grexel the market-based method produces far more positive results than the location-based equivalent. Compared to 2014, the biggest change appears in remote development team's electricity consumption as a result of choosing renewable energy for the whole electricity consumption in the market-based method. Also, when using the location-based method, Grexel home office produces a relatively small amount of emissions for the inventory.



Figure 1: Grexel Scope 2 market- and location-based emission inventories in comparison

For Grexel, the comparison shows that 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. When comparing the situation of using the Indian grid average to the alternative of also taking account own renewable on-site production and the available certificates, it can easily be argued that such local investments and greening measures have significant effect on mitigating the overall emission levels.

Scope 3 - Corporate value chain

In order to account for indirect emissions from our business value chain, the GHG Protocol's Scope 3 Corporate value chain standard was used. The 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.

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 our home office and the remote development team in India.

For the past three years, Grexel has used the climate calculator (http://www.ilmastolaskuri.fi/en) provided by WWF to calculate our Scope 3 Category 1 emissions. The tool has proven extremely useful, since it contains all the needed emission factors needed in the calculation.

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

Table 10: Grexel office appliances and resulting emissions

	Amount	Emission factor (tCO2)	Product lifespan (years)	Emissions per year (tCO2)
Mobile phone	5	0,06	5	0,06
Laptop	3	0,16	5	0,09
Desktop computer	11	0,20	5	0,44
LCD monitor	16	0,33	5	1,05
MFP	2	0,41	5	0,16
Server	7	0,20	5	0,28
LED TV	2	0,21	5	0,08
			Total	2,17

Table 11: Grexel office furniture and resulting emissions

	Amount	Emission factor	Product lifespan	Emissions per year
		(tCO2)	(years)	(tCO2)
Office table	1	0,22	5	0,04
Office desk (electrical)	9	0,25	5	0,46
Office chair	9	0,03	5	0,06
Saddle chair	1	0,02	5	0,00
Other chair	7	0,01	5	0,01
Storage unit (low)	10	0,05	5	0,10
Storage unit (high)	2	0,07	5	0,03



Partition	10	0,05	5	0,10
			Total	0,81

In addition to more permanent procurements, we have included our office paper consumption in Category 1 resulting in 1,81 kgCO2 emissions for 2015.

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 factor	Product lifespan	Emissions per year
		(tCO2)	(years)	(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 employees	9
			Total	1,67

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

Additionally, Grexel has used dedicated servers from an offshore provider in the UK. To meet our demand, seven servers and one network appliance have been dedicated to Grexel's use. 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 6,46 tCO2 emissions is allocated to Scope 3 Category 1 for 2015.

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 arrangements are made by Grexel. In this category, we have initiated the inventory by gathering all Grexel's business related travels that would qualify for Category 6. However, as emission offsetting is gaining ground also among our peers, we have excluded flights that have already been offset by some other party.



Included flights were categorized according to their haul length. The assumed distances and according emissions were adopted from 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting³.

Category	DEFRA category	Assumed distance	Emissions factor	Emissions
		(km)	(kg/km)	(kgCO2)
Short haul	Domestic	463	0,20124	93,17412
Medium haul	Short-haul international	1108	0,11486	127,26488
Long haul	Long-haul international	6482	0,13143	851,92926

In order to estimate the flight distances (from departure location to destination location) of reported flights, we used a web-based calculation tool⁴. The below table contains the overview of Grexel flights for year 2015. As an update implemented last year, for security reasons the complete listing of allocated flights has been removed, and only the category-based sum volumes have been presented.

Category	Quantity	Assumed distance (km)	Emissions factor (kg/km)	Emissions (kgCO2)
Short haul	17	463,00	0,20	1583,96
Medium haul	50	1108,00	0,11	6363,24
Long haul	0	6482,00	0,13	0,00
			Total	7947,20

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 distances per means of transportation per person. Because of variations in employee commutation during the year, all gathered data was changed to a format of average distance per working day.

Table 13: Average distance travelled per day per means of transportation for Grexel home office employees

Employee	Walking	Bike	Metro	Tram	Train	Bus	Car	Scooter
1	4							
2	1,7		9,4			16,1		
3			10				10	
4	1	2		7				
5	0,6				3	1,2		3
6	1							
7	3							
8	3					17,5		

³ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69554/pb13773-ghg-conversion-factors-2012.pdf

⁴ http://www.travelmath.com/



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, car, and scooter) a calculation system for traffic exhaust emissions in Finland⁵ was used.

	Walking	Bike	Metro	Tram	Train	Bus	Car	Scooter
km in 2015	3718	520	5044	1820	780	9048	2600	780
gCO2/km	0,00	0,00	0,00	0,00	0,00	58,00	98,00	34,00
kgCO2	0,00	0,00	0,00	0,00	0,00	524,78	254,80	26,52
							Total	806,10

As during 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 of a typical bus. The average distance travelled in one year was calculated using Indian working days⁶.

Number of dedicated employees	9
Average distance travelled one-way (km)	17
Average distance travelled in one year (km)	8228
Emissions factor (gCO2/km)	89,00
Emissions due offshore employee commuting (tCO2)	0,73

By combining the emissions from both Grexel home office and remote development team employee commutation, a total of 1,54 tCO2 emissions is allocated to Scope 3 Category 7 for 2015.

Scope 3 assessment

In Scope 3, our emissions are mainly divided between categories 1 and 6, procurements and business travel. The lifespan concept used for procurements has been useful in making the inventory more stable and also 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 14: Grexel Scope 3 emissions

Category 1 - Purchased goods and services	6,46
Category 6 - Business travel	7,95
Category 7 - Employee commuting	1,54
Total	15,95

⁶ http://www.workingdays.in/



⁵ http://lipasto.vtt.fi/indexe.htm



Figure 2: Grexel Scope 3 emissions

The dominating Category 6 - Business travel is typical to our kind of company which has all of its customers and potentials abroad, requiring relatively high amount of travelling. Grexel has also been involved in major European projects also adding to the total quantity of flight mileages.

Inventory overview and comparison

Our GHG emissions inventory for 2015 is presented in Table 15. Our emissions in scopes 1 and 2 are very low compared to our value chain emissions. This is mainly 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 15: GHG emissions for 2015

	2015
Scope 1 - Direct GHG emissions	0,00
Scope 2 - Indirect GHG emissions	3,80
Market-based method	3,80
(Location-based method)	33,42
Scope 3 - Corporate value chain	15,95
Category 1 - Purchased goods and services	6,46
Category 6 - Business travel	7,95
Category 7 - Employee commuting	1,54
Total	19,75

For Scope 3, our value chain, the emissions mainly originate from categories 1 and 6, procurements and business travel, leaving category 7, employee commutation near ideal levels.



Retrospect

Grexel has disclosed and offset all its emissions since 2012. The following table summarizes the evolution of Grexel-induced emissions during 2012 – 2015

	2012	2013	2014	2015
Scope 1 - Direct GHG emissions	0,00	0,00	0,00	0,00
Scope 2 - Indirect GHG emissions	16,95	17,39	17,50	3,80
Market-based method	16,95	17,39	17,50	3,80
(Location-based method)	-	-	30,13	33,42
Scope 3 - Corporate value chain	13,00	13,28	13,36	15,95
Category 1 - Purchased goods and services	7,61	7,98	4,58	6,46
Category 6 - Business travel	4,81	4,32	7,66	7,95
Category 7 - Employee commuting	0,59	0,98	1,12	1,54
Total	29,95	30,67	30,86	19,75

During the time Grexel has disclosed and offset its carbon footprint, the emissions have remained on a relatively constant level. However, the decision of using renewable energy also for our remote development team in India has dropped our emissions by 78 % for Scope 2 and by 36 % for the entire inventory. We are extremely pleased that by taking such steps we have been able to further promote sustainability in our business functions.



Figure 3: GHG emissions per scope for 2012-2015

Future views

As climate change mitigation is gradually becoming a new cornerstone for an increasing amount of responsible companies and third parties, we expect carbon footprint offsetting to become rather the norm than surplus in companies' yearly operations. Also, global events like the COP21 conference in Paris pave way for entire countries to adopt more sustainable legislation and targets – this being the most effective way for cutting the location-based emissions.



As shown in our Scope 2 calculation, Grexel is approaching the ideal minimum of no emissions in our energy procurements. We hope that during 2016 we would be able to update our district heating consumption to also be 100% renewable as this option is now becoming available in the Helsinki area.

Offsetting

In order to offset our business related emissions, we have used Certified Emission Reduction (CER) units imported to Grexel's GECCO domain certificate bank. The units are originally from a Shaanxi Shenmu Hengdong waste gas based electricity generation project (UNFCCC Project no. 4292). The links to the cancellation statement and project information site can be found below.

The cancellation statement for emission offsets can be found <u>here</u>⁷.

More information about the source project can be found <u>here</u>⁸.

⁸ https://cdm.unfccc.int/Projects/DB/LRQA%20Ltd1293113907.36/view



⁷ http://cmo.grexel.com/CancellationStatements/CancellationStatement_100118_aa1a978e-2608-4787-8d02-a9d56154abcc.pdf

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