Carbon Assessment 2022

APRIL 5TH 2023

LID TECHNOLOGIES

Key Data

LID TECHNOLOGIES' CARBON ASSESSMENT

1,791 tCO_2e
emitted in total

1,316 tCO_2e
emissions due to the transport of goods outwards (transport of finished products to customers), i.e., 73% of GhG emissions are indirect

99,85 %
of GhG emissions are indirect

CONTRIBUTION TO GLOBAL CARBON NEUTRALITY

60,563 tCO_2e
avoided by Tyre Pressure Monitoring System's (TPMS) sales

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1 - LID's Overview

LID TECHNOLOGIES is an automotive supplier specialised in the development, industrialisation, and marketing of smart, wireless embedded electronic systems.

With operations in Europe, Japan, Turkey, and the United States, the company is committed to developing innovative, smart, and reliable embedded systems that contribute to the preservation of the environment.

Industrial Sector	Electrical/Electronic Components Industry
Workforce	60
Location of Headquarters	Ramonville-Saint-Agne, Occitania, France
Registered Status	Civil Entreprise/Commercial Company/Other Types of Companies
Date of Creation	2004
NAF Code (France)	71.12B – Engineering, technical studies
Fields	Tire Pressure Monitoring Systems (TPMS) Telematic Systems Passive Entry Passive Start Smart Telematics Gateway Immobilizer System Embedded Electronic Systems Wireless Sensor Networks & Wireless.

With a staff of 60 collaborators, LID Technologies is not required to carry out an assessment of its Greenhouse Gas (GhG) emissions. However, as part of our voluntary sustainable development approach, undertaken since 2018 and in order to respond to energy and climate issues, we carry out an internal Carbon Footprint Assessment on our activities, not verified by a third party.

This Carbon Assessment, carried out on Scopes 1 and 2 in 2018 and 2019, includes Scope 3 since 2020.

The assessment allows us to evaluate the Greenhouse Gas emissions generated by our activity and to identify possible actions to reduce them.

We follow the methodology of the Carbon assessment developed by the ADEME (the French Environment and Energy Management Agency).

2 – Methodology

The GhG assessment has been mandatory since the publication of the Article 75 of the Law N° 2010-788 of July 12th, 2010 on the national environmental agreement and the publication of the implementation decree N° 2011-828 of July 11th, 2011.

The greenhouse gases analysis is compulsory, under private law, for legal entities with more than 500 employees, as well as for legal entities with more than 250 employees and for local authorities with more than 50,000 inhabitants. A GhG analysis must be carried out every 3 years, as of 2012.

The main difference between the GhG analysis and the Carbon Assessment lies in the definition of the range of measurement of the emissions.

While a GhG analysis requires the measurement of emissions of categories 1 and 2. The Carbon Assessment methodology integrates all three categories of emissions in the definition of its scope.

A Carbon Assessment is an evaluation of the quantity of greenhouse gases emitted (or captured) into the atmosphere over a year by the company's activities.

To achieve our company's Carbon Assessment, we mainly used the methodological guides and emission factors necessary to calculate our carbon emissions made available by the ADEME (see Sources).

The Carbon Assessment method, developed by the ADEME, allows greenhouse gas emissions to be measured using readily available data in order to achieve a good assessment of the direct emissions or those generated by our activity.

The emissions are ranked according to predefined categories called "items."

This classification makes it possible to identify the emission items where the carbon constraint is the strongest. It is on these items that the energy and environmental strategies will focus in order to reduce emissions.

2.1 – Greenhouse Gases (GhG)

Greenhouse gases, or GhGs, are gaseous compounds capable of absorbing thermal infrared radiation. GhGs contribute to the regulation of the Earth's surface climate. The increase of their concentration in the atmosphere is the main cause of global warming.

The Carbon Assessment is a method of inventorying human (or anthropogenic) GhG emissions. The greenhouse gases measured are those listed in the Kyoto Protocol:

- **Carbon Dioxide (CO_2),** which comes from deforestation and the use of fossil fuels (coal, oil, and gas). Organic CO_2 emissions are responsible for 69% of the greenhouse effect induced by human activities.
- **Methane (CH_4),** generated by the fermentation of organic matter in the absence of oxygen (marshes, rice fields, etc.), but also by leaks linked to the use of fossil fuels

such as natural gas or coal, or by cattle breeding. It is responsible for 18% of the greenhouse effect induced by human activities.

➔ **Nitrous Oxide (N_2O),** results from the oxidation of nitrogen compounds in the air and 2/3 of its emissions are due to the use of manure and fertilisers. It is also used as a propellant in aerosols. It is responsible for 5% of the greenhouse effect induced by human activity.

➔ **The so-called "industrial" gases (HFC, PFC, SF_6),** because they do not exist in their natural state but are produced by humans. They are used for cold production, in air conditioners, refrigerators, and other industrial systems. Although they are present in very low concentrations in the atmosphere, some of them have a very high GWP (Global Warming Potential).

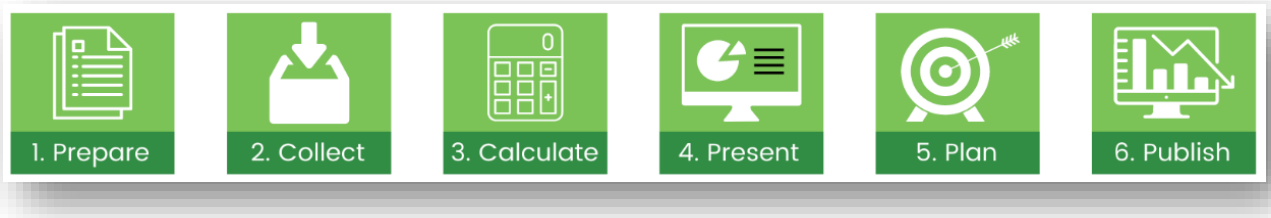
2.2 – Level of Magnitude

To get an idea of what one ton of carbon equivalent represents, here are some levels of magnitude; one ton of carbon equivalent corresponds to:

- One year of gas heating for a 3-bedroom apartment in Paris
- 1.8 tons of paper
- 150,000 km by train, i.e., 160 round-trips between Paris and London
- 180Kg of beef
- 14,000 km in a Twingo in town
- 8,500 km in a 4x4 in town
- Less than one round-trip from Paris to New-York by airplane

2.3 - Approach

The process of a Carbon Assessment is divided into the next 6 steps:



The Carbon Assessment consists of:

- Collecting readily available data
- Listing the direct and indirect GhG item emitters
- Assessing their respective emissions
- Proposing ways to reduce these emissions

2.4 – Range of the Study

There are two ranges: the **organisational range**, which refers to all the organisation's sites and facilities; and the **operational range**, which refers to all the emissions generated by

the organisation's activity (whether these are direct or indirect), grouped according to the three categories of scopes 1, 2, and 3 emissions. The range chosen is the **operational range.**

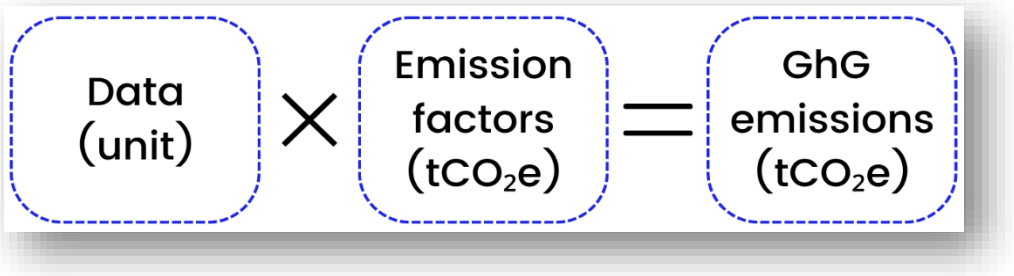
Categories of Emissions	N°	Emission Factors	Concerned Activities
SCOPE 1 Direct GhG Emissions	2	Direct emissions from the combustion of engine mobile sources	Fuel consumption of company's vehicle
	4	Direct fugitive emissions	Heating/Air conditioning equipment in the facilities (building n°2); Refrigerant R-410A
		Sub-total	Sub-total
SCOPE 2 Indirect Energy-related Emissions	6	Indirect emissions linked to electricity consumption	The operation of LID France's buildings: all electricity consumption is taken into account (heating, lighting, etc.)
SCOPE 3 Other Indirect GhG Emissions	9	Purchases of products & services	Purchases of goods (energy, components, etc.) necessary to the manufacture of finished products. Purchases of goods (computer equipment, measuring equipment, etc.) needed for the company's operation
	10	Immobilised assets	The materials stock of IT & measurement equipment, buildings, company's vehicle
	11	Waste	Waste produced by LID France: cardboard, paper, SIW, CIW, WEEE, others, etc.
	13	Professional travels	Professional travels (car + airplane) within the framework of the company's activities
	17	Transport of goods transported outwards	Transportation of products to the customers
	22	Commuting	Commuting of employees
		Sub-total	Sub-total

- **SCOPE 1:** direct emissions from fixed or mobile installations within the organisational range.
- **SCOPE 2:** indirect emissions associated with the production of electricity, heat or stream imported from the organisation's activities.
- **SCOPE 3:** other emissions indirectly generated by the organisation's activities that are not measured in Scope 2, yet are related to the full value chain.

2.5 – Emission Factors

The calculation of GhG emissions is based on:

- Activity data
- Emission factors



The sources of the emission factors required for the measurements are those defined by the ADEME's Carbon Base.

The data is converted into tons of CO_2 equivalent: tCO_2e.

As most of the approach is based on average emission factors resulting from various studies, this method is primarily intended to provide orders of magnitude and not exact results.

The results obtained should not have more than two or three significant figures.

The uncertainty associated with the measured emissions must be specified.

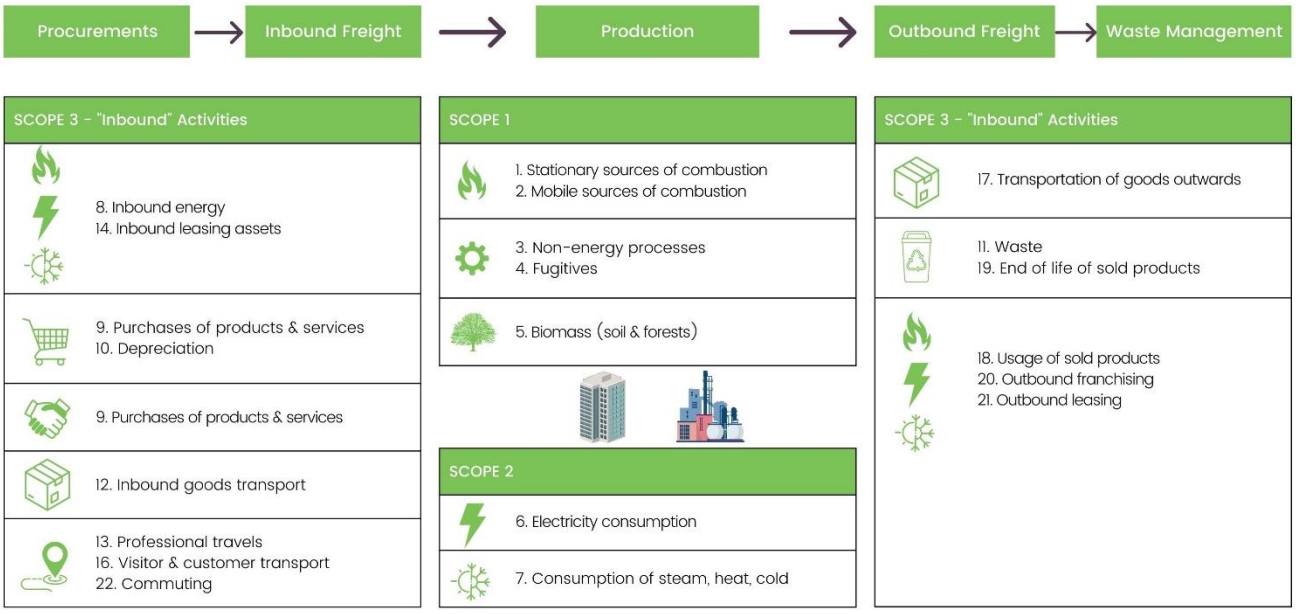
3 – LID's Carbon Footprint Assessment

3.1 – Flow Map

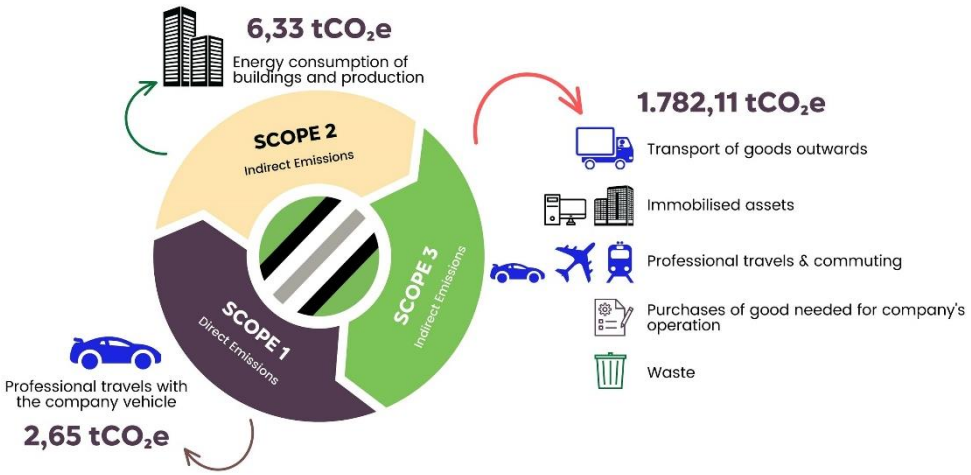
SCOPE 1	SCOPE 1 – Non applicable	
2 Direct emissions from the combustion of engine mobile sources	1 Direct emissions from stationary combustion sources	
4 Direct fugitive emissions	3 Direct emissions from non-energy processes	
	5 Emissions from biomass (soil & forests)	
SCOPE 2	**SCOPE 2 - Non applicable**	
6 Indirect emissions linked to electricity consumption	7 Indirect emissions related to the consumption of steam, heat or cold	
SCOPE 3	**SCOPE 3 - Non applicable**	**SCOPE 3 - Not measured**
9 Purchases of products & services	8 Energy-related emissions not included in the "direct GhG emissions" and "indirect energy GhG emissions" categories.	12 Inbound goods transport
10 Immobilised assets	18 Usage of sold products	14 Inbound leasing assets
11 Waste		15 Investments
13 Professional travels		16 Visitor & customer transport
17 Transportation of goods outwards		19 End of life of sold products
22 Commuting		20 Outbound franchising
		21 Outbound leasing
		23 Other indirect emissions

3.2 – Emission Items Considered

In compliance with regulations, all Scopes' 1 and 2 items are accounted for in the GhG report. The Scope's 3 items taken into consideration are the significant emission items related to our activity.

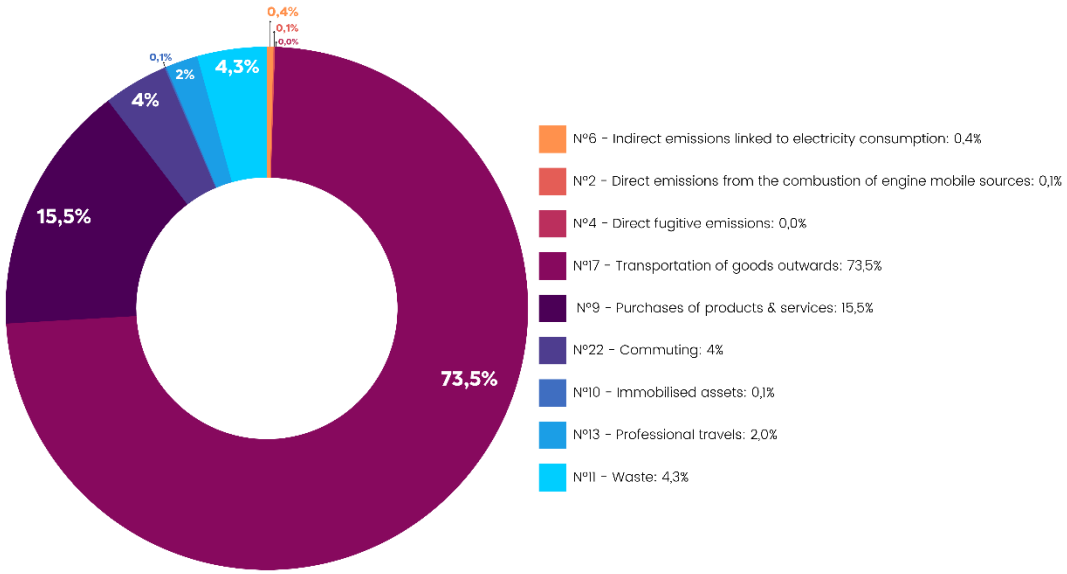


3.3 – Results on the 3 Scopes



The overall GhG emissions generated in 2022 by LID Technologies' activities have been assessed at 1.791,09 tCO_2e, namely an increase of 150% compared to 2020 (714.24 tCO_2e), due to the triple increase of the item "Transport of goods outwards" as a result of the doubling of the activity (sales & stocking). This takes into consideration the taxable weights measured by the carriers instead of the weights of the products, thus integrating the weight of the packaging and pallets.

3.4 – Allocation of Emission Items



It is apparent that the "Transportation of Goods" item is considerably the most emissive (73,5% of the total GhG emissions of LID Technologies), followed by the "Purchases" item, which accounts for 15,5% of the GhG emissions, and by the "Waste" and "Professional Travels" items (4,3% and 4%, respectively).

The data taken into account for each category is in Chapter 6.

4 – Action Plan

In the framework of our sustainable development approach, we have identified a set of actions to be taken in order to reduce our CO_2 emissions.

4.1 - Scope 1

➔ Opt for a low CO_2 vehicle when purchasing a new company vehicle.

4.2 - Scope 2

➔ Implement the Energy Saving Plan in 2023.

4.3 - Scope 3

➔ Optimise the number of products per pallet to be transported in order to rationalise packaging and transportation.

➔ Identify a production partner in Europe for our European customers.

➔ Continue with our “Design-To-Cost” actions to reduce the weight of our products.

➔ Implement a strategy to encourage eco-mobility in 2023 and early 2024.

5 – Contribution to Global Carbon Neutrality

The Tyre Pressure Monitoring Systems (TPMS) developed by LID Technologies measure tyre pressure. Ensuring correct tyre pressure can improve tyre rolling resistance, saving fuel, and reducing CO_2 emissions. Properly inflated tyres improve:

- ➔ The lifespan of the rolling tread by about 15%
- ➔ The number of kilometres driven as the fuel consumption of a vehicle by 1%*

** The United States' National Highway Traffic Safety Administration's (NHTSA) TPMS Efficiency Study of 2012 found that properly inflated tyres increase fuel economy by at least 1%.*

2022	Average kilometrage per vehicle in France**	Average fuel consumption (L per 100 km)	Fuel emission factor ($KgCO_2e/L$)	Uncertainty	N° of sensors sold in 2022 & estimated not disposed of	N° of vehicles equipped in 2022 (40% of sales)	GhG emissions avoided (tCO_2e)
Car	10621	7	2,7	10%	761278	76128	1528
Motorcycle	2549	5	2,7	10%	530929	106186	365
Truck	41402	33	2,7	10%	343205	22880	8440
Total	**54572**			**10%**	**1635412**	**205194**	**10334**

***(Data taken from the French Ministry of Ecological Transition's "Annual Transport Review of 2021)*

Vehicles equipped with the Wheel Unit Sensor (WUS) in 2022 saved 10,334 tCO_2e in 2022 alone.

Given that the lifespan of our WUS is 8 years, we have calculated the avoided GhG emissions of WUS-equipped vehicles from the turnover (2019 being the reference):

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Turnover (Million €)	5,3	6,9	13,5	9,9	12,1	15,8	15,4	16	21	28
GhG emissions avoided tCO_2e	2497	3422	7047	5440	6999	9620	10936	4 015	6 172	10 334

As a result, in 2022, LID Technologies has contributed to avoiding 60,563 tCO_2e in the atmosphere with the WUS' sold since 2013.

In addition, with its "Solar Roof" project, our manufacturing partner in Thailand has recovered **16,9 tCO_2e** in solar energy for LID in 2022.

APPENDIX 1: Detailed Data from LID's Carbon Assessment

6.1 – Direct Emissions from Combustion Engine Mobile Sources

Professional travels with the company vehicle

Pers.km	Emission Factors $kgCO_2e/km$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
13812	0,192	2,65	60%

Source: Mission statements

6.2 – Direct Fugitive Emissions

R410-A gas leakage from heating/air conditioning equipment in building N° 2

Leaked Volume kg	GWP $kgCO_2e/kg$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
0	1924	0,00	50%

Source: Annual audit

6.3 – Indirect Emissions Linked to Electricity Consumption

Operation of LID France's Buildings

kWh	Emission Factors $kgCO_2e/km$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
105632	0,0599	6,33	10%

Source: Invoices with consumption records

6.4 – Purchases of Goods & Services

6.4.1 – Purchases of Materials Used in the Composition of our Finished Products

Material type	Ton	Emission Factors $kgCO_2e/ton$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Steels / cast steel / sintered steel	8,15	2211	18,01	10%
Aluminium and aluminium alloys	6,79	7803	53,01	10%
Copper (i.e., copper amounts in cable harnesses)	5,29	1445	7,64	10%
Copper alloys	0,00	1445	0,00	10%
Zinc alloys	0,01	2490	0,04	10%
Nickel alloys	0,11	4290	0,48	10%
Other special metals	1,16	2211	2,57	10%
Thermoplastics	33,51	2350	78,75	10%
Thermoplastic elastomers	0,06	2350	0,14	10%
Elastomers / elastomeric compounds	1,02	2350	2,39	10%
Duromers (Mainly Polyurethane)	10,10	2350	23,74	10%
Polymeric compounds	6,42	2350	15,09	10%
Lacquers	0,02	6770	0,14	10%
Adhesives, sealants	0,03	6900	0,19	10%
Modified organic natural materials (i.e., leather, wood, cardboard, cotton fleece)	0,00	390	0,00	10%
Ceramics / glass	1,31	0,81	0,00	10%
Other compounds (i.e., friction linings)	2,95	2350	6,93	10%

Electronics (i.e., pc boards, displays)	0,00	866	0,00	10%
Electrics	2,81	352	0,99	10%
Fuels	0,46	3222	1,47	10%
Lubricants	0,00	6900	0,01	10%
Washing water, battery acids	0,33	0	0,00	10%
Other fuels and auxiliary means	0,04	3222	0,14	10%
Total	80,58		212	10%
	100% of sold products		255	

Scope of calculation: 83% of products sold (if quantity >50 and IMDS) - Source: IMDS [International Material Data System] + ERP SAGE – The results retained in the Carbon Assessment correspond to an extended "Cradle-To-Gate" perimeter that account for emissions related to the extraction of raw materials, procurement, shaping, assembly, and distribution.

For 100% of the sold products, we estimate **255 tCO_2e**.

6.4.2 – Subcontracted Production in Thailand

6.4.2.a – Energy Required for Production in Thailand:

CO2 Emission : Kgs.	January	February	March	April	May	June	July	August	September	October	November	December	Total
Day	31	28	31	30	31	30	31	31	30	31	30	31	365
LDL	1,624	771	752	1,395	776	1,913	1,641	540	955	1,374	691	1,547	13,979

Source: SVI

6.4.2.b – Waste Generated from the Manufacture of our Products in Thailand:

Type	Ton	Emission Factors $kgCO_2e$/ton	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Scrap from Lathe Machining	0	884	0,00	20%
Solder dross	0,0899	884	0,08	20%
Used solvent/Thinner	0,0856	884	0,08	20%
Contaminated packaging	0,0743	884	0,07	20%
Contaminated hand glove/Clothes	0,0163	884	0,01	20%
Fluorescent lamps	0,0016	884	0,00	20%
FA lab waste	0,0238	884	0,02	20%
Battery	0,0001	803	0,0000803	20%
Wastewater from wet scrubber	1,8364	0,262	0,00	20%
Expire chemical	0,0184	2,13	0,00	20%
Cooling waste	0,0355	1,99	0,00	20%
Plastic Waste	0,2094	662	0,14	20%
Wooden waste	0,0012	69	0,00	20%
Scrap Lead	0,0014	1,77	0,00	20%
Scrap Aluminium	0,0001	873	0,00	20%
Paper Waste	1,1681	0,0537	0,00	20%
PCB Edge	0,1714	347	0,06	20%
Plastic packaging	0,2514	2,28	0,00	20%
Total	3,9849		0,46	20%

Source: SVI

6.4.3 – Acquisition of IT Equipment

	k€	Emission Factors $kgCO_2e$/keuro	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Purchase Amounts (Z906A)	7,163	917	7	50%

Source: SAGE

6.4.4 – Acquisition of Measuring Equipment

	Unit	Emission Factors $kgCO_2e$/unit	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Number of Equipment Purchased	8	296	2	50%

Source: Database of measuring equipment.

6.4.5 – Immobilised Assets

	Unit	Emission Factors $kgCO_2e$/XX	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Number of light-duty vehicles	1	1375	1,38	50%

4 years of capital expenditure.

6.4.6 – Waste Produced by LID France

	Ton	Emission Factors $kgCO_2e$/ton	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
CIW	8,052	374	3,01	20%
Cardboard/Paper	5,3454	120	0,64	20%
Waste Sorting	10,05	542	5,45	20%
Glass	0,425	130	0,06	20%
Wood	0	69	0,00	20%
SIW	80,62	844	68,04	20%
WEEE	0	1995	0,00	20%
Total	104,4924		77,20	20%

6.4.7 – Employee Mobility

6.4.7.a – Professional Travels (Airplane + Train)

	N° of Flights	km	Emission Factors $kgCO_2e$/km	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Distance < = 3000 km	26	36042	0,258	9,30	70%
Distance between 3000 et 6000 km	1	4548	0,187	0,85	70%
Distance > 6000 km	7	174066	0,152	26,46	70%
Total				36,61	70%

Source: Mission statements.

6.4.7.b – Commuting (to & from work)

	N° of Employees	km	Emission Factors $kgCO_2e/km$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty
Car	49	381672	0,178	67,94	60%
Motorised 2-wheelers	4	12312	0,1147	1,41	60%
Public Transport	2	39672	0,06599	2,62	60%
Bicycle + Electric Scooter	15	21888	0,01795	0,39	50%
Total		455544		72,36	58%

Source: Mobility Plan 2022 Survey

6.4.8 – Transport of Goods Outwards

Transport of Goods Outwards	Total Weight (T)	Distance (km)	Emission Factors $kgCO_2e/t.km$	ADEME's Carbon Assessment® TCO_2e	ADEME Uncertainty in %
AIRPLANE: Distance 500 – 1000 km	0.000	0	2.57	0	70%
AIRPLANE: Distance between 1000 et 3500 km France - Europe	2.197	1000	1.74	2	70%
AIRPLANE: Distance > 3500 km Thailand - Europe	69.150	10000	1.08	747	70%
AIRPLANE: Distance > 3500 km France - AOTW	6.668	10000	1.08	72	70%
AIRPLANE: Distance > 3500 km Thailand - USA (Michigan)	28.630	15000	1.08	464	70%
AIRPLANE: Distance > 3500 km Thailand - Japan	2.579	4607	1.08	13	70%
ROAD TRANSPORT Thailand - Thailand	3.273	200	1.01	0	70%
ROAD TRANSPORT France - Europe	18.498	1000	1.01	19	70%
TOTAL AIRPLANE + ROAD TRANSPORT	130.995			1316.10	70%

Transport of our finished products to our customers; Scope of the calculation = products with IMDS.

APPENDIX 2: Definitions

The definitions below are those mentioned in the "Method for the implementation of greenhouse gas emission assessments" (Méthode pour la réalisation des bilans d'émissions de Gaz à effet de serre), published by the French Ministry of Ecology, Sustainable Development, Transport, and Housing, in October 2016. Most of these definitions are taken from the NF-ISO 14.064-1: 2006 Regulation.

Greenhouse Gases (GhG or GHG): a gaseous constituent of the atmosphere, whether natural or anthropogenic, that absorbs and emits radiation of a specific wavelength in the infrared radiation spectrum emitted by the Earth's surface, the atmosphere, and clouds. The Greenhouse gases considered are those listed in the French Decree of January 25th 2016 relative to the GhG included in the Greenhouse gas emission assessments.

Greenhouse Gas (GhG) Emissions Assessment: evaluation of the total volume of GhG emitted into the atmosphere over one year by activities of the legal entity on the French territory, and expressed in equivalent tons of carbon dioxide (CO_2)

Emission Category: set of GhG emission items. Three categories of emissions are distinguished: direct GhG emissions, indirect energy-related GhG emissions, and other indirect GhG emissions. These categories are referred to as "scope" in other standards.

Operational Range: all emission sources considered in an organisation's carbon measurement process.

Organisational Range: all sites, facilities, and authorities included in an organisation's carbon measurement process.

Direct GhG Emissions: GhG emissions from fixed and mobile sources of greenhouse gases controlled by the legal entity.

Indirect Energy-related GhG Emissions: GhG emissions resulting from the production of imported electricity, heat or steam consumed by the legal entity for the purposes of its activities.

Other Indirect GhG Emissions: GhG emissions, other than indirect energy-related GhG emissions, that are a consequence of a legal entity's activities, but which originate from greenhouse gas sources controlled by other entities.

GhG Reduction or **Emission Factor (EF):** a factor relating activity data to GhG emissions or reductions.

Emission Items: GhG emissions from homogeneous sources or source types. An emission item can be considered as a subcategory.

Global Warming Power (GWP): a factor describing the radiative forcing impact of a mass unit of a given GhG relative to an equivalent unit of carbon dioxide (CO_2), for a given time frame.