Bilan Carbone® 2023

Report

March 2024

Acknowledgements

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- Dmitri Pigoulevski, CFO Ekinops, for his confidence in O2M throughout the project,
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- All the employees of the company whom we met during the data collection and site visits and who helped us in this process.

Thank you all and I wish you every success in your Carbon and Sustainable Development projects!

Preface

For several decades now, we have been observing and measuring an increase in the quantity of greenhouse gases (GHG) in the Earth's atmosphere.

The "greenhouse effect" is the retention at Earth level of some of the heat emitted by the sun. This is caused by gases in the atmosphere that prevent some of the Earth's infrared radiation from escaping into space.

Without this greenhouse effect, the planet's average temperature would be -18°C. The natural greenhouse effect is therefore beneficial and has enabled the development of life on Earth as known.

This increase in the concentration of greenhouse gases in the atmosphere is currently the cause of what is known as "climate change".

In addition to a rise in the planet's average temperature, climate change is having several other consequences: the most visible now are the melting of the polar ice caps, the retreat of glaciers, rising sea levels and an increase in the intensity of extreme phenomena (hurricanes, cyclones, torrential rain, droughts, heatwaves, etc.). All the planet's ecosystems are affected, with direct consequences for landscapes, fauna, flora and human life and activities.

This increase in greenhouse gases in the Earth's atmosphere is directly linked to human activities, particularly since the start of the industrial revolution (end of the 19th century), when man began to exploit fossil resources to obtain energy and to massively destroy forests to develop agricultural land. As a result, the Earth's average temperature has risen by 1°C over the last 150 years, which is staggering on a global scale.

All human activity (feeding, housing, moving, clothing, etc.) has consequences in terms of greenhouse gas emissions, because it requires energy to carry out.

Aware of the risks and their influence, people are taking action to limit the increase in the concentration of greenhouse gases in the atmosphere and the resulting climate change, in order to preserve the Earth's environment as we know it and pass it on to future generations.

At global level, scientists are working together within the IPCC (set up by the UN in 1988) and national decision-makers are coming together to drive forward debates and action plans, including targets for reducing greenhouse gas emissions by country (International Climate Conference in Geneva in 1979, Rio Earth Summit in 1992, Kyoto Protocol in 1997, Copenhagen Summit in 2009). In 2015, at COP21, a universal agreement was reached to combat climate change, adopted by 195 nations. The main objective of this agreement is to keep the increase in global temperature below 2°C and to make even greater efforts to limit this increase to 1.5°C. To achieve this objective, France has put in place a strategy (Stratégie Nationale Bas Carbone, SNBC). The first strategy (2015) was revised in 2017 to speed up implementation of the Paris Agreement.

At local level, we can all act, as citizens or economic players (companies, local authorities, etc.). In France, ADEME developed the Bilan Carbone® method in 2004 to measure the greenhouse gases generated by an activity. In addition to the raw data, this tool enables any proactive organisation to identify and implement measures to reduce its greenhouse gas emissions.
Your company is committed to this responsible approach.

Sommaire

1 The carbon language

Entering the world of Bilan Carbone® and greenhouse gases (GHGs) means integrating new units of measurement and looking at the world around us differently.
The units traditionally used to describe goods, services, or flows (monetary, volumetric, mass, kilometre units, etc.) need to be converted to incorporate a new frame of reference: that of carbon accounting.

1.1 CO2 equivalent:

Several gases generate a greenhouse effect. The main ones are:
- carbon dioxide (CO_2), released by the combustion of fossil fuels (oil, coal, gas)
- methane or natural gas (CH_4), released by the decomposition or pyrolysis of organic molecules or compounds (cattle rumination, landfill sites, rice paddies, fires, etc.)
- nitrous oxide (N_2O), produced by nitrogen fertilisers or the chemical industry, for example
- refrigerant gases (various CFCs or HFCs, SF_6) and fluorinated hydrocarbons (CFCs) from industrial processes.

All these gases have a specific warming power, depending on their ability to retain solar heat reflected by the ground (radiative forcing) and their lifetime in the atmosphere (longevity).

To enable measurements and comparisons to be made, a common unit has been defined: the GWP or Global Warming Potential, based on the most emblematic gas of all: CO_2.

The GWP defines the warming power of each gas compared with CO_2 over a time scale of 100 years, or roughly speaking, answers the question: "how many times CO_2?

Gas	Origin	PRG (100ans)
H_2O - Water vapor	Evaporation	
CO_2- Carbon dioxide	Combustion Oil, Coal, Gas	1
CH4 - Methane; Natural gas	Anaerobic decomposition of organic molecules (cattle, rice fields, landfills, etc.) or pyrolysis of organic compounds (exploitation of fossil fuels, fires)	30
N_2O-Nitrous Oxide	Nitrogen fertilizers - chemical industry	265
HFC – PFC – SF_6 Fluorinated hydrocarbons (CFC...)	Refrigerant gases Various industrial processes (expansion of plastic foams, electronic components, HV equipment, alumina electrolysis, etc.)	100 ... 15000
O3 - Ozone	No direct emissions - CH_4 and NOx reaction photo	

For example, methane has a GWP of 30 (IPCC AR5 Report, 2013), which means that one unit (kilogram, tonne, etc.) of methane released into the atmosphere will be 30 times more warming than the same unit of CO_2.

1.2 The Emission factor.

To calculate a company's carbon footprint, it is necessary to convert its data (€, kWh, tons, km, litres, etc.) into CO_2 equivalent (CO_2e). To do this, the Bilan Carbone® method uses emission factors expressed in kilograms or tons of carbon dioxide equivalent (kg CO_2e or t CO_2e). The acronym for "emission factor" is EF.

The Base Carbone® lists all these factors in a public database created by ADEME and updated regularly. New emission factors are added to each new version of the Bilan Carbone®.

The emission factors are calculated based on averages and estimates, so they are not raw values but **orders of magnitude**, with degrees of uncertainty that we also consider in the results.

2 The Bilan Carbone® tool

The Bilan Carbone® tool developed by ADEME is now supported by ABC (Association Bilan Carbone). However, ADEME retains ownership of the carbon base, which is the database of emissions factors that companies must use when carrying out a greenhouse gas emissions assessment, to ensure consistency in the results of organisations' assessments.

Why companies should carry out a GHG assessment (Source: EPE)

Note: what we call "Bilan Carbone®" represents both:
- the Excel-based greenhouse gas accounting tools initially developed by ADEME
- the method developed and standardised by the ABC to accompany the implementation of these tools within the entity studied
- the result obtained is a snapshot of the carbon footprint of the entity studied at a given time.

2.1 Historical background

In 2004, ADEME launched the Bilan Carbone®, created by Jean-Marc Jancovici, an environmental engineer and partner at Carbone 4 cabinet. The Bilan Carbone® is a method for quantifying greenhouse gas (GHG) emissions for businesses and thus, working to reduce them. In other words, it involves assessing their vulnerability to fossil fuels and carbon taxes.

The principle is clear: it is not a question of defining WHO is responsible for emissions, but WHO is able to reduce them.

The Bilan Carbone® then undergoes a 3-year trial phase before being rolled out by training professionals.

To provide the tool, a Base Carbone® is available and open to all free of charge on the ADEME website. It lists the emissions factors required for carbon accounting, and the source data.

In 2010, the Association Bilan Carbone (ABC), the Association des Professionnels en Conseil Climat Energie et Environnement (APCC) and the Institut de Formation Carbone (IFC) were created. ABC then took over the Bilan Carbone® to devote itself fully to its development and distribution. The Bilan Carbone® remains the property of ADEME in order to remain public. The IFC is the only entity with the right to train people in this tool. Access requires a licence, which must be purchased, and training is compulsory.

2.2 Key players

ABC was set up to transfer ADEME's Bilan Carbone® method to the company.
At the same time, the IFC was created to train professionals in the method.
The APCC provides a network that offers visibility and keeps its members up to date with the latest developments. The aim is to contribute to the transition to an economy with a low impact on the climate. Three missions support this objective:
- To represent companies that provide support and advice to businesses, local authorities and public bodies on issues relating to climate change.
- To involve members in a process of exchange and continuous improvement.
- To inform, explain and disseminate best practice to organisations on issues relating to climate change and sustainable mobility.

2.3 Bilan Carbone® Objectives

A Bilan Carbone® has several objectives:
- Define an entity's carbon footprint over a given period and its impact on climate change
- Assess its dependence on fossil fuels
- Define and estimate ways to reduce its carbon footprint and set up a continuous improvement system. To go further, it may be useful to use the SM-GES tools.

2.4 Bilan Carbone® principles

To carry out a Bilan Carbone® for an entity, a large amount of data relating to its operation and consumption will be entered into the tool, which will convert each item of information into CO2 equivalent.

In this way, analytical accounting is carried out, i.e. an analysis by predetermined items:

- ENERGY: energy consumption by the system/site (electricity, fuels, steam, etc.)
- NON-ENERGY: non-combustion greenhouse gas emissions (methane, nitrous oxide, CO_2, etc.), e.g. consumption linked to the use of refrigerants.
- INPUTS: all the raw materials required for the activity (agricultural raw materials, services, etc.)
- FUTURE PACKAGING: elements specifically dedicated to packaging products.
- FREIGHT: all goods transport required for the business, whether upstream, internal, or downstream
- TRAVEL: travel required for the business (home-work, missions, visitors, etc.)
- DIRECT WASTE: waste generated by the activity.
- FIXED ASSETS: physical assets of the organisation
- USE: energy required to use products (e.g. electricity to run a coffee machine)
- END OF LIFE: waste generated by the consumer or end user of the product or service.

The result is a snapshot in CO_2 equivalent of the impact of each item.

2.5 Main stages of Bilan Carbone®

As each entity is different, the implementation of the Bilan Carbone® methodology will be adapted, but several major "practical" stages are essential to its implementation and effectiveness:

- Define the scope of the study (physically and over time) and list all the materials, flows, etc. required for the activity. Defining the scope of the study is an essential phase in carrying out a Bilan Carbone® project, as it determines its limits. The scope studied thus represents the elements/stages over which the organisation has a responsibility, an influence, or levers for action in terms of GHG emissions (both through its direct actions and through its choices, procurement, or distribution, for example).
- Collect data on consumption and flows.
- Transform these data into CO_2 quantities using spreadsheets.
- Analyse the GHG results.
- Establish ways/options of reducing emissions.

Organisational and managerial steps are also essential to the success of the project:

- Raising awareness of greenhouse gases and climate change, a prerequisite for a proper understanding of the project's challenges
- Setting up a working group, the operational driving force behind the collection, processing, analysis, and implementation of actions.

2.6 Database used.

The entity's activity data is entered into the Bilan Carbone® tool. To obtain a carbon equivalent, these data are multiplied by an emission factor. In our methodology, we have used the September 2023 version of ADEME's Base Carbone® for this Bilan Carbone®.

Unfortunately, the Base Carbone currently includes very few emission factors from the digital world (hardware & software). We have therefore had to use conventional emission factors in this study. The correspondence between Ekinops products and the emission factor is weak. The results should therefore be interpreted with caution.
We used an emission factor developed in-house and specific to the One 521 router product.

2.7 Precautions for use

As no scope is comparable with another, the carbon footprints are not comparable with each other and there are no "bad" or "good" Bilans Carbone®, but rather a result at a given point in time, with no value judgement. The aim is not to compare two Bilans Carbone® from different companies, but to compare them at t+1. It is the notion of variability and continuous improvement that should be considered.
If we consider two identical sites with equivalent production, employees' home-work journeys can vary greatly from one region to another depending on population density.

Since emission factors are orders of magnitude (with uncertainties) and the data themselves may be more or less reliable, the results are also orders of magnitude and not firm, definitive data.

In conclusion, and to paraphrase ADEME, "the aim of a Bilan Carbone® is not to determine who is **responsible** for emissions, but **WHO** is best placed to **take action** to **reduce** them".

The results are therefore guides, decision aids offering a new way of looking at the system and new steering indicators: environmental impacts in terms of greenhouse gases, with one objective: to reduce emissions.

3 Pocess

3.1 Support and guidance throughout the project to integrate the carbon reflex.

The Bilan Carbone® is not an end in itself, but a decision-making tool that enables companies to

- Take account of energy and environmental issues
- Design, produce and market differently.
- Take an active role in their local area and with their employees.
- Rally around a common project.

Our aim is to

- Integrate this tool into the existing management system.
- To make it user-friendly, operational, and systematic within an organisation, while limiting the burden of its use
- Make this tool a lever for innovation and competitiveness.
- Initiate eco-design initiatives
- Prepare for environmental labelling.

3.2 Bilan Carbone® project methodology

Before implementing the Bilan Carbone® process, the project must be supported by management to make it a successful, unifying corporate project.

1 - Definition of project leaders

At the start of the process, it is important to define one or two project leaders who will lead the project internally. It is preferable to identify two people in case one of them is forced or obliged to leave the project during its implementation.

2 - Raising awareness among stakeholders

At the start of the assignment, the project team and all those involved are invited to a meeting to raise awareness of the benefits and uses of the method. At this meeting, the risks associated with climate change are discussed, as well as general information on the applicable regulations.

3 - Site visit and data collection

Data is collected from the various resource persons during face-to-face discussions with those concerned. The project manager was present at each interview, so that he could conduct the interviews alone when the Bilan Carbone® was reproduced. All the company's sectors were scanned in order to gather all of the data representative of direct and indirect activities.

4 - Using the data: processing and integration into the tool

Once the data has been collected, it is processed and integrated into the Bilan Carbone® spreadsheet. A review is organised with the O2M team and the project manager.

5 - Results: a snapshot of the situation at a given point in time and joint development of action plans

Once the results have been consolidated in the spreadsheet(s), we obtain a photography of the company for the year under review. This photography and several results are presented to management and the entire project team at an interim presentation.

6 - Validation of action plans by management

Ideas for action are proposed in this report and can then be reworked internally in order to be presented to management. Management then validates which actions to implement and over what period.

7 - Drafting this report

4 Activity, challenge and scope

4.1 Ekinops's business activities

Ekinops is a leading provider of open, interoperable telecommunications solutions for service providers (telecoms operators and enterprises) worldwide.

The company has around 500 employees and is present in 10 countries. Its activities are based around 3 offerings:

- "Optical Transport", i.e. the deployment of interconnection modules and solutions for data transport.
- "Access", the production and sale of voice and data access solutions (routers, etc.)
- "Software Defined", to facilitate the transformation of IT and networks

4.2 Key issues

Implementing the Bilan Carbone® approach enables the company to understand the current regulatory, fiscal and market challenges:

- The non-linear but steady rise in energy prices, which is prompting in-depth reflection on industrial investment. On 29 August 2022, French Prime Minister Elisabeth Borne asked companies to reduce their energy consumption by drawing up their own energy efficiency plans by September. This will limit the risk of power cuts and rationing.
- For more than 10 years (NRE, Grenelle, POPE, AGEC anti-waste and circular economy laws), companies have been obliged to prove their interest in energy and greenhouse gas issues by implementing environmental audits and indicators, CSR reporting and the DPEF (Extra-Financial Performance Declaration EFPD), and to present reduction trends to their stakeholders. These constraints then have repercussions throughout the value chain.
- The gradual introduction of a carbon tax: introduced in 2014 in the form of a carbon component proportional to CO2 emissions in taxes on fossil fuels, its rate was set at €14.50/T in 2015, €22/T for 2016 and €30.5/T in 2017. And €44.60 since 2018, now stable since the social movements at the end of 2019.
- A growing demand for transparency on the environmental impact of products from consumers (YUKA, Nutri-score, Eco-score) and customers such as supermarkets, catering, etc., which can influence the organisation of the company in terms of time and energy (time-consuming external demand, risk of communication, work overload). This demand leads the entity to integrate the carbon reflex into general management to facilitate its implementation and sustainability and to develop internal skills.
- The law on the fight against waste and the circular economy aims to accelerate the change in production and consumption models in order to reduce waste and preserve natural resources, biodiversity, and the climate. The law focuses on several key areas: reducing waste and moving away from disposable plastic, providing consumers with better information, acting against waste, improving production, and combating illegal dumping. New waste reduction targets have been set for 2030: -15% less household waste per capita and 5% less waste from economic activities. The law also sets a target of 100% recycled plastic by 2025 and an end to the marketing of single-use plastic packaging by 2040.
- A target of 100% reduction in unnecessary single-use plastic packaging, defined as packaging that has no essential technical function, such as protection, health and product integrity, transport, or regulatory information support, has been set for 31 December 2025.
- The National Low Carbon Strategy, which sets a target of carbon neutrality for France by 2050. These objectives are then broken down by sector of activity, and the entire economy is concerned. Banks and insurance companies are paying increasing attention to the compatibility between business development and this trajectory. This is leading, for example, to a system of extra-financial ratings dedicated to carbon, as proposed by the ACT (Assessing low Carbon Transition) method.

It is against this backdrop that the entire Bilan Carbone® project has been carried out, by setting up a carbon project team, in a spirit of innovation and the search for solutions.

Further information: Climate and Resilience Act - Environmental claims on products

The Climate and Resilience law is the result of proposals made by the Citizens' Climate Convention. Promulgated and published in the Official Journal in August 2021, it incorporates half of these proposals. Various measures will aim to reduce France's greenhouse gas emissions by 40% by 2030, compared with 1990 levels.

The law introduces a section on environmental claims for products:

Article L229-68 – current version since 25 August 2021

I. - It is prohibited to state in an advertisement that a product or service is carbon neutral or to use any wording of equivalent meaning or scope, unless the advertiser makes the following readily available to the public:

1° A greenhouse gas emissions balance sheet integrating the direct and indirect emissions of the product or service.

2° The process by which the product's or service's greenhouse gas emissions are first avoided, then reduced and finally offset. The greenhouse gas emission reduction trajectory is described using quantified annual progress targets.

3° The methods used to offset residual greenhouse gas emissions must comply with minimum standards defined by decree.

4.3 Operational scope studied for the le Bilan Carbone® assessment

The scope is defined in a general way by ADEME, but the limits are adapted to each entity and/or available data.

The elements included are:

- Description of the activities studied
- Quantities and characteristics of energy consumed
- Nature and quantities of products and raw materials purchased
- Characteristics of upstream and downstream goods transport methods
- Employee travel
- Nature, quantity, and method of waste recovery
- Details of depreciation of production facilities and offices
- Use of products

Data collection for the Bilan Carbone ® Ekinops assignment was carried out between 21/11/2023 and 15/02/2024. Despite the responsiveness of the teams, the following elements were not included:

1. Travel

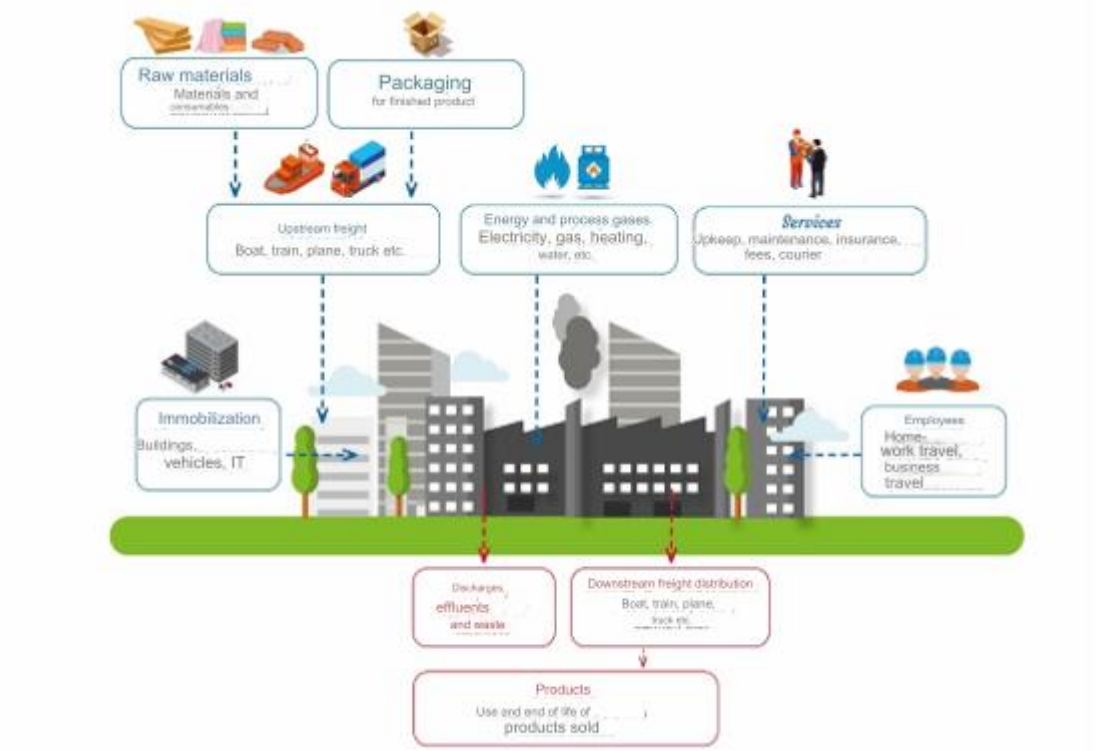
a- Fuel consumption of company and service vehicles, by type of fuel, for all sites

b- Business travel for Australia, Brazil, India, and the USA (not included in the extraction from the booking platform).

2. Fixed assets
    a. List of company and service vehicles and model
    b. m2 of buildings, for all sites
    c. List of test bench

3. Waste
    a. Lannion site

Assumptions, extrapolations, and approximations have been made:
1. Inputs: Extrapolation of the results of the ONE 521 LCA on similar products ("Manufacturing" stages).
2. Waste: Use of waste data for the Belgium site in 2021.
3. Travel: Extrapolation of the results of the mobility survey



Reference data:

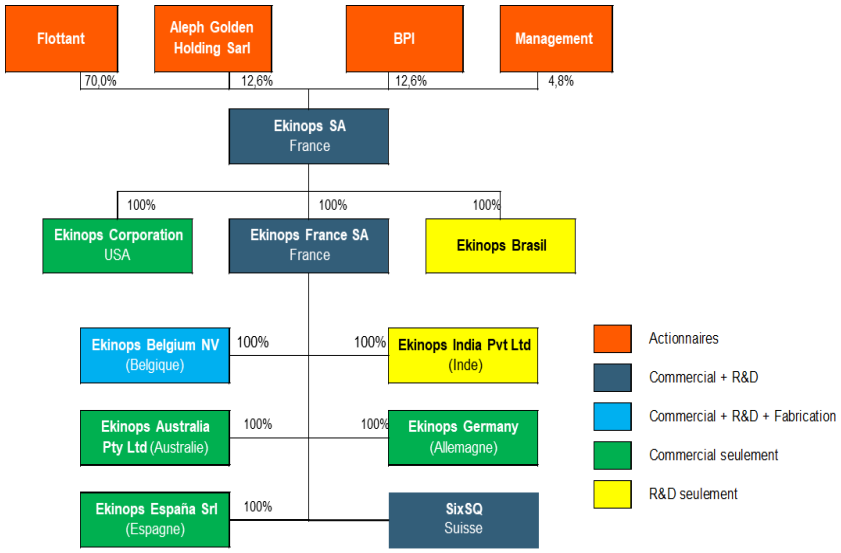
Year studied: 2023.

Number of employees over the period: 532

4.4 Ekinops organisational and operational scope reminder

Organisational Perimeter

Reconstitution	
Entité (10)	Site (15)
Ekinops SA	Lannion
Ekinops France	Vélizy
Ekinops France	Sophia
Ekinops France	Varsovie
Ekinops France	Londres
Ekinops Belgium	Leuven
Ekinops India	Bangalore
Ekinops Brazil	Campinas
Ekinops Australia	Pyrmont
Ekinops Espana	Madrid
SixSQ	Genève
Ekinops Corp (USA)	Rockville
Ekinops Germany	Büttelborn
Ekinops France	Moscou
Ekinops France	Nur-sultan



Details of the sites included in the study.

There is no physical site (neither office, nor entity, nor even address) for Warsaw, London, Moscow and Nor-sultan. These are sales representatives working for these geographical areas. From a management point of view, they are attached to Ekinops France. For the site in Belgium, the R&D and sales part can be distinguished from the Factory/Manufacturing part.

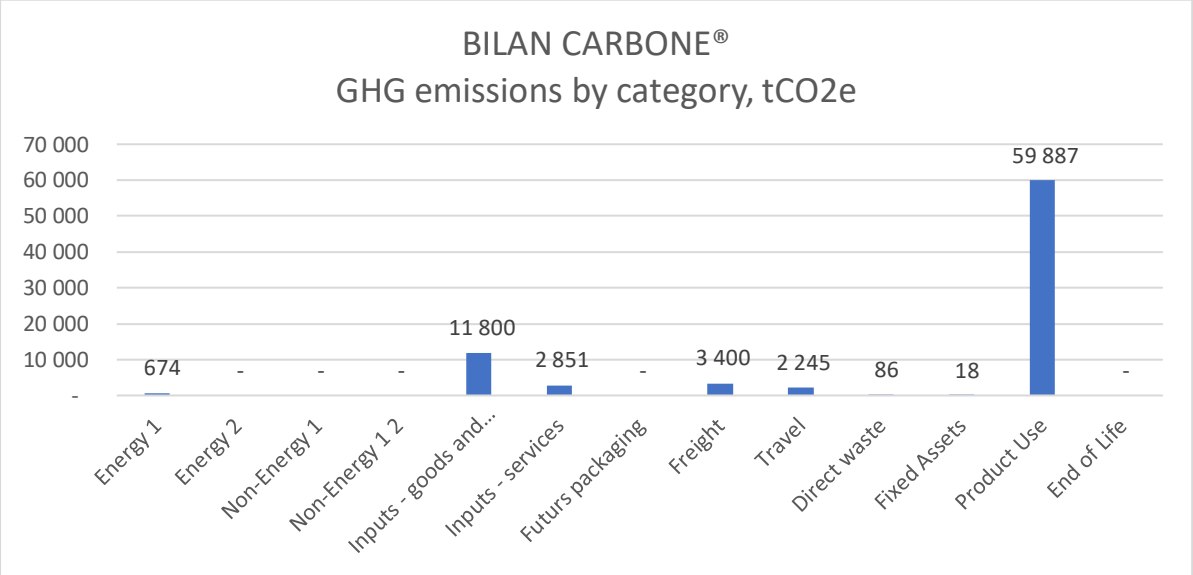
Consequently, 3 Bilan Carbone ® were used for the study:

1. Ekinops Access
2. Ekinops Transport Optique
3. Ekinops Others (Support)

5 Ekinops's results

5.1 Multisite results

Bilan Carbone® 2023 : 80 960 tCO_2e



Recap CO2e all sites	Emissions 2023		
	tCO2e		Relatives
Energies	**674**	**0**	**0,0%**
Finished products	**11 800**	**0**	**14,6%**
ACCESS	**0**	**9 261**	**11,4%**
Transport optique	**0**	**2 538**	**3,1%**
Future packaging	**0**	**0**	**0,0%**
Purchases of services	**2 851**	**0**	**3,5%**
Freight	**3 400**	**0**	**4,2%**
ACCESS	**0**	**2 683**	**3,3%**
Transport optique	**0**	**718**	**0,9%**
Travel	**2 245**	**0**	**2,8%**
Direct waste	**86**	**0**	**0,1%**
Fixed Assets	**18**	**0**	**0,0%**
Product use	**59 887**	**0**	**74,0%**
ACCESS	**0**	**52 009**	**64,2%**
Transport optique	**0**	**7 878**	**9,7%**
Total	**80 960**		**100%**

The Product Use (the energy consumption of finished products during their use) represents 74% of Ekinops' GHG emissions. The manufacture and production of finished products sold by Ekinops accounts for 15%. This is due to the materials required and the energy used during manufacture. Finally, freight and services account for 4% of emissions, and personal and business travel for 3%.
The sum of the other emissions items (energy, direct waste, and fixed assets) represents 1% of the total impact.

5.2 Performance indicators

To track changes over time, the company must monitor 2 indicators:

- Overall emissions in tCO_2e /year, i.e. **the absolute value**
- Global emissions per activity in kg CO_2e/kg finished product delivered, i.e. the **relative value**.

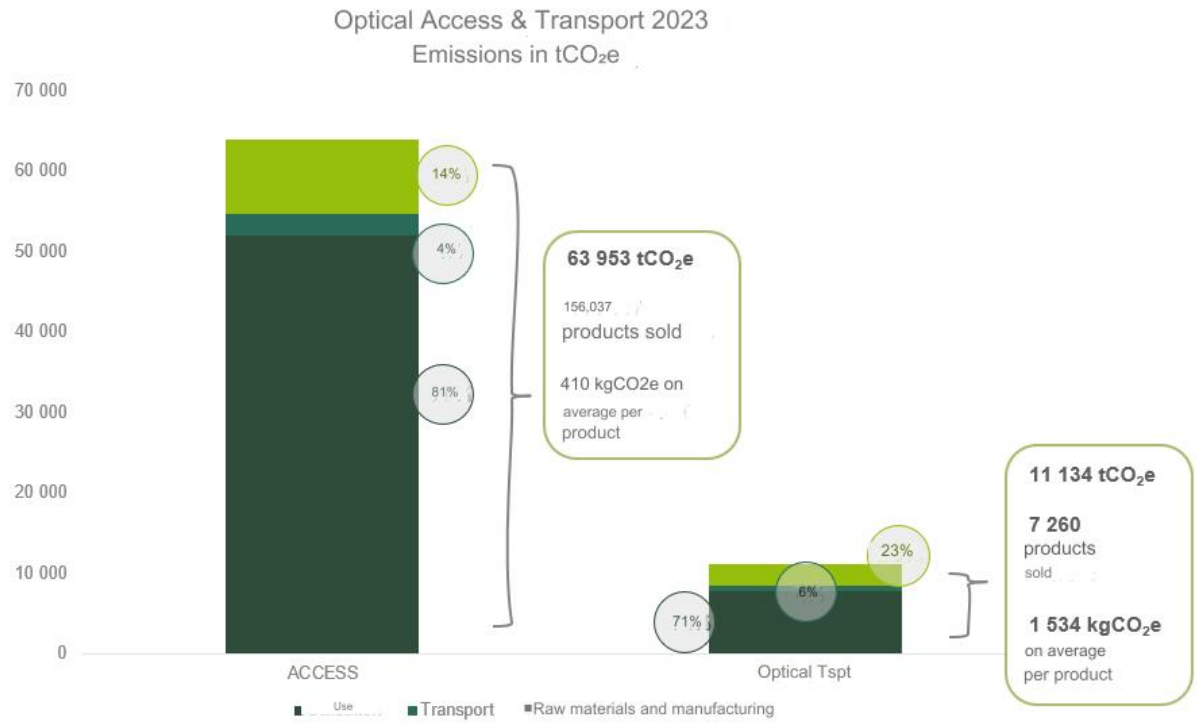
To get involved into a virtuous circle and meet greenhouse gas reduction targets, as well as the objectives set by national, European, and international policies, these 2 indicators must tend to decrease over time. France has committed, via its National Low Carbon Strategy (SNBC 1), to dividing its emissions by 4 by 2050 compared with 1990 emissions (i.e. -75% in absolute terms, regardless of French economic growth). This strategy was revised in 2020 (SNBC 2), with the aim of cutting CO2 emissions by a factor of 6, i.e. by 83% in absolute terms, or by 10% per year.

Results in absolute value:

- Ekinops = 80960 tCO_2e

Results in relative value:

- Ekinops = 410 kgCO2/kg Access finished product and 1,534 kgCO2/kg Optical Transport finished product (based on 156,037 and 7,260 finished products sold).



5.3 Comparison between 2022 – 2023

The Ekinops Group carried out its third Bilan Carbone® in 2023, its first in 2021 and its second in 2022. We can observe the evolution of emissions.

Recap CO2e all sites	Emissions 2022		
	tCO2e		Relatives
Energies	664	0	0,5%
Finished products	16 026	0	11,9%
Future packaging	8	0	0,0%
Purchases of services	0	0	0,0%
Freight	2 295	0	1,7%
Travel	1 355	0	1,0%
Direct waste	2	0	0,0%
Fixed Assets	594	0	0,4%
Product use	113 169	0	84,4%
Total	134 114		100%

Recap CO2e all sites	Emissions 2023		
	tCO2e		Relatives
Energies	674	0	0,0%
Finished products	11 800	0	14,6%
Future packaging	0	0	0,0%
Purchases of services	2 851	0	3,5%
Freight	3 400	0	4,2%
Travel	2 245	0	2,8%
Direct waste	86	0	0,1%
Fixed Assets	18	0	0,0%
Product use	59 887	0	74,0%
Total	80 960		100%

If we compare the results on a gross basis, we see a 40% reduction in emissions. Ekinops' Bilan Carbone® has decreased by approximately 53,000 tCO2e. This reduction is almost entirely due to changes in the use of ACCESS products and Optical Transport. There are two main reasons for this:

- Reducing emissions linked to electricity consumption in countries where products are sold

- Changes to product ranges

- Calculation of consumption according to the measured typical value for more references

Evolution of product ranges

Ekinops regularly improves the products it sells. These improvements can relate to several aspects of the product. The one that has the greatest impact on use is the ratio of data processed per KWh consumed. The more efficient the equipment, the greater the amount of data it is capable of processing in relation to its power, size, etc. Sometimes, this improvement reduces the amount of KWh consumed, for the same amount of use by the customer.

Calculating consumption according to" the measured typical value"

We have calculated the consumption in kWh of the products sold by Ekinops. To simplify, the calculation is equal to the power of the appliance, multiplied by the length of time it will be used over its lifetime (estimated lifetime: 10 years). The power chosen for this calculation is

therefore crucial. In 2021, the information concerning the power of the appliance was that of the installed power, i.e. the maximum power that the appliance can develop. However, an Ekinops appliance rarely, if ever, operates at its maximum power.

In 2022, the Ekinops team will have access to more detailed data. Tests have been carried out to observe the power developed by the device, depending on several conditions (quantity of data processed, outside temperature). An average power output has been observed, which is more reliable for our calculation. This data was used for the Bilan Carbone 2022.

5.4 Standardised extraction

A Bilan d'Emission de Gaz à Effet de Serre (BEGES) is a simplified Bilan Carbone ®. It may be mandatory for certain structures. The results of the Bilan Carbone ® are broken down and classified according to 3 scopes and 23 emission items.
Under the regulations, companies with more than 500 employees listed on the SIREN must publish a BEGES every 4 years, together with a 4-year action plan. The scope of this GHG assessment is much narrower than that of the Bilan Carbone ®, since it focuses solely on scopes 1 and 2, i.e. the first 7 items only.
Companies benefiting from the stimulus plan are also required to produce a simplified BEGES covering scope 1 only, before the end of 2022 for companies with more than 250 employees and before 2023 for companies with between 50 and 250 employees.

However, since July 2022, a decree has changed the scope to be taken into account for companies subject to the EPFD (see box below). From now on, we will no longer be talking about scope 1 and 2, but about significant positions. This can now include items from all 3 scopes.

Simplified GHG balance

Decree no. 2021-1784 of 24 December 2021 on simplified greenhouse gas emissions assessments.

This decree specifies the terms and conditions for the application of 1° of I. and II. of article 244 of law no. 2020-1721 of 29 December 2020 on finances for 2021, which provides for the establishment of a simplified greenhouse gas emissions balance sheet for legal entities under private law benefiting from credits opened by this law under the "Recovery Plan" mission. Failure to comply with the regulations could result in a €10,000 fine.

Who ?	What ?	When?

Between 50 and 250 employees, benefiting from the recovery plan	Simplified BEGES (scope 1)	Before le 31/12/2023
> 250 employees, benefiting from the recovery plan	Simplified BEGES (scope 1)	Before le 31/12/2022
> 500 employees not subject to extra-financial performance declaration	BEGES scope 1 and 2	Already required
> 500 employees subject to extra-financial performance declaration	BEGES significant positions	Starting from 01/01/2023

Here is an extract of the results of the regulatory GHG balance, to date:

		Groupe	Emissions de GES						
sions	Numéros	Postes d'émissions	CO2 (t CO2e)	CH4 (t CO2e)	N2O (t CO2e)	Autres gaz (t CO2e)	**Total (t CO2e)**	CO2 b (t CO2e)	Incertitude (t CO2e)
1. Emissions directes de GES	1.1	Emissions directes des sources fixes de combustion	69,19	-	-	-	69,19	-	2,46
	1.2	Emissions directes des sources mobiles de combustion	-	-	-	-	-	-	-
	1.3	Emissions directes des procédés hors énergie	-	-	-	-	-	-	-
	1.4	Emissions directes fugitives	-	-	-	-	-	-	-
	1.5	Emissions issues de la biomasse (sols et forêts)	-	-	-	-	-	-	-
		Sous total	**69,19**	**-**	**-**	**-**	**69,19**	**-**	**2,46**
2. Emissions indirectes associées à l'énergie	2.1	Emissions indirectes liées à la consommation d'électricité	532,59	-	-	-	532,59	-	41,22
	2.2	Emissions indirectes liées à la consommation d'énergie autre que l'électricité	-	-	-	-		-	-
		Sous total	**532,59**	**-**	**-**	**-**	**532,59**	**-**	**41,22**
3. Emissions indirectes associées au transport	3.1	Transport de marchandise amont	1 837,57	16,99	25,56	1 520,05	3 400,17	-	1 264,65
	3.2	Transport de marchandise aval	-	-	-	-	-	-	-
	3.3	Déplacements domicile travail	1 707,35	-	-	-	1 707,35	-	469,78
	3.4	Transport des visiteurs et des clients	-	-	-	-	-	-	-
	3.5	Déplacements professionnels	289,38	2,31	4,04	241,51	537,23	-	241,74
		Sous total	**3 834,30**	**19,30**	**29,59**	**1 761,55**	**5 644,74**	**-**	**1 420,91**
4. Emissions indirectes associées aux produits achetés	4.1	Achats de biens	11 870,93	0,36	0,07	0,06	11 871,42	0,18	3 912,94
	4.2	Immobilisations de biens	17,50	-	-	-	17,50	-	8,35
	4.3	Gestion des déchets	85,70	-	-	-	85,70	-	14,52
	4.4	Actifs en leasing amont	-	-	-	-	-	-	-
	4.5	Achats de services	1 466,47	-	-	-	1 466,47	-	457,45
		Sous total	**13 440,61**	**0,36**	**0,07**	**0,06**	**13 441,09**	**0,18**	**3 953,50**
5. Emissions indirectes associées aux produits vendus	5.1	Utilisation des produits vendus	59 887,47	-	-	-	59 887,47	-	4 505,71
	5.2	Actifs en leasing aval	-	-	-	-	-	-	-
	5.3	Fin de vie des produits vendus	-	-	-	-	-	-	-
	5.4	Investissements	1 384,39	-	-	-	1 384,39	-	431,85
		Sous total	**61 271,85**	**-**	**-**	**-**	**61 271,85**	**-**	**4 615,59**
6. Autres émissions indirectes	6.1	Autres émissions indirectes	-	-	-	-	-	-	-
		Sous total	**-**	**-**	**-**	**-**	**-**	**-**	**-**
			0	0	0	0	0	0	0
		TOTAL	**79 148,54**	**19,66**	**29,66**	**1 761,61**	**80 959,47**	**0,18**	**6 370,26**

IMPORTANT: the table corresponds to scopes 1 and 2, which represent the scope of a regulatory GHG balance. The regulatory GHG Balance corresponds to 602 tCO_2, i.e. 0.7% of the total Bilan Carbone®. When communicating externally, you must therefore be careful to define the scope you are talking about and to be vigilant and critical about the scope when observing the GHG or carbon footprint of another organisation.

5.5 Uncertainties

The Bilan Carbone® is a tool for quantifying a company's CO2 emissions. However, the data obtained is only an order of magnitude. The uncertainty surrounding the emissions factors and certain inventory data means that it is impossible to give a precise figure.

Data	Emission factors (EF)	Results	EF uncertainty	Data uncertainty	Calculation	Uncertainty
1000 kWh electricity	0,084 $kgCO_2e$/kWh	84 $kgCO_2e$	10%	0%	= 84*0,1	± 8,4 $kgCO_2e$ Soit 10%
				20%	=84*(1-(1-0,1)*(1-0,2))	± 23,52 $kgCO_2e$ Soit 28%

Uncertainty Bilan Carbone® Ekinops

BILAN CARBONE®	Emissions		Uncertainties	
	t CO2e	Relatives	t CO2e	%
Energy 1	674	0,8%	45,44	7%
Energy 2	-	0,0%	-	0%
Non-Energy 1	-	0,0%	-	0%
Non-Energy 1 2	-	0,0%	-	0%
Inputs - goods and materials	11 800	14,6%	3 894,21	33%
Inputs - services	2 851	3,5%	889,30	31%
Futurs packaging	-	0,0%	-	0%
Freight	3 400	4,2%	1 264,65	37%
Travel	2 245	2,8%	544,88	24%
Direct waste	86	0,1%	14,52	17%
Fixed Assets	18	0,0%	8,35	48%
Product Use	59 887	74,0%	4 505,71	8%
End of Life	-	0,0%	-	0%
Total	80 960	100,0%	6 365,48	8%

The total uncertainty obtained is **+/- 6365 tonnes of CO2 equivalent out of 80960, i.e. 8% of the total balance.**

In order to refine these values, it is necessary to monitor emissions factors. In addition, one of the roles of a company committed to a carbon approach is to influence its stakeholders to encourage them to adopt this type of approach. In this way, it can hope to obtain information on emission factors from its suppliers, partners, etc.

6 Results per item and possible actions

This section details the emissions by item, the data included in the spreadsheets and recommendations for reducing the impact of the item studied.
The items are presented in the order of their contribution to the overall emissions balance.

Reminder of emissions factors
The entity's activity data is entered into the Bilan Carbone® tool. To obtain a carbon equivalent, this data is multiplied by an emissions factor. In our methodology, we have used the February 2023 version of ADEME's Empreinte® database for this Bilan Carbone®.

6.1 Products use: 74%

Integrated data & calculation
Firstly, each product reference sold in 2023 has been given an average power output (in watts), the 'typical value'.. Ekinops also collected the product's destination (country of use). This data is exhaustive and precise, and has made it possible to calculate the impact of electricity consumption according to the country and therefore its electricity mix.

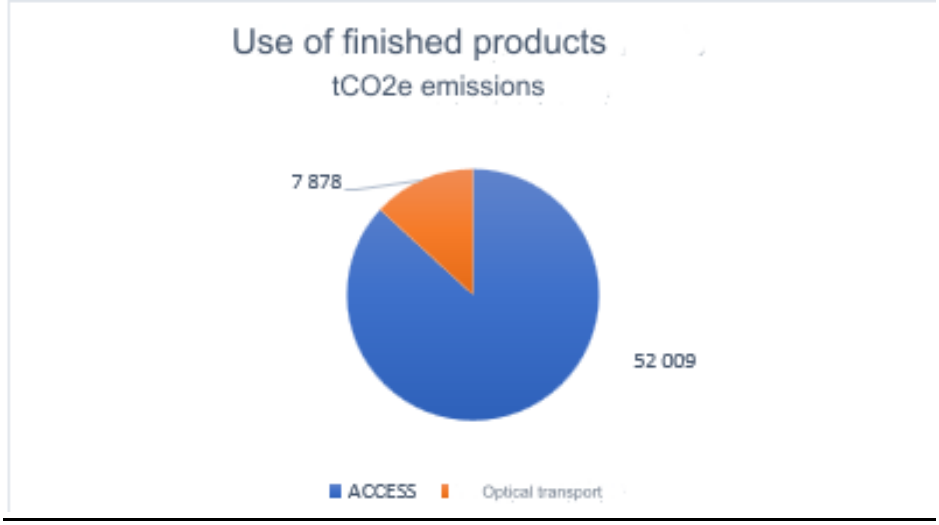
First assumption, for the calculation of emissions, the average period of use of the products is 10 years.

Second assumption: the frequency of use over one year. All products would operate 24 hours a day, non-stop. However, products do not operate all year round. According to an ADEME study, a typical digital device plugged into the mains works 360 days a year. The 5 days of downtime are due to power cuts and maintenance. For router-type products, ADEME specifies this value: 359 days. This figure is 360 days/year for Optical Transport products and 359 days/year for Access products.

Third assumption: the emission factor. Although ADEME's Base Carbone offers a large number of emission factors per country (kgCO2e/KWh consumed), some countries have not been studied. In this case, there are two possibilities:
- Either the emission factor has been found in another reliable database (e.g. Hong Kong's EF comes from the EcoInvent 3.0 database, Electricity Map)
- Or the emission factor chosen is that of another country whose electricity mix, after research, appears to be similar (e.g. use of the Nigeria EF for Mali).
- 1 exception: Singapore, where the EF does not exist and there is no equivalent to replace it.

Results

The impact of use is **59 887 tCO2e, i.e. 74%** of the total Bilan Carbone®.



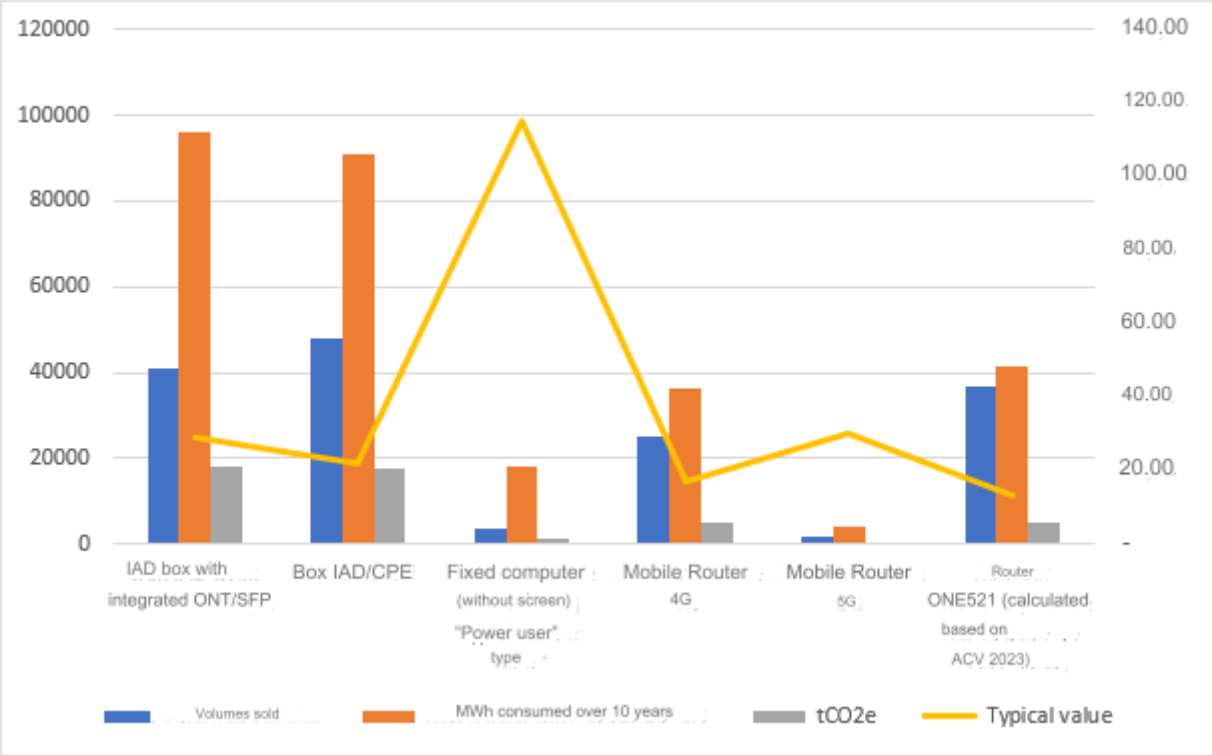
The impact of use is therefore due to two main factors:

- KWh consumed, which in turn depends on
    - How often the appliance is used (all day?)
    - the power used during use

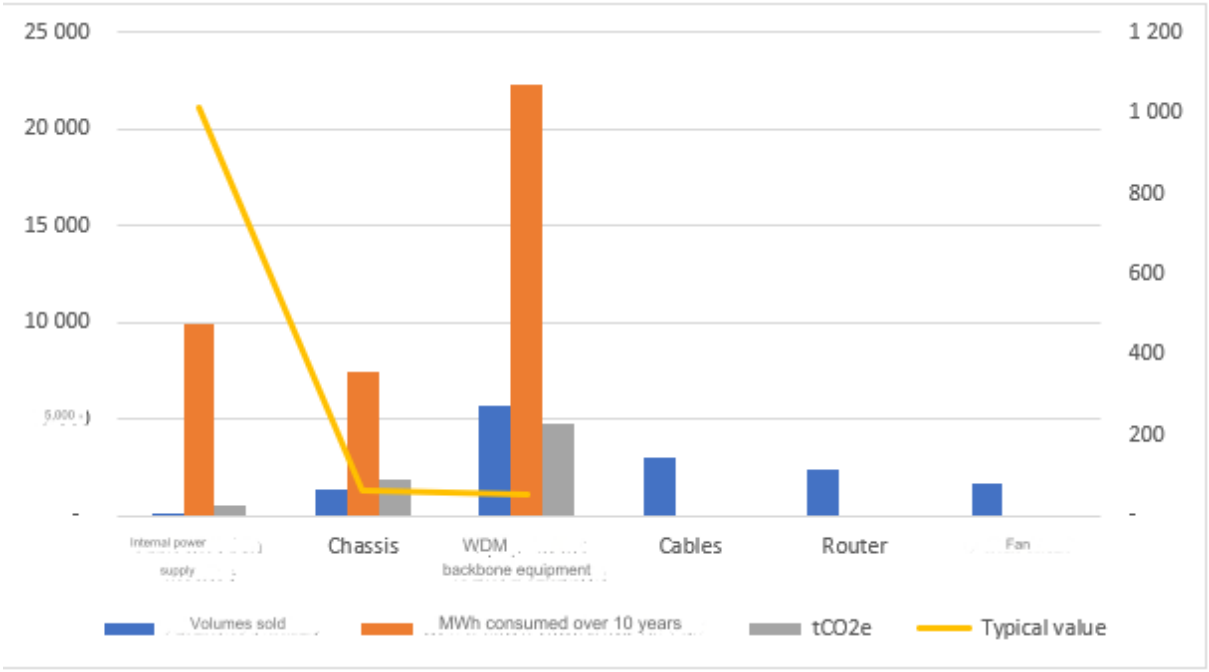
- The impact of electricity consumption

KPI E-4 : Average annual electricity consumption of products sold	2023			2022			2021		
	TOTAL MWh/an	Products number	Average/product/year	TOTAL MWh/an	Products number	Average/product/year	TOTAL MWh/an	Products number	Average/product/year
Accès	28 766	156 037	184,4 KWh	30 479	212 961	143,1 KWh	42 017	200 289	210 KWh
Transport	3 959	7 260	545,3 KWh	1 855	6 391	175,9 KWh	2 672	5 936	295 KWh
Group	32 725	163 297	200,4 KWh	32 334	219 352	147,4 KWh	44 689	206 225	217 KWh

Volumes sold, MWh consumed, power developed and tCO2e for ACCESS products.



Volumes sold, MWh consumed, power developed and tCO2e for Optical Transport products.



Please note that the chart above shows both passive and active products, so the quantities sold are different from the tables shown, and there is no induced energy consumption for some of them.

Areas for improvement

The digital world is a major challenge for the climate. It accounts for 2.5% of France's carbon footprint and 10% of French electricity consumption. On the other hand, the National Low Carbon Strategy

stipulates that emissions should be reduced by 81% in the industrial sector and by 95% in the energy production sector, thanks to "greater sobriety on the part of consumers".

Recommendation to reduce GHG emissions from the digital sector:

The 2023 mission has not been the subject of work on the company's action plan. However, this year's action plan is very similar to the previous year's plan. In addition, some of the actions mentioned are already underway at Ekinops.

Action item Use in 2022:

- Measuring and monitoring the consumption of appliances according to their use: ongoing

- Reduce the installed power of appliances sold

- Raising consumer awareness of the need to switch off appliances when not in use

- Optimising the temperature of Optical Transport products

- Adapting Gbit capacity to customer demand

- Deactivation of software functions for Optical Transport products

- Deactivation of WIFI and use of an Ethernet cable (switch) for ACCESS products

- Disable 4G for ACCESS products

- Reducing the clock frequency for ACCESS products

- Reducing transport capacity for Ethernet cables for ACCESS products

Reducing emissions from the general use of devices by 1% would result in a 0.9% reduction in Ekinops' Bilan Carbone ®.

To find out more:

https://normandie.ademe.fr/sites/default/files/chiffres-cles-consommation-energetique-equipements-informatiques.pdf

https://librairie.ademe.fr/consommer-autrement/5226-evaluation-de-l-impact-environnemental-du-numerique-en-france-et-analyse-prospective.html#/44-type_de_produit-format_electroniq

6.2 Production and manufacturing = 15%

Integrated data

This item represents the GHG emissions linked to the production and manufacture of finished products, "out of the factory" for the Bilan Carbone® Ekinops.

Methodologically, carbon accounting requires raw materials, freight and energy to be accounted for in the Bilan Carbone® in order to reconstruct the impact and value chain of a finished product. To do this, we collect the quantities of materials purchased, the tonnes transported and kilometres travelled by mode of transport, and the energy consumption of the production sites.

Given the time available and the availability of data, this method could not be applied to the Bilan Carbone ® Ekinops. Data relating to transport and electricity consumption at the Belgium and Lannion sites were collected, but not data relating to raw materials.

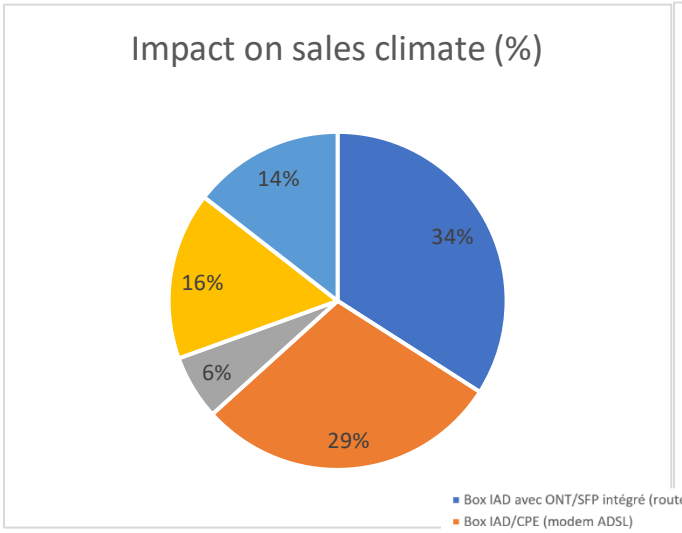
The "reverse path" method was chosen. ADEME's Base Carbone provides emission factors with the difference in impact per stage of the life cycle. The impact of transport (upstream and downstream) has been eliminated. However, the impact of the energy required for production has not been removed, as the expression of the results of the EFs (Energy (Forming) and Energy (Assembly)) was not considered sufficiently clear to be removed.

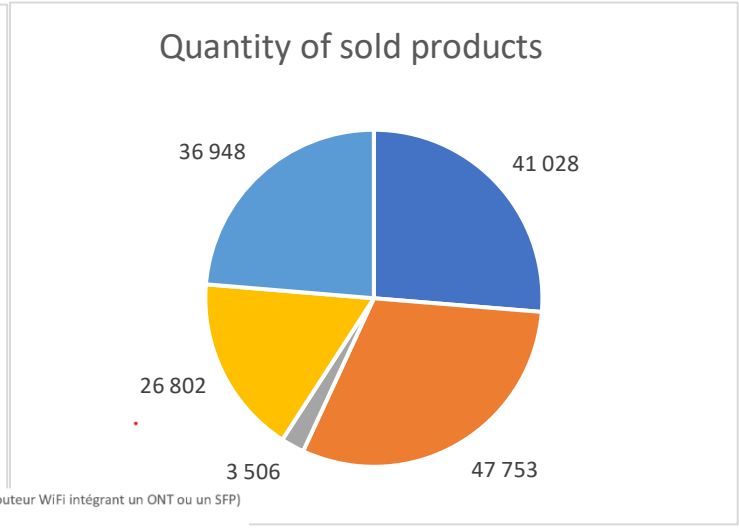
Example with the "Modem - fibre" EF

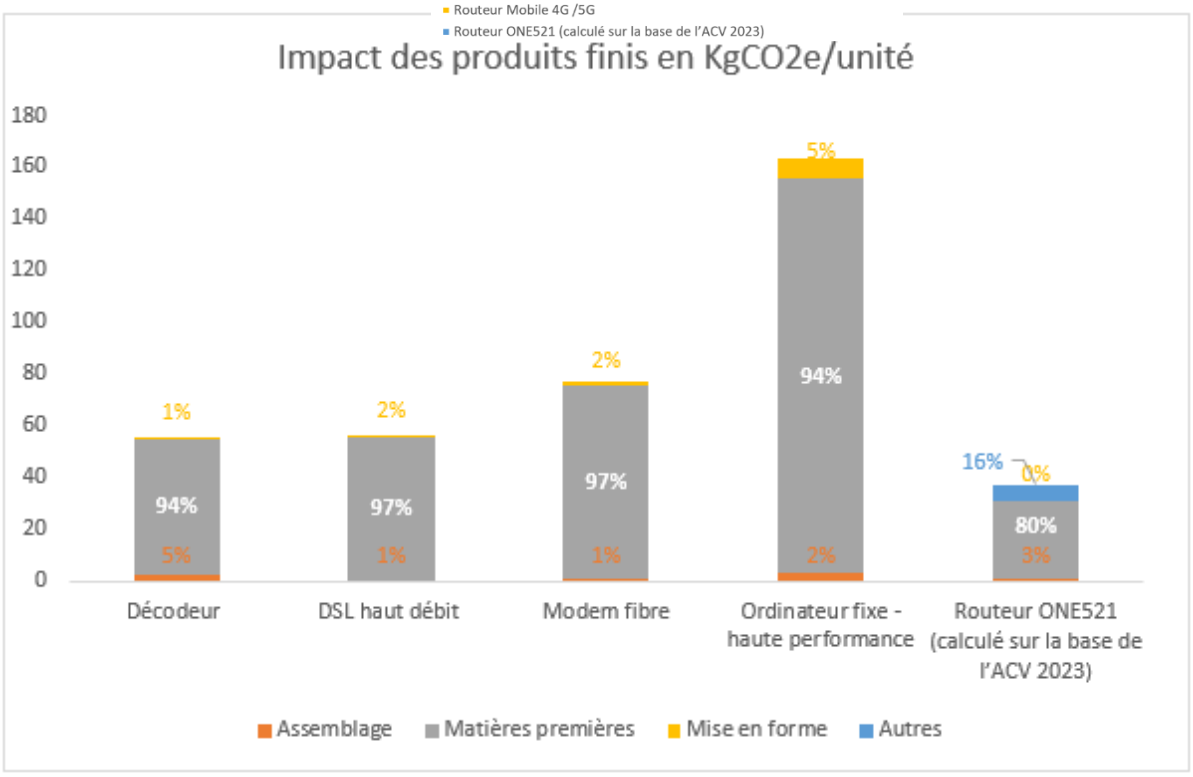
There is a high risk of double counting emissions (including the same source of emissions several times). Emissions linked to energy consumption at the Lannion site, and the Belgium site have been included, even though finished products are produced there. However, this risk is less than 0.6% of the Bilan Carbone ® result.

Results

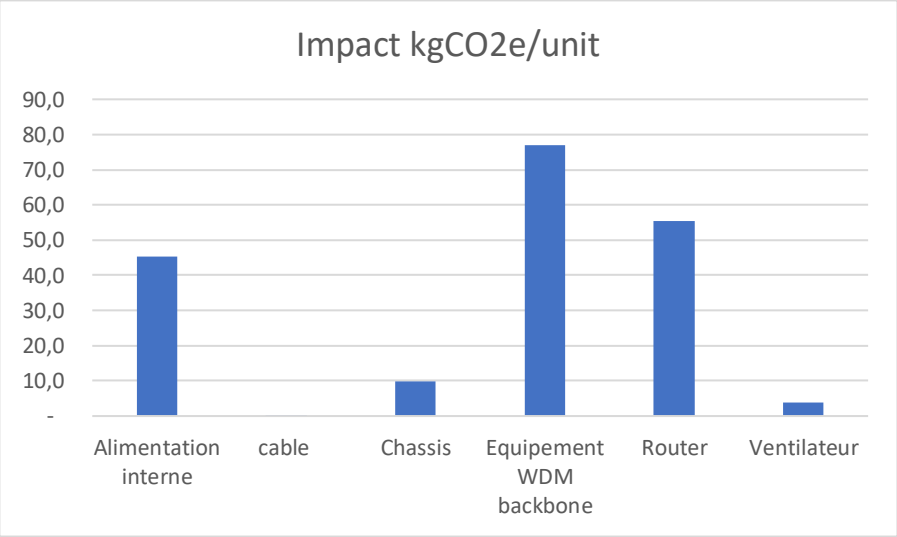
The impact of production and manufacturing is **11,800 tons of CO2, i.e. 15%** of the total Bilan Carbone®.

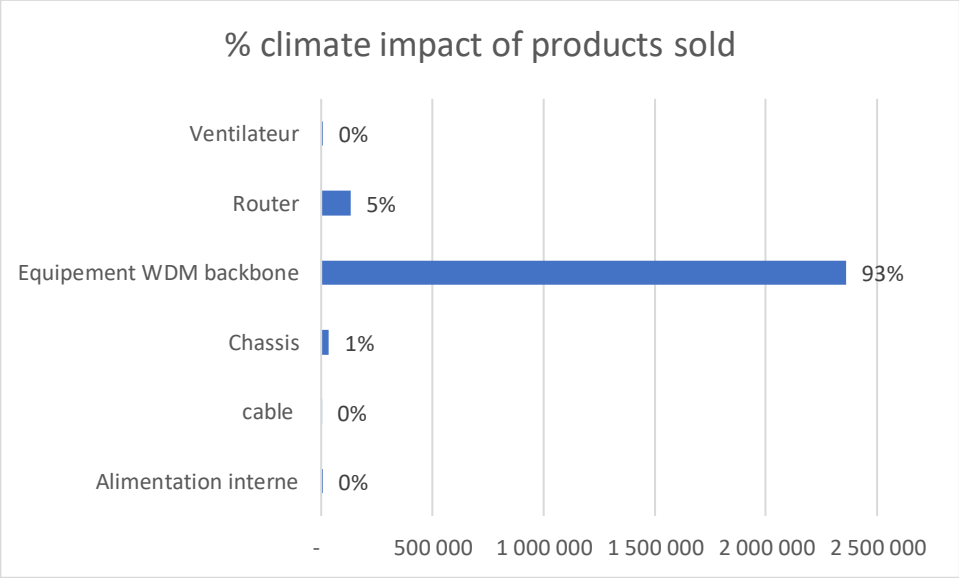


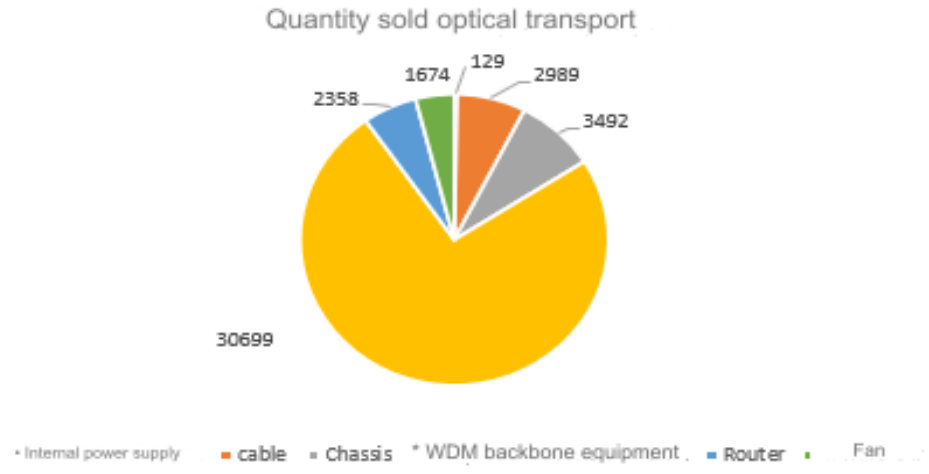




Impact of Products of “Transport Optique”







Areas for improvement

Action by the Production and Manufacturing item in 2022:

- Action carried out in 2022-2023: Life cycle analysis (LCA) study carried out on an ACCESS product. Following the presentation of the results, the company has a better understanding of the elements that make up the product's impact. This analysis led to the calculation of the emission factor for one type of router: the ONE 521. It turns out to be better than the average market emission factor

- Integrating environmental criteria into component purchasing

- Offering router cables as an option and raising customer awareness

- Use of recycled materials.

6.3 Freigt = 4%

Integrated data

By way of introduction, it is important to remember what is included under the heading 'FRET'.

As far as possible, the following elements have been included:

For FREIGHT IN

- Transport of raw materials from country of origin -> to supplier
- Transport of raw materials from supplier -> to factories
- Transport of packaging from the actual place of manufacture -> to the supplier's known site
- Transport of packaging from supplier -> to factories
- Transport of trading products -> to logistics platforms

For INTERNAL FREIGHT

- Flows between storage warehouses <-> and factories
- Inter-plant flows
- Flows from factories -> to logistics platforms

For OUTGOING FREIGHT

- Transport of finished products (including trade) -> to customers (shops or customer platforms)
- Transport products -> to the relevant structures.

Nb: in outgoing freight, only the transport of waste is not considered, as waste collection is already included in the waste emission factor.

Results

Freight has an impact of **3,400 tonnes of CO2, or 4.2%** of the total Bilan Carbone®..

Site	Freight's type	Transportation type	t.km	EF (kgCO2e/t.km)	kgCO2e
ACCESS	Incoming	Road	25436	0,08	2093
ACCESS	Incoming	Aircraft	559687	3,47	1943172
ACCESS	Outgoing	Road	113227	0,08	9319
ACCESS	Outgoing	Aircraft	202971	3,47	704694
Trasport Optique	Incoming	Road	22271	0,08	1833
Trasport Optique	Incoming	Aircraft	20802	3,47	72224
Trasport Optique	Outgoing	Road	26492	0,08	2180
Trasport Optique	Outgoing	Aircraft	184721	3,47	641332

Areas for improvement include.

- Choosing local raw materials to limit the impact of transport
- Choosing local suppliers whenever possible to limit the distances travelled by products (MP and Packaging)
- Committing the 12 lorries in the in-house fleet to a Charte Objectif CO_2 (CO_2target charter), with the aim of reducing fuel consumption and greenhouse gases by 3%.
- Limiting air freight to customers, in the interests of carbon performance and consistency
- Choosing service providers committed to the Objectif CO2 Charter or Label, thereby reducing greenhouse gas emissions by 3 to 5%.
- The company's commitment to FRET 21, a commitment specifically aimed at shippers, which also targets a 5% reduction in emissions from downstream flows in France. This scheme requires the company to take action in at least 3 of the following 4 areas:

Going further: FRET 21

FRET 21 is one of four voluntary environmental commitments in the transport and logistics sector. The aim of the scheme is to reduce emissions by 400,000 tonnes of CO2e to 1990 levels.

The commitment lasts for three years, with an annual assessment to monitor compliance with the commitments and adjust the actions and targets set by the companies.

Companies are required to reduce their GHG emissions by a minimum of 5% over three years, compared with their baseline year.

The scope is free but must include at least 100% of downstream flows in France. If the company so wishes, it can also include upstream flows outside France. All modes of transport are covered. Once the scope has been chosen, it must remain constant throughout the commitment period.

Finally, the action plan must cover at least three areas, including the loading rate, distance travelled, means of transport and responsible purchasing.

6.4 Travelling = 3%

Integrated data

This item includes:

- Employees' travel to work, otherwise known as home-work travel. This estimate of the number of kilometres travelled is based on the actual number of days worked per person. People with company cars are excluded from this scope because all their journeys are included in the Results.

The impact of travel is **2,244 tonnes of CO2, or 2.77%** of the total Bilan Carbone®.

Site	Type	Mode	Quantity	Unit	kgCO2e/uni	KgCO2e
Transport Optique	pro	Train	895 019	Passager.km	0,00334	2 989
Transport Optique	pro	Aircraft	46 329	Passenger.km	0,33600	15 567
Transport Optique	Home-work	Car	530 719	vehicle.km	0,22000	118 563
Transport Optique	Home-work	Car	1 040 891	vehicle.km	0,21000	220 773
Transport Optique	Home-work	Car	60 720	vehicle.km	0,10000	6 278
Transport Optique	Home-work	Car	57 200	vehicle.km	0,07000	4 198
Transport Optique	Home-work	Bus	96 606	Passenger.km	0,11000	10 936
Transport Optique	Home-work	Motocycle	11 330	vehicle.km	0,03000	864
Transport Optique	Home-work	Bike	90 790	vehicle.km	0,01000	994
Access	Home-work	Car	2 087 734	vehicle.km	0,22000	466 400
Access	Home-work	Car	2 076 830	vehicle.km	0,21000	440 496
Access	Home-work	Electric car	108	vehicle.km	0,10340	11 192
Access	Home-work	Hybrid car	1 135 815	vehicle.km	0,07340	83 369
Access	Home-work	Bus	371 765	Passenger.km	0,11000	42 084
Access	Home-work	Motocycle	264 968	vehicle.km	0,03000	20 217
Access	Home-work	Bike	233 086	vehicle.km	0,01000	2 552
Access	Home-work	Metro	2 023 208	Passenger.km	0,00000	8 174
Access	pro	Train	101 500	Passenger.km	0,00334	339
Access	pro	Aircraft	[2]	Passenger.km	0,33600	483 363
Others	Home-work	Car	388 520	vehicle.km	0,22000	86 795
Others	Home-work	Car	531 168	vehicle.km	0,21000	112 661
Others	Home-work	Car	50 600	vehicle.km	0,07000	3 714
Others	Home-work	Bus	321 763	Passenger.km	0,11000	36 424
Others	Home-work	Motocycle	392 339	vehicle.km	0,03000	29 935
Others	Home-work	Bike	32 754	vehicle.km	0,01000	359
Others	Home-work	Metro	90 948	Passenger.km	0,00000	367
Others	pro	Train	7 306	Passenger.km	0,00334	24
Others	pro	Aircraft	103 992	Passenger.km	0,33600	34 942

Areas for improvement

- Replace journeys for a meeting by a videoconference.
- Reduce aircraft kilometres on short journeys.

Further information: mobility

Coming into force on 26 December 2019, the law radically transforms mobility policy, with a simple objective: everyday transport that is easier, cheaper, and cleaner. This law meets several ambitions by introducing new concepts for employers.

The so-called "mobility payment" is a contribution by employers with 11 or more employees to the financing of public transport in the Paris region and in communes or groups of communes that have introduced this payment.

It is compulsory for all sites with more than 50 employees to include mobility issues in their annual negotiations. The company is thus obliged to include in the negotiation's measures aimed at improving employee mobility between their usual place of residence and their place of work. This involves reducing the cost of mobility and encouraging the use of environmentally friendly modes of transport by covering the cost of fuel and sustainable mobility. The law makes it compulsory for companies to cover at least 50% of the cost of public transport season tickets. It should be noted that this funding is 100% tax-exempt.

In addition to these points, the modification of the conditions linked to the employer mobility plan introduces new objectives for optimising the efficiency of travel linked to the company's activity, particularly that of its staff, with a view to reducing greenhouse gas emissions and atmospheric pollutants, as well as reducing the congestion of transport infrastructures.

6.5 Energies = 1%

Integrated data

Energy data are classified under 2 sub-headings:

- Consumption by offices, R&D sites, and plants
- Natural gas consumption at the Belgium site

The impact of the electricity consumed by the Test Bench at the Hungarian site has been included in the Bilan Carbone ® France.

Results

The impact of energy is **674 tonnes of CO2, or 0.8%** of the total Bilan Carbone®.

Site	Type	Pays	KWh	FE (kgCO2e/KWh)	kgCO2e
Transport Optique	Electricité	France	524 438	0,05	27 292
Autres (support)	Electricité	Inde	242 375	1,00	241 180
Autres (support)	Electricité	Allemagne	9 540	0,50	4 799
Autres (support)	Electricité	Brésil	36 213	0,09	3 430
Autres (support)	Electricité	Suisse	30 205	0,03	900
Autres (support)	Electricité	Royaume-Uni	12 331	0,50	6 149
Autres (support)	Electricité	Russie	10 601	0,42	4 441
Autres (support)	Electricité	Pologne	73 198	0,85	62 375
ACCESS	Gaz naturel	France	156 061	0,24	37 442
ACCESS	Gaz naturel	France	188 179	0,24	45 147
ACCESS	Electricité	Belgique	91 477	0,24	21 958
ACCESS	Electricité	France	135 234	0,05	6 929
ACCESS	Electricité	Australie	8 514	0,92	7 813
ACCESS	Electricité	États-Unis	47 006	0,57	26 772
ACCESS	Electricité	Belgique	737 433	0,24	177 012
Total					**673 638**

KPI E-2 : Group energy consumption per €M of sales	2023		
	ACCESS	Tspt Optique	Total
total energy consumption (KWh)			2 179 449
Turnover (M€)	66,41	62,69	129
KPI E-2 (KWh/M€)			16 882

KPI E-3 : GHG emissions per turnover	2023		
	tCO2e	M€	tCO2e/M€
ACCESS	67 395,38	66,41	1 014,88
Transport	12 935,64	62,69	206,34
Autres (supports)	628,97		
Group	80 960,00	129,10	627,13

KPI E-4 : Average annual electricity consumption of products sold	2023		
	TOTAL MWh/an	Products number	Average/product/year
ACCESS	28 766	156 037	184,4 KWh
Transport	3 959	7 260	545,3 KWh
Group	32 725	163 297	200,4 KWh

Further information: Statutory energy audit

The regulatory energy audit is the obligation for a company meeting certain criteria to have an energy audit of its activities carried out in accordance with standards NF EN 16247-1 to 4. This includes an assessment of a company's energy performance, leading to an action plan to improve its energy efficiency. It was introduced by the decree and order of 24 November 2014 relating to the terms of application of the energy audit provided for in Chapter III of Title III of Book II of the Energy Code

Companies affected by these obligations must meet one of the following two conditions over the last two accounting periods:

- Number of employees greater than 250 ;

- Sales more than €50 million and an annual balance sheet in excess of €43 million.

The mandatory scope (and therefore the associated activities) of the audit must represent at least 80% of the site's energy bills (identified by a SIREN number).

The audit must be carried out by an internal or external auditor with accreditation certification. The audit must be carried out every 4 years. The results obtained must be communicated to ADEME via a filing platform.

Going further: the 50001 standards

Unlike the regulatory audit, ISO 50001 is a voluntary standard designed to provide a methodical analysis of energy use and consumption. By building a management system based on the principle of continuous improvement, the standard aims to ensure that energy consumption is reduced over time.

The main stages of this system are as follows: Identification of energy uses, development and deployment of an action plan, periodic monitoring, and analysis of results. All these stages need to be known and, consequently, communicated to all the managers and users of energy-intensive operations.

Over a 3-year cycle, this standard ensures technical and organisational control of energy management, while anticipating regulatory changes. Certified companies are not subject to regulatory energy audits.

Numerous regional and national funding and subsidy programmes exist to reduce the costs of certification. The Pro-SMEn programme is one of them. This is a national programme whose main objective is to encourage and accelerate the deployment of the ISO 50001 standard, for companies and national authorities.

6.6 Direct waste = 0,1%

Integrated data

The Bilan Carbone® makes a distinction between two things:

- Emissions linked to the collection and treatment of waste, accounted for in the Bilan Carbone® like any other item.
- Avoided emissions linked to the recycling or reuse of materials. These avoided emissions are not accounted for in the Bilan Carbone®; the calculation is carried out "on the side".

The impact of direct waste in France was calculated according to an ADEME study on waste quantity habits for an office activity: 10 kg of plastic/employee/year and 10 kg of paper/employee/year. It is estimated that, in a tertiary company, the quantity of plastic increases by 40% if employees eat at the office. This assumption has not been extrapolated to the other Ekinops sites, for two reasons:

- Employee habits other than those at Vélizy are unknown.
- No EF on waste processing outside France.

The Lannion site is not included. Use of waste data for the Belgium site in 2021

Results

The impact of direct waste is **85 tonnes of CO2, or 0.11%** of the total Bilan Carbone®.

Site	Heading FE waste	Units	Quantity	EF(kgCO2e/tonne)	KgCO2e	tCO2e	% of post
Access	Steel	tons	10	41	392	0,392	0,5%
	Plastics	tons	46	1844	85082	85,082	99,3%
	Special industrial waste	tons	0,27	844	228	0,228	0,3%

Possible actions include better monitoring of waste at each site and the systematic treatment of this waste.

6.7 Fixed Assets = 0,02%

Data not integrated/not calculated

a. List of company and service vehicles and their models
b. m2 of buildings, for all sites
c. List of test bench

Integrated data: IT equipment for ACCESS and Optical Transport

Results

The impact of assets is **17.55 tonnes of CO_2, or 0.02%** of the total Bilan Carbone®.

Areas for improvement

It is not possible to improve this item retrospectively, as these are goods already purchased by the company. The aim is to make decision-makers aware of the right questions to ask themselves for future investments, particularly in view of the carbon impact:

- Consideration prior to the construction of a new site or extension: 'clean' materials, eco-designed buildings, energy recovery systems, production of new and renewable energies, etc.
- Implementing a purchasing policy that favours the use of biomaterials or recycled materials, equipment leasing systems, purchase of second-hand equipment, etc.
- Extending the lifespan of equipment

Further information: Tertiary sector decree

The tertiary sector decree, which came into force on 1 October 2019, sets out the terms and conditions for implementing article 175 of the ELAN law (Evolution du Logement, de l'Aménagement, et du Numérique) by requiring a reduction in the energy consumption of France's tertiary sector building stock.

The ÉLAN law sets a target for reducing the energy consumption of commercial buildings: -40% by 2030, -50% by 2040 and -60% by 2050 compared with 2010, or the achievement of a defined energy performance threshold for each type of building. These targets are in line with the objectives of the SNBC (National Low Carbon Strategy).

The scope of application extends to all buildings housing tertiary activities (with or without mixed use) and with a surface area of more than 1000m². Data for the previous year must be submitted annually, by 30 September at the latest.

The implementation of the objectives is characterised by:

- Actions to improve the energy performance of buildings.
- The installation of energy-efficient equipment and devices for monitoring and actively managing this equipment.
- Equipment operating methods.
- Adapting premises for energy-efficient use.
- Occupant behaviour.

For each building subject to the obligation, the owner (or lessee where applicable) declares the following information on an online platform: Tertiary activities carried out, surface area of the building subject to the obligation, annual energy consumption by type of energy and, where applicable: reference year (1° of art R.131-39) and associated reference consumption as well as consumption linked to the recharging of electric or hybrid vehicles, indicators of intensity of use relating to the activities housed, and potential adjustments (revision of targets in the light of technical constraints, a change of activity, or a disproportionate cost in relation thereto).

The platform manager will assess compliance with the reduction obligations on 31 December 2031, 2041 and 2051. In the event of non-compliance, a technical file ensuring justification must be notified to the control officers. If the file is incomplete or missing, administrative and financial penalties may be applied.

6.8 Future packaging = 0,0%

This item has not been included for ACCESS, OPTICAL TRANSPORT and OTHER.

Areas for improvement

Eco-design of packaging.

- Reduction in the quantity of materials used (dematerialisation).
- Improving production processes
- Reducing waste by reducing the size and weight of packaging
- Substitution by more sober materials
- Choice of recycled or renewable materials
- Drawing up specifications for suppliers
- Origin of packaging
- Work on recyclability.
- Improving the container-content ratio

Why eco-design packaging beyond reducing the carbon footprint?

- Consider the expectations of consumers, NGOs, and society as a whole.
- Reduce production costs (fewer raw materials, optimised logistics)
- Improving recyclability
- Reduce eco-packaging contributions
- Comply with environmental labelling requirements

- Give your packaging a second life by disseminating sorting instructions

Going further: AGEC law

Law no. 2020-105 on the fight against waste and for a circular economy (the AGEC law) was adopted in France on 10 February 2020.

The aim of the AGEC Act is to provide "answers to [citizens'] expectations in terms of ecology through everyday measures, thanks to a concrete ecology that preserves resources, health and purchasing power, while enabling economic and industrial development in the regions".

It is based on four main measures:

- Phasing out single-use plastics
  - The law provides for an end to the marketing of single-use plastic packaging by 2040.
- - Combating waste and promoting solidarity-based re-use
  - The law puts an end to the disposal of unsold non-food products. This measure, which is a world first, is designed to encourage donations to associations working to combat poverty and to social economy organisations. Manufacturers will also have to manage their stocks more effectively to avoid surplus production. The measure will come into force no later than 31 December 2021 for products covered by an EPR (extended producer responsibility) scheme and no later than 31 December 2023 for other products.
  - The food distribution and catering sectors (supermarkets, canteens, etc.) will have to reduce food waste by 50% compared with 2015 levels by 2025. Sectors that produce or process foodstuffs, as well as commercial catering, will also have to reduce their food waste by 50% compared with 2015 levels by 2030.
- - Better consumer information and sorting of packaging
  - Standardisation of sorting logos
  - Harmonisation of the colours of sorting bins
- - Extend EPR schemes to other sectors
  - Assumption of responsibility for waste management through compulsory funding of structures that give objects a second life.
    - For more information: : Les filières à Responsabilité élargie des producteurs (REP) – Ademe

7 Recommandation for the future Bilan Carbone® updates

7.1 Principles

The Bilan Carbone® can be updated every year or at any other time that is relevant to the company, always covering the previous period. This enables the company to track changes in its emissions over time, with the aim of identifying a trajectory.

An inter-annual comparison of Bilan Carbone® reports develops a new environmental performance indicator. The benefits of the actions taken can also be assessed.

Finally, updating the Bilan Carbone® enables the company to improve its data and therefore reduce uncertainties. The results can be more accurate, and any missing data can be tracked for the next Bilan Carbone®

7.2 Access and update tools

Training in the Bilan Carbone® method by the "Institut de Formation Carbone (IFC)" provides access to the latest version of the tool. You then need to join the Bilan Carbone® Association to receive the latest updates to the tool. ABC updates the tool regularly

Going further: Bilan Carbone® licences

ABC sells brand licensing contracts to authorise any trained organisation to carry out a Bilan Carbone®, use the Bilan Carbone® brand and access the Bilan Carbone® tools and spreadsheets.

There are two types of licence, with additional options, to be selected according to your use of the Bilan Carbone®.

1- User licence enabling you to carry out your organisation's Bilan Carbone®.

2- Operating licence enabling you to carry out Bilan Carbone® services, i.e. Bilan Carbone® assessments for other organisations.

/To have access to the licences, the organisation must have a person who has taken the training corresponding to the licence requested.

7.3 Activity data monitoring

The organisation must update the data for the period under review and then re-integrate it into the latest version of the Bilan Carbone® spreadsheet.

To make it easier to monitor environmental performance, the organisation can define indicators corresponding to its most important items. A quantified map can be used to support monitoring.

FIGURE 1 : EXAMPLE OF A QUANTIFIED MAP OF THE MAIN FLOWS

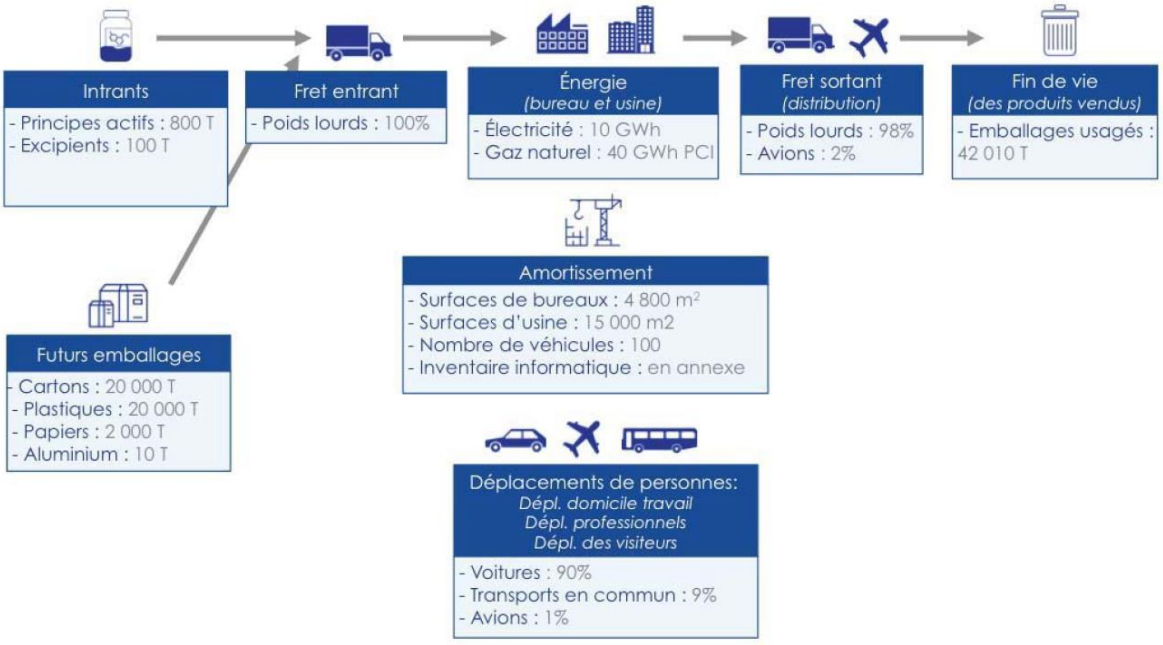


FIGURE 2 : MONITORING INDICATORS BY ITEM

Post	Details	Monitoring indicator
Energy	Electricity	kWh
	Gas	kWh
	Fuel	l
	Steam	t
Non energy	Kyoto hallocarbon emissions	kg
	Non-Kyoto gas emissions	kg
Inputs	Metals	t
	Plastics	t
	Glass	kg
	Paper, cardboards	t
	Construction materials	m2, t
	Chemical products	t
	Food and drink	kg, t
	Balance of accounts 60, 61 and 62	€
	Services, maintenance	€
	Water consumption of the 3 buildings	m3
	Office supplies and consumables	unit or €
Future packaging	Metals	t
	Plastics	t
	Glass	kg
	Paper, cardboards	t
Direct waste	Building, mineral, organic, plastic, household	t
Freight	Owned vehicles	l
	Freight	t.km
Travel	Home-work (ship, train, car...)	l,km
	Professional with car	l or km
	Professional with car, train, aircraft, ship	km
	Visitors	km
	km travelled, litres consumed by owned vehicles	l and km
Fixed Assets	Building areas and structure type (metal, concrete)	m2
	Number of owned véhicles	t
	Car parks and roads	m2
	Real estate	unit
	Computer equipment (printers, etc.) in each building	unit

/!\ Assets remain the same unless there is a change (new building, new equipment, etc.). In this case, don't forget to complete the Bilan Carbone®.

Organisations wishing to renew their Bilan Carbone® approach must carry out the following actions:

- Analyse changes in the indicators used to monitor actions to reduce emissions.
- Update its low-carbon transition vision.
- Analyse the period between the two exercises and deduce any changes to the current action plan(s).

7.4 Feedback and warning points

An initial Bilan Carbone® assessment highlights any missing data and/or emission factors. In this way, the company is alerted to the gaps that need to be filled to improve the next assessment. What's more, the people involved know what to expect and can deliver the necessary data more quickly and easily.

The Bilan Carbone® update must consider the points for improvement in the previous version. Data that may have been missing due to non-existent monitoring must be included.

Attention must also be paid to emission factors. Updating the Base Carbone® does not automatically feed the tool. As a result, some EFs may change. This may explain the differences between the various Bilan Carbone® reports.

If the perimeter changes, the new Bilan Carbone® must take this into account, but may isolate certain results to compare the Bilan Carbone® with an isoperimeter. An indicator of CO2e emissions per unit produced makes it possible to integrate the change in activity.

Finally, certain specific years can change the results of the Bilan Carbone®, such as 2020, when activity was impacted by the Covid-19 health crisis. The year-on-year comparison must take account of changes in activity to explain the differences.

8 Conclusion

8.1 Innovation – investment – R&D

The Bilan Carbone® approach has made it possible to:

- A different view of the business, in the form of carbon accounting, which makes it possible to highlight good and bad practice in a way that conventional financial accounting cannot.

- Incorporate new requirements into purchasing policies, for example:
  - Qualifying material references, types, and weights for each supplier,
  - Qualify transporters who have signed the Objectif CO2 charter or label,
  - Qualify suppliers' low-carbon manufacturing processes (biomass)
  - Continue ongoing efforts on waste monitoring and management.
  - Involve R&D and suppliers to make progress on the database of purchased products.
- Emphasise the importance of mobilising all the players in this area, particularly R&D, purchasing and marketing, to work together on the development of future products with lower CO2 emissions. We need to work on the following areas.

  - The installed power and energy consumption characteristics of appliances
  - Raw materials: work on components, possible substitutions of one material by another, the industry link and specific EFs.
  - Packaging: develop more robust databases on purchasing policy, highlight the opportunity to develop eco-design of packaging, reduce references, materials with lower CO2 emissions, increase the % of recycled materials, etc.
  - Energy: Continuous improvement, heat recovery, changing habits and behaviour, renewable energies, etc.
  - Goods transport: signature of the Objectif CO2 Charter internally and selection of transporters adhering to voluntary GHG reduction programmes (Objectif CO2 label and charter).
  - Travel: financial incentives for soft transport, fuel-efficient cars, and car-pooling, which can be organised as part of the mobility plan.

8.2 Organisation – Management – skills development

The effectiveness of the approach lies in:

- Maintaining an operational carbon project team that is trained, expert and aware of the issue. The challenge for this team is to apply this method at all levels of the organisation to make it sustainable and consistent.
- The implementation of a post-Carbon Audit® action plan, supported by management and coordinated and led by a steering committee supported by trained staff.
- The introduction of a limited but comprehensive number of indicators shared by all departments. Their validation and dissemination must remain a priority for management.
- Facilitating data collection with a view to reproducing the Bilan Carbone®.

- Sharing best practice between sites within the entity. Despite differences in context and activity, this enables the implementation of actions to reduce emissions to be optimised (pooling, pilot on innovative projects, etc.).
-

8.3 Monitoring and regulation

The project team must remain expert by keeping a watch on climate and carbon issues and by planning the carbon dimension into its annual workload.

8.4 Internal and external communication- Product communication and site communication

Upstream of customer requirements or regulatory constraints, the entity must endeavour to:

- Raise awareness of greenhouse gases throughout its sphere of influence to support its sustainable development approach.
- Allocate human resources and responsibilities in this area. This is necessary and should be seen as an investment. The challenge is to give everyone a sense of responsibility, to move towards a carbon reflex that is systematically integrated into decision making, and so act on the mass.
- Communicate on the variability of its carbon footprint and not on the absolute value as part of its communication strategy. It will need to identify who communicates what, how and at what pace before any publication to avoid any risk of misinterpretation by stakeholders in its environment.
- At product and marketing level, act and communicate in a transparent and coherent way: communicate on the function and service provided by the product, on the fact that every means has been taken to limit its impact and set an example with sales tools (product footprint and environmental labelling).

- Companies can now use this approach to:
- Improve the company's environmental and economic performance.
- Align customer expectations.
- Integrate carbon data into investments.
- Promote the technical teams.

And thus, reinforce management's determination to integrate the carbon reflex into its organisation and strategy.