Carbon Impact Analytics

How to measure the contribution of a portfolio to the energy and climate transition

carbon impact analytics

carbone 4

mirova
Responsible Investing

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INTRODUCTION

In a world transitioning to a low-carbon economy, it is crucial that investors and asset managers are equipped with strategies and tools to choose the financial assets most likely to thrive. Carbon Impact Analytics is an answer to this pressing yet unfulfilled need.

This methodology was developed by Carbone 4 in collaboration with Mirova, Natixis Asset Management subsidiary dedicated to responsible investment. MAIF, a mutual insurance company, is also an early sponsor of the methodology.

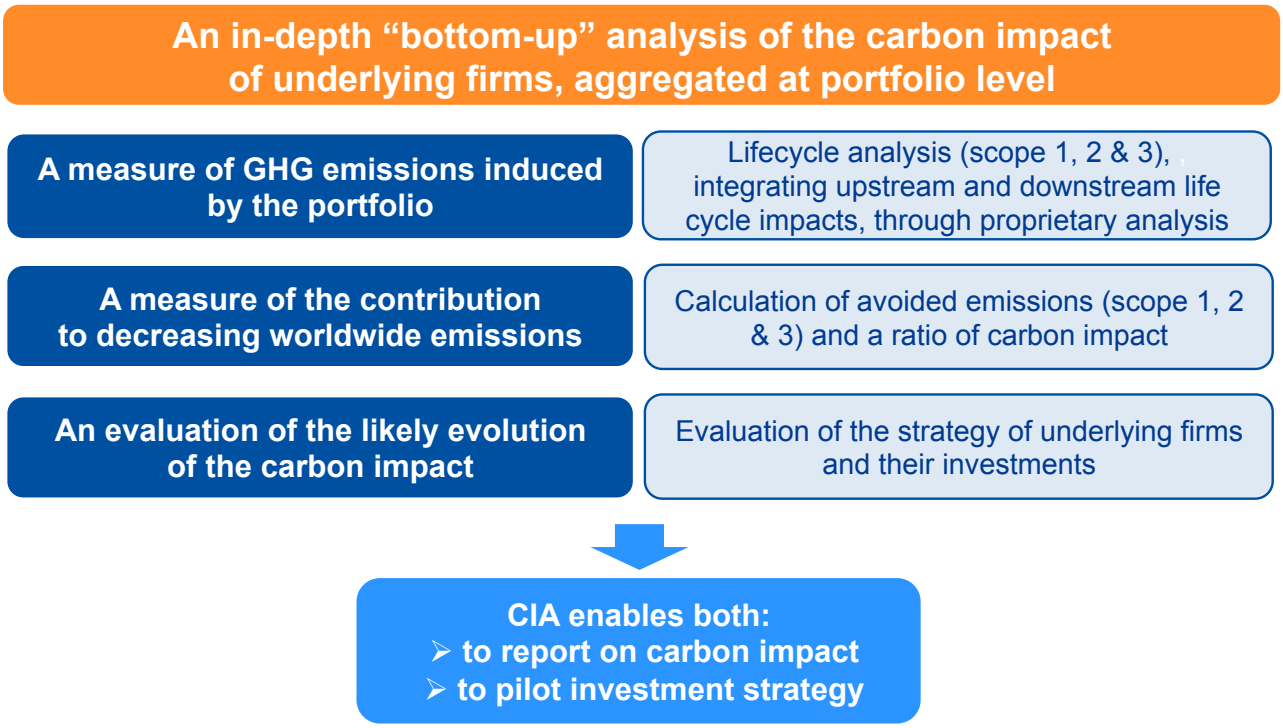
Carbon Impact Analytics (CIA) intends to measure and compare the contribution of financial assets and portfolios to the low-carbon economy. In this first version, the methodology covers corporate equities and bonds, with an international scope.

This guide details the methodological principles of Carbon Impact Analytics. It is aimed at portfolio managers and asset owners interested in implementing Carbon Impact Analytics, and more broadly, to anyone seeking details on the methodology.

EXECUTIVE SUMMARY

CARBON IMPACT ANALYTICS: AN INNOVATIVE METHODOLOGY TO MEASURE THE CLIMATE CHANGE IMPACT OF AN INVESTMENT PORTFOLIO

For an investor, measuring financial assets' climate change impact is a necessary step in building portfolios which contribute to the shift to a low carbon economy, both for limiting carbon risks and seizing low carbon opportunities. Hence Carbone 4, in collaboration with Mirova, has developed an innovative methodology that goes beyond carbon footprinting. Carbon Impact Analytics provides asset managers with an in-depth, "bottom-up," analysis of the carbon impact of a portfolio and its underlying firms, as illustrated below.



In its first version, Carbon Impact Analytics is designed to cover stocks and bonds of any listed company (even those not reporting their carbon footprint). It will be extended to other financial assets in future versions, most notably to sovereign bonds and infrastructure portfolios.

CORE METHODOLOGICAL PRINCIPLES OF CARBON IMPACT ANALYTICS

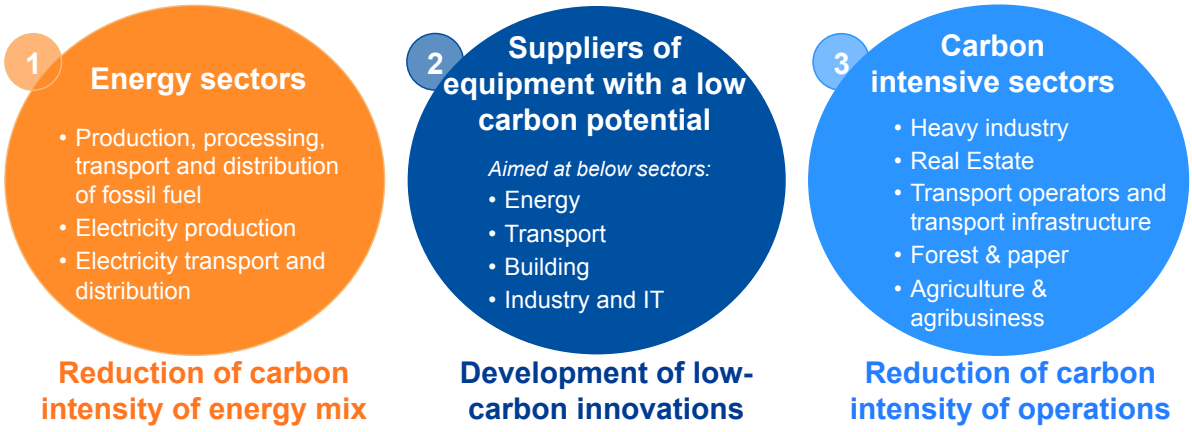
"Bottom-up" analysis

The analysis of the carbon impact of a portfolio begins with an in-depth assessment of each underlying firm, followed by aggregation at the portfolio level. This allows for differentiation between companies in the same business sector, and enables recognition of companies' efforts in integrating climate and energy-related issues in their strategic decisions and reporting.

Sectorial approach with specific insights for "high stakes" sectors

Challenges regarding the low-carbon transition vary depending on the characteristics of each economic sector. Therefore, Carbon Impact Analytics differentiates "high stakes" and "low stakes" sectors, and provides specific insights for "high stakes" sectors with tailored calculation principles for each sector.

"High stakes" sectors for which a detailed Carbon Impact analysis is performed are detailed below:



Aggregation at portfolio level eliminates emissions double-counting

Double-counting of GHG emissions arises when the same ton of GHG emissions is counted more than once within a portfolio due to the aggregation of companies' indirect emissions within the same value chain. While consolidating the carbon impact of a portfolio, Carbon Impact Analytics reprocesses results (both induced and avoided emissions) to eliminate most double-counting.

KEY OUTPUTS OF CARBON IMPACT ANALYTICS EVALUATION

Results of Carbon Impact Analytics evaluation are provided to asset managers at portfolio level as well as for each underlying firm, thereby enabling both reporting and piloting of investments.

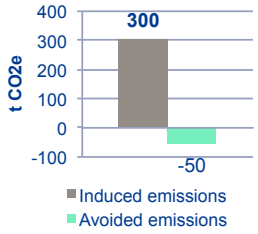
Below is an example (illustrative only, without accurate figures) of key outputs, as provided at portfolio level:

Portfolio overall rating:

Quantitative indicators:

Carbon impact (scope 1, 2 & 3)
Induced emissions: 300 tCO2e / M€ invested
Avoided emissions: 50 tCO2e / M€ invested

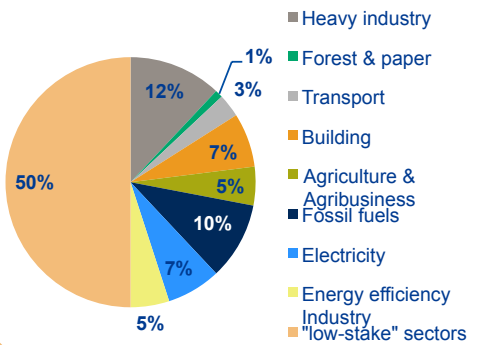
Direct carbon impact (scope 1 & 2)
Induced emissions: 150 tCO2e / € M invested



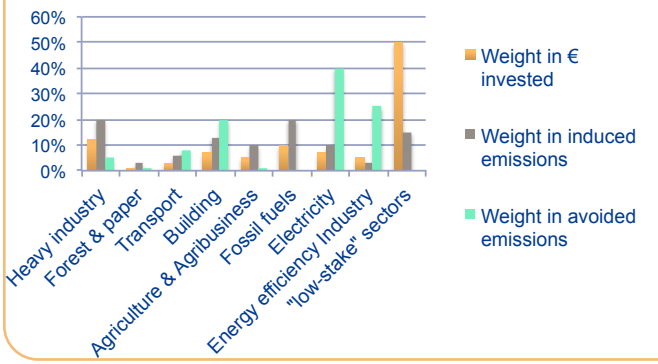
Forward-looking ratings

Forward-looking rating	Weight in the portfolio
+ +	10%
+	55%
-	30%
- -	5%

Sectorial weight in € invested



Weight in € vs. Weight in CO_{2e}



Top 5 contributors in portfolio induced emissions:

Company name	Weight in portfolio emissions
Company A	9%
Company B	8%
Company C	7%
Company D	5%
Company E	5%

Top 5 best carbon impact:

Company 1
Company 2
Company 3
Company 4
Company 5

Top 5 contributors in portfolio avoided emissions:

Company name	Weight in portfolio emissions
Company A	9%
Company B	8%
Company C	7%
Company D	5%
Company E	5%

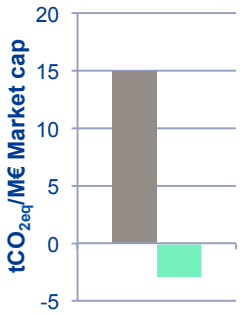
And an example (illustrative only) of key outputs provided for each underlying company:

Comments on the analysis:

X realizes 30% of its turnover from products linked to the low-carbon transition. The strategy of X is to increase strongly its turnover related to the low-carbon transition, however no information is available on CAPEX and R&D expenditures related to the low-carbon transition. The scope 1 and 2 emissions reporting is reliable.

Overall rating: **Significant contribution to the climate transition**

Quantitative indicators



Induced emissions

Avoided emissions

Carbon impact ratio

$$= \frac{\text{Avoided emissions}}{\text{Induced emissions}} = 0.2$$

Induced emissions

= 350,000 tCO_2

Scopes 1+2+3

Avoided emissions

= 60,000 tCO_2

Improvements in efficiency OR comparison with a reference scenario

Qualitative indicators

Company's tendency to contribute to the energy transition: +

Transparency and reporting quality : +

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A methodology and a tool developed by Carbone 4

Main sponsor and co-developer: Mirova

Sponsor: MAIF

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1. CONTEXT AND OBJECTIVES OF CARBON IMPACT ANALYTICS

1.1. FINANCING A LOW-CARBON ECONOMY

Since the first IPCC report in 1990, scientific research has continued to support the importance of reacting to anthropogenic climate change and its potentially vast and adverse impacts, both societal and environmental. The need for a transition to a low-carbon economy has become increasingly evident and agreed upon by business leaders, political executives, and the general population. Achieving a rapid and successful transition, however, relies on a great need for "green" infrastructures, a reduction of current energy consumption, development of energy efficient solutions, and a radical change of the energy mix, especially through decreasing fossil fuel dependence in favour of low-carbon energy sources.

The financial industry can see these challenges from three perspectives: the economic case, the financial case, and the moral case. From an economic point of view, climate change will have major consequences on companies. From a strictly financial perspective, potential regulation of carbon threatens the value of portfolios. From a moral viewpoint, as economic actors and stakeholders in society, the financial industry has a responsibility to do its best to meet the challenge of climate change. All three contribute to a global motivation capable of inducing concrete action.

Even if the financing of a low-carbon economy remains insufficient, various financial players have already implemented strategies to face this issue. To illustrate, the International Climate Summit, which took place on September 23, 2014, led to two initiatives:

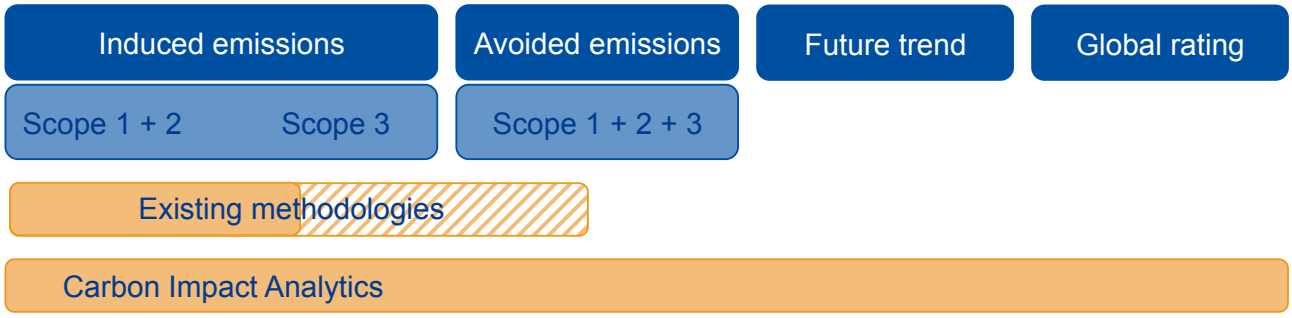
- The Montreal Carbon Pledge gathers more than 50 signatories as of June 2015, who commit to measure and publicly disclose the carbon footprint of their investment portfolios annually.
- The Portfolio Decarbonisation Coalition goes one step further: a coalition of institutional investors has committed to decarbonising US$100 billion in equity investments by December 2015. The first measure will be to disclose the carbon footprint of their portfolios, for which the Montreal Carbon Pledge will be a platform.

Implementing these strategies implies the need for carbon footprint assessments, as well as another set of indicators as explained below.

1.2. CARBON FOOTPRINT ASSESSMENT

CARBON FOOTPRINT: A COMPLEX SUBJECT

Measuring the carbon footprint of a portfolio is a complex issue; it can imply different scopes of analysis and / or different timeframes, as mapped in the figure below:

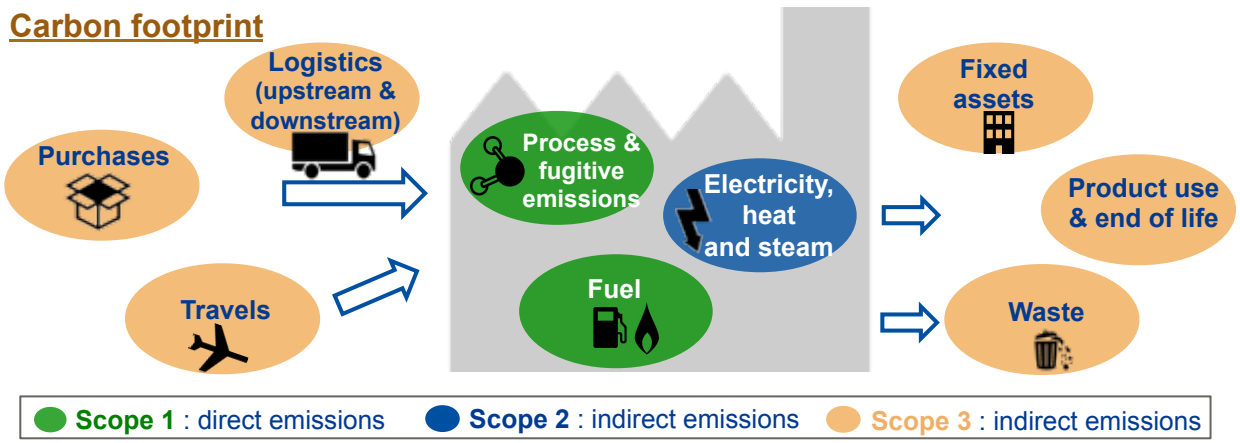


Carbon Impact Analytics has been developed with the aim of deepening the analysis offered by existing methodologies and answering to the following needs of asset managers:

1. Measure greenhouse gas (GHG) emissions induced by investments on the complete scope of underlying firms' impact
2. Measure how underlying firms are contributing to and / or compatible with decreasing worldwide carbon emissions
3. Evaluate how the carbon impact of underlying firms will evolve in the coming years
4. Enable reporting on the carbon impact of portfolios and piloting of investment strategy

A DEEPENED MEASURE OF INDUCED EMISSIONS

In order to have a complete and comparable picture of induced emissions by underlying firms, it is necessary to measure both direct and indirect emissions of these firms throughout their whole supply chain, as illustrated by scopes 1, 2 and 3 (both upstream and downstream) shown in the picture below.



For most firms, the majority (typically 80%) of greenhouse gas emissions are indirect emissions, attributable to purchases and eventual use of products sold. As a result, limiting the assessment of carbon emissions generated by a portfolio to scopes 1 and 2 often leads to misleading conclusions in understanding an activity's true dependence on fossil fuels.

When looking solely at scope 1 and 2 emissions, the impact of an oil company, for example, would be reduced to the carbon issued during oil extraction and refining. Similarly narrowing the scope of carbon impact for a producer of insulating material for refurbishment, for instance, will not account for the product's lifetime reduction of GHG emissions. Such methodologies, too limited in scope, lead to the conclusion that the highest risk in a low carbon world lies with specific carbon-intensive sectors, cement makers for example, while some other sectors – such as media and banks – are inherently compatible with a low carbon world. Real leverage seems possible in sectors responsible for releasing significant carbon emissions, which represents an opportunity for the climate transition.

To be consistent with financing a low-carbon economy, it is necessary to take into account induced emissions on the whole scope of impact of underlying firms, including scope 1, scope 2, and scope 3 emissions, both downstream and upstream.

A MEASURE OF AVOIDED EMISSIONS

To evaluate the alignment of an investment portfolio with the low-carbon transition, an additional indicator is necessary, complementary to the carbon footprint. A firm in a highly carbon intensive sector could contribute significantly to decreasing emissions, perhaps by creating a disruptive product or process. The additional indicator should therefore generate understanding of how an underlying firm is disrupting its sector, either through more efficient processes or through carbon-efficient products or services.

The largest share of CO_2 emissions mitigation will come from today's most GHG-intensive sectors: buildings, transport, industry, and power, as shown in the following chart from the IEA[1]:

Global CO2 reductions between 6DS and 2DS by sector

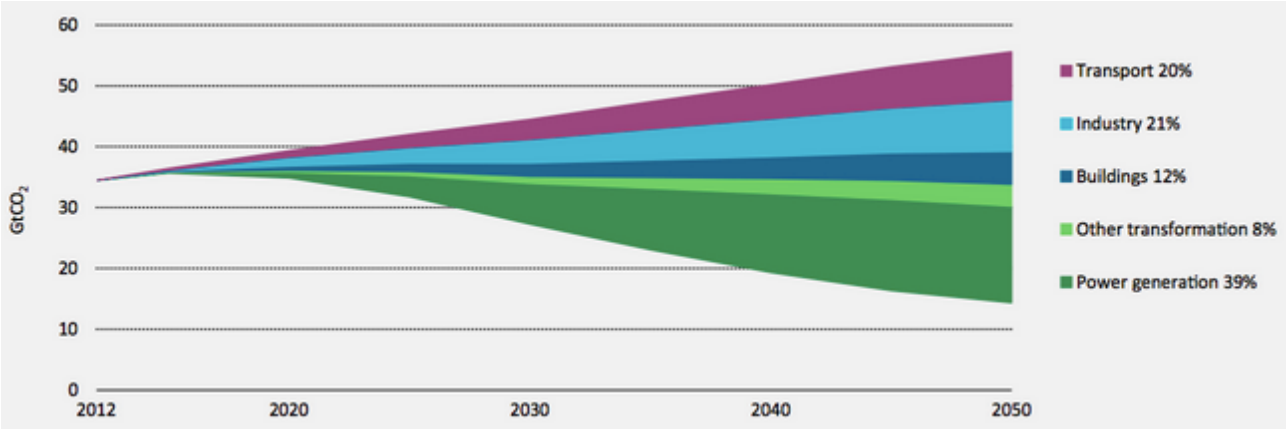


Figure 1.8, ETP 2015, IEA. Key point: Reduction efforts are needed on both the supply and end-use sides; focusing on only one does not deliver the 2DS.

Consequently, in addition to the absolute figure of induced or avoided emissions, the extent to which a firm reduces GHG emissions relative to total GHG emitted is very important; this ratio measures the carbon performance of the firm.

A FORWARD-LOOKING ANALYSIS AND A GLOBAL RATING TO ASSESS THE CONTRIBUTION TO THE ENERGY TRANSITION

Carbon emissions measures only give an historical viewpoint of a firm's carbon impact, whereas financial analysis requires a more forward-looking evaluation of carbon impact. Such an evaluation includes an analysis of investments and R&D expenditures that will contribute to decrease carbon emissions, as well as an analysis of the firm's positioning and strategy regarding the low-carbon transition. A progress indicator would allow analysts to project how induced and avoided emissions of the firm will evolve in the coming years.

Finally, a global rating is needed for each company, to assess its impact on climate change and contribution in GHG emissions reduction, taking into account induced emissions, avoided emissions and the forward-looking analysis.

A METHODOLOGY THAT ENABLES BOTH TO REPORT AND TO PILOT INVESTMENT STRATEGY

On one hand, asset managers and owners need easy-to-read and easy-to-understand indicators, fit for use in external communications. They need indicators which allow them

[1] ETP 2015, IEA

to honour their engagements, most notably those to the Montreal Carbon Pledge and the Portfolio Decarbonisation Coalition.

On the other hand, asset managers and owners who want to reduce carbon risks and capture low-carbon opportunities also require indicators to guide their investment choices using carbon impact criteria.

2. CARBON IMPACT ANALYTICS CORE PRINCIPLES AND RESULTS

Carbon Impact Analytics is:

- a guidance tool to manage the carbon impact of (corporate stocks and bonds) investment portfolios
- a calculation tool to measure and report on the carbon impact of portfolios

It provides asset managers with a methodology to assess the carbon impact (positive or negative) of their portfolios and to assess how their portfolios contribute to the low-carbon economy transition.

The first version of Carbon Impact Analytics is directly applicable to portfolios of listed companies' stocks and bonds, and can also be easily used to cover unlisted companies. Future methodological developments could enable expansion of coverage to project finance and sovereign bonds.

2.1. KEY INDICATORS OF CARBON IMPACT ANALYTICS

Carbon Impact Analytics focuses on the following set of indicators:

Investment decision support indicators and reporting indicators
At company level
• Induced and avoided carbon emissions at company level • CIR : Carbon Impact Ratio
• Forward-looking qualitative rating • Transparency and quality of reporting
• Global assessment of the contribution to climate change
At portfolio level
• Charts of sectorial distribution of induced and avoided emissions
• Total induced and avoided emissions at portfolio level
• Distribution of qualitative ratings in each sector and in the portfolio

This set of indicators provides a comprehensive overview of:

- carbon risks
- contribution to the low carbon transition
- the future carbon impact trend

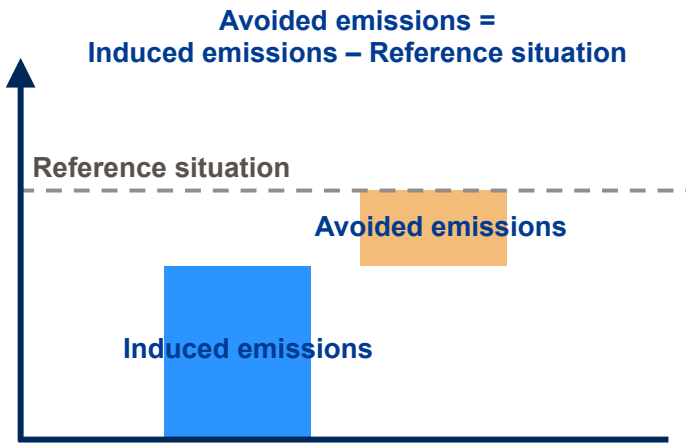
INDUCED EMISSIONS

Induced emissions are emissions actually emitted by a firm within the relevant scope for the assessment (typically, it is comprised of all emissions tabulated over all three scopes, not just scopes 1 and 2). Induced emissions are annual emissions due to the activity of the company over one year and include both direct and indirect emissions.

Conceptually, induced emissions are similar to what is commonly called the *carbon footprint*.

AVOIDED EMISSIONS

Avoided emissions are those not actually emitted by the activities of the firm or its products sold, within the same scope as induced emissions. When applicable, it is measured as compared to a reference case (when the reference case is less favourable) or is due to improvement in operations' carbon intensity. This is illustrated in the figure below:



The calculation of avoided emissions is defined on a case-by-case basis for each sub-sector (see appendix for details on reference scenarios). Avoided emissions are annual emissions due to the activity of the company over one year.

The "avoided emissions" concept is widely used to measure the carbon impact of project finance, and directly derived from the methodologies that were used in the Clean Development Mechanisms of the Kyoto Protocol. In particular, all major International Financial Institutions are reporting their carbon impact thanks to a measure of avoided carbon emissions.

Avoided emissions vs. induced emissions

Avoided emissions are "virtual" emissions: emissions which would exist unless the company had actively made an effort to decrease them. Induced emissions already take this decrease into account as compared to the reference scenario. Therefore, subtracting avoided emissions from induced would entail double-counting of these "negative emissions".

As a result, avoided emissions cannot be subtracted from induced emissions.

CARBON IMPACT RATIO

The carbon impact ratio is the ratio of avoided emissions to induced emissions. It is an easy-to-read indicator of the carbon impact of a company, and enables comparison between the carbon impact of a company and the impacts of its sectorial peers.

$$\text{Carbon impact ratio of a company} = \frac{\text{Avoided emission } (TCO_{2eq})}{\text{Induced emissions } (TCO_{2eq})}$$

In particular, the carbon impact ratio enables the identification of companies which have significantly improved the carbon-efficiency of their operations, as well as companies that sell products and solutions leading to GHG emissions reduction over their lifetime.

When this ratio is zero, it means that a given company has no avoided emissions whatsoever. If the ratio equals ten, it indicates that the company's emissions savings in the global economy represent ten times the emissions induced by the activity of the company (on scopes 1, 2, and 3). The Carbon Impact Ratio of a company will increase if avoided emissions increase or if induced emissions decrease.

The Carbon Impact Ratio therefore represents the capacity of an actor to reduce GHG emissions as compared to the emissions generated by its activity and products. Furthermore, the Carbon Impact Ratio is an easy-to-read indicator of the carbon performance of a company, and enables comparison between the carbon impact of a company and that of its sectorial peers.

QUALITATIVE INDICATOR OF FORWARD-LOOKING TREND

Evaluating the forward-looking trend of induced and avoided emissions requires analysis of investments and R&D expenditures which will contribute to decreasing carbon emissions in the future, as well as analysis of the firm's positioning and strategy regarding the low-carbon transition. Given that the vast majority of firms do not directly report on the share of their investments and R&D expenditures that contribute to decreasing GHG emissions, this metric is obtained through a qualitative indicator.

A GLOBAL RATING TO ASSESS THE CONTRIBUTION TO THE ENERGY TRANSITION

Finally, a global rating is provided for each company. This rating seeks to assess the company's impact on climate change and its contribution to reduced GHG emissions, while taking into account induced emissions, avoided emissions and the forward-looking analysis.

2.2. LOW-CARBON "BOTTOM-UP" APPROACH

The methodology is based on a bottom-up approach, with a methodology specifically tailored to evaluate the carbon impact of companies within each sector of activity. As a result, the method takes into account both the carbon stakes of each sector and the activity data – physical and financial – made public by companies.

The chosen approach allows for differentiation between companies in the same business sector, and enables the recognition of companies' efforts in integrating climate and energy related issues in their strategic decisions and reporting.

Finally, Carbon Impact Analytics can be applied to stocks and bonds of any listed company, even those that do not report their carbon footprint; the methodology is based in the economic and climate data disclosed by companies. In order to make the methodology applicable to as many organisations as possible, an extensive review was conducted prior to shaping the calculation principles, covering the published data and calculated indicators by companies from each business sector. As a result, Carbon Impact Analytics does not rely solely on the carbon reporting of firms. This is a major advantage of the methodology, as carbon reporting does not yet cover all listed companies, and computational methodologies tend to diverge significantly between sectors. Carbon Impact Analytics has been designed to facilitate dialog with companies in order to help improve their reporting (and, consequently, the quality of CIA analysis) over time. It is partly for this reason that the methodology relies on activity data that is often disclosed by companies, but CIA methodology could also be directly implemented by companies who would then disclose their induced and avoided emissions.

2.3. SECTORIAL DIFFERENTIATION

The level of "carbon challenge" varies depending on the characteristics of each economic sector. Being aligned with the low-carbon transition, for instance, does not necessarily require the same efforts to be made by an energy producer, a cement manufacturer, or a company which creates highly energy efficient motors. Moreover, carbon issues affect some sectors far more than others. Consequently, Carbon Impact Analytics has created sector-specific calculation principles.

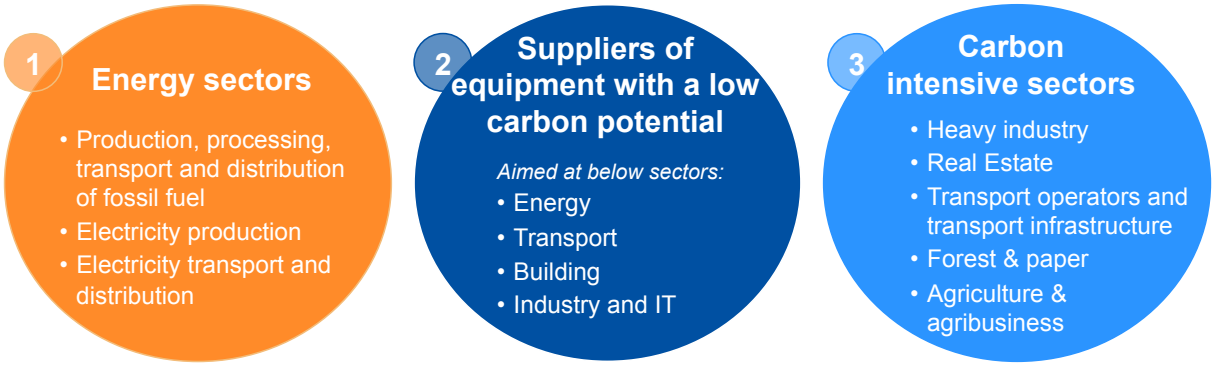
First, the methodology divides sectors into two categories, largely based on the importance of the energy and climate transition in their business:

- A detailed analysis is performed for all companies with "high stakes" in the energy and climate transition (energy, building, transport, etc.), including assessment of their induced and avoided emissions, carbon impact ratio, and a qualitative rating.

- A simplified analysis is performed for companies in "low-stakes" sectors regarding the energy and climate transition (pharmaceuticals, tertiary sectors etc.), which represent a low share in global GHG emissions. For these companies, the methodology focuses on scope 1+2 emissions reported by companies. Scope 3 emissions, which are rarely published by companies and are calculated on disparate perimeters, are not taken into account.

Next, the main sources of induced and avoided emissions are identified for all "high stakes" sectors." "High stakes" sectors are grouped into three main categories, each of which is an aggregate of similar sub-sectors. These three categories then present very specific challenges regarding the energy and climate transition:

- **Energy sectors:** the most pertinent challenge of energy companies is to diversify their energy mix, favouring more low-carbon sources, and reduction of direct emissions.
- **Suppliers of equipment with a low-carbon potential:** the challenge of these companies is to innovate, and to make these innovations available on the market.
- **Carbon intensive sectors:** the challenge of these companies is to reach "climate operational performance" by implementing energy-efficient and low-carbon solutions.



For each of these sectors, Carbon Impact Analytics methodology first defines which scopes are relevant, in terms of both emissions and levers of action. Financed and avoided emissions are therefore computed on a specific perimeter for each sector, with potential inclusion of emissions related to internal, upstream and downstream activities (scopes 1, 2 and 3).

In this first version of the methodology, selection of "high stakes" sectors depends largely on their overall share of global emissions, as well as an awareness of their activity's impact on GHG emissions (indirect impacts, in particular). This list of sectors is likely to evolve in future versions.

SECTORIAL CLASSIFICATION

The following represents how sectors are classified into the 3 relevant calculation categories:

"High stakes" categories regarding the low-carbon transition	Sectors	Sub-sectors
Category 1: Energy sector	**Fossil fuels**	Oil, gas and coal industry
	Electricity	Electricity industry
Category 2: Providers of efficient solutions	**Buildings**	Buildings: construction of new buildings and suppliers of energy efficient equipment (hvac, insulation, etc.)
	Energy	Energy : suppliers of equipment and solutions for the energy sector (electricity and fossil)
	Transport	Transport: suppliers of energy efficient transport equipment and construction of transport infrastructure
	Industry	Industry and IT: suppliers of energy efficient equipment and solutions
Category 3: Energy and greenhouse gas intensive sectors	**Heavy industry**	Cement and clinker production Steel production Aluminium production Plastics production Chemicals production Glass production Sugar production

	Forest & paper	Forest and wood products Paper production
	Transport	Transport operators Transport infrastructure operators
	Building	Buildings: real estate managers and owners
	Agriculture	Agriculture, fisheries, food-processing and fertilizer industry

The three "high stakes" categories have been subdivided into sectors and sub-sectors *(see the table above)*, all of which have been identified as highly significant throughout the low-carbon transition.

As a result, the energy and climate challenges faced by each of these sub-sectors have been studied in detail. Within agriculture, for example, challenges will be largely related to methane (CH_4) and nitrous oxide (N_2O) emissions reduction, and for the building sector, a main focus will be extended promotion of more efficient heating and insulation. Adopting a sectorial approach brings an informed view to the energy transition's key issues.

Calculation principles are thus different for each sector, while core principles remain common.

As previously mentioned, industries facing lower stakes are not analysed in detail during this first level of the methodology, and are instead taken into account in the final aggregation at portfolio level. Because the issues are far less contextually significant for this set, only the scope 1 and 2 emissions are aggregated in the calculation of portfolio's induced emissions.

Unlike other sectorial classifications, the Carbon Impact Analytics does not require allocation of a firm or a group to a unique sub-sector. On the contrary, activities of a group are broken down into various activity segments, each corresponding to one CIA sub-sector.

FOCUS ON MAJOR SOURCES OF EMISSIONS

Major sources of emissions were identified for each sector and sub-sector, and Carbon Impact Analytics focuses on evaluating these emissions. Therefore, the calculation methodology is specific to each sector and accounts for its key attributes. Indirect upstream and downstream emissions are taken into account whenever they represent a significant share of emissions and represent mitigation opportunities for a sector, such as the emissions induced by deforestation in the wood and paper industries.

According to the same logic, major mitigation levers were identified for each of the sub-sectors covered in detail by CIA. The calculation methodology which underlies the quantification of avoided emissions therefore also depends on the specifics of each sector.

3. IMPLEMENTATION OF CARBON IMPACT ANALYTICS

The following section details how to implement Carbon Impact Analytics for asset managers and owners. The analysis process is broken down into two main phases: the bottom-up analysis of underlying companies (carried out by Carbone 4) and the portfolio-level aggregation of results.

3.1. BOTTOM-UP COMPANY ANALYSIS

STEP 1: DISTRIBUTION OF THE COMPANY'S ACTIVITIES BETWEEN CIA SUB-SECTORS

Since the majority of companies operate in more than one business sector, it is necessary to decide in which of the CIA sub-sectors the company is active. Therefore, the first step is to distribute each company's activities between the sub-sectors per the Carbon Impact Analytics sub-sectorial split. The analysis provides insight into both detailed activity reporting and group reporting in order to use the most precise activity data possible.

STEP 2: CALCULATION OF INDUCED AND AVOIDED EMISSIONS FOR EACH ACTIVITY OF THE FIRM

Induced and avoided emissions are then calculated for each activity of the company, depending on sectorial principles. For activities not included in the sub-sectors covered by Carbon Impact Analytics, the analysis requires collection of disclosed scope 1 and 2 emissions (or a proxy of the carbon footprint based on sectorial GHG intensities). For all activities included in the sub-sectors (i.e. typically 40 to 50% of assets in a portfolio) the analysis provides insight into detailed business and financial data in order to compute indicators specific to Carbon Impact Analytics.

STEP 3: AGGREGATION OF RESULTS AT COMPANY LEVEL

- AGGREGATION OF QUANTITATIVE INDICATORS

The quantitative indicators are:

- absolute induced carbon emissions : the sum of all induced emissions by the different activities of the firm
- absolute avoided carbon emissions : the sum of all avoided emissions by the activities of the firm
- the Carbon Impact Ratio (CIR) : the ratio of total avoided emissions to total induced emissions

These quantitative indicators represent a company's carbon impact level throughout the previous year and are thus calculated at the company level.

STEP 4: QUALITATIVE ASSESSMENT OF FUTURE CARBON IMPACT TREND OF THE COMPANY

The qualitative rating assesses the likely evolution of company's carbon impact over the coming years and is again evaluated at the company level, taking all activities into account.

The qualitative rating is based on the evaluation of:

- The company's low-carbon capital expenditures and low-carbon research and development expenses (CAPEX and R&D)
- The strategy and positioning of the firm regarding the low-carbon transition

This evaluation is synthetized in a rating (++ to -- scale), under these guidelines:

- **Rating ++**: The company has integrated the fight against climate change as a key element of its strategy and has ambitious goals to address climate change. The share of sales in line with the challenges of climate change is likely increase in the coming years. The company's investments and R&D policy are aligned with the challenges of climate change. Typically, over 50% of the company's investments and R&D expenditures are related to the low-carbon transition.
- **Rating +**: The company has integrated the fight against climate change as an important element of its strategy. The company integrates the challenges of the transition in its investments and R&D policy, without it representing the majority of these expenditures. Typically, between 20% and 50% of the company's investments and R&D expenditures are related to the low-carbon transition
- **Rating -**: The company's strategy regarding climate change lacks ambition. The share of sales in line with the challenges of climate change is low and not expected to increase in the coming years. The challenges of the climate transition are a factor taken into account to a limited extent in investments and R&D policy of the company. Typically, between 5% and 20% of the company's investments and R&D expenditures are related to the low-carbon transition.
- **Rating --:** The company is carbon-intensive and has not integrated the climate change awareness as an important element of its strategy. The share of sales in line with the challenges of climate change is typically less than 5%, and there is no evidence that this share will increase in the future. The company has not incorporated the challenges of transition in its investments and R&D policy. Less than 5% of the company's investments and R&D expenditures are related to the low-carbon transition.

In addition, the company's reporting quality and transparency is also evaluated to indicate the relative precision of the quantitative indicators and to open pathways for dialogue and engagement. This evaluation is not taken into account in the global rating of the carbon performance of the company

STEP 5: GLOBAL RATING OF THE CARBON PERFORMANCE OF THE COMPANY

Finally, once the quantitative and qualitative indicators have been computed, Carbon Impact Analytics offers a global rating of the firm's carbon performance. This global rating is based on:

- an intrinsic evaluation of the carbon performance of the firm, consisting of the quantitative and qualitative assessments;
- an assessment of a firm's relative carbon performance, using performances of firms in the same business sector as the benchmark.

The global rating is thus a qualitative measure which builds on the knowledge of companies' carbon performance by sector. It further enables asset managers to easily understand and assess the carbon performance of a particular firm and compare it to others'.

The global rating is defined as follows:

- **High contribution to the climate transition:** Companies who contribute extensively to global GHG emissions reduction, either through the low carbon intensity of their operations or through the efficiency of products and services they offer.
- **Significant contribution to the climate transition:** Companies who contribute to reducing GHG emissions, either because a substantial part (but not the main part) of their products and services enables GHG emissions reduction, or through a moderate decrease in the carbon intensity of their operations.
- **Low contribution to the climate transition:** Companies whose products and/or operations have a negative impact on climate change and who show limited efforts to reduce this impact, either through a small part of efficient products and solutions in their sales or through minimal actions to reduce the carbon intensity of their operations.
- **Negative contribution to the climate transition:** Companies whose operations and/or products have a highly significant impact on climate change and whose investments to transform its current business model into a more sustainable one are absent or insufficient.

Companies in the "low stakes" sectors are classified as "neutral":

- **Neutral contribution to the climate transition:** Companies whose products and operations present neither significant opportunities nor significant risks to the climate transition and/or companies for which the impact is not evaluated due to lack of knowledge.

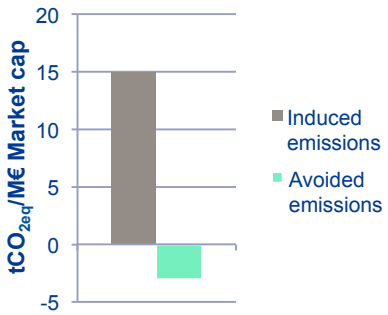
- **KEY OUTPUTS OF THE ANALYSIS**

Comments on the analysis:

X realizes 30% of its turnover from products linked to the low-carbon transition. The strategy of X is to increase strongly its turnover related to the low-carbon transition, however no information is available on CAPEX and R&D expenditures related to the low-carbon transition. The scope 1 and 2 emissions reporting is reliable.

Overall rating: **Significant contribution to the climate transition**

Quantitative indicators



Carbon impact ratio

$= \frac{\text{Avoided emissions}}{\text{Induced emissions}} = 0.2$

Induced emissions

= 350,000 tCO_2

Scopes 1+2+3

Avoided emissions

= 60,000 tCO_2

Improvements in efficiency OR comparison with a reference scenario

Qualitative indicators

Company's trend regarding the contribution to the energy transition: +

Transparency and reporting quality : +

3.2. PORTFOLIO ANALYSIS

Once the analysis has been conducted for each underlying company included in the portfolio, indicators can be aggregated to obtain key results at the portfolio level.

AGGREGATION PRINCIPLES

- **AGGREGATION PRINCIPLES FOR QUANTITATIVE INDICATORS**

This paragraph details how Carbon Impact Analytics aggregates companies' results to provide quantitative portfolio-level indicators.

Eliminating carbon emissions double-counting

Double-counting of emissions takes place when the same ton of GHG emissions is counted more than once within a portfolio, typically due to compilation of indirect induced and avoided emissions within the same value chain. For example, GHG emitted by a truck's fuel combustion is taken into account as a direct emission for the company operating the truck, as an indirect emission for the company producing the fuel, and as an indirect emission for the company that manufactured the truck. In this example, if all 3 companies are included in the portfolio (the freight company, the truck manufacturer and the energy supplier), induced emissions coming from fuel combustion in the truck's engine will be

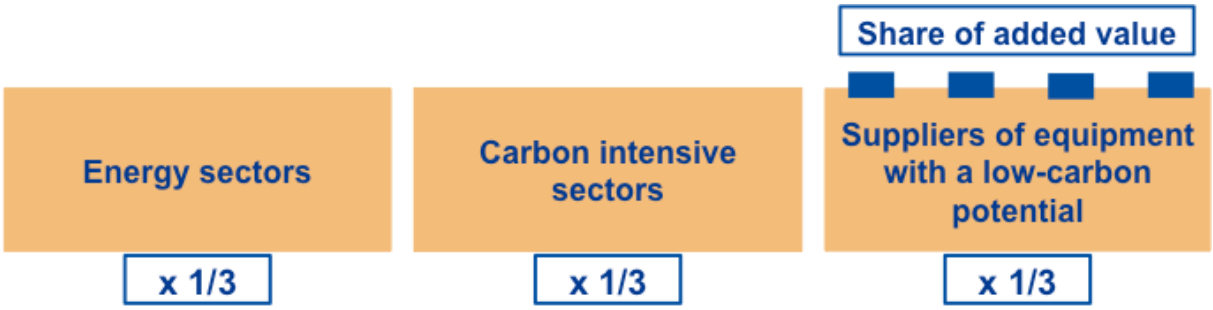
taken into account three times. Addressing double-counting is therefore a crucial issue in the Carbon Impact Analytics methodology.

Double-counting tends to occur between three categories of actors in the value chain:

- energy suppliers (the oil company providing fuel in the above example)
- energy and carbon intensive companies (the company operating the truck in the above example)
- companies providing equipment and solutions (the truck manufacturer in the above example)

Therefore, the Carbon Impact Analytics methodology reprocesses total figures of GHG emissions by allocating one third of the emissions of each category (see figure below). Both induced and avoided emissions are treated reprocessed in this fashion, thereby eliminating most double-counting at the portfolio level.

The following figure describes how CIA resolves the issue of double-counting:

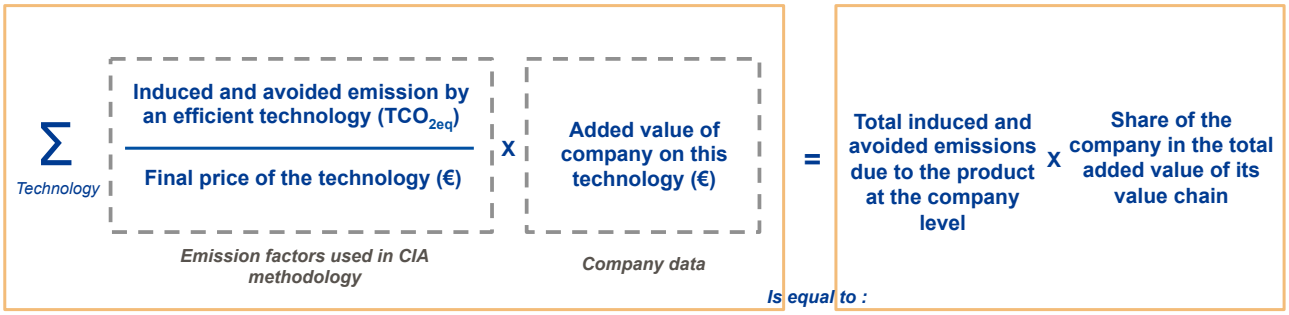


Double-counting can also appear within the categories of actors identified above, but the methodology is designed to further limit double-counting by allocating indirect emissions to actors within the same value chain.

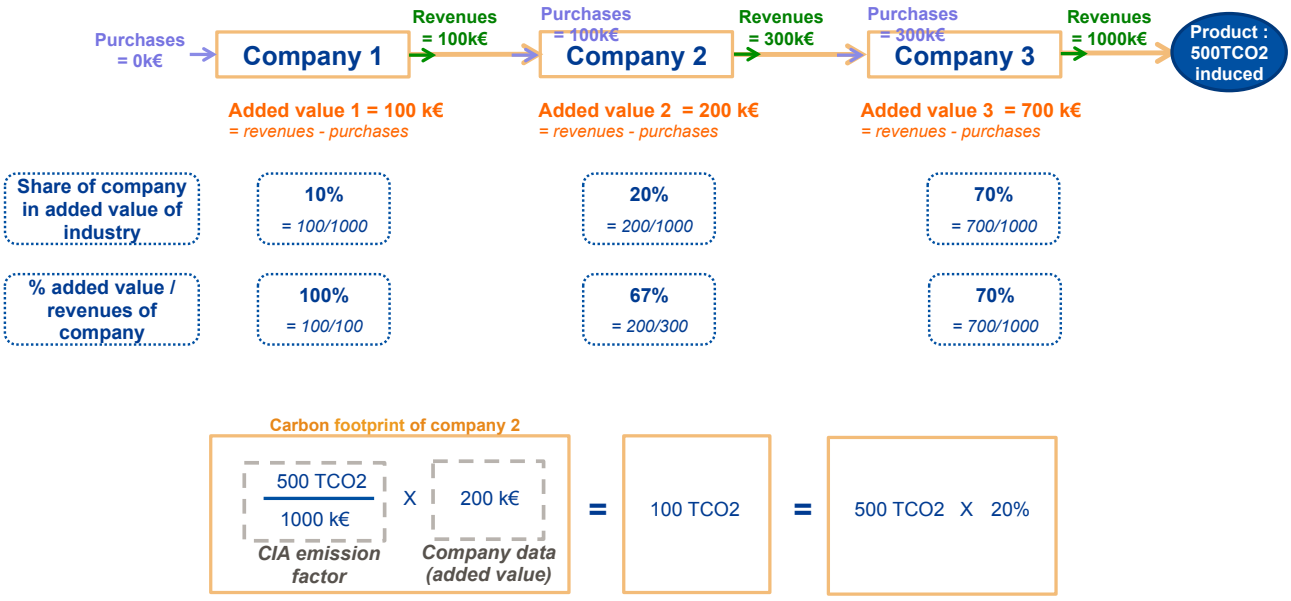
For instance, in the category "suppliers of equipment with a low-carbon potential", double-counting can readily occur between various suppliers who all contribute to the production of a single, efficient piece of equipment (suppliers within the same value chain, each producing a different part of the final product). Double-counting will occur if the total of all upstream, scope 3 emissions due to product use are tabulated for each company.

To avoid this second set of double-counting, Carbon Impact Analytics considers the summation of all induced and avoided emissions that were accrued in creating the final product to be proportional to the added value of the company in the final product's creation. So, the total induced and avoided emissions due to sold products (quantified at the company level) is multiplied by the share of the company in the total value added throughout the value chain.

However, the value added by a company in its value chain is rarely known, so Carbon Impact Analytics implements the calculation directly at the company level and designs custom emission factors. Then, multiplying total induced emissions by the company's share in total added value becomes equivalent to multiplying total emissions induced by 1 € of the final product by the added value of the company (the company's revenues minus its purchases). The same rule applies to avoided emissions.



An example is given in the figure below:



This methodology allows for measuring the relative weights of each company in the whole value-added chain associated with a final product.

Using the aforementioned principles, the Carbon Impact Analytics methodology avoids the majority of prevalent double-counting problems. In addition, the reprocessing of induced and avoided emissions separately provides valuable insight, especially since the results are undistorted and highly comparable.

Aggregation of results at portfolio level

After taking action to limit double-counting, the figures for induced and avoided carbon emissions are summed up separately according to their weight in the portfolio:

- Step 1: Calculation of the carbon emissions (induced and avoided emissions separately) per euro of enterprise value for each underlying company in a portfolio

Carbon intensity per euro of Enterprise Value:

In order to avoid double-counting of a firm's emissions between its stocks and corporate debt, the carbon intensity of a firm is computed on the Enterprise Value of the firm, instead of solely on the market capitalisation. Thus, total emissions of the firm are allocated proportionally between its equity and its debt, and one euro of equity has the same carbon intensity as one euro of debt.

The Enterprise Value used to calculate the carbon intensity is the average Enterprise Value of the firm on the reporting period. It is calculated as: market capitalisation + preferred stocks + (interests bearing) short-term and long-term debt – cash and cash-equivalents.

Note: Other aggregation rules can be implemented depending on the portfolio that is analysed. For instance, for long-term investors, carbon emissions can be aggregated based on acquisition values.

- Step 2: Multiplication of the exposure of the portfolio to this underlying company (in million euros)

$$\frac{\text{Reprocessed emissions (tCO2e)}}{\text{Enterprise value (M€)}} \times \text{Portfolio exposure (M€)} = \text{Emissions to add up (TCO2e)}$$

- Step 3: Summation of all underlying companies' emissions at portfolio level, induced emissions on one side and avoided emissions on the other (again, induced and avoided emissions are not to be added together)

- **AGGREGATION PRINCIPLE FOR THE FORWARD-LOOKING QUALITATIVE INDICATOR**

Portfolio-level aggregation of the forward-looking qualitative indicator consists primarily of the distribution of the underlying companies' qualitative indicator scores. It provides the percent of portfolio values which should see their carbon intensity decrease in the coming years (thus have forward-looking ratings of + or ++), as well as those for which the opposite is true. Illustrated below is an example of this distribution:

Forward-looking rating	Weight in the portfolio
A	10 %
B	55 %
C	30 %
D	5 %

- **AGGREGATION PRINCIPLE FOR THE GLOBAL RATING**

At the firm level, the global rating is a qualitative synthesis of all indicators previously analysed (induced and avoided emissions, Carbon Impact Ratio and qualitative forward-looking indicator). It provides an evaluation of the overall carbon performance of a firm. At the portfolio level, it is necessary to evaluate the carbon performance of the portfolio, so two particular representations of the ratings are of greatest interest for asset managers:

- A global carbon performance rating of the portfolio, calculated based on the global ratings of financial securities in the portfolio;
- A distribution of global ratings of underlying companies in the portfolio (weighted share of global ratings of companies).

KEY OUTPUTS OF THE ANALYSIS

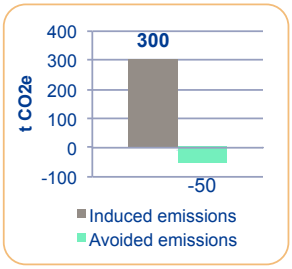
Key outputs of the portfolio-level analysis are summarized below:

Portfolio overall rating:

Quantitative indicators:

Carbon impact (scope 1, 2 & 3)
Induced emissions: 300 tCO2e / € M invested
Avoided emissions: 50 tCO2e / € M invested

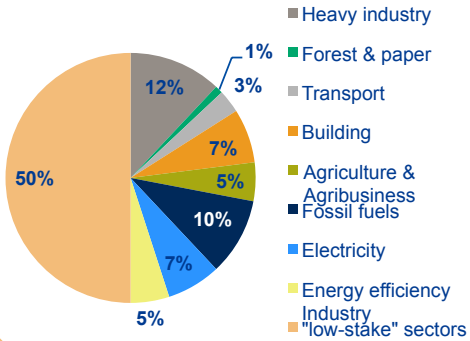
Direct carbon impact (scope 1 & 2)
Induced emissions: 150 tCO2e / € M invested



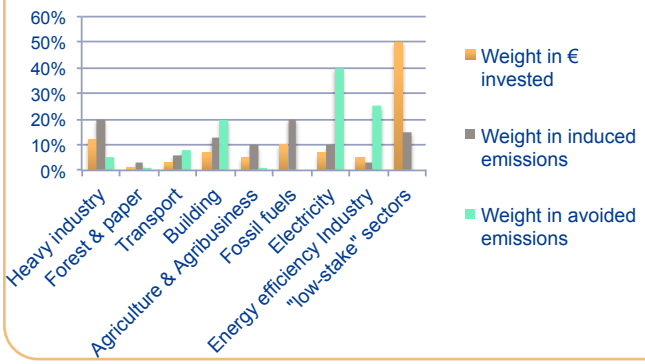
Forward-looking ratings

Forward-looking rating	Weight in the portfolio
+ +	10%
+	55%
-	30%
- -	5%

Sectorial weight in € invested



Weight in € vs. Weight in CO_{2e}



Top 5 contributors in portfolio induced emissions:

Company name	Weight in portfolio emissions
Company A	9%
Company B	8%
Company C	7%
Company D	5%
Company E	5%

Top 5 best carbon impact:

Company 1
Company 2
Company 3
Company 4
Company 5

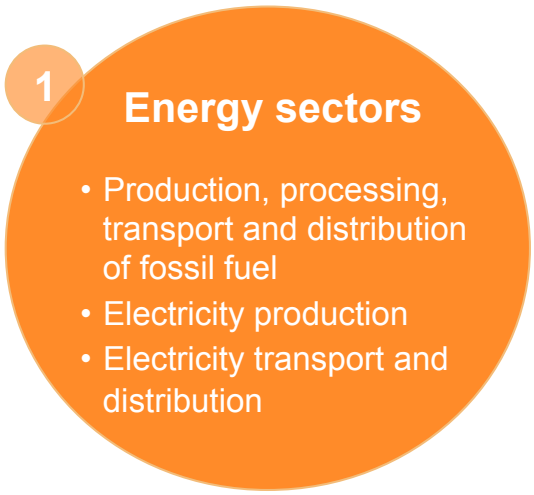
Top 5 contributors in portfolio avoided emissions:

Company name	Weight in portfolio emissions
Company A	9%
Company B	8%
Company C	7%
Company D	5%
Company E	5%

4. QUANTIFICATION OF INDUCED AND AVOIDED EMISSIONS: METHODOLOGICAL PRINCIPLES

The following paragraphs detail the computational principles for each of the three activity categories (energy sector, carbon-intensive sectors, and suppliers of equipment with a low-carbon potential). For more precise details on data used and reference values for each sector, please refer to the appendix.

4.1. ENERGY SECTORS



•	Category 1: Energy sectors
Calculation principles for induced carbon emissions	Scopes 1 + 2 + 3, upstream and downstream (combustion of the fuel produced and/or sold during the year)
Calculation principles for avoided carbon emissions	For electricity only: Comparison of the carbon intensity of electricity produced by the company with a reference scenario
Results analysis: induced emissions	Comparison of the carbon intensity enables selection of companies with a low-carbon energy mix. In particular, in the fossil-fuel sector, companies with lower induced emissions are preferred to companies with high induced emissions
Results analysis: avoided emissions	In the electricity sector, companies with avoided emissions already have a production mix by fuel source less carbon intensive than IEA target at 2025 in the 2DS scenario

Three main sources of emissions are significant when assessing the carbon impact of an energy producing company:

- Emissions induced by its activity (oil extraction and refining for an oil company, for example) (scope 1 and 2)

- For electricity, emissions due to upstream activities along the value chain (such as the production of the windmill or the extraction of fossil fuels burned to produce electricity) (scope 3 upstream);

- For fossil fuels, emissions related to the combustion of fossil fuel produced (scope 3 downstream).

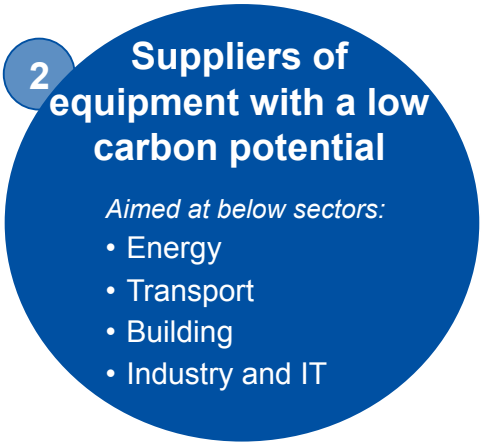
Calculation of scope 1 and 2 induced emissions is based on disclosed data whenever available, if this data is considered reliable. If scope 1 and 2 reporting is not available (or not reliable), production volumes are used instead to calculate emissions. Scope 3 emissions are usually calculated by Carbone 4 and are based on production volumes.

In the electricity sector, avoided emissions are calculated as the difference between the actual carbon intensity of the company's production (emissions per kWh of electricity produced and/or sold) and a "low-carbon electricity intensity" in line with a 2° climate scenario, multiplied by the total annual electricity production volume *(see boxed text below)*.

Carbon intensity of electricity generation in a 2° scenario
Electricity generation is one of the few business areas where 2° scenario downscaling is reliable and adequately detailed enough to allow a comparison of business activities with a 2° scenario benchmark. Therefore the reference for the computation of avoided emissions on the electricity generation sector has been set on a 2° scenario, specifically the IEA 2DS scenario in 2025 (as described in the *Energy Technology Perspectives 2014* (ETP 2014) report).

Refer to appendices for detailed computational principles for each sub-sector of the Energy category.

4.2. SUPPLIERS OF EQUIPMENT WITH A LOW-CARBON POTENTIAL



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	Category 2: Suppliers of equipment with a low-carbon potential
Calculation principles for induced carbon emissions	Scopes 1 + 2 + 3 downstream (due to products and services sold by the company) Induced emissions take into account future emissions due to products sold during the year (if they consume energy), taken into account over the whole lifetime of products
Calculation principles for avoided carbon emissions	Emissions avoided thanks to efficient products sold during the year, taken into account over the lifetime of products and compared to the products that will be replaced
Results analysis: induced emissions	Companies with high induced emissions are companies which sell products which will consume energy over their lifetime (cars, buildings, etc.). High induced emissions are not as such sufficient to assess the carbon impact of companies in this category
Results analysis: avoided emissions	"Carbon efficient" companies have high carbon impact ratios, as well as important avoided emissions per euro of turnover

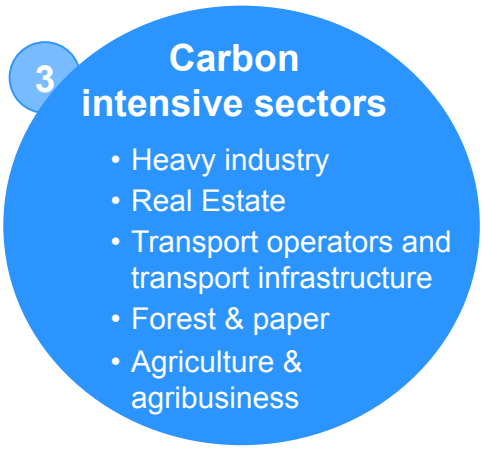
This category includes companies that manufacture efficient products for the energy, transport, building and industry sectors. The major source of emissions in this category is not the GHG emissions due to operations (scopes 1, 2 and 3 upstream), but GHG emissions due to products sold during the year. As such, the analysis focuses on measuring induced and avoided emissions due to products sold. In the case of a company producing insulating materials for buildings, the methodology enables estimation of emissions avoided over the insulating material's lifetime due to the renovation of existing buildings. For a car manufacturer, induced emissions take into account a lifetime of fuel consumption by cars sold during the year, but a certain share of a car manufacturer's sales will also lead to avoided emissions, as the sales served to replace older, less fuel efficient cars.

Calculation of induced emissions is mainly derived from the turnover generated by efficient products and solutions. This necessitates estimating the share of a company's turnover which is due to efficient products. For certain cases (building construction, car manufacturing, etc.), it is possible to estimate induced emissions based on volumes produced during the year (number of cars, square meters of buildings built) and the energy performance data available for these products.

Avoided emissions are usually calculated by comparing emissions of existing products to emissions of "efficient" products over their lifetime, with an estimation of what fraction of products sold will replace existing products. For instance, if a company manufactures efficient motors, avoided emissions are calculated as the difference between future GHG emissions of an energy-efficient motor and an existing motor, multiplied by the share of sales which serve to replace existing motors.

Refer to appendices for detailed calculation principles for each sub-sector of this category.

4.3. CARBON INTENSIVE SECTORS



	Category 3: Carbon intensive sectors
Calculation principles for induced carbon emissions	Scopes 1 + 2 + 3 (operational, when relevant)
Calculation principles for avoided carbon emissions	Decrease in the GHG-intensity of the company for the past 5 years (GHG intensity per unit of volume produced or managed) + In some cases, comparison with a reference situation
Results analysis: induced emissions	Companies with the lowest induced emissions are the companies with the most « carbon-efficient » operations. Note: The carbon intensity of business activities of several companies within the same sub-sector can be compared in some cases. However, operational differences (vertical integration, outsourcing) can also explain discrepancies between carbon intensities.
Results analysis: avoided emissions	Companies with the highest Carbon Impact Ratio (avoided emissions / induced emissions) are the ones which have reduced the most their carbon intensity over the past five years.

In energy and GHG-intensive sectors, the most daunting challenge through the transition is to reduce the carbon intensity of processes. As a result, induced emissions and avoided emissions mainly cover scopes 1 and 2, as well as operational scope 3 when relevant.

Calculation of induced emissions is based on disclosed data for scopes 1, 2 and 3 whenever available, or, by default, on production volumes (in tonnes, m^2, km travelled, etc.). In the absence of production volumes, emissions are estimated based on the company's turnover (converted by Carbone 4 using their usual ratios). When the available emissions reporting seems to be of high quality, scope 1 and 2 emissions are used as reported, while scope 3 is calculated by Carbone 4.

Avoided emissions are calculated as the decrease of GHG-intensity of the activity over the past five years (per unit of volume produced or managed), multiplied by the production volume in the last reported year.

In some cases, avoided emissions can be calculated by comparing the company's emissions to a reference situation, but this is only practised when the item sold is a low carbon product considered substitutable with a carbon intensive product. This technique must be applied carefully; for instance, the methodology does not consider low-carbon and high-carbon steel products to be substitutable, as they are likely to have significantly different physical properties. So, in practise, this analysis is done for only a few sectors in this first version of the methodology:

- Low carbon passenger and freight transport operators: per the methodology, these operators offer a service which enables substitution to high carbon transport services
- Wood products : wood products enable substitution for other energy sources used in the residential and tertiary sector (100% of the wood fuel produced, as well as some other wood-based products ultimately used as fuel at end-of-life)
- Organic fertilizers : organic fertilizers are capable of substituting for mineral fertilizers
- Biofuels: biofuels are substitutable with fossil fuels fossil fuels

Refer to appendices for detailed calculation principles for each sub-sector of this category.

5. APPENDIX: DETAILED CALCULATION PRINCIPLES FOR EACH SUB-SECTOR

Sector	Sub-sector	Perimeter of induced emissions	Perimeter of avoided emissions	Reference situation (to quantify avoided emissions)
Electricity	**Electricity producers**	Scope 1 + 2 + Scope 3 fuel upstream + Scope 3 construction of plant	Comparison between financed emissions and reference scenario	Emission factor of world electricity mix in IEA 2DS scenario at 2025
	Operators of electricity transmission and distribution networks	Scope 1+2 due to energy losses in the network and SF6 leakages (reported or by default calculated based on activity data or by default on national electricity losses rates for transmission or distribution, and for global average per TWh regarding SF6 leakages)	Avoided emissions thanks energy losses reduction and SF6 leakage reduction over the past 5 years (reduction of the GHG-intensity per unit kWh distributed)	n/a
Fossil fuels	**Energy producers (coal, gas, etc.)**	Scope 1+2 + Scope 3 combustion Allocation of scope 3 emissions from combustion between the 4 process steps inside one company : MAX volume of each step	None	None
	Operators of energy transmission and distribution networks (excl. electricity)	Scope 1+2 due to energy losses in the network (calculated based on average global energy losses per type of network, excluding non-technical losses) + energy used by the process	None	None
	Energy suppliers	Scope 1+2 + Scope 3 combustion	None	None

5.1. DETAILED CALCULATION PRINCIPLES FOR SUB-SECTORS OF THE ENERGY SECTOR'S "HIGH STAKES" CATEGORY

Sector	Sub-sectors	Perimeter of induced emissions	Perimeter of avoided emissions	Reference situation (to quantify avoided emissions)
Electricity	**Electricity producers**	Scope 1 + 2 + Scope 3 fuel upstream + Scope 3 construction of plant	Comparison between financed emissions and reference scenario	Emission factor of world electricity mix in IEA 2DS scenario at 2025
	Operators of electricity transmission and distribution networks	Scope 1+2 due to energy losses in the network and SF6 leakages (reported or by default calculated based on activity data or by default on national electricity losses rates for transmission or distribution, and for global average per TWh regarding SF6 leakages)	Avoided emissions thanks energy losses reduction and SF6 leakage reduction over the past 5 years (reduction of the GHG-intensity per unit kWh distributed)	n/a
Fossil fuels	**Energy producers (coal, gas, etc.)**	Scope 1+2 + Scope 3 combustion Allocation of scope 3 emissions from	None	None

Sector	Sub-sectors	Perimeter of induced emissions	Perimeter of avoided emissions	Reference situation (to quantify avoided emissions)
		combustion between the 4 process steps inside one company : MAX volume of each step		
	Operators of energy transmission and distribution networks (excl. Electricity)	Scope 1+2 due to energy losses in the network (calculated based on average global energy losses per type of network, excluding non-technical losses) + energy used by the process	None	None
	Energy suppliers	Scope 1+2 + Scope 3 combustion	None	None

5.2. DETAILED CALCULATION PRINCIPLES FOR SUB-SECTORS OF THE "HIGH STAKES" CATEGORY "SUPPLIERS OF EQUIPMENT WITH LOW-CARBON POTENTIAL"

Sector	Sub-sectors	Perimeter of induced emissions	Perimeter of avoided emissions	Reference situation (to quantify avoided emissions)
Building	**Construction of new buildings**	Scope 1+2+3 upstream emissions due to construction works +scope 3 upstream emissions (due to total energy consumption of building over its lifetime)	Construction works: emissions avoided thanks to efficiency measures planned over the next 5 years (as proxy: past 5 years) + Avoided emission due to efficient buildings displacing existing building stock	Carbon intensity of existing building stock, taking into account that only a share of new buildings replace existing buildings (others are additional buildings that increase the building stock)
	Products for buildings: heating equipment, insulation, smart devices, insulated glazing, lightning	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures Avoided emission due to efficient products sold during the year over their lifetime, displacing existing equipment	Carbon intensity of existing equipment, taking into account that only a share of new equipment replace existing equipment (others are used in new buildings that increase the equipment stock)

Transportation	**Manufacturers of automotive and airplanes**	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures Avoided emission due to efficient products sold during the year, over their lifetime, displacing existing equipment	Carbon intensity of existing transport means, taking into account that only a share of new equipment replacing existing equipment (others are used in new buildings that increase the transport means stock)
	Manufacturers of buses, trains, bikes and ships	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures + Avoided emission due to efficient means of transport displacing existing means of transport	Carbon intensity of existing transport means, taking into account that only a share of new efficient means of transport replace existing means (others are additional transport capacity that increase the global offer for transport) + Low carbon transport mix in IEA 2DS scenario (as described in ETP 2014 report)
Industry	**Energy efficient products for industry**	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures Avoided emission due to efficient equipment displacing existing equipment	Carbon intensity of existing equipment, taking into account that only a share of new equipment replace existing equipment (others are additional capacity that increase the global industry output)

Energy	**Products for oil&gas sector**	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures	
	Products for power sector (generation, transmission and distribution)	Scope 1+2 emissions due to equipment manufacturing +scope 3 upstream emissions (due to total energy consumption of equipment over its lifetime)	Emissions avoided thanks to energy efficiency measures Avoided emission due to efficient equipment displacing existing equipment	Carbon intensity of existing power generation and T&D infrastructure, taking into account that only a share of new equipment replace existing equipment (others are additional capacity that increase the global capacity

DETAILED CALCULATION PRINCIPLES FOR SUB-SECTORS OF THE "HIGH STAKES" CATEGORY "CARBON INTENSIVE SECTORS"

Sector	Sub-sectors	Perimeter of induced emissions	Perimeter of avoided emissions	Reference situation (to quantify avoided emissions)
Buildings	**Real estate companies (residential and tertiary)**	Emissions due to energy consumption of buildings managed and/or owned (scopes 1+2+3)	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per unit of surface area managed)	n/a

Heavy industry	**Producers of steel, cement, clinker, aluminium, plastics, glass, sugar, chemicals**	Scope 1+2 emissions due to the company's activity during the year	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per tonne produced)	n/a
Forest and paper	**Forestry and wood products**	Scope 3 emissions due to deforestation risks induced by the company's activities + Scope 1&2 emissions due to company's activity during the year	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per tonne produced) + Emissions avoided thanks to the direct management of reforestation programs on exploited forests + Emissions avoided thanks to the substitution of GHG-intensive energy sources by wood	Average GHG-intensity of fuel substituted by wood products
	Pulp, paper and cardboard products	- Scope 3 emissions due to deforestation risks induced by the company's activities + Scope 1&2 emissions due to company's activity during the year	achieved over the past 5 years (reduction of the GHG-intensity per tonne produced) + Emissions avoided thanks to the direct management of reforestation programs on exploited forests + Emissions avoided thanks to the energy valorisation of products at end of life	Average GHG-intensity of fuel substituted by wood products

Agriculture	**Agriculture**	Emissions due to the energy consumption (Scope 1+2) + Other emissions due to production of crop and livestock products (Scopes 1+2+3)	Emissions avoided thanks to GHG mitigation actions achieved over the past 5 years (reduction of the GHG-intensity per tonne produced) + Emissions avoided thanks to the production of biofuels compared to fossil fuels	n/a
	Agribusiness	Scope 1+2 emissions due to the company's activity during the year + Scope 3 emissions due to production of crop and livestock products, food packaging and upstream freight + Scope 3 emissions due to deforestation risks induced by the company's activities such as palm oil consumption	Emissions avoided thanks to GHG mitigation actions achieved over the past 5 years (reduction of the GHG-intensity per tonne produced) + Emissions avoided thanks to the production of biofuels compared to fossil fuels	n/a
	Fertilizers	Scope 1+2 emissions due to the company's activity during the year	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per tonne produced) + Emissions avoided thanks to the production of organic fertilizers instead of mineral fertilizers	Average GHG intensity of substituted mineral fertilizers

Transport	**Transport operators**	Emissions due to the energy consumption of the vehicles operated (Scopes 1+2)	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per passenger.km or tonne.km transported) +Emissions avoided compared to a low-carbon transition mix	Low carbon transport mix in IEA 2DS scenario (as described in ETP 2014 report)
	Transport infrastructure companies	Scope 1+2 emissions due to the company's activity during the year + Scope 3 emissions due to vehicles' movement in the infrastructure's perimeter	Emissions avoided thanks to energy efficiency achieved over the past 5 years (reduction of the GHG-intensity per passenger.km or tonne.km transported) +Emissions avoided compared to a low-carbon transition mix	n/a