carbon4 | finance

Forest & paper :
A sector with tree-mendous potential

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Sector review of the
2024 CIA campaign

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Summary

- The value chain in the forestry and paper sector is made up as follows: **upstream forestry** (silviculture), followed by primary processing (crushing, sawing) and finally secondary processing (downstream), which involves the sale of **finished products** (timber, industrial wood and wood energy).

- In a **poorly capitalised** sector, the few large listed companies have adopted an **integrated** business model, focusing mainly on the manufacture of **paper and cardboard** (industrial wood), particularly for **packaging**.

- **Deforestation** is the sector's main climate issue, as the preservation of forest ecosystems is imperative if we are to have any hope of limiting global warming. The **transition risks** associated with deforestation have been clearly identified by industry players, while some are warning that deforestation could become the "new coal" in investors' portfolios.

- However, this is not the only issue that needs to be taken into account to maximise the climatic benefits of the forest: wood products continue to **store the carbon** absorbed during the growth of the tree throughout their **lifespan**, and some of them can **replace** more emissive products as a source of **energy** or as a **building** material.

- Based on scientific literature, the CIA **sector methodology**, comprising past, present and future indicators reflecting the sector's climate challenges, was applied in this study to **listed companies** in the sector that are included in the major stock market **indices**.

- In the overall ranking, the companies obtained CIA scores ranging from **4.58 to 10.81,** with ratings from 1 (best) to 15 (worst). Between these two extremes, the scores are relatively **tight**, by virtue **of the homogeneity** of the company profiles in the sample.

- In terms of **past** and **present** performance, with the exception of a few poor performers, the majority of companies have relatively **low Scope 3 deforestation intensities**, thanks to sourcing from low deforestation countries, and despite a lack of transparency on certification.

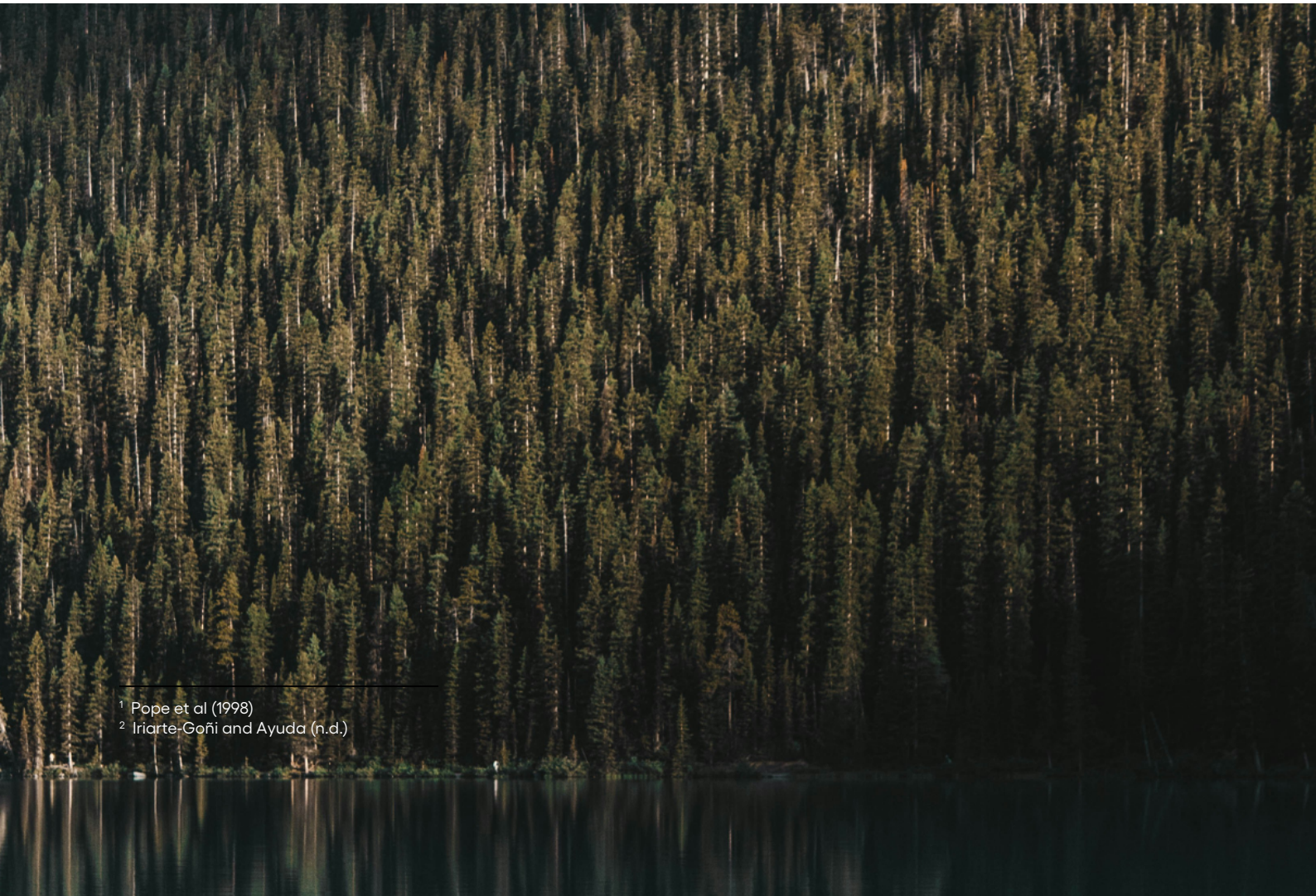
- However, there is considerable room for improvement in the **choice of products**: the overwhelming majority of products sold (by volume) belong to the pulp, paper and cardboard categories. These are the products that are least valued by the CIA methodology, particularly when combined with low rates of use of **recycled materials** and **co-products**.

- Finally, in terms of **future** performance, almost half of the companies demonstrate a good or very good understanding of the climate **risks** and **challenges** associated with their sectors. They set ambitious reduction targets in terms of **operational emissions** (Scope 1&2), but seem to be more cautious when it comes to emissions from their **value chain** (Scope 3). In terms of **governance**, they are in the 2nd quartile compared with all CIA sectors.

Introduction

Wood is one of the oldest materials used by mankind. The first traces of its use for fire date back 750,000 years. Evidence of its use in construction in Tanzania dates back 60,000 years. Tree species have been cultivated for thousands of years, but the first mention of a forest nursery dates back to the Middle Ages, in the 15th century . [1]

During the industrial revolution, the use of fossil fuels reduced the economy's dependence on wood as an energy source. Since then, the importance of wood in a country's GDP has tended to decline. However, the absolute volume of wood consumed has continued to rise, driven by population growth and economic development. And with them, the pressures exerted by the economy on forest ecosystems. [2]



[1] Pope et al (1998)
[2] Iriarte-Goñi and Ayuda (n.d.)

1.
Dynamics and challenges facing the sector

1. Sector dynamics and challenges

Description of the sector and scope of the study

Value chain and business profiles

The value chain for the forestry and paper sector is as follows:

1) **Upstream forestry** (silviculture), involving the ownership, management, maintenance and operation of forest land.

2) **Primary processing,** which includes industrial stages such as crushing, sawing, slicing, peeling and pulping.

3) **Secondary processing** (downstream), which involves the sale of finished products. There are three categories of product and three types of outlet for the sector:
   a) *Lumber*: made from high-quality wood, these products have a long service life, for uses such as furniture and construction. This includes sawn timber, plywood and round wood.
   b) *Industrial wood*: which can be made from lower quality wood, co-products or recycled fibres, these products undergo more crushing and processing, and have a shorter lifespan. They include pulp, paper, cardboard and particleboard.
   c) *Wood energy*: this covers all products that convert wood into a source of energy, such as logs, pellets and forestry chips. Wood energy does not require any particular quality of wood.

Our study covers **the entire** value chain of the sector, and the products mentioned above. In our sample, the majority of companies manufacture paper and board, and only a few produce other wood products. The majority of the sector's market capitalisation is concentrated in **paper and board** manufacturing, particularly for **packaging**. This is because upstream forestry companies are more local, more family-owned. Downstream companies, on the other hand, tend to concentrate flows, resulting in large companies that are naturally more likely to go public.

A large proportion of the companies studied have finally developed an **integrated** model: they own forest management activities in order to guarantee a supply of wood for their processing activities.

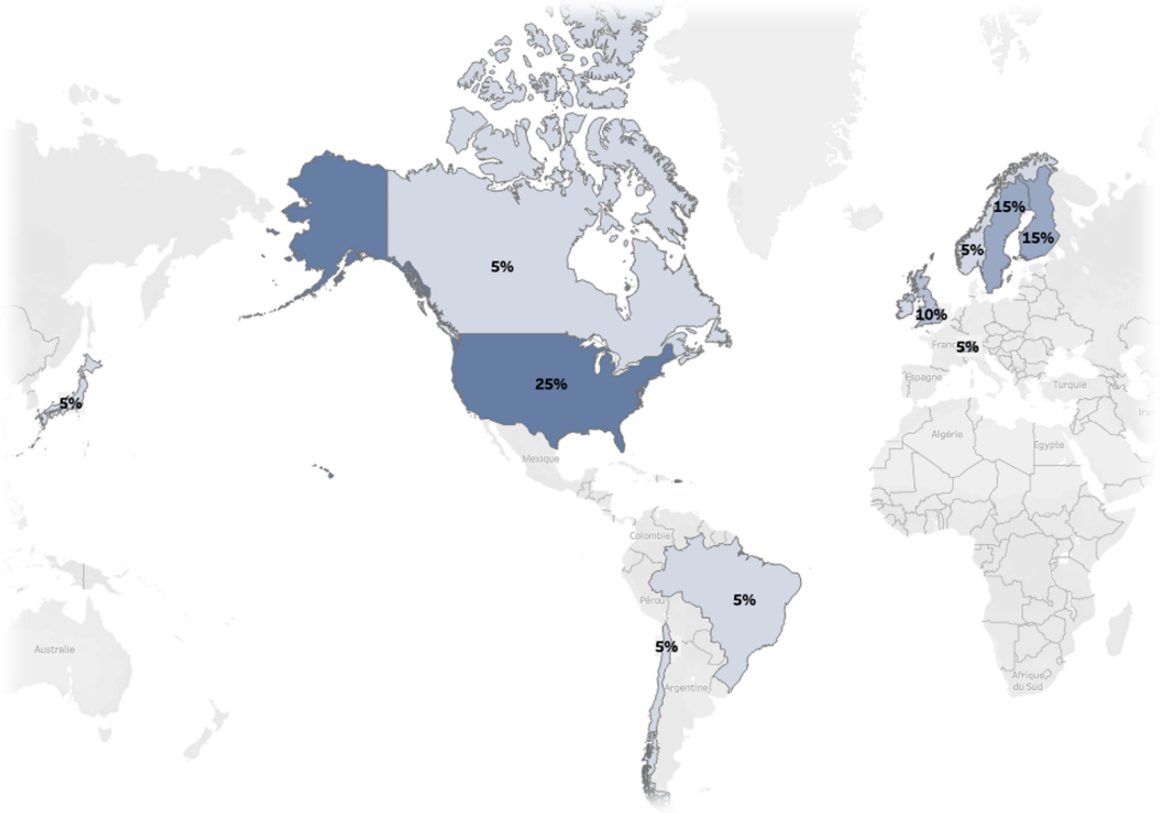
Market capitalisation

It is estimated that the market capitalisation of the Forest & Paper sector will be around €310 billion in 2022.[3] Historically, the sector has been affected by "under-investment and insufficient competitiveness"[4] . The sector is heterogeneous and fragmented, with small, local companies upstream (forestry work and 1st transformation of wood), and property builders, energy companies and global paper groups downstream, as well as craft companies, such as in the carpentry and joinery sectors. Our sample covers 20 of the largest companies in the sector, representing a market capitalisation of €176 billion, or around **57%** of the sector's total capitalisation.

Our sample is limited to listed companies included in the main international market indices, and therefore excludes certain emblematic unlisted companies in the sector, such as **Ikea**.

Geographical breakdown

The map opposite shows the geographical distribution of the head offices of the companies in the sample. Most are located in the **United States**, followed by Northern Europe. Unsurprisingly, countries with a tradition of forestry and a certain degree of forest cover are found overall.



[3] Global Paper And Forest Products Market Size (2024)
[4] Cour des Comptes (2016)

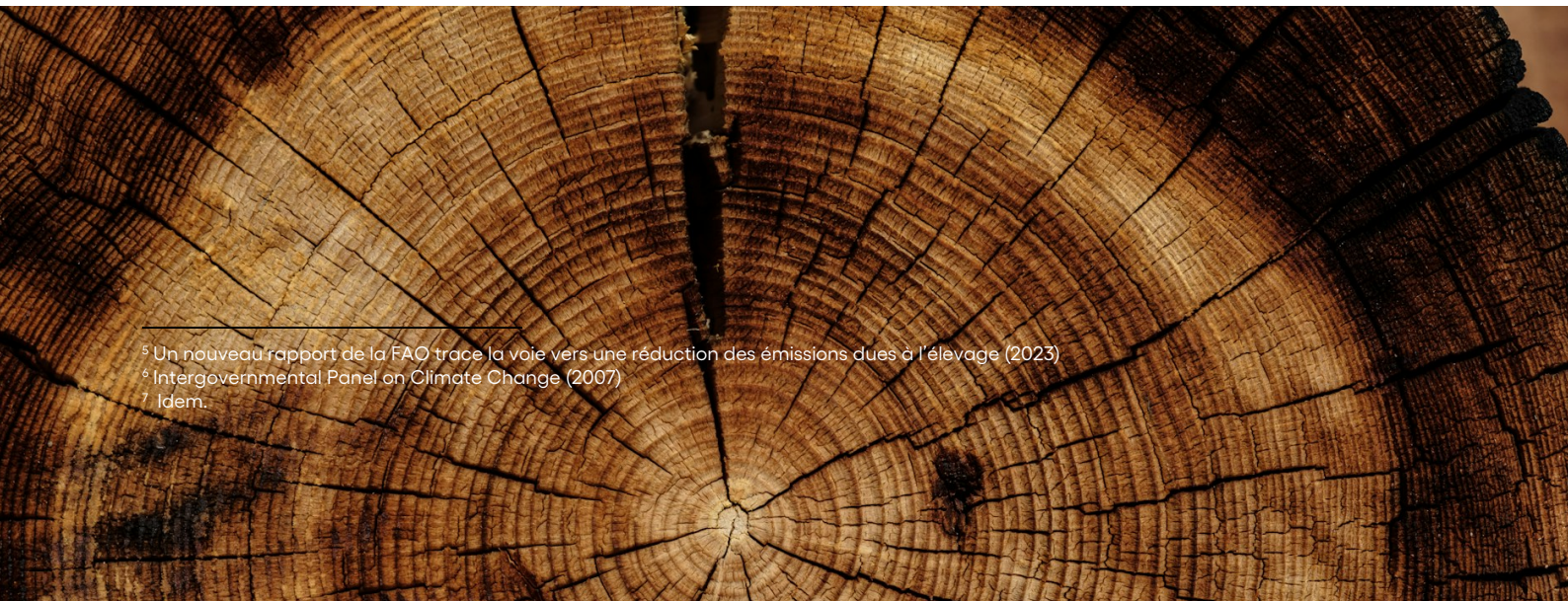
Deforestation, the sector's number one climate issue

Forests play a key role in regulating the climate. They are the second largest carbon sink on the planet, after the oceans. In its third assessment report, the IPCC estimated that the Forest & Paper sector had a climate change mitigation potential of 5.4 billion tonnes of CO_2 per year until 2030. By way of comparison, in 2015 the FAO estimated that the livestock sector was responsible for the emission of 6.2 billion tonnes of CO_2 equivalent per year[5] . Preserving forest ecosystems is therefore imperative if we hope to limit global warming . [6]

The main challenge facing the Forest & Paper sector is to minimise deforestation and forest degradation. However, this does not mean a total halt to the harvesting of wood from forests, because in addition to its social and economic benefits, wood processing also offers interesting opportunities for carbon capture. Indeed, over their entire lifespan, wood products continue to store the carbon absorbed during the growth of the tree. Long-lasting wood products therefore contribute to the conservation of carbon stocks. What's more, products from balanced forests can replace more emissive products as a source of energy and heat (instead of natural gas, for example) or as a building material (instead of steel and cement).

In order to maximise the climatic benefits of the forest, the ideal solution is to continue to exploit its raw material by prioritising uses that generate sustainable carbon capture, while maintaining a high level of standards in terms of forestry practices. The IPCC sums up the situation as follows:

"In the long term, the sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual yield of wood, fibre or energy from the forest, will generate the greatest sustainable mitigation benefit."[7]



[5] Un nouveau rapport de la FAO trace la voie vers une réduction des émissions dues à l'élevage (2023)
[6] Intergovernmental Panel on Climate Change (2007)
[7] Idem.

Transition risks in the sector

Given the climatic challenges posed by human forest management, it is understandable that companies involved in this sector will come under increasing scrutiny.

Extent of the risks associated with deforestation

According to the 'Race to Zero' initiative of the United Nations Framework Convention on Climate Change (UNFCCC),

"Deforestation could become the "new coal" in investors' portfolios...

... because exposure to the companies behind them represents considerable financial, regulatory and reputational risks. Yet the potential financial impact is only considered by a small minority of investors today." [8][9]

Risk management by companies

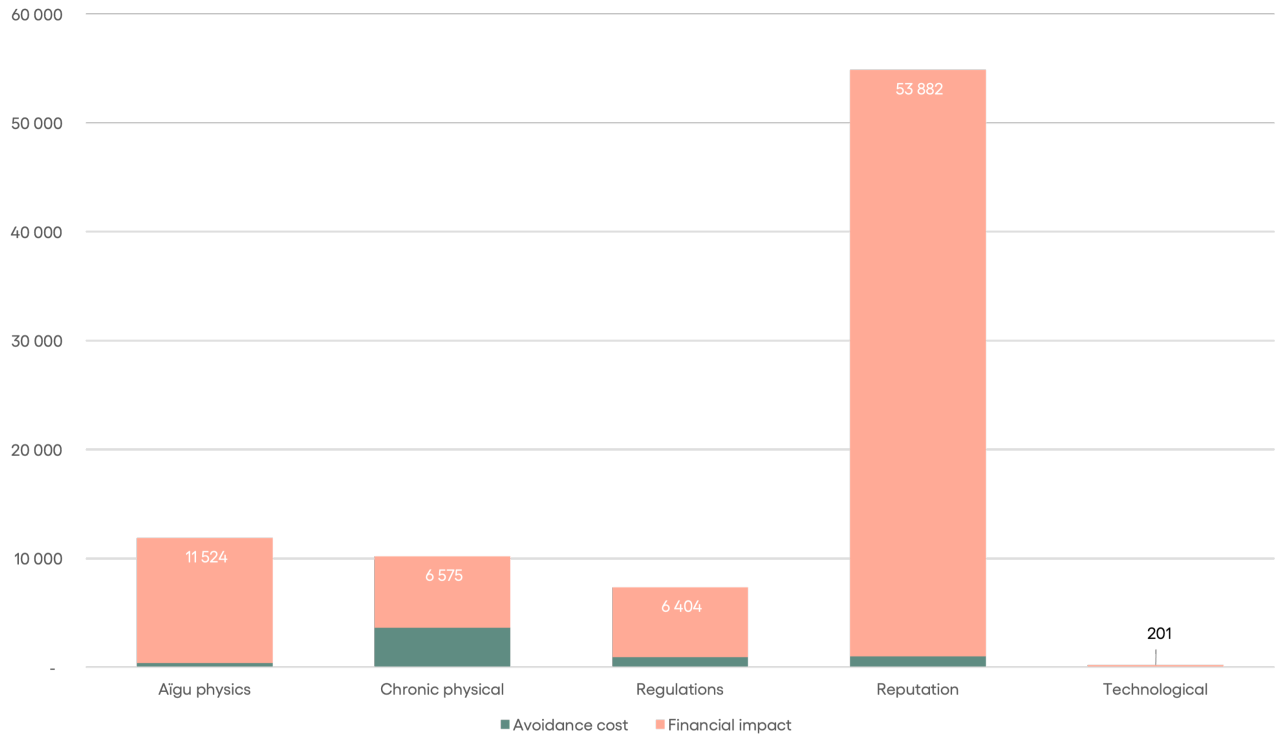
The Carbon Disclosure Project's (CDP) 2023 deforestation questionnaire was completed by over 1,000 companies, mainly active in timber production. The majority of these companies recognise the risks they face in terms of deforestation, and have set targets in this area. However, in reality, very few of them (1 in 10) are taking measures to achieve these targets and reduce their risks. The explanation, put forward by the CDP thanks to the companies' responses to the questionnaire, is that there is not enough pressure from stakeholders (consumers, investors, regulation). From our point of view, it is reasonable to assume that these pressures are likely to increase, and then in a uniform and irreversible way. [10]

[8] It is important to note, however, that deforestation does not only concern the Forest & Paper sector, but primarily the agri-food sector: the primary cause of deforestation is the conversion of forest land into agricultural land.
[9] UNFCCC (2022)
[10] Carbon Disclosure Project (2023)

Financial assessment of risks and opportunities

Carbon4finance analyses the various economic sectors according to the risks and opportunities induced by the environmental transition, and we do not generally venture to put a figure on the costs associated with these transformations. That said, it is interesting to note that companies themselves are identifying expenses associated with the transition.
Two-thirds of the companies that completed the CDP questionnaire identified forest-related risks. On average, the companies in the sample (269 companies) estimate the costs associated with this risk at $300 million, while the costs of mitigating this risk amount to only $17 million per company.[11] The graph below shows the sum of all the financial impacts identified by the companies for each type of risk, as well as the cost of responding to it.

Potential financial impact of forest-related risks and their avoidance costs in millions of USD for the entire sample (269 companies)[12]



Source: Carbon Disclosure Project

However, while the risks are significant, so too are the opportunities in a low-carbon future, provided that companies have addressed the problem of deforestation in their value chain.

[11] Idem.
[12] An explanation of the physical and transitional risks applied to the Forest & Paper sector can be found on the following page.

Presentation of the main risks and opportunities in the sector

TRANSITION RISKS AND OPPORTUNITIES [13][14][15]

	Risks	Opportunities
Policy	➤ New regulations limiting deforestation → *EU 2023 Deforestation law* ➤ New regulations to eliminate single-use packaging	➤ Promoting wood as a building material and energy source → *France RE2020 law*
Market	➤ Reduced availability and rising costs of certified sustainable raw materials ➤ Rising energy costs ➤ Consumer demands concerning deforestation and recycling	➤ Consumer preference for paper and cardboard packaging instead of plastic ➤ Choice of wood as a heat source for economic and climatic reasons
Reputation	➤ Environmental scandals linked to deforestation, poor forest management and deceptive practices	

PHYSICAL RISKS

Acute

- Forest fires
- Droughts
- Storms

Chronicles

- Increase in the severity of extreme weather events
- Changes in precipitation patterns
- Increased vulnerability of ecosystems

[13] Le Parlement Adopte une Nouvelle Loi Pour Lutter Contre la Déforestation (s. d.)
[14] AICVF (2022)
[15] *Paper* (n.d.)

Levers for decarbonisation

Reducing energy consumption through operational efficiency

Although the pressure on forests is the main issue facing the sector, it remains an industrial sector, and therefore an energy-intensive one. Companies in the sector consume energy (both fuel and electricity) to harvest, transport, dry, grind and process wood. Reducing energy consumption through operational efficiency remains essential. Companies in the sector can also use less carbon-intensive energy sources in their processes. In particular, many companies in the sector use biomass from their own production lines to power their machinery.
These actions have an impact on Scope 1&2 emissions.

Quality and stringency of wood supplies

To limit their exposure to the risk of deforestation, companies can increase the proportion of materials used that are certified by demanding labels or certifications. Wood with a demanding certification is less likely to come from deforestation and more likely to come from sustainably managed forests. However, not all certificates issued by different certification bodies reflect the same requirements in terms of deforestation. It is possible to classify the reliability of certifications according to the following criteria: rules on the presence of wood from legal and illegal deforestation, transparency and quality of governance, frequency and method of controls. In the CIA methodology, the two organisations included in this ranking are the Forest Stewardship Council and the Programme for the Endorsement of Forest Certification schemes.

Similarly, for a purchaser of wood, the countries of the world are not all equal when it comes to deforestation: depending on national laws, the local socio-economic context and the rigour of local certification initiatives, wood from a country does not present the same risk of being the result of deforestation. Companies can direct their sourcing to avoid high-risk countries as far as possible.

Sobriety of materials through recycling and the use of by-products

In order to reduce the pressure on forests, it is essential to reduce material losses in the sector, and to maximise the use of each tree cut. To achieve this, companies can make maximum use of recycled material for products where this is applicable (paper, cardboard).
Similarly, it is essential to make the most of the co-products of the value chain (sawdust, wood shavings) as well as the parts of the tree that cannot be transformed into wood products (branches, bark). These co-products can easily be used in the manufacture of wood energy (pellets, chips) as well as paper and cardboard.

Choice of manufactured products

Products made from wood can be very useful in the transition, as they can replace more carbon-intensive products and also guarantee carbon sequestration over their lifetime. For this reason, certain types of long-lasting wood products should be favoured by companies: construction timber, carpentry and plywood.

2.

Application of the CIA methodology to the Forest & Paper sector

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Calculating emissions

Scope 1 and 2 induced emissions

The Scope 1 and 2 induced emissions used in the analysis can either come from information published by the company, or be calculated using the CIA methodology. For published emissions to be included, they must be consistent with the energy consumption data published by the company, and they must follow the location-based method (for Scope 2).

Scope 3 induced emissions

For the Forest & Paper sector, the CIA methodology considers that the most significant source of Scope 3 emissions is **deforestation**. These emissions are calculated by CIA on the basis of several items of information:

- The carbon intensity of the company's sourcing, which depends on the level of certification (credible[16]) and the geographical origin of the wood used.
- The quantity of wood needed to manufacture the product, in *solid wood equivalent* (SWE), which takes into account the rate of recycled material.

Reduced emissions (Scope 1&2)

As with other sectors, the CIA methodology for the Forest & Paper sector can calculate reduced emissions, based on changes in the company's Scope 1&2 carbon intensity between years N-5 and N. However, cases where these emissions are calculated are rare, as this requires high-quality reporting in N and N-5.

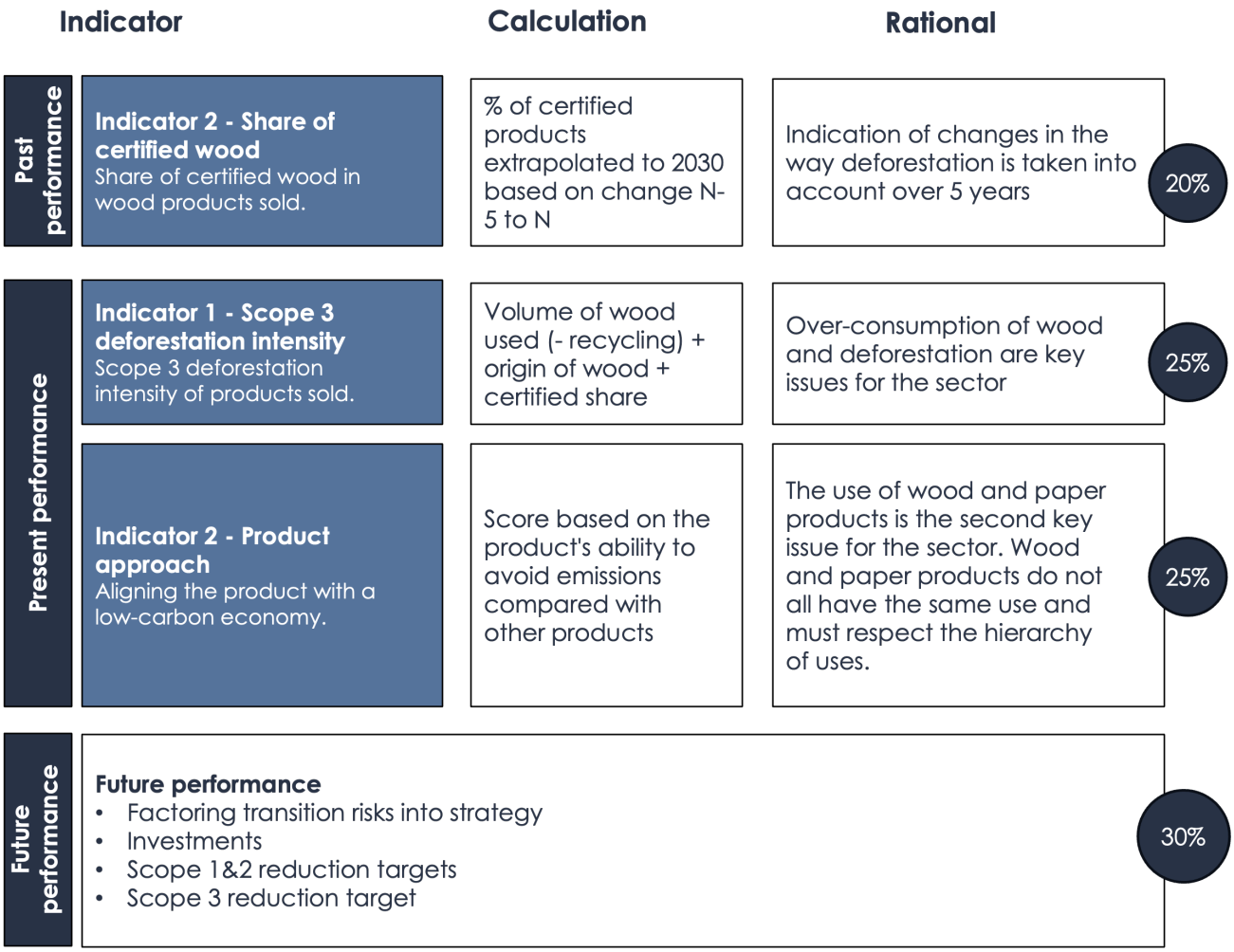
Avoided emissions (Scope 3)

For the Forest & Paper sector, the CIA methodology calculates avoided emissions specific to the nature of the activity. These are emissions avoided as a result of using wood products instead of more carbon-intensive construction materials or energy sources. This calculation therefore depends on the category of products sold by the company. Some products, such as paper and cardboard, do not avoid emissions.

[16] See the section of this report onQuality and stringency of wood supplies

Calculating performance: the CIA score

The CIA score seeks to measure a company's contribution to the low-carbon transition. For each sector, the CIA score is calculated in a specific way and reflects the main challenges of the transition, on the past, present and future pillars.



Past performance

The past performance indicator reflects the company's development over the last five years. The choice of indicator depends on its relevance to the sector. However, the availability of data published by companies is also a factor.

For companies in the Forest & Paper sector, the CIA methodology chooses to focus on changes in the **percentage of certified wood** used by the company to manufacture the products sold. To do this, we study the change in the proportion of certified wood in year N and year N-5, and extrapolate this change to 2030. This extrapolation avoids penalising companies that already had a good certification rate in N-5, and which would therefore not have much room for improvement. We are therefore adopting a convergence approach here.

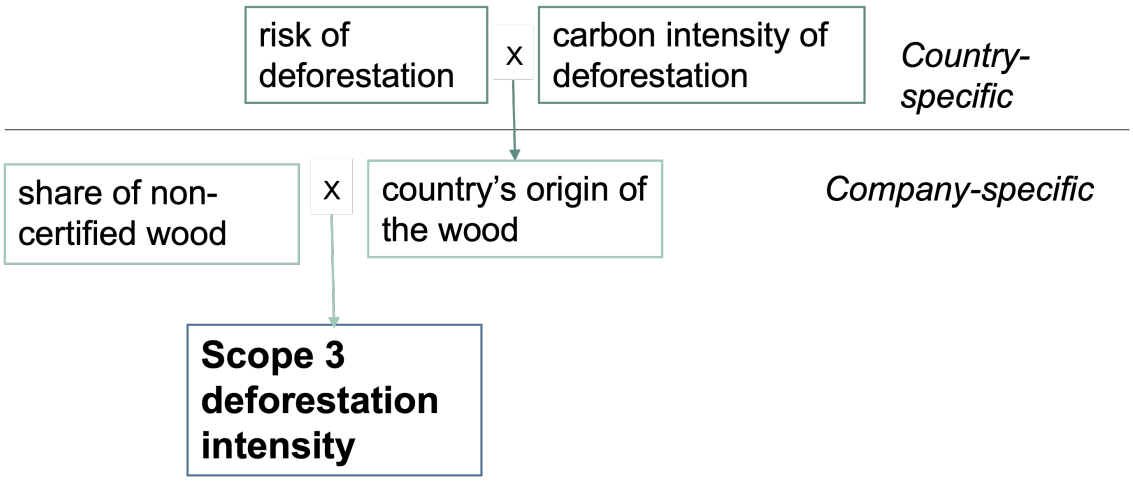
Present performance

For the Forest & Paper sector, current performance is made up of two indicators.

SCOPE 3 DEFORESTATION INTENSITY

This indicator is calculated on the basis of several items of information:

- The carbon intensity of the company's sourcing, which depends on the level of certification and the geographical origin of the wood used, which represents an estimate of the risk of deforestation (see diagram below).
- The quantity of wood required to manufacture the product, in roundwood equivalent, taking into account the rate of recycled material. For example, a company that uses a high proportion of recycled materials will require less 'new' wood and will therefore have a lower Scope 3 deforestation intensity.



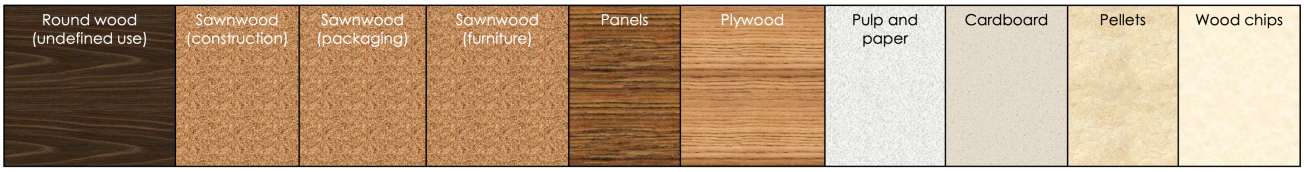
PRODUCT ALIGNMENT SCORE

This indicator is a score based on the alignment of products sold with a low-carbon economy. Products made from wood can be more or less useful in the transition, in two ways:

- *Sequestration*: products made from wood continue to store the carbon absorbed during the growth of the tree throughout their **lifetime**. Encouraging the production of long-lasting products therefore maximises carbon sequestration and delays the release of carbon into the atmosphere.
    - The longest-lasting products are those used in the construction industry (sawn timber, panels, plywood).
- *Substitution*: wood-based products can be **substituted** for other products whose production is more carbon-intensive. For example, a timber frame will emit much less carbon than a steel frame, just as a wood-fired boiler - from a mature forest - will emit less than a gas-fired boiler.
    - The products that avoid emissions are those intended for the construction industry (sawn timber, panels, plywood), as well as wood energy (logs, pellets, chips), subject to its origin as mentioned above.

The alignment score therefore seeks to encourage the production of products that maximise the two positive impacts mentioned above. However, this does not mean that the sector should necessarily stop producing other types of product (notably paper and cardboard). It just means that it is necessary to increase the production of virtuous products. So, thanks to the use of by-products and recycled fibres, increasing timber production will also make it possible to produce paper, cardboard and wood energy.

The wood product categories are as follows:



Future performance

The future performance score reflects the commitments and strategic directions taken by the company to reduce its carbon footprint. It is made up of the following elements: Risks and Strategy, Investments, Scope 1&2 and Scope 3 reduction targets, and finally Governance. Some of these criteria (Risks, Governance) are cross-cutting for all CIA sectors, so we will focus here on those specific to the Forest & Paper sector.

STRATEGY AND INVESTMENTS

The decarbonisation levers on which companies in the Forest & Paper sector are assessed are grouped into three main pillars:

- Energy: optimising freight (reducing distances) and energy efficiency in processes.
- Wood supply :
    - Transparency on the proportion of certified wood, specifying the type of certification used and the origin of the wood used.
    - Increase in the proportion of certified wood and/or switch to a more ambitious type of certification.
    - Work to stop sourcing from countries at high risk of deforestation.
- Circular economy: using recycled materials and by-products, improving reparability and recyclability, shifting the business model towards longer-lasting products.

REDUCTION TARGETS

For the Forest & Paper sector, emission reduction criteria are assessed using the following scenarios:

- The "Forestry Land and Agriculture" (FLAG) sectoral scenario developed by the SBTi (Science Based Target Initiative) specifically for companies in the Forestry, Land and Agriculture sector. This scenario corresponds to an alignment temperature of 1.5°C.
- The IEA (International Energy Agency) generalist scenario for the 1.8°C, 2.7°C and 4°C temperature ranges.

The CIA methodology considers that the most relevant emissions item for the sector is category 1 of the GHG Protocol - "Purchases of goods and services", as it covers emissions linked to **deforestation**. Consequently, Scope 3 reduction targets that do not cover this category will not be considered relevant and will therefore be given a score of 4/5.

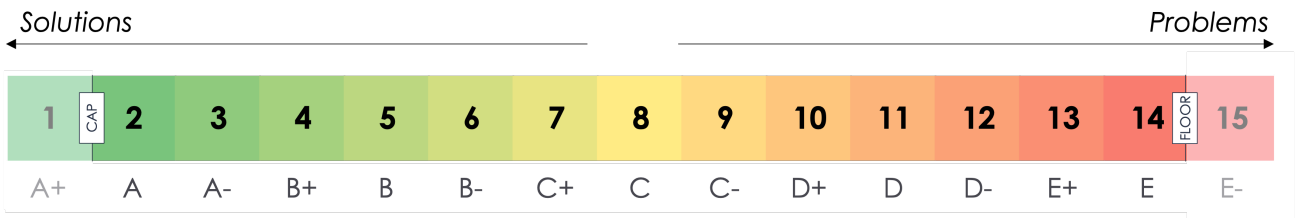
Aggregation of CIA scores

Weighting of indicators

The various past, present and future performance indicators are uniquely weighted from one sector to another to reflect the key issues.

For the Forest & Paper sector, the methodology considers that the company's current performance should have a more important place in the score, as it reflects the company's real impact on forest ecosystems, as well as its contribution to a low-carbon economy. Present performance is therefore weighted at 50% of the score, followed by future performance at 30% and past performance at 20%.

Cap and Floor



In order to guarantee the comparability of CIA scores between companies in different sectors, the scores are standardised: this makes it possible to classify the different sectors of activity covered by CIA according to their capacity to contribute or not to the transition (which determines the maximum possible score), and to contribute or not to contribute significantly to current emissions (which determines the minimum possible score). These maximum and minimum scores are therefore based on the intensity of the activities and their possible role in decarbonising our economy. These are known as "Cap & Floors".

Companies in the Forest & Paper sector will be given scores ranging from 2 to 14 (out of 15). Compared with other sectors, these Cap & Floors are relatively broad, reflecting the fact that companies in the sector can range from very contributory to decarbonisation (2) to very contributory to climate change (14). However, we consider that a company in the sector cannot obtain the worst score (15) because it remains a low-carbon sector, but that it cannot obtain the best score (1) either, because its activity depends on the exploitation of natural resources.

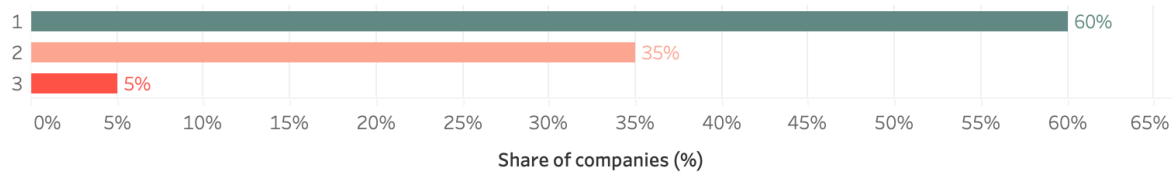
Multi-sector companies

When a company is exposed to several activities, analysed by different CIA sector methodologies, an aggregate score is calculated. This score reflects the company's performance with regard to climate issues in each of its activities. To do this, a score is calculated for each activity, according to the principles set out above, and the scores for each sector are weighted by the importance of the activity in the company's revenues.

3. Results

3. Results

Transparency



Score 1 - The company reports its Scope 1, 2 and 3 emissions transparently, for the most significant items.
Score 2 - The company reports its emissions in a fairly transparent way, but these only cover Scope 1 and 2.
Score 3 - The company reports its emissions with little detail or transparency.

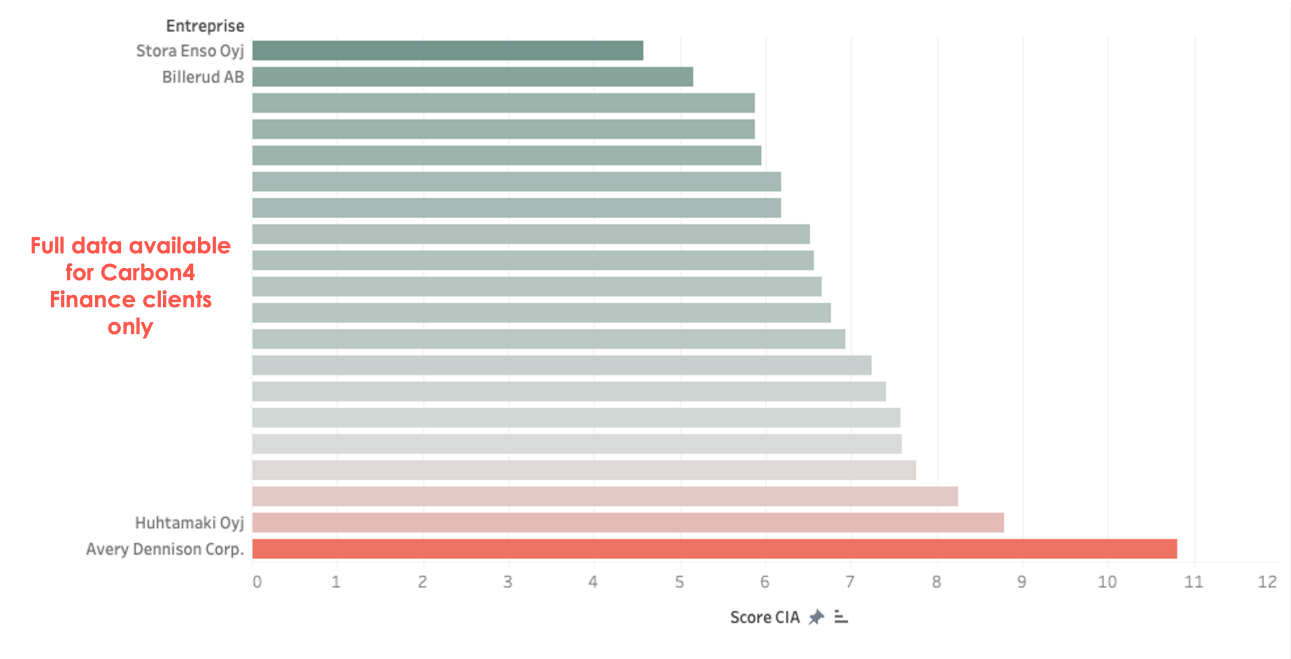
The assessment of the transparency of companies in the Forest & Paper sector reflects a sector that is fairly mature when it comes to carbon accounting.[17]

Overall ranking: CIA score

The CIA score is an aggregation of all the carbon performance indicators. It is specific to the company's sector of activity and is therefore the best tool for understanding a company's alignment with a low-carbon economy.

The graph below shows the scores for all the companies in the sample, although only the two best and worst scores in the ranking are public. CIA scores are relatively tight. This is due in part to the construction of the performance indicator scoring grid, as well as to the homogeneity of the profiles of the companies in the sample.

[17] The majority of companies correctly report their Scope 1&2 emissions, as well as the most relevant emissions items for Scope 3.



The table below shows the breakdown of the CIA score for the best and worst companies in the ranking.

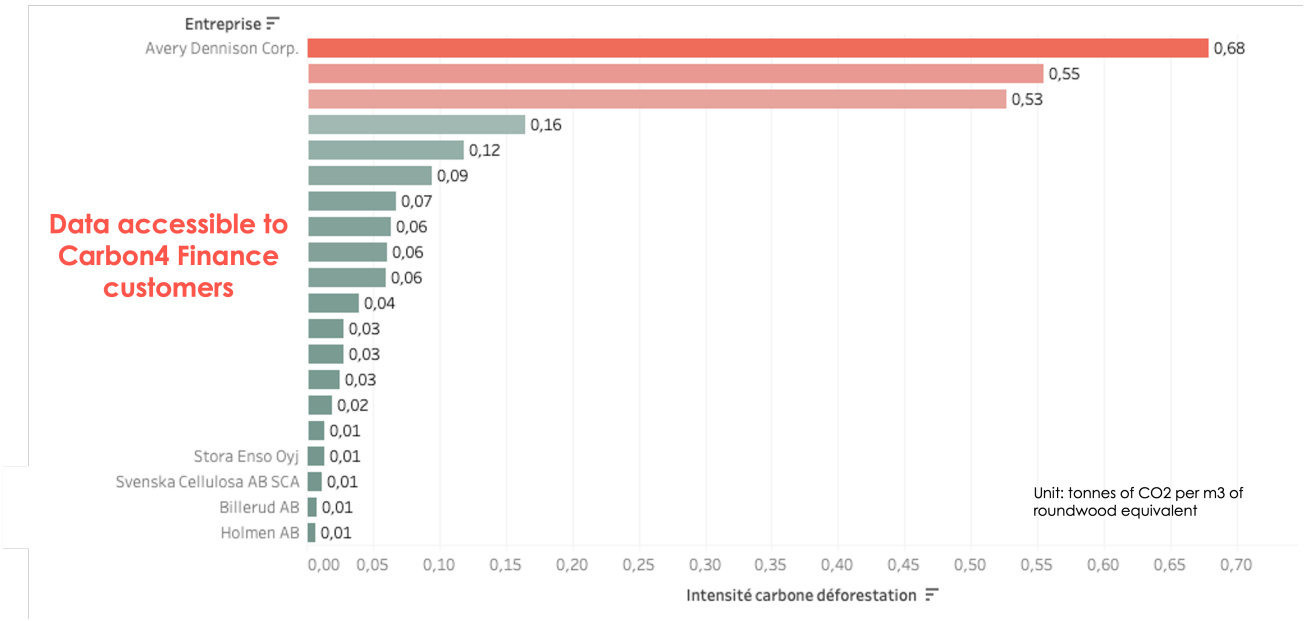
Company	Past performance 20%	Performance Present 50%	Performance Future 30%	CIA score
Stora Enso Oyj	1 *Excellent past performance score linked to an ambitious certification rate and transparency in N and N-5.*	4 *Good performance score thanks to :* - *Very low deforestation intensity (thanks to certification)* - *A relatively high alignment score (timber production + recycled materials)*	6 *Average future performance score due to correct performance on all rating criteria*	**4,58**
Avery Dennison Corp	15 *Very poor past performance due to a lack of transparency about the type of certification used.*	12 *Poor performance score due to* - *high deforestation intensity (little certification + high-risk regions)* - *a low product rating (short-life products, no recycled materials or co-products)*	7,6 *Average future performance score due to inadequate strategy, investment and targets, offset by good climate governance and understanding of risks.*	**10,81**

Present performance

Scope 3 deforestation intensity

The graph below shows the Scope 3 deforestation intensities obtained by the sample (in tonnes of CO2e per m3 of roundwood equivalent). For a reminder of the methodology for this indicator, see the section of this report on Scope 3 deforestation intensity.

Scope 3 deforestation intensity



It can be seen that the majority of companies have a relatively low Scope 3 deforestation intensity, with the exception of a few companies.

Product alignment score

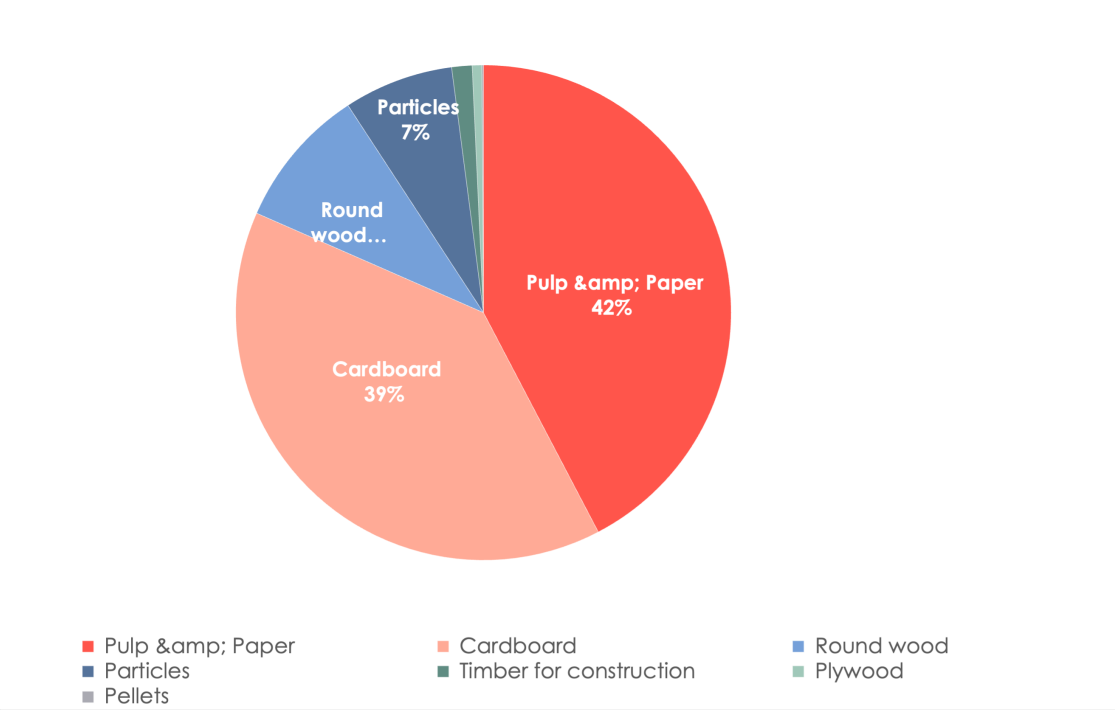
The table below shows the best and worst product ratings obtained by the companies in the sample.

Breakdown of the worst and best alignment scores

Company	Product category	Use of recycled materials and by products	Rating from 15 (best) to 1 (worst)
Holmen AB	*25% « Sawnwood »* *75% « Pulp & Paper » and « Cardboard »*	*29% use of by products*	**5,66**
Avery Dennison Corp	*100% « Pulp & Paper »*	***0%** use of by products or recycling*	**2,00**

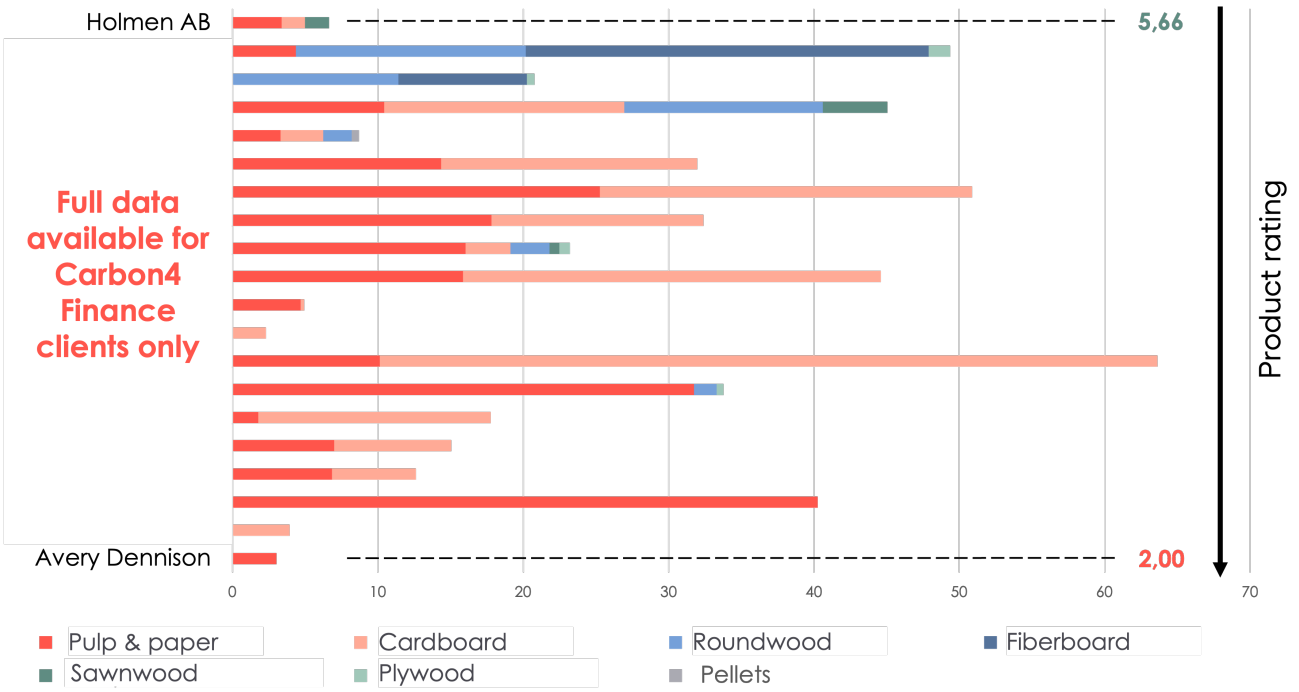
PRODUCT CATEGORIES

The graph below illustrates the share of volumes sold by the companies in the sample by product category, in roundwood equivalent. The overwhelming majority of products sold are in the pulp, paper and board categories.



The graph below shows the volumes sold by company and by product category, this time in absolute terms. In addition, the companies are ordered, from top to bottom, from the best to the worst score received by the company on the Alignment Score indicator.

Sales volume by product category (in millions of tonnes)



This graph illustrates a number of interesting points:

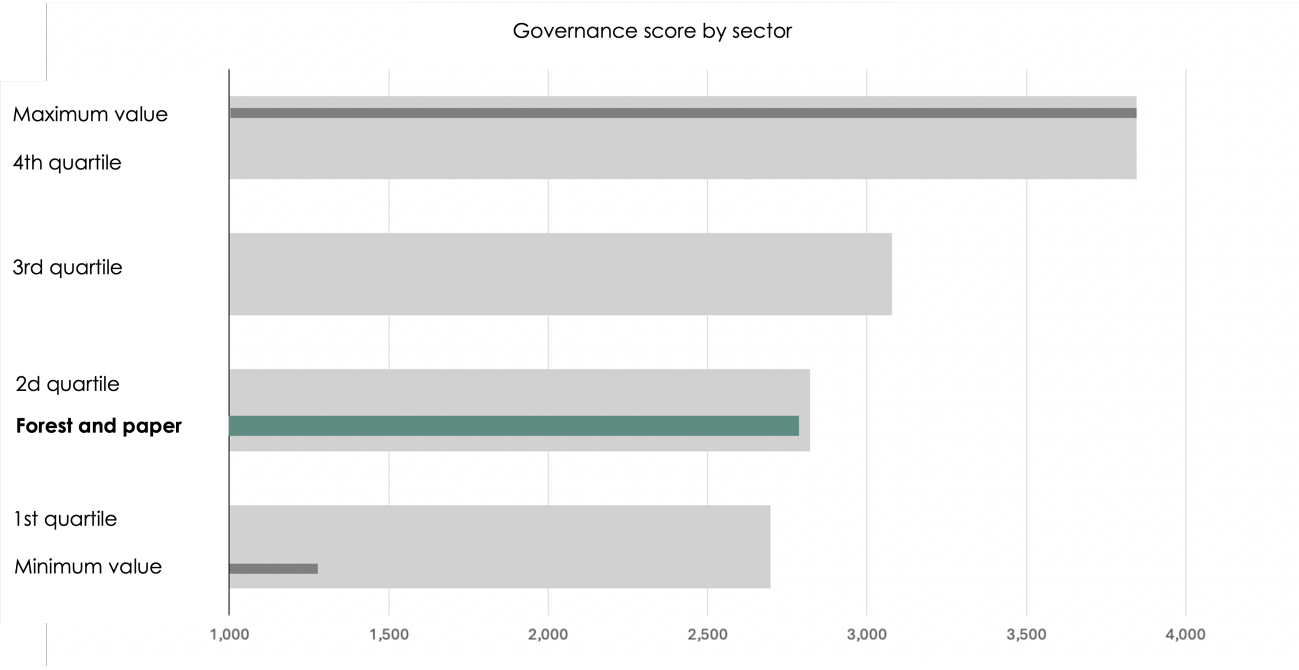
- Companies with a basket that includes long-life products, such as timber, score higher.
- However, the score can vary within the same product category, depending on the level of use of recycled materials and co-products.

The main conclusion of this part of the study is that the companies in the sample remain focused on short-life products that do not replace carbon products. **In this respect, the mitigation potential of the forest and paper industry is not being maximised.**

Future performance

Governance

The graph below shows the sector's average score on the Governance criterion (with a best score of 1 and a worst score of 5), compared with other CIA sectors.

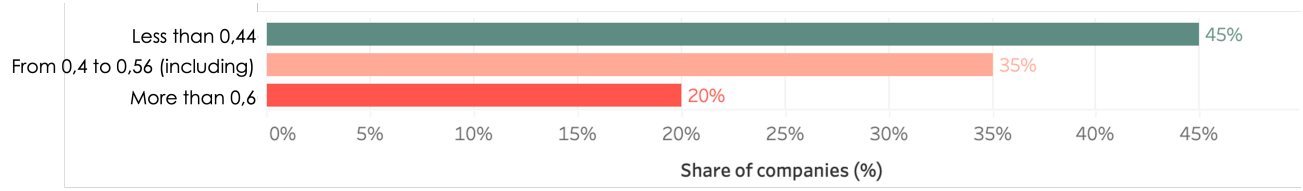


The Forest & Paper sector is one of the most advanced in terms of governance. As a reminder, this criterion covers the following aspects:

- Involvement of senior management in decarbonisation issues
- Training employees in the challenges of climate change
- Integrating carbon performance into employee remuneration criteria

Strategy

The graph below shows the distribution of scores on the Future Performance Strategy criterion, with this criterion rated from 0 (best) to 1 (worst).



As a reminder, in the CIA methodology, the Strategy criterion is made up of the following elements:

- Understanding and taking into account the physical and transitional **risks** associated with climate change.
- Understanding the transition **issues** specific to the sector and aligning the **business model** with these issues.

A reminder of the issues specific to the Forest & Paper sector can be found in Strategy and investments section of the report.

The table below shows the breakdown of the best and worst Strategy scores in the sample.

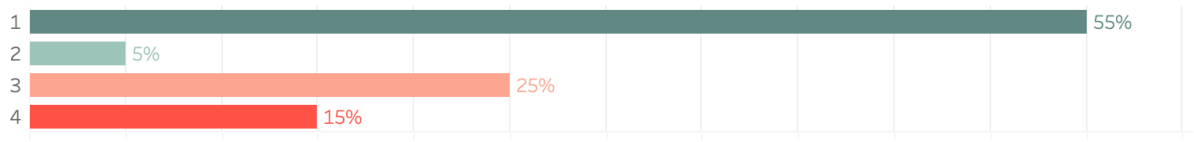
Company	**Climate risks** from 1 (best) to 5 (worst) *(weighted at 0.2)*	**Decarbonisation strategy** from 1 (best) to 5 (worst) *(weighted at 0.8)*	**Strategy note** from 1 (best) to 5 (worst)
Holmen AB	The company publishes information on how the transitional and physical risks associated with climate change may impact its business. However, it has not carried out an analysis of its business model based on scientific scenarios. *3/5*	The company is aware of the pressure exerted on forest resources and seeks to limit it through sustainable forestry practices and relatively ambitious certification rates, as well as a high level of use of co-products. The company also recognises the usefulness of wood as a building material and is seeking to gear its business model towards these products. *1/5*	**1,4/5**
Weyerhaeuser Co.	The company publishes only a very limited list of transition and physical risks that may impact its activities, and does not appear to have carried out a scenario analysis. *→4/5*	In its public documents, the company does not demonstrate its understanding of the climate issues specific to the Forest and Paper sector and does not present any projects aimed at improving its carbon performance. However, it receives a bonus for integrating long-life products into its business model. *→4/5*	**4/5**

It is important to remember that these criteria are assessed on the basis of information disclosed in the company's public documents. A poor rating can be the result of a poor strategy, but it can also be the result of a lack of transparency.

Emission reduction targets

OPERATIONAL EMISSIONS

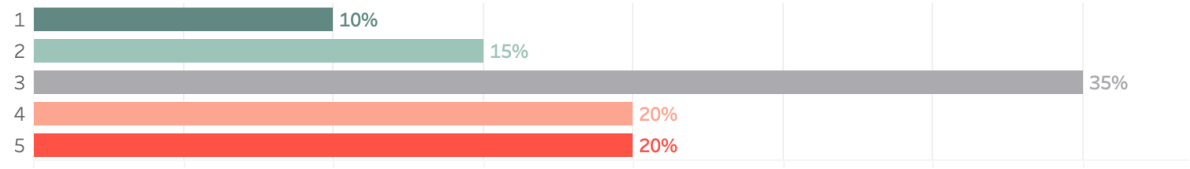
The graph below shows the scores obtained by the companies in the sample on their **Scope 1 & 2 emissions reduction targets.**



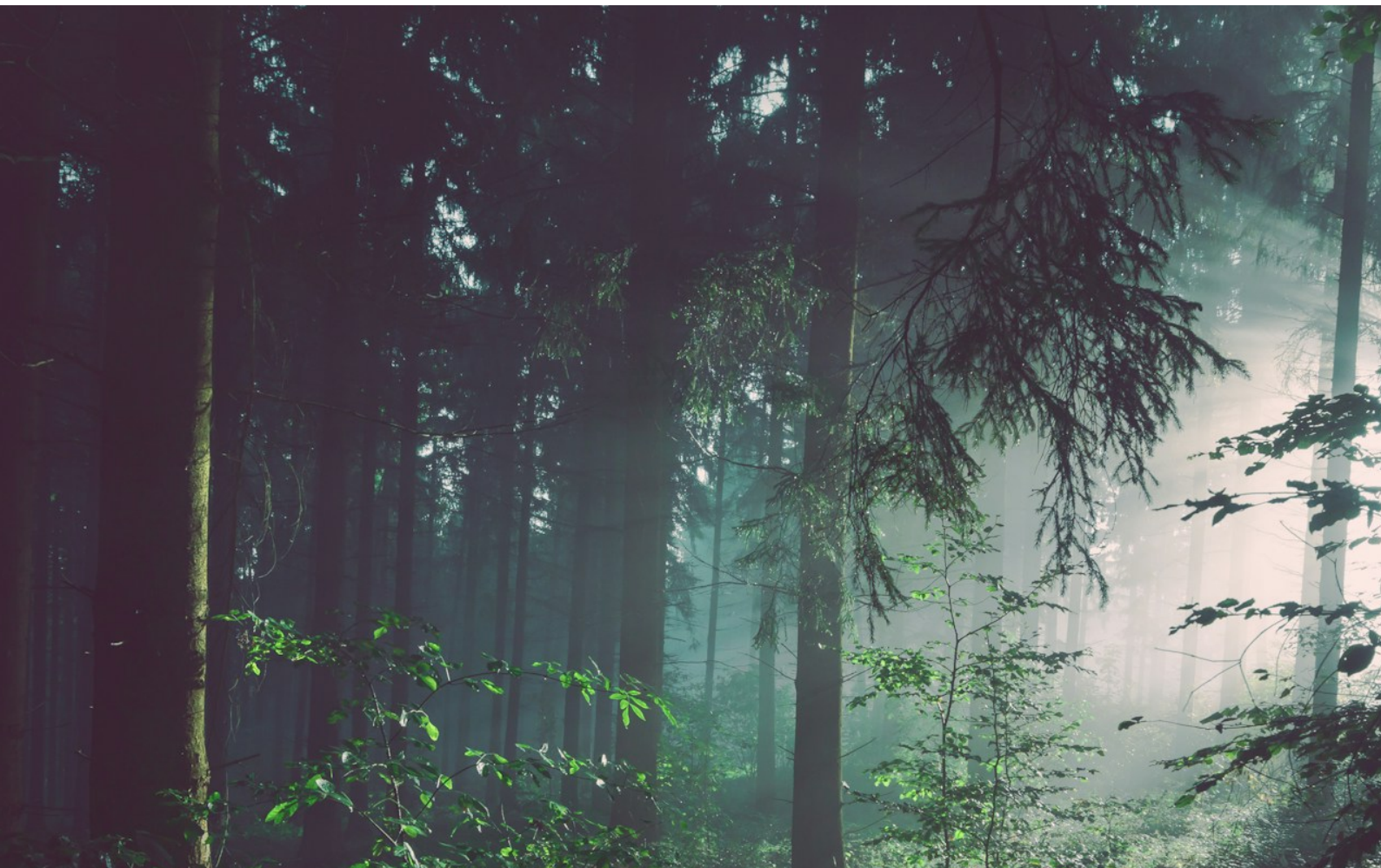
We can see that the majority of companies receive a score of 1, which corresponds to a transparent and ambitious decarbonisation trajectory, aligned with a warming scenario of 1.5°C. However, a number of companies received scores of 3 and 4, corresponding to unambitious or irrelevant targets.

VALUE CHAIN EMISSIONS

The graph below shows the scores obtained by the companies in the sample on their **Scope 3 emissions reduction targets.**



The scores obtained here are lower than for Scope 1&2. In fact, 35% of companies received a score of 3, corresponding to a temperature trajectory in line with a 2°C warming scenario (the IEA's 2DS scenario). In addition, scores of 5 have appeared on this criterion, which means that some companies have not yet set a target for reducing their Scope 3 emissions. For more information on the methodology, see the section onReduction targets



Conclusion

The Forest & Paper sector in a low-carbon world

The challenges facing the Forest & Paper sector are not as well known to the general public and investors as they are for other sectors. Yet the literature gives a fairly detailed picture of what the sector would look like in a low-carbon world.

In a low-carbon world, companies in the sector adopt the following behaviours, divided into two main categories:

- They limit deforestation and the impact of their activities on forest ecosystems. This involves :
    - Wood sourcing that minimises the risk of deforestation: the raw material comes from forests certified by demanding labels, and from countries where the risk of deforestation and the carbon intensity of deforestation are low.
    - A reduction in the amount of raw materials used, thanks to sobriety and circularity: companies use as much recycled fibre as possible for paper and cardboard products, and recover co-products (sawdust, branches, bark) from the value chain to manufacture other products (panels, chipboard, wood energy, paper, cardboard).

- They respect the hierarchy of uses and prioritise the manufacture of products aligned with the transition.
    - High-quality wood is used to make long-lasting products that replace more carbon-intensive products (lumber, sawn timber, plywood).
    - Lower quality wood and co-products (branches, bark, wood chips) are used to manufacture other products (particleboard, energy wood, paper, cardboard).

The current Forest & Paper sector

The results of the study show that the Forest & Paper sector is not yet structured in such a way as to be compatible with a low-carbon world.

In their public reports, companies almost invariably claim to be committed to combating deforestation and making it a priority. In reality, however, they show a striking lack of transparency regarding their wood sourcing, both in terms of geographical origin and certification. Whether this is due to a lack of maturity in the sector, or a desire to make their impact invisible, the fact remains that it is preventing companies from making progress.

In addition, the companies in the sample remain focused on the production of short-lived products that do not replace more carbon-intensive uses. What's more, although some companies are incorporating recycled materials and co-products into their manufacturing processes, the majority of products are still made from virgin materials.

Appendix 1: Key principles of the CIA methodology

The Carbon Impact Analytics (CIA) methodology produces indicators for assessing the exposure of financial asset portfolios to transition risks, as well as the contribution of portfolio holdings to the transition to a low-carbon economy. These indicators are constructed using a bottom-up analysis of the holdings in the financial portfolio: each holding is analysed individually before the results are consolidated at portfolio level.

Each instrument in the portfolio is linked to an entity, and an analysis of the entity's physical (or monetary) flows is then used to calculate the GHG emissions it generates, as well as a set of indicators to construct a transition contribution score.

CIA offers methodologies specific to each type of instrument and issuer. This section deals only with the methodology applied to debt and equity instruments issued by non-financial companies.

Unlike a statistical approach, the "bottom-up" approach is based on public operational data specific to each company, and favours the use of physical flows (tonnes produced, number of vehicles sold, etc.) over monetary flows (turnover, OPEX, etc.), enabling GHG emissions to be calculated as close as possible to physical reality. In addition, a company is considered as a set of activities analysed separately with a methodology adapted to each of them, allowing the most significant GHG emissions to be modelled for all the industrial processes that make up each activity - particularly Scope 3 emissions.

In addition to the emissions generated by the company's activities, CIA makes it possible to assess the company's contribution to the transition to a low-carbon economy, using various indicators. Firstly, saved emissions, which measure the emissions avoided thanks to the

company's products and services, as well as the emissions reduced thanks to improvements in its carbon efficiency. Secondly, the overall CIA score, based on indicators measuring the company's past, current and future performance. While past and current performance is measured by quantitative indicators, future performance is assessed by means of a qualitative analysis of the company's strategy for reducing its exposure to transition risks (including its GHG emission reduction targets, the investments earmarked for mitigation projects, and the governance rules put in place to ensure that transition risks are properly taken into account). The figure below shows the components of the overall CIA score:

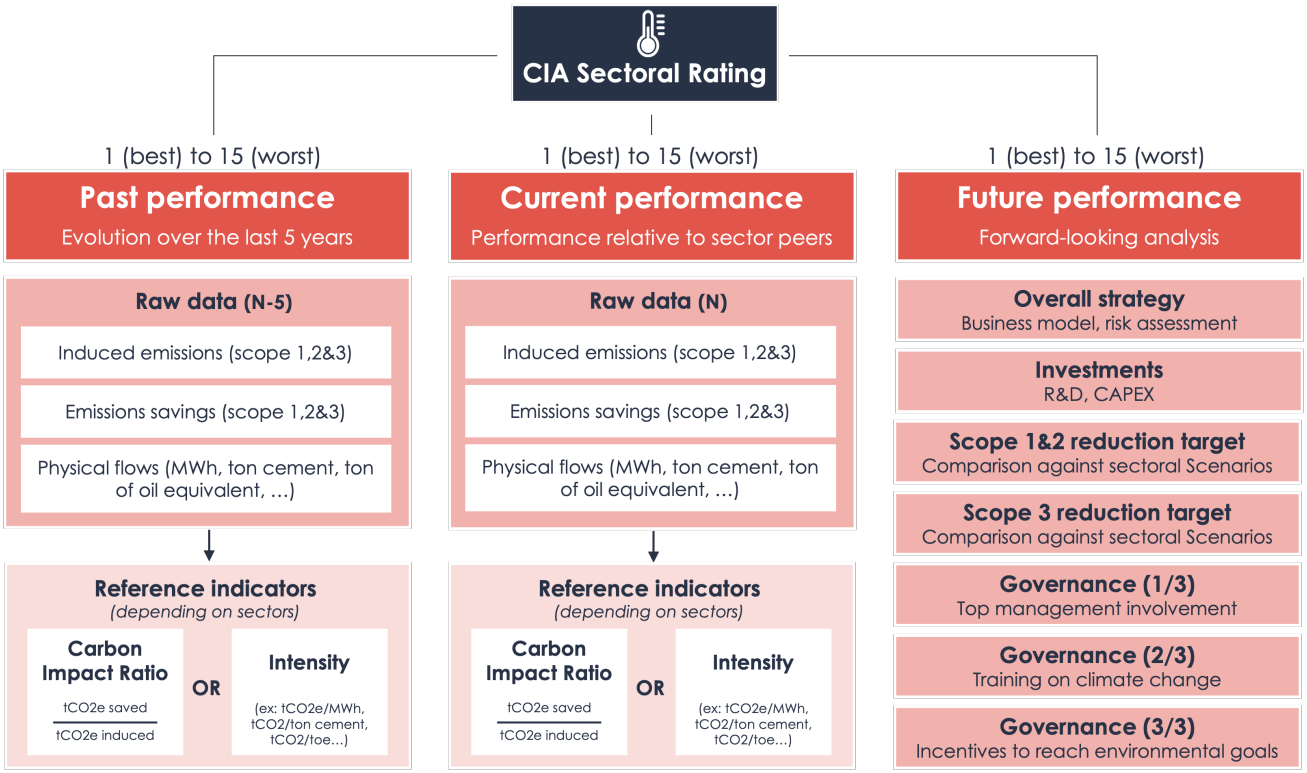


Figure 1: Composition of the overall CIA score for companies

In addition, the CIA method produces other indicators for assessing the contribution or exposure to transition risks:

- The Carbon Impact Ratio (CIR) is the ratio of emissions saved (in absolute terms) to emissions induced. It is a good measure of a company's contribution to the low-carbon transition: the CIR indicates, for each tonne of CO_2e emitted by the company's activities, the capacity of its products and services to avoid GHG emissions by offering a less carbon-intensive alternative to the market.
- The taxonomy indicators provide information on the proportion of sales generated by green, brown, fossil or other activities, and thus provide information on the company's exposure to different types of activity.
- GHG emission intensities, calculated using different approaches, also enable a relative comparison of companies, taking into account their respective size.

The indicators obtained using the CIA method therefore enable a detailed comparison of companies within their sector, and produce an order of merit which is the subject of this publication.

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