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# Emissions Saved and Avoided: Capital Goods

Marketing communication

**CANDRIAM** 

A NEW YORK LIFE INVESTMENTS COMPANY

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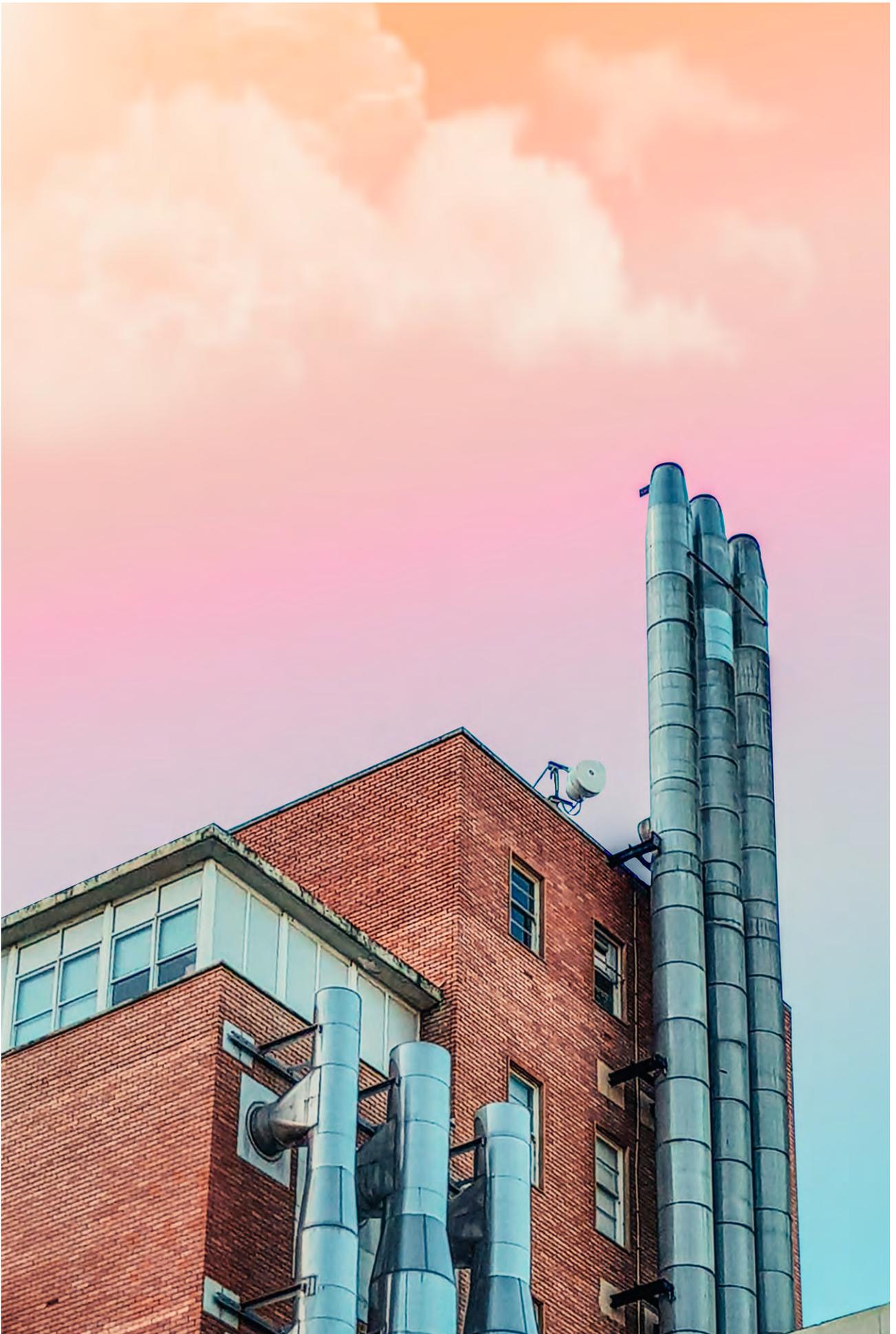
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# Table of contents

<b>Capital Goods Companies, the Enablers of the Low- Carbon Industrial Revolution</b>	<b>04</b>	<b>The Reality on the Ground</b>	<b>13</b>
<b>Greenhouse Gas Emissions Scopes 1, 2, and 3</b>	<b>07</b>	<b>Case Study ABB</b>	<b>14</b>
<b>Scopes 1, 2, 3 and . . . Four?</b>	<b>08</b>	<b>Methodologies and Best Practices</b>	<b>15</b>
<b>Case Study Schneider Electric</b>	<b>12</b>	<b>Case Study Legrand</b>	<b>18</b>

<b>Engagement</b>	<b>20</b>	<b>Challenges and Limits – the User Perspective</b>	<b>27</b>
<b>Case Study Signify</b>	<b>23</b>	<b>Conclusion: Making Scope 4 a Powerful Tool</b>	<b>28</b>
<b>Case Study Vestas</b>	<b>25</b>	<b>Notes &amp; References</b>	<b>29</b>

# Capital Goods Companies, the Enablers of the Low-Carbon Industrial Revolution

**To tackle Climate Change, we need to go beyond measuring emissions – Scopes 1, 2, and 3. We must also measure the climate-related benefits generated by products and technologies. Enter Scope 4, *emissions saved and avoided*.**

As an ever-increasing number of nations announce ambitious climate objectives, the global economy is embracing net zero carbon as a common direction. For example, the European Union targets a 55% reduction in Greenhouse Gas (GHG) emissions by 2030 and net zero by 2050, while the United States seeks a GHG reduction of 50% by 2030 and net zero by 2050.

**The coming zero-carbon industrial revolution cannot arrive too soon.** High-emission industries are under pressure from regulators and markets to decarbonize. The good news is that the **Capital Goods sector** is kick-starting the solution to this challenge by innovating and providing low-carbon equipment and services to clients in manufacturing, energy management, etc.

Capital goods are emerging as key **“enablers” of the ecological transition**. As developers and providers of a wide range of components, as well as automation solutions, capital goods manufacturers enable energy efficiency, green mobility, and ‘greenification’ of electricity systems for a large variety of products and end-markets. More importantly, they **provide equipment and technological solutions to those end-markets which comprise the highest-emitting sectors directly concerned by climate regulations**, as illustrated in figure 1. The latter, together with the long lifespan of their solutions that be used for many years or even decades, highlights the importance of their “enabler” role in reducing CO2 impacts of their customers’ products.

**“As energy savings become ever more important for clients, so will calculating Scope 4 emissions moving forward. It is therefore vital for companies to be able to understand, describe and quantify improvements between different products and product generations.”**

**- Legrand**

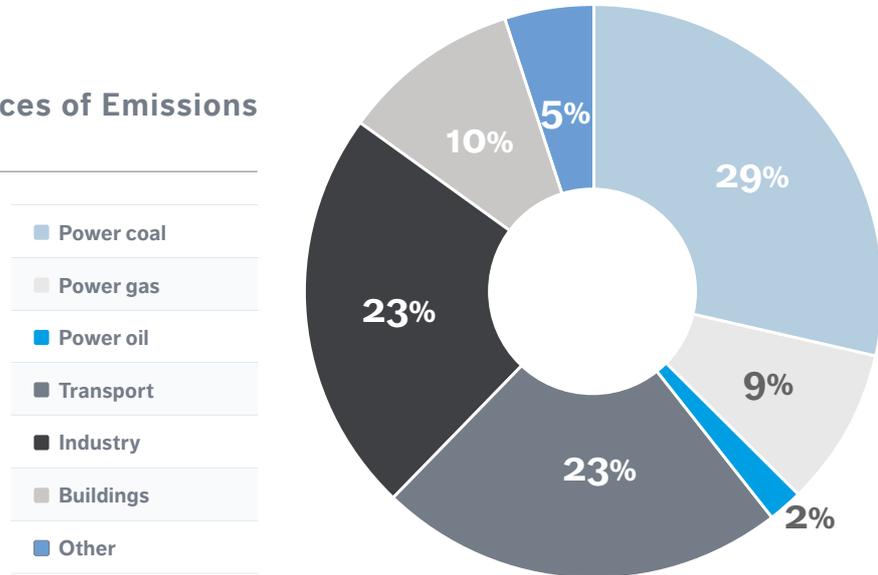


## Figure 1: Global Energy-Related CO2 Emissions by Sector

Capital Goods Companies are Perfectly Positioned to Partner with Emitters

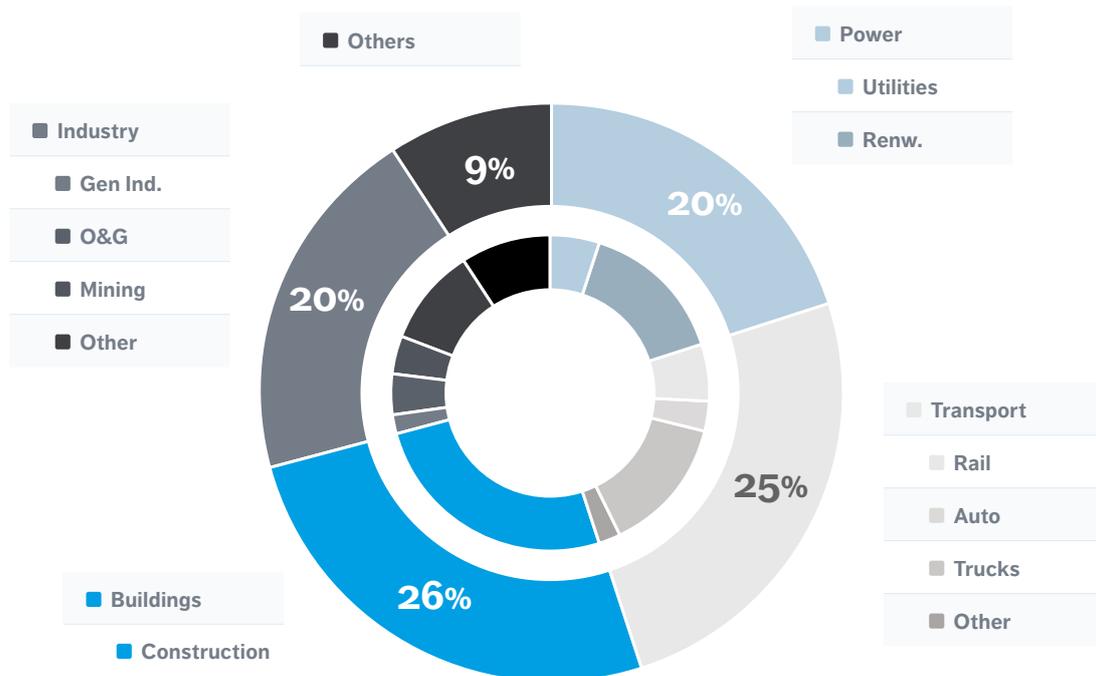
### Figure 1a: Sources of Emissions

by Sector (Global)



### Figure 1b: Capital Goods Customers

by Sector (European)



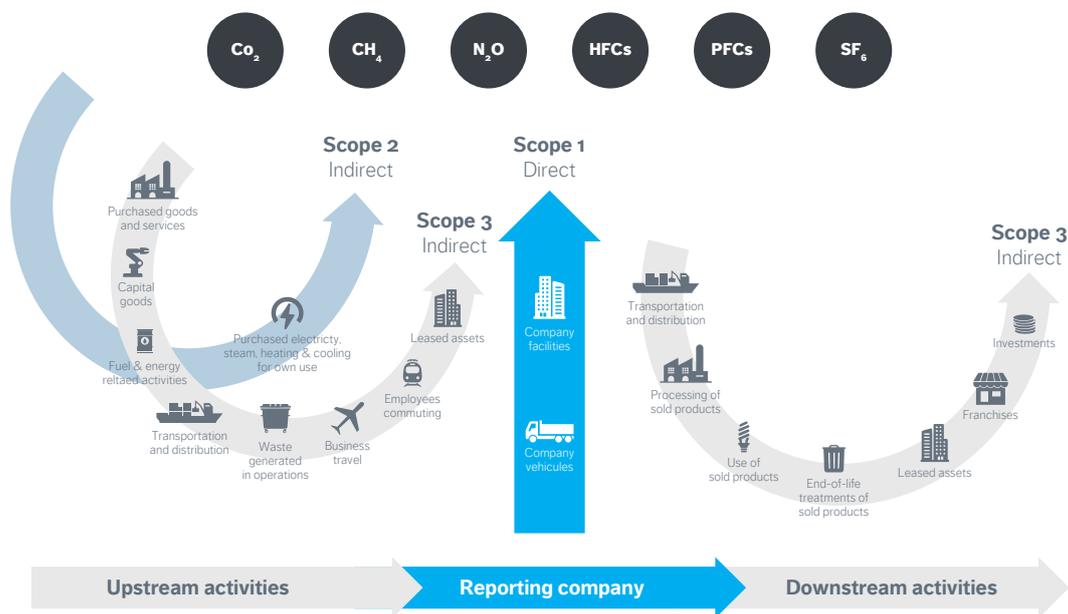
Source: IEA, Société Générale, company data (32 companies), 2021

# Greenhouse Gas Emissions

## Scopes 1, 2, and 3

*The Greenhouse Gas Protocol launched a universal method for emissions accounting in 2016, which are often categorized as Scopes 1, 2 and 3.<sup>1</sup>*

**Figure 2: Overview of Scopes and Emissions Across a Value Chain**



- **Scope 1:** Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.
- **Scope 2:** These are indirect GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.
- **Scope 3:** These are all the other indirect emissions of a company on the full value chain of its activities. Scope 3 emissions are a consequence of the activities of the company, but arise from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

# Scopes 1, 2, 3 and . . . *Four?*

The enabler role of Capital Goods companies is underpinned by the nature of the emissions through the value chain. **Scope 3 accounts for around 90% of total emissions across the value chain**, and the use phase of products (a part of Scope 3 – figure 2) can represent over 80% of the end-to-end CO2 footprint.

The extraordinary opportunity for Capital Goods players is **their ability to provide “low carbon” solutions** for their clients. The most advanced companies are beginning to quantify the carbon impact of their products for their customers by calculating **‘Scope 4’ emissions**; that is, **emissions saved and/or avoided for their customers** thanks to the performance of their products.<sup>2</sup> It must be remembered that Scope 4 is not an official category of the GHG protocol; and **does not count as a reduction of a company’s Scope 1, 2 and 3 emissions**. Rather, scope 4 is a theoretical calculation that is measured through a reference scenario, usually comparing products to the average market solution, a solution previously in place, and/or a previous generation of a product. The calculation of this metric allows us to see the “decarbonization” power of products as well as innovation quality of a company.

The reduction of the carbon footprint, and in particular the reduction of Scope 3 “use of products and services sold”, is often confused with saved/avoided emissions. The main difference lies in the point of view taken, either that of the company or its customer. For a carbon footprint reduction, the point of view is that of the company, where

the real-life emissions of the solutions sold are compared from one year to the next. On the other hand, for saved/avoided emissions, the point of view of the company’s customer is taken. Here, two scenarios are compared, one *with* and one *without* the solutions sold by the company (figure 5).

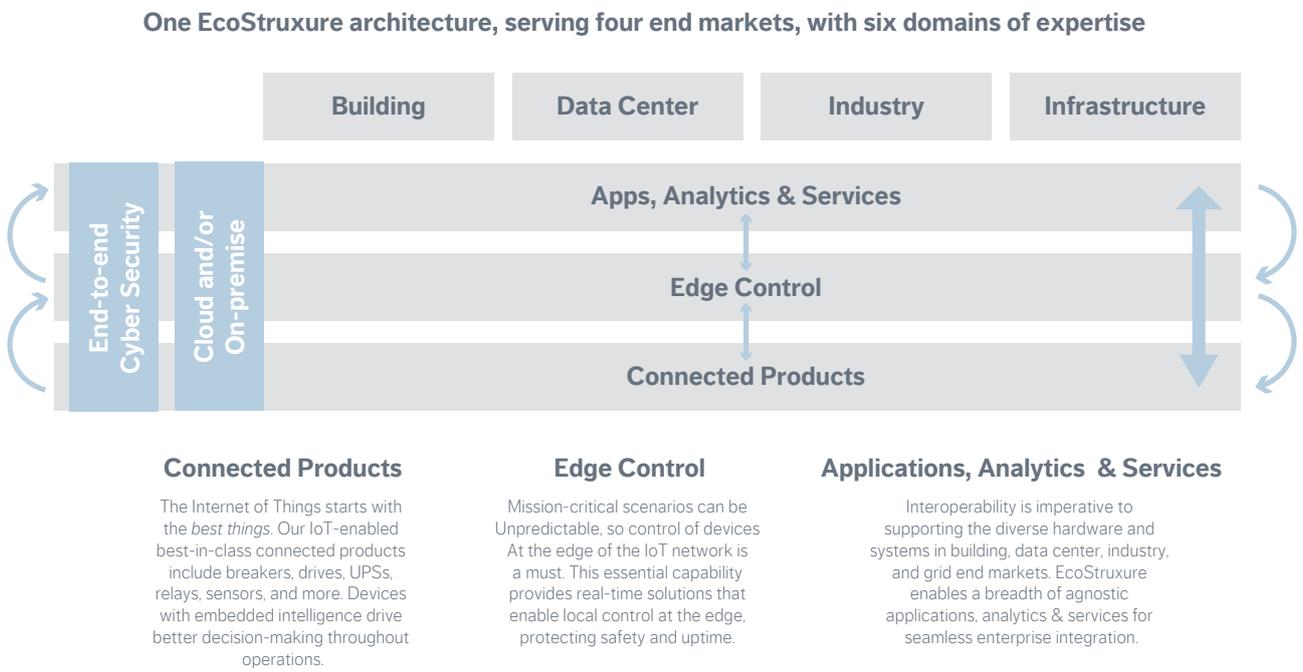
Lastly, these solutions are not to be confused with carbon removal technologies. Products offering **Scope 4 savings do not remove carbon from the atmosphere**, they just offer more efficient solutions compared to a business-as-usual scenario.

Efficient motors, turbines, electric motors (IE4/IE5), AC drives, and automation solutions are all examples of products that can save or avoid emissions. Automation, coupled with the Industrial Internet of Things (IIoT), has become a key strategic offering. Services can provide customers of Cap Goods companies with not only enhanced operational efficiency but also energy efficiency, leading to CO2 reductions. In their 2021 Sustainability report, Schneider demonstrates that via its *EcoStruxure IIoT* platform it has helped customers save 134 million metric tons of CO2 since 2018. This is the equivalent of 28,872,877 gasoline-powered passenger cars driven for one year.<sup>3</sup>

Schneider helps end-users create an ecosystem of connected products which offer “edge control”, providing real-time operational data and remote control as well as closing the full loop by incorporating and acting on data analytics.

### Figure 3: Example of End-to-End Solution for Reducing Emissions

Schneider Electric



Source: Schneider Electric, by kind permission

In recent years, companies have begun to report 'green revenues'. Scope 4 emissions reporting promises to become a more powerful metric. **By going beyond the level of product 'greenness', Scope 4 could provide insights into the real-world impact of solutions on carbon emissions.** It can also differentiate between different shades of "green" that can generate different level of carbon benefits. There tends to be a significant gap between "green revenues" and avoided emissions, at least across these capital goods companies. At times, green revenues may include solutions which may have a minimal impact on energy savings and emissions and therefore may be more appealing as a story than as an actual CO2 impact.

Scope 4 disclosure can also provide a more **holistic view on a company's contribution to Paris-aligned trajectories**, as it allows the avoided emissions to be analyzed alongside the

company's Scopes 1, 2, and 3 reported emissions. These first three Scopes may understate the climate added value of capital goods products and their contribution to decarbonizing the economy. **Scope 4 disclosure not only makes sense from a sustainability point of view, but also makes financial sense as it shows the added value of products for clients**, in enabling them to reduce their own carbon footprint. Scope 4 reporting and objectives are at a nascent stage, with a handful of players leading the way. These include Schneider, Vestas, Siemens, and ABB.

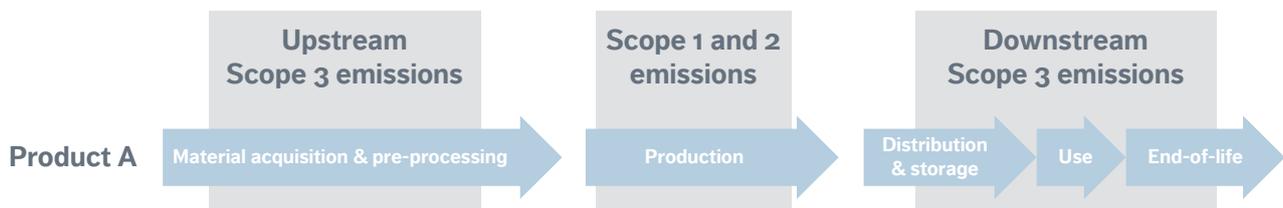
There is positive momentum amongst Capital Goods players and we encourage companies to include Scope 4 reporting in their climate roadmaps, in addition to setting Paris-Aligned objectives for Scopes 1-3. We recognize the lack of industry standards makes this a challenge – but hopefully this will improve in the future.

# Value Chain vs Product Emissions

Value chain emissions, referred to as Scope 3, are indirect emissions from both the upstream and downstream activities associated with the operations of the reporting company. In the example of a manufacturing company, upstream emissions can typically be considered as the emissions from activities before the production phase of the company such as material acquisition and pre-processing, whilst downstream emissions are those from post-production activities including distribution and storage, product use, and end-of-life.

The level of a company's use-phase emissions can indicate the potential impact it can have when providing customers with low-carbon solutions. For instance, if the majority of a company's emissions are concentrated in the use-phase, it may indicate that one of the greatest contributions it can make to decarbonization of the economy can be the development of low-carbon solutions.

**Figure 4: Value Chain Emissions**



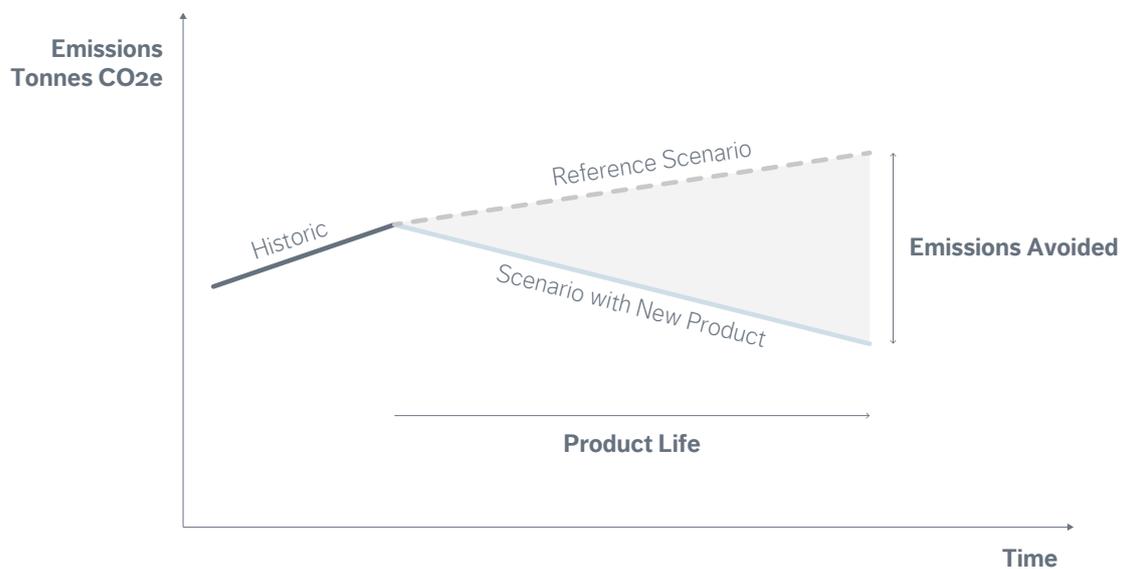
Source: GHG Protocol, Corporate Value Chain Accounting Reporting Standard 041613

It is a good sign when companies have truly reflected and applied a robust approach encompassing Life Cycle Analysis on their products to calculate saved/avoided emissions. We believe this produces a more viable figure, that can really demonstrate the carbon benefits of their products. In addition to transparency, a credible figure can provide a true commercial argument for customers.

# Is Scope 4 “a Real Thing”?

Scope 4 is not an official category of the GHG protocol; and does not count as a reduction of a company's Scope 1, 2 and 3 emissions. Scope 4 is not a “real” emission figure rather it is a theoretical calculation of carbon benefits that is measured compared to a reference scenario, usually comparing products to the average market solution, a solution previously in place, and/or a previous generation of a product.

**Figure 5: Emissions Avoided/Saved is the Difference Between the Reference Scenario and the New Product**



Source: Carbon4, Net Zero Initiative

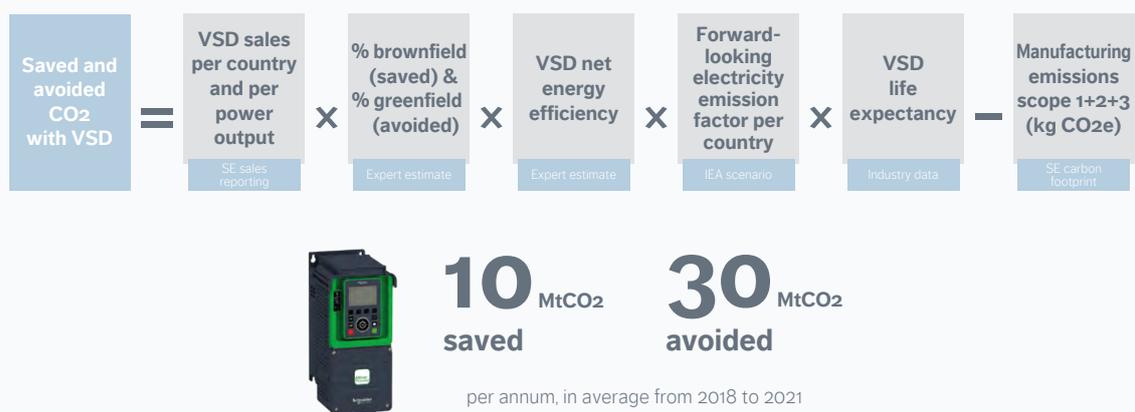
# Case Study

## Schneider Electric

*Schneider Electric provides us with a concrete example of calculation of saved and avoided CO2 emissions through use of its variable speed drives (VSD). These generate savings on electricity consumed by motors by regulating their speed and rotational force.*

*A concrete example is provided of saved and avoided CO2 emissions.*

**Figure 6: Example of Calculating Emissions Savings from Variable Speed Drives**



Source: Schneider Electric

In its white paper,<sup>4</sup> Schneider demonstrates an intricate approach encompassing a number of factors which impact estimations and calculations. Notably, Schneider's methodology clearly differentiates between saved and avoided emissions related to brownfield versus greenfield installations of its products, and uses a forward-looking energy mix in its calculation. Breaking down sales by country permits Schneider to adjust for national electricity generation sources, and factor in different emissions averages for purchased electricity by country and by year. These distinctions highlight Schneider's conservative approach.

# The Reality on the Ground

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Given the diverse range of capital goods products coupled with the specialized nature of the components, the reach of their products goes beyond the defined industry sector. Capital goods equipment and solutions serve a wide range of industries and end-markets. Consider the specialized knowledge for windows and insulation products, transport knowledge useful in designing rolling stock, and power technologies feeding into specialized equipment such as gas turbines for the energy sector and one can imagine 'enabler' products being produced in the Buildings, Transport, and Power sectors, for example. Here, we focus on European companies, in part because they are the leaders in GHG awareness and disclosure.

This is particularly true for the **Electrical Equipment** sub-sector. Products can provide a variety ranging from **components** such as **specialized cables** (for example, Nexans and Prysmian), lighting and electrical equipment (Legrand, Signify) to very specific **energy transition technologies** such as wind turbines (Vestas, Siemens, Gamesa) or even pure **hydrogen players** (Powercell, NEL).

The Fourth Industrial Revolution, or *Industry 4.0*, builds upon previous automation to further improve resource efficiency and face up to the need for greater reductions in energy use. Capital Goods players such as **Siemens**, **ABB**, and the ESG Industry leader **Schneider Electric** are stepping up their game. Coupling their automation solutions with IIoT capabilities they are combining technologies to create ecosystems of connected products, automation and digital platforms. These ecosystems enable clients to close the loop on data, and enhance both preventive actions and real-time actions to optimize production and energy efficiency across some of the highest-emitting sectors of our economy.

## Case Study

### ABB

***ABB launched its Scope 4 objective in its 2021 Sustainability Report. The company provides concrete case studies with a focus on their Motion Business, which offers a range of high-efficiency motors and drives. In the future, we would hope to also see information at the product level.***

ABB describes its collaboration with Yara, a mineral fertilizer producer in Norway, to refit Yara's largest production site with high-efficiency motors and drives. A thousand of the facility's motors were upgraded, while another 2,500 motors are expected to be replaced with ABB's IE5 SynRM motors and drives. ABB estimates that in total annual power savings will be 32-40 GWh, for an annual reduction of 12 to 19 kilotons of CO<sub>2</sub> emissions. This is the equivalent 2,586 to 4,094 gasoline-powered passenger cars driven for one year.<sup>5</sup>

In its 2021 Sustainability Report, ABB calculates that from a basket of 15 business cases, its products enabled customers to reduce GHG emissions by 11.5 megatons in their first year.

# Methodologies and Best Practices

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As a new measurement, Scope 4 is still trying to overcome methodological challenges. As we attempt to measure saved/ avoided emissions, some of these methodological differences, which need to be tested and discussed, are quite wide.

- **Cumulative or Yearly Accounting?** -- Cumulative methods track the overall installed base of the assets, thus all the products sold to date, to determine the level of emissions 'avoided' and 'saved' up until and including the last reported year. Yearly accounting is more pragmatic and forward-looking. The yearly method accounts for 100% of lifetime emissions and the savings on products sold within a year.
- **Top-down, or Bottom-up?** -- Top-down calculations estimates avoided emissions by business line, while bottom-up calculations base estimates of emissions savings for each specific products sold.
- **Estimated lifetime?** -- The product's lifetime is essential in calculating saved/avoided emissions as the emissions are calculated on a lifetime basis.
- **Reference scenario?** -- The scenario used to measure saved/avoided emissions will have a material impact on the final calculations. Examples of reference scenarios include average market solutions, solution previously in place, or a previous product generation.

**“The reference scenario used to measure saved and avoided emissions will have a material impact on the final calculations.”**

For instance, we also note that the **percentage of the company portfolio mapped varies** across companies. Depending on the offering, an increase in percentage of mapped products can lead to additional calculated savings for a company on a year-to-year basis. Amongst the companies in figure 7, Vestas is the only one to have fully mapped its business portfolio. As a pure player in wind turbines and solutions, the accounting is indeed easier. Conversely, Siemens – which offers a diversified product range – also uses a top-down approach with savings per business line, rather than savings relative to specific products. In light of the wide range of its offering, a bottom-up approach such as Schneider uses may be deemed more appropriate.

Some companies distinguish between “saved” and “avoided” emissions. Saved emissions are **from brownfield retrofits** and replacements of existing systems, and **emission avoidance** are from **greenfield** new projects versus the most likely alternative.

**Figure 7: Scope 4 Disclosure – Selected Capital Goods Companies**

	Accounting Standard	Top-down/ Bottom Up	% of portfolio mapped	Savings Target & Year (in Mt)	Sales Period for savings Target	Key Savings Areas	Estimated lifetime
<b>Schneider</b>	Yearly	Bottom-up	20%	800+ (2025)	2018-2025	PPA, variable speed drives	5-15
<b>Legrand</b>	Yearly	Bottom-up	21%	12+ (2024)	2022-2024	Energy efficiency portfolio	4-15
<b>ABB</b>	Yearly	Bottom-up	“basket of 15 business cases” >20%	100+ (2030)	2021-2030	Variable speed drives, electric motors	Lifetime does not impact target as savings are only for the savings realized in the year 2030
<b>Vestas</b>	Yearly	Top-down	100%	-	-	Wind Turbines	21
<b>Siemens</b>	Cumulative	Top-down	32%	-	-	-	-

Source: Candriam, company reports, Société Générale

**Transparency remains key in Scope 4 reporting**, especially in light of these differing accounting methods. Schneider's 2019 White Paper<sup>4</sup> on its Scope 4 savings methodology contained remarkable detail per product family. The company is often considered the sector leader not only in its saved/avoided emissions calculations and disclosure but as well in overall ESG practices. Schneider partners with a respected external company, Carbon4, to implement its methodology.

We are starting to see some promising efforts from the Net Zero Initiative (NZI) on avoided emissions. Net Zero Initiative is a Carbone 4 project supported by the French Agency for Ecological Transition (ADEME), and twenty-one major companies including Schneider Electric. NZI aims to provide organizations with a way to describe and organize their climate action to maximize their contribution within achieving global carbon neutrality.

In June 2022, NZI and Carbon4 published its "Pillar B" Guidelines which seeks to address lack of standardization by defining a common framework for saved/avoided emissions. At this stage, the guide only covers 3 sectors (Mobility, Buildings and Energy) using reference situations in terms of solutions and emissions specific to France. We applaud these efforts and believe that this first step will allow the relevant industry players to move forward together in transparent manner. More work still needs to be done to construct a framework that covers all sectors on a global basis, we thus look forward to following NZI's work and advancement on this topic.

It must be noted that at this stage that given the nascent stage of saved/avoided emissions there still needs to be a consensus amongst climate organizations and standards as to the question of officially including saved or avoided emissions in climate strategies. For instance, we find differing points of view between SBTi and C4F. This is mainly due to the lack of calculation standards and lack of transparency. Although we are cognizant of the challenges faced, we believe that saved/avoided emissions are particularly important for Capital Goods players as the majority of their emissions are within Scope 3 and depending on the nature of the product are within the 'use' phase. We believe these companies have an important role to play in the decarbonization of the full ecosystem in addition to their direct emissions.

# Case Study

## Legrand

***Legrand, a global leader in low-voltage electrical components, has been reporting avoided emissions since 2014. In its first campaign, from 2014 to 2021, covering two CSR roadmaps (2014-2018 & 2019-2021), the company employed a cumulative bottom-up approach to measuring Scope 4.***

The company has updated and improved its methodology, most significantly by adopting yearly accounting instead of its previous cumulative method. Legrand believes the yearly approach aligns with current best practice, and that yearly accounting provides a more forward-looking picture. Indeed, we consider this a positive evolution.

As part of Legrand's 2022-2024 CSR Roadmap, it targets cumulative CO<sub>2</sub> emissions avoidance for customers of 12 million tons via its energy efficiency product line, which represented approximately 21% of revenues in 2021. The example below illustrates a savings calculation from their Lightning Management Systems.

Legrand offered investors a recap of key energy efficiency gains for their product families during their 2021 Capital Markets Day, reproduced below, for commercial segments (figure 8).

Lighting Management Systems provides a simple example of Legrand's CO2 avoidance calculation methodologies.

Based on French energy efficiency standard RT2012, a savings of 40 % can be achieved using a lighting management system. This amount of energy saved has been estimated based on an average lighting consumption per room of 140 Kwh per annum, i.e. a savings of 56 kwh for each connected lighting sensor.

This saving of 56 kwh, applied to the number of sensors sold in a given country and multiplied by the electricity emission factor of that country and the lifetime of the sensor (10 years), indicates the CO2 emissions saved through the yearly sales of this product in this particular country. This calculation being applied to all worldwide sold quantities considering the relevant country emission factors provides the annual CO2 emissions saved through the use of this product family sold by Legrand to its customers.

**Figure 8: Legrand Commercial Products Potential Energy Savings**

Step	Offerings examples	Applications	Positive Impact*
<b>Tailored solutions</b>	Guest room management with UX for upscale hotels	<b>Smart management of hotel rooms functions</b> (access, heating, electrical appliances, lighting and more)	<b>From 25% to 35%</b> Average energy saved per year*
<b>Reducing use of energy</b>	Lighting control and presence sensors	<b>Adjusted lighting to actual needs</b> with automatic OFF & manual ON scenarios	<b>Up to 55%</b> Average lighting energy saved per year through the combination of automatic OFF and manual ON scenarios*
<b>Measuring &amp; optimizing use of energy</b>	Measuring solutions	<ul style="list-style-type: none"> <li>• <b>Automatic collection</b> of electrical data</li> <li>• <b>Comparison</b> of site performance &amp; <b>optimization</b> of subscribed power</li> <li>• <b>Addresses the needs of all functions</b> (purchasing, CSR, maintenance)</li> </ul>	<b>From 5% to 15%</b> Average energy saved per year*

\* Non contractual estimated energy consumption or savings determined per year compared to standard solutions and specific usage. The above estimated figures do not constitute a commercial commitment. Mentioned impacts include some overlap and cannot be cumulated.

Source: Legrand, by kind permission

# Engagement

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*The consensus among the companies with which we engaged on reporting saved and avoided emissions was that most difficult element was just getting started. Each would encourage companies to use Scope 4 estimations for their clients, other stakeholders, and their own strategic business understanding. Of course, companies which are most interested in the topic are the ones most willing to respond, so this was hardly a random sample!*

## Our Candriam Philosophy

At Candriam, Engagement is a part of the investment ecosystem, in which we learn from companies, and they learn from us. It can also be an essential element in stewardship of our investments and those of our clients. In order to use Engagement as a stewardship tool, we must first understand the ESG risks and opportunities faced by issuers. In the end, Engagement is a tool to encourage best practice across the stakeholder universe.

## Our Scope 4 Campaign

The calculation and reporting of saved or avoided emissions are still in a nascent phase. As part of Candriam's normal approach, we reached out to specific industry players to improve our understanding of topic broadly. We discussed methodologies, obtained additional insight into their individual Scope 4 journeys including their initial motivations and challenges along the way, as well as their words of wisdom on this topic. More specifically, we had the opportunity to Engage with five key players -- Schneider Electric, Legrand, ABB, Vestas and Signify.

The companies in our Engagement survey began to calculate saved and avoided emissions at different points in time. Legrand was the first among this group, beginning to report in 2014, with Schneider the most recent, first reporting in 2018. Their initial motivations were rather similar, including their willingness and desire to the impact and added-value of their offering and to shed light on their 'enabler' roles in the low-carbon transition.

Schneider also shared with us that the energy savings of their products was and remains to this day a topic of strong interest from external stakeholders, such as customers and investors. Legrand echoed this sentiment, and added that *"As energy savings become ever more important for clients, so will calculating Scope 4 emissions moving forward. It is therefore vital for companies to be able to understand, describe and quantify improvements between different products and product generations."*

Another fundamental reason as to why many of these companies started to report on saved/avoided emissions was the importance of product use in Scope 3 emissions, and thus in overall emissions (box, page 7). Indeed, for most capital goods, Scope 3 remains the most important part of a company's overall emissions. Depending on the nature of the product, the end-use phase can account for the vast majority of the emissions. For example, **product-use emissions for Signify, Schneider and ABB represent at least 80% of their Scope 3 emissions**. Acting on this part of the emissions chain is critical, as it is where they can make the greatest contribution.

## Obstacles Overcome

Each of the surveyed companies described many challenges along the way. **The first hurdle is the current lack of industry standards** for estimating, calculating, or reporting saved and avoided emissions -- so the exercise has not been straightforward. Another common challenge has been defining the **'best' reference point** – one which is relevant, comparable, calculable. Questions arose including, Should the reference be the previous product generation or an external reference?, What is the market average for a specific product?, and others. Some companies worked with specialized external consultants and drew on studies from well-recognized industry groups to establish reference points, some compared calculations to their previous product generations, and others used both.

**“With some passion, dedication, and hard work, saved and avoided emission calculation and disclosure are very achievable and within the reach of all companies. We are looking forward to peer companies joining in this journey for a more comprehensive climate reporting.”**

**– Schneider Electric**

An additional challenge for certain players was the difficulty of deriving accounting methods that are simple enough to calculate and understand, whilst remaining robust and credible. For example, as a global company with turbine installations in some 88 countries, Vestas faces a certain amount of complexity in the estimations needed to calculate emissions avoided. They indicated that they “have tried to simplify where we can by taking global averages, average lifetime, and average capacity factors, which we believe gets us reasonably close to the correct numbers. However, we could always improve our data and assumptions.”

We agree that there is no perfect methodology and no perfect avoided emission figures for companies. At this stage, there exists only a first a set of best practices for saved and avoided calculations. Another challenge mentioned is the eventual need for comparability in terms of methodologies, and most particularly targets versus peers. Indeed, we would concur that in addition to the heterogenous nature of methodologies and variety of products and technologies, it may not be possible to directly compare specific players. For instance, a company providing wire and electronic components versus a company providing wind turbines will not have the same reach and scale, and direct comparisons may be unfair or misleading.

# Case Study

## Signify

***Signify is a unique case among peer companies, as it has discontinued disclosure of avoided emissions, at least for the moment.***

### **Objectives: 2015 through 2020**

As part of their campaign, “Brighter Lives, Better World”, Signify (previously Philips Lighting) set an objective to deliver 2 billion LED lamps and luminaires in total between the years 2015 and 2020. This was part of their participation in the Global Lighting Challenge, a campaign from the Clean Energy Ministerial of the IEA to accelerate the global clean energy transition.

As part of this objective, they also monitored and disclosed avoided emissions. By the end of 2020, Signify had delivered 2.9 billion LED lamps and luminaire lighting units and reported that via this initiative avoided 72,988 kilotonnes in CO<sub>2</sub>. As stated in their 2020 annual report, calculations of avoided emissions generated by the sales of LED lamps are based on the difference in energy use between conventional and LED light technologies. Use of Signify’s LED lamps and luminaires resulted in energy savings of 8,293 kilotonnes CO<sub>2</sub> equivalent.

### **Objectives: through 2030**

Avoided emissions were not reported in 2021. Signify views the conclusion of the 2015-2020 campaign as an opportunity to reassess methodology, and the company is seeking to expand its life cycle analysis and fine-tune other aspects. In line with the GHGP and SBTi, Signify distinguishes Scope 4 emissions (i.e., avoided emissions) from reduced emissions. Avoided emissions occur outside of a product’s life cycle or value chain and are achieved by potentially replacing another reference product. Whether the replacement occurs and which product to replace are key questions to consider when it comes to avoided emissions reporting. To enhance credibility and transparency, Signify is currently refining the methodology for quantifying avoided emissions in an effort to enable better decision-making.

In the meantime, the company is concentrating on its newly-set climate objectives, validated by the Science Based Targets initiative (SBTi). Signify has set a new climate objective, to reduce emissions by 30% from use of products sold by 2030, a target for actual emissions reduction. This is particularly important as the use of products represents approximately 95% of its Scope 3 emissions. Signify is on track to double the pace of the Paris Agreement 1.5 degrees pathway to reduce emissions across its full value chain by the end of 2025, as reported in the 2021 Annual Report. We believe that the company has formulated a robust climate strategy, but we hope that Signify will report on avoided emissions once again upon the update of their methodology.

# Worth the Effort, Say the Companies

Despite the challenges, all the companies with which we engaged strongly encouraged others to embark on Scope 4 calculations. This topic that is important to clients, and crucial to a company's understanding of its offering and its improvements between product generations. In addition, it serves a great means to engage with clients. We believe Scope 4 will be ever more important for clients, and even more so if the geopolitical forces behind rising energy prices persist.

All the companies we spoke to stressed that taking the first step was the hardest part, but the most important aspect is getting started. They stated it was best to start by understanding their full emissions and where they could make the greatest contribution. To facilitate the journey, some companies suggested working with external experts such as *Life Cycle Analysis* and *Climate Change* experts to facilitate the process. They also advised a conservative approach, to mitigate the risk of overstating impacts.

Schneider encourages other companies, saying, "With some passion, dedication, and hard work, saved/avoided emission calculation and disclosure are very achievable and within the reach of all companies. We are looking forward to peer companies joining in this journey for a more comprehensive climate reporting."

It is important to note that there was a consensus amongst the companies in stating saved and avoided emissions is a 'learning process', you will naturally improve as you go. Legrand altered and embedded some best practices into the second iteration of its methodology by switching from a cumulative to yearly accounting approach, while Signify is currently pursuing improvements in its overall methodology.

Lastly -- as pointed out by Signify -- as for sustainability strategies overall, having a successful Scope 4 strategy starts with the full integration within the company's global strategy. This includes establishing direct targets at multiple levels within the organization, including the CEO and business units. Bravo, Signify! And we observe that the majority of the companies interviewed have already embedded this best practice in some fashion or plans to do so in the near future.

# Case Study

## Vestas

**As a pure-player in wind turbines, the similarity of products facilitates a top-down calculation of avoided emissions.**

Vestas calculates CO<sub>2</sub>-equivalent avoided emissions by using the wind turbines as source and comparing them to the average level of CO<sub>2</sub> impact of electricity generation globally. For the global average, Vestas uses the latest figure on global average carbon emissions for electricity from the International Energy Agency (IEA). This figure stood at 477 grams of CO<sub>2</sub> per kWh (2021).

Vestas does not provide any specific graphic on Scope 4 savings. However based on their definition, we were able to obtain a mocked up a chart from a broker that we believe would best represent their definition.<sup>6</sup>

**Figure 9: Top-Down Illustration for Vestas, Turbine Emissions Savings/Avoided – Scope 4**

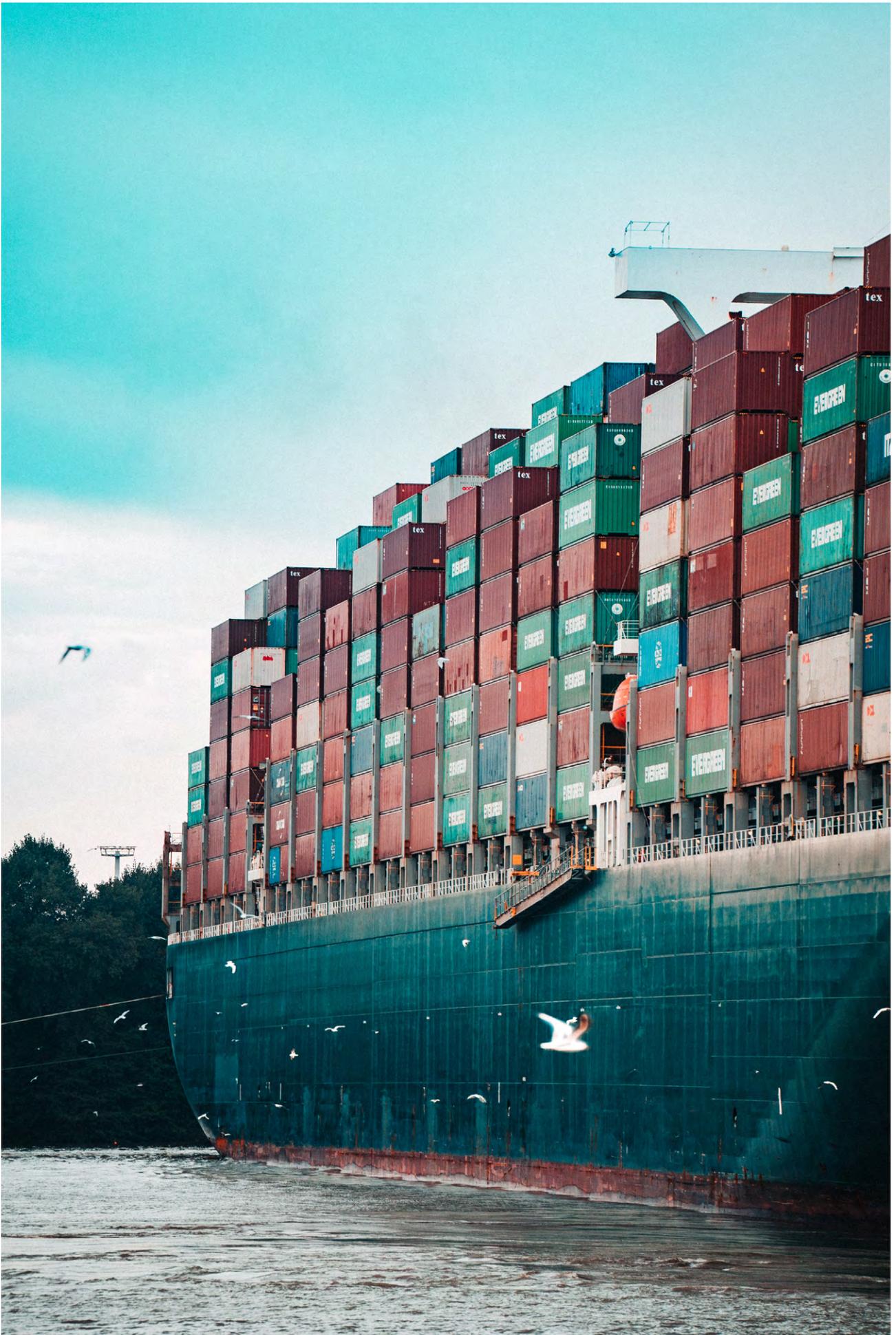
Turbines produced and shipped (in MWh) = 2021 MW x Days x No of hours (1) = 17,800 x 865 x 24	155,928,000
X	X
Capacity factor (%) (2)	34%
X	X
Expected lifetime of the turbine (# of years) (3)	21
X	X
IEA Global avg CO <sub>2</sub> e for electricity in 2021 (in mWhh) (4)	0.477
=	=
Expected CO <sub>2</sub> e avoided over the lifetime of the capacity produced and shipped during 2021 (in million tonnes) = [(1) * (2) * (3) * (4)] / 1000	532



Source: Société Générale, Vestas, Candriam.

One refinement we would like to see for the emission factor would be to use average carbon emissions for electricity generation on a country-by-country basis, in accordance with country-level sales. Vestas does not currently plan to use an emissions factor by country, as management believes this would make it more difficult to track year-on-year progress against targets should they change their methodology. The company is indeed ahead of industry practice, as some wind turbine manufacturers calculate Scope 4 avoided emissions relative to replacing *coal-fired* electricity generation, while Vestas compares to the global *average* electricity emissions mix. Indeed, we believe a comparison solely to coal is an inappropriate reference across the board.

Importantly, beginning in 2022, Vestas includes Scope 4 as one their global bonus KPIs, placing saved emissions at the core and their business purpose.



# Challenges and Limits – the User Perspective

Given the nascent stage of *Scope 4 emissions avoided*, in addition to **limited disclosure of methodologies**, the most significant challenge is the **lack of industry standards** for companies to follow in both the calculation and reporting of saved/avoided emissions.

The current lack of consensus on accounting methods leads not only to a lack of standardization but also hints at liberties which companies may take in their Scope 4 approach. Key assumptions such as product lifetime and reference scenarios have a significant impact on estimates and could even be misleading.

For example, a longer **lifespan** may not adequately reflect technological evolutions and/or upgrade frequency, and could enhance the estimate of avoided emissions when annual emissions are multiplied over a longer period.

Another imprecision is that **the reference scenario** may not accurately represent either the current technology and/or the current emissions of the market average technology. For instance, using the performance of an obsolete technology as a reference point may overstate avoided emissions versus a comparison to the most current, and likely more CO<sub>2</sub>-efficient, technology. A reference point that represents a more CO<sub>2</sub>-intensive scenario than the case at hand, such as the country's energy

mix, is another assumption that might enhance the estimation of a product's ability to save/avoid emissions. For instance, assuming a high-fossil-fuel energy mix for a product with an end-user in France would overstate the avoided emissions versus that assumption in a country such as China or the US.

For transparency in company disclosures, **we believe that saved/avoided emissions should not be subtracted from real emissions**, as this would combine 'real' and theoretical figures, and would provide a misleading view of the company's carbon footprint. We encourage a ratio approach, in which the company reports full Scopes 1, 2, and 3 emissions over its avoided emissions. We believe this provides stakeholders with a better understanding of the emissions-avoiding value of a company's products, relative to that company's full emissions output in producing those products.

Auditing of saved/avoided figures is a Best Practice. Until a consensus is established for Scope 4 accounting standards, the pitfall here is that the audit is in relation to the individual company's established Scope 4 approach, rather than representing any indication of the robustness of the methodology itself. Nevertheless, the auditing of both the methodology and yearly disclosed figures will enhance quality assurance of the information most notably for external stakeholders.

# Conclusion

## Making Scope 4 a Powerful Tool

***Capital Goods innovations increasingly enable downstream manufacturers and product end-users to reduce their emissions and tackle climate change. The end-products to which capital goods products contribute are amongst the global economy's highest-emitting sectors, and include those sectors which under the greatest regulatory pressure to decarbonize their activities. Quantifying the emissions savings or avoidance provided by Capital Goods companies' products should prove a powerful tool, and an opportunity for those companies which develop meaningful solutions.***

We are already seeing promise from efforts such as the Net Zero Initiative on avoided emissions. Yet, Scope 4 is in a nascent stage. Enhancing transparency and increasing consensus on measurement methods will improve its usefulness to customers and investors. In addition, we believe it will help bring a consensus amongst climate organizations, and standards as to the question of officially including saved or avoided emissions in climate strategies.

An understanding of key methodological differences and baseline assumptions across different company Scope 4 reporting and objectives should help stakeholders contribute to the progress in defining this measurement. An important prerequisite is that companies fully analyse and disclose *reliable* and full Scope 3 emissions figures to understand their real carbon footprint and set appropriate objectives.

Despite the long road ahead, we expect Capital Goods ESG leaders to push forward the standardization and disclosure of Scope 4 emissions savings. We expect Scope 4 measurement will demonstrate the added value of Capital Goods products and solutions in the end-to-end reduction of Greenhouse Gas emissions. Lastly, the real-world benefits of these intermediate products will become increasingly pertinent under the European Taxonomy. Companies that are able to quantify savings together with life cycle analysis will be better positioned to determine eligible and aligned revenues for the "Manufacture of other low-carbon technologies", one of the most relevant Taxonomy activities for industry players. Demand for energy-efficient products most notably in the current geopolitical backdrop, coupled with regulations for both the client and industry end-user, will play a crucial role in spurring the advancement of saved and avoided calculation and disclosures.

# Notes & References

<sup>1</sup> Greenhouse Gas Protocol, *FAQ*, accessed 28 June, 2022. [https://ghgprotocol.org/sites/default/files/standards\\_supporting/FAQ.pdf](https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf)

<sup>2</sup> Greenhouse Gas Protocol, 5 November, 2013. *Do We Need a Standard to Calculate "Avoided Emissions"?*, accessed 28 June, 2022. <https://ghgprotocol.org/blog/do-we-need-standard-calculate-%E2%80%9Cavoided-emissions%E2%80%9D>

<sup>3</sup> US Environmental Protection Agency. *Greenhouse Gas Equivalency Calculator*, accessed June, 2022. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>

<sup>4</sup> Schneider Electric. *CO2 Impact Methodology: Saved and avoided emissions by Schneider Electric offers*. France, 2019, accessed 28 June 2022. [https://www.se.com/fr/fr/download/document/co2\\_emission\\_guide/](https://www.se.com/fr/fr/download/document/co2_emission_guide/)

<sup>5</sup> US Environmental Protection Agency. *Greenhouse Gas Equivalency Calculator*, accessed June, 2022. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>

<sup>6</sup> Société General Cross Asset Research. Leslie, Alasdair and Amith Shah. *Capital Goods: Calculating the sector's Scope 4 savings and net carbon positive potential*. 7 April, 2021.



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