

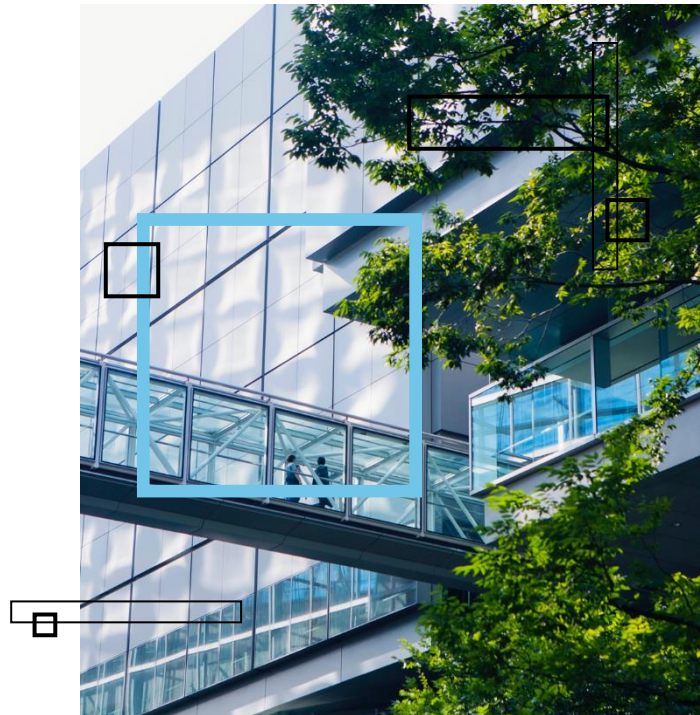


ICE SUSTAINABLE FINANCE & ECOFIN ADVISORS LIMITED

# From Climate Risk to Opportunity: The Concept of Avoided Emissions

---

June 2023



# Table of Contents

<b>1</b>	<b>EXECUTIVE SUMMARY</b> .....	<b>2</b>
<b>2</b>	<b>INTRODUCTION</b> .....	<b>4</b>
2.1	THE CONCEPT .....	4
2.2	THE APPROACH .....	5
2.3	THE RESULTS .....	6
<b>3</b>	<b>THE IMPORTANCE OF AVOIDED EMISSIONS</b> .....	<b>8</b>
3.1	A FOCUS ON POSITIVE IMPACTS .....	8
3.1.1	<i>Emphasis on the enabling aspect</i> .....	8
3.2	BEYOND THE CARBON FOOTPRINT .....	9
3.2.1	<i>Missed opportunities</i> .....	9
3.2.2	<i>Sustainable finance regulation vs Avoided Emissions</i> .....	10
<b>4</b>	<b>CURRENT MARKET UNDERSTANDING</b> .....	<b>11</b>
4.1	USE CASE FOR INVESTMENT MANAGERS .....	11
4.2	MAJOR FRAMEWORKS .....	12
4.3	AVOIDED EMISSIONS DATA .....	12
4.4	TYPICAL MISCONCEPTIONS OF REPORTED AVOIDED EMISSIONS INCLUDE: .....	13
<b>5</b>	<b>SECTOR SELECTION</b> .....	<b>14</b>
<b>6</b>	<b>METHODOLOGIES</b> .....	<b>15</b>
6.1	CASE STUDY: SOLAR PANEL MANUFACTURING .....	17
<b>7</b>	<b>FUTURE DEVELOPMENTS</b> .....	<b>18</b>
7.1	A COMPREHENSIVE CLIMATE STRATEGY .....	18
<b>8</b>	<b>CONCLUSIONS</b> .....	<b>19</b>
	<b>APPENDIX</b> .....	<b>20</b>

# 1 Executive Summary

*“Avoided emissions are emission reductions that occur outside of a product’s life cycle or value chain, but as a result of the use of that product.”<sup>1</sup>*



ICE Climate Transition Finance (CTF) and Ecofin Advisors Limited (“Ecofin Advisors”) have developed a framework to quantify Avoided Emissions for individual companies within investment portfolios.

The ability to analyse Avoided Emissions can be a powerful tool for sustainable investing, helping to identify opportunities with a positive impact and quantify the real-world difference such investments can generate.

Using its extensive carbon emissions database and an existing avoided emissions methodology, ICE has constructed company-specific models to estimate Avoided Emissions and built the methodological frameworks to better understand the requirements for future enhancements.

Ecofin Advisors, drawing on their experience and expertise in impact and sustainable investing, provide insight on how Avoided Emissions can be incorporated in climate financial risk management and investment decision making.

In this paper we detail the processes used in developing our approach and discuss the merits of the two main Avoided Emission methodologies: Attributional and Consequential.

The three elements to the ICE framework - data analysis, modelling, and comparative scenario analysis - are explained, and we expand on the five key concepts that underpin our approach to methodology construction: lifecycle assessment approach, materiality, apportionment, forward-looking capabilities, and geographical granularity.

A case study, using a solar energy company, is presented below to demonstrate how the methodologies are used to identify and analyse both current Avoided Emissions, and future projections.

---

<sup>1</sup> Definition of Avoided Emissions provided by the World Resources Institute (Do We Need a Standard to Calculate “Avoided Emissions?”).

*“Sustainable investing means mobilizing investments to help tackle global issues such as climate change, water scarcity, and human rights. It is about companies, investors, and managers being intentional with their actions and ultimately their impacts such that they make a positive difference in the world.”<sup>2</sup>*



We also address some of the broader issues and misconceptions regarding the concept of Avoided Emissions, including confusion regarding what Avoided Emissions represent, the relationship to Scope 3 emissions, and how they can be integrated into a climate strategy.

Indeed, Avoided Emissions can provide more insight to climate analysis, enabling the assessment of the positive impact contribution of individual companies to the transition towards a low-carbon economy, rather than just assessing climate risk.

The concept of Avoided Emissions is applicable not only to the most obvious sectors, such as renewable energy and utilities. Below we show that analysis across a broader range of sectors can identify sources of positive climate impact, even in the depths of complex supply chains.

We also provide suggestions for the improvement of data methodology, reporting, and transparency to advance the role of Avoided Emissions in the financial community. The need for a clear definition of Avoided Emissions along with substantive and science-based quantifications of the contributions of goods and services towards the low-carbon transition is also highlighted.

Overall, we show how the concept of Avoided Emissions has the potential to channel capital towards solutions providing positive climate impact, shifting the focus from Climate Risk to Opportunity.

---

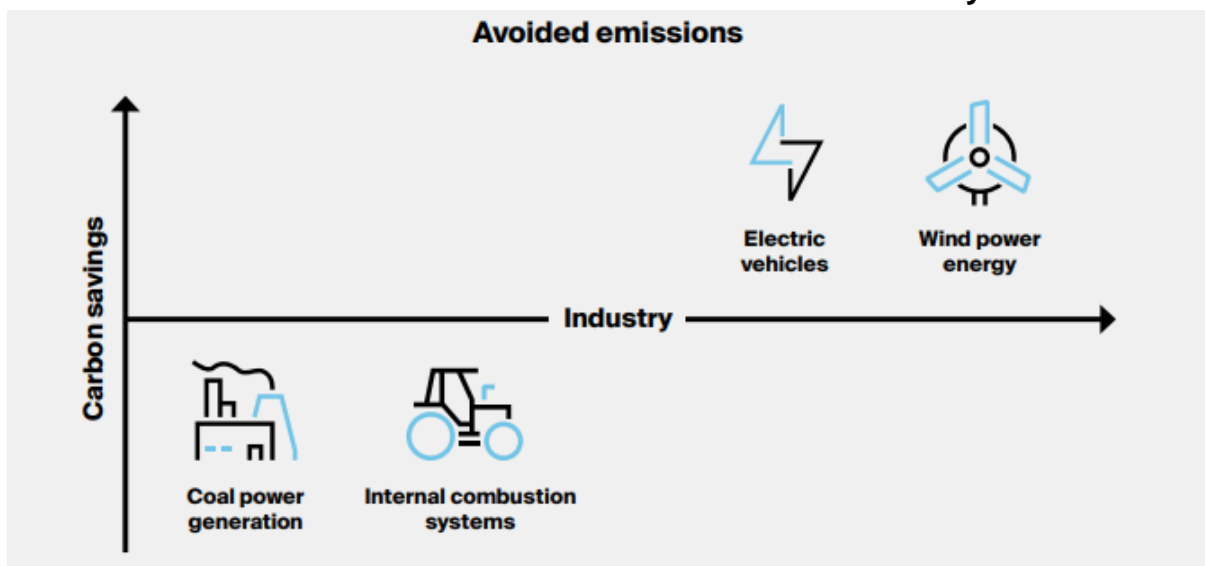
<sup>2</sup> [editorial-5-takeaways-on-sustainability.pdf \(ecofininvest.com\)](#)

## 2 Introduction

Globally, governments and regulators are implementing climate policy with an emphasis on companies setting their own Net Zero targets. While this encourages companies to reduce emissions across not only their own direct operations but also their value chains (Scope 3 emissions), the need for companies to also develop innovative low or zero emissions solutions is becoming increasingly important for global decarbonisation. The extent to which a company contributes to the broader global goal of Net Zero with decarbonising solutions is measured via its potential Avoided Emissions, commonly referred to as “Avoided Emissions”.

*“Avoided emissions are emission reductions that occur outside of a product’s life cycle or value chain, but as a result of the use of that product.”<sup>3</sup>*

**Exhibit 1: Illustration of Potential Avoided Emissions at Industry Level**



### 2.1 The concept

While the concept of Avoided Emissions is currently not as clearly defined as other climate metrics, the underlying intention is clear: to help stakeholders understand a company’s role in the global transition towards a low carbon economy. Such an understanding also allows the identification of low emission and carbon reducing solutions, driving investment towards these opportunities. Hence, Avoided Emissions analysis can shift the focus from Climate Risk to Climate Opportunity.

<sup>3</sup> Definition of Avoided Emissions provided in article by the World Resources Institute (Do We Need a Standard to Calculate “Avoided Emissions?”).

Having worked closely with climate-focussed asset managers and investors, such as Ecofin Advisors, over many years, ICE has utilised its extensive carbon emissions database to construct a methodological framework to help estimate potential Avoided Emissions in portfolios and develop a better understanding of investors' overall climate position. Ecofin Advisors demonstrate how an understanding of Avoided Emissions can be used to generate climate opportunities.

In this paper we provide an overview of our methodology and approach to Avoided Emissions, as well as discussing some of the broader themes and issues including the current market understanding, trends, and frequent misconceptions, especially the relationship with Scope 3 emissions.

We also highlight some of the challenges associated with identifying, reporting, and incorporating an Avoided Emissions strategy into an investment risk management framework and investment decision making process.

## 2.2 The Approach

The structure of this approach to Avoided Emissions analysis consists of three main elements:

### Exhibit 1: Three Stage Process to Avoided Emissions Analysis



The first element is the collection, assessment, and analysis of emissions data and information of individual companies to identify the various Avoided Emissions mechanisms, which each company may contribute to. Here we draw on ICE's extensive emissions and climate database, together with the expertise and experience of our climate analysts to collect and analyse specific company information.

The second element is the modelling, where we explain the various methods, metrics and systems used as part of the overall process. Both bespoke company level bottom-up models and sector-specific methodologies are used, including concepts such as Materiality Assessment and Life Cycle Assessment (LCA) modelling.

The table below highlights one of the important tools we use to conduct our Avoided Emissions Materiality Assessment of various business products, services, and solutions.

### Exhibit 1: Avoided Emissions Materiality Analysis Framework

	Data Quality	AE Efficiency	AE Market Potential
5	No relevant data found	No evidence or weak logic that the product/service/mechanism would lead to avoided emissions, or it is not currently market ready	No evidence or indication that avoided emissions would occur in the future
4	Some data found, but not substantial or only partially relevant	Some evidence this may lead to some avoided emissions and/or is highly dependent on context	Some evidence that limited avoided emissions may occur in the future and/or is highly dependent on context
3	Some data found which can be useful to quantify AE	Evidence exists that this would lead to avoided emissions, but is not typically a large emissions source and/or is context dependent	Evidence that avoided emissions could occur at a reasonable level and/or is only applicable in some scenarios
2	Quantitative data is available to estimate but some elements are missing or require further assumptions	Evidence suggests that large amounts of emissions may be avoided and/or applies to most contexts	Evidence that this may be a significant source of avoided emissions in the future and/or is applicable across most contexts
1	Avoided emissions are reported or all necessary information is presented	Clear evidence that the business products and/or services have a significant potential to avoid emissions	Clear evidence that this will lead to large-scale, drastic avoidance of emissions in the future

Source: ICE

The third element of the approach is our comparative scenario analysis, including “what-if” scenarios and forward-looking analysis to help put the results of the process into context. Here various climate scenarios (including NGFS - Network for Greening the Financial System) are used to better understand how the results depend on the various input variables under different scenarios.

## 2.3 The Results

The output from this process is a detailed set of results for each Avoided Emissions mechanism for individual companies, both current and/or forward-looking, representing Avoided Emissions already achieved and potential future Avoided Emissions. We would also like to highlight here that while Avoided Emissions are usually calculated and analysed at the product and company level, a project-level approach can also be beneficial (e.g. when examining pilot-phase products/services in a particular region).

*ICE Sustainable Finance and Ecofin Advisors Limited: From Climate Risk to Opportunity | June 2023*



Transparency is at the heart of our approach and in this paper, we outline different limitations of the models, calculations, underlying data points and comparative scenario analysis. The sophistication of the methodologies and understanding of the market are still evolving, hence our work is also constantly being updated taking into account most recent market changes.

While Avoided Emissions analysis has developed rapidly in recent years and is starting to be gain recognition, not just by climate investors but by the wider financial industry, the concept is still in its infancy and there is still plenty of scope for further development. Here we also highlight areas of further development and exploration.

### Exhibit 1: Approach to Avoided Emissions Analysis





## 3 The Importance of Avoided Emissions

The identification of Avoided Emissions within individual companies, and more broadly within investment portfolios, is an important indicator of the decarbonisation potential and ability to achieve climate (net zero) goals for both the individual companies and the investment strategy.

Climate analysis is often focused on the risks and the negative factors, but Avoided Emissions analysis allows for a positive narrative to be developed regarding a company's environmental impact, shifting the focus to Climate Opportunity.

### 3.1 A Focus on Positive Impacts

A focus on Avoided Emissions and their positive environmental impact by investors within their decision-making framework should encourage more companies to develop a solid Avoided Emissions strategy.

#### Exhibit 1: Investor Focus on Positive Environmental Impact



An effective Avoided Emissions strategy at corporate level should be fully integrated into a company's overall processes from product design, manufacture and through to distribution. Being integral to a company's overall climate strategy, Avoided Emissions considerations can then be a guiding factor for companies in their business decision making.

Implementing such an approach to Avoided Emissions at the corporate level is not always easy. Companies can find themselves facing dilemmas, such as a rise in their own carbon footprint because of the development and growth of products and services designed to enhance broader Avoided Emissions.

However, we believe Avoided Emissions strategies should not be considered a trade off against the reduction of an individual company's own carbon emissions (Scope 1,2 and 3). Companies acting as climate champions aim to reduce not only their own carbon footprint, but at the same time provide products and services to help their clients transition towards a lower carbon economy. These two goals should not be mutually exclusive.

#### 3.1.1 Emphasis on the enabling aspect

Climate champions with a focus on products and services that have the potential to reduce emissions for the whole economy have a significant role to play in leading

sustainability practices and showing how individual companies can help the wider society decarbonise.

The role of climate champions also extends to attracting capital towards investment, products and services that can provide the opportunity to help decarbonise not just the value chain, but the wider economy.

In this regard, Avoided Emissions can provide useful tools to help investors identify opportunities with a wider climate impact. The development of Avoided Emissions metrics can enable investors to take a more comprehensive view of climate related risk and opportunities within portfolios, allowing comparisons across industries and companies. In the transition to a lower carbon economy, companies that provide significant Avoided Emissions for the entire economy are potentially exposed to additional growth opportunities.

Hence, both ICE and Ecofin Advisors believe that the addition of Avoided Emissions analysis to traditional climate risk analysis can provide investors with a greater understanding of the effects of climate change and impact at company and portfolio level.

## **3.2 Beyond the Carbon Footprint**

In addition to the conventional carbon emissions metrics of Scope 1, 2 and 3, we believe there is now a need for more innovative and quantitative methodologies and tool kits to conduct a more thorough analysis across a broader range of perspectives to gain a holistic view of individual companies' wider climate impact.

This is where we believe the concept of Avoided Emissions has a significant role to play, especially when it comes to providing investors with a better understanding of the overall effects of decarbonisation. Until now there has been little research on Avoided Emissions, contributing to the concept being widely unrecognised, or even misunderstood.

### **3.2.1 Missed opportunities.**

Indeed, it is not uncommon for companies in sectors with large Avoided Emissions potential not to report this information; instead there is a tendency to focus entirely on emissions (Scope 1,2&3), the risk side of the equation, in their sustainability reports.

A good example for this could be a manufacturer of cables, which are used in telecommunications, renewable energy transmission and distribution, transportation, and infrastructure. Cables are an integral component in PV (Photovoltaic) utility-scale solar, onshore, and offshore wind power transmission and distribution. Thus, when calculating the Avoided Emissions for solar and wind energy systems, a share should be attributed to the cable manufacturer. Conducting lifecycle assessments of their cable products and mapping the use of their cables in renewable energy and EV applications will help this company report Avoided Emissions.

While reporting Scope 1, 2 and 3 emissions can help investors, regulators and the wider society understand a company's carbon footprint and identify climate-related risks and exposure in their supply chain, reporting Avoided Emissions can be an important tool towards understanding and assessing the potential climate-related opportunities of the company's products and services.

### 3.2.2 Sustainable finance regulation and Avoided Emissions.

While global financial market regulators have been at the forefront with regards to implementing climate related guidelines and regulations, these have tended to focus on the risk side of the equation. Namely the identification and reporting of emissions at investment/portfolio level, climate alignment (net zero) analysis, and temperature target setting.

There is now opportunity, we believe, for policy makers and international organisations to also consider encouraging the development and use of metrics aimed at measuring and promoting positive climate impact, helping to direct capital to climate solutions and innovation rather than just discouraging investment in high-emitting industries. The disclosure of additional key climate information, such as Avoided Emissions, could go a long way in supporting these advancements in climate reporting.

## 4 Current Market Understanding

Research and reporting of Avoided Emissions is currently developing rapidly, especially in several key sectors. Based on our analysis of reported Avoided Emissions data, the below sectors and industries particularly stand out in terms of reporting:

- Renewable energy
- Biofuels
- Utilities and power generation
- Waste management
- Semiconductors, electrical equipment
- Industrial machinery and automation

The sectors above represent approximately 75% of all companies that report Avoided Emissions based on the ICE Avoided Emissions Dataset. Every year, ICE analyses around 5,500 companies globally for emissions and Avoided Emissions data. The companies that report Avoided Emissions are flagged for further analysis. However, only a small portion of these companies will tend to report Avoided Emissions for a material source of their products and services.

### 4.1 Use Case for Investment Managers

Understanding and identifying Avoided Emissions can be useful and even important for investment managers. It can inform the creation of a product or service that enables wider decarbonisation and can create a business opportunity with potential for growth.

A company cutting its own Scope 1 and 2 emissions has little to do with the business of decarbonising; it's simply an activity like any other, which can be undertaken by a wide range of companies.

But companies identifying and reporting Avoided Emissions activities in their revenue and/or capex (future revenues), may assist investors in finding companies with meaningful secular growth opportunities in sustainability.

This is different to identifying companies with large carbon footprints and arguing there could be a growth opportunity from the reduction of those emissions. An example could be a refinery company that is introducing renewable natural gas or green hydrogen to their products. This could lead to Scope 1 and 2 reductions, which many investors view positively from a sustainability perspective. However, the refinery would still be selling refined petroleum products, which could be viewed negatively from a climate perspective.

## 4.2 Major Frameworks

While there is a lack of standardised methodological guidance, frameworks and reporting standards on Avoided Emissions, our approach takes into consideration several leading best-practise frameworks and research conducted by organisations such as the World Resources Institute<sup>4</sup>, Mission Innovation<sup>5</sup> and Project Drawdown<sup>6</sup>.

This is reflected in many aspects of our approach to Avoided Emissions, including, but not limited to:

- Ensuring a life-cycle assessment approach consistent with the attributional approach to Avoided Emissions;
- Ensuring transparency in disclosing assumptions and limitations with Avoided Emissions modelling;
- Extensive review of baseline options;
- Extensive literature and peer-reviewed research review to minimize reliance on a single source;
- Incorporating primary and secondary enabling effects in constructing Avoided Emissions models;
- Incorporating regional variations and building forward-looking components; and
- Reviewing solutions and sectors associated with varying emissions reduction and sequestration potential, based on different climate scenarios. This allows us to sense check and evaluate the alignment of our Avoided Emissions models and calculations to third-party sector-level, forward-looking research.

## 4.3 Avoided Emissions Data

Our data team collects reported Avoided Emissions data on an annual basis, with quality assurance processes to ensure we do not collect any reported Avoided Emissions that fall under some of the common misconceptions of what constitutes Avoided Emissions. These are highlighted in the following section.

Additionally, our Avoided Emissions model is designed to ensure that the most material business and product segments of a company are considered, both in terms of potential to reduce emissions as well as in the context of the company's operational and supply chain emissions footprint.

Reviews of company and industry-level research, peer-reviewed academic research and LCAs are conducted periodically to update our models and capture any improvements in data quality and availability.

---

<sup>4</sup> World Resource Institute: <https://www.wri.org/>

<sup>5</sup> Mission Innovation: <http://mission-innovation.net/>

<sup>6</sup> Project Drawdown: <https://drawdown.org/>

#### 4.4 Typical Misconceptions of reported Avoided Emissions include:

A theme that we have noted is the level of misconceptions around the concept of Avoided Emissions, especially when it comes to what's included and the relationship to Scope 3 emissions. This points to a need for a clear definition of Avoided Emissions along with substantive and science-based quantifications of the contributions of goods and services towards the low-carbon transition.

The main areas that tend to cause confusion in our experience, which also inform our data collection process are:

- Operational efficiencies;
- Scope 3 emission reductions;
- Immaterial sources of Avoided Emissions (e.g. fossil fuel company claiming Avoided Emissions for a renewable energy project which is insignificant compared to their fossil fuel extraction);
- Reporting renewable electricity purchases or off-grid renewable power installations (these can lead to emissions reductions in Scope 2 emissions, but should not be associated with Avoided Emissions); and
- Reporting energy-efficiency improvements in operations and manufacturing facilities (e.g. installing LED lightbulbs and installing more energy efficiency heating and ventilation equipment). These can lead to emission reductions in Scope 1 and 2 emissions but should not be associated with Avoided Emissions.

Additionally, even when companies do report meaningful Avoided Emissions, they often do not disclose sufficient information around the underlying methodological assumptions or calculation process, making it quite hard to assess whether the figures can be trusted for further research and investment analysis. Usual gaps in disclosure include:

- Identification of the baseline;
- Distinguishing between annualised or cumulative Avoided Emissions;
- Clarity on whether a lifecycle assessment-based approach has been undertaken or only certain stages in the product's lifecycle are under consideration; and
- Reporting Avoided Emissions only for the specific product/service provided by the company that constitutes a component/particular segment of the overall product or whether the company has claimed Avoided Emissions for the entire product value chain, even when they are only providing certain components.

This makes it difficult to verify, as well as understand, the assumptions built into the calculations. The lack of a global standard or regulation focusing on Avoided Emissions reporting or calculations is a key factor contributing to the lack of transparency regarding the underlying methodologies.

## 5 Sector Selection

As the range of climate solutions continues to expand across different sectors and industries, it is important to map the mitigation potential associated with different technologies and solutions as per the latest industry research and climate science.

In our analysis, we focus on sectors that provide climate solutions and do not include any solutions that are implemented towards fossil fuel production and distribution, as well as mining industries - except when there are direct implications towards battery manufacturing for zero emissions vehicles and renewable energies.

Based on our research, we have highlighted examples of sectors with large Avoided Emissions potential:

- Photovoltaic and Concentrated Solar Power Equipment;
- Onshore and Offshore Wind Energy Equipment;
- Battery Electric Vehicle and Fuel Cell Vehicle Components;
- Waste Management;
- Energy Efficient Semiconductors; and
- Energy Efficient Heating, Ventilation and Air-Conditioning Products (HVAC)

A key consideration in understanding the sectors and solutions with the highest Avoided Emissions potential is a comprehensive assessment and formulation of the baseline (reference situation). Understanding the current market conditions of the product/solution in question is important in establishing the baseline. E.g., The baseline for calculating the Avoided Emissions from an electric vehicle would be an internal combustion engine vehicle (ICEV) in many regions where EV adoption is currently low. However, as per IEA (International Energy Agency) projections, EVs will represent more than 50% of the active vehicle stock in some regions by 2030. In this scenario, ICEVs would no longer represent the baseline case.

When assessing the Avoided Emissions potential at the company-level, a bottom-up approach where the Avoided Emissions are calculated at the product level and then aggregated based on revenue/sales shares minimizes the risk of overestimating the Avoided Emissions.



## 6 Methodologies

Approaches to Avoided Emissions calculations often fall into two broad categories: Attributional and Consequential.

The Attributional approach examines the emissions of the product in focus, from a lifecycle assessment approach and compares it with the lifecycle emissions of a comparative product (this forms the baseline which the product in focus is being compared to). The difference between the two lifecycle emission footprints results in the Avoided Emissions.

The Consequential approach on the other hand, takes a broader perspective and examines the emissions reductions/removals arising because of a specific policy action or decision. The effects of this action/decision can result an increase or decrease in emissions.

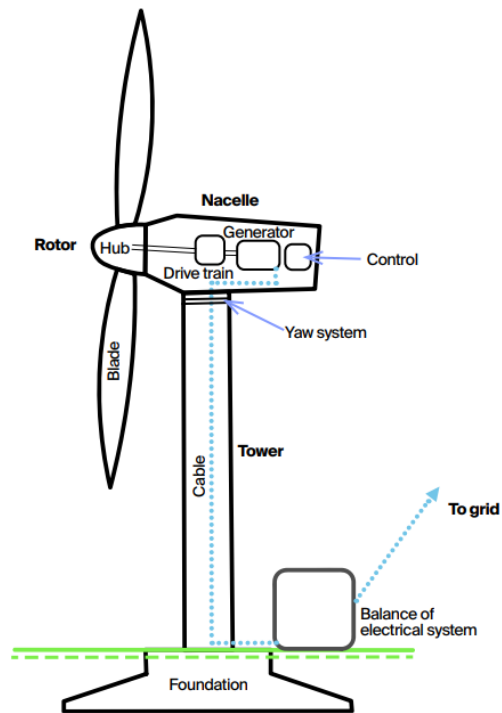
While the World Resources Institute (WRI) and Greenhouse Gas (GHG) Protocol recommend using the Consequential approach, there is a lack of data to implement this approach effectively. We use the attribution approach, keeping in mind the limitations and the assumptions.

Constructing the Avoided Emissions model from the bottom-up ensures granularity as well as a holistic understanding of the limitations and assumptions, which is key to ensuring the results can be utilised and improved upon in the future.

Principally, five key concepts underpin our approach to methodology construction: lifecycle assessment approach, materiality, apportionment, forward-looking capabilities, and geographical granularity:

- Undertaking a lifecycle assessment (LCA) approach is one of the fundamental components in Avoided Emissions calculations. Ensuring a cradle-to-grave approach and accounting for emissions arising in all stages of a product's life are vital to comprehensively understand the emissions footprint for the low-carbon product in question as well as the comparative product which forms the baseline;
- Materiality is another key consideration for identifying the business segments that would contribute most significantly to Avoided Emissions in the context of the company's Scope 1, 2 and 3 emissions footprint;

## Exhibit 2: Wind Energy Projects - Example of How Apportionment Can Help Attribute Avoided Emissions



- Apportionment is not currently widely discussed as a concept but is pivotal in ensuring the calculations of Avoided Emissions are as granular as possible. E.g., while calculating the Avoided Emissions of a wind energy project, utilising robust apportionment estimates can help quantify the Avoided Emissions attributable to the different companies manufacturing and supplying the turbine, cables, inverters, rotor etc (Image 1). This ensures all the Avoided Emissions calculated for the project are not attributed to only the energy distribution/utility company and the different component manufacturers are also apportioned Avoided Emissions.

- We also incorporate forward-looking capabilities in our methodologies for companies in the electric vehicles, batteries, and renewable energy markets. Using IEA and NGFS grid projections as well as sales estimates, we construct forward-looking methodologies to estimate the Avoided Emissions through to 2050.
- Lastly, geographical granularity is another important consideration to calculating Avoided Emissions. We utilise sales/revenue breakdown estimates by country/region, at the company level and product (if available), as the potential for Avoided Emissions can vary significantly across different countries and regions. E.g.: while calculating the Avoided Emissions for electric vehicles, the grid emissions factors vary significantly between countries, which will subsequently affect the overall LCA emissions footprint.

## 6.1 Case Study: Solar panel manufacturing

The above points can be better highlighted through a case study example of a leading, global solar panel manufacturer. The Avoided Emissions model specifically looks at the Avoided Emissions arising from solar panels in solar power plants.

Key inputs at the company level are utilised in the model including:

- Total energy produced by power plants and utilities using the company's solar panels, as reported by the company; and
- Sales breakdown by country/region.

These are combined with further inputs:

- Lifecycle Assessment (LCA) based emissions factors for different energy types (e.g., Coal, oil, solar, wind etc.);
- Current and forward-looking projections of grid compositions at the country level; and
- CAPEX (Capital Expenditure) and/or LCOE (Levelized Cost of Energy) based estimates on the value share of solar panels within a solar energy system. These estimates are used to apportion the total Avoided Emissions attributable to the panels specifically within the overall solar energy system.

Grid composition data is used to calculate the percentage of a country's grid that is comprised of non-renewables (coal, oil, natural gas and nuclear). This is vital as the share of a country's grid powered by renewables must be excluded from Avoided Emissions calculations.

Combining this data with LCA-based emissions factors for non-renewable energies and energy production figures are important to calculate the baseline - i.e., if the total solar energy produced using the company's panels was produced by non-renewable energies, what would the emissions footprint look like.

Similarly, as the next step the emissions footprint for solar energy generation is calculated.

The difference between the resulting emissions footprint of non-renewable energy and solar energy results in Avoided Emissions. As the last step, the apportionment estimates described earlier are applied to calculate the share of Avoided Emissions attributable to the company's solar panels.

Using forward-looking projections of country-specific grid compositions and projected sales, a forward-looking model is also created. This provides an estimate of Avoided Emissions for future years, leading to 2050.

## 7 Future Developments

For the concept of Avoided Emissions to gain further momentum within the financial industry, we believe greater recognition within international climate organisations is needed. Inclusions in scientific climate frameworks and accounting standards would be an important step forward.

While there is a broad acceptance that Avoided Emissions have an important role to play in the transition to a low carbon economy, inclusion into a recognised climate analytical and reporting framework is likely to drive the key developments needed to take Avoided Emissions from concept to implementation within comprehensive decarbonisation strategies.

Key developments we would like to see to make Avoided Emissions more easily adoptable include:

- Standardisation of Avoided Emissions methodologies;
- Transparency of methodologies and data; and
- Prioritisation of appropriate carbon reduction solutions

As we have repeatedly outlined, there are misconceptions regarding the concept of Avoided Emissions that can even promote greenwashing. There is a clear need of a convergence of methodological assumptions behind the calculation of Avoided Emissions. This includes combatting the double-counting approach as many companies can claim the same source of avoided emissions, as well as correctly accrediting and portioning Avoided Emissions to each stage of the product value chain.

### 7.1 A comprehensive climate strategy

Alongside setting temperature reduction and decarbonisation targets, considering potential Avoided Emissions solutions will allow companies to develop comprehensive climate strategies to enhance their journey to net zero.

Individual companies starting to incorporate Avoided Emissions in their strategic decision-making processes to encourage product innovation can help drive an overall society wide decarbonisation. This is where having standardised methodologies, approaches and internationally agreed frameworks will likely help companies start thinking in broader terms when it comes to climate strategy.

The inclusion of Avoided Emissions into different international standards is also vital, to ensure a more scientific approach is applied. Whilst we truly believe that the primary focus of companies is to reduce emissions, an understanding and quantification of the impact of products that are contributing to the low carbon transition is required, to appropriately capture the climate opportunities generated and intensify the transition to Net Zero.

## 8 Conclusions

In this paper we have highlighted the importance of Avoided Emissions and how investors can gain a broader understanding of the climate impact of individual companies in their portfolios by incorporating this analysis into decision frameworks.

By taking factors such as Avoided Emissions into consideration investors can start to shift the balance of their analysis and therefore are able to identify companies with positive climate impact, rather than just focusing on the climate risks. This augmented process will allow investors to make more informed decisions from an environmental perspective.

We also hope to have demonstrated that Avoided Emissions can be identified in different sectors and in segments of a company's supply chain beyond the usual suspects. While the Renewable Energy and Utilities sectors are the obvious focus, we would recommend extending Avoided Emissions analysis into other areas of a product's value chain, such as companies selling Semiconductors, Industrial and Factory Automation-related equipment, Waste Management services and Industrial & Vehicle Batteries.

Company level Avoided Emissions reporting is gaining momentum and we are encouraged by this trend. However, we make the case for greater transparency and detail regarding the methodologies used to arrive at reported Avoided Emissions data. Calls from the investment community should urge for a global reporting standard to help promote disclosure and transparency.

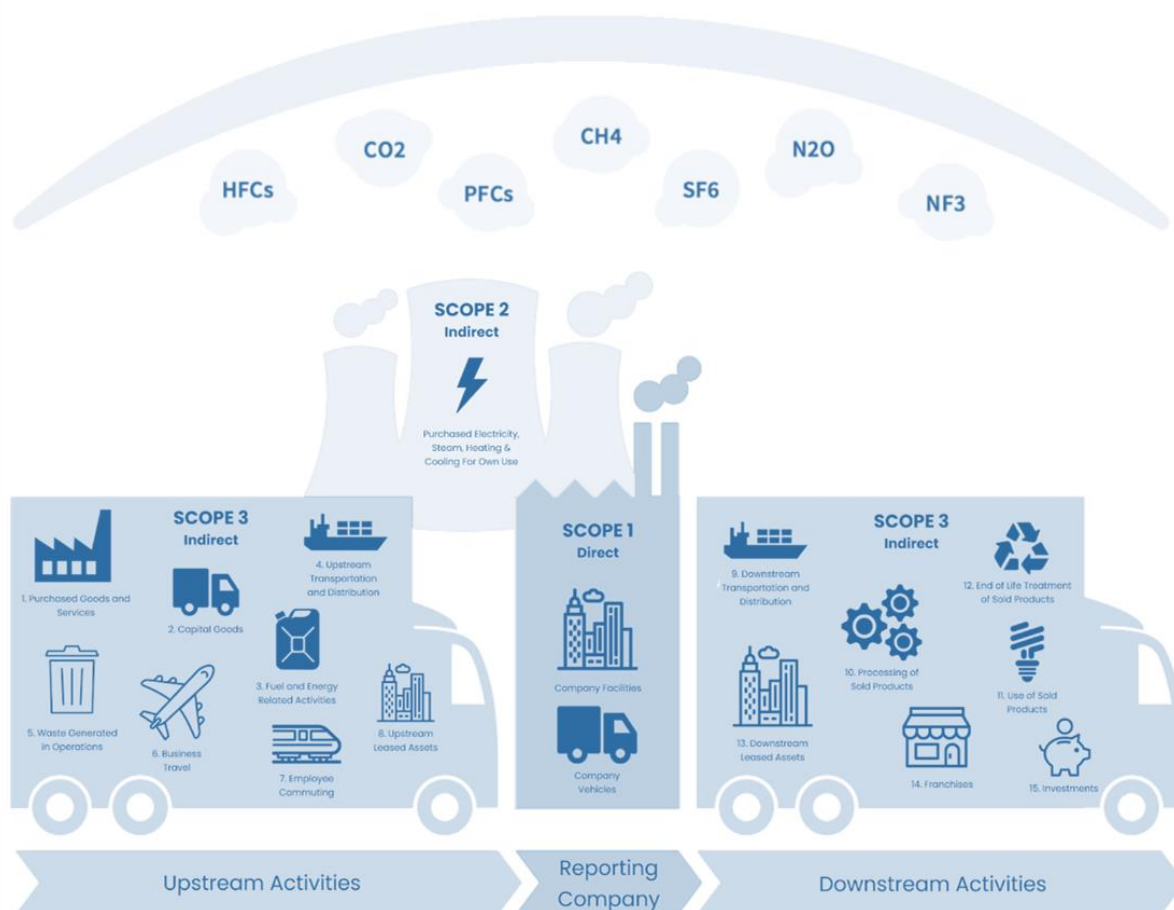
The current level of understanding and adoption of the Avoided Emissions concept within the financial industry is reminiscent of Scope 3 emission analysis only a few years ago.

The pace at which company level Scope 3 data reporting and analysis has developed in recent years to become an essential part of the climate analytical framework of investors is an encouraging precedent for the adoption of Avoided Emissions into mainstream investment analysis.

# Appendix

The GHG Protocol Corporate Standard classifies a company's GHG emissions into three 'Scopes'.

- Scope 1 emissions are direct emissions from owned or controlled sources. Mobile emissions, process emissions and fugitive emissions are counted as Scope 1 if the company owns or controls the activities or equipment associated with the emissions.
- Scope 2 emissions are indirect emissions from the generation of purchased energy. The emissions resulting from the production of grid electricity are accounted for under Scope 2.
- Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.



Source: ICE, Greenhouse Gas Protocol

ICE Sustainable Finance and Ecofin Advisors Limited: From Climate Risk to Opportunity | June 2023

# Disclaimer

Use of this documentation is limited to authorized clients of Intercontinental Exchange, Inc. and/or its affiliates (the "ICE Group") services. This document contains information that is confidential and proprietary property and/or trade secret of the ICE Group, is not to be published, reproduced, copied, disclosed or used without the express written consent of ICE Group.

This document is provided for informational purposes only. The information contained herein is subject to change without notice and does not constitute any form of warranty, representation, or undertaking. Nothing herein should in any way be deemed to alter the legal rights and obligations contained in agreements between ICE Group and its respective clients relating to any of the products or services described herein. Nothing herein is intended to constitute legal, tax, accounting, investment or other professional advice. Clients should consult with an attorney, tax, or accounting professional regarding any specific legal, tax, or accounting situation.

ICE Group are not registered as nationally registered statistical rating organizations, nor should this information be construed to constitute an assessment of the creditworthiness of any company or financial instrument.

GHG emissions information available is either compiled from publicly reported information or estimated, as indicated in the applicable product and services.

Fixed income evaluations, continuous evaluated pricing, end-of-day evaluations, evaluated curves, model-based curves, market sentiment scores and Fair Value Information Services related to securities are provided in the US through ICE Data Pricing & Reference Data, LLC and internationally through ICE Data Services entities in Europe and Asia Pacific. ICE Data Pricing & Reference Data, LLC is a registered investment adviser with the US Securities and Exchange Commission.

Additional information about ICE Data Pricing & Reference Data, LLC is available on the SEC's website at [www.adviserinfo.sec.gov](http://www.adviserinfo.sec.gov). A copy of ICE Data Pricing & Reference Data, LLC's Form ADV is available upon request.

Trademarks of the ICE Group include: Intercontinental Exchange, ICE, ICE block design, NYSE, ICE Data Services, and New York Stock Exchange. Information regarding additional trademarks and intellectual property rights of Intercontinental Exchange, Inc. and/or its affiliates is located at <https://www.theice.com/terms-of-use>. Other products, services, or company names mentioned herein are the property of, and may be the service mark or trademark of, their respective owners.

© 2023 Intercontinental Exchange, Inc.