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Carbon Accounting : Leveraging GHG Data for Sustainable Business Strategies

White Paper Vol. 9
Greenwise Consulting



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FOREWORD

The pressing need to address climate change has put businesses at the forefront of global efforts to reduce greenhouse gas (GHG) emissions. At Greenwise Consulting, we believe that GHG data is more than just a regulatory requirement–it's a crucial resource for shaping sustainable business strategies that drive both environmental and financial performance.

This whitepaper explores how carbon accounting enables organizations to leverage their emissions data in a way that informs smart, strategic decisions. By aligning with established frameworks like the GHG Protocol and the new IFRS S1 and S2 standards, businesses can turn data into a roadmap for reducing their carbon footprint, enhancing operational efficiency, and staying competitive in an evolving marketplace.

At Greenwise Consulting, our goal is to help organizations navigate these complexities, using carbon accounting to meet sustainability targets while also delivering long-term value. We hope this whitepaper offers practical insights on how leveraging GHG data can lead to more sustainable, forward-thinking business strategies.

Lenny Hidayat

Founder & Partner at Greenwise Consulting

Introduction



The Paris Agreement, established in 2015, set an ambitious target to limit global temperature rise to 1.5°C by 2050. Achieving this goal requires collective action in reducing greenhouse gasses emission by governments, organizations, and companies worldwide. In order to determine a clear carbon reduction target, the first and most crucial step is measuring and keeping inventories of carbon emission. This practice has been around since the late 1990, when the WRI and World Business Council for Sustainable Development (WBCSD) launched the GHG Protocol in 1998. To this day, the GHG Protocol becomes the foundation for corporate carbon accounting.

As the 2050 deadline approaches, the importance of carbon accounting has intensified. The International Financial Reporting Standards (IFRS) Foundation, a not-for-profit organization that establishes globally accepted financial accounting standards which are required for use by more than 140 jurisdictions, has formed the International Sustainability Standards Board (ISSB) in 2021 as a response to the growing market demands for globally comparable sustainability-related financial disclosures for capital markets. This initiative led to the issuance of IFRS S1 and S2 in June 2023 by the ISSB. The IFRS S2 requires entities to disclose their carbon emissions in accordance with the GHG Protocol Corporate Standard.

These new standards are currently being adopted into regulatory frameworks across the globe, including Turkey, Nigeria, and Sri Lanka. Indonesia, although still in the process of developing its sustainability disclosure standards through Dewan Standar Keberlanjutan Ikatan Akuntan Indonesia (DSK IAI), has also expressed the commitment to aligning with IFRS S1 & S2. The adoption of these standards will catapult Indonesia's sustainability efforts, as currently carbon emission disclosure is still voluntary and sustainability report is only mandatory for publicly listed companies. By standardizing disclosures, these regulations will enhance the credibility of sustainability reports, thereby empowering investors to make more informed decisions based on a clearer understanding of climate-related risks and opportunities.

UNDERSTANDING CARBON ACCOUNTING

What is Carbon Accounting?

Carbon accounting has emerged as a critical practice in the global effort to combat climate change. While organizations and governments around the globe are trying to seek ways and means to immediately reduce greenhouse gasses.

Carbon accounting therefore refers to the structured process of measuring and controlling the greenhouse gas (GHG) emissions produced by an organization. It involves identifying, quantifying, and reporting emissions to provide a clear and accurate picture of an entity's contribution to climate change. This process assists in monitoring the carbon footprint of an organization and enables organizations to develop ways and means of managing their carbon footprint as per the set sustainability standards and legal compliances..





EXISTING STANDARDS

A set of standards and frameworks directs the application of carbon accounting, ensuring consistency, accuracy, and comparability in reporting. Key standards include:

ISO 14064

ISO 14064 refers to the international standard that provides guidelines for quantifying, monitoring, reporting, validating and verifying greenhouse gas emissions and removals. It helps organizations to carry out the quantification, monitoring, reporting, validation and verification of GHG emissions and removals. The standard encourages the ongoing process of improvement and serves to assist organizations in raising the standard of their carbon accounting and reporting.

GHG PROTOCOL

The Greenhouse Gas Protocol is the most commonly used tool for quantization and reporting of the emissions of GHG. It offers detailed strategies for measuring and reporting emissions in diverse areas and fields. The GHG Protocol provides clear guidelines on how to carry out the calculation of emissions through a structure of three scopes of emissions, which gives a comprehensive check of the carbon footprint of an organization. It assists organizations to locate sources of emissions, measure emissions, and design and implement plans for managing emissions.

DIFFERENCES BETWEEN STANDARDS



The primary distinction between ISO 14064 and the GHG Protocol is in the sphere of their activity and orientation. ISO 14064 is a more procedural framework, outlining the steps for quantifying, reporting, and verifying GHG emissions. The GHG Protocol, on the other hand, offers detailed guidance on calculating emissions for various activities and sectors but lacks formal verification requirements. Many organizations apply both standards simultaneously to have effective environmental management and reliable information on GHG emissions .

Explanation of Emission Scopes

Understanding the scopes of emissions is crucial for comprehensive carbon accounting. The GHG Protocol categorizes emissions into three scopes:



Scope 1: Direct Emissions

Scope 1 includes all the direct emissions that are\ owned and controlled, occurring within the firm's operational control. This includes combustion processes in owned or controlled boilers, furnaces, vehicles, and other equipment. Some examples include emissions from company owned vehicles, emission from fuel used within the company premises and from industrial processes. Mitigating Scope 1 emissions include reduction of the amount of fuel used, increase in efficiency, and investing in cleaner technologies.



Scope 2: Indirect Emissions from Energy

Scope 2 includes all the indirect emissions resulting from purchased energy such as electricity, steam, heating, and cooling. These emissions occur at the facility where the energy is generated, not at the point of consumption. Scope 2 emissions can be controlled by improving the efficiency standards, using renewable energy sources, buying green power or renewable energy certificates (RECs).



Scope 3: Other Indirect Emissions

Scope 3 encompasses all other indirect emissions that take place in an organization's value chain, including upstream and downstream activities. This scope includes emissions from acquired goods and services, business travel, employee business travel, waste disposal, and leased assets. Scope 3 is generally the largest and also the most difficult to measure because it includes emissions from the organization's value chain. Managing Scope 3 emissions entails working with the supply chain, optimizing the supply chain and communicating with stakeholders.

Global Harmonization of Sustainability Reporting

The International Sustainability Standards Board (ISSB) has introduced IFRS S1 and S2 as new global standards for sustainability reporting. IFRS S1 establishes general requirements for disclosing sustainability-related financial information. It requires entities to disclose information about all sustainability-related risks and opportunities that could reasonably affect the entity's cash flows, access to finance, or cost of capital over various time horizons. IFRS S2 specifically addresses climate-related disclosures, requiring companies to provide detailed information about their governance, strategy, risk management, and metrics and targets related to climate risks and opportunities. This standard aligns with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), ensuring consistency with widely adopted climate reporting practices.



Integration and Implementation of New Standards

The new IFRS standards are designed to work in conjunction with existing frameworks like the Global Reporting Initiative (GRI) standards. This integration aims to provide a more uniform global basis for reporting environmental, social, and governance (ESG) information.

The alignment between these standards covers key aspects including governance, strategy, risk management, and metrics and targets. Implementation of IFRS S1 and S2 will require companies to ensure consistency in reporting entities and timeframes, conduct more comprehensive materiality analyses, link governance and strategy to financial positions, provide detailed calculations of greenhouse gas emissions, and set and monitor emission reduction targets.



Benefits of Carbon Accounting

Carbon accounting has emerged as a crucial tool for organizations aiming to measure and manage their greenhouse gas (GHG) emissions. By providing detailed insights into emissions across various operations, carbon accounting enables companies to develop targeted strategies for reducing their carbon footprint.

This is not only beneficial for the environment but also aligns with global efforts to mitigate climate change. Through precise tracking of emissions, organizations can comply with international standards, such as those outlined in the Paris Agreement, by meeting specific emission reduction targets.

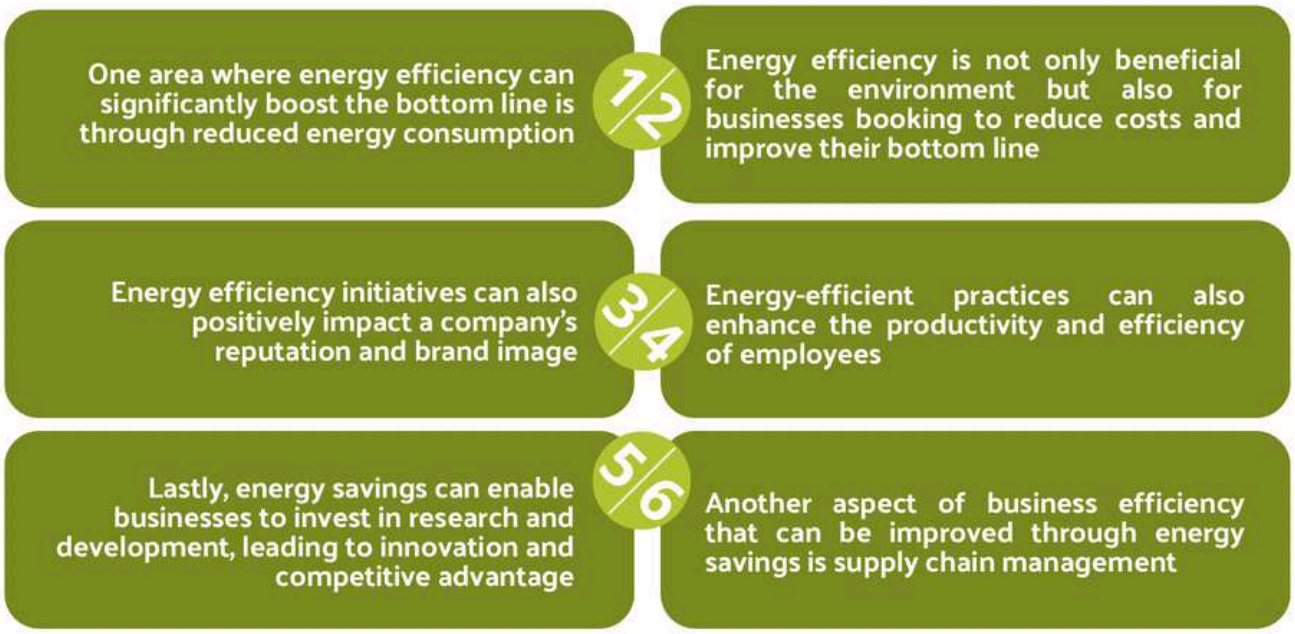


The importance of carbon accounting extends beyond environmental impact. It plays a vital role in risk management and compliance, allowing organizations to anticipate and respond to regulatory changes. This proactive approach minimizes legal risks and financial liabilities, ensuring adherence to environmental laws and regulations. Companies are better equipped to handle market fluctuations and regulatory shifts related to carbon pricing and trading schemes.

Moreover, carbon accounting assists in identifying and mitigating risks associated with climate-related events, such as extreme weather conditions, thus safeguarding the organization from potential disruptions.

In addition to risk management, carbon accounting contributes significantly to operational and financial efficiency.

By analyzing energy use and resource management, organizations can identify opportunities to reduce energy consumption, which directly lowers operational costs. Streamlining processes and reducing waste further enhance financial performance, creating cost savings that can be reinvested into the business. Furthermore, carbon accounting opens up avenues for investment in green technologies, promoting long-term profitability and sustainability.



Another significant benefit of carbon accounting is its positive impact on corporate reputation. In today's market, companies that actively manage and report their carbon footprint are often viewed more favorably by consumers, investors, and regulators. Transparency in carbon accounting demonstrates a company's commitment to sustainability and social responsibility.

This not only enhances the company's brand image but also builds trust with stakeholders who prioritize environmental stewardship. Additionally, a strong commitment to reducing emissions and promoting sustainability can attract and retain top talent, fostering a culture of responsibility within the organization.

Challenges in Carbon Accounting

Data Collection and Quality

One of the most significant challenges in carbon accounting is the collection of high-quality data. The reliability, completeness, and representativeness of primary and secondary data can vary widely, making it difficult for companies to accurately reflect their emissions activities. It is crucial for companies to carefully select data that aligns with their specific operations in terms of technology, time, and geography. However, this process is complicated by the reliance on value chain partners for data collection. Companies often have limited control over the data management practices of their partners, which introduces variability and uncertainty.

Specific challenges in Scope 3 data collection include:

- **Reliance on value chain partners**: Companies must depend on various partners, such as suppliers and logistics providers, to provide the necessary data.
- **Limited influence**: Companies have less control over how their partners collect and manage data, which can lead to inconsistencies.
- **Knowledge gaps**: There is often a lesser degree of understanding within companies regarding data types, sources, and quality.
- **Greater need for secondary data**: Due to the complexity and scope of emissions, companies often rely on secondary data, which may not fully capture their unique circumstances.
- **Need for assumptions and modeling:** The lack of comprehensive data forces companies to make assumptions and use models, which can introduce further uncertainty.



Complexity of Scope 3 Emissions

Scope 3 emissions, by definition, are generated from sources **not owned or controlled by the reporting company** but by other entities within the value chain. These include materials suppliers, third-party logistics providers, waste management companies, travel suppliers, franchisees, retailers, and even customers. The complexity of Scope 3 emissions arises from the broad range of activities involved, from the operations of suppliers to the end-use and disposal of products by consumers.

The data required to account for these emissions is often **sparse and fragmented**, requiring companies to make assumptions and develop models that may introduce further uncertainty. The challenge is further compounded by the fact that companies typically have **limited influence** over the data collection practices of their suppliers and other value chain partners. This lack of control can result in **incomplete or inconsistent data**, making it difficult to track emissions accurately over time.

Key challenges in managing Scope 3 emissions include:

Poor data quality and availability: High-quality primary data is often lacking, especially among smaller businesses within the value chain.

Evolving and inconsistent disclosure standards: Keeping up with rapidly changing standards requires expert knowledge, and even then, there is room for interpretation.

Stakeholder engagement: Collecting Scope 3 emissions data requires cooperation from stakeholders across the value chain, which can be difficult due to concerns about confidentiality and reputation.

Resource constraints: Many companies, particularly small and medium-sized enterprises (SMEs), struggle to process the large volume of data involved in Scope 3 emissions measurement and reporting due to limited financial and human resources.

Limited integration into business operations: Scope 3 emissions are often not fully integrated into many business operations and processes, which slows down both the collection of emission data and the decarbonization process.



Limitations of Sources and Resources

The limitations in available data sources and resources add another layer of complexity to the process of carbon accounting. Many companies are forced to rely on secondary data, which may not fully represent their specific operations or emissions profiles. Additionally, a lack of in-house expertise in understanding and managing data types, sources, and quality can lead to significant gaps in the greenhouse gas (GHG) inventory, ultimately undermining its accuracy and usefulness for both internal decision-making and external reporting.

Best Practices for Carbon Accounting

Carbon accounting calculations must be disclosed comprehensively, accurately, and transparently as a reflection of the company's performance. Accurate carbon calculations can provide insights to the board of directors in determining various strategic actions. Furthermore, disclosing carbon accounting information can give shareholders peace of mind that the organization is operating ethically and sustainably. There are several steps a company can take to implement best practices for carbon accounting

Including:

01

Record relevant assets & activitie

Thoroughly recording relevant assets and activities, including assets, activities, and processes, can contribute to the company's total carbon emissions. This impact will be more comprehensive if carried out across the company's entire supply chain.

02

Document data sources

In carbon accounting, documenting all activities related to the company's emissions is essential. Therefore, proper documentation is necessary.

03

Track your carbon emissions

Carbon accounting measurements need to be conducted consistently over specific periods, including monthly, quarterly, and annual carbon measurements, in line with company policies.

04

Follow standards & frameworks

Choose a standard or framework, and ensure your approach adheres to its guidelines.

05

Use appropriate carbon accounting technology

The collection, analysis, and reporting of sustainability data can be synchronized with specialized technology designed to gather carbon accounting data that can be applied across the company's business chain. This collected data can then be compared with the company's goals, international sustainability performance, and provide audit-ready reports.

06

Maintain a board-ready dashboard

With an easily understood dashboard, all stakeholders can access real-time carbon measurement data for key metrics such as total emissions and emissions in Scope 1, 2, and 3. This dashboard should be tailored to the company's needs to help stakeholders make strategic decisions related to the company's sustainability performance.

07

Get certified

To enhance the understanding of carbon accounting for all company personnel, various formal training programs are necessary, such as the Climate Leadership Certificate Program from Diligent, which provides organizations with the skills to effectively complete carbon accounting, including overseeing climate risk and creating informed growth strategies.

Case Study

Case Study: Carbon Accounting in the Forestry Sector

This case study focuses on the Finnish boreal forests, which are significant carbon sinks–areas that absorb more carbon dioxide from the atmosphere than they release. The research delves into how these forests can be managed to maximize their carbon sequestration potential.

Key Components of the Study:

1. **Life Cycle Assessment (LCA) Methodology:**
   - The study employs LCA, a systematic method for evaluating the environmental impacts associated with all stages of a product's life, to assess the carbon sequestration capabilities of boreal forests.
2. **Forest Management Practices:**
   - The research highlights the importance of sustainable forest management practices in enhancing the carbon sequestration capacity of these ecosystems.
3. **Challenges in Carbon Accounting:**
   - One of the significant challenges addressed in the study is the difficulty of accurately accounting for carbon over the long life cycles of forests, which can span decades or even centuries.
4. **Implications for Policy and Practice:**
   - The findings have important implications for climate change mitigation strategies, especially in regions heavily covered by boreal forests like Finland.

Impact on the Company (Forestry Sector Case Study)

- Enhanced Forest Management
- Regulatory Compliance and Advantage
- Improved Market Position
- Long-Term Viability

This case study is a prime example of how detailed carbon accounting can inform sustainable forest management practices, contributing to global efforts to mitigate climate change by enhancing natural carbon sinks.

Case Study: Carbon Accounting in the Corporate Sector

This case study delves into the complex process of carbon accounting within a large multinational corporation (MNC), which operates across multiple countries and industries. The study provides insights into how such corporations measure, report, and manage their carbon emissions.

Key Components of the Study:

1. **Corporate Carbon Footprint:**
   - The study begins by outlining the concept of a corporate carbon footprint, which represents the total greenhouse gas (GHG) emissions caused directly and indirectly by a company's activities.
2. **Carbon Accounting Methodologies:**
   - The study highlights the different methodologies used by the corporation to account for its carbon emissions, such as the Greenhouse Gas Protocol, which is a widely accepted standard for measuring and managing emissions.
3. **Challenges in Harmonizing Carbon Accounting:**
   - One of the significant challenges identified in the study is the difficulty in harmonizing carbon accounting practices across different regions and subsidiaries, especially when dealing with different regulations, standards, and data collection practices.
4. **Reporting Practices and Transparency:**
   - The case study examines the company's reporting practices, emphasizing the importance of transparency and accuracy in corporate sustainability reports.

Impact on the Company (Forestry Sector Case Study)

- Enhanced Strategic Decision-Making:
- Improved Efficiency and Cost Savings:
- Enhanced Corporate Reputation and Brand Value
- Compliance and Regulatory Advantages
- Long-Term Sustainability and Risk Mitigation

The impact of carbon accounting on multinational corporations was significant. It helped the company reduce its environmental footprint while achieving business benefits like cost savings, a stronger reputation, and better regulatory compliance. This case study shows how effective carbon accounting can drive both sustainability and profitability within a corporation

Future Trends and Innovations in Carbon Accounting

The increasing global focus on sustainability and the need to mitigate climate change have propelled carbon accounting to the forefront of corporate responsibility. Carbon accounting involves the systematic quantification and reporting of GHG emissions, providing organizations with the data needed to implement effective emission reduction strategies. However, as the complexities of carbon accounting grow, so does the need for more sophisticated tools and methodologies.



Emerging Trends in Carbon Accounting

1

Digitalization and Automation

The digital revolution is transforming carbon accounting by automating data collection, processing, and reporting. Innovations in software tools, such as blockchain technology, are enabling more accurate and secure tracking of carbon emissions across the supply chain. These tools can enhance the credibility of carbon accounting by reducing human error and ensuring data integrity.

2

Integration of Artificial Intelligence (AI) and Machine Learning (ML)

AI and ML are being integrated into carbon accounting processes to improve the analysis of large datasets. These technologies can identify patterns and trends in emissions data, providing insights that were previously unattainable. AI-driven models are also being used to predict future emission trends and assess the impact of various reduction strategies.

3

Standardization and Harmonization of Reporting Frameworks

As carbon accounting becomes more widespread, there is a growing need for standardized reporting frameworks that can be universally applied. Initiatives like the Task Force on Climate-related Financial Disclosures (TCFD) are working to harmonize reporting standards, making it easier for companies to compare and benchmark their carbon performance against industry peers.

4

Enhanced Verification and Certification Processes

The accuracy of carbon accounting is heavily dependent on verification processes. Innovations in verification techniques, including the use of satellite data and remote sensing technologies, are improving the reliability of carbon accounting. These advancements are particularly important for ensuring the credibility of carbon offset projects.

5

Policy Developments and Regulatory Pressure

Governments worldwide are introducing stricter regulations related to carbon emissions. Future trends in carbon accounting will likely be influenced by these policy developments, as organizations will need to adapt their accounting practices to comply with new regulations. This includes the potential introduction of mandatory carbon reporting for certain industries.



Innovations in Carbon Accounting



Blockchain Technology

Blockchain offers a decentralized and immutable ledger system, which can be used to enhance transparency in carbon accounting. By recording each transaction in a blockchain, organizations can create a traceable and verifiable record of their carbon emissions. This innovation is particularly useful for tracking emissions across complex supply chains.



Internet of Things (IoT) and Real-time Data Collection

IoT devices are being increasingly used to monitor emissions in real time. These devices can provide continuous data streams, allowing organizations to track their carbon footprint with greater precision. Real-time data collection also enables more responsive and dynamic carbon management strategies.



Carbon Accounting in the Cloud

Cloud-based carbon accounting platforms are emerging as a scalable solution for businesses of all sizes. These platforms offer the flexibility to manage carbon data from multiple sources and locations, making them ideal for multinational corporations. Cloud technology also facilitates collaboration and data sharing across organizations.

GWC is currently developing an integrated solution that includes carbon accounting, allowing companies to track, measure, and manage their carbon footprint more efficiently. These features allow companies to make decisions based on With this latest technology, GWC is committed to helping companies achieve their sustainability targets and support global efforts in reducing greenhouse gas emissions.

CONCLUSION

Carbon accounting plays a critical role in addressing climate change by providing a structured method for organizations to measure, manage, and report greenhouse gas emissions. Through frameworks like ISO 14064 and the GHG Protocol, companies can ensure accuracy and consistency in their emissions reporting. However, challenges such as data collection, tracking Scope 3 emissions, and limited resources still exist. Organizations must navigate these issues while embedding carbon accounting into their broader sustainability strategies, aligning with global standards like IFRS S1 and S2.

As the transition to a low-carbon economy accelerates, mastering carbon accounting becomes increasingly important for organizations aiming to remain competitive (effect from supply and demand, client and investors) and comply with regulations. By quantifying emissions across all scopes–direct, indirect, and those related to the supply chain–carbon accounting enables alignment with global sustainability objectives. Adopting best practices such as tracking assets and activities, leveraging technology, and adhering to established standards ensures comprehensive, accurate, and transparent carbon calculations.

Case studies from various industries, including forestry and large multinational corporations, highlight the benefits of carbon accounting. These examples demonstrate how it enhances decision-making, strengthens market position, and improves resource management. Emerging technologies like blockchain, IoT, AI, and real-time data collection are further transforming carbon accounting, enabling more precise analysis, reporting, and regulatory compliance.

As regulatory demands increase and new innovations arise, carbon accounting will continue to evolve. Companies that embrace these advancements will not only meet regulatory requirements but also gain a competitive edge by improving their sustainability performance and mitigating climate-related risks. In conclusion, carbon accounting serves as a vital tool, providing actionable insights that enhance both sustainability initiatives and business strategies.

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