The Product Durability and Lifetime Emissions Dilemma

Global Compact Network Denmark

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Part I

Introduction

1.1 The product durability and lifetime emissions dilemma

In this brief, we delve into the intricate dilemma of product durability versus lifetime emissions, a juxtaposition which poses a strategic quandary for companies aspiring to achieve excellence in sustainability.

On the one hand, the European Green Deal and its related regulations and directives incite companies within the Union to produce more durable and longer-lasting products with a focus on circularity[1]. At the same time the GHG Protocol's Technical Guidance for Calculating scope 3 Emissions, Category 11 ("Use of Sold Products") states that companies must account for the direct use-phase emissions of their products. Hence, the longer the product lifespan, the more emissions associated with using the product a company must account for in their scope 3, increasing their overall emissions.

Consequently, while more durable products result in reduced production related emissions and usage of finite materials, which is highly positive for the environment, and longer lifespans of purchased products are highly positive for consumers, the longer durability results in increased emissions for the companies producing the energy-consuming products. Accordingly, the increased durability will counteract efforts to reach any ambitious emission reduction targets, providing counterproductive incentives for companies to create durable products when viewed strictly from a GHG accounting perspective. Furthermore, given the increased private sector focus on reaching science-based climate targets, a potential negative consequence could be that companies reduce their products' lifespans to decrease total emissions and meet climate targets.

Thus, the benefits to the environment and consumers are not necessarily aligned with the benefits of companies aiming at decreasing their overall GHG emissions and reach science-based targets.

One solution that has been put forth informally by the Science Based Targets initiative (SBTi), is for a company creating longer-lasting products to decrease its product output (i.e. the longer the products last, the fewer the company needs to put on the market) to even out the increased emissions from direct use-phase emissions. That could be combined with increasing the sourcing of low-carbon materials. This, however, could decrease a company's revenue on a short to medium term even with a price increase while the use-phase emissions could take too long to decrease to reach short-term climate targets. Hence, that argument does not necessarily find support at a company's executive level because of the risks of losing competitiveness and market shares.

1 Particularly addressed in the EU Taxonomy and the proposal for a new Ecodesign for Sustainable Products Regulation.

1.2
Focus and purpose

The purpose of this brief is to provide companies with a deliberated understanding on the product durability and lifetime emissions dilemma, by exploring the related key challenges, equipping them to make informed decisions that not only enhance product durability but also minimise GHG emissions and environmental impact. At the same time, it is acknowledged that the issues and proposed actions outlined may not universally apply to all companies, given the multifaceted nature of the dilemma at hand. Therefore, this brief aims to provide a comprehensive, though not exhaustive, compilation of challenges and potential solutions related to the dilemma, to inspire affected organisations to undertake measures to address these issues. It is particularly geared toward climate/decarbonisation leads, sustainability officers, decision-makers in product development, strategists, and other staff members keen to adopt best practices in their respective industries.

In addition, the brief aims to provide helpful input to the GHG Protocol in its current work on updating its Technical Guidance on scope 3.

The brief also outlines possible alternative strategies to showcase climate action beyond the conventional emissions reporting as outlined by the GHG Protocol.

Consequently, this document initially focuses on the intricacies of the product durability and lifetime emissions dilemma, examining key challenges and delineating proposed actions for companies intent on proactively addressing these challenges. Subsequent sections look into approaches to reporting on avoided GHG emissions, and considerations for communicating and making claims for products. These sections conclude with a series of recommended actions for businesses. Lastly, specific contributions are offered for the forthcoming updates to the GHG Protocol Guideline, included in the Appendix.

The content is informed by insights gathered from industry leaders during two workshop sessions hosted by the UN Global Compact networks in Denmark, Finland, Norway, and Sweden, and supported by the Nordic Council of Ministers. The workshops focused on tangible dilemmas and solutions from frontrunner companies in the Nordics, in addition to input from subject matter experts from Rambøll Management Consulting. These same companies also provided input for the planned update of the GHG Protocol Guideline.

Part II

The product durability and lifetime emissions dilemma – challenges and recommended focus areas

This section introduces three of the main challenges associated with the product durability and lifetime emissions dilemma. For each challenge, proposed focus areas and recommended actions are outlined to enable companies to proactively address the respective challenge.

2.1
Regulation complexities and lack of standards

One of the primary challenges in addressing the product durability and lifetime emissions dilemma is the absence of comprehensive and pertinent regulations and standards specifically tailored to this issue. Hence, it is difficult for companies to find guidance on how to deal with and reduce use-phase emissions (especially associated with longer-lasting products). This challenge is intensified by the abundance of new sustainability-related regulations that add layers of complexity to the matter.

In addition, the lack of standards for product-related metrics and calculations makes sensibly assessing and comparing the lifespan of products difficult due to variations in assumptions, user profiles, maintenance practices, and the gap between technical specifications and actual use. These could be aspects such as assessment values for product lifetimes and running hours, simplified calculation of operational energy use, assessing the full lifecycle impact of products, and defining use-phase scenarios.

One example can be given from the consumer electronics industry, particularly with smartphones. Manufacturers often release technical specifications that suggest optimal battery life and performance under certain conditions. However, without standardised metrics for assessing these specifications, it becomes challenging to compare the actual lifespan of smartphones across different brands and models. Consumers' usage patterns, such as screen time, app usage, and charging habits, vary widely and can significantly impact battery longevity and overall device performance. Additionally, maintenance practices, such as software updates and battery replacements, further contribute to discrepancies between the advertised technical specifications and the real-world use of the device. This variation complicates efforts to make informed decisions based on product durability and emissions over the device's lifetime, underscoring the need for unified standards that account for real-life use and maintenance scenarios.

Another example of the challenge related to regulation complexities and lack of standards is the attribution of emissions to individual components within larger structures, such as buildings or vehicles. The need to accurately assess the environmental impact of each component over its lifecycle, from production through to disposal is a complicated exercise. For example, in a building, different materials like steel, concrete, and glass each have unique emissions profiles based on their production processes, transportation, installation, and eventual recycling or disposal. Without standardised methodologies to attribute emissions to these components accurately, it becomes difficult to identify where the most significant environmental impacts occur and where efforts should be concentrated to reduce the overall emissions of the structure. Standardisation in this area would facilitate more precise calculations, enabling targeted strategies for emissions reduction and more transparent sustainability reporting.

1. Instigate industry-wide collaboration

Specific issue: The absence of a unified regulatory framework means that companies often have to navigate a patchwork of guidelines, which can vary significantly from one region to another. This inconsistency poses a significant challenge for global companies, complicating efforts to standardise sustainable practices regarding the durability of products across different markets.

Proposed actions: To overcome the challenge of inconsistent regulations and standards regarding product-related metrics and calculations, there is a pressing need for industry-wide collaboration to develop and adopt uniform guidelines. These standards should encompass methods for calculating product lifetimes, operational energy use, emissions, and other sustainability metrics. Regulatory bodies, industry associations, and sustainability-focused NGOs can play a pivotal role in this process. Companies should proactively advocate for and adopt emerging standards to stay ahead in sustainability leadership.

2. Internal company standardisation

Specific issue: Establishing internal standards for product-related metrics and calculations ensures that all products are evaluated using consistent criteria, facilitating meaningful comparisons and insights into product durability and performance, both between products and for tracking progress over time. This is essential for identifying areas for improvement and driving product efficiency innovation.

Proposed actions: Until official industry-wide standards are in place, companies are advised to develop and implement their own unified metrics and calculation standards. This includes establishing fixed values for product lifetimes and running hours to offer a consistent baseline for durability and emissions assessment. Here it is important to document assumptions and estimations transparently to show that calculations are based on informed and realistic scenarios.

Using Environmental Product Declarations (EPDs) that incorporate user scenarios and scope 3 category emissions reporting, can help enhance transparency and accountability in product lifecycle assessments, which will aid in tackling the risk of greenwashing, in addition to providing a solid grounding for baselines.

2.2

Data and data management across value chains

The lack of access to reliable and comprehensive data both downstream and upstream in a product's value chain is a significant hurdle to confronting the product durability and lifetime emissions dilemma: How can companies reduce emissions if they don't have an adequate or correct overview of emissions? Quality data is essential for informed assessments and calculations, optimising product design for durability, and assessing the true environmental impact of products from manufacture to end-of-life.

The following are recommended focus areas and actions for companies to proactively address the challenge of lacking data and data management across value chains:

1. Systems ensuring data and data management:

Specific issue: Accurate data gathering is complicated by the vast amounts of data in a product value chain, not to mention in a company's overall value chain, from all the different suppliers, users, and end-of-life actors. Ensuring the quality of this data while effectively managing the risk of double or triple counting and addressing the inherent uncertainties in use phase data and emission factors further complicates things. Operating without digital solutions for data gathering and management, companies face difficulties in accurately tracking and managing crucial data. Although purchasing and implementing such digital solutions can be costly, the manual processes they would be substituting are time-consuming, prone to error, and unsustainable for scaling, which becomes increasingly challenging as sustainability reporting requires increasing disclosures on whole value chains, while the value chains become more complex and globalised. Thus, investing in a data management system can save time and resources in the longer run. The lack of digital platforms also limits transparency and accountability and impedes the potential for data-driven insights that could drive significant improvements in sustainability performance.

Proposed actions: Invest in developing or adopting digital platforms and tools tailored for sustainability data management. This could involve partnerships with technology providers or collaborating with industry peers to co-develop solutions, to share the related costs. Regular updates and maintenance of these systems, along with ongoing assessment and integration of emerging technologies, will keep the data management process robust, responsive, and aligned with evolving sustainability requirements.

Regarding the product durability and lifetime emissions dilemma, the system needs to especially support the collection and verification of use-phase data, considering varied technical lifetimes, user profiles, and maintenance investments. This could be through innovative solutions such as Internet of Things (IoT) devices and sensors in combination with Blockchain Technology, Data Analytics and Machine Learning systems, or Predictive Maintenance Technologies.

Here are examples of how different systems can be employed to gather reliable data for the use phase of products:

Internet of Things (IoT) devices and sensors: IoT devices can be integrated into products to monitor and record real-time data on how a product is used and how it performs over time. For example, in a smart refrigerator, IoT sensors can track energy consumption, operating efficiency, and even predict maintenance needs based on usage patterns.

Blockchain technology: Blockchain can be used to create a secure and transparent ledger of product usage and maintenance history. By storing data from IoT devices on a blockchain, manufacturers can ensure data integrity and provide verifiable records of a product's environmental impact throughout its lifecycle.

Data analytics and machine learning systems: These technologies can analyse the vast amounts of data collected from IoT devices to identify patterns, predict failures, and optimise maintenance schedules. For example, machine learning algorithms can predict when a product is likely to fail or require maintenance.

Predictive maintenance technologies: Predictive maintenance uses data analytics to pre-emptively address maintenance issues before they lead to product failure. By analysing data from sensors embedded in products, companies can identify when a part is wearing out and replace it in a timely manner. This not only extends the product's lifespan but also ensures it operates at peak efficiency, minimising emissions during the use phase.

By leveraging IoT for real-time data collection, blockchain for data verification, and data analytics for insightful analysis and predictive maintenance, companies are provided with a wealth of more reliable data on the use phase of their products and their related GHG emissions.

2. Consumer engagement and data sharing:

Specific issue: Effective data management across the value chain is not merely a technical challenge but also a strategic one. It requires the integration of data from diverse sources, overcoming obstacles related to data availability, standardisation, and interpretation.

The use phase presents a particularly formidable challenge, due to the varying patterns of product usage and maintenance exhibited by users, as discussed above. In addition to technical ways of accessing data on the use-phase, innovative solutions that actively engage consumers and implement mechanisms to facilitate enhanced data sharing during the use phase can be considered.

Proposed actions: Engaging consumers directly through feedback mechanisms, and user-centric data collection tools can provide valuable data on product usage, maintenance, and end-of-life handling. It can also promote awareness on the actual product lifetime. Such consumer-oriented approaches can be further strengthened by integrating smart technologies that enable users to easily share data on product performance and usage patterns. Such initiatives not only enrich the company's data pool but can also strengthen customer relationships and brand loyalty.

For B2B customers, data-sharing clauses could be incorporated into contracts.

2.3
Circularity options

Circularity forms a crucial component of both present and forthcoming sustainability reporting requirements and regulations. It can also play a role in addressing the challenging "hard to abate" emissions in the final stages of achieving net-zero goals. By emphasising the reuse, recycling, and refurbishing of materials and products, circular economy principles significantly reduce the demand for raw materials and the associated energy-intensive processes of extraction and processing. This not only decreases direct emissions but also mitigates indirect emissions throughout the product lifecycle. Consequently, prioritising circular initiatives not only serves as a proactive measure for future-proofing companies but also enhances their competitive edge in an increasingly sustainability-focused market landscape.

In the context of addressing the dilemma between product durability and lifetime emissions, certain circular business model formats can also offer viable solutions to mitigate this challenge.

The following are **recommended focus areas and actions** for companies to proactively apply circularity approaches to alleviate the product durability and lifetime emissions dilemma:

1. Mitigating the dilemma through circular business models

Specific issue: Aspects of circularity can alleviate some of the challenges companies face when balancing the demands for higher product durability with the need to manage and report on scope 3 use-phase emissions.

Proposed actions: Companies could consider these two circular business models that can help mitigate use-phase emissions:

Product-as-a-service model: Adopting a product-as-a-service model shifts the focus from selling a product to selling the use of the product as a service, e.g., through leasing. This model enables companies to maintain ownership and control over the product lifecycle, facilitating regular maintenance and upgrades that can improve energy efficiency and thus, reduce use-phase emissions, even as products remain durable and have longer lifespans.

Designing for upgradability: Circular design principles focus on making products that are easily repairable and upgradable. This approach extends the useful life of products while allowing them to stay technologically up-to-date and energy efficient. By enabling upgrades, companies can ensure that their products do not become obsolete due to efficiency standards or technological advancements, thus mitigating use-phase emissions over time.

These approaches not only meet the demand for higher product durability but also address the challenge of decreasing scope 3 use-phase emissions, enabling companies to showcase a commitment to reducing their overall environmental impact.

2. Alleviating costs of transitioning to circular business models:

Specific issue: The initial cost of transitioning to circular business models can be substantial, and it can be challenging to maintain profitability while shifting to models that potentially reduce the frequency of repeat purchases. Companies also face the risk of uncertain market demand for circular models such as customers being willing to lease, rather than own, which can impact return on investment.

Proposed actions: Companies can adopt a phased approach, starting with small-scale pilot projects to test feasibility and consumer response, and subsequently refine their chosen circular business models before full-scale implementation. This allows for a gradual investment, reducing initial financial risk while gathering valuable insights and data to inform larger strategic decisions.

Additionally, companies should look into possibilities for leveraging government incentives or subsidies for sustainable practices, which could provide financial support.

However, implementing circular business models can also diversify revenue streams or even create new ones. For example, product-as-a-service leasing business models can provide more predictable and steady revenue over time and build long-term customer relationships, rather than the more unpredictable product sales model.

Designing for upgradability can bring additional benefits besides mitigating the product durability and lifetime emissions dilemma, including potential marketing benefits in offering customers products that can evolve over time, thereby reducing their energy expenses. Typically, upgradability also implies repairability and potentially facilitates material separation for end-of-life recycling, leading to cost efficiencies in waste management and enhanced access to environmentally friendly recycled materials.

Furthermore, in markets increasingly driven by environmentally conscious consumers, circular products can also enhance brand value and customer loyalty, leading to potential market share growth. Thus, while implementing circular product models can require an initial investment, its long-term economic benefits can be substantial, aligning sustainability with profitability, and contributing to the broader goals of circular economy practices.

Part III

Reporting on avoided GHG emissions

In addition to diminishing use-phase emissions, there are alternative methodologies available to demonstrate commitment to climate action, extending beyond the traditional emissions reporting as delineated by the GHG Protocol. This could involve reporting avoided emissions for products and services, which would necessitate documenting emissions that have been prevented or reduced throughout the product's lifecycle, such as those stemming from enhanced energy efficiencies relative to alternative products or established benchmarks. This strategy relies on recognising and communicating the environmental benefits realised through innovative product design and service offerings, thereby presenting a holistic perspective on a company's role in climate change mitigation.

To be able to credibly document saved and avoided emissions, a consistent set of criteria and methodology is needed, ensuring that the reported values are reliable and comparable across sectors or product categories. This section presents some approaches to calculate and report on avoided emissions including how to present and communicate these.

1. Criteria for reporting avoided emissions:

Specific issue: Currently no standards and criteria exist for calculating avoided emissions from use of more efficient products or services. Moreover, avoided emissions are not included in the GHG Protocol framework and cannot therefore be reported along with scope 3 emissions. Companies delivering products and services that have the potential to save energy and GHG emissions are thus, not benefitting from a GHG accounting perspective, even though they are delivering more energy-efficient solutions.

Consequently, established methodologies and a comprehensive set of criteria need to be developed, that define the processes for calculating and presenting avoided emissions. One of the main issues is establishing a baseline scenario comparing a company's high-efficiency product against a situation where no product is used or a situation where a product with inferior efficiency is used. In presenting such baseline scenarios it is imperative that all involved prerequisites and assumptions are clearly stated, and that a standard product in the product category exists which could serve as the inferior efficiency baseline product. Also, when comparing a high-efficiency product, it should be clearly stated whether the baseline product used is an industry average, Best Available Technology (BAT), or the second-best average technology.

Proposed actions: Companies should clearly state key product information, such as product lifetime and usage parameters in the baseline scenario, to ensure accurate comparisons when assessing avoided emissions. Moreover, the use of emission factors should be standardised across both the baseline and the improved scenarios to ensure that avoided emissions are truly comparable. Finally, it is essential to conduct comparisons between different products or product groups based on their functions and characteristics, with a particular focus on attributes such as connectivity and adaptability that contribute to energy savings. This approach ensures that products and services can be evaluated on a level playing field in terms of their performance.

2. Strategic application and communication:

Specific issue: Companies need to report and document their avoided emissions to substantiate that their products and services offer optimised solutions with reduced GHG emissions. For both reporting and marketing purposes, companies also need to effectively communicate that their solutions are more environmentally advantageous, particularly when drawing comparisons between newer versions and older ones within the same company's portfolio.

However, as for standards and criteria for calculating avoided emissions, there is neither a guideline on how to communicate avoided emissions for new or refurbished products. The development of such guidelines is imperative to facilitate companies in leveraging avoided emissions as a means to contribute to climate change mitigation efforts, while also helping to minimize the risk of greenwashing.

Proposed actions: When communicating information on avoided emissions, it is essential to ensure transparency regarding all prerequisites and assumptions, including how baselines have been defined. This is crucial in conveying credibility when representing and comparing to a "normal" version of the product. When communicating on saved emissions, it should be clearly specified that the results are based on assumptions rather than real monitored data, and what those assumptions are. It is also important to be transparent about the hypothetical nature of avoided emissions, steering clear of wild or misleading claims.

Finally, companies should consider adopting a conservative approach in calculations and claims, given the limitations of the involved analyses. Whenever possible, companies are encouraged to opt for certifications where applicable.

Part IV

Recommendations for businesses

Based on the challenges and proposed actions detailed in this brief, the following recommended actions summarise the most important calls to actions.

4.1

Regarding the product durability and lifetime emissions dilemma

As discussed in section 2, the intricate dilemma of product durability versus lifetime emissions is a juxtaposition which poses a strategic quandary for companies aspiring to achieve excellence in sustainability. Below is a summary of several recommended actions for businesses looking to confront this dilemma.

Instigate industry-wide and internal standardisation

01

Seek industry-wide collaboration on developing and adopting uniform guidelines for product-related metrics and calculations. Regulatory bodies, industry associations, and sustainability-focused NGOs can play a pivotal role in this process. In the meantime, consider developing and implementing internal unified metrics and calculation standards, ensuring careful documentation of assumptions and estimations to confirm that calculations are based on informed and realistic scenarios.

Invest in a digital data- and supply chain management system

02

Invest in developing or adopting digital platforms and tools tailored for sustainability data management, making sure it especially supports the collection and verification of use-phase data, considering varied technical lifetimes, user profiles, and maintenance investments. This could be through innovative solutions such as Internet of Things (IoT) devices and sensors in combination with Blockchain Technology, Data Analytics and Machine Learning systems, or Predictive Maintenance Technologies.

Adopt circular business models

03

Leverage circular business models that can help alleviate the product durability and lifetime emissions dilemma, such as Product-as-a-Service and Designing for Upgradability to reduce scope 3 use-phase emissions. These approaches not only meet the demand for increased product durability but also address the challenge of decreasing scope 3 use-phase emissions, enabling companies to showcase a commitment to reducing their overall environmental impact.

4.2

Regarding communicating and making claims for products

As discussed in section 3, there are alternate strategies to showcase climate action beyond the conventional emissions reporting. Below is a summary of several recommended actions for businesses considering communicating and substantiating environmental or “green” claims about products.

Ensure transparency and clarity in reporting

01

When reporting, explicitly specify the baseline and key product assumption parameters used and the emissions calculation methods. Transparency regarding these factors is crucial to ensure the integrity and credibility of the reported information.

Provide targeted staff training

02

Provide additional training and guidance for staff responsible for end-user communication, focusing on how to effectively communicate a precise message on emissions from production, use, and possibly avoided emissions. It is important to use precise, technically specific language, particularly in B2B contexts. Here it could be of interest to consider learning from the communication strategies of medical companies, where regulation has set strict standards, in order not to be misinterpreted. This would also mitigate the risk of inadvertently engaging in greenwashing.

Be cautious and accurate

03

Be very cautious with terms like “sustainable,” “green” and other positive adjectives to endorse a product or service which could be overinterpreted, and carefully ensure the accuracy of information shared to prevent false or misleading claims and avoid greenwashing. There does exist guidelines on making environmental and sustainability claims, even though these do not cover recommendations on communicating on avoided emissions, e.g. EU’s “Green Claims Directive”, so ensure you follow these. Lastly, it is advisable to avoid or carefully consider any comparisons with competing products or services, which might potentially lead to disputes between companies.

Apply third-party verification when possible

04

When communicating environmental claims, adhere to established standards and guidelines for safe documentation and claims validation. Moreover, to verify claims, calculations, and results, it should be considered to apply a third-party verification e.g., for comparative claims, and particularly when comparing products within the same company’s portfolio.

Expand beyond GHG considerations

05

Consider reporting on other environmental impacts of a product that those outlined in the GHG Protocol, even if the claim addresses only a specific aspect like cost, energy saving, or circularity. Furthermore, any indirect side effects or trade-offs, acknowledging that lower emissions might lead to changed behaviour or resource consumption could be described.

Appendix

Recommendations for the revision of the Technical Guidance on scope 3 (GHG Protocol)

5.1
Standardising how to model best practices

- Implement standardised lifetimes for product categories and annualised calculations of emissions to ensure consistency.
- Develop clear allocation rules for emissions, such as deciding between accounting for losses or full power consumption in electric motors.
- Adopt standardised emission factors for different energy types, with clearly communicated choices and justifications.
- Define typical usage parameters for energy-using products and standardise lifecycle assessment (LCA) methodologies, including simplified LCAs and full life cycle (cradle to grave) assessments as default.

5.2
Cross-comparability considerations

In the context of environmental sustainability, while the idea of cross-comparability between companies is favourable for transparency, achieving full comparability in practice presents significant challenges. Each company should primarily focus on minimising its own emissions. However, there is a growing consensus that standardisation across industrial sectors is beneficial, not only at the components or feedstock level but also at the final product level. This standardisation would enable investors and customers to make informed decisions based on a company's performance in carbon reporting, ultimately guiding investment choices. Therefore, while perfect comparability may be difficult, striving towards standardised reporting frameworks across sectors can significantly enhance transparency and accountability in environmental performance.

5.3

Category 11 – differentiating between long-lived and short-lived products

DUAL METRIC REPORTING AND FUNCTIONAL UNIT APPROACH:

- Implement a dual metric system that reports both annual and lifetime emissions, or annualised emissions, for products.
- Utilise a functional unit approach to assign benefits accurately to products exceeding their average lifecycle, thereby providing a more comprehensive picture of their environmental impact.

INTENSITY METRICS AND TRANSPARENCY ENHANCEMENT:

- Adopt intensity metrics, such as GHG emissions per functional use or per year, to provide clearer insights, especially for long-lived products.
- Ensure transparency by disclosing both absolute and intensity metrics, including future grid greening scenarios and circularity possibilities.

PRODUCT LIFECYCLE GROUPING AND VOLUME ANALYSIS:

- Differentiate between long-lived and short-lived products by annualising emissions for the production phase and considering emissions per product for short-lived items.
- Group products into families based on their lifecycle length and include volume/sold products in the analysis, specifying the lifetime range for better context and understanding of GHG emissions per year and over the product's lifetime.