Deloitte.

Decarbonizing the supply chain
A focus on purchasing

Taking action against climate change: businesses are working hard to reduce their carbon footprints. The climate targets set by lawmakers and by companies for themselves are ambitious. Decarbonizing the supply chain plays a major role in achieving these targets, as purchasing of goods and commodities alone accounts for 23%[1] of emissions.

Increased transparency about ESG data and new steering mechanisms for suppliers are laying the foundations for this process.

MAKING AN IMPACT THAT MATTERS since 1845

[1] Average emissions distribution of an OEM in 2022.

Executive Summary

Sustainability has long been a huge issue in industry. Sectors such as automotive manufacturing are already making valuable contributions to decarbonization. Concepts such as electrification, and use of biogas and electricity from renewable sources enable companies to achieve substantial reductions in manufacturing emissions. But there is another factor to consider. Given that the carbon footprint of the new electric vehicles (BEVs) that run on green electricity is drastically in the use phase, there will be greater focus going forward on the materials used in vehicle manufacture.

The 30,000 components, primary products and raw materials used on average account for a large part of the supply chain and scope 3 emissions.

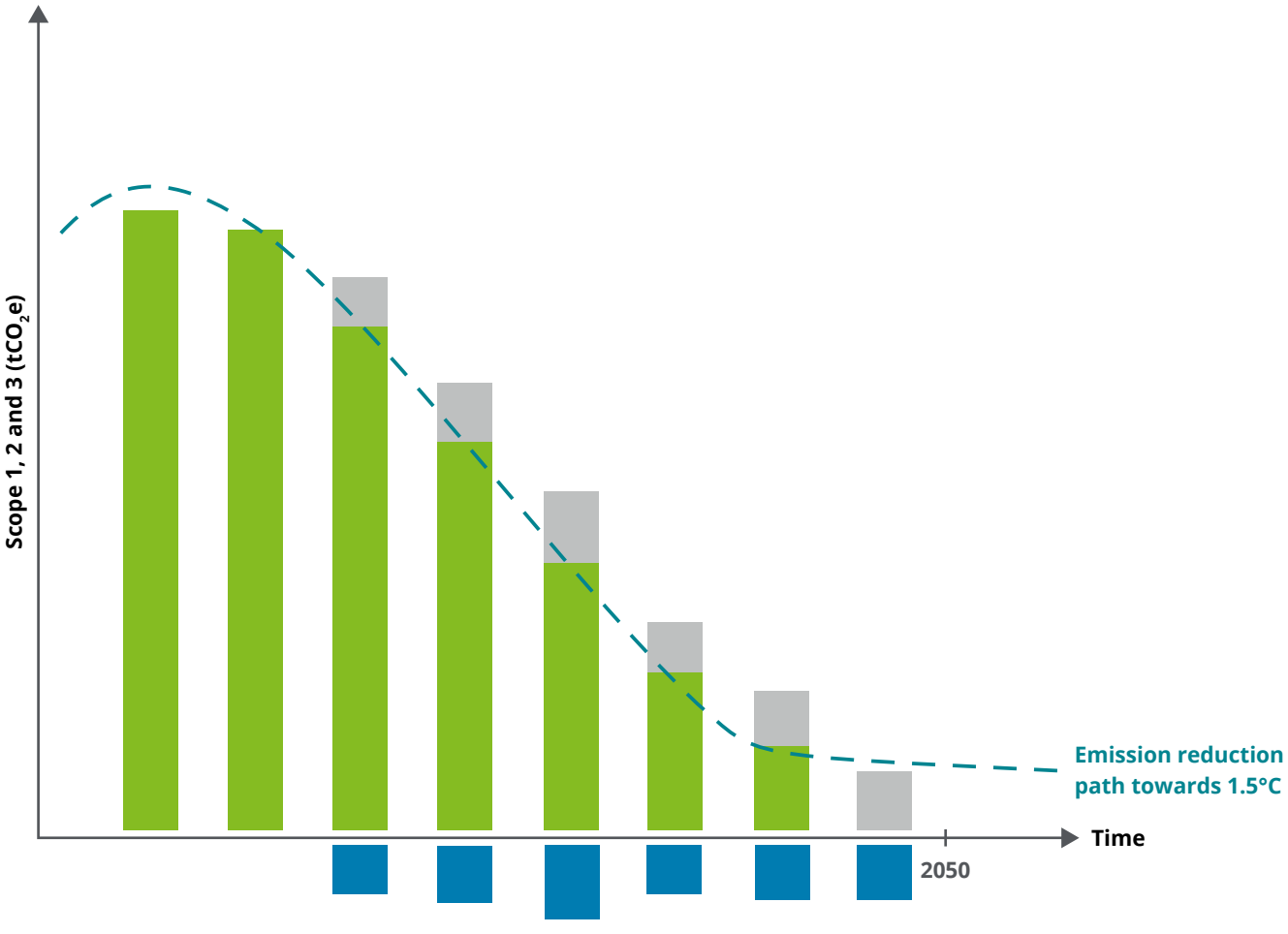
Reducing these emissions is hugely significant in terms of decarbonization for these companies.

But how sustainable are these purchased products, looking all the way back to the raw material extraction stage? Decarbonization is much harder to control outside of company boundaries than in internal processes. One of the main reasons is the widespread lack of transparency, particularly at the lower levels of the supply chain, which makes it difficult to accurately measure the CO_2e footprint of intermediate products and complicates supplier management.

But companies still need to decarbonize their supply chains if they want to achieve their climate targets in line with the Paris Agreement.

This Point of View aims to set out the challenges this process presents for purchasing departments and the approaches to solving them. We will present a four-stage model for practical realization based on Deloitte project experience. The focus is on the automotive industry, but the implications are largely transferrable to other sectors, too.

Fig. 1 – Emission reduction path towards 1.5°C



The situation in the automotive sector

Challenges of decarbonizing the supply chain

It is not news that climate action is urgently required in the industry, with increasing demands from customers, investors, policymakers and regulators. For instance, the far-reaching disclosures of sustainability information required under the Corporate Sustainability Reporting Directive (CSRD) from the 2024 reporting period[2] apply to all companies regardless of their capital market status.

This involves a wide range of ESG issues, such as circular economy, biodiversity and social impact.However, in view of the particular threat posed by climate change, the spotlight is on the CO_2e footprint. After all, road traffic is accountable for 10% of global greenhouse gas emissions[3], and the European Commission is in favor of largely banning internal combustion engines from 2035.[4]

But effective decarbonization will require a whole range of challenges to be tackled.

The top 5 challenges of decarbonizing the supply chain

1) Complex supply chains and resulting lack of CO_2e data transparency
2) Comparability of CO_2e emission calculations for primary products
3) Reducing emissions in conjunction with suppliers
4) Assessing emission reductions in the supply chain
5) Availability of low carbon and green products

[2] The Directive (EU) 2022/2464 as regards corporate sustainability reporting (Corporate Sustainability Reporting Directive, CSRD) entered into effect on January 5, 2023. The CSRD replaces the NFRD (2014/95/EU) and amends directives including the Accounting Directive (2013/34/EU). EU Member States are required to adopt the legislation into national law by July 2024.

[3] Transport – UN Climate Change Conference (COP26) at the SEC – Glasgow 2021 (ukcop26.org); accessed on March 27, 2022.

[4] https://www.bundesregierung.de/breg-de/themen/europa/verbrennermotoren-2058450; accessed on March 23, 2023.

Aside from actual reduction of emissions by suppliers, such as through use of green electricity, the restrictions relating to data availability, different data types, and different methods of calculating the carbon footprint make it difficult to collect the information needed for the calculation from the supply chain.

Supply networks are highly complex nowadays, with thousands of tier-n suppliers potentially involved, and constant movement in the lower levels of the chain. These factors serve to further restrict transparency beyond tier 1, which is exacerbated by inadequate reporting lines and insufficient quality and availability of data. Tier n is responsible for 80% of supply chain emissions[6], making the monitoring mechanisms for this area costly and time-consuming.

Awareness of the requirements of ESG management is also at a very different level among suppliers. Monitoring and effective management is weak to non-existent along the entire supply chain. Industry-wide initiatives such as Catena-X are attempting to standardize the collection of data on CO_2e emissions throughout the supply chain. Electromobility is causing additional problems in decarbonizing the supply chain in the automotive sector.

Catena-X
The Catena-X initiative's data ecosystem for companies in the automotive sector is a forward-looking example of data sharing. It guarantees maximum data security and complete data sovereignty for participants, with control over the data always remaining with the company that owns it.

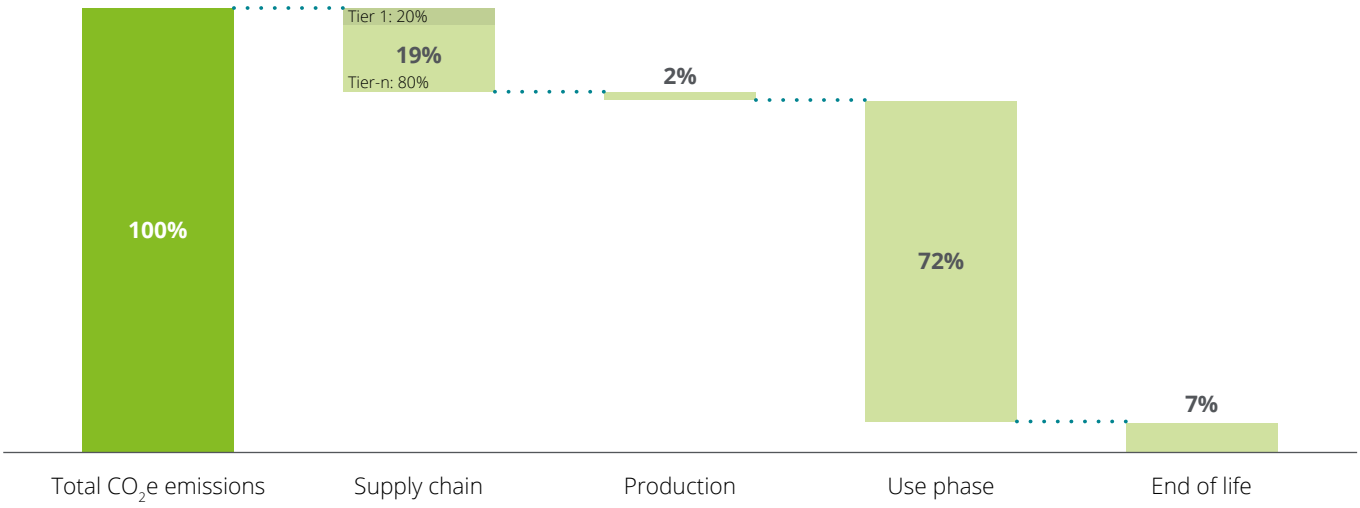
"Catena-X is the first collaborative, open data ecosystem for the automotive industry of the future, linking global players in end-to-end value chains – as simply, securely and independently as never before.

The shared goal: a standardized global data exchange based on European values. Data sovereignty is key. The company supplying data retains control over it and decides on a case-by-case basis with whom, how, when, where, and on what terms it will share data. Catena-X ensures that this happens securely and reliably" – the Catena-X vision.[5]

The comprehensive product life-cycle analysis has a particular focus on the climate impact of manufacturing components such as the battery. The battery makes the upstream footprint for typical BEVs twice as high as for comparable vehicles with internal combustion engines (ICEs).[7] The main emission drivers aside from the battery, which primarily comprises copper, graphite, plastic, aluminum and lithium, are steel, other plastics and aluminum for vehicle manufacture.

[5] https://catena-x.net/de/; accessed on March 27, 2023.
[6] Average emissions distribution of an OEM in 2022 (calculated by Deloitte).
[7] Agora Verkehrswende Thinktank (2019): Klimabilanz von Elektroautos. Einflussfaktoren und Verbesserungspotenzial, p. 58. Available at https://www.agora-verkehrswende.de/fileadmin/Projekte/2018/Klimabilanz_von_Elektroautos/Agora-Verkehrswende_22_Klimabilanz-von-Elektroautos_WEB.pdf; accessed on March 27, 2023.

Fig. 2 – CO_2e emissions of an average OEM*



*Assuming a share of 10% BEVs in the OEM's revenue.

Decarbonizing the supply chain therefore presents companies with a myriad of challenges. They currently rely primarily on secondary data from manual data systems in a complex legal environment with a very large number of suppliers.

A total of 72% of emissions are currently produced during the use phase. The shift to electromobility combined with green electricity will make the tier-n supply chain the main driver of emissions.

Decarbonization in purchasing

In order to reduce the CO_2e footprint in the supply chain, it is first important to know what that actually means. The necessary data needs to be available as a basis for developing and realizing action, with the process as follows: comprehension, measurement, decarbonization, integration and management. Digital approaches are invaluable at every stage – for data collection, but also in streamlining operating processes. New technologies enable processes to be digitalized, business decisions to be based on data, and new digital business models to be developed. Carbon accounting applications are an important IT solution for measuring the footprint of a product, enabling a projection of the climate impact along the supply chain by accessing the relevant data. Supply chain solutions aid data capture and facilitate informative product life cycle assessments.

Open data sharing networks increase transparency in the supply chain and expand the data basis for insights into decarbonization. In terms of practical implementation, it is advisable to divide the decarbonization approach for purchasing into four stages.

Fig. 3 – The Deloitte approach to decarbonizing the supply chain

Comprehension
Recognizing dependencies and defining the level of ambition

- Understand the implications for purchasing of the company-wide decarbonization target
- Define the level of ambition for purchasing
- Derive a carbon accounting approach for purchasing

Measurement
Gathering data, calculating emissions and improving quality

- Identify and assess the sources of emissions
- Gather and extrapolate activity data
- Select appropriate emission factors
- Calculate CO_2e emissions
- Perform continuous quality control and increase data quality

Decarbonization
Setting targets, planning a roadmap, initiating avoidance and reduction measures

- Identify, evaluate and prioritize avoidance and reduction measures
- Set decarbonization targets and plan a roadmap
- Initiate prioritized avoidance and reduction measures with the top suppliers

Integration and management
Managing measures and developing suppliers

- Define responsibilities
- Implement and manage measures and KPIs
- Define and implement supplier management and incentivization approach
- Eliminate divergence between purchasing and emission reduction goals
- Future role of procurement

The timings of the stages overlap and certain measures run parallel

Stage 1: Comprehension – recognizing dependencies and defining the level of ambition

This stage starts with understanding the implications for purchasing of the company-wide decarbonization target. The underlying level of ambition is also determined at this point, which requires defining the scope and making an initial appraisal of the representative products for the carbon footprint. The accounting standards used (e.g., GHG Protocol, ISO) and the forms of greenhouse gas considered are defined.

In order to reach the net-zero targets, other forms of greenhouse gas apart from CO_2 also have to be taken into account, such as CH_4, N_2O, HFC, FC, SF_6, and NF_3 (carbon dioxide equivalents – CO_2e).

Scope 3 emissions are required to be recorded in the upstream value chain up to the point of raw material extraction. Data should be gathered from the correct data sources in line with the defined accounting standard, such as the GHG Protocol, which provides a solid basis.

In practice

An example OEM 2030 decarbonization strategy set the target of reducing greenhouse gas emissions by 70% in production, by 35% in the use phase, and by 25% in the supply chain. A total of 96% of emissions were upstream and downstream in this example. The emissions from purchased goods and commodities alone (scope 3.1) account for 23% of total emissions, with 20% of them via direct suppliers (tier 1) and the lion's share of almost 80% via tier-n suppliers.[8]

Stage 2: Measurement – gathering data, calculating CO_2e emissions and improving data quality

Gathering ESG data is typically one of the main problems in decarbonization of the supply chain. It is an extremely time-consuming task. However, the footprint can only be reduced if there is sufficient transparency in sufficient depth. The highly complex nature of the data and the variety of sources mean that measures are required to ensure the quality and depth of data, also at the technical level. Data on scope 3 emissions should be reviewed by external auditors, although increased scope of examination in the supply chain can certainly pose challenges. It is important to determine the optimum data quality for each purpose to ensure an efficient approach at this stage.

CO_2e emissions are projected largely on the basis of purchasing data relating to components, primary products and raw materials, and of specific emission factors such as those of a high-volume model, which are then extrapolated to the entire fleet. This can be done using specialized databases that enable a well-founded estimate of the footprint of certain primary products and raw materials from the relevant region. There is a whole range of possible data sources, including supply surveys, input-output models, hot-spot analyses, life-cycle assessments and links between management and IT systems. Links to financial ERP data should also be considered in the context of data linking. Sufficient transparency and data depth must be guaranteed for all significant suppliers and measures in order to create the necessary data basis.

In practice

A global chemical company achieved astounding success with this type of ambitious and comprehensive data approach. It established group-wide transparency about the climate footprint of the entire product range, comprising tens of thousands of items, based on a modern data approach. This is the type of information that actually makes it possible for customers to make climate-neutral choices, and is therefore an essential requirement for effective decarbonization.

In practice

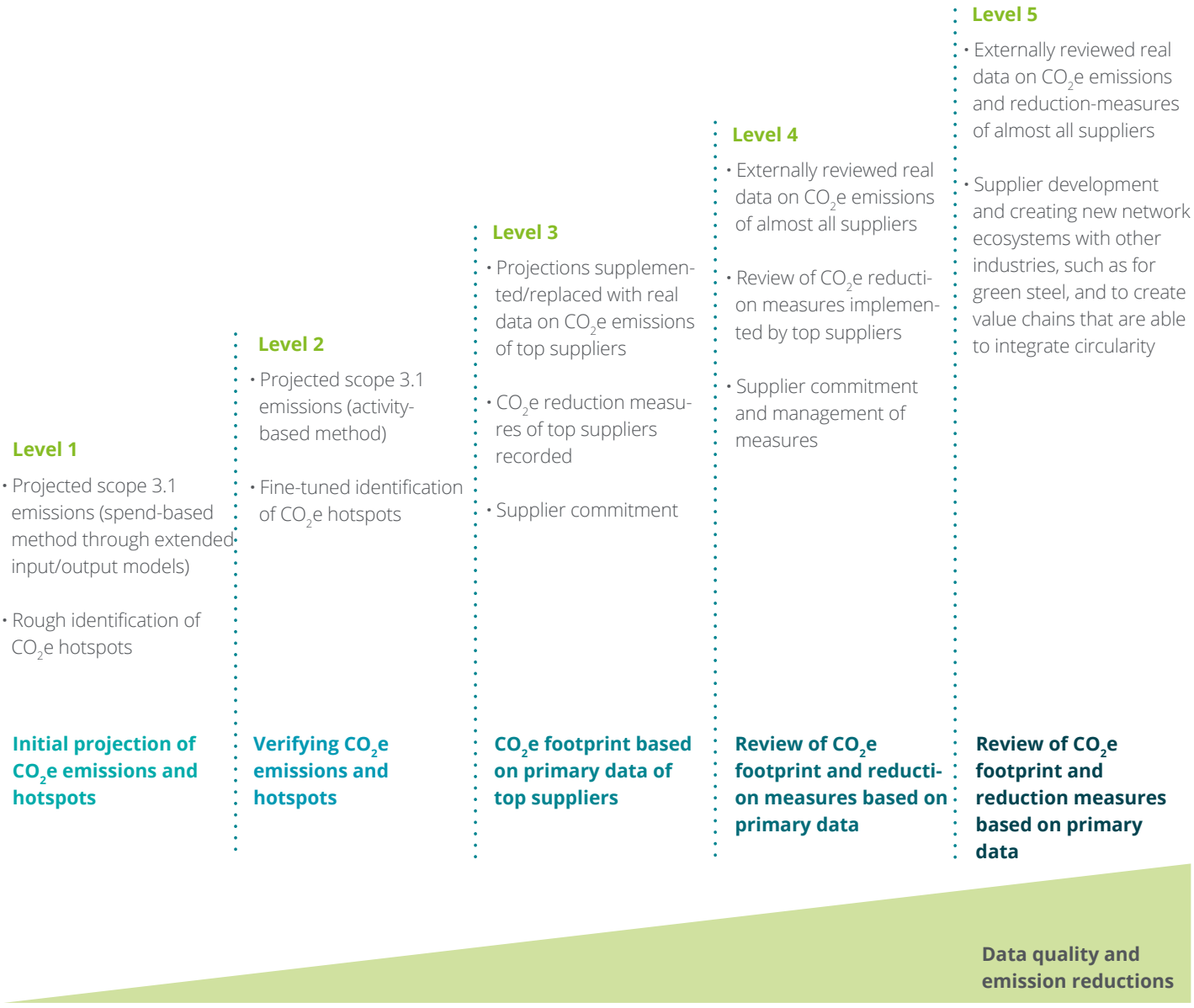
Another global manufacturing company developed its own tool to measure CO_2e emissions based on supplier primary data.

It also produced learning materials and proposed measures to reduce carbon emissions. However, most companies still rely on secondary data and manual data interfaces with a large number of suppliers in a complex environment.

At higher levels of maturity, the secondary data can be replaced by primary data from suppliers, thereby providing a more robust basis for measuring the footprint. In the final stage, externally verified real data from the suppliers is included in the company's own scope 3.1 footprint.

[8] Average emissions distribution of an OEM in 2022

Fig. 4 – Maturity of emission data for the supply chain



Pioneers in decarbonizing the supply chain have their suppliers' CO_2e emissions verified externally and initiate new measures jointly.

Stage 3: Decarbonization – setting targets, planning a roadmap, initiating avoidance and reduction measure

Another important aspect is comparing goal divergence in procurement, as cost-cutting and emission reduction targets can be at odds.

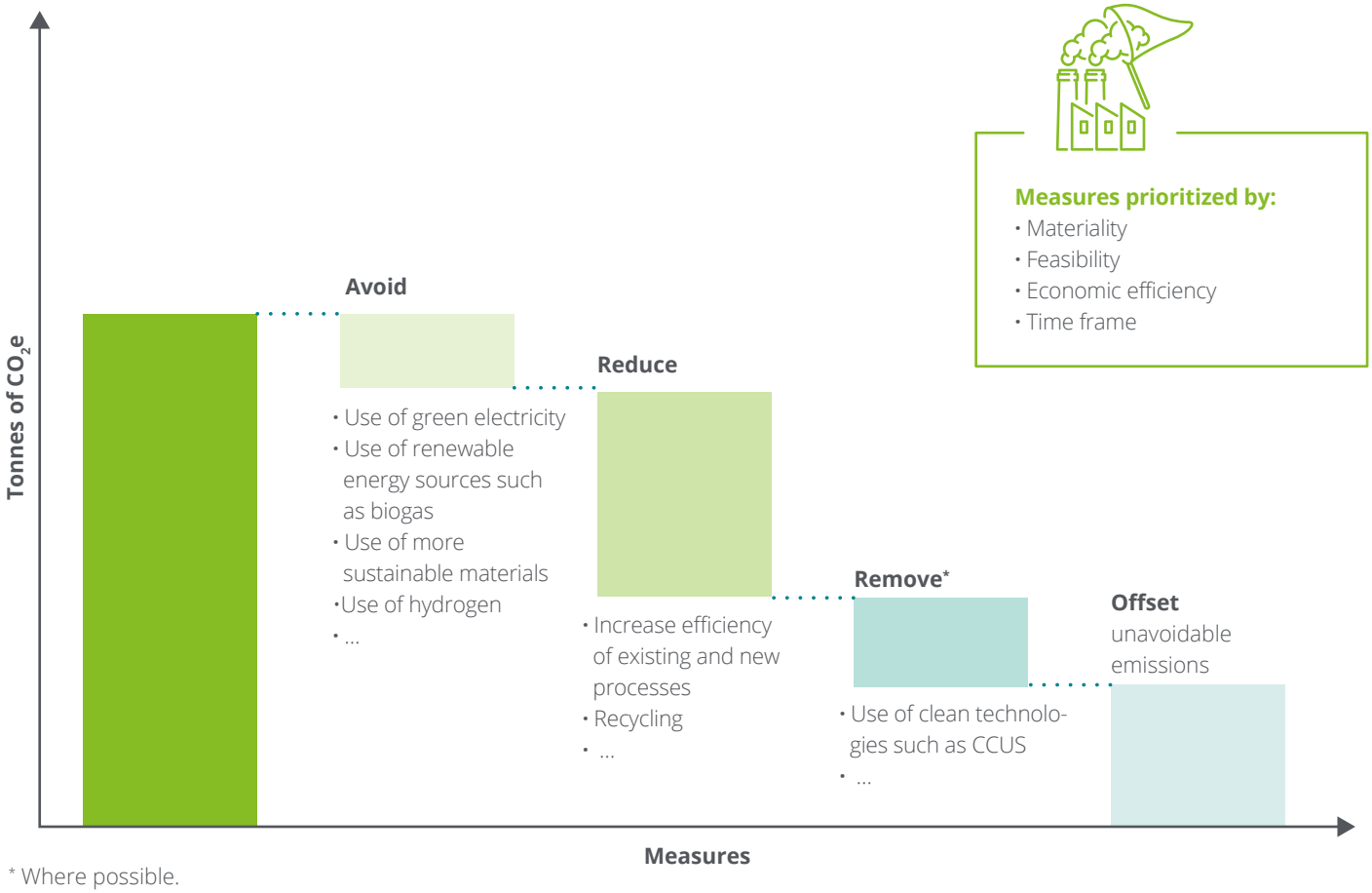
Reducing the carbon footprint in the supply chain follows the well-known hierarchy: avoid, reduce, remove, offset. Stage 3 involves deriving specific and effective measures to this end and prioritizing them in terms of their decarbonization impact for the company in question. It is important to consider the current and future environmental conditions in this regard (taxes, subsidies, etc.)

Appropriate avoidance, reduction and removal measures are to be determined based on the main sources of emissions from stage 2 and prioritized with a view to materiality (climate impact), timeline, required outlay and technical feasibility. Potential offsetting projects need to be devised for the remaining portion of unavoidable emissions, with attention paid to quality criteria. Any goal divergences between financial savings targets and greenhouse gas reduction targets are to be identified and resolved. The cost effectiveness of each measure must be considered, as well as which measures could also improve the cost-benefit ratio.

Close cooperation with the supplier network is paramount for successful planning of measures. This forms the basis for decarbonization targets and specific material targets such as a 70% ratio of secondary raw materials for aluminum purchasing.

The final step is to initiate the prioritized avoidance and reduction measures with the top suppliers.

Fig. 5 – CO_2e reduction measures



* Where possible.

Stage 4: Integration and management – managing measures and developing suppliers

Clear responsibilities need to be defined and relevant KPIs implemented for the company and the department in order to manage the measures efficiently and continuously. If the suppliers have already disclosed their CO_2e emissions or even integrated them in the supplier tender, supplier development and the search for low-carbon materials can now be initiated, or secondary raw materials or other alternative materials used.

There is a range of potential mechanisms to promote sustainability in the upstream supply chain. CO_2e-reduction initiatives vary widely depending on the importance of the supplier and the necessary reduction in emissions.

Fig. 6 – Managing implementation

At the same time, it is advisable to establish KPIs internally to measure target achievement, e.g., carbon per vehicle, carbon per kg of material, or even "further removed" KPIs that measure decarbonization measures (e.g., ratio of secondary material/green material per material category).

Linking this with the internal bonus incentive provides motivation at management level to take a long-term view in supplier selection. Potential external management mechanisms include supplier assessment systems, target agreements and supplier audits (also involving external agencies). The mechanisms should be selected based on the existing level of influence. Whereas tier-1 suppliers can be managed directly, indirect mechanisms need to be developed for tier-n suppliers, depending on effective cascading of the defined material efficiency targets.

In practice

For instance, implementation with suppliers at a major consumer goods manufacturer was expanded to tier 4 (raw material producers). The targeted development of suppliers of critical raw materials was also an important step in the sustainability strategy. A digitalization initiative with technical support options is intended to further increase transparency in this company's supplier network.

Introducing an internal carbon tax or carbon shadow price provides particularly effective leverage, as these help to offset the costly reduction measures.

Resources can also be taken from a carbon fund, which could be fed by carbon shadow price payments, for instance. This means that what were previously expensive decarbonization measures are now cost-neutral for the department, and therefore realizable.

This in turn enables the reduction target to be continually increased. An internal CO_2e price also enables suppliers to be selected that are more expensive in purely financial terms, but more cost-effective where the CO_2e price is concerned because they offer low-carbon products. It is also important to eliminate goal divergences between the purchasing and emission reduction targets.

However, purchasing is not only responsible for implementing low carbon procurement approaches where possible, but will also have other strategically demanding roles in future.

The procurement function should be involved in the decision-making stage on new products, and should have a veto right in order to reinforce the "sustainability" design target from the very start.

Four management mechanisms for decarbonization of the supply chain

1) Internal KPIs to measure CO_2e emission reductions
2) Carbon tax or shadow price
3) Inclusion of CO_2e emissions in supplier tenders
4) Target agreements for suppliers and supplier audits

Moving towards climate neutrality together

Optimizing the climate footprint of the intermediate products and raw materials used first requires projecting the emissions concerned, and then comparing them with real data. Measures are then defined, management and monitoring mechanisms developed, and implementation planned. Cooperation between the departments within the organization and outside of the company is key to the entire process – in particular for suppliers – as this is the only way to create transparency in the supply network and reliability in terms of realization. Companies should also cooperate with associations, research institutions and competitors when it comes to decarbonizing the supply chain, such as in establishing climate-neutral raw materials supply (e.g., green steel) and developing suppliers of critical raw materials.

Forward-looking projects such as the Catena-X data sharing platform provide effective digital leverage for this cooperation, and demonstrate what is already possible in terms of technology.

Effective decarbonization of the supply chain is only possible with a comprehensive ecosystem. The tremendous importance of cooperation also applies to other key sustainability approaches such as the circular economy.

Deloitte offers valuable support in this process as a competent partner, with solutions including evaluating a company's climate impact and net zero readiness, digital carbon footprint calculations in line with established standards, and the GreenLight Solution, a modular software solution for decarbonization with a strong network of alliance partners.

Decarbonization of the supply chain is an indispensable component of the sustainability strategy – in particular for industrial companies – not to mention the considerable advantages in terms of resilience that can be achieved through data-driven transparency in the supply network. That's why now is the time to make this issue the top priority on the strategic agenda.

Contacts

Lars Essers
Director
Sustainability & Climate
Co-Lead Risk Advisory
Tel: +49 211 8772 5423
lessers@deloitte.de

Cathleen Gutglück
Senior Manager
Sustainability & Climate
Climate Lead RA Germany
Tel: +49 69 75695 6210
cgutlueck@deloitte.de

Flora Borek
Senior Manager
Sustainability & Climate RA
(Central Europe)
Tel: +36 20 268 2817
fborek@deloittece.com

Tobias Hausotter
Senior Manager
Sustainability & Climate
Tel: +49 30 25468 5472
thausotter@deloitte.de

Tanja Schäfer
Senior Consultant
Sustainability & Climate
Tel: +49 40 32080 8676
tanschaefer@deloitte.de

Manuel Rücker
Senior Consultant
Sustainability & Climate
Tel: +49 89 29036 6625
mruecker@deloitte.de

Deloitte.

Issue 09/2023