



Towards carbon neutrality

How to sustainably optimize your carbon footprint



Increasing ambitions of OEMs to reduce CO₂ emissions will drive sustainability requirements for suppliers

Emission reduction & sustainability announcements by automotive OEMs (selection)

Volkswagen

Way to Zero

- Until 2030:
 - Electric vehicle should account for 80% in European production share
 - CO₂ emissions reduced of individual vehicle by 40% in comparison to 2018
- Until 2050: CO₂-neutrality

Electrification of the fleet

Utilisation of green electricity

Decarbonisation of the supply chain

Recycling the vehicle



Daimler

Vision to 2039

- Until 2030:
 - CO₂ emissions reduced of individual vehicle by 50% in comparison to 2020
 - 70% coverage of energy in production with renewable energies
- Until 2039: Entire new vehicle fleet to achieve CO₂ neutrality throughout the value chain and life cycle



Volvo

Road to climate neutral

- Until 2030:
 - Every new vehicle is solely electric
 - CO₂ emissions reduced of individual vehicle by 75%
- Until 2040:
 - Net greenhouse gas emissions of zero
 - Being a circular economy company



CO₂ emissions will become a decisive factor in automotive sourcing

Source: [Volkswagen](#), [Daimler](#), [Volvo](#)

Executive Summary: AVL and SE Supporting in Achieving your CO₂e Targets



Corporate Level

Scope 1, 2, 3 emissions
Strategic actions to become
carbon neutral

 **Vision**  **Methods**  **Targets**  **Roadmap**

CO₂e ... Carbon dioxide equivalent; metric measure, converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential



Product Level

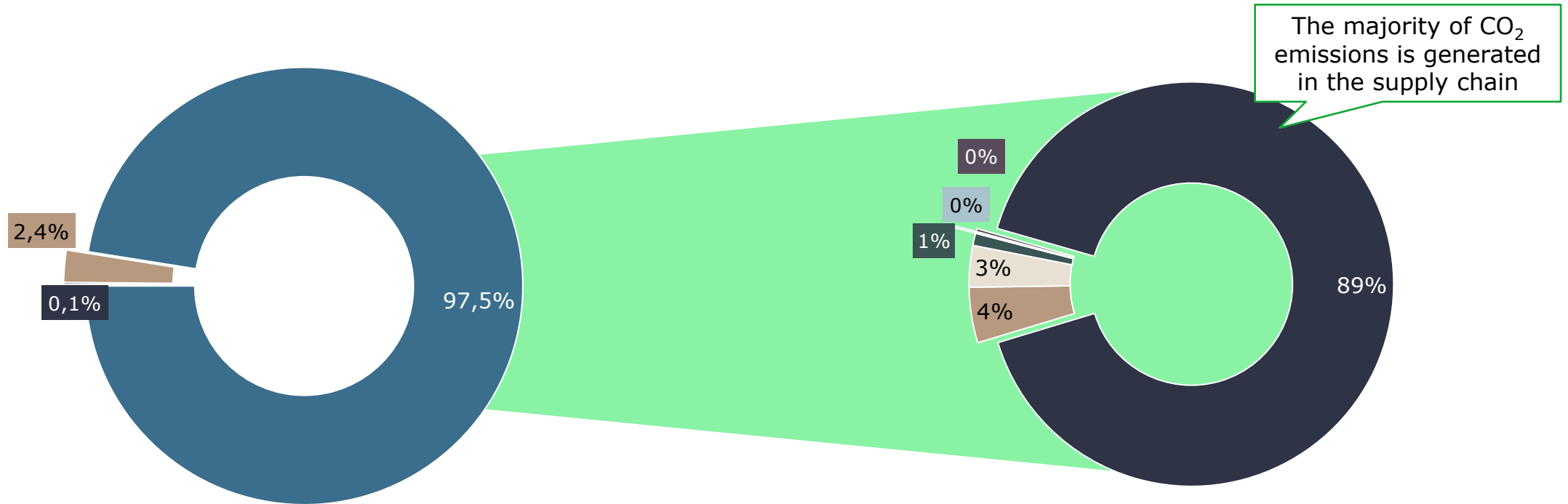
Environmental footprint for
components, drivetrains and
vehicles

 **Product footprint optimization**
 **CO₂ Supplier management**
 **Sustainable design of components**

Product-related emissions are currently the main emission driver – Component and raw material suppliers will be pushed to reduce their footprint

Exemplary corporate CO₂ emissions

PROJECT EXAMPLE: TIER 1 SUPPLIER



- Scope 1: Direct emissions (combustion of fossil raw materials)
- Scope 2: Indirect emissions (use of electricity)
- Scope 3: Emissions from company processes
- Purchased components
- Transportation
- Production materials
- Employee commuting
- Business travel
- Other

Source: Strategy Engineers

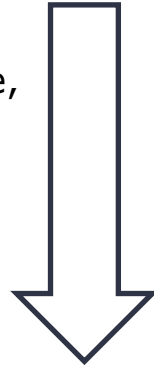
CO₂ emissions must therefore be considered and determined from the company's and the product's point of view

How can CO₂ emissions be determined?

Corporate Carbon Footprint

Top-down:

- Assessment of company-wide, overarching CO₂ emissions



Bottom-up:

- Calculation of CO₂ emissions of purchased components of selected products
- Extrapolation to entire product range to determine supply chain emissions



Scope 1 emissions¹⁾

- Stationary combustion
- Mobile combustion
- ...

Scope 2 emissions¹⁾

- Purchased electricity
- Purchased energy
- ...

Scope 3 emissions¹⁾

- Purchased goods and services
- Fuel and energy-related activities²⁾
- ...

Product Carbon Footprint

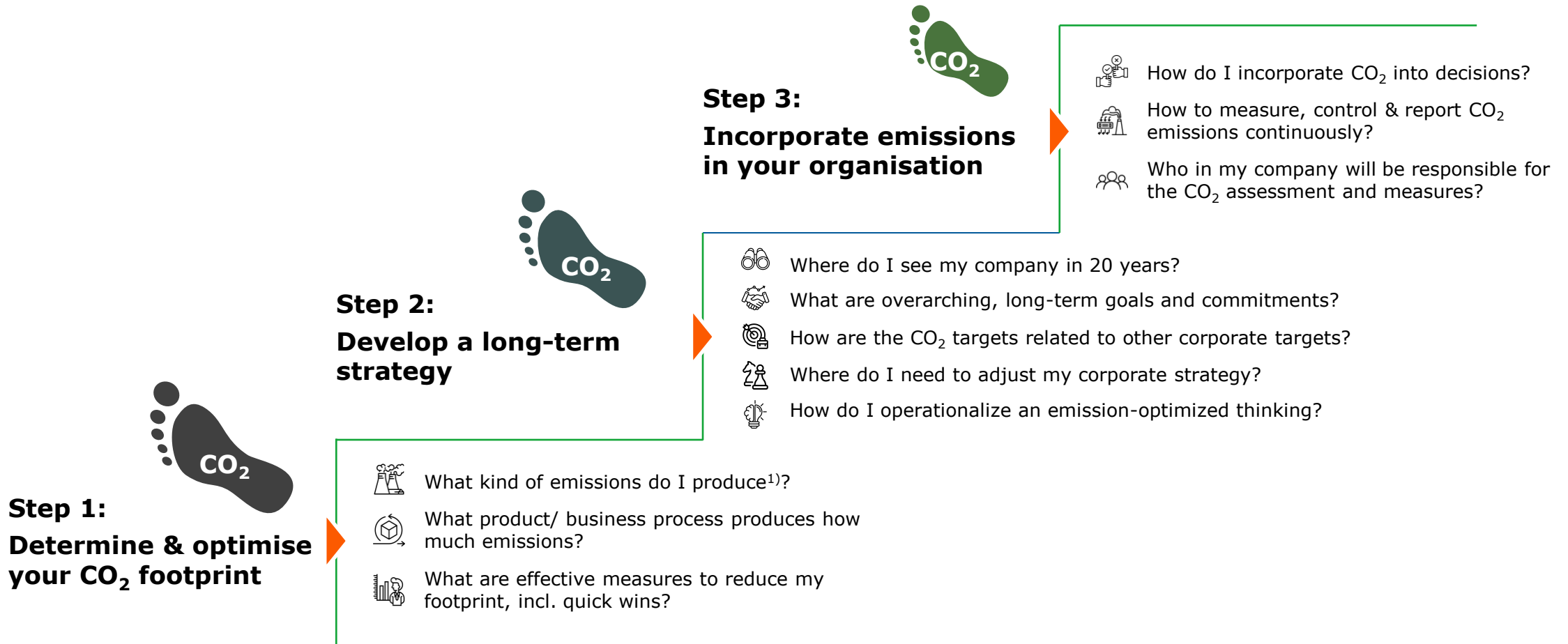
Bottom-up:

- Calculation of product-specific CO₂ emissions included:
 - Raw materials
 - Pre-production within supply chain (purchased components)
 - Transport of purchased components
 - In-house production / assembly
 - Distribution of products

Source: Strategy Engineers | 1) According to GHG protocol | 2) not included in scope 1 or scope 2

After an initial optimization of the carbon footprint, next steps are the development of a strategy and the incorporation of emissions in the organization

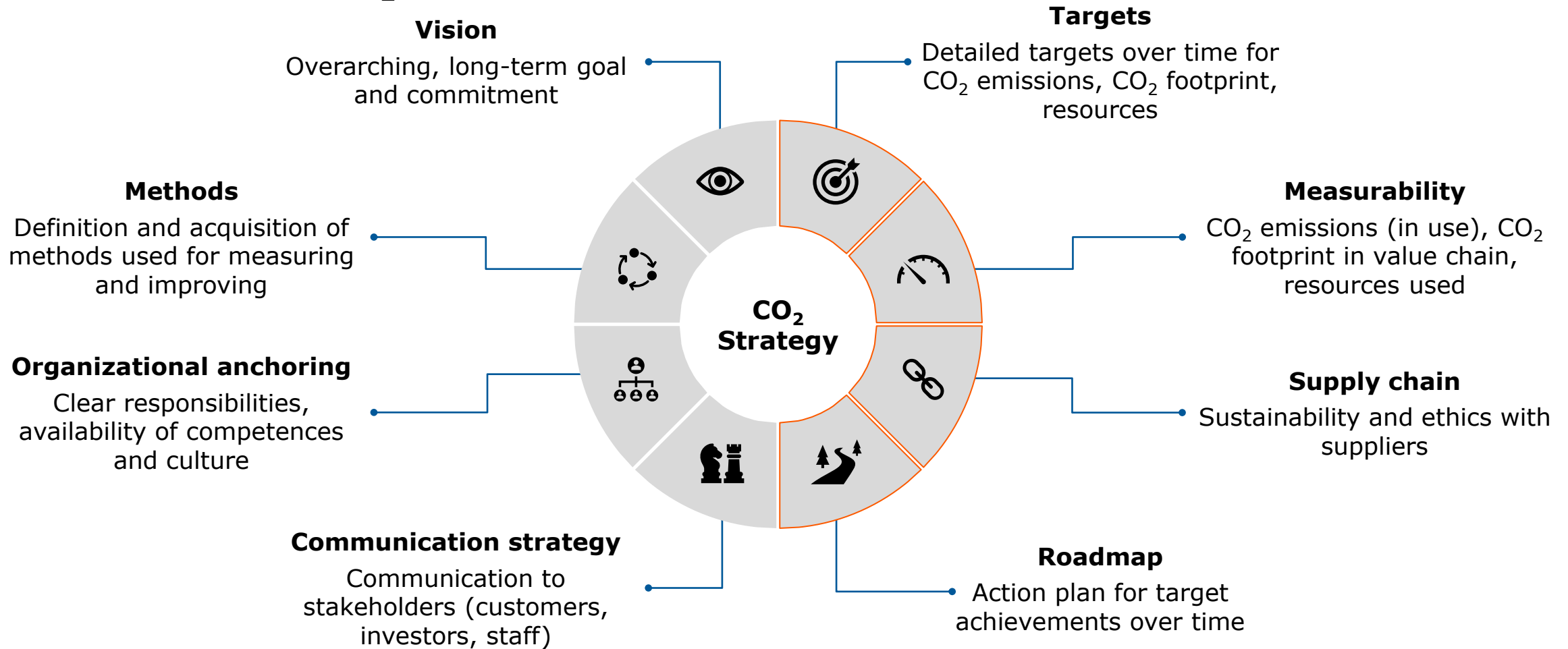
Which steps must be taken to achieve climate neutrality?



Source: Strategy Engineers | ¹⁾ According to ISO standard | Steps depend on the individual client situation

A comprehensive CO₂ strategy should address 8 key elements

Key elements of a CO₂ strategy



Source: Strategy Engineers |  Includes concrete data content

Our consulting offerings support you on your way to net zero

AVL and SE consulting offerings towards carbon neutrality



CO₂ footprint optimisation

Determination and optimization of the carbon footprint of your company



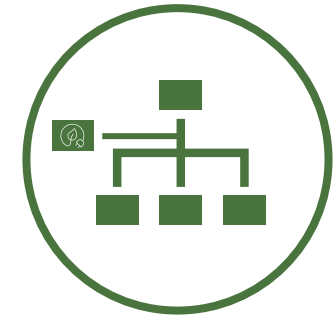
Focus topic: Reduction of direct CO₂ emissions

Technological and economical analysis of the introduction of climate-neutral energy supply systems, production facilities or vehicle fleets



Sustainability strategy & review of business model

Definition of corporate targets based on e.g. emissions and recycling, as well as development and evaluation of new business models



Integration of sustainability in the organization

Integration of sustainability into the organization and processes, including decision-making mechanisms, roles and responsibilities

SE & AVL provide a unique combination of technical industry expertise and consulting methodologies to deliver implementable solutions



Joint value proposition SE & AVL



Your trusted advisor in the technology-driven industries – delivering real implementable solutions

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