

An aerial photograph of a two-lane asphalt road that curves through a dense, lush green forest. Several cars are visible on the road, including a white car in the upper left, a blue car in the upper right, and a white car in the lower right. The text 'Decarbonization Roadmap for the Automotive Industry' is overlaid in large, white, sans-serif font on the left side of the image.

Decarbonization Roadmap for the Automotive Industry



Index

1. Project concept
2. Results from 1st Phase
3. Ongoing challenges
4. Final Remarks



Different Phases of the Project



The project was split into two distinct phases:

- Phase I

Involving 20 companies, members of Mobinov – 2023

- Phase II

Involving 10 companies, members of Mobinov – 2024



5. Roll-out and expansion

Start of the process of **implementing different decarbonization initiatives** and extending them to other companies that make up the national automotive sector

4. Communication and Training

Implementation of a **communication plan** across the entire project, aimed at **training the sector** on this topic and **disseminating and promoting** best sustainability practices

3. Decarbonization Roadmap

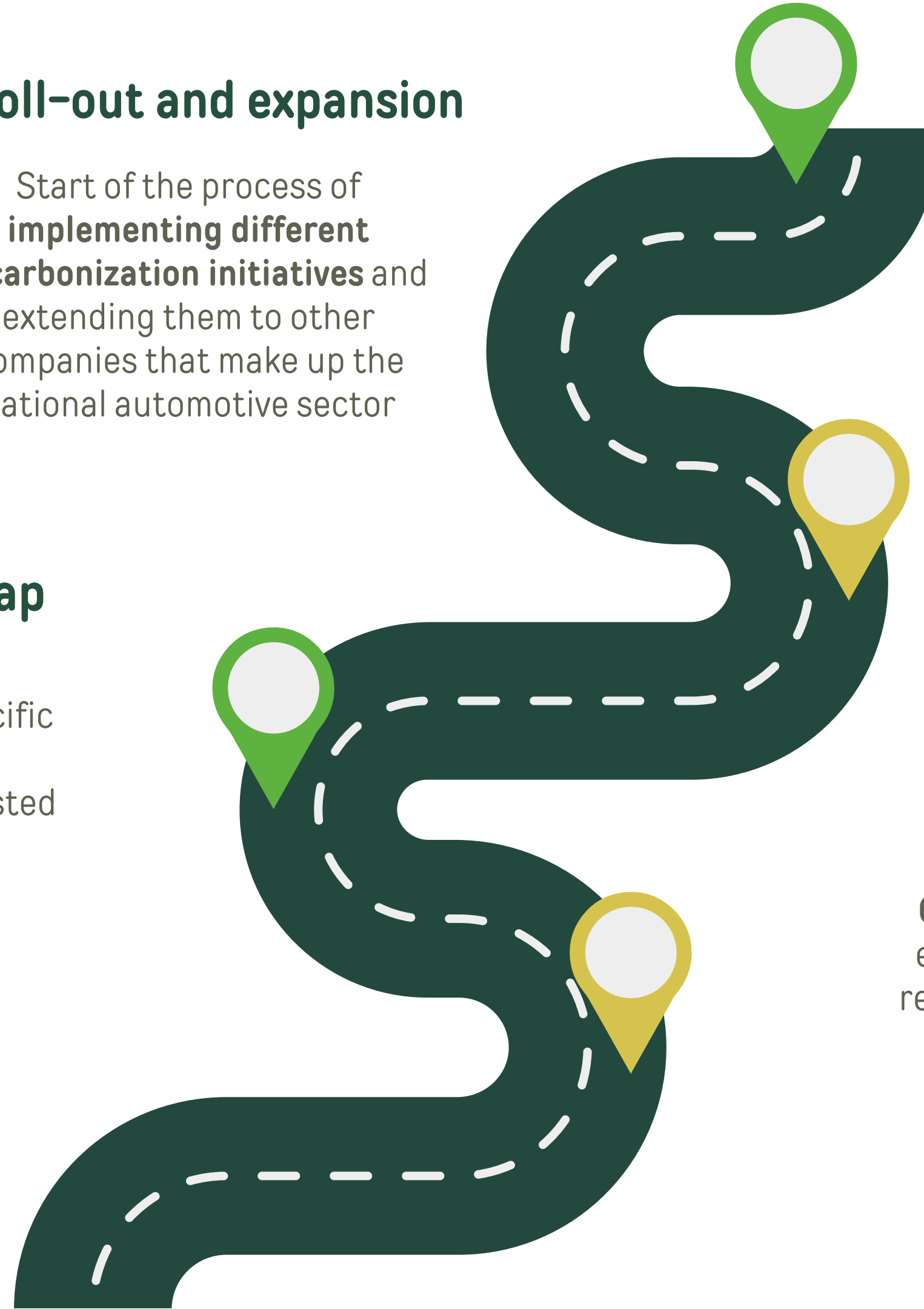
Development of a sector **decarbonization plan** with specific initiatives, targets and **implementation roadmap** adjusted to the sector's reality

1. Context Analysis

Characterization of the sector's main **value chain**, assessment of the main national and international **drivers** and development of a **benchmark analysis**

2. Carbon Footprint

Quantifying greenhouse gas (**GHG**) emissions from 30 companies/sites representing the national automotive sector using a **cradle-to-gate + distribution approach**.





3. Decarbonization Roadmap

1

Macro Targets Definition for decarbonization targets for different temporal horizons

2

Development of specific initiatives for reducing emissions and adapting to climate change across value chains

3

Creation of an implementation roadmap with defined temporal horizons, identifying main risks and opportunities.

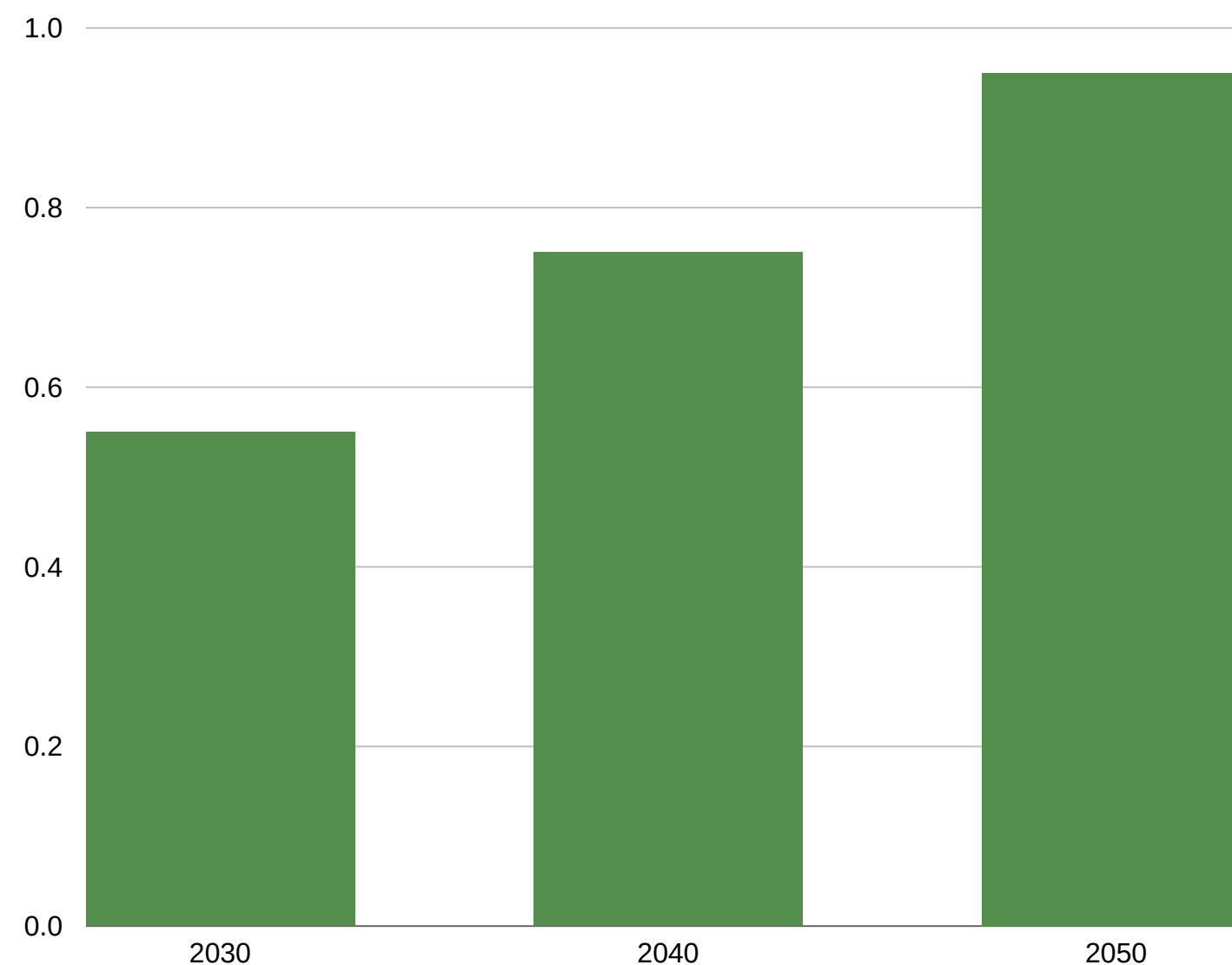


Results from the 1st Phase





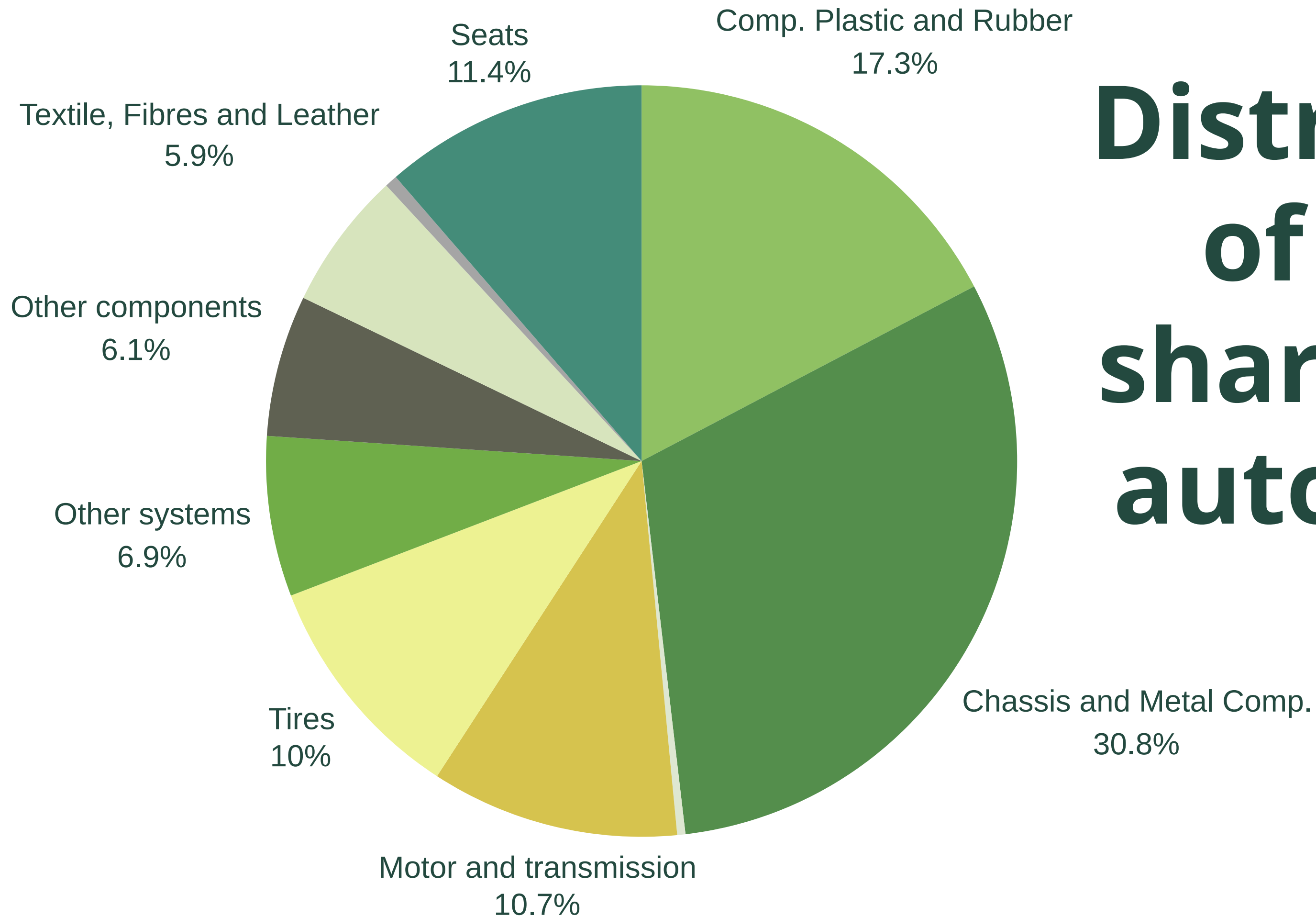
Portugal must achieve carbon neutrality by 2050, which may be brought forward to 2045.



Portuguese Carbon Neutrality Roadmap

Source: Roteiros para a Descarbonização no Setor Automóvel | KPMG, Mobinov 2023

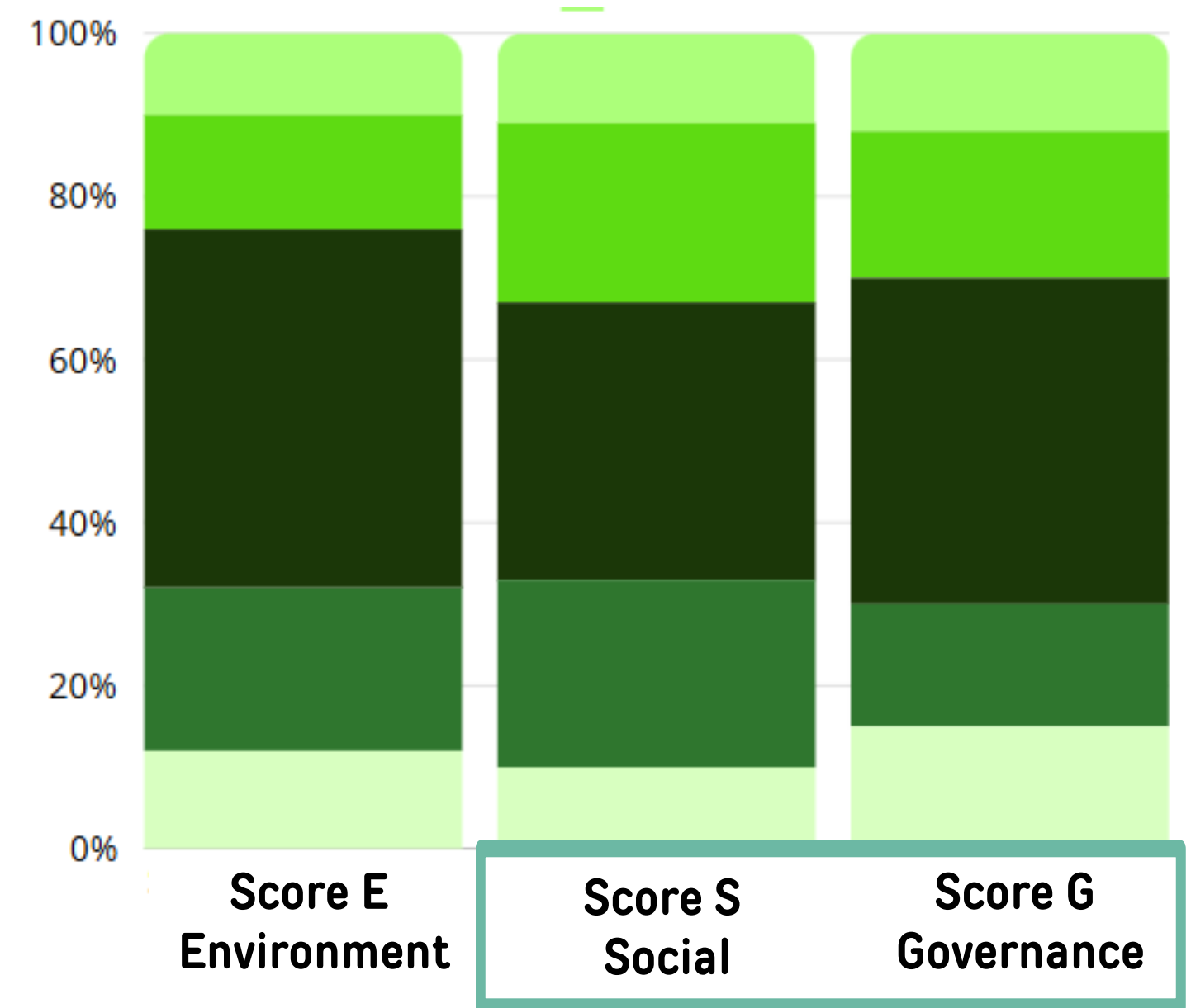
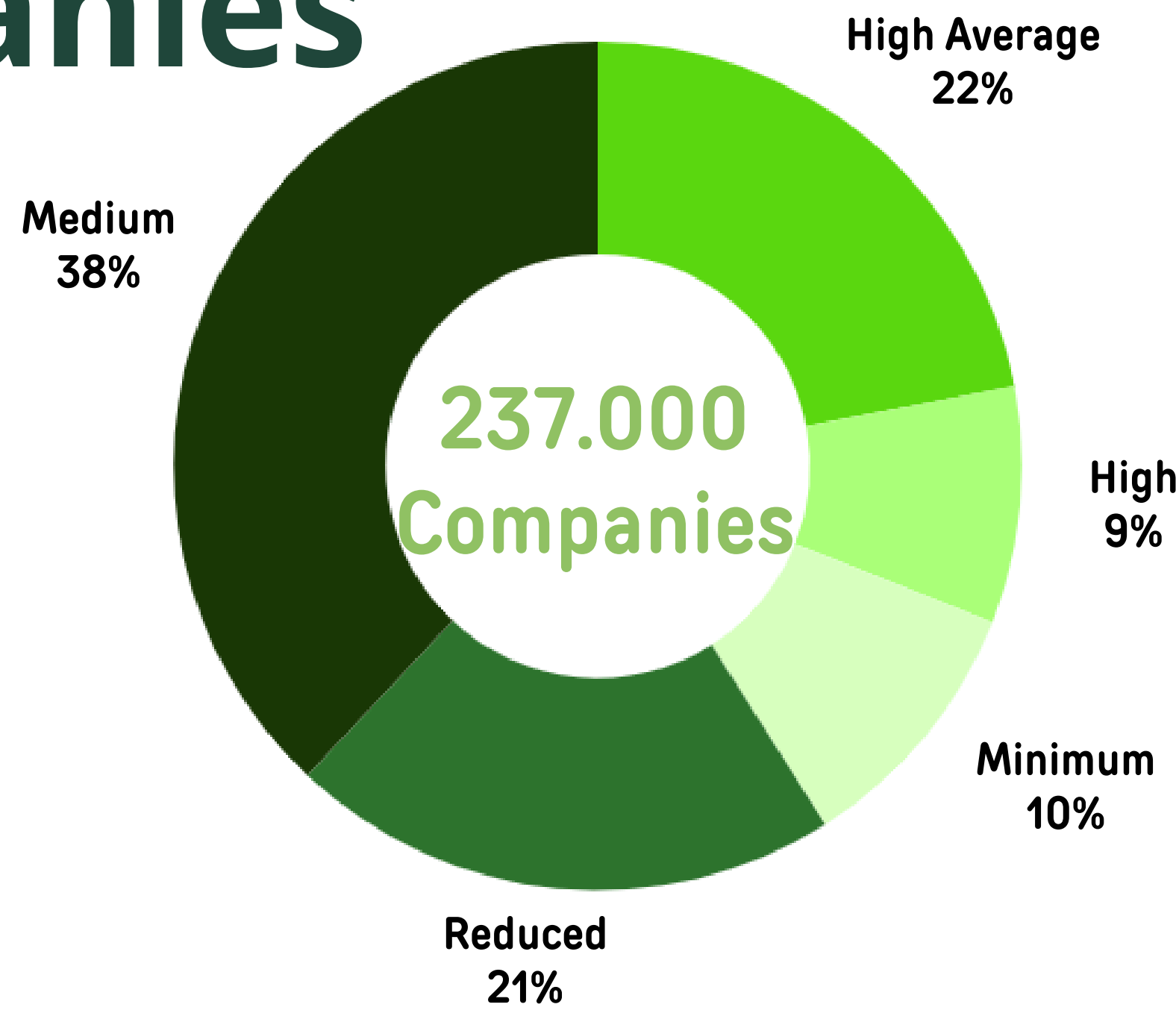
Distribution of market share in the automotive sector



Turnover \approx 30.000 M€

Total de RH do
Setor \approx 125.400

Score ESG of Portuguese Companies



Areas where
Portuguese
companies are
more advanced

Note: Score ESG date de Dez/2023 with financial Data referring to 2022 |
Source: Score ESG Informa

Scope Analysis

Production Process

Product Innovation

Transportation

Power Generation

Raw-Material

Scope 1

Scope 1 emissions in the national automotive sector are essentially centered on three large groups: fleet fuel, factory fuel and fluoridated gases



Maturity Level



Automobile fleet electrification



Leakage reduction and gas recycling



Electrification of the internal processes

Scope 2



Market-Based Emissions

The estimated greenhouse gas emissions from electricity consumption are 200,989 tCO₂eq/year.



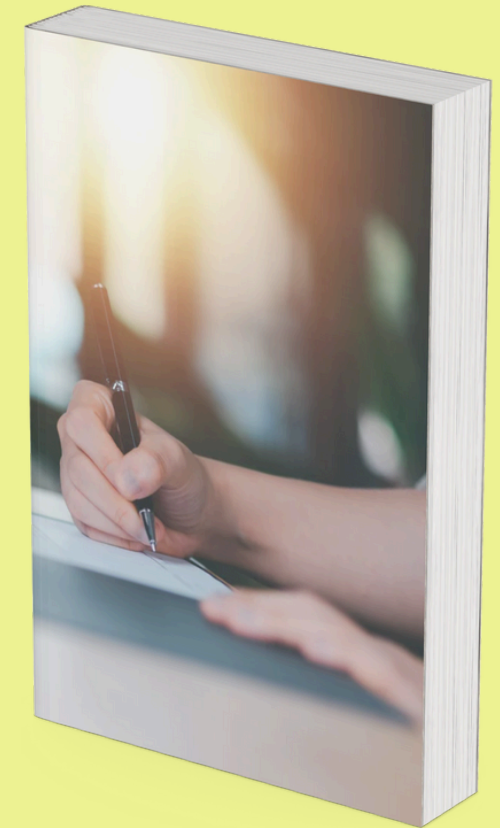
Emissions Location-Based

They amount to 134,845 tCO₂eq/year.



Energy Productive Capacity Renewables

Installed energy production capacity, equivalent to 5% of total energy consumed



Power Purchased Agreements (PPA)

29% of companies in the sector present a PPA to ensure the incorporation of renewable energy into their energy mix

Scope 2

Maturity Level



Installation of Photovoltaic Panels



Purchasing Energy from Certified Green Sources

Scope 3

77,4%

Average weight of
Scope 3 in the
portuguese automotive
sector

95%

Average weight of Scope 3
in the miscellaneous
systems and other
components subsector

**7 861 242
tCO₂eq**

Total emissions
associated with
Scope 3 in the
national automotive
sector

Scope 3

Maturity Level



Acquisition of low carbon footprint products



Reduction of raw materials used via eco-design and Smart Design



Shortening the Value Chain



Transport Optimization



Investing in low-emission road freight transport



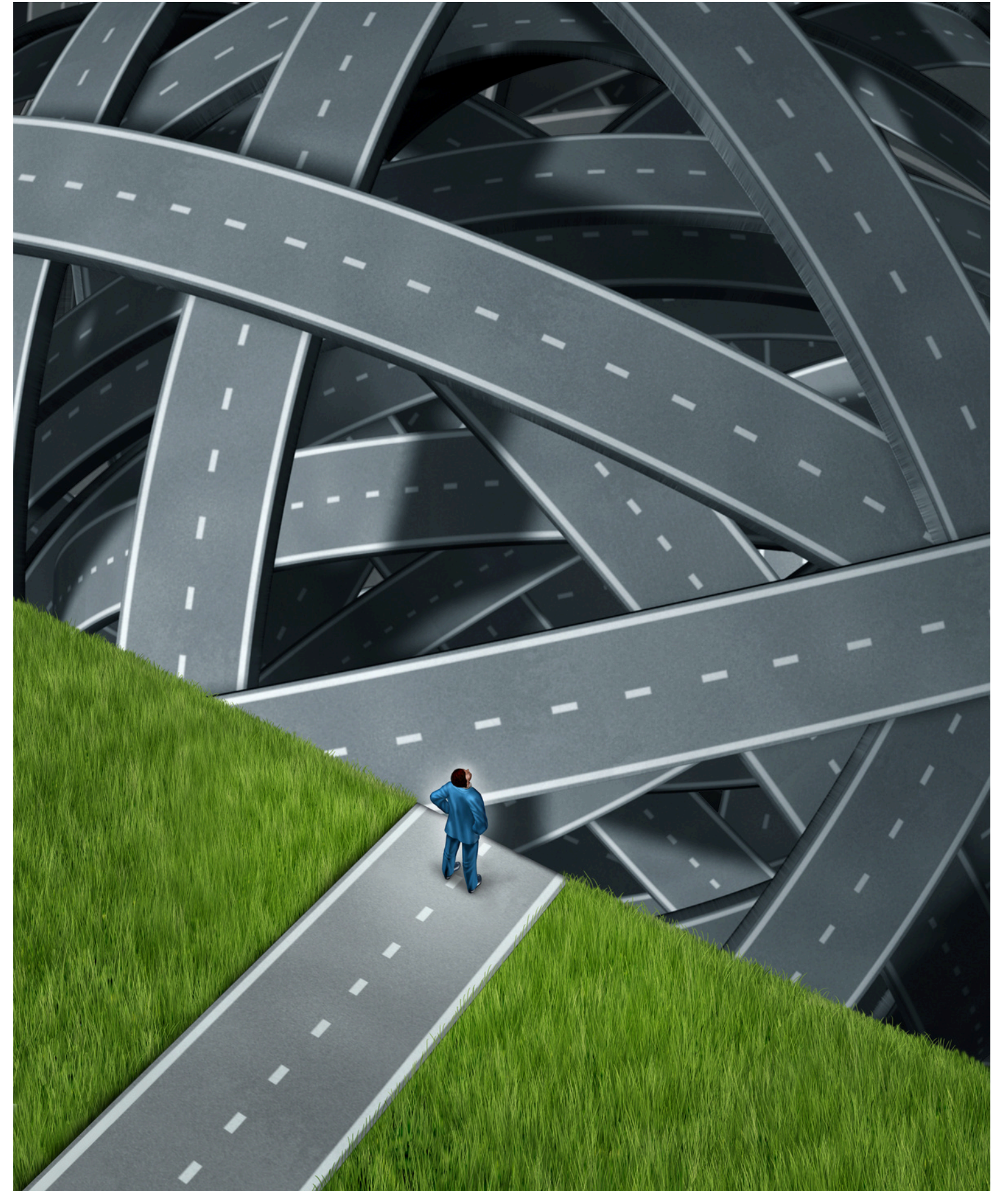
Investing in low-emission air and sea freight transport

Having analyzed a wide variety of goods, raw materials, and services acquired by companies, these results reinforce the importance of acting at the level of the respective value chains, prioritizing and valuing suppliers that offer products and services with lower GHG emissions.





Ongoing Challenges



There is a global pressure at multiple levels to achieve carbon neutrality.



Innovations and Trends Driving Renewable Energies

1. AI-powered solar energy production systems with modular panels on facades.
2. Development of Energy Communities in line with the National Energy and Climate Plan (PNEC) 2030.
3. Development of new energy storage systems such as solid-state batteries, sodium-ion, and carbon dioxide.
4. Integrated and intelligent management solutions for electrical consumption of infrastructures using AI-based predictive models.





Examples of Other Low Carbon Footprint Materials

1. Production of materials from renewable sources like soy, combined with other biobased products, can reduce GHG emissions by 90% in seats.
2. Polypropylene with short glass fibers and recycled polypropylene with glass fibers benefit from sustainable manufacturing and recycling processes, reducing carbon footprint by up to 60%.
3. Recyclable suede surface solutions made from polyester yarn extracted from recycled plastic bottles, finished with recycled wool, reduce water, energy consumption, and emissions in manufacturing.

Nearshoring and Maritime and Air Freight

1. Restructuring value chains to shorten them, despite potential premium costs for raw materials, optimizes processes, reduces GHG emissions, and increases resilience.
2. Portugal is considered the second most attractive country for nearshoring in the industry.
3. Maritime transport is investing in decarbonization technologies, such as biofuels, electrification, energy optimization, and direct emission capture.
4. The air transport sector is reducing its footprint by investing in SAF, greater efficiencies, hydrogen, and emission offsets.
5. Both maritime and air transport sectors aim to be net zero by 2050.





Final Remarks



Key Points and Initiatives

- Periodic quantification of Scope 1, Scope 2, and Scope 3 emissions
- Digitalization and automation of carbon footprint quantification through specific software
- Allocation of emissions to respective products and development of reporting and communication tools
- Development of climate risk assessments
- Implementation of technological solutions to support climate assessments
- Development of mitigation plans for identified risks

Outputs

- Detailed annual GHG emissions monitoring reports
- Continuous and automated GHG emissions monitoring and allocation to products
- Product passports for tracking and direct communication with stakeholders regarding their climate impact
- Climate risk assessment framework
- Digitalization and automation of the climate risk assessment process
- Mitigation plans for climate risks

¹Reduções estimadas face a pegada carbonica global do setor

Programas	2030 ¹	2040 ¹	2050 ¹
Eletrificação das Organizações	-24%	-90%	-90%
Energias Renováveis	-100%	-100%	-100%
Matérias Primas de Baixa Pegada Carbónica	-20%	-40%	-95%
Transporte de Mercadorias Neutro em Carbono	-14%	-53%	-98%
Economia Circular e Gestão Eficiente de Resíduos	-23%	-34%	-69%
Viagens de Negócio de Baixa Pegada	-28%	-100%	-
Mobilidade Suave	-30%	-72%	-80%
Créditos e Compensação Carbónica	33 694 tCO ₂ eq	235 859 tCO ₂ eq	673 882 tCO ₂ eq

Monitorização da Pegada Carbónica e Passaporte de Produtos

Avaliação de Riscos Climáticos

Nearshoring e Reformulação das Cadeias Logísticas

Cluster de Reciclagem de Veículos e Baterias

Formação e Sensibilização para as Alterações Climáticas

Estas iniciativas, tendo como grande foco a adaptação e o aumento da resiliência das Organizações aos riscos e impactos climáticos, possuem também um impacto indireto ao nível da redução das emissões do setor, permitindo otimizar os processos de gestão e alavancar os targets e os resultados preconizados no restante Roteiro



**Entidades
Governamentais**



**Associações do
Setor Automóvel**



**Empresas do
Setor Automóvel**



**Stakeholders e
Parceiros**

Obrigado!
Thank You

