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Toward Sustainable Mobility: The Stellantis Case Study

Environmental Initiatives and Digital Communication in the Automotive Sector

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ABSTRACT

In an era where climate change and environmental concerns are reshaping industrial priorities, the automotive sector stands at the forefront of the green transition. This thesis investigates Stellantis as a case study, exploring the company's environmental initiatives and its approach to sustainability communication. It examines how Stellantis integrates ecological strategies across its operations, from circular economy practices and electrification plans to green investments and supply chain management. Furthermore, the thesis explores Stellantis' use of digital platforms such as websites and social media for communicating sustainability to stakeholders. Through qualitative research, including official reports and social media content analysis, this study evaluates the company's communication strategies and identifies areas for improvement. The results emphasize the importance of aligning corporate sustainability actions with transparent and engaging communication to foster stakeholder trust and drive systemic change in the automotive industry.

1. Introduction

In recent years, sustainability has become one of the key challenges and priorities facing contemporary society. Increasing concerns about climate change, environmental degradation, and the depletion of natural resources are pushing governments, businesses, and all civil societies to adopt more responsible and forward-looking practices.

The automotive industry is among the sectors most directly affected by this transition, historically associated with high greenhouse gas emissions, resource-intensive production, and significant environmental externalities; it now finds itself at the core of a necessary and urgent transformation.

Within this evolving landscape, car manufacturers are expected to take an active role in designing, producing, and promoting mobility solutions that are cleaner, safer, and more sustainable.

This thesis explores the ecological initiatives and the communication of sustainability through social media channels in the automotive sector, with a specific focus on the case of Stellantis. The aim is to understand which actions are undertaken, how the company translates its environmental and social strategies into narratives and public-facing messages and how it could possibly improve. Effective communication, in this context, is not only a matter of transparency and accountability but it is also a crucial tool for shaping stakeholder perceptions, engaging consumers, and encouraging behavioral change. The research is based on a combination of publicly available sources and internal company information. Materials such as sustainability reports, the official corporate website, social media content, and sector-specific publications have been used to understand how the company communicates its sustainability efforts to the public. These sources offer useful insights into Stellantis' communication strategies, the narratives it promotes, and how these

align with international sustainability frameworks.
At the same time, the study also draws on internal data, which has made it possible to explore more closely how sustainability is managed and communicated within the company. This includes access to internal documents, and direct input from company representatives through interviews. The methodological approach is mainly qualitative and focuses on interpreting messages, strategies, and communication practices rather than measuring them in quantitative terms.

2. The Context of Industrial Sustainability in the Automotive Sector

2.1 Green Transition and Corporate Leadership in the Automotive Industry

The ecological transition in the automotive industry signifies a comprehensive transformation of production, distribution, and consumption models in response to the escalating demand for environmentally sustainable mobility. This shift is determined by multiple factors including the urgent need to mitigate greenhouse gas (GHG) emissions, the depletion of non-renewable resources, the tightening of international environmental regulations, and the gradually increasing awareness of sustainability-related issues by consumers.
Over the years, the automotive industry has played a major role in contributing to global carbon emissions, largely because of the dominant presence of internal combustion engine (ICE) vehicles. Nevertheless, in the last twenty years, growing regulatory demands combined with rapid technological advancements have increasingly pushed the sector to adopt more environmentally sustainable approaches. A crucial role has been played by the European Union in

promoting the ecological transition through policy instruments like the EU Green Deal, and the EU Taxonomy for Sustainable Activities. These frameworks aim to establish clear benchmarks for decarbonization, resource efficiency, and circularity within industrial sectors. Automotive manufacturers are now required to meet more and more stringent CO_2 targets and implement measures aligned with sustainable finance criteria to remain competitive and eligible for public, private investments and protected from heavy fines.

Moreover, the advent of digital technologies such as artificial intelligence (AI), the Internet of Things (IoT), and big data analytics is facilitating the development of new models of mobility that are smart, connected and environmentally sustainable. Innovations like autonomous vehicles, car-sharing platforms, and Mobility-as-a-Service (MaaS) are reshaping the way individuals engage with transportation, solutions like these have the potential to reduce the overall number of vehicles in circulation optimizing their utilization and consequently lower the environmental impact of mobility systems.

As mentioned before the tailpipe emissions from ICE vehicles have traditionally been the focal point of environmental concerns caused by the automotive industry but it's evident that also the automotive supply chain contributes significantly to the industry's overall environmental footprint. The production of materials such as steel, aluminum, plastics, and batteries involves energy-intensive processes that emit substantial GHGs.

For instance, the automotive value chain is responsible for approximately 10% of global GHG emissions annually [1]. The sector consumes 16% [2] of global steel and 30% of global aluminum each year [3].

The shift toward electric vehicles (EVs), while reducing tailpipe emissions, introduces new environmental challenges because the production of batteries can emit 35% to 50% more GHGs than traditional gasoline vehicles due to processes like mineral mining (such as lithium, cobalt, and nickel), metal smelting, and

manufacturing.

In particular the extraction and processing phases of these minerals have significant environmental and social impacts on the territory, these kinds of activities often occur in regions with neglected environmental regulations, leading to habitat destruction, water pollution, and human rights concerns.

To address these issues, automotive manufacturers need to focus also on decarbonizing their supply chains by adopting strategies like sourcing low-carbon materials, implementing circular economy principles, and investing in recycling technologies. For example, using low-carbon electricity, circular materials, and recycling, as well as technological improvements, emission intensities in the production of materials like steel and aluminum can be decreased by 69% to 91% by 2050 [4].

While advancements in vehicle technology are essential, a comprehensive approach that includes the decarbonization of the entire automotive supply chain is imperative for the industry's ecological transition. This holistic strategy ensures that environmental benefits are not offset by upstream emissions and that sustainability is achieved across all facets of automotive production and operation.

For this very reason in the context of the automotive industry's ecological transition, leading companies play a fundamental role not only as producers of goods and services but also as agents of systemic change. Their capacity to innovate, influence supply chains, set industry standards, and shape consumer behavior places them in a dominant position to accelerate the shift toward sustainability. Companies such as Stellantis, Volkswagen Group, Toyota, BMW, and Hyundai have increasingly embedded ESG principles into their business models. These firms are not only investing heavily in the electrification of their vehicle fleets but are also transforming their production plants into low-emission and resource-efficient facilities. For instance, as can be seen in the following image, many are adopting renewable energy sources, implementing circular economy

practices, and seeking carbon neutrality through a combination of innovation, carbon offsetting, and supply chain reorganization.

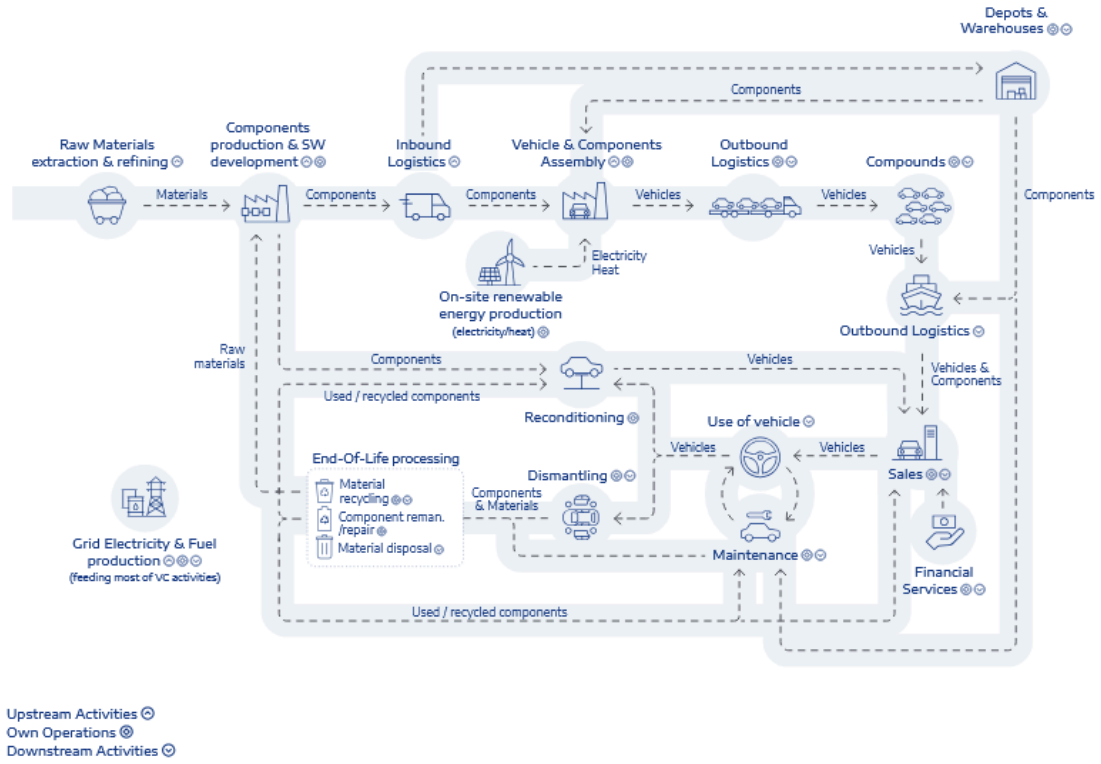

Figure 1: Diagram illustrating Stellantis's value chain, including upstream, operational, and downstream activities, with a focus on circular economy practices such as recycling, reconditioning, and renewable energy integration [5]

Beyond their internal processes, major companies play a key role in promoting sustainability by influencing the behavior of suppliers and business partners, setting clear environmental and ethical requirements, conducting regular audits to ensure transparency, and encouraging joint projects centered on green innovation, these companies are able to amplify the reach of their sustainability efforts throughout the entire value chain. In doing so, they help drive a systemic change across the wider industrial ecosystem for the benefit of the entire community. However, leadership in sustainability also requires consistency and credibility. In fact stakeholders like investors, consumers, and public institutions expect companies to demonstrate

results, not just intentions. This includes setting measurable goals, publishing verified non-financial reports, and ensuring that sustainability communication is backed by transparent data and real impact. In this regard, the case of Stellantis which will be analyzed in chapters 3 and 4, offers an illustrative example of how a global automotive group can position itself as one of the leaders in the ecological transition through strategy, innovation, partnerships, and communication.

2.2 Agenda 2030, SDG Objectives for Automotive and EU Taxonomy

First of all, the 2030 Agenda for Sustainable Development, officially adopted by the United Nations General Assembly on 25 September 2015 through Resolution A/RES/70/1 [6], represents a global and shared commitment to a new development model capable of integrating economic growth, social inclusion, and environmental protection.

The agenda is composed of 17 Sustainable Development Goals (SDGs) and 169 specific targets to be achieved by 2030. These goals are globally applicable and are designed to engage both developed and developing countries.

Is important to underline the balance among the three core dimensions of sustainable development: economic, social, and environmental. This balance is essential to ensure long-term and inclusive prosperity that does not compromise the ability of future generations to meet their own needs.

Figure 2: Infographic illustrates the 17 Sustainable Development Goals (SDGs) defined by the United Nations. Each goal addresses a critical global challenge [7]

Several Sustainable Development Goals (SDGs) are directly linked to the environmental dimension of the automotive industry highlighting the urgent need for radical transformations. These goals include:

- Goal 6: Ensure availability and sustainable management of water and sanitation for all
- Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable
- Goal 12: Ensure sustainable consumption and production patterns
- Goal 13: Take urgent action to combat climate change and its impacts
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems

The 2030 Agenda strongly affirms the need for urgent action to address environmental degradation, promote sustainable consumption and production, and fight climate change. The document reaffirms the principle of "common but differentiated responsibilities", first introduced in the Rio Declaration of 1992, and highlights international cooperation as a strategic tool to address global environmental challenges. Environment is not treated as an isolated sector, but rather as a foundational and cross-cutting element: the protection of natural resources and the fight against climate change are prerequisites for human well-being and socio-economic peace. The integrated approach of the Agenda reflects the idea that no social or economic progress is truly achieved if it comes at the expense of natural capital. Regarding the EU scenery the principal regulations applied to the automotive industry to protect the environment and stimulate eco-friendly solutions are:

1) Regulation (EU) 2019/631 on CO_2 Emissions from Passenger Cars and Light Commercial Vehicles

Regulation (EU) 2019/631 [8] sets binding CO_2 emission limits for new passenger cars and new light commercial vehicles, in line with the European Union's climate change objectives and the commitments made under the Paris Agreement. Starting from 2020, the limits are set at 95 g CO_2/km for passenger cars and 147 g CO_2/km for light commercial vehicles. But these targets won't stay static—manufacturers will need to keep up with tightening restrictions: a 15% reduction by 2025, and by 2030, a 37.5% cut for cars and 31% for commercial vehicles, compared to 2021 levels.

To encourage the transition, the regulation promotes low- and zero-emission vehicles, with minimum benchmarks set at 15% in 2025 and up to 35% in 2030, and introducing incentive mechanisms through supercredits and target adjustments for compliant manufacturers.

Additionally, the WLTP (Worldwide Harmonised Light Vehicles Test Procedure) cycle is adopted, providing more realistic data compared to the previous NEDC cycle.

To ensure compliance, the regulation provides for a centralized monitoring system and financial penalties for excess emissions. Exemptions are foreseen for small manufacturers, and it is possible for manufacturers to form pools to share targets. Lastly, the regulation highlights the need to accompany this transformation with social and economic measures that support the transition for workers and industries involved.

2) Euro Emission Standards (Euro 6 and the Upcoming Euro 7)

The Euro standards define emission limits for air pollutants such as nitrogen oxides (NOx), carbon monoxide (CO), unburned hydrocarbons (HC), and particulate matter (PM).
The Euro 6 standard, currently in force, introduced strict requirements aimed at reducing urban pollution. As part of a broader policy to lower air pollution, the Euro 6 standard limits emissions according to different phases.
The table [9] outlines the main pollutant emission limits under Regulation 692/2008 (Euro 6a and Euro 6b, i.e., the first revisions of the directive):

Mezzo/classe veicolo	Motorizzazione	CO	HC	NOx	Particolato	Unità di misura
Autoveicolo e Autocarri leggeri M	Benzina	1	0,1	0,06	0,005/0,0045	g/km
	Diesel	0,5	0,17 ($HC + NO_x$)	0,08		
Autocarri leggeri N ≤ 1.250 kg Autocarri leggeri ≤ 1.700 kg Autocarri leggeri > 1.700 kg	Benzina	1 1,81 2,27	0,1 0,13 0,16	0,06 0,075 0,082		
	Diesel	0,5 0,63 0,74	0,17 ($HC + NO_x$) 0,195 ($HC + NO_x$) 0,215 ($HC + NO_x$)	0,105 0,125 0,125		

Table 1: Table compares pollutant emissions from various vehicle classes (regarding Euro 6), highlighting differences between gasoline and diesel engines. It provides data on CO, HC, NOx, and particulate matter per kilometer

The Euro 6 Standard (EU Anti-Pollution Directives) is divided into classes (Euro 6a, 6b, 6c, 6d-TEMP, 6d), which correspond to different

methods for measuring fuel consumption and pollution levels, along with their respective deadlines for type-approval and registration of new vehicles. Each class represents a specific revision of one or more EU regulations.
In 2027 there will be the Euro 7 that will had:

- Stricter limits, including emissions from brakes and tires (microplastics)
- More realistic testing under Real Driving Emissions (RDE) conditions
- Continuous emission monitoring via onboard devices

3) Directive (EU) 2019/1161 on the Promotion of Clean Vehicles

The Directive (EU) 2019/1161 [10] modifies and improves the Directive 2009/33/EC by promoting the purchase and use of clean and energy-efficient vehicles by public authorities.

The demand for eco-sustainable solutions is stimulated by the public procurement, specifically, the Directive introduces binding obligations for Member States regarding the minimum share of low and zero emission vehicles to be procured in public tendering procedures. These quotas are differentiated by vehicle type (passenger cars, buses, light-duty vehicles) and phased over time (up to 2030).
It is important to consider not only emissions during the vehicle's use phase but also other factors such as energy consumption and overall environmental impact, promoting a life-cycle assessment approach. The initiative is part of an integrated strategy aimed at stimulating industrial innovation and the development of infrastructure for alternative fuels, in synergy with other EU measures for sustainable mobility.

4) Regulation (EU) 2023/1542 on Sustainable Batteries

Regulation (EU) 2023/1542 [11] marks a significant turning point in European battery legislation, replacing Directive 2006/66/EC. This measure addresses the need to support the growth of electric mobility

with a modern, harmonized, and sustainability-oriented regulatory framework covering the entire life cycle of batteries. The role of batteries in the energy transition and the EU's industrial competitiveness is vital so the directive sets strict requirements for the responsible sourcing of raw materials, minimum recycled content (such as lithium, cobalt, nickel, and lead), and waste management.
For batteries used for electric vehicles and light transport equipment, the regulation also mandates the provision of a carbon footprint declaration and sets future maximum thresholds for emissions related to production processes. To ensure product safety, consumer information transparency, and an efficient single market, it introduces the Digital Battery Passport, documenting material origin, performance, lifespan, and reusability. Moreover the battery reuse and remanufacturing is promoted, fully integrating the principles of the circular economy and strengthening Europe's strategic autonomy in a globally competitive sector.

5) Directive 2000/53/EC on End-of-Life Vehicles (ELV)

Directive 2000/53/EC [12] on end-of-life vehicles is aimed at reducing the environmental impact of vehicles at the end of their life cycle. It introduced a systemic approach to the management of this specific waste stream, with the goal of preventing the release of hazardous substances and promoting recycling and material recovery.
In particular, the directive requires manufacturers to design vehicles in a way that facilitates dismantling and end-of-life treatment. The use of hazardous substances such as lead, mercury, cadmium, and hexavalent chromium is prohibited, except under specific exemptions. Moreover the directive also mandates the establishment of collection systems and authorized treatment facilities, as well as the issuance of a certificate of destruction for deregistration purposes.
One of the most innovative elements introduced by the directive is the obligation for producers to financially support collection and

treatment operations, even when end-of-life vehicles no longer have market value. As a result, the directive has had a significant impact not only environmentally, but also industrially and organizationally, encouraging the development of more sustainable design solutions from the outset.

6) The "Fit for 55" Package and the European Green Deal

The Fit for 55 legislative package, adopted in 2021 as part of the European Green Deal, aims to reduce the EU's greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.
The European Green Deal is the European Union's sustainable growth strategy, presented by the European Commission on December 11, 2019. This cross-sectoral plan seeks to transform Europe into the first climate-neutral continent by 2050 through a coordinated set of environmental, economic, and industrial policies.
The core of the Green Deal is the objective of achieving net-zero greenhouse gas emissions by 2050, in line with the Paris Agreement of 2015. To meet this goal, the EU has planned a series of measures that involve all sectors of the economy: from energy to agriculture, transport to construction, and the manufacturing industry.
The Fit for 55 includes the strengthening of the Emissions Trading System (ETS), new energy efficiency standards, and stricter vehicle emission regulations.
For the automotive sector the most important changes include:

- Extension of the ETS to road transport
- Introduction of the Carbon Border Adjustment Mechanism (by imposing tariffs on imports of carbon-intensive materials)
- Incentives for electric mobility and charging infrastructure
- Social Climate Fund to support vulnerable groups during the ecological transition

7) Directive (EU) 2022/2464 on Corporate Sustainability Reporting

The Corporate Sustainability Reporting Directive (CSRD), by replacing and expanding the previous Non-Financial Reporting Directive (NFRD), introduces much stricter ESG (Environmental, Social, and Governance)

reporting obligations on large European companies. Starting from the 2024 financial year, listed companies and those with more than 250 employees must:

1. Report in accordance with the European Sustainability Reporting Standards (ESRS) developed by EFRAG (European Financial Reporting Advisory Group)
2. Provide detailed information on environmental risks and impacts across the entire value chain
3. Submit their sustainability data to independent external assurance

The ESRS represent the regulatory reference framework governing mandatory sustainability disclosure for companies operating within the European Union.

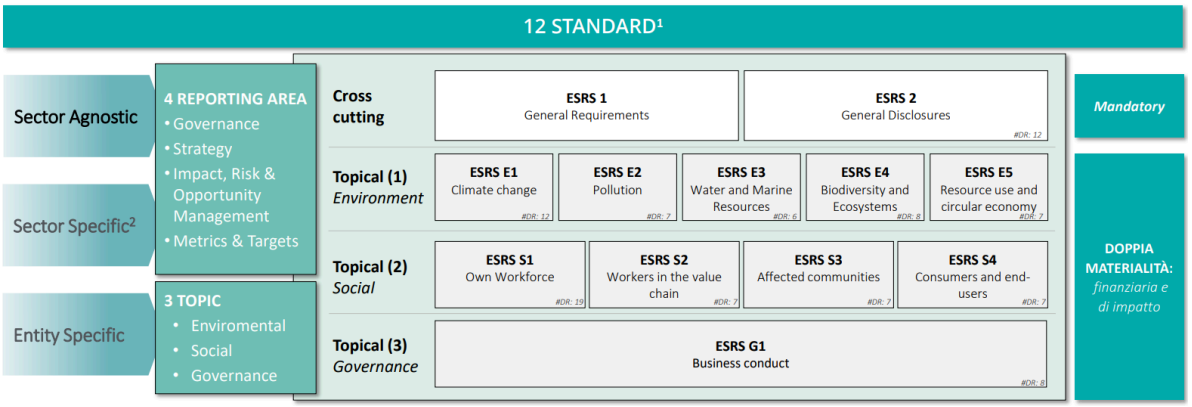

Figure 3 : Diagram of the ESRS architecture, categorizing environmental, social, and governance standards, while highlighting the dual materiality approach and mandatory reporting areas [13]

The ESRS aim to ensure greater transparency, comparability, and reliability of ESG information published by companies. The standards are structured as follows:

- General Standards:
    - ESRS 1 – *General Requirements*

- ESRS 2 – *General Disclosures*

- Topical Standards, divided into:
  - Environmental (ESRS E1–E5): climate change, pollution, water and marine resources, biodiversity, resource use and circular economy
  - Social (ESRS S1–S4)
  - Governance (ESRS G1)

In particular:

The Principle of Double Materiality

A cornerstone of the ESRS framework is the concept of double materiality, which requires companies to assess and report sustainability-related information considering both:

- Impact materiality (inside-out): the effects that the company has on the environment and society
- Financial materiality (outside-in): the effects that environmental and social conditions have on the company, influencing its performance, costs, access to capital, and long-term resilience

An issue is considered "material" if it is relevant from at least one of the two perspectives, although ideally it should be material from both. This approach reflects a systemic and dynamic view of the interdependencies between sustainability and corporate management.

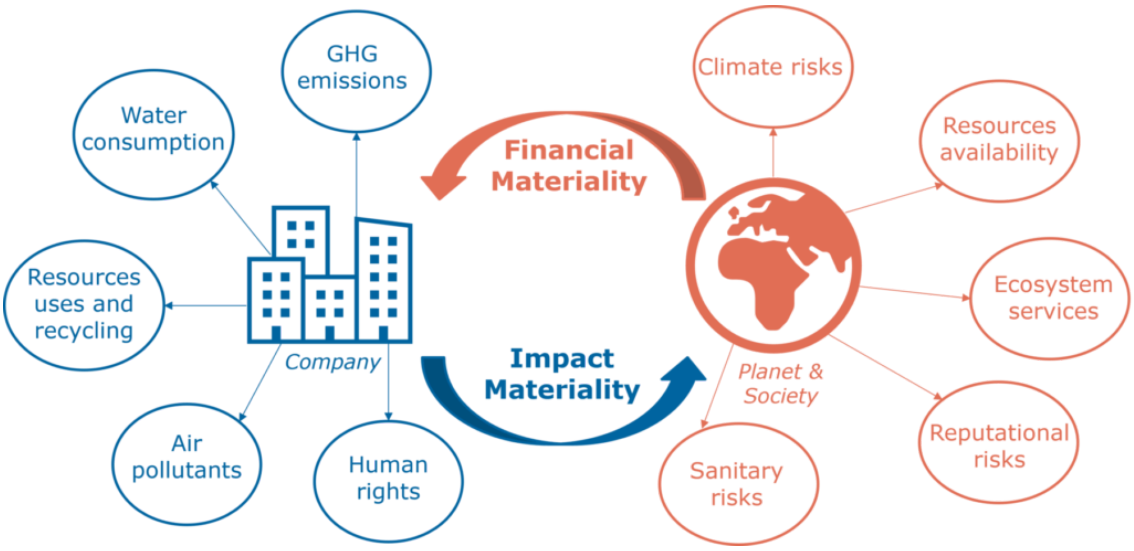

Figure 4: Figure illustrates the principle of double materiality, which connects a company's internal financial materiality with its external impact on society and the environment

Due Diligence and Value Chain

The ESRS place a strong emphasis on due diligence, understood as the process by which a company identifies, prevents, mitigates, and discloses actual or potential negative impacts on people and the environment, arising from its operations and its entire value chain.
The fundamental elements of Due Diligence are directly reflected in the disclosure requirements of ESRS 2 and the thematic ESRS:

- Integration into governance, strategy, and the business model
- Stakeholder engagement
- Identification and assessment of negative impacts on people and the environment
- Addressing negative impacts on people and the environment
- Monitoring the effectiveness of metrics

Sustainability reporting must extend to all actors within the value chain, both upstream (e.g., suppliers) and downstream (e.g., distributors, customers, partners), going beyond the consolidated financial perimeter.

Where direct data is unavailable, companies may use sector averages and proxy data, but must disclose the assumptions and methodologies used.

Environmental Standards (ESRS E1–E5)

The five environmental standards address key aspects of ecological sustainability:

- ESRS E1 – Climate Change: includes disclosure of Scope 1, 2, and 3 GHG emissions, transition plans, and mitigation actions
- ESRS E2 – Pollution: requires information on hazardous substances and direct/indirect environmental impacts
- ESRS E3 – Water and Marine Resources: focuses on usage, management, and impacts on water systems
- ESRS E4 – Biodiversity and Ecosystems: assesses the resilience of corporate strategy in relation to ecosystems and natural services
- ESRS E5 – Resource Use and Circular Economy: addresses resource flows, material efficiency, and circular economy strategies

2.3 Key Concepts

2.3.1 Carbon Net Zero

Carbon net zero refers to a state in which the amount of carbon dioxide (CO_2) emissions produced by human activities is balanced by an equivalent amount of CO_2 removed from the atmosphere, either through natural processes or technological interventions. In this state, emissions are reduced as much as possible, and the remaining emissions are compensated through credible offsetting measures.
To be considered "Net Zero," a company must undertake an emissions reduction pathway consistent with the goals of the Paris Agreement,

limiting the global temperature increase below 2°C compared to pre-industrial levels. This implies a concrete and measurable commitment to decarbonizing its activities.
To achieving the three main strategies can be pursued together:

1. Emission Reduction includes shifting to renewable energy sources such as wind, solar, hydro, geothermal, improving energy efficiency, electrifying transport, and adopting sustainable practices across industries and their respective value chain

2. Carbon Removal, removing CO_2 from the atmosphere through natural means such as reforestation, soil carbon sequestration, regenerative agriculture or technological methods like direct air capture and storage, bioenergy with carbon capture and storage

3. Offsetting Residual Emissions for emissions that are difficult or impossible to eliminate entirely, organizations or governments may invest in certified carbon offset projects to neutralize their climate impact

The pursuit of carbon net zero is an environmental imperative and also an economic and reputational necessity for companies and nations for our future. Consumers, investors, and regulators increasingly demand transparent climate strategies and verifiable progress toward emission reduction goals. For companies, especially in sectors with significant environmental footprints such as automotive, achieving net zero is both a challenge and a strategic opportunity to innovate, differentiate, and contribute to global sustainability goals.

2.3.2 Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) is the voluntary commitment of businesses to integrate social, environmental, and ethical valuations

into their operations and interactions with stakeholders [14]. It extends beyond legal compliance, aiming to foster sustainable development by delivering economic, social, and environmental benefits for all stakeholders. According to the European Commission, CSR is "the responsibility of enterprises for their impacts on society." This encompasses internal responsibilities, such as employee well-being and sustainable resource use, and external responsibilities, including community engagement and environmental administration.

As said before, the CSR initiatives address three main dimensions [15]:

1. Environmental Responsibility: efforts driven to minimize ecological footprints, including resource efficiency, emissions reduction, waste management, and investments in renewable energy

2. Social Responsibility: initiatives aimed at improving the quality of life for employees, local communities, and society in general. This includes labor rights, diversity and inclusion, workplace safety, and philanthropic activities

3. Ethical Responsibility: practices that ensure fair economic operations, transparency, and ethical behavior in business dealings, contributing to long-term profitability and stakeholder trust

The notion of Corporate Social Responsibility is relatively recent and it has undergone a significant evolution over the past few decades.
Initially, during the 1970s and 1980s, CSR began to emerge as a response to growing social movements and rising environmental concerns, in this period there was an overall increasing public awareness of the negative externalities associated with industrial activities such as pollution, labor exploitation, and human rights violations which led to pressure on businesses to consider their impact

on society.

In the 1990s, CSR began to be more integrated into corporate strategies rather than being viewed merely as a philanthropic or public relations tool, CSR started to be seen as an essential component of long-term business success. During this time, companies increasingly began to measure and communicate their social and environmental performance, leading to the publication of the first sustainability and corporate responsibility reports.

From the 2000s to the present day, CSR has evolved into a strategic priority for many organizations, global frameworks such as the United Nations Global Compact and ISO 26000 have played a key role in providing comprehensive guidelines for ethical and sustainable business practices. As a result, CSR is no longer seen as optional or peripheral but as a core element of corporate identity and competitiveness in an increasingly responsible and sustainability-oriented global market.

Beyond simple compliance, companies can gain a number of strategic advantages by implementing CSR practices.

A strong commitment to social and environmental issues can significantly enhance a company's reputation among the stakeholders, by aligning with values that matter to consumers companies can strengthen their brand image and gain greater customer loyalty. In addition, CSR serves as a valuable tool for risk management by addressing potential social and environmental challenges in advance allowing organizations to mitigate risks that could otherwise lead to reputational damage, regulatory sanctions, or operational disruptions. Moreover a positive impact on the internal dynamics of an organization, the employees are more likely to feel motivated and engaged when they perceive their workplace as socially responsible. Lastly, CSR performance is increasingly relevant in the eyes of investors, many are now integrating ESG criteria into their decision-making processes, recognizing that socially responsible companies are often better positioned for sustainable growth and long-term profitability. As a result, CSR can enhance a company's

attractiveness to investors and support access to capital.

2.3.3 Circular Economy (CE)

The circular economy is a regenerative system where products, materials, and resources are kept in use for as long as possible, when they reach the end of their service life, they are reused, repurposed, or recycled into new products, thereby closing the loop of product life cycles [16]. This concept is completely opposite to the traditional linear economy which is based on a simple flow of take, make, use and dispose.

The guiding principles of the CE include:

1. Designing out waste and pollution from the start
2. Keeping products and materials in use through reuse, repair, refurbishment, and remanufacturing
3. Regenerating natural systems, rather than merely minimizing environmental harm

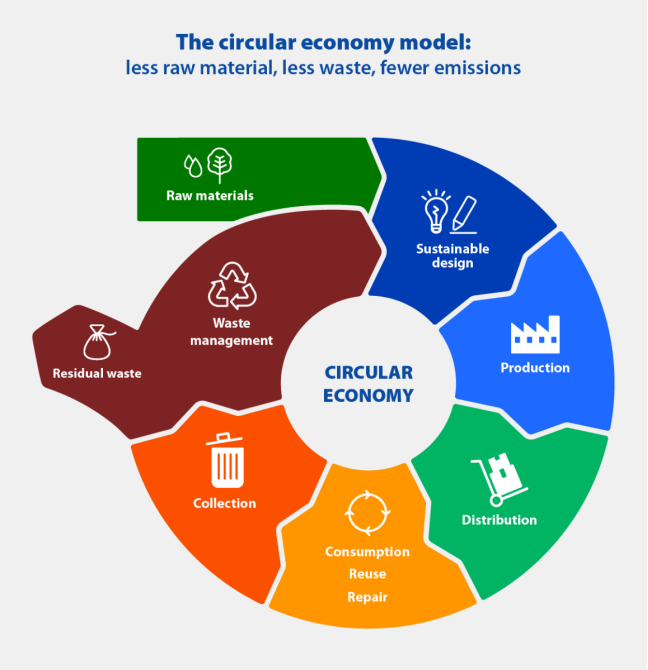

Figure 5: Diagram presents the Circular Economy model, depicting key

stages such as raw materials, sustainable design, production, and waste management. It emphasizes minimizing inputs, emissions, and waste through reuse, repair, and recycling [17]

This model requires rethinking entire value chains, from product design and manufacturing to logistics, consumption, and post-consumer recovery systems. It implies a deep integration of systems thinking, where environmental, social, and economic outcomes are considered together.

By promoting resource efficiency, reduced emissions, and innovative business models, the circular economy is increasingly being recognized as a strategic pathway to long-term economic resilience and environmental sustainability.

Governments around the world, particularly the European Union, have embedded circularity into their policy agendas. The European Green Deal and the EU Circular Economy Action Plan (CEAP, 2020) provide regulatory and financial frameworks to drive systemic change across sectors.

Measures that will be introduced under the action plan aim to [18]:

- Make sustainable products the norm in the EU
- Empower consumers and public buyers
- Focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients
- Ensure less waste
- Make circularity work for people, regions and cities
- Lead global efforts on circular economy

3. Stellantis: A Case Study in the Ecological Transition

3.1 “Dare Forward 2030” Strategy and Main Environmental Goals

In March 2022, Stellantis presented Dare Forward 2030, its long-term strategic plan aimed at radically transforming the company into a sustainable mobility tech leader. At its core, the plan is driven by an urgent commitment to address the climate crisis and to lead the automotive industry’s transition toward carbon neutrality. Unlike traditional business strategies focused purely on growth or profit, Dare Forward 2030 embraces a holistic vision centered on environmental responsibility, innovation, and long-term value for all stakeholders.

One of the central goals of the plan is a 50% reduction in carbon emissions by 2030, relative to 2021 levels, with the aim of becoming a net-zero carbon company by 2038. This includes emissions not only from Stellantis's own operations (Scope 1 and 2), but also across the entire value chain (Scope 3) from materials sourcing to vehicle use and end-of-life management. To support this, Stellantis is investing heavily in renewable energy, efficient logistics, and circular economy practices such as vehicle remanufacturing and parts recycling.

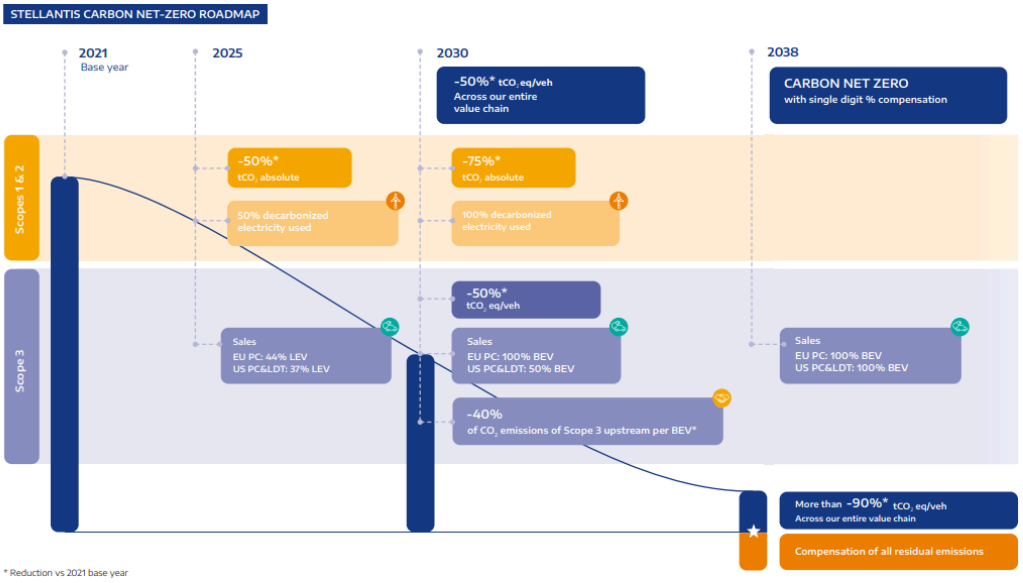

Figure 6: Stellantis Carbon Net-Zero Roadmap outlining the company's progressive targets from 2021 to 2038, including CO_2 emission reductions across Scopes 1, 2, and 3, increased electrification, and the transition to fully decarbonized energy sources

Electrification is another key pillar of the strategy. Stellantis plans for 100% of vehicle sales in Europe and 50% in the U.S. to be battery electric (BEV) by 2030. This transformation is supported by the launch of over 75 BEV models, five battery gigafactories in Europe and North America, and the development of alternative clean technologies such as hydrogen fuel cells. In doing so, the company is not just electrifying its lineup, but also working to make electric mobility more accessible, efficient, and sustainable for consumers worldwide. Moreover, Dare Forward 2030 aims to position Stellantis as a leader in responsible innovation. Through smart software platforms, connected vehicles, and cleaner powertrains, the company seeks to offer more than just greener cars—it wants to create a sustainable ecosystem around the mobility experience. Initiatives include digitalizing operations, improving supply chain transparency, and using AI to optimize energy usage and product life cycles [19].

3.2 Green Initiatives: Process (SUSTAINera and Circular Economy, Plants, E-Campus, Battery Centers)

The following subchapter will outline the actions taken by Stellantis in relation to its process. In particular, the circular economy is one of the most important actions, its principles are being embedded into Stellantis' business and consumption model, aiming to extend product lifespan and decrease natural resource usage. These principles cover the entire lifecycle of a vehicle, from production to end-of-life, incorporating reusable materials, recycled scrap and waste into the production loop. These principles are expected to be formally adopted into a policy in the near term, addressing the circular economy through two main approaches:

- Products: designing products to reduce their environmental impact throughout the entire life cycle, in line with the Stellantis Carbon Net Zero Targets
- Operations: using resources responsibly, efficiently, and sustainably, promoting the circular economy within our operations and supply chain
- Communities: engage with communities where we operate regarding environmental conservation and biodiversity through dialogue and activities with internal and external stakeholders

Specifically, the dedicated business unit for circular economy, supported by central and regional teams, suppliers, and partners is:

1)SUSTAINera

SUSTAINera represents Stellantis' pledge to offer customers sustainable, transparent, and affordable products and services, without compromising on quality and while safeguarding the environment by reducing waste and minimizing the use of the planet's

natural resources [20].

SUSTAINera embodies the integrated ecosystem of most Stellantis' Circular Economy activities and initiatives. It seeks to shift from a traditional linear consumption model "produce – use – dispose" to a circular approach that maximizes the lifespan of resources and products. The main goals are:

- To reduce the demand for new raw materials and the use of limited natural resources
- To decrease waste, inefficiencies, and pollution
- To lower energy consumption and CO_2 emissions

This business model is grounded in the principles of the Circular Economy and is implemented through the 4R strategy: Reman (Remanufacturing), Repair, Reuse, and Recycle. This strategy aims to extend the useful life of products and reduce the use of natural resources by reintegrating waste and materials back into the production cycle. What follows is a quantitative overview of the main indicators:

- Reman or Remanufactured Parts: used, worn, and defective components are recovered, disassembled, cleaned, and remanufactured according to OEM specifications, ensuring the same performance and warranty coverage as original MOPAR parts (**12.000 Product Codes, Over 40 Products Lines**)
- Repaired Components: Components removed from a customer's vehicle, repaired, and then reinstalled on the same vehicle. (**1,500 Multi-brand Spare Part Codes, 24 E-Repair Centers for High-Voltage Batteries**)
- Reused Parts: Original multi-brand parts in good condition, recovered from end-of-life vehicles and reused as-is for installation on other vehicles (**Over 10 Million Multi-brand Spare Parts Available in Stock**)

- Recycled Materials: Materials sourced from production processes, maintenance waste, and end-of-life vehicles (ELVs) are reintegrated into the manufacturing of new vehicles and aftermarket products (**Over 1.6 Million Parts Recycled in 2024**)

Availability of the SUSTAINera 4R on parts (excluding HVBs) and on HVBs in Regions

	Availability of the SUSTAINera 4R solutions on parts (excluding HVBs)				Availability of the SUSTAINera 4R solutions on HVBs			
Geographical Area	Reman	Repair	Reuse	Recycle	Reman	Repair	Reuse	Recycle
Enlarged Europe	●	●	●	●	●	●	●	●
North America	●	●	●	●	●		●	●
South America	●		●	●				●
Middle East & Africa	●		●	●				●
India & Asia Pacific	●					●		●
China	●	●				●		●

Figure 7: Overview of the regional availability of SUSTAINera 4R solutions (Reman, Repair, Reuse, Recycle) for parts (excluding HVBs), across key global markets

Circular economy strategies are implemented across the value chain, regarding spare parts, entire vehicles, and electric vehicle (EV) batteries.

Circular economy of High-Voltage Batteries

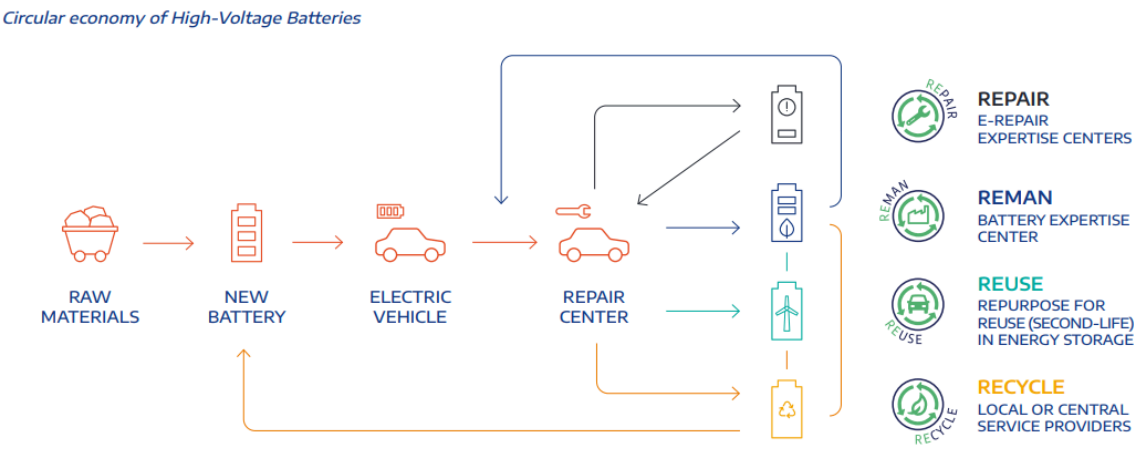

Figure 8: This diagram illustrates the circular economy model for high-voltage batteries, showing how they follow different paths (repair, remanufacture, reuse, and recycling) after use in electric vehicles

While there are no mandatory targets based on current regulations regarding resource use and the circular economy, Stellantis is committed to reducing the use of primary raw materials, it is voluntarily implementing targets aiming to boost sustainability and resource efficiency and has established waste related goals applicable to the manufacturing activities guided by best practices and guidance from the Global Reporting Initiative. The objective is to recover a specific percentage of waste from total waste, focusing on recycling and waste recovery stages [21].

2) PLANTS & OFFICES

To reduce negative externalities on the societies Stellantis aim to cut energy usage, waste, emissions and water usage in its facilities, to ensure this most of Stellantis plants comply the ISO 14001 certification.

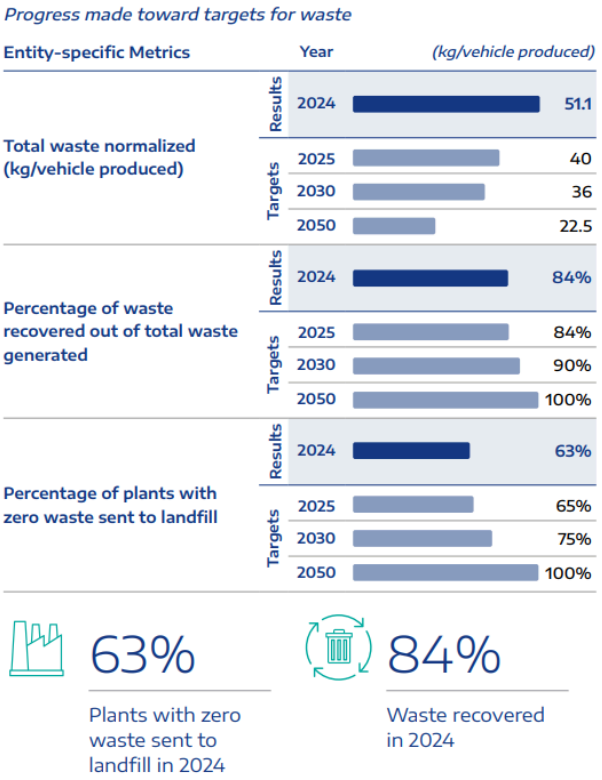

Figure 9: Progress toward waste reduction goals: in 2024, 84% of waste was recovered and 63% of plants achieved zero waste to landfill, with clear targets set through 2050 for further reduction and recovery

Energy efficiency is the cornerstone of Stellantis' approach, efforts to implement decarbonized electricity on a broader scale are getting into gear, with ambitious projects on photovoltaic and wind parks which will operate on and off-site in Europe, North America and South America.

In fact in the Mangualde plant in Portugal, Stellantis announced the implementation of a photovoltaic solar energy capture project for self-consumption. Once fully implemented, it will cover 31% of the facility's electricity needs, allowing the annual avoidance of 2,500 tons of CO_2 emissions. In Zaragoza, Spain, the plant will generate 14,340 MWh per year thanks to a ground-mounted system of 34,800 solar panels. In Madrid, Spain, the facility's rooftop displays a 6.7-MWp solar

on-site generation system, made by 15,000 solar panels that will cover over 30% of the factories energy needs, saving more than 8,000 MWh per year. Various other locations around the world also embrace solar power to provide self-produced green energy, including sites in France, India and Germany [22]. In addition Stellantis adopts flexible ways of working for its workforce that safeguard its employees as well as reduce real estate footprint at its facilities. The Company targets to cut emissions 75% by 2030 and its "New Era of Agility" (NEA) project contributes to this goal. NEA transforms Stellantis' working methods, with an average distribution of 70% of working time at distance and 30% on site for all employees whose activity allows it. The project allows Stellantis to be more agile and efficient while the Company continues to work to optimize its manufacturing footprint.

3) GIGAFACTORY

Stellantis is building a global network of six gigafactories capable of supplying up to 400 gigawatt-hours of battery capacity by 2030.
This network includes three production sites with Automotive Cells Company in Europe, one in Canada through the NextStar Energy joint venture established with LG Energy Solution, and two in the United States with Samsung SDI. These partnerships allow Stellantis to leverage its design and engineering expertise to optimize battery pack production and position the company as an industry leader in battery pack cost efficiency. Responsible sourcing of raw materials is a key component of this strategy, in fact, Stellantis has invested in Vulcan Energy Resources Ltd. signing an agreement with the company to produce lithium hydroxide in Germany without the use of fossil fuels, achieving a net-zero carbon footprint. Stellantis has also entered into an agreement with Controlled Thermal Resources Ltd. to supply lithium hydroxide for batteries intended for electrified vehicle production in North America.

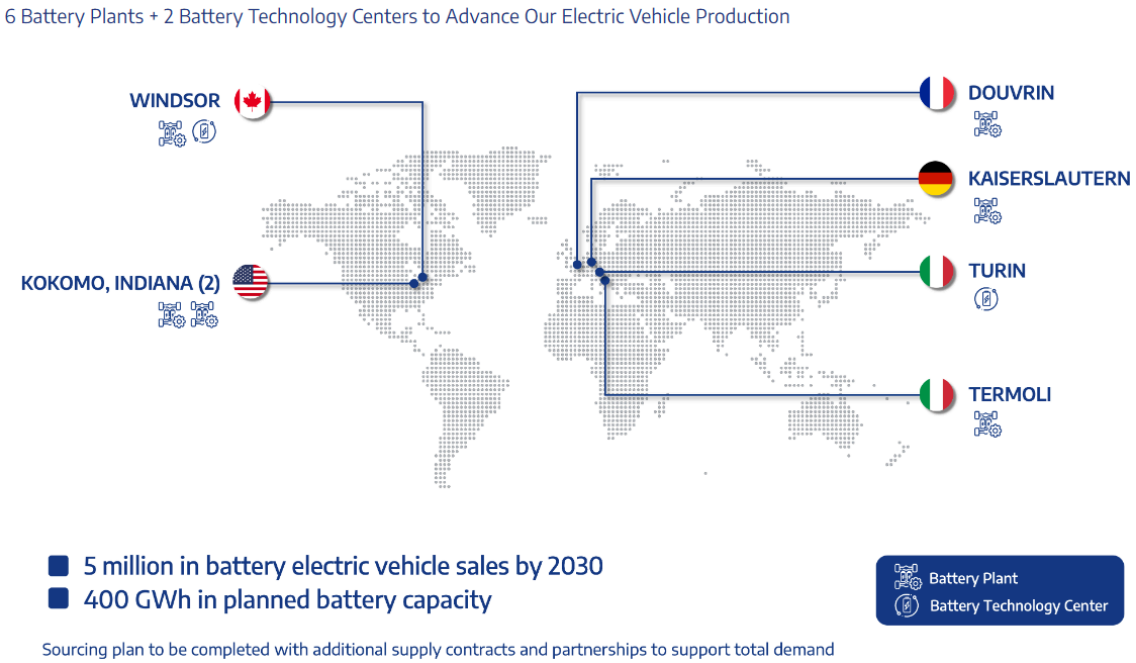

Figure 10: Map highlighting Stellantis' global battery infrastructure: 6 battery plants and 2 battery technology centers across North America and Europe, supporting a target of 400 GWh battery capacity and 5 million electric vehicle sales by 2030

4) GREEN CAMPUS

Within the context of organizational transformation and environmental sustainability, Stellantis has launched the grEEn-campus program, a project focused on redeveloping and innovating workspaces at its key historic European sites. The goal is to create collaborative, flexible, and carbon-neutral workplaces aligned with the company's Dare Forward 2030 strategy. In particular the firs three site will be Poissy (France), Mirafiori (Italy, Turin), and Rüsselsheim (Germany). These sites will be transformed into innovation hubs featuring sustainable design and hybrid work models, supporting flexible mobility and remote working.
Efforts include installing extensive solar panels on roofs, ultra low energy ventilation system, generous green spaces to enhance thermal regulation and employee well-being, material reuse and using cutting-edge construction technologies to reduce CO_2 emissions. The "EE" in grEEn campus stands for both Energy (environmental

commitment) and Education (continuous employee development), aiming to improve the overall employee experience.

3.3 Green Initiatives: Product (Vehicles, Green Technologies)

1) VEHICLES

By developing a wide range of BEVs, FCEVs and PHEVs and aiming to be one of the leading players in the LEV market, Stellantis addresses the environmental challenges associated with vehicle use.
As part of the Dare Forward 2030 strategic plan, Stellantis is investing more than €50 billion in electrification over the next decade, setting the course for a 100% passenger car battery electric vehicle (BEV) sales mix in Europe and a 50% passenger car and light-duty truck BEV sales mix in the United States by 2030. By then, Stellantis plans to offer more than 75 BEV models, representing 5 million units in annual BEV sales globally [23].

2) TECHNOLOGIES

A) Multi-Energy Platform

Thanks to their versatility, the multi-energy platforms easily adapt to the demands of different markets, providing the most efficient solution for every vehicle category from city cars to pickups and SUVs. The flexibility offered by the platforms reduces complexity enhancing the waste management and enables economies of scale, with each platform capable of supporting production of up to two million units per year.

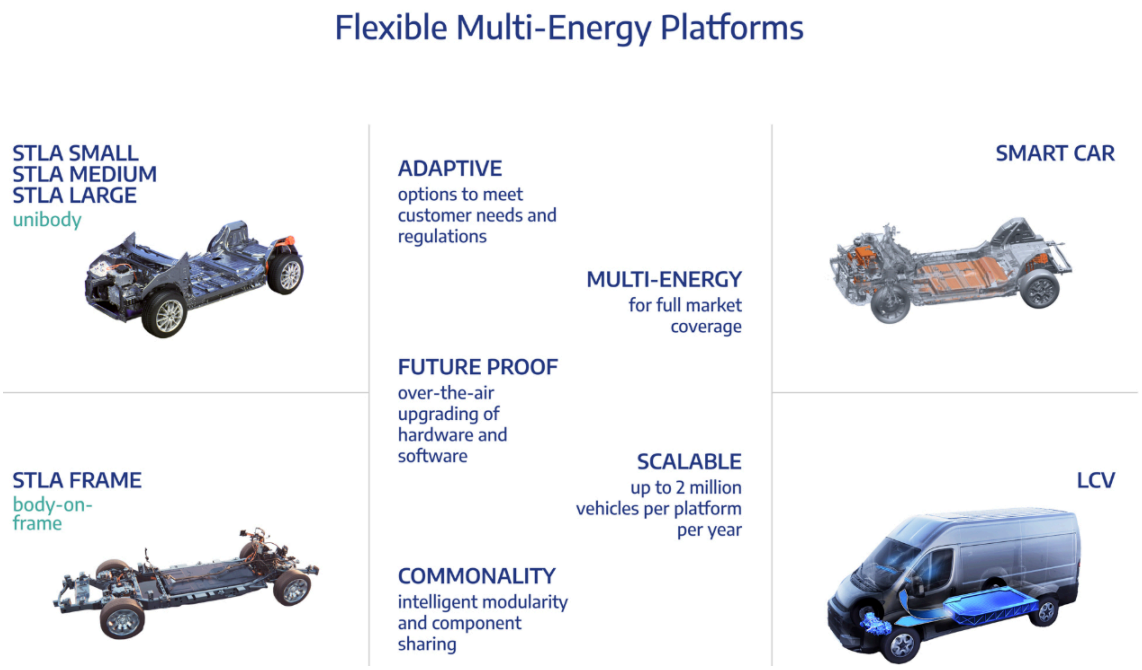

Figure 11: Flexible multi-energy platforms designed to cover all vehicle segments, from compact cars to commercial vans. Scalable, modular, and future-proof solutions to meet global market and regulatory demands

B) Hydrogen Fuel Cells (LCV only)

Stellantis has developed a zero-tailpipe emission hydrogen fuel cell solution that combines the advantages of hydrogen fuel cell technology with those of battery electric technology in a fuel cell electric vehicle (FCEV). This solution is ideal for drivers of light commercial vehicles (LCVs) who require long range, fast refueling, and zero tailpipe emissions but without compromising cargo capacity.

With customer needs in mind, Stellantis has designed a mid-power architecture that offers a best-in-class range (up to 400 km) for medium-sized vans. In large vans, this solution can deliver a range of up to 500 km, with refueling times of just 5 minutes. To preserve full cargo capacity, all components of the fuel cell powertrain are positioned outside the loading area. The system can also be integrated with the battery electric platform for LCVs, requiring minimal modifications and enabling excellent synergy between

battery-electric and hydrogen-powered versions. Stellantis has commenced production of hydrogen fuel cell vehicles (medium and large vans) at its Hordain (France) and Gliwice (Poland) plants.

C) Painting Phase

Paint shops, major users of an assembly plant's overall energy (around 50%) and water resources (around 55%), also generate around 65% of a plant's overall CO_2. To ensure the best outcome in terms of CO_2, energy and water reduction while maintaining the highest standards, the following three key areas of transformation have been pinpointed for immediate and medium-term actions [24].

Process Transformation

One of the major evolutions is a reduction in the number of baking operations during the painting process. Moving to a four-wet (compact) painting process away from the traditional two-wet painting process enables paint shops to apply four coatings with only two curing ovens. By contrast, the two-wet painting process requires four energy-consuming ovens to heat and dry each coating, reducing energy consumption by up to 30%. An aggressive global roadmap has been implemented to transform the Stellantis paint shops to the four-wet process:

- In 2022, our Gliwice, Poland paint shop started four-wet production and is now a benchmark with energy consumption of only 245 kWh/vehicle
- 14 more paint shops will complete the transformation to the four-wet process in 2024 - nine in Europe, three in North America and two in South America
- By the end of 2024, Stellantis will have transformed 70% (25) of its existing paint shops to the four-wet process, with all new paint shops designed to use the four-wet paint process

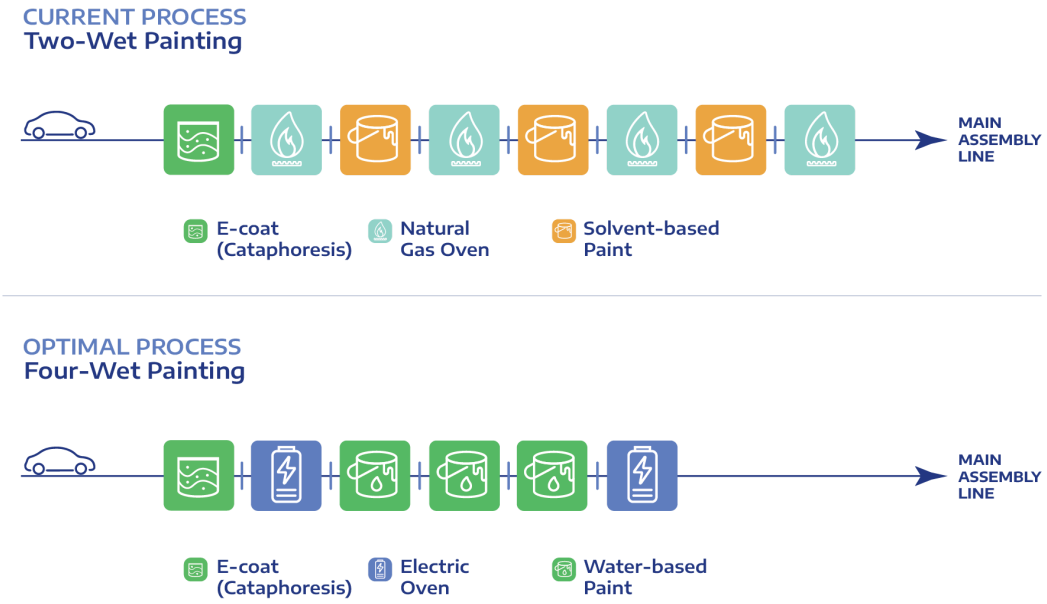

Figure 12: Comparison between the current "Two-Wet" painting process and the optimized "Four-Wet" process. The new method replaces natural gas ovens with electric ones and uses water-based paints to reduce environmental impact and improve energy efficiency

Electrifying Painting Processes

Another driver for CO_2 reduction is the electrification of paint shops. Traditionally, paint-curing ovens have been powered by natural gas. New paint shops are being built with electric ovens while existing ovens are shifting from natural gas to green or renewable electricity. Energy reduction initiatives, such as spray booth air recycling combined with electrification provide the best synergies for capital expenditure efficiency and CO_2 reduction. Additionally, the shift to electric from natural gas-powered curing ovens, gains even more significance when green electricity (photovoltaic, wind, geothermal and biomass) is procured or self-generated.

New Materials

In the past couple of years, the Stellantis paint team developed and validated a new generation of innovative sealers, paint and low-bake E-coats, opening additional opportunities for some plants to reduce CO_2, including:

- Lower bake E-coat, first introduced in France, has spread across Stellantis paint shops achieving energy and cost savings
- A generation of new lower bake sealers has enabled the four-wet implementations in solvent-based paint shops in England, France, Portugal and Spain, and has overcome significant constraints
- A new generation of two-tone monocoat paint has been implemented in Brazil and spread to other regions

3.4 Green Initiatives: External (Joint Ventures, Investments, Supply Chain, Certifications)

1) JOINT VENTURES

In the following subchapter are pointed the major partnership of Stellantis

Free2move

Free2move is the Stellantis's technology company specializing in mobility, offers a comprehensive ecosystem of services focused on enhancing the customer experience. Already operating on a global scale, Free2move is planning to further expand its presence worldwide, aiming to reach 15 million active users by 2030. In 2022, Free2move expanded by acquiring Share Now, previously a joint venture between BMW and Mercedes-Benz. In 2023, it acquired Kuantic, a fleet management specialist, further expanding its capabilities in the sector.

Leasys

A 50/50 joint venture between Stellantis and Crédit Agricole Consumer Finance, Leasys specializes in multi-brand operational leasing and corporate fleet management. It offers innovative mobility solutions ranging from medium and long term rentals to advanced fleet management systems. In 2023, Leasys consolidated its activities with Free2move Lease, creating a new mobility operator in Europe with the goal of becoming a European leader in leasing services and reaching a fleet of one million vehicles by 2026.

Symbio

In 2023, Symbio, a joint venture equally owned by Forvia, Michelin and Stellantis, inaugurated its first gigafactory in France. This is the largest integrated fuel cell production site in Europe and will allow Stellantis to expand its hydrogen vehicle offerings.

Stellantis – CATL (China)

In December 2024, Stellantis and Chinese battery manufacturer CATL announced a joint investment of €4.1 billion to build a large LFP battery factory in Zaragoza, Spain. Scheduled to begin operations in 2026, the plant will have a capacity of 50 GWh and aims to reduce Europe's dependence on Asian supply chains.

Stellantis – Samsung SDI (South Korea)

The two companies have launched two joint ventures for electric vehicle battery production in Kokomo, Indiana (USA). The first facility, with a $3.1 billion investment, will begin production in 2025, followed by a second plant with a $3.2 billion investment, scheduled for 2027.

NextStar Energy – LG Energy Solution (South Korea)

This joint venture will build Canada's first gigafactory for lithium-ion battery cell and module production, an investment of approximately 4.1 billion dollars.

Stellantis – Galloo (Valorauto)

In 2023, Stellantis and Belgian company Galloo formed a joint venture for end-of-life vehicle recycling. The service is already active in France, Belgium, and Luxembourg, with plans to expand across the rest of Europe.

Emotors (with Nidec)

Dedicated to the production of electric motors, Emotors supports Stellantis's electrification strategy throughout its Dare Forward 2030 Program. The first product, the M3 motor, will operate at 400 V and deliver 115 kW of power.

e-Transmissions (with Punch Powertrain)

Provides next-generation eDCT transmissions to various Stellantis brands started in 2023. These are available in two electrification levels, 48 V and 320 V, and are suitable for hybrid and plug-in hybrid (PHEV) applications.

Free2move eSolutions

Founded in 2021 by Stellantis and NHOA, Free2move eSolutions provides electric vehicle charging solutions, including:

- Charging devices for home, business, and public use
- Charging-as-a-Service subscription models
- Vehicle-to-Grid (V2G) technologies for integrating vehicles into the power grid

This joint venture aims to support the transition to electric mobility by offering innovative, tailored solutions for both private and business customers.

2) INVESTMENTS

To further promote the development and adoption of innovative technologies, in 2022 Stellantis established its Corporate Venture Fund,

Stellantis Ventures. With an initial fund of €300 million, Stellantis Ventures invests in high-potential start-ups to accelerate innovation within the company. Below are the investments undertaken by Stellantis related to the world of sustainability [25]:

NetZero

NetZero is a climate tech company specializing in long-term carbon removal by converting agricultural residues into biochar through pyrolysis. This process locks CO_2 in soil for hundreds of years, enhances soil quality and crop yields, and reduces fertilizer use. Their biochar projects are certified by the Puro Standard/ICROA and are being deployed at scale in tropical regions [26].

Niron Magnetics

Niron Magnetics manufactures Clean Earth Magnets™, a high performance, rare-earth-free permanent magnets made from iron nitride. These magnets offer up to 50% greater magnetization than Neodymium-Iron-Boron magnets, significantly lower cost and reduced environmental impact. The company is scaling up mass production in Minnesota for use in EV motors, electronics, wind turbines, and defense applications [27].

Tiamat

Originating in 2017 as a CNRS spin-off, Tiamat designs, develops, and plans to industrialize sodium-ion battery cells. Their Gen 1 and Gen 2 cells support mobility (road, rail, marine), stationary storage, off-highway, and power tools with fast charging and long cycle life with freedom from lithium and cobalt [28].

Electra

Electra focuses on AI-driven battery energy storage solutions for Battery Management Systems (BESS). Their EVE-Ai™ platform offers predictive analytics and diagnostics, optimizing charge/discharge cycles and extending asset lifespan. They're also developing North

America's only cobalt sulfate refinery and pioneering BESS recycling initiatives, onshoring critical mineral supply chains [29].

3) CERTIFICATIONS ISO14001 & ISO 50001

Stellantis production plants and some non-production sites are certified in accordance with ISO 14001 and ISO 50001. The ISO 14001 standard provides a globally recognized framework for developing environmental management systems (EMS) that help organizations achieve environmental objectives, manage compliance obligations, and continuously improve environmental performance [30]. This standard enables companies to systematically identify and control the environmental impact of their activities, promote sustainable resource use, and reduce waste and emissions. On the other hand, the ISO 50001 standard supports organizations across all sectors in using energy more efficiently, aiming to conserve and protect natural resources while reducing energy costs and greenhouse gas emissions. These certifications play an important role for Stellantis as they are key components of the company's broader sustainability and corporate responsibility strategy. Beyond ensuring compliance with environmental regulations these ISOs improve the company's reputation with stakeholders, including customers, investors, and regulatory bodies. Both standards follow the Plan-Do-Check-Act (PDCA) cycle, fostering a culture of continuous improvement through regular audits, performance reviews, and corrective actions.

4) SUPPLY CHAIN

To reach the Company's carbon net zero goal it's essential to work with suppliers in an effective and cohesive manner, to do so Stellantis includes climate requirements in its purchasing agreements, using a CO_2 "cradle-to-gate" performance as a guideline for the contract assignments. This means that all CO_2 equivalent emissions from the

extraction of raw material to part production by the suppliers are considered [31]. For this reason, Stellantis has identified the list of the top CO_2 emitting commodities, which accounts for 80% of the CO_2 footprint from EV components. For these top commodities a CO_2 equivalent emission maximum is defined as a requirement for being awarded business by Stellantis. It's a call for collaboration that involves thousands of suppliers in dozens of countries, working with Stellantis towards net zero.
The responsible purchasing practices are articulated by [32]:

Performance

The suppliers are selected based on the competitiveness of their products and services, on their adherence to social, ethical and environmental principles, and maintaining the highest standards of quality and care for the communities in which Stellantis does business.

Human Rights and Climate Commitment

The preservation of human rights requires respect for ethical rules by everyone. This approach helps develop opportunities within the supplier organizations, while minimizing risk and potential reputational damage to Stellantis. Stellantis monitor compliance with its Code of Conduct and respect for human rights by its partners, requiring contractual commitments and ongoing evaluations.
Stellantis acts in compliance with social, environmental and ethical principles such as those identified in the ILO Conventions, the OECD Guiding Principles, the 2030 UN Sustainable Development Goals (SDGs) and the UN Global Compact, among others. Stellantis expects suppliers to respect human rights in all countries in which they operate, including in geographical areas where human rights may not yet be sufficiently protected.

Supplier Localization

Having suppliers close to Stellantis manufacturing locations supports the local community and reduces the risk of supply disruption. This

also has major financial implications as it can reduce inbound logistics costs, limit customs duties and reduce exposure to exchange rate fluctuations that affect production costs, margins and sales volumes. Reduction of long-distance shipping also benefits the environment by reducing CO_2 emissions. In addition, local sourcing enables the Company to better understand the expectations of stakeholders, helping to find technological solutions specific to the context and constraints of the local area. Operational proximity with partners means helping them make technological, logistical, social and environmental progress and provides greater flexibility in the supply chain.

Due Diligence

Supplier social and environmental performance is regularly assessed by a third party. Suppliers are required to be reassessed each year to ensure continuous improvement in their CSR performance. This assessment is also used for risk identification and selection of sites to be audited. In case of non-compliance with Stellantis's principles, Stellantis might require implementation of action plans and follow-ups and reserve the right to early termination of the business relationship. Products or goods bought from suppliers must respect legislation or regulations applicable in the country where they are produced and in markets where they are sold or used. This includes, for example, laws and regulations that require traceability of substances of concern for protection of health or the environment. As a Company fully committed to development of safe and sustainable activity, Stellantis asks its suppliers to also consider substances subject to restriction by draft regulations as well as any requirements to address their substitution with viable alternatives. For example, Stellantis has already set up dedicated action plans to address European Universal REACH PFAS restriction proposals and European Taxonomy regulation on targeted new vehicle programs.

Stellantis' policy is to establish transparency with suppliers relative to the origin of minerals used, especially from conflict affected and

high-risk areas (CAHRAs), including but not limited to tungsten, tantalum, tin and gold (known as “3TG”) as well as cobalt.

4. Sustainability Communication at Stellantis

In the context of the ecological transition, communication plays a great role in shaping public perception, engaging stakeholders, and reinforcing corporate commitment to sustainability.
For a global mobility leader like Stellantis, effectively communicating its green initiatives with its various stakeholder groups, including employees, customers, suppliers, shareholders and civil society is not only a matter of transparency but also a strategic tool to build trust, align internal objectives with external expectations, differentiate its brands and lead by example in the global transition to sustainable mobility. To ensure effective engagement, Stellantis employs a wide array of communication channels and tools tailored to each stakeholder category. The following section provides an overview of these stakeholder groups and the methods used to interact with them.

Clients

Engagement with clients, including end users and B2B customers (such as the dealership network), is carried out through brand websites, social media platforms, dealership events and customer relations teams. Regular customer satisfaction surveys and market research are conducted to assess the quality of products and services, and sustainable mobility. For business clients, communication also includes direct interaction with fleet sales teams, commercial training, and risk assessments (including ethical considerations) before contracts are signed.

Employees

Employee engagement is facilitated through internal communication tools such as newsletters, company events, town halls, employee

portals, training and regular satisfaction surveys. There is also direct dialogue with management and channels for collecting employee suggestions.

Financial Community

Communication with shareholders and financial analysts, including those focused on sustainable and responsible investment, takes place through shareholder letters, annual and quarterly reports, corporate websites, press releases, and annual general meetings. These platforms are used to present the company's strategic plans, financial results, and sustainability performance. Specific events such as roadshows, Q&A sessions, and responses to questionnaires further strengthen transparency and trust.

Partners and Suppliers

The company engages with suppliers and business partners through periodic meetings, supplier awards, innovation days, conventions, and representation in industry associations and trade bodies. Additional tools include ESG self-assessment questionnaires, responsible purchasing guidelines, and contractual sustainability clauses. These initiatives aim to foster innovation, ensure supply chain sustainability, and align supplier practices with the company's strategic goals.

Civil Society

Engagement with civil society covers a wide spectrum, including NGOs, local communities, academic institutions, public authorities and the media. NGOs are involved through meetings, social media interaction, charitable initiatives, and participation in the "Freedom of Mobility Forum" with a focus on issues such as human rights, education, and environmental impact. Local communities and administrations are engaged through open days, facility visits, and structured discussions to support socio-economic development and manage local environmental concerns. Collaboration with universities and schools includes internship programs, joint research and site visits, particularly around sustainable mobility. The media are addressed through direct

dialogue, press conferences, social channels, and public events such as auto shows.

Environmental Groups
The company also maintains active dialogue with environmental associations and NGOs through ESG reports, meetings, social media, and joint development programs. Topics of focus include climate strategy, real-driving emissions, circular economy initiatives, and the broader environmental impacts of the company's activities.

4.1 Internal Communication: Training, Workshops, and the Climate School

As previously mentioned, internal training for employees includes a variety of courses aimed at raising awareness and developing their knowledge. Among the main ones there are:

1) STELLANTIS CLIMATE SCHOOL

The Stellantis Climate School promotes awareness and understanding of climate related issues among employees. Acquiring knowledge on these topics is essential not only to comprehend the challenges of the world of tomorrow, but also to actively contribute to the company's strategic vision, particularly the *Dare Forward* roadmap and its ambitious goal of achieving net-zero carbon emissions by 2038. The training program is designed to provide both theoretical and practical tools to help employees engage with the complexities of climate change. The Climate School is structured into two main chapters, "Understand "and "Act", and offers content organized into two complementary perspectives: *Thematic*, which explores key environmental topics, and *Jobs*, which focuses on climate-related implications specific to different professional roles within the company. The course is accessible from each employee's personal page on the Stellantis Hub.

2) CARBON NET ZERO

The formation ensures employees are aligned with the Stellantis' roadmap toward achieving Carbon Net Zero (CNZ) by 2038, targeting a 50% reduction in carbon emissions per vehicle by 2030 compared to 2021 levels. This holistic strategy goes beyond electrification, addressing emissions across Scopes 1, 2, and 3, including direct operations, energy consumption, and the entire value chain. Even full electrification only achieves half the necessary reductions, this means that is necessitating further measures such as green energy, supply chain decarbonization and compensation for residual emissions to reach carbon neutrality.
This formation is used in town halls, staff meetings, network meetings, internal conferences.

3) CIRCULAR ECONOMY

The course focuses on explaining the general concept of the Circular Economy, its relevance to the automotive sector, and the specific after-sales solutions developed by Stellantis. It introduces key definitions, provides examples and outlines the company's strategy based on the 4R model (Reman, Repair, Reuse, Recycle), supporting employee alignment with Stellantis' sustainability and carbon neutrality goals. The course is accessible from each employee's personal page on the Stellantis Hub.

4) THE PLANET, STELLANTIS, AND ME

The workshop is designed to raise employee awareness about the urgent impacts of climate change and the role both individuals and company play in addressing them. It presents scientific data on rising global temperatures, extreme weather events, and CO_2 concentrations, emphasizing the risks posed to human health and global stability. The module encourages employees to understand their personal carbon footprint and offers strategies to reduce emissions through lifestyle changes and corporate initiatives. The

course is specifically dedicated to the SVP Seminar (the annual top management seminar), enabling senior leaders to have a greater impact by executing Dare Forward commitments from the highest level, welcoming and encouraging new initiatives, and driving the company's transformation and adaptation.

5) BEV TRAINING (AMBASSADOR PROGRAM)

The BEV Training is a workshop designed to equip participants with the knowledge and communication skills necessary to become effective BEV (Battery Electric Vehicles) ambassadors. It covers key topics such as the environmental and regulatory push toward zero CO_2 emissions, the technical functioning of BEV, and the advantages of electric mobility. The training emphasizes empathetic communication, myth-busting, and handling objections with facts, particularly using tools like TCO (Total Cost of Ownership) to demonstrate cost-effectiveness. It also delves into the fundamentals of electricity, charging systems (AC/DC, charging modes, and infrastructure), and energy recovery methods like eCoasting and eBraking. Lastly, it introduces Stellantis' Free2move Charge ecosystem and addresses common EV-related misinformation with data-backed fact-checking.

4.2 External Communication

4.2.1 Official Website (ESG and Annual Reports)

The official website hosts a comprehensive Sustainability section, featuring the company's ESG vision, CSR reports (and the Carbon Net Zero strategy. All the stakeholders can explore detailed information on sustainable industrial practices, responsible sourcing, and environmental governance to learn more about Stellantis' commitment to sustainability. Additionally, the Investor section includes the Annual Report and the Sustainability Statement, providing in-depth insights into Stellantis' environmental and social performance.

SUSTAINABILITY STATEMENT

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Figure 13: Table of Contents of the Sustainability Statement outlining general, environmental, social, and governance topics

Press releases and updates are also available on the dedicated Media Website of Stellantis, offering real-time communication on strategic actions and achievements in sustainability.

4.2.2 Social Channels: LinkedIn, Facebook, X, YouTube

1) LINKEDIN

LinkedIn is one of Stellantis' main corporate communication tools. The channel is very active, sharing updates on ESG strategies, circular economy initiatives, company events and progress towards carbon neutrality. New ranges of electric vehicles and battery technologies are often highlighted. Posts often emphasize the group's technological innovation, from new BEV fleet to advanced battery solutions to support the transition towards zero-emission mobility. On this platform Stellantis actively promotes projects linked to sustainable mobility, such as the Freedom of Mobility Forum, SUSTAINera, and Green Campus, demonstrating its commitment to shaping a more

responsible and inclusive future of transportation.

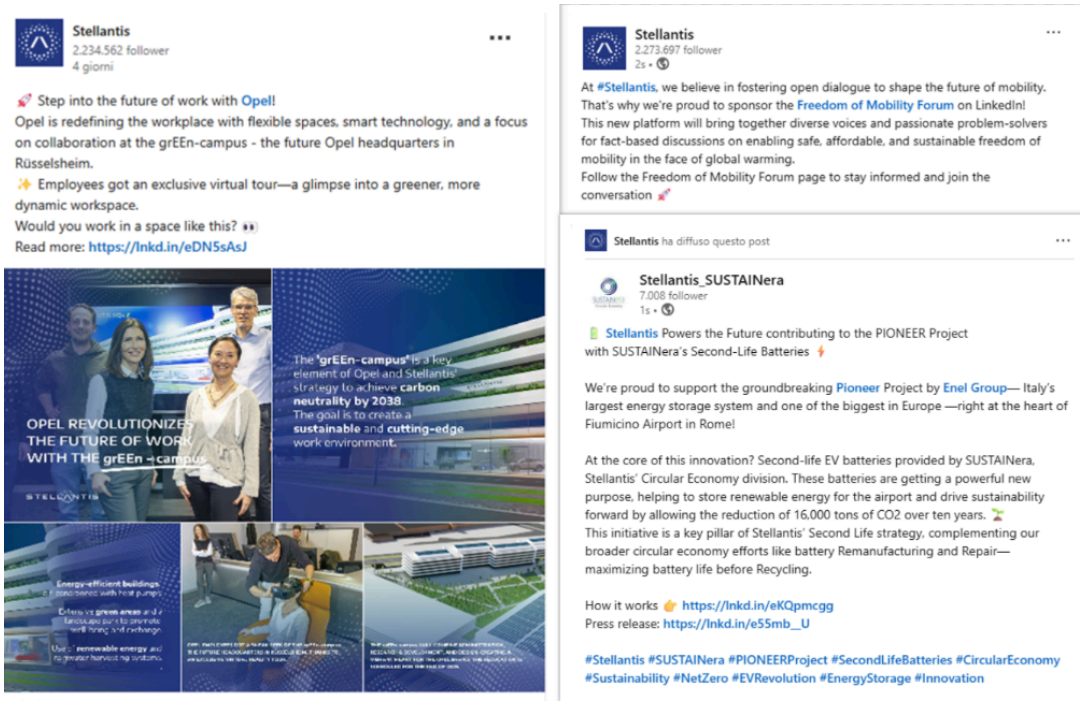

Figure 14: Stellantis' LinkedIn posts promoting sustainable mobility initiatives, circular economy projects, and future workplace innovations

Unlike Stellantis SUSTAINera, the main Stellantis LinkedIn page generally does not use specific hashtags in its posts. In contrast, SUSTAINera actively uses hashtags to emphasize its circular economy efforts, including #SecondLifeBatteries, #CircularEconomy, #Sustainability, #NetZero, #EVRevolution, #EnergyStorage, #Innovation.

2) X

Stellantis' X account is another active platform, with communication focused on hashtags such as #CircularEconomy, #Electrification, #EV and #Sustainable. Posts related to sustainability mainly cover new BEV models (repost announcements from other accounts within the group), technological innovations linked to the energy transition and the various partnership undertaken by Stellantis.

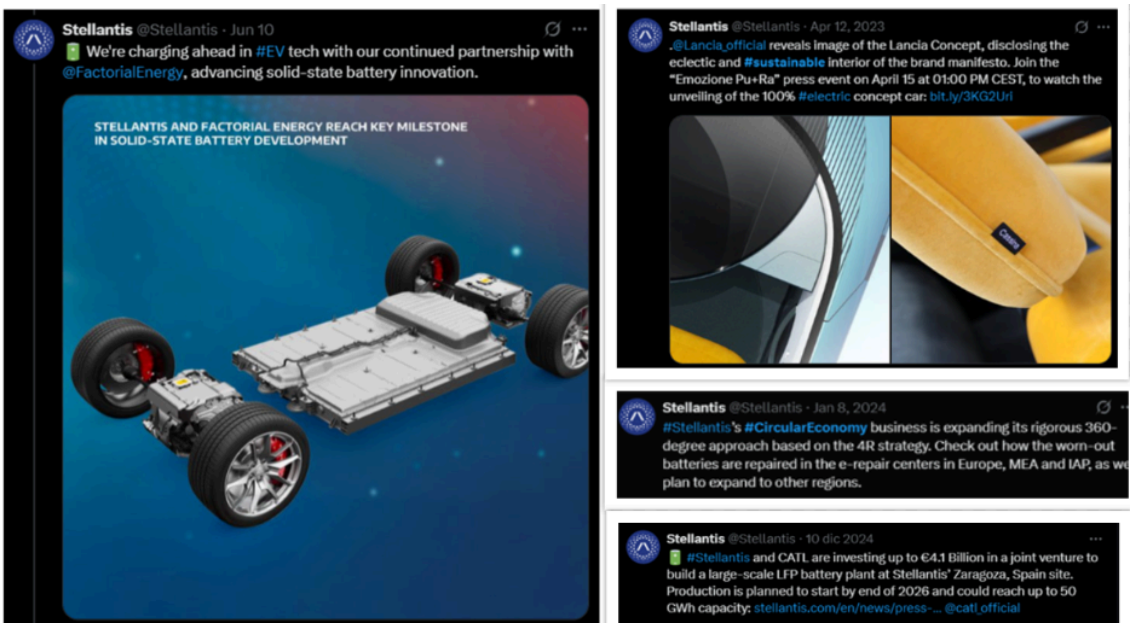

Figure 15: Stellantis' X posts highlighting innovations in EV technology, battery production, and circular economy initiatives

3) YOUTUBE

YouTube is used to a lesser extent compared to other channels. Published content mostly includes official presentations and institutional videos, with limited focus on sustainability-specific initiatives. The most sustainability related contents regard Circular Economy and Dare Forward strategy.

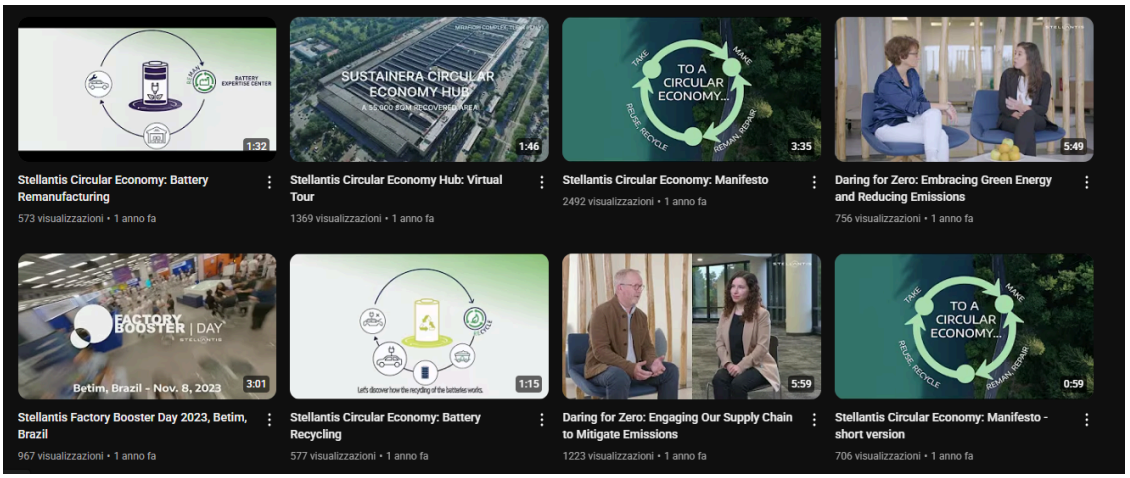

Figure 16: Stellantis' YouTube content focused on circular economy, battery recycling, and sustainability initiatives

4) FACEBOOK

The Stellantis global Facebook page is very active, often sharing content similar to what is published on LinkedIn. The posts related to sustainability primarily focus on new BEV launches and highlight local initiatives from the group's various brands. In general posts specifically dedicated to sustainability topics are less frequent, with communication mainly supporting product announcements or general company news rather than detailed environmental strategies.

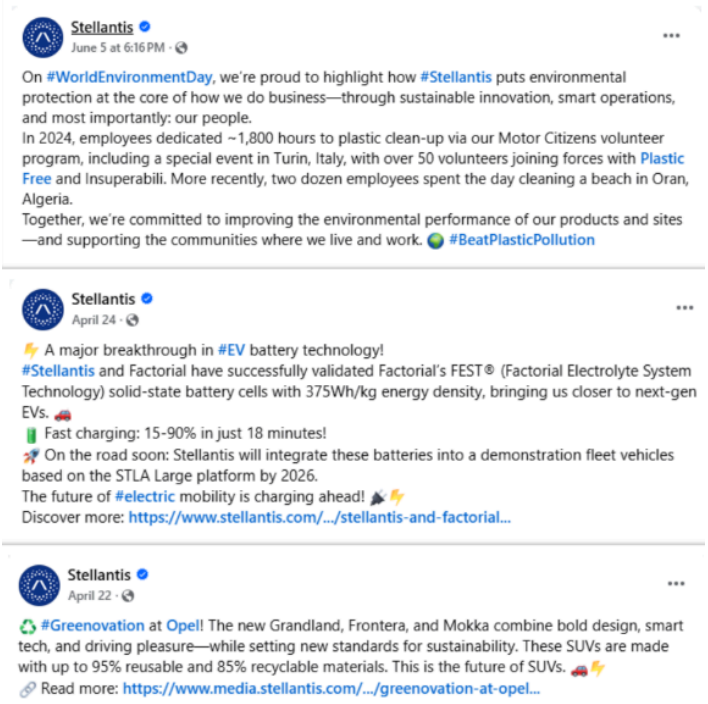

Figure 17: Stellantis' Facebook posts showcasing environmental initiatives, EV technology breakthroughs, and sustainable vehicle innovations

4.2.3 Eco-Sustainable Positioning of Stellantis Brands

The social media pages of the various Stellantis brands mainly focus on promoting new vehicle models. The posts that align most closely with eco-sustainability themes are typically those that emphasize the vehicle's status as a battery electric vehicle (BEV). For example, in the case of the Fiat Grande Panda, posts highlight features such as the BEV version and the Spiral Cable but make no mention of the use of recycled materials or other detailed sustainability aspects. In general, posts do not provide in-depth information on eco-sustainable features but instead, sometimes, direct users to dedicated websites for further details.

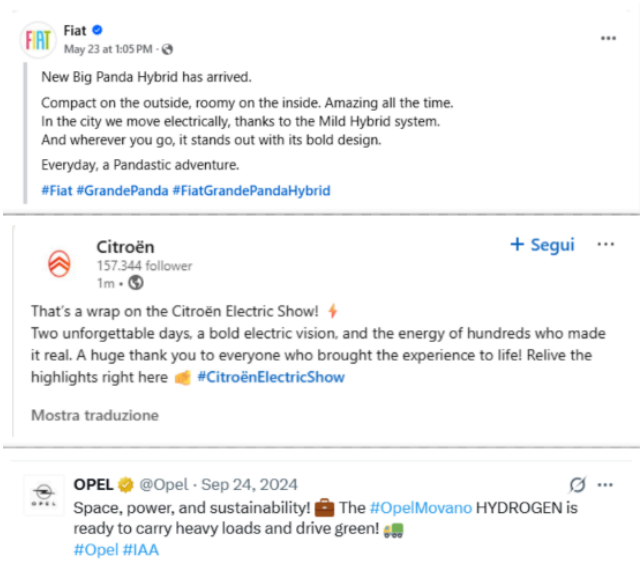

Figure 18: Content highlights new model launches, sustainable mobility events, and green technology innovations

4.2.4 Freedom of Mobility Forum

The *Freedom of Mobility Forum* is an initiative launched by Stellantis in 2022 with the aim of creating a neutral, transparent, and independent space for discussing the global challenges of future mobility [33]. The Forum seeks to address mobility issues in a broad and interdisciplinary manner, placing at the heart of the debate the need to ensure that freedom of movement is sustainable, safe, and accessible to all, while respecting the rights and needs of both present and future generations. The Forum is guided by key principles: transparency, collaboration between participants from diverse backgrounds, a fact-based approach, and a commitment to tackling mobility challenges with a comprehensive, 360-degree perspective. This means that each discussion considers not only technical and environmental issues but also the social, economic, and cultural dimensions of mobility. A distinctive element of the *Freedom of Mobility Forum* is the active involvement of younger generation, students and young professionals from universities around the world such as Brandeis University (USA), HEC Paris (France) and ENSA Kenitra

(Morocco) contribute fresh and innovative viewpoints to the discussions. Beyond its main annual events, the *Freedom of Mobility Forum* distinguishes itself through its production of content: in-depth articles, interviews, resource databases, and key takeaways from the debates. The Forum is not only a place for dialogue but also a laboratory of ideas and a reference point for both public and private decision-makers seeking to build a fairer and more sustainable mobility system.

5. Identified Issues and Strategic Proposals for Integrated Sustainability Communication

5.1 SWOT Analysis of Stellantis' Sustainability Communication

The following SWOT analysis aims to provide a comprehensive overview of Stellantis' sustainability communication strategy, highlighting its key strengths, weaknesses, opportunities, and threats. This evaluation is based on the company's current practices, as outlined in its corporate reports, digital channels, and initiatives described in the previous analysis.

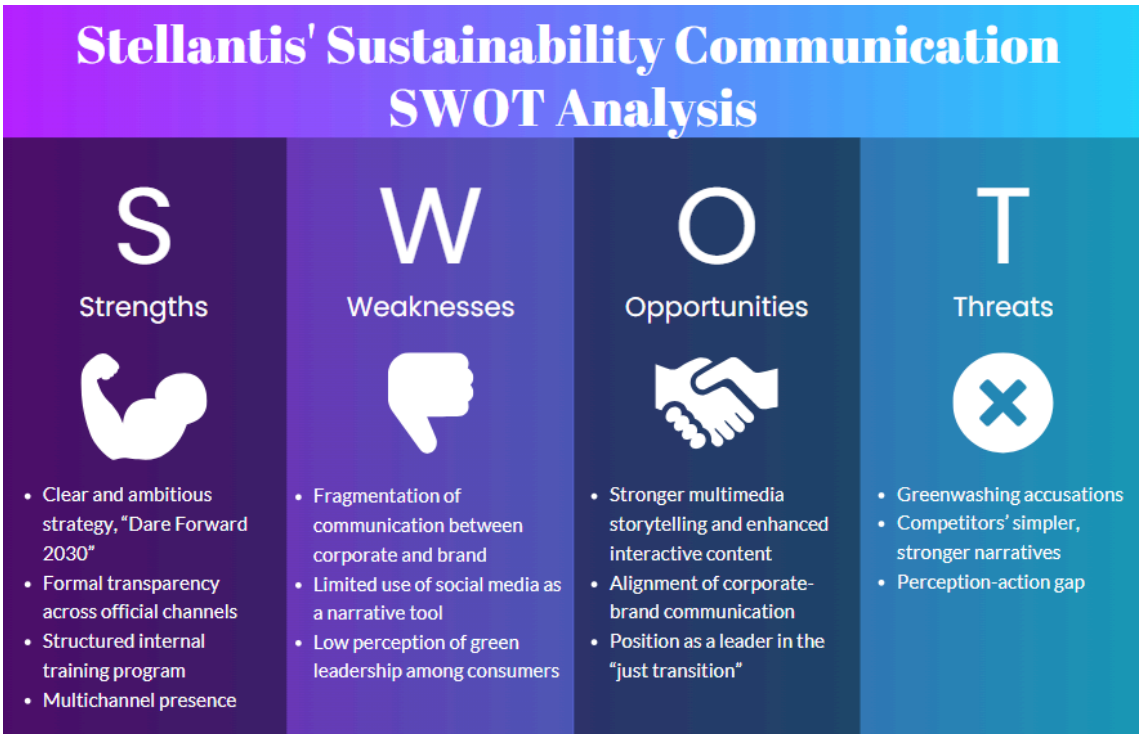

Figure X: visual summary of Stellantis' sustainability communication strategy and its SWOT analysis

Strengths

Stellantis demonstrates a clear commitment to sustainability with its Net Zero 2038 strategy. The company targets Scope 1, 2, and 3 emissions, following a detailed roadmap aligned with globally recognized standards such as ESRS. This solid foundation supports transparent ESG reporting, with annual reports and sustainability statements easily accessible from the official website and compliant with leading frameworks. Internally, Stellantis invests in comprehensive training programs that help align employees with the company's sustainability vision and promote sustainability across the organization. Additionally, the brand actively leverages platforms such as LinkedIn and X to share updates on green innovations, circular economy initiatives, and technological advancements.

Weaknesses

Despite these strengths, communication between Stellantis' corporate headquarters and its individual brands appears fragmented. Many brands tend to focus their sustainability messaging primarily on the features of their electric vehicles, often neglecting to highlight the broader systemic sustainability efforts of the company which results in customers having a limited understanding and low perception of the company's true green actions. Furthermore, consumer perception does not strongly associate Stellantis with sustainability leadership compared to players such as Tesla whose brand for which consumers instantly linked to green mobility thanks to its fully electric product line and clear, emotionally engaging sustainability narrative. While Stellantis, as mentioned in the strengths, uses a wide range of channels to communicate its green initiatives, its presence on social media platforms is often underutilized for sustainability messaging, instead, social posts tend to focus on general corporate updates and vehicles launches. When eco-sustainability content is shared, it often lacks the appeal and engagement seen in competitors' posts, such as those from Renault.

Opportunities

The company has already begun to strengthen its storytelling for example on the circular economy, a theme that could become a key pillar of its green communication strategy by promoting it through platforms such as LinkedIn on dedicated pages like Stellantis_SUSTAINera. However, there is potential to further amplify and integrate these messages across all channels and audiences, helping Stellantis stand out more clearly from competitors. Expanding the use of engaging multimedia content such as short videos, infographics, virtual tours, and interactive dashboards could also make the company's sustainability narrative more accessible and compelling to the stakeholders. Additionally, aligning corporate and brand level ESG messaging through unified guidelines would help reinforce the company's commitments with consistency and clarity, directly addressing the current gap in consumer awareness of the

broader commitments made at the corporate level or by other brands within the group. Lastly, Stellantis could position itself as a leader in the just transition, highlighting efforts to support workers, communities, and responsible supply chains during this transformation.

Threats

While Stellantis provides detailed and transparent CSR reporting, there is still a risk that some stakeholders might perceive a disconnect between the company's ambitious sustainability goals and the visible, easily understood results. This could lead to skepticism or concerns about the credibility of its commitments, even in the absence of actual greenwashing. Competitors, particularly pure EV players with simpler and more emotionally compelling narratives, continue to dominate the green mobility conversation. This makes it challenging for Stellantis' more comprehensive and systemic sustainability efforts to achieve comparable visibility and emotional resonance. Finally, a perception-action gap could persist if communications do not effectively translate the company's real progress into tangible, impactful stories that resonate with the public.

5.1.1 Proposals for an ESG-Oriented Social Media Strategy Compared to Competitors

Stellantis is already doing a respectable job in communicating, with a high level of transparency through its detailed ESG and CSR reporting. However, there is room to further strengthen the impact and resonance of these messages, particularly on social media platforms that can engage wider and younger audiences such as Instagram. By looking at competitors, several best practices emerge that Stellantis could consider to implement in its communication. For instance, Renault by successfully integrating sustainability facts and statistics directly into its visual content or captions ensures that ESG messages are immediately visible and impactful to the audience, capturing attention without relying on lengthy explanations. Renault also makes strategic use of Instagram features, including Stories Highlights

dedicated to sustainability, which provide followers with a permanent, easy-to-access archive of green initiatives. Furthermore, Renault engages its audience through interactive tools, such as polls and quizzes in Stories. These elements not only reinforce the brand's green positioning but also present product features like those of electric vehicles in a fun and approachable way, creating a connection with the community.

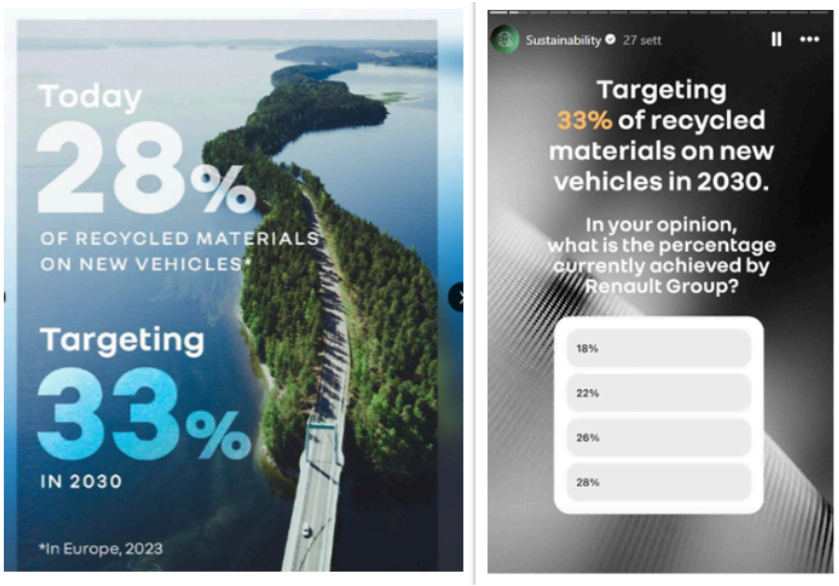

Figure X: Instagram content published by Renault Group to communicate its sustainability goals

Building on its existing strengths, Stellantis could enhance its ESG-oriented social media strategy by:

- Embedding key facts, data points, or sustainability claims directly into images, graphics and captions, ensuring that the green message is clear at first glance and reinforces credibility
- Creating permanent Stories Highlights focused on sustainability topics across platforms like Instagram, where followers can explore the company's long-term commitments, initiatives and progress at any time.

- Expanding the use of interactive elements such as polls, quiz or Q&A sessions in Stories, to educate and engage followers while simultaneously showcasing vehicle features linked to sustainability (e.g., low emissions, recycled materials, energy efficiency)
- Launching interactive campaigns, for example challenges or user-generated content contests, that encourage followers to share their own sustainable actions, experiences with Stellantis vehicles, or ideas on green mobility. This could foster a stronger community around the brand's ESG mission
- Collaborating with eco-conscious influencers and content creators, particularly those who appeal to Gen Z and Millennial audiences, to amplify Stellantis' ESG messages through authentic, relatable storytelling that resonates with younger consumers
- Producing and promote across brands short, dynamic videos, virtual tours (e.g., of gigafactories or recycling centers) and infographics that illustrate complex sustainability efforts such as circular economy initiatives or supply chain decarbonization in a way that is simple and engaging

By introducing these enhancements, Stellantis can simplify and humanize its sustainability narrative while maintaining the technical depth and credibility it already demonstrates through its ESG reporting. These actions would help bridge the perception-action gap, closing the competitive distance with players like Renault, and position Stellantis more firmly as a leader in sustainable mobility in the eyes of both general and niche audiences.

5.1.2 Enhancing Transparency and Aligning Sustainability Communication

To further strengthen stakeholder trust and engagement, the company could evolve transparency from an activity primarily guided by a once-a-year report into an ongoing, interactive dialogue with its ecosystem. One potential initiative would be the creation of a real-time, interactive ESG dashboard accessible on the corporate website. This platform could allow stakeholders to monitor key sustainability metrics such as energy transition milestones or water usage on a continuous basis, enhancing both visibility and trust in the company's efforts. Additionally, Stellantis could host regular webinars, virtual roundtables, or Q&A sessions featuring sustainability leaders, brand representatives, and subject matter experts. These events could be framed around key themes of the group's vision, such as the current Freedom of Mobility Forum. Through these formats, investors, customers, employees, NGOs, and local communities would have the opportunity to engage directly with the company, ask questions, and provide feedback on how Stellantis is balancing environmental goals with its commitment to ensuring inclusive access to sustainable transportation. To complement this, Stellantis could launch open stakeholder consultations or periodic online surveys to gather input on future priorities, perceived gaps in ESG initiatives, and community expectations. Such actions would demonstrate a genuine culture of listening and co-creation. Finally, a critical dimension of this approach involves better integrating communication between the corporate level and individual brands to present a unified, coherent narrative on sustainability. Stellantis could develop and deploy a formal Sustainability Communication Playbook, a set of internal guidelines designed to ensure that all brands convey ESG messaging that reflects and amplifies the group's commitments. This would help ensure that consumers of specific brands are aware not only of product-level sustainability features but also of the broader systemic efforts led by the group.

6. Conclusions

The ecological transition in the automotive sector is not only a technological and industrial challenge but also a cultural and communicative one. This thesis has explored the case of Stellantis, analyzing both its environmental initiatives and its sustainability communication strategies. The analysis has shown that Stellantis is actively committed to reducing its environmental impact through a wide range of actions, from electrification and circular economy practices to investments in renewable energy and responsible supply chain management; these initiatives are not isolated efforts but are part of a broader ecosystem all committed to reach the carbon net zero by 2038. In parallel, Stellantis' use of digital communication across multi-channel platforms shows a growing awareness of the importance of transparency, stakeholder engagement, and storytelling in the sustainability domain. However, the study has also highlighted some areas for improvement, particularly in the alignment between corporate and brand-level communication and in the emotional and narrative effectiveness of messages conveyed through social media. To address these challenges, the thesis proposed a series of strategic actions, including the creation of a Sustainability Communication Playbook, the development of interactive and real-time ESG dashboards and the use of more engaging and accessible formats. These proposals aim to strengthen the credibility, visibility, and impact of Stellantis' sustainability efforts, helping the company to position itself as a leader in the transition toward sustainable mobility. Despite these important insights, the study has certain limitations, the analysis is primarily qualitative in nature and relies on publicly available sources and few internal documents. While this approach provides valuable insights, it may not fully capture the complexity of internal decision-making processes within the company. Additionally, the evaluation of communication effectiveness is based

on content analysis without the support of direct measurements of stakeholder perceptions or engagement metrics. This limitation suggests a direction for future research, by gaining access to internal stakeholder engagement data such as interaction rates and feedback the analysis could offer a more accurate understanding of which sustainability campaigns are truly effective and which may require rethinking. Such data would allow researchers to move beyond assumptions and observe the real impact of communication strategies on different stakeholder groups. Moreover, the case study focuses exclusively on Stellantis. While this provides a detailed and in-depth view of one major player in the automotive sector, the findings may not be fully generalizable to other companies with different structures, cultures or market positions. Future studies could benefit from a comparative approach, analyzing multiple automotive groups to identify common patterns and unique strategies. In sum, the research confirms that Stellantis is moving in a promising direction, combining industrial innovation with a growing emphasis on sustainable values. However, to fully realize the potential of its efforts, the company will need to continue strengthening the alignment between what it does and how it communicates it internally and externally.

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