Luxury Auto and the Electric Powertrain

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Abstract

The luxury automotive sector is undergoing significant transition toward electrification, but the pace and depth of this shift remain contested. This thesis investigates the drivers of electrification. The research is framed by four drivers, namely regulatory and policy, consumer and market, technological and competitive, and symbolic and brand-related drivers, and the managerial lenses of dynamic capabilities, institutional theory, and brand heritage.

A triangulated mixed-methods design was applied. A literature review developed the analytical framework, eighteen semi-structured expert interviews with senior managers across strategy, product development, brand management, sales, and engineering captured industry-side perspectives, and an online survey with 161 usable responses provided the consumer-side complement. Interview transcripts were analyzed through deductive and inductive coding along the four driver clusters; survey data were examined through scale construction, regression, and item-level analyses.

The findings indicated that electrification in luxury is a multi-variate phenomenon in which the four clusters do not operate with equal force. EU regulation operates as the dominant industry-level push, while consumer and market evidence reveals a structural gap between recognition of these drivers and willingness to buy. Technology and competition reshape the playing field, and brand identity acts more as a strategic filter than a pure driver. The realistic near to medium term path is hybridization and segmented electrification rather than a uniform BEV-only commitment. The thesis contributes a structured, segment-specific reading of luxury electrification that connects regulatory pressure, capability reconfiguration, and brand-heritage constraints.

Keywords: Luxury Automotive, Electrification, Electric Powertrain, Electric Vehicles, Brand Heritage, Dynamic Capabilities, Institutional Theory, EU Regulation, Triangulation, Mixed-Methods Research

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Resumo

O setor automóvel de luxo encontra-se em transição rumo à eletrificação, mas o ritmo e a profundidade dessa mudança permanecem em debate. Esta dissertação investiga os fatores que a impulsionam, com base em quatro grupos – regulatórios, de consumidor e mercado, tecnológicos e competitivos, e simbólicos e de marca – e em três lentes de gestão: capacidades dinâmicas, teoria institucional e património de marca.

Foi aplicada uma metodologia mista triangulada. Uma revisão estruturada da literatura desenvolveu o quadro analítico; dezoito entrevistas semiestruturadas com gestores seniores de estratégia, desenvolvimento de produto, gestão de marca, vendas e engenharia captaram a perspetiva da indústria; um questionário online com 161 respostas válidas forneceu a vertente do consumidor. As transcrições foram analisadas por codificação dedutiva e indutiva nos quatro grupos, e os dados do questionário com construção de escalas, regressão e análises ao nível dos itens.

Os resultados indicam que a eletrificação no luxo é um fenómeno multidimensional, em que os quatro grupos atuam com intensidades distintas. A regulamentação da UE é o motor estrutural dominante, enquanto a evidência do consumidor revela uma lacuna entre o reconhecimento dos fatores e a disposição para comprar. A tecnologia e a concorrência reconfiguram o terreno competitivo, e a identidade de marca atua como filtro estratégico, não como motor pleno. A curto e médio prazo, a trajetória realista é a hibridização e a eletrificação segmentada, e não um compromisso uniforme em BEV. A dissertação propõe uma leitura específica que articula pressão regulatória, reconfiguração de capacidades e constrangimentos de marca.

Palavras-chave: Automóvel de Luxo, Eletrificação, Sistema de Propulsão Elétrico, Veículos Elétricos, Património de Marca, Capacidades Dinâmicas, Teoria Institucional, Regulamentação da UE, Triangulação, Métodos Mistos

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AI Disclaimer

This document has been reviewed using AI tools for linguistic refinement and clarity. AI was not used to generate any of the substantive research content of this thesis.

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List of Abbreviations

ANOVA	Analysis of Variance
BEV	Battery Electric Vehicle
CO_2	Carbon Dioxide
CSR	Corporate Social Responsibility
ESG	Environmental, Social, and Governance
EU	European Union
EV	Electric Vehicle
GCC	Gulf Cooperation Council
ICE	Internal Combustion Engine
IEA	International Energy Agency
LFP	Lithium Iron Phosphate
MSRP	Manufacturer's Suggested Retail Price
NMC	Nickel Manganese Cobalt
OEM	Original Equipment Manufacturer
OLS	Ordinary Least Squares
OTA	Over-the-Air
PHEV	Plug-in Hybrid Electric Vehicle
R&D	Research and Development
R^2	Coefficient of Determination
US	United States
WTP	Willingness-to-pay

1 Introduction

1.1 Background and Motivation

The automotive sector is currently undergoing electrification. Batteries and their performance have improved to make battery electric vehicles more viable in various segments (Ziegler & Trancik, 2021). At the same time, European regulators are pushing for low-emission and zero-emission offerings. This is having a direct impact on product development and investment allocation (Regulation (EU) 2019/631). Luxury carmakers have historically competed based on brand heritage, craftsmanship, luxury customer experience, and product differentiation. Electrification could facilitate differentiation based on performance, software-based functionality, and sustainability positioning. At the same time, it could disrupt brand meaning and undermine the driving experience associated with luxury auto ownership. Thus, luxury auto's transition to electrification is also a strategic and brand-related transition.

Various carmakers have announced flexible timelines and a parallel emphasis on combustion or hybrid alternatives in response to demand uncertainty, profitability, and infrastructure limitations (Reuters, 2024). The market reception of Ferrari's new electric Luce illustrates how even committed luxury electrification can trigger sharp backlash, with shares falling sharply and former executives publicly questioning whether the model betrays Ferrari's heritage (Piovaccari & Beaulieu, 2026). In a similar vein, Maserati cancelled the electric version of its MC20, citing insufficient demand for a battery electric supercar (Reuters, 2025). These signals indicate that luxury electrification is uneven and warrants closer examination of its drivers.

1.2 Research Gap and Research Question

Most scholarship on electric mobility concentrates on mass market adoption and country-level factors such as economic incentives or charging infrastructure (Sierzchula et al., 2014). In contrast, segment-specific strategic studies are less prevalent. From a management theory point of view, factors such as external pressures from regulation or stakeholder demands raise the importance of strategic choices related to changes in the external environment. Meanwhile, firm-specific factors such as reconfiguring resources and capabilities affect firm-level action among manufacturers. In the luxury segment, these factors combine with other pressures, such as the need to preserve brand equity, sustain high margins, and provide best-in-class usability. This thesis aims to answer the following research question: **What are the drivers of electrification in the luxury automotive sector?**

2 Literature Review

This chapter examines literature relevant to electrification in the luxury vehicle segment. Section 2.1 discusses electrification as an industry transition and what it means to be a luxury vehicle. Section 2.2 develops four broad pressures upon the luxury segment and Section 2.3 sets out theoretical lenses.

2.1 Core Concepts and Industry Context

2.1.1 Electrification as an Industry Transition

Electrification in the automotive industry is a systemic socio-technical transition rather than simple product substitution. The socio-technical electrification landscape represents macro-level contextual pressures, including issues such as climate policy, geopolitical shifts, and cultural change (Geels, 2002). From this perspective, the internal combustion engine, as the regime technology, has been destabilized over the last few decades by many emerging pressures (Geels, 2019).

The process has been slow due to techno-economic, social-cognitive, and institutional-political lock-ins. Incumbent firms, far from being passive receivers of pressure, are actively seeking to shape transition pathways through lobbying, standard-setting, and framing the market. Hence, the pace and direction of this transition are very much contested (Geels, 2019).

Since 1991, the real price of lithium-ion cells has declined by about 97%, showing an annual price decline of around 13% (Ziegler & Trancik, 2021). Battery suppliers have emerged as powerful new players, inter-plant competition for the allocation of new models has intensified, and much simpler electric vehicle architecture has led to production efficiencies (Rísquez Ramos & Ruiz-Gálvez, 2024). Moreover, Tesla's market entry has challenged many of the commonly accepted assumptions about structural barriers insulating incumbents in the automotive sector (Perkins & Murmann, 2018).

Fundamental paradigm shifts tend to overwhelm competencies firms have built up under previous regimes because incumbents, having bounded cognition, are unable to perceive opportunities that require a different competitive logic (Jiang & Lu, 2023). For this thesis, electrification will be treated as a multi-dimensional strategic issue, involving compliance, capability reconfiguration, transformation, and competition.

2.1.2 Defining Luxury in the Automotive Context

It is important to note that luxury is not a price category but a competitive logic. Luxury brands are based on rarity, socially stratified access, and the creation of desire beyond any rational justification for purchase (Kapferer, 2016; Kapferer & Michaut-Denizeau, 2019). From this perspective, a premium brand will regard electrification primarily as another cost and feature parity issue. In contrast, a luxury brand needs to frame electrification as an ineluctable evolution of its promise of absolute quality beyond traditional thermic engines. Furthermore, electrification opens up a new dimension of status display through "green conspicuousness" (Griskevicius et al., 2010, as cited in Kapferer & Michaut-Denizeau, 2019). What threatens the symbolic underpinnings of luxury is not the electric powertrain itself, but rather the broader concept of sustainability, which fundamentally contradicts luxury's core DNA of excess and vertical social stratification (Kapferer & Michaut-Denizeau, 2019).

The extant literature has proposed several ways of operationalizing luxury's brand value. The Brand Luxury Index identifies five consumer-facing dimensions: conspicuousness, uniqueness, quality, hedonism, and extended self (Vigneron & Johnson, 2004). A four-dimensional model separates luxury value into financial, functional, individual, and social components, with the relative weight of each varying across consumer segments and cultures (Wiedmann et al., 2009). Another framework defines luxury through five elements: public versus private, excellence versus mediocrity, artistic creativity versus profitable creativity, long-term versus short-term, and feeding the spirit to pandering the self (Cristini et al., 2017). Across all conceptualizations, the value of luxury is not solely symbolic and relational; it encompasses psychological elements and functional and utilitarian components, such as superior quality and basic usability (Vigneron & Johnson, 2004; Wiedmann et al., 2009).

Value attributes of luxury car brands are based on strategic positioning of symbolic differentiation elements: socially differentiating benefits, identity-expressive benefits, experiential benefits, and hedonic benefits. These justify premium prices far beyond price paid for functional goods. This encompasses ultra-luxury marques such as Rolls-Royce, Bentley, and Ferrari; performance-luxury marques such as Porsche, Lamborghini, and Aston Martin; and, at least in part, the top-tier models of broad-luxury groups such as BMW M, Mercedes-AMG, and Audi RS, for whom heritage, performance symbolism, and exclusivity constitute relevant strategic dimensions. Volume mass-premium segments, for example, entry-level configurations of the BMW 3-Series or the Mercedes C-Class, would be excluded from this working definition, though they might feature as benchmarking comparative factors.

Two additional findings from the literature on luxury are relevant for electrification. First, the perceived minimum price for luxury follows a lognormal distribution and varies greatly among individual consumers and across cultures. Luxury, thus, is not located above some definite starting price but spans a wide price range that varies socially (Kapferer & Laurent, 2016). Second, there are two psychological mechanisms underlying luxury consumption: a bandwagon effect based on social conformity and belonging, and a snob effect based on uniqueness and differentiation (Kastanakis & Balabanis, 2014). Applying these psychological perspectives to the emerging EV market, symbolic meanings related to electrification will be very different: on the one hand, conspicuously green luxury EVs will be attractive to bandwagon consumers seeking to align themselves with emerging environmentally progressive norms (Griskevicius et al., 2010; Ali et al., 2019); alternatively, snob consumers will either seek to be exclusive in adopting EVs early or will resist EVs because they have become mainstream (Ali et al., 2019). Managing these two segments creates a tension distinct from the mass-market.

According to Tynan et al. (2010), luxury value is not embedded in the product but co-created throughout the ownership experience, with brand narrative and customer engagement. This implies that electrification should not be viewed simply as a product transformation but as something that must be considered within the co-creation system of value-adding activities, from retailing to after-sales, community membership, and brand storytelling, a shift currently observed in high-end EV sales business models (Li et al., 2021).

2.2 Drivers of Electrification in the Luxury Auto Sector

The drivers of electrification at the luxury end of the market are different from the industry in general (Hardman et al., 2016; Noel et al., 2019). While mass-market manufacturers respond primarily to cost imperatives and regulatory compliance floors, luxury manufacturers have the added complexity of a brand-mediated logic where symbolic value and integrity of identity are paramount (Kapferer, 2016).

2.2.1 Regulatory and Policy Drivers

Regulation is the most influential driver of automotive electrification. EU Regulation 2019/631 set binding targets for CO_2 performance for new passenger cars and commercial vehicles sold, which would become increasingly more stringent over time to achieve climate neutrality by 2050. The 2023 amendment through Regulation (EU) 2023/851 introduced a 100% CO_2 emission reduction target for new cars and vans from 2035 onwards. The Fit for 55 package and the European Climate Law placed an additional “legal ratchet” closing off any regulatory

rollback that manufacturers had anticipated (Regulation (EU) 2019/631, 2019; Regulation (EU) 2023/851, 2023; Schlacke et al., 2022).

Regulatory pressure on luxury OEMs is more intense than it appears in aggregate. While the EU provides some limited flexibility for heavier vehicles and temporary derogations for niche manufacturers with low production volumes (Regulation (EU) 2019/631, 2019), this regulatory accommodation is nowhere near enough to absorb the emissions of high-performance luxury powertrains in the long term. Moreover, the penalty regime means that luxury OEMs will have to pay a fine per gram of CO_2 above the target (Regulation (EU) 2019/631, 2019). This implies financial exposure relative to the degree heritage performance diverges from the regulatory floor. Since luxury OEMs produce high-displacement, higher-emission vehicles, this structural element opens a much broader compliance chasm compared to mass-market OEMs. Electrification stands as the most plausible solution, without changing portfolio content or downsizing that would damage brand identity.

A cross-national study of EV adoption across 30 countries revealed that national EV adoption rates were largely explained by financial incentives and charging infrastructure, while sociodemographic variables such as income and education failed to have any independent significance (Sierzchula et al., 2014). This presents two main implications for the luxury segment. First, policy incentives matter in creating demand conditions, regardless of consumer affluence. In other words, the regulatory environment plays a material role in influencing EV market uptake for segments that may be deemed insensitive to price changes. Second, given that luxury buyers are more likely to reside in urban areas, charging infrastructure would less likely act as a key constraint for them compared to the broader market. While charging infrastructure remains a critical barrier to overall EV adoption (Sierzchula et al., 2014), this spatial concentration potentially reduces its limiting effect for the luxury segment.

2.2.2 Consumer and Market Drivers

Luxury EV consumers operate differently from mass-market buyers. EV adoption research suggests that instrumental attributes such as range and charging speed matter only in terms of their associated hedonic and symbolic attributes, and not in isolation (Schuitema et al., 2013). In this respect, a strategic opportunity is present for luxury vehicles. Since the dimensions related to hedonic pleasure and identity already dominate the value proposition, electrification could be presented as a feature that adds driving pleasure and boosts social identity, rather than as an environmentally motivated concession.

This is how cost signaling applies. Making status motives salient increases consumer willingness to purchase green products over conventional alternatives, even if green alternatives are functionally inferior. This is because an observable environmental sacrifice is a credible signal of both wealth and pro-social virtue. Buying an expensive electric vehicle fits exactly this pattern (Griskevicius et al., 2010). This may accelerate diffusion: high-status consumers drive EV adoption, while "conspicuous diffusion" legitimizes electric mobility at an aspirational level rather than only at a responsible one (Noel et al., 2019).

Studies show that luxury brands that strongly associate themselves with self-enhancement values, such as prestige, dominance, and personal success, tend to be evaluated negatively when communicating sustainability. At the cognitive level there is CSR disfluency because CSR themes of benevolence and collective welfare cannot be reconciled with a self-enhancement positioning (Torelli et al., 2012). Green communication backfires on luxury brands whose identity is built on personal success, alienating the consumer segments who are closest to and most defining the brand's core market. Thus, the luxury EV consumer may be segmented according to the relative weight of self-enhancement versus self-transcendence values.

Despite this, status motivation can drive the purchase of green luxury products. Status motivation significantly predicts purchase intention of green luxury vehicles for BMW; however, this is especially true for more materialistic consumers (Ali et al., 2019). Another study with more than 2000 respondents showed that consumers concerned about reputation preferred premium pricing which maintained the status-related signaling of owning an EV (Buhmann & Criado, 2023). Low-cost messaging or promoting affordability paradoxically reduced demand.

This important distinction concerning the identity dimension illustrates how green self-identity rooted in personal values of ecological concern and moral obligation is a driver of EV adoption among mainstream consumers (Barbarossa et al., 2017). In the luxury segment, however, identity expression is driven by hedonic aspiration and status rather than biospheric values.

While millennials are primarily motivated by the "new chic" of green conspicuousness and the belief that modern luxury quality must include sustainability, older generations require that luxury brands should be exemplary in every respect. Additionally, when millennials disengage from sustainable luxury, it is often because they perceive contradictions between luxury and sustainability (Kapferer & Michaut-Denizeau, 2019). Tesla is identified as a rare exception that has resolved this tension. Most importantly, sensitivity and insensitivity to sustainability

represent two dimensions rather than opposites because the same consumer can score high on both.

2.2.3 Technological and Competitive Drivers

Powertrain costs have been largely mitigated by the steep decline in lithium-ion cell prices (Ziegler & Trancik, 2021). For luxury manufacturers, higher margins absorb cost premiums. Battery progress now enables performance characteristics unavailable in combustion vehicles: instantaneous full torque, flat torque curves, and software-defined dynamics that redefine luxury performance.

In addition, new entrants have shifted the competitive reference group. As noted in Section 2.1.1, Tesla demonstrated that barriers to entry were far lower than generally assumed (Perkins & Murmann, 2018). More relevant to the luxury segment is that Tesla has proven the value of software, over-the-air updates, and direct customer relationships, as substitutes, at least in part, for what has historically been regarded as the luxury value proposition: traditional physical craftsmanship and intimate dealer relationships. If so, then luxury in the automobile industry is shifting from hardware know-how to software and ecosystem control.

However, some view Tesla as an idiosyncratic case, not a model to be followed (MacDuffie, 2018). Rather than destroying structural advantages of the incumbent, electrification merely shifts the locus of those structural advantages. On this point, Teece (2019) also argued that despite four paradigm shifts occurring simultaneously, the multinational firm possesses complementary assets and accumulated dynamic capabilities that enable it to remain competitive; strong brands represent one of these complementary assets. This suggests that brand equity is a co-specialized complementary asset for luxury OEMs (Teece, 2007), creating demand-side barriers to imitation and thus increasing the effect of, rather than substituting for, capability investments.

OEM dominance in the value chain, historically based on customer relationship control, quality guarantorship, and systems integration, is now contested by battery manufacturers, software developers, and charging network operators who are becoming structurally indispensable (Jacobides et al., 2016; Rísquez Ramos & Ruiz-Gálvez, 2024). Luxury OEMs that succeed in integrating all these components into a seamless branded experience will emerge stronger, whereas those that outsource critical elements to suppliers or platforms beyond their reach may lose control over the perception of value.

2.2.4 Symbolic and Brand-Related Drivers

The sustainability paradox in luxury is a central tension. In a systematic review of 113 articles, this paradox was reported as the main concern of sustainable luxury: While culturally, luxury is related to ideas of excess, ostentation, and conspicuous consumption, sustainability relates to ideas of moderation, collective responsibility, and conservation (Kunz et al., 2020). However, this is far from an absolute. Alghanim and Ndubisi (2022), considering a sample of 348 consumers, showed that most luxury value perceptions (conspicuousness, uniqueness, social value, and quality) positively predict the attitude toward consuming sustainable luxury products, while emotional value has a significant inverse relationship. Income was further identified as a moderator specifically for uniqueness: The higher the income, the stronger the positive relationship between the perceived unique value and the willingness to consume sustainable luxury products. This suggests that the paradox can be overcome at higher wealth levels. Luxury electrification may therefore be most viable precisely among the highest-income segment of the luxury market.

However, as mentioned in Section 2.2.2, the cognitive incompatibility between self-enhancement brand concepts and CSR values triggers negative evaluations, even for genuinely sustainable brands (Torelli et al., 2012). Therefore, any luxury car brand positioning regarding dominance, prestige, and personal achievement needs careful calibration regarding the communication around electrification. It needs to be presented as leadership in technology and innovation, not as social responsibility. The former better fits with brand concept of self-enhancement. Athwal et al. (2019) identified this as one of the most under-researched matters in their review of the literature on sustainable luxury marketing.

Brand heritage is a parallel driver. Heritage brands, according to Urde et al. (2007), create value through temporal continuity and the authenticity that such continuity bestows. They are defined along five dimensions: history of track record, longevity, core values, usage of symbols, and an organizational belief that history matters. Electrification creates a strategic dilemma: drawing on the logic of Urde et al. (2007) regarding brand adaptability, brands that frame it as a rupture risk damaging their heritage, while those that resist it risk appearing strategically obsolete. Heritage brands avoiding this understand the core of their heritage transferred through time, such as design philosophy, performance ethos, or standards of craftsmanship, and reinterpret it in terms of an electric architecture. How luxury OEMs accomplish this reinterpretation is important.

Last, as more announcements about electrification appear in the luxury segment, delaying electrification or being publicly ambiguous can appear as strategic weakness rather than a commitment to heritage. Mimetic pressure forces firms to do something, thereby signaling that they are still in the game to investors, analysts, and their best customers. This cannot be underestimated compared to other regulatory or consumer pressures in a segment where brand perception is the main driver of differentiation (Bohnsack et al., 2020).

2.3 Related Management Concepts

Three theoretical perspectives are reviewed in this section, dynamic capabilities, institutional theory, and brand heritage, all of which are relevant firm-level factors.

2.3.1 Dynamic Capabilities

Dynamic capabilities proposed by Teece et al. (1997) can explain how luxury automakers, endowed with similar resources, respond differently to pressures of electrification. The framework distinguishes ordinary capabilities, which allow for efficient execution of existing activities, from dynamic capabilities that enable strategic changes in the resource base itself. Dynamic capabilities do not imply superior performance *per se*. On the contrary, firms lacking dynamic capabilities may remain trapped in a position in which they cannot adapt despite recognizing the need to do so.

Three microfoundations unpack dynamic capabilities: sensing, which identifies and interprets emerging threats and opportunities; seizing, which involves resource allocation to pursue the identified opportunities; and transforming, in which the assets, structures, and business model must be continuously reconfigured to remain competitively relevant (Barreto, 2010; Eisenhardt & Martin, 2000; Teece, 2007). For luxury automotive firms, each element carries specific content. Sensing involves not only tracking battery technology and regulatory timelines, but also recognizing how electrification is reshaping the symbolic economy of the category. This is an interpretive task that requires cognitive flexibility alongside technical foresight. Seizing requires governance structures capable of sustaining long-horizon EV investment under near-term pressure from highly profitable combustion lines (Bohnsack et al., 2014). Finally, transforming is perhaps the most demanding task, both in operational restructuring (manufacturing, supply chain, software) and in reinterpreting brand architecture to an electric context while not losing heritage associations that have long anchored brand equity.

Teece (2019) reaffirms that complementary assets matter. With Chinese auto firms competing with established multinationals, the multinationals still have significant advantages due to well-

established brands and strong dynamic capabilities, even though new entrants have successfully entered the market. For luxury OEMs specifically, brand equity functions as a co-specialized complementary asset: it creates demand-side barriers to imitation that reinforce the value of capability investments (Teece, 2007).

Werner et al. (2022) show that dynamic capabilities also matter outside the boundaries of a firm by shaping the regulatory environment, customer expectations, and standards. This is strategically relevant for luxury manufacturers, whose institutional relationships and brand prestige may provide disproportionate influence over how the electrification transition is framed and paced.

Limits of the adaptive incumbent view, however, must also be acknowledged. When a paradigm shift exceeds the cognitive frame within which capabilities were developed, those capabilities may not transfer (Jiang & Lu, 2023). For example, luxury car manufacturers have been competing within an ICE framework for several decades. Therefore, they may not correctly identify or interpret electrification signals. In other words, they may be too cognitively bounded with older analytical frames to recognize new competitive threats (Tripsas & Gavetti, 2000). This is further complicated by the heritage dimension where identity commitments within organizational self-understanding can preclude electrification innovation.

2.3.2 Institutional Theory

While Dynamic Capabilities explain firm-level variation in responses to exogenous market-based threats and opportunities, Institutional Theory proposes how firms respond similarly to social external pressures. DiMaggio and Powell (1983) identify three mechanisms of isomorphic convergence: coercive isomorphism, arising from regulatory mandates and legal requirements; normative isomorphism, arising from professional standards, ESG expectations, and the diffusion of shared cognitive frameworks among managers; and mimetic isomorphism, arising from uncertainty-driven imitation of perceived leaders. These can explain why, even if internal capabilities and strategic preferences differ, firms announce similar electrification commitments along broadly similar timelines (Bohnsack et al., 2020).

An empirical study of EV strategies across the 13 largest global automakers from 2006 to 2016 found evidence of all three mechanisms at work, with coercive pressure from regulation driving convergence, while normative and mimetic pressures shaped the framing and timing of announcements (Bohnsack et al., 2020). In addition to convergence, there was always divergence beneath the surface: the content, sequencing, and strategic depth of electrification

commitments differed substantially. Thus, institutional pressure at the level of public discourse yielded a semblance of conformity, but there may be divergence at the strategic level.

2.3.3 Brand Heritage as Identity Constraint and Strategic Asset

Brand heritage offers another theoretical strand. It speaks to how historical identity limits a firm's managerial perception of organizationally legitimate choice options (Tripsas, 2009). For firms where brand identity is tightly coupled with organizational self-understanding, as is generally the case with luxury automotive, managers evaluate strategic options against historically constituted standards of what the brand is allowed to be. Options that meet this standard will be registered as opportunities, while those that do not will be rejected as threats to brand integrity even if they are commercially viable (Urde et al., 2007). Consequently, such identity-based filtering serves as a cognitive antecedent to sensing and seizing; even before formal analysis, this would have already filtered what will be taken as a strategic signal.

The heritage quotient, comprising track record, longevity, core values, symbols, and organizational belief in the importance of history, generates authenticity and temporal continuity (Urde et al., 2007). Where brand identity has been historically associated with the best combustion engineering, evaluation of electrification is likely to be framed in terms of what combustion has delivered, rather than redefinition of the value proposition with a new architecture. Thus, identity-anchored framing may delay viewing electrification as an opportunity consistent with identity rather than a disruptive threat.

This is compounded by operational challenges: incumbent automakers burdened with path dependencies regarding their current business models could cross-subsidize investment in EVs with profits from combustion vehicles (Bohnsack et al., 2014). Together, these perspectives provide the analytical foundation for the empirical analysis.

3 Methodology

3.1 Scientific Method

This study followed the scientific method, combining theoretical foundations with empirical data (Zikmund et al., 2013). The research was data-driven and centered on a single research question with a clearly defined dependent variable: what drives the pace and direction of electrification in the luxury automotive sector. Terms such as “electrification,” “luxury segment,” and “strategic drivers” were defined precisely at the outset to avoid conceptual ambiguity. Falsifiability was preserved by allowing the framework to accept that qualitative patterns might not appear in the survey results. Theoretical grounding came from a structured literature review, which fed directly into both the interview guide and the survey instrument. The study blended deductive and inductive reasoning: literature-based categories were refined through expert interviews and then tested quantitatively in the survey. Taken together, this reflects an abductive logic, where the aim was to work toward the most plausible explanations for whatever patterns emerged (Saunders et al., 2009) and establish conclusions replicable by other researchers.

3.2 Secondary Data Gathering

Secondary data came from a structured literature review with clear inclusion criteria. Studies had to address the core concepts, explain potential electrification drivers, and yield material for interview themes or survey items (Saunders et al., 2009). The scope covered academic work on electric vehicle adoption, strategic management in the automotive industry, and brand-related considerations specific to the luxury segment.

3.3 Primary Qualitative Data Gathering

Semi-structured expert interviews were well suited for the study for qualitative data gathering. They keep conversations focused while leaving room to follow analytically promising threads and allowing for cross-respondent comparison (Edwards & Holland, 2013). Experts were chosen purposively with direct relevance to the topic as those who could speak to it in an informed way. The sample was designed to capture a balanced cross-section of perspectives, pulling in professionals from strategy, product development, brand management, sales, retail, consulting, and technical/R&D roles across different luxury automotive firms. In total, 18 interviews were performed. An anonymized overview of the experts was put together for reference (see Table 1).

Table 1: Overview of Interview Experts (anonymized)

Code	Functional Role	Industry Tenure	Geographic Focus	Brand-Tier Exposure	Methodological Relevance
E1	Sales management	10–20 yrs	Middle East	Luxury	Regional dealer-network and brand-strategy view
E2	Brand & marketing management	10–20 yrs	Europe	Luxury, premium	European retail perspective on EV demand and luxury positioning
E3	Management consulting	15+ yrs	International	Luxury	Long-horizon strategic perspective on the ultra-luxury segment
E4	Sales & brand management	5–15 yrs	Middle East	Luxury	Customer expectations and luxury identity in the GCC market
E5	Sales management	15+ yrs	Europe / Asia	Luxury, premium	Cross-brand portfolio and regulation-driven strategy
E6	Marketing & customer management	5–15 yrs	Europe	Luxury, hypercar	Group-level brand exposure and customer-research insights
E7	Technical / R&D	5–15 yrs	Europe	Luxury, premium	Engineering and battery / fast-charging perspective
E8	Sales management	5–15 yrs	Middle East	Luxury	Network operations and demand-generation view
E9	Independent retail and advisory	20+ yrs	Europe	Luxury, hypercar	Critical retail perspective on EV demand and supply chain
E10	Dealership sales & product	5–15 yrs	Asia	Luxury, premium	Retail perspective on EV adoption and incentives
E11	Management consulting	10–20 yrs	Americas	Luxury, premium	External US/Europe consumer-experience view
E12	Marketing and sales	5–15 yrs	Americas	Luxury, premium	Retail perspective and emerging-market dynamics
E13	Independent retail and advisory	10–20 yrs	International	Luxury, hypercar	Resale, rarity and emotional-value perspective
E14	Sales management	5–15 yrs	Europe	Luxury, premium	Dealer-side perspective on EV uptake, residual value dynamics and luxury customer sentiment
E15	Technical / R&D	15+ yrs	Europe	Luxury, premium	Battery-development perspective on electrification, drivetrain technology and lifecycle emissions
E16	Senior management, R&D	15+ yrs	Europe	Luxury, premium	Vehicle-development and platform-strategy perspective on electrification and transformation

E17	Senior management, R&D	15+ yrs	Europe	Luxury, premium	OEM-side perspective on charging, high-voltage storage and lifecycle sustainability
E18	Sales & marketing management	5–15 yrs	Europe	Luxury, premium	Market-, customer- and competitive-landscape perspective on electrification and Asian entrants

Interview count was guided by data saturation: once new interviews stopped adding fresh insights, collection ended (Guest et al., 2006). The findings refined the analytical framework before the survey phase. All participants took part voluntarily, gave informed consent, and were anonymized.

The interview transcripts were analyzed using deductive and inductive coding (Mayring, 2014). The four literature-based driver clusters from Chapter 2 (regulatory and policy, consumer and market, technological and competitive, and symbolic and brand-related) provided the deductive frame, while inductive subthemes were developed where the data pointed beyond these initial categories. The thematic mapping is documented in Table 6 and Appendix A. Frequencies were interpreted with care, as indicators of salience rather than as a basis for statistical generalization (Saunders et al., 2009).

3.4 Primary Quantitative Data Gathering

The quantitative data collection was an online survey. The questionnaire was built from the analytical framework of the literature review refined by what emerged from the interviews (Saunders et al., 2009). After cleaning the data, the final sample landed at 161 usable observations. The target was a sample large enough to support meaningful statistical analysis. The survey included background questions, items tied to the main analytical constructs, and measures for the dependent variables that linked back to the research question. Most constructs were captured using Likert-type items. These were combined into scales for analysis (Carifio & Perla, 2008). Both continuous and binary variables were included where it made sense. Participation was anonymous and voluntary, and all data were stored securely.

3.5 Triangulation of Findings

After the literature review and the qualitative and quantitative phases, results were compared systematically. The literature review provided the theoretical driver clusters and management lenses, which were then examined against the expert interviews and survey findings. Patterns from the expert interviews were checked against the survey data across a broader sample.

Convergence between the literature-based expectations, qualitative evidence, and quantitative evidence increased confidence in the findings; divergence prompted explanations such as sample differences, market-specific conditions, or self-report limits. This triangulation approach helped balance theoretical grounding, qualitative depth, and quantitative breadth (Flick, 2002).

3.6 Complex Systems Considerations

The luxury automotive sector can be understood as a complex system in which electrification decisions are shaped by multi-variate, interdependent factors. Regulatory pressure, technological change, consumer preferences, and brand heritage all play a role and do not operate in isolation. Relationships are rarely linear, and outcomes often emerge from dynamics that unfold over time rather than from simple cause and effect. Specific characteristics of complex systems matter here. First, electrification strategies can exhibit path dependence. This means that prior technological choices, asset investments, and organizational routines constrained the set of feasible options in later periods. A luxury carmaker that spent decades refining combustion engines cannot simply pivot overnight without carrying forward some of that legacy. Second, feedback loops occur when early investments and learning effects reinforce further capability development, which then accelerates subsequent electrification efforts. Third, emergent properties arise when system-level outcomes, such as strategic group shifts or changes in competitive positioning, result from the interaction of multiple drivers rather than from any single isolated factor (Sterman, 2002).

These kinds of outcomes are not designed but emerge from the bottom up. This complexity was considered throughout the research design and analysis. In the quantitative phase, results were interpreted cautiously with respect to goodness-of-fit measures. In complex systems, the dependent variable can be influenced by factors that sit outside the model being run. Relying too heavily on R squared can also be misleading, especially as models become more elaborate (Chen & Qi, 2023). The qualitative phase complemented this by capturing how different drivers actually interact in practice. It also supported the interpretation of patterns through plausible mechanisms rather than leaning too hard on single-variable explanations. Error terms and uncertainty were not treated as annoyances but as meaningful indicators of the limits of predictability in this context.

4 Analysis & Discussion

4.1 Expert Interview Findings

This study's qualitative section consisted of eighteen semi-structured interviews with senior managers in the luxury car industry. Transcripts were analyzed through deductive and inductive coding (Mayring, 2014). The four categories of drivers from Chapter 2 (Regulatory, Consumer/Market, Technology/Competition, and Symbolic/Brand) were used as the frame of reference, along with themes inductively developed from the data, such as residual-value uncertainty, loss of sensory experience, hybrid as a bridging technology, and skepticism about the carbon-footprint argument. Thematic recurrence supports the robustness of the analysis (Guest et al., 2006). Interviews are referenced by anonymized codes E1 to E18, only verifiable quotations are used, and frequencies are interpreted as indicators of salience (Saunders et al., 2009).

4.1.1 Regulatory and Institutional Drivers of Electrification

Regulation was the single most powerful force pushing luxury brands toward electrification. From the majority of those interviewed, the focus has been on the EU's CO_2 fleet targets and, linked to this, the de facto ICE phase-out by 2035 set under Regulation (EU) 2023/851 (Regulation (EU) 2023/851, 2023). Table 2 summarizes the institutional layers and the experts who anchored each. More generally, two interviewees went one step further by saying that this path would not have been taken without being imposed: "Even luxury manufacturers would never have moved that fast into electric vehicles if they had not been pushed by legislation" (E3). From the dealer perspective, regulation was described as the "forcing" mechanism behind the BEV pivot between 2019 and 2020 (E8). E14 added one further nuance: As soon as one leading premium manufacturer unveiled its concept, the first customers put down deposits, so genuine early demand coexisted with the regulatory imperative.

Development people saw this differently, however. For example, E16 emphasized that CO_2 regulation was the very first trigger 10 years ago, but today, drivers come from within the product itself; everything is moving towards electric platforms: electrical architectures, software-defined vehicles, and OTA updates. E17 also presented this synthetic view against the background of the Paris Agreement and the perfect fit of electric vehicles. E11 traced how generous tax credits made EVs "the hot thing" before the political environment shifted and 2030 to 2035 mandates were walked back. According to E16, the US clearly shows the clearest retreat path, as manufacturers are already writing down committed investments in EVs.

According to E17, this is where the "softening" of the US trajectory came from, with fading subsidies and no strategic will to push it.

A second recurring theme was the difference between regulatory ambitions and market realities. This was mainly a transition driven by politics rather than customer demand (E5). A similar picture emerged from one of the Asian growth markets, where, according to E10, the same reliance on government targets applied. However, E16 did distinguish genuine withdrawals from operational rebalancing at the plant level, which reflects only a slower pace of transformation than originally envisaged. Because product cycles run between five and nine years (E1, E3, E9), the industry remains exposed to regulatory expectations set years before, even if the political climate has changed.

Table 2: Regulatory and institutional drivers by jurisdiction (interview evidence)

Jurisdiction / Layer	Mechanism	Effect on luxury electrification	Experts
European Union	CO_2 fleet targets, 2035 ICE phase-out	Primary push factor; defines strategic horizon	E1 to E6, E8, E14 to E18
China	Registration regime and market-access constraints on ICE	Forces electrification of locally sold portfolio and shapes product-strategy adaptations	E1, E5, E16
North America	Tax credits now being walked back	Earlier accelerator turning into genuine retreat	E11, E16, E17
Asian growth markets	Government EV targets and tax benefits	Demand contingent on subsidies and infrastructure	E10
ESG / capital markets	Investor pressure on parent groups	Indirect strategic pressure independent of segment demand	E5
Tax-exempt jurisdictions	Removal of luxury or registration tax for EVs	Converts regulation into consumer-driven demand	E8

4.1.2 Market Demand, Willingness-to-pay, and Residual Value Concerns

Once regulatory pressure was set aside, the demand-side case proved far weaker than the announcements of 2020 to 2021 suggested. Three developments reinforced each other: little willingness-to-pay an EV premium over equivalent combustion engine vehicles, a very fragile secondary market, and the perception of rapid obsolescence of the underlying technology. From

the development side, a counter-narrative exists, stating that at price parity, willingness-to-pay occurs if the product convinces (E15, E16, E17).

Luxury buyers proved to be value-sensitive rather than price-sensitive. E4 was precise: ultra-high-net-worth buyers pay an EV premium when the proposition is coherent, but a half-hearted EV at a 20 percent premium is punished. E5 placed the acceptance band at 10 to 20 percent above ICE prices, beyond which resistance grows sharply, and E11 estimated that EVs at MSRP carry roughly USD 10,000 of additional cost without payback in a luxury horizon. E6 noted that within one brand's line-up the electric model had to be priced below the combustion sibling to find buyers. E10 sharpened this for Asian growth markets, where at parity "there is no point for choosing the EV". E14 reported that early enthusiasm reversed once first-generation flagships imposed major losses on early buyers. Development-side voices qualified rather than contradicted this: E17 confirmed that core-segment buyers do choose electric at parity, citing a recently launched parity model. E15 argued the luxury price point absorbs higher production costs without an extra EV premium. E16 offered a heuristic in which a small share actively seek electric, a similar share reject it, and the large middle decides on lifestyle fit and tangible benefits, such as range and charging convenience.

A relevant counter-consideration was residual value. Table 3 summarizes the empirical evidence on this. The technology is moving so fast that what is the flagship today is expected to be obsolete after one or two refresh cycles (E1, E9, E11, E15), and long-term battery degradation is not something a buyer can judge with confidence (E3, E4, E7). According to E11, combustion engine luxury vehicles offer a stable and coherent base for at least seven years, which is not the case for electric vehicles. According to E7, the relevant indicator shifted from mileage to battery condition, and the necessary data infrastructure is still being built. E15 noted that residual value matters less for buyers whose absolute resale losses are already substantial, while E16 observed that pressure was most acute in small cars and improvements in luxury, such as battery durability, exceeded original projections. According to E6, weak WTP and weak residual values reinforce each other. Therefore, high promotional discounts on premium EVs are interpreted as proof of structurally insufficient demand (E1). Thus, leasing becomes the rational instrument (E2, E7). E18 adds that, over time, long warranties help rebuild buyers' trust in EVs.

Table 3: Residual-value evidence in the luxury EV segment

Source	Empirical observation	Interpretation
E5	About 40 percent loss within a few years on a leading premium electric model	Canonical cautionary case across the segment
E10	40 to 50 percent depreciation within one year of ownership in an Asian growth market	Cycle exacerbated where infrastructure and incentives are weaker
E14	Premium electric flagship leasing returns at about 50 percent of list (€140 to 150k to about €70k)	Original purchasers absorb substantial losses, in some cases approaching €100k within two years
E11	EV-MSRP premium of about USD 10,000 vs. ICE; no payback in luxury horizon	Combustion cars retain stable 7-year-plus platform; EVs do not
E16	Residual pressure most acute in small-car segment, less pronounced in luxury	Outlook improving as battery durability beats original projections
E18	Long battery and component warranties extending across generations	Gradually rebuilding buyer trust and reducing residual-value concerns

A generational pattern surfaced. E12 distinguished Gen X/Y customers, who still aspire to combustion sports cars, from younger Gen Z/Alpha buyers, more open to mobility-as-a-service. E18 described much of the remaining skepticism as habitual rather than objective, noting that a weekend with an electric car often leads skeptical buyers to reconsider quickly. E6 reported convergent customer-research evidence that initially hesitant customers tend to become more positive after direct exposure to EVs. Therefore, WTP for luxury EVs varies by cohort, region, tax regime, and emotional fit.

4.1.3 Technological and Competitive Dynamics

The technological discussion ran along three axes: charging and range, battery technology, and new (primarily Asian) competitors. Charging and range, constraints are real but more salient are perception barriers. E4 stressed that Arab Gulf heat and patchy fast-charging infrastructure outside urban centers genuinely shape buyer perception, while E2 made the usage-behavior counterpoint that many customers drive around 50 km per day, making range anxiety largely perceptual in many use cases. Several experts indicated a threshold after which range and charging speed concerns vanish: for E3, this was 500-700 miles of range and 15-20 minutes charging time. E14 reinforced this with a 550 km trip in a long-range EV, adding that most luxury EV owners charge overnight via a wall box. E18 added that 800-volt architectures and charging speeds of several hundred kilometers in ten minutes or less quickly erase what remains

of the gap in experience. In this regard, E7 and E17 stated that voltage architecture and related innovations happen at the mid-segment level, defining the maximum level achievable in luxury, given that dedicated powertrain R&D is almost never conducted at the luxury level. They added that high-voltage storage, charging hardware, and the whole surrounding ecosystem, including green electricity sourcing, are developed as one system.

On battery technology, the trajectories named in the interviews are summarized in Table 4. All three experts gave a more temperate assessment on the near-term horizon. E15 saw no credible alternative to lithium-ion technology for the next five to ten years. E16 considered the most material change to be internal to the family of lithium-ion chemistries, with LFP gaining ground over NMC and viewing the hype around solid-state technology with caution. E17 believed that the effect on cost from LFP and European cell localization will be important for the volume segment, while the luxury segment will continue to use cobalt-based lithium-ion chemistries. Two further themes surfaced: E16 identified automated vehicle-initiated charging as a promising luxury use case, and E2, E15 and E17 added that e-fuels will remain a relevant option for sport-luxury enthusiasts, with combustion-powered high-performance cars likely persisting in this segment. E16, however, cautioned that while alternative fuels serve necessary roles in aviation and maritime transport, they are unlikely to become a central solution for passenger cars, given how well the car functions as an intermediate store of electrical energy. Luxury benefits from innovation primarily as it migrates up from mainstream platforms.

Table 4: Battery technology trajectories named in the interviews

Technology	Role / horizon for luxury	Experts
Solid-state cells	Most mentioned next-generation candidate; energy density, faster charging, temperature performance; major Asian timeline 2027–2028; cell + software ownership decisive	E4, E5, E11, E17
Silicon anodes	Shorter-term improvement already moving toward production	E5
Sodium-ion	Mass-market displacement of low-end Li-ion, easing upstream supply pressure	E5
Hydrogen fuel cell	Long-term grand-touring candidate; infrastructure remains a barrier	E2, E4, E11
LFP within Li-ion	Most material near-term shift; cost-led, broader market; luxury stays on cobalt-based Li-ion	E16, E17
e-fuels	Niche solution for sport-luxury enthusiasts	E2, E15, E17

The competitive landscape is sharply two-tiered. At the premium tier, Asian manufacturers are an increasingly direct threat. E2 noted that Chinese OEMs bring a new model to market in roughly one year against a four-to-six-year European cadence and lead on interior technology, software, and connectivity. E4 and E5 named several Asian EV-native brands as the genuine luxury-EV disruptors, designed as electric from the ground up with vertically integrated battery supply and fast software cycles, and E6 read this as a textbook innovator's dilemma. E16 captured the dynamic vividly: from the Chinese customer's perspective, traditional European combustion luxury reads like a fine mechanical Swiss watch while an EV reads more like a Swatch, so combustion-era heritage does not automatically transfer. E18 illustrated this with a recently introduced large Chinese luxury electric flagship that combined material quality, digital functionality, and smartphone integration at a speed and price that European brands struggled to match. And E17 added that digitally native players from consumer electronics are increasingly entering the segment. At true ultra-luxury, the moats remained robust: E3 argued that leading ultra-luxury brands carry "enormous heritage, culture, history, and a bespoke story that Chinese brands simply cannot replicate overnight." E9 was even more dismissive of Chinese presence at the very top. E18 cautioned, however, that heritage is not a permanent moat, since Chinese players can build their own narrative within a few years where buyers are not anchored to European traditions, and E15 added that the brand-image barrier still protects established players in Europe and the United States, while Chinese buyer and producer preferences create genuine openings at home. From a geographic perspective, Asian OEMs have already won the connectivity battle (E4, E5, E6, E8, E18). Retaliatory tariffs further compound the structural disadvantage faced by established European manufacturers (E11). At the same time, the Middle East and North America remain regions where combustion engines retain commercial relevance (E4, E11).

4.1.4 Brand Identity, Luxury Meaning, and Strategic Response

Most experts defined luxury beyond price: rarity, heritage, craftsmanship, storytelling, and customer experience (E1). A deliberately constructed object, "the weight of a door closing, the specific hand-stitching pattern on a hide selected from a single tannery" place the buyer inside a lineage (E4). Other luxury notions mentioned were desirability and individualization (E2); dream, mystery and rarity (E3); uniqueness, demand-supply imbalance, and customer recognition (E5); the ecosystem around the car (E11); and the emotional logic of the hypercar segment (E13). The most recent interviews extended these definitions: price level (broadly €120,000 to €150,000 upward) and very low annual production (E15). Buyer profile and

regional variation matter rather than absolute size (E16). Other mentions were: consistent over-fulfillment of customer expectations (E17); and the experiential dimension, with the caveat that new Chinese entrants already deliver many of these attributes at lower prices but still lack the heritage to qualify as luxury for traditional buyers (E18).

Electrification creates structural tension along three sub-dimensions. The first is sensory loss. Engine sound, mechanical vibration, gear character, and the perceptible complexity of a combustion drivetrain are part of what the customer pays for, particularly in sport-luxury and hypercar (E2, E4, E6, E8, E9, E10, E11, E12, E13). E4 framed it compactly: an electric powertrain asks the brand to redefine what luxury sounds and feels like, and E12 added that sports-car desirability remains tied to engine sound and combustion feel. E18 noted that synthesized combustion-style sounds read as inauthentic, whereas an original electric sound is more credible. The opposite framing was made by E3: for brands centered on refinement and quiet composure, electrification amplifies rather than undermines brand DNA. E17 reinforced this from an established European premium-luxury manufacturer which concluded years ago that acoustic refinement, comfort, and drivability align with its core driving promise. E15 went further, holding that no tension exists where luxury is defined by comfort, design, and image, except in sports-car and supercar. E7 added that an electric drivetrain delivers the most refined driving experience currently engineerable.

The second sub-dimension is the loss of powertrain differentiation. Electric motors are similar across segments, and the historical premium associated with a hand-built large-displacement engine can only be transported if one redefines what the premium is about (E4, E5, E8, E11). This was framed by E11 as the most structurally acute yet unresolved issue. Perceived quality becomes the main battleground, further complicated by the "Made in China" tag, according to E1. E5 noted that instant torque and silent acceleration are "table stakes rather than differentiators," while E16 quantified that once compact EVs cross the 2.5-second barrier from 0 to 100 km/h, further acceleration in an ultra-luxury sports car becomes hardly differentiating. According to E18, this makes differentiation reside in design, materials, software, personalization, and brand experience.

The third sub-dimension is the strategic response. Experts almost unanimously agreed that the most straightforward path to a fully electric future is through hybridization and selective electrification rather than reinvention from scratch. Concrete moves named are summarized in Table 5. E11 captured the consumer-level corollary: for most luxury clients the realistic answer is a two-car solution, one EV for short-range urban use and one combustion vehicle for grand-

touring. The most recent interviews nuanced this. E17 underlined that a multi-technology approach encompassing combustion, hybrid, and BEV from the start makes continued electrified luxury possible without strategic reversal. E15 expected the long-run picture to remain mixed. What has shifted is the speed and segmentation, not the direction. A small number of respondents objected to the framing of structural incompatibility. According to E4, engineered silence is the answer to the question, "Where is the narrative of craftsmanship in an electric car?" According to E1, handcrafting will find a new expression if battery and motor production are anchored in Europe. Ultra-luxury electrification works when individualized configurations lead the way, according to E2. E13 warned that technology alone does not create luxury.

Table 5: Strategic responses observed across the segment

Sub-segment / response	Observed move	Experts
European grand-touring	Phased electrification rather than full BEV pivot	E4
Premium sports	Reversal on a planned full-electric sports model	E8
European hypercar	Postponement of BEV program	E5, E6, E8
European heritage sports	BEV postponement	E5
Ultra-luxury	Revitalization of twelve-cylinder powertrains	E9
Group portfolio	Parallel-brand strategy (heritage combustion alongside pure-EV brand)	E6
Multi-technology OEMs	Continued combustion + hybrid + BEV without strategic reversal	E16, E17
Sports-car / supercar long run	Meaningful combustion share retained via e-fuels	E15, E17

4.1.5 Sustainability and the Credibility of the Carbon Footprint Narrative

The credibility of the environmental rationale recurred across a substantial share of interviews. The picture was more skeptical than the public narrative suggested, although the most recent interviewees leaned toward clearer endorsement at the larger-vehicle end. Most experts answered with a qualified "it depends", with grid carbon intensity, battery scale and chemistry, vehicle use, and end-of-life management as key groupings. E4 invoked IEA methodology and concluded that EVs come out ahead over a sufficiently long horizon, but only when grid mix and battery production are accounted for. E5 quantified the production-phase premium at roughly 5 to 10 tonnes of CO_2 equivalent for a premium EV, with lifecycle outcomes in countries with a partly decarbonized grid typically 20 to 40 percent better than combustion equivalents over an 8 to 12 year window. E7 reinforced that the answer depends fundamentally

on charging source. E16 added that the lifecycle balance becomes clearer as vehicle size increases, with historical break-even estimates of 60,000 km for larger vehicles, well below typical lifetime mileage. E17 reported that with certified renewable electricity a large premium EV can reach break-even within roughly one year, although materials sourcing remains an upstream challenge, and E15 and E18 confirmed the same direction.

A more critical strand argued that the popular framing (no tailpipe equals green) understates upstream and downstream costs. E2 highlighted lithium and cobalt extraction in selected mining regions, groundwater contamination, and working conditions, adding that EVs produce more particulate matter than ICE cars at comparable weights. E9 characterized the public framing as greenwashing based on personal travel to mining regions, and E11 went so far as to call the combination of unresolved end-of-life battery handling, carbon-intensive mining and shipping, and weak recycling something close to environmental misrepresentation. E14 offered a dealership-level illustration: internal estimates put the operational break-even at roughly 160,000 km, yet typical luxury buyers in this segment drive at most 50,000 to 60,000 km before selling, making it structurally unreachable. The contrast with E16 and E17 reflected different reference assumptions – small-segment vehicles and short luxury ownership cycles versus larger vehicles, lower-carbon electricity, and longer lifetimes. E3 pushed back against the question itself, since ultra-luxury vehicles will never have a low absolute carbon footprint regardless of drivetrain. This means that, in absolute terms, the lifecycle case is more questionable in luxury, which moderates the impact of regulation, as discussed in Section 4.1.1, and contributes to strategic latitude.

4.1.6 Summary of Interview Findings

The five themes did not carry equal weight. Regulation and government pressure stood out as the primary drivers, while market demand, residual values, technology, brand identity, and sustainability operated more as enabling, constraining, or legitimizing conditions. Table 6 maps the empirical role and representative experts within each cluster. Luxury electrification has been institutionally pushed rather than market-pulled, and as regulatory pressure eases, brands are slowing, reshaping, or partially reversing commitments, most visibly in sport-luxury. Development-side voices framed the European OEM trajectory as operational rebalancing rather than retreat. Customer-level WTP was conditional rather than absent. Residual values represent the second-order concern through which the demand and competitive analyses are linked. Competitively, the ultra-luxury segment still enjoys a relatively safe position thanks to heritage and ecosystem-based moats, whereas the premium segment is directly challenged by

Asian OEMs. The dominant strategic response was hybridization and selective electrification. The sustainability debate is more nuanced than popular discourse suggests. The four deductive driver categories were confirmed by the data, and the inductive themes – residual-value risk, sensory loss, two-tier competition, hybrid bridging, and lifecycle credibility – complement that framework.

Table 6: Thematic clusters and expert contributions in Section 4.1

Thematic Cluster	Empirical Role	Core Finding	Representative Experts
Regulatory & Institutional Drivers	Dominant primary driver	EU CO_2 targets, ICE phase-out, Chinese registration regime, North American incentives, and ESG pressure created the strategic push toward EV commitments, often before customer demand was sufficiently developed.	E1 to E6, E8 to E18 (mechanisms vary by region: China-related regulatory and market-access pressure specifically E1, E5, E16; North American tax-credit and subsidy retreat specifically E11, E16, E17; ESG/capital-market pressure specifically E5; tax-exempt jurisdictions specifically E8)
Market Demand, WTP & Residual Values	Secondary, largely constraining condition	Demand was conditional rather than absent; WTP depended on incentives, buyer profile, region, and emotional fit, while residual-value collapse and battery uncertainty reinforced leasing as the rational instrument.	E1 to E18 (E7 did not contribute to WTP; E12 and E17 did not contribute to residual values)
Technology & Competitive Dynamics	Enabling and disruptive driver	EV technology delivered torque, silence, refinement, range, and charging gains, but shifted competition toward batteries, software, and Asian OEMs with faster cycles	E1 to E18

Thematic Cluster	Empirical Role	Core Finding	Representative Experts
		and digital leadership; threat strongest at premium tier.	
Brand Identity & Strategic Response	Strategic filter and boundary condition	Electrification fit serenity-focused ultra-luxury but produced sensory loss and powertrain homogenization in sport- and hyper-luxury, explaining hybridization and coexistence rather than full conversion.	E1 to E18 (the brand-identity question was not posed to E9; his contribution covers sensory and competitive dimensions only)
Sustainability & Carbon Credibility	Contested legitimizing rationale	Lifecycle CO_2 benefits were treated as conditional on grid mix, battery scale, usage duration, and end-of-life handling; the luxury combination of large batteries, low annual mileage, and high break-even thresholds made the rationale ambiguous.	E2 to E7, E9 to E18

4.2 Survey Analysis

The survey was designed as the consumer-side complement to the interviews. It captured how a broader set of respondents perceive the drivers of luxury electrification, how they evaluate brand and technology choices, and how willing they are to consider a luxury electric vehicle. The full questionnaire is reproduced in Appendix B.1. The presentation follows the four-driver structure of Sections 2.2 and 4.1 to allow cluster-by-cluster comparison.

4.2.1 Data Cleaning and Sample Profile

The study was based on a single online survey distributed across multiple channels. The raw dataset contained 182 responses with no duplicate identifiers.

The cleaning routine followed the sequential logic shown in Table 7. Incomplete questionnaires and those with less than 95% progress were removed (17 cases), one non-consenting respondent was excluded, three respondents failed the attention check, and no further responses were lost on the 120-second minimum duration criterion. The final sample comprises 161 valid respondents.

Table 7: Sequential data-cleaning log

```
=======================================================
Sequential Data Cleaning Log
-------------------------------------------------------
Step                                Removed Remaining
-------------------------------------------------------
Raw complete dataset                      0       182
Finished == TRUE and Progress >= 95      17       165
Consent given                             1       164
Attention check (Q36 == Agree)            3       161
Duration >= 120 seconds                   0       161
=======================================================
```

The cleaned cohort is best described as a young, well-educated sample with a clear European core. About 83% of respondents were aged 18 to 34, 61% identified as male, and 78% were based in Germany, with smaller groups in Austria, Portugal, Switzerland, the Netherlands, Italy, and a handful of other countries. Educational attainment was high: 50% had a bachelor's degree and 32% held a master's or doctoral degree. About 43% owned or leased a car, 33% had regular access through family, partner, or employer, and 24% reported no regular car access. Across the full cleaned sample, the current primary drivetrain is predominantly combustion (59% gasoline or diesel). Fully electric vehicles account for 9%, plug-in hybrids for 5%, and mild or

full hybrids for 5%. Direct experience with luxury automobiles is limited, with 17% currently owning such a car, 15% having done so in the past, and 50% reporting no plans to buy one. Luxury brand familiarity was nevertheless high, since 66% of respondents are at least familiar with major luxury brands. Personal net worth estimates reinforce this framing: 39% of respondents reported a net worth below EUR 50,000, 26% between EUR 50,000 and EUR 249,999, 16% above EUR 250,000, and 19% either preferred not to answer or gave no response (see Appendix B.2, Tables B.2.1 to B.2.10). The sample therefore lacked the purchasing power of actual luxury car buyers, and its results should be read as informed consumer perceptions rather than as revealed preferences of the luxury market. Any inference drawn from this chapter must acknowledge the youth bias, the German concentration, and the gap between the respondents' financial profile and the target segment.

4.2.2 Perceived Drivers of Luxury Electrification

The most direct item asked respondents to select up to three factors they consider most important in driving luxury car brands to develop electric vehicles. Figure 1 reports the resulting selection frequencies.

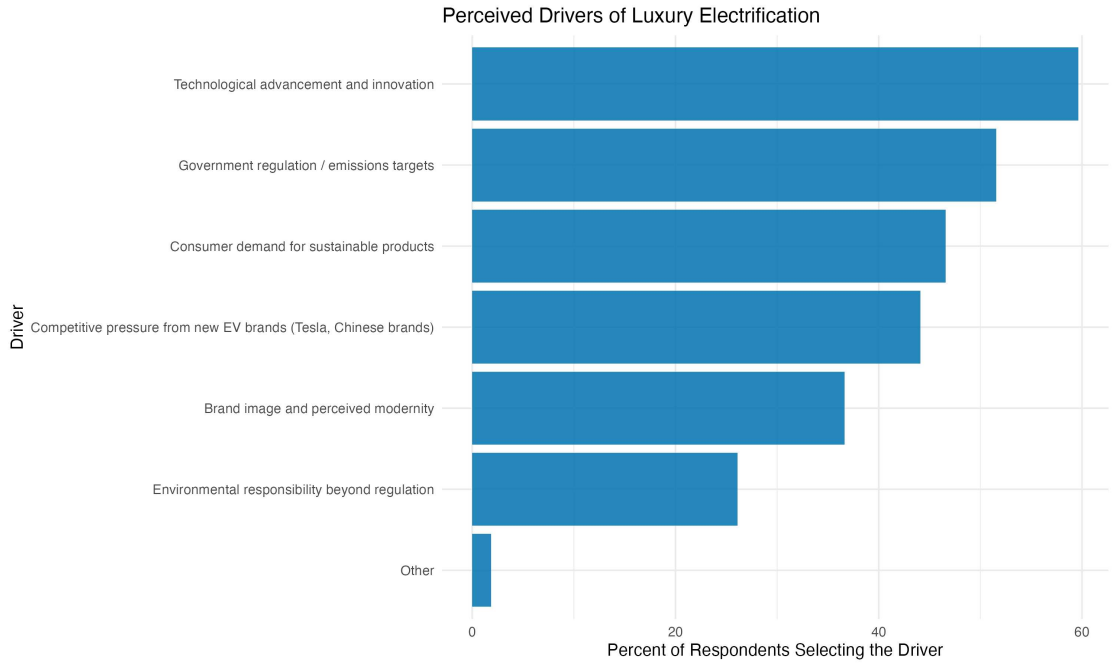

Figure 1: Perceived drivers of luxury electrification (up to three answers, N = 161).

Technological advancement and innovation were selected by 59.6% of respondents, government regulation by 51.6%, consumer demand for sustainable products by 46.6%, and competitive pressure from new EV brands such as Tesla or Chinese OEMs by 44.1%. Brand image and perceived modernity (36.6%) and environmental responsibility beyond regulation

(26.1%) followed. The pattern indicates that respondents perceived electrification as a multi-driver phenomenon rather than as a purely regulatory one. The next four subsections move from this aggregate ranking to the four theoretical driver clusters in detail, using the same order as Sections 2.2 and 4.1.

4.2.3 Regulatory and Policy Drivers

Awareness of the EU ban on new combustion-engine passenger cars from 2035 was uneven. Forty percent of respondents described themselves as fairly or very well informed, while 60% reported limited or no detailed knowledge. The asymmetry between the perceived importance of regulation in Figure 1 and the actual awareness of its central content suggests that regulation functions partly as a heuristic rather than as a concrete reference point.

At the item level, respondents agreed most strongly that relaxed rules would slow electrification (mean of 3.99 on a five-point scale) and that EU regulation is a key driver of current strategies (mean of 3.87) (Appendix B.2, Table B.2.23). The view that brands without active electrification appear strategically outdated was only mildly endorsed (mean of 3.11), and the statement that brands deliberately keeping combustion models look more authentic also received moderate agreement (mean of 3.36). Taken together, the regulatory items reproduce the interview position that regulation matters strategically, but they also reveal that consumers do not yet read a slower electrification path as a sign of strategic obsolescence.

4.2.4 Consumer and Market Drivers

The consumer cluster covered product evaluation, price expectations, the symbolic status of a luxury electric vehicle, and the role of sustainability. In a forced choice between an equally priced combustion V8 or V12 variant and a fully electric variant of the same brand, 57% of respondents leaned towards or clearly preferred the combustion variant, 37% leaned towards or clearly preferred the electric variant, and 7% considered both equally attractive (Appendix B.2, Table B.2.14). The unambiguous combustion preference (34%) was the largest single category, indicating that even with price held constant, a clear combustion preference remains the modal response in this sample.

Pricing expectations followed the same logic. Only 23% accepted a 5 to 20% premium over a comparable combustion model, 41% expected the same price, and 36% expected a discount, of which 10% expected a discount of more than 20% (Appendix B.2, Table B.2.15). The corresponding Likert item that a luxury electric vehicle should be priced above its combustion equivalent to retain luxury status was clearly rejected (mean of 2.06, the lowest mean across the entire item set). Respondents therefore did not grant electrification a price-based luxury

premium, which complements the residual-value concerns voiced in the interviews from the demand-side angle.

The symbolic dimension of the luxury EV was probed through a multi-select item on the strongest status signals. The leading choice was technological avant-garde or pioneer status (54.7%), followed by ecological responsibility (35.4%), belonging to a progressive urban elite (24.2%), and access to exclusive software ecosystems (20.5%) (Appendix B.2, Table B.2.16). A further 24.2% selected the option that an EV is not a status signal for them at all, and only 6.2% saw status in a high price despite reduced mechanical complexity. The avant-garde framing therefore dominated the symbolic interpretation of a luxury EV, while a substantial minority denied that an EV functions as a status signal in the first place.

Sustainability behaved as an enabling rather than a defining attribute. The statement that a modern luxury brand must be sustainable to be credible reached a neutral mean of 3.21, and the counterstatement that sustainability is a short-term trend was rejected (mean of 2.43). The item that an electric vehicle appears socially responsible averaged 3.55, indicating moderate endorsement, yet it ranked well below the traditional luxury attributes that respondents consider most important. The full ranking of luxury attribute ratings from highest to lowest importance is: craftsmanship (4.43), performance (4.14), emotional driving experience (3.98), brand heritage (3.75), personalization (3.59), exclusivity (2.94), and sustainability (2.48) (Appendix B.2, Table B.2.26). Electrification therefore enters a value hierarchy in which the core experiential and craft-based luxury attributes still dominate. Sustainability itself ranked lowest among the listed luxury attributes, while the social-responsibility association of EVs receives moderate endorsement but does not displace craftsmanship, performance, emotional driving experience, brand heritage, or personalization as primary luxury markers. The motivational item on luxury consumption is consistent with this profile: 67% of respondents reported buying luxury primarily for themselves, 12% selected differentiation from others, 9% selected belonging to an aspired-to group, and 12% weighted both motives equally (Appendix B.2, Table B.2.11). Intrinsic and aesthetic motives therefore dominated over purely positional ones, which echoes the interview observation that sustainability and ecological responsibility operate as legitimacy conditions rather than as primary purchase drivers.

4.2.5 Technological and Competitive Drivers

The technology cluster produced two clear results. First, charging was the single most consistent barrier identified in the sample. Seventy-two percent of respondents stated that charging issues, including charging time and infrastructure, would deter them strongly or very

strongly from buying a luxury EV, and 35% described charging as an explicit deal-breaker (Appendix B.2, Table B.2.17). Only 8% considered the issue slight or non-existent. Second, the heritage customer experience was seen as non-negotiable in the electric era. The item that an established heritage luxury brand must preserve its characteristic customer experience reached the highest mean among the technology statements (3.94), while the statement that range is not a decisive purchase criterion received only weak support (mean of 2.50). Range therefore remained a binding constraint rather than a secondary concern, and an electric platform is only accepted in luxury if it preserves the existing brand experience.

Respondents also drew a clear distinction between heritage and EV-native brands. The statement that new brands such as Tesla, Lucid, Rimac, or NIO can match the desirability of European heritage brands averaged only 2.66. When asked which providers they currently considered the most credible luxury EV suppliers, respondents named Porsche (39.8%), Mercedes-Maybach or AMG (36.6%), BMW M (31.7%), and the combined Lucid or NIO option (27.3%) most often. Heritage ultra-luxury names ranked lower, with Rolls-Royce reaching 23.0%, while Ferrari (4.3%), Lamborghini (5.6%), and Aston Martin (5.0%) trailed (Appendix B.2, Table B.2.20).

A revealing pattern emerged when these credibility ratings are compared with the earlier item on which luxury brands respondents find most attractive overall. Porsche led both rankings with 69.6% on general attractiveness and 39.8% on electric credibility, but the gap is most striking for the sport-luxury and ultra-luxury icons: Ferrari moved from 28.6% on attractiveness to 4.3% on electric credibility, Lamborghini from 15.5% to 5.6%, and Aston Martin from 19.9% to 5.0%. Lucid and NIO showed the inverse pattern, with 2.5% on attractiveness but 27.3% on electric credibility. The picture matches the two-tier competitive structure surfaced in Section 4.1.4: the premium segment is openly contested by new entrants, whereas the most iconic ultra-luxury and sport-luxury heritage brands enjoy strong general desirability yet have not earned electric credibility in the eyes of consumers.

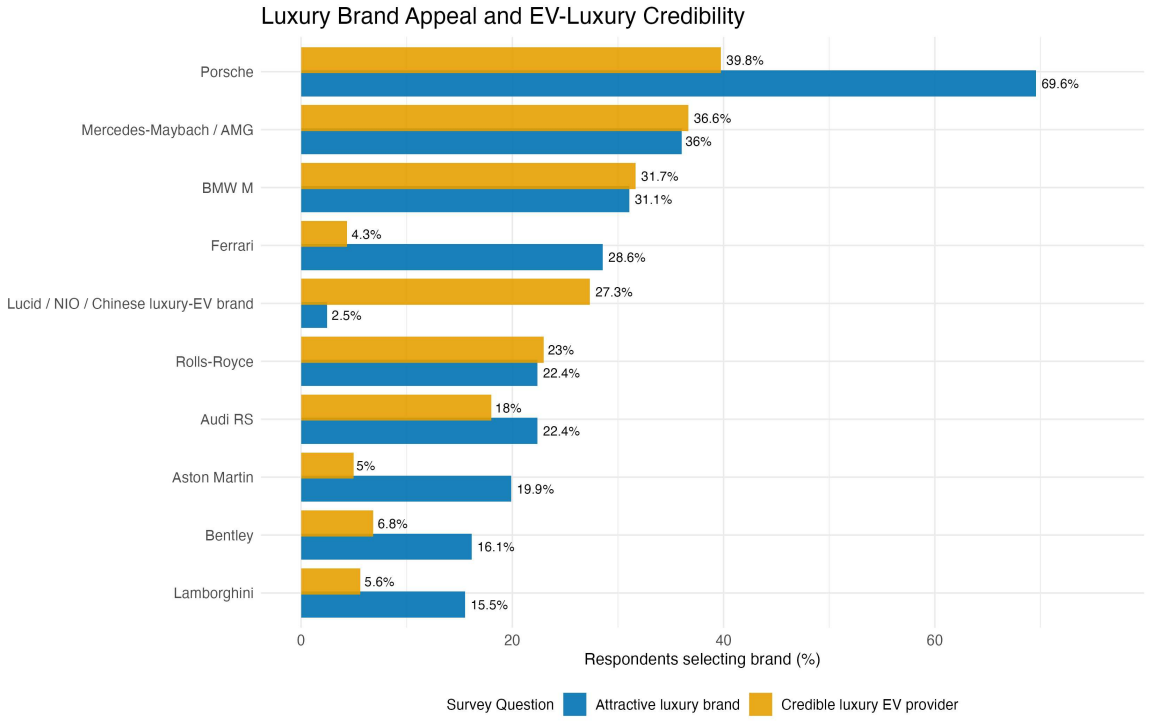

Figure 2: Luxury brand appeal versus EV-luxury credibility (% of respondents selecting each brand, multi-select). A high attractiveness score with a low credibility score signals a brand-identity gap in the electric transition.

4.2.6 Symbolic and Brand-Related Drivers

The symbolic cluster examined how respondents would react to a fully electric brand commitment and how they expect the luxury segment to look in the medium term. If their favorite luxury brand announced an exclusively electric line-up from 2030, 43% would react somewhat or very negatively, 27% neutrally, and 30% positively (Appendix B.2, Table B.2.18). The somewhat-negative response (35%) was by far the largest single category. Engine sound was rated as moderately important (mean of 3.32), and a simulated soundscape was rejected as an equivalent substitute (mean of 2.25). Heritage brands were granted more electric viability than sport-luxury brands: respondents agreed more readily that Rolls-Royce or Bentley can remain iconic without combustion engines (mean of 3.64) than that Ferrari, Lamborghini, or Porsche can do so (mean of 3.16) (Appendix B.2, Tables B.2.23 and B.2.26). This is a direct empirical correlate of the brand-identity constraint discussed for sport-oriented brands in Section 4.1.4.

The preferred drivetrain mix for luxury carmakers over the next ten years was a balanced portfolio of combustion, hybrid, and electric models (42%), followed by a mostly electric portfolio with hybrids (25%), a hybrid and combustion focus with selected electric models (17%), fully electric only (9%), and combustion as long as possible (7%) (Appendix B.2, Table B.2.19). The 9% share for a fully electric preferred future is particularly striking when set

against the EU regulatory target: the policy trajectory mandates precisely the outcome that only one in eleven respondents actively endorses. Consumer preference and the regulatory path were, in this sense, almost directly opposed at the extreme end of the distribution. The expected industry composition in 2035 followed the same logic, with 52% expecting a roughly balanced electric, hybrid, and combustion segment, 29% expecting a mostly electric segment, and only 3% expecting a fully electric segment (Appendix B.2, Table B.2.21). Consumer expectations therefore diverged from the regulatory schedule even where respondents accepted regulation as an important driver. The dependent variable, luxury EV purchase likelihood within five years, reflected the same caution: it averaged 1.90 on a five-point scale, with a median of 1.00. On aggregate, respondents in this sample did not see themselves as likely buyers within the immediate horizon, even though they considered electrification a multi-driver and largely inevitable phenomenon.

4.2.7 Synthesis: What the Survey Tells the Research Question

The analyses in Sections 4.2.2 to 4.2.6 provide the primary evidence for the research question at item and frequency level. To assess whether the four theoretical driver clusters also operate as coherent scales, multi-item summated scales were constructed after appropriate reverse coding and tested for internal consistency. Internal consistency was measured here using Cronbach's alpha, a standard reliability index that takes values between 0 and 1; values at or above 0.70 are generally considered acceptable for grouping items into a single scale. As Table 8 shows, reliability differs substantially. Only the symbolic and brand-related scale met the conventional acceptable threshold (alpha = 0.71). The Consumer/Market scale was borderline but still below the 0.70 threshold (alpha = 0.65), while the regulatory and technological constructs fell clearly below threshold (alpha = 0.30 and 0.44 respectively; full reliability output in Appendix B.2, Tables B.2.23 to B.2.26). Scale-level findings must therefore be treated as exploratory supplements to the item-level evidence, not as its replacement. The exploratory construct descriptives are reported in Appendix B.2 (Table B.2.25) and visualized in Appendix B.2 (Figure B.2.38).

Table 8: Cronbach's alpha by theoretical construct

```
============================================================
Cronbach's Alpha by Construct
------------------------------------------------------------
Construct              Raw_alpha  Interpretation  Recommended
------------------------------------------------------------
Regulatory                  0.30  Below acceptable  Descriptive
Consumer/Market             0.65  Borderline        Exploratory
Technology/Competition      0.44  Below acceptable  Descriptive
Symbolic/Brand              0.71  Acceptable        Use as scale
============================================================
```

Before turning to those item-level patterns, a brief scale-level check is warranted. An exploratory OLS regression of luxury EV purchase likelihood on the four construct means produced an R^2 of 0.025 with no significant construct coefficient. R^2 captures the share of variation in purchase likelihood that the model is able to explain, so a value of 0.025 indicated that the four driver clusters together explained essentially none of the variation between respondents and did not predict individual purchase intention. A controlled model adding sociodemographic variables, car access, luxury ownership, EV/PHEV use, luxury familiarity, and automobile interest raised R^2 to 0.133 (adjusted R^2 = 0.054), which remains modest in absolute terms. Within this controlled model, personal automobile interest was the only predictor (among the controls) that reached statistical significance. The full regression output is reported in Appendix B.2 (Table B.2.29), the standardized coefficients in Appendix B.2 (Table B.2.30), and the diagnostic tests in Appendix B.2 (Table B.2.31). Figure 3 visualizes the controlled focal coefficients and shows the main point graphically: the construct intervals cross zero, while personal automobile interest remains positive and statistically significant. Standard regression assumption checks raised two concerns (non-normal residuals and a possible functional-form issue), which is why robust standard errors were applied as a conservative reporting choice. The regression is best read as a controlled exploratory check rather than as confirmatory evidence.

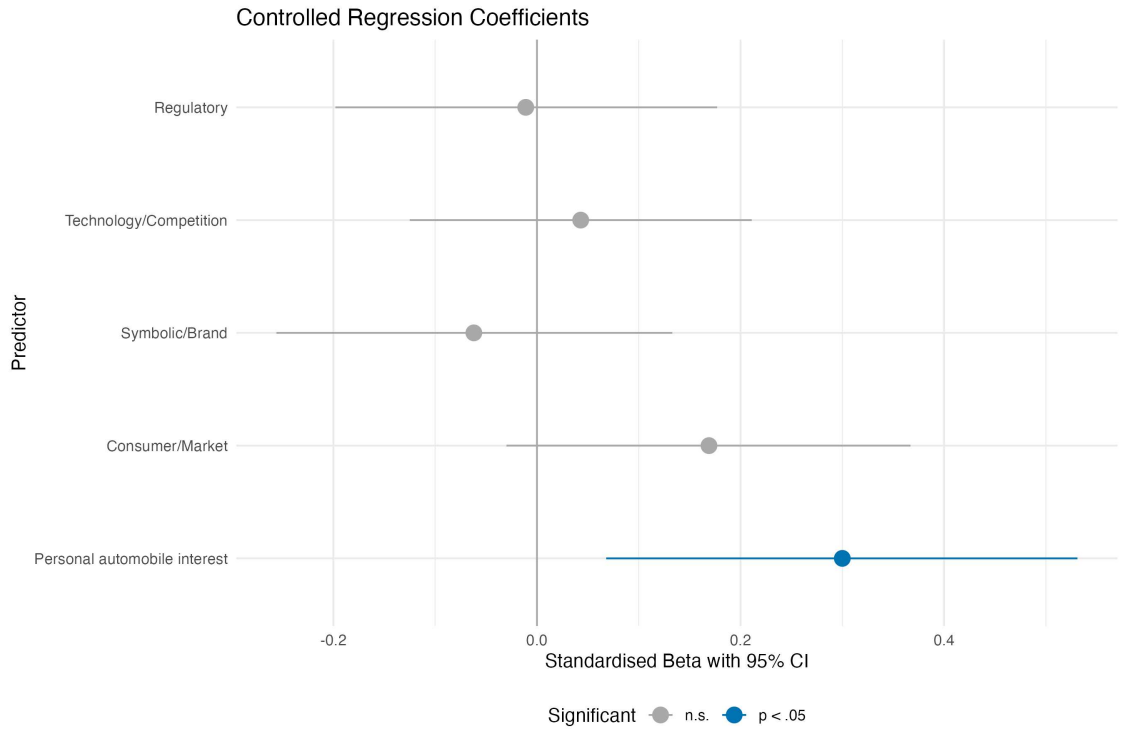

Figure 3: Controlled regression coefficients for focal predictors. Standardized beta coefficients are shown with 95% confidence intervals; blue indicates p <0.05.

The picture sharpens at item level, but the effect sizes remain modest. Spearman rank correlations, which measure the strength of the rank-based association between two variables on a scale from minus one to plus one, showed weak but statistically significant associations between purchase likelihood and two consumer-market identity items: 'EV signals an avant-garde mindset' (rho = 0.17, p = 0.032) and 'EV as personal identity and lifestyle' (rho = 0.17, p = 0.037; full item-level correlation output in Appendix B.2, Table B.2.35). Emotional driving experience was positive but not statistically significant (rho = 0.15, p = 0.060). Regulatory items, by contrast, showed weak and non-significant correlations with purchase likelihood (max rho = 0.10). The pattern therefore suggests that openness to a luxury EV was more closely linked to symbolic identity and modernity framing than to regulatory recognition, although the associations are small. A chi-square test further showed that luxury car ownership experience was significantly associated with EV preference: only 27.5% of current or former luxury car owners preferred or found equally attractive the fully electric variant, compared with 50.9% of non-owners (chi-square (1) = 7.80, p = 0.005; Appendix B.2, Table B.2.36). Additional subgroup tests showed that luxury owners scored significantly higher on the symbolic/brand scale and lower on regulatory and consumer/market scales, whereas age-group ANOVAs did not show systematic differences in symbolic/brand evaluations or purchase likelihood

(Appendix B.2, Tables B.2.32 to B.2.34). The segment most directly relevant to the research question is, in other words, also the segment most attached to the combustion experience.

Taken together, the survey evidence points to one central pattern: a structural gap between driver recognition and consumer action. Respondents acknowledged regulation, technological competition, and brand pressure as forces pushing the luxury segment towards electrification, yet these perceptions did not convert into purchase intention at the individual level. What correlated most clearly with openness to a luxury EV was a value-based framing of electrification as avant-garde status and personal identity. Emotional driving experience pointed in the same direction descriptively, but its item-level association remained just outside conventional statistical significance. This aligned with the expert interviews, which suggested that successful luxury electrification depends less on regulation being recognized by consumers and more on whether EVs can be translated into a credible symbolic and experiential brand proposition. The group most attached to the combustion experience was also the segment most relevant to the research question: current and former luxury car owners. They were significantly less likely than non-owners to prefer or accept the electric variant in a direct trade-off, even though their broader five-year purchase likelihood is not significantly lower. For the research question, this means that the drivers identified at industry level are not yet internalized as personal motivators by the consumer side of the market. The integration of the quantitative and qualitative evidence is taken up in Chapter 5.

5 Conclusion

This thesis set out to answer the question of what drives electrification in the luxury automotive sector. The answer was developed by triangulating three complementary evidence strands: a structured literature review that derived four theoretically grounded driver clusters and three management lenses (Chapter 2), eighteen semi-structured expert interviews with industry experts and senior professionals across OEM, retail, consulting, technical and R&D, and market-facing roles (Section 4.1), and a survey of 161 respondents that tested the same driver clusters from the consumer side (Section 4.2). This chapter consolidates the evidence, considers theoretical and practical implications, acknowledges limitations, and outlines directions for further research.

5.1 Main Findings: Triangulation of Evidence

The data indicates that electrification in the luxury automotive sector is a multi-driver phenomenon, and the four major drivers do not pull with equal force. The literature review identified regulation, primarily EU Regulation 2019/631 and its tightening through the Fit for 55 package, as the most influential structural driver of automotive electrification, with luxury OEMs particularly exposed because of their high-emission portfolios (Regulation (EU) 2019/631, 2019; Regulation (EU) 2023/851, 2023; Schlacke et al., 2022). The interviews named regulation as the original trigger of the BEV pivot and as the reason the industry moved on a timeline that customers would not, by themselves, have demanded. The survey reproduced regulatory salience at the perception level: respondents attributed electrification to a combination of technological advancement, regulation, consumer demand for sustainable products, and competitive pressure, with technology and regulation leading the ranking. Crucially, however, the survey also showed that recognizing regulation as a driver does not translate into individual willingness to buy: the construct-level regression is flat, item-level correlations between regulatory perception and purchase intention remain weak, and the share of respondents endorsing a fully electric long-term portfolio sits below ten percent. The triangulated picture is therefore that regulation is the dominant industry-level force, broadly in line with the literature, but it functions primarily as a coercive mechanism rather than as a consumer-internalized motivation.

The consumer and market driver category is where the segment's strategic dilemma is most visible. The literature review pointed to two competing logics: cost-signaling and conspicuous-diffusion arguments (Griskevicius et al., 2010; Noel et al., 2019) suggested that status

motivation could legitimately drive luxury EV adoption, while CSR-disfluency (Torelli et al., 2012) and the sustainability paradox (Kunz et al., 2020; Kapferer & Michaut-Denizeau, 2019) suggest that environmental framing could backfire on luxury brands. The interviews described a fragile demand-side marked by limited willingness-to-pay an EV premium, residual-value uncertainty, and the perception of rapid product obsolescence. The survey reproduced this from the consumer side, with a clear combustion preference at price parity, a refusal of any electric price premium, and a value hierarchy in which craftsmanship, performance, and emotional driving experience remain the dominant luxury attributes. Sustainability does feature in both strands, but as a legitimacy condition rather than as a primary purchase motive. Current and former luxury car owners, the segment most directly relevant to the research question, were also the group most attached to the combustion experience and the least open to the electric variant in a direct trade-off. The three strands therefore broadly converged, while qualifying each other in important ways: the demand-side foundation that the literature flagged as fragile is empirically as fragile as predicted, and the costly-signaling channel operates only conditionally, restricted to consumers who frame the EV as avant-garde rather than as a moral concession.

Technological and competitive drivers play a more enabling role. The literature review framed this category around the steep decline in lithium-ion cell prices (Ziegler & Trancik, 2021), the shift towards software and ecosystem control (Perkins & Murmann, 2018), and the persistence of incumbent complementary assets (MacDuffie, 2018; Teece, 2019). The interview evidence supported the second and third points while qualifying the first: the basic constraints of range and charging are gradually being engineered away, and the new front line of competition does run through software, connectivity, and ecosystem integration, but luxury benefits from technological progress mostly as it migrates up from mainstream platforms. The survey added an important divergence: charging remains the single most consistent perceived barrier for consumers, and EV-native brands are credited with electric credibility yet not with luxury desirability. The literature's optimism about technological convergence is therefore tempered by an interview-level acknowledgment of mid-segment dependence and a survey-level user perception that lags the engineering reality. Together, the three strands describe a two-tier competitive structure: ultra-luxury is still protected by heritage and ecosystem moats, while premium-luxury is openly contested by Asian OEMs at the level of digital experience.

Symbolic and brand-related drivers operate more as a constraint than as a pure driver of electrification. The literature review anticipated this tension through three concepts: the

sustainability paradox in luxury (Kunz et al., 2020; Kapferer & Michaut-Denizeau, 2019), brand heritage as both asset and identity constraint (Urde et al., 2007; Tripsas, 2009), and the mimetic legitimacy pressure for visible electrification commitments (Bohnsack et al., 2020). The interviews translated these abstractions into concrete mechanisms: sensory loss, the erosion of powertrain differentiation, and the difficulty of carrying combustion-era heritage into an electric architecture, sharpest in sport-luxury and softest in refinement-led brands. The survey confirmed this asymmetry. Engine sound carries moderate weight, simulated soundscapes are rejected, and respondents grant electric viability more readily to brands defined by refinement and comfort than to brands defined by sport-luxury heritage. The dominant strategic response observed by experts, hybridization and selective electrification, was also endorsed by the consumer side, with a balanced combustion, hybrid, and electric portfolio identified as the preferred segment composition for the next decade. Across all three strands, brand identity acts as a filter that determines which electrification responses are organizationally and culturally legitimate, broadly in line with the mechanism the literature predicted.

Taken together, the three strands broadly converge, while also qualifying each other in important ways. The answer to the research question is not a single driver but a constellation in which regulation pushes from the outside, technology and competition reshape the playing field, brand identity filters which strategic moves are legitimate, and the consumer side recognizes electrification as an industry trajectory without yet internalizing it as a preferred purchase path.

5.1.1 Theoretical Implications

The findings extend rather than overturn the literature reviewed in Chapter 2. Within the dynamic capabilities framework, the evidence reinforces Teece's (2019) argument that incumbents retain advantages through complementary assets, particularly brand equity, but it also illustrates the cognitive limits described by Tripsas and Gavetti (2000) and Jiang and Lu (2023). Luxury OEMs are not failing to sense electrification; they are filtering it through an identity-anchored interpretive frame in which sensory experience, powertrain craftsmanship, and heritage continuity define what counts as legitimate strategic choice. Transformation, in this segment, is therefore as much a brand-narrative task as an operational one.

Institutional theory receives mixed support. Coercive isomorphism through EU regulation is the clearest mechanism observed across both data strands and remains the firmest force behind the convergence of announced timelines. Mimetic pressure, by contrast, weakens once the regulatory landscape softens. The interviews described an operational rebalancing rather than

a coordinated retreat. But the announcement-level convergence noted by Bohnsack et al. (2020) is visibly decoupling from the substantive trajectory in several firms. The findings thus support the view that institutional pressure can produce a semblance of conformity at the discursive level while leaving meaningful divergence underneath.

The brand heritage perspective is, perhaps, most strongly corroborated. Heritage operates both as an asset, protecting ultra-luxury from new entrants, and as a constraint, complicating the electrification of sport-luxury brands whose identity is tied to combustion sensory cues. The findings also nuance the sustainability paradox in luxury (Kunz et al., 2020; Kapferer & Michaut-Denizeau, 2019). In the luxury automotive context, the paradox manifests less as a moral conflict and more as a concrete economic and experiential problem: this implicates residual-value uncertainty, sensory loss, and the difficulty of communicating sustainability without triggering the CSR disfluency described by Torelli et al. (2012). Sustainability ranking lowest among the luxury attributes tested in the survey provides a clear empirical anchor.

5.1.2 Practical Implications

For luxury OEMs, the dominant practical implication is that the realistic near- to medium-term transition path is hybridization and segmented electrification rather than a uniform BEV-only commitment. Communication should frame electrification as technology and innovation leadership rather than as social responsibility, since the latter is cognitively incompatible with self-enhancement branding and is empirically de-prioritized by the consumer side. Differentiation needs to migrate from the powertrain to design, materials, software, personalization, and brand experience, given that performance metrics are already converging across the segment.

The two-tier competitive structure has direct managerial consequences. Premium-luxury brands need to defend the digital experience layer against EV-native and Asian entrants now, including connectivity, over-the-air updates, and the surrounding software ecosystem. Ultra-luxury brands have more time, but their long-run opportunity set is still bounded by credibility necessary for any electric reinterpretation of heritage. Residual-value uncertainty should be actively managed through leasing structures, battery-health certification, and long warranties, since weak willingness-to-pay and weak residual values reinforce one another.

For policymakers, consumer endorsement of a fully electric trajectory remains thin, even where regulation is recognized as an important driver. Any softening of the regulatory ratchet creates strategic latitude that brands will use, particularly in sport-luxury. Charging infrastructure

remains the most consistent perceived barrier and should be treated as binding even within the luxury segment.

5.2 Limitations

There are limitations which control generalizability of these findings. The survey sample of 161 respondents was skewed towards young, well-educated, German-based respondents, and below the financial profile of an actual luxury buyer. The results should therefore be read as informed consumer perceptions rather than as revealed preferences of the target segment. The Cronbach's alpha values reported in Section 4.2 mean that only the symbolic and brand-related scale met standard reliability thresholds. Consequently, construct-level findings are exploratory and should be interpreted with caution. The regression models produced low R-squared values, consistent with the complex-systems considerations set out in Chapter 3, but this also implied that the analysis is best understood as descriptive rather than predictive.

Although data saturation was reached in the eighteen interviews, the sample remains purposive and tilted toward European OEMs and dealers, with limited Asian and ultra-luxury manufacturer representation. Interpretation relied on researcher judgment, and the deductive driver categories may have shaped which inductive themes emerged. The study is also a snapshot from early 2026, during a period of flux in EV-mandate politics, which limits temporal generalizability.

5.3 Future Research

Several directions follow from the limitations above. A first priority is to replicate the survey with an actual luxury-buyer sample, ideally combined with transaction-level data on residual values and ownership cycles, to test whether perception-level patterns hold for revealed preferences. A longitudinal extension tracking willingness-to-pay, brand credibility, and the progress of Asian luxury entrants would clarify the robustness of the two-tier competitive structure over time and whether heritage is a permanent or transitional moat.

Second, the brand-heritage mechanism would benefit from comparative case studies of specific luxury manufacturers and their electrification narratives. The evidence in this thesis suggests that brands able to reinterpret heritage attributes, rather than framing electrification as rupture, hold the strongest position. But the precise managerial routines through which that reinterpretation would happen remain underexplored. Related to this, the strategic role of hybridization as a bridge technology deserves more empirical attention as policy paths evolve.

Finally, a cross-regional design comparing European, North American, Middle Eastern, and Asian markets would help separate structural drivers identified here from the regulatory and cultural contexts in which they operate. The interviews already point to substantial regional variation, so a dedicated comparative study could test how the constellation of regulatory, consumer, technological, and symbolic drivers play out across markets and what that means for the strategic options available to luxury OEMs.

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Appendix A: Interview Material

A.1 Interview Questions

Q1. Could you briefly introduce yourself and describe the perspective from which you follow the luxury automotive segment?

Q2. How would you define a luxury car?

Q3. From your perspective, what are the main forces pushing luxury automotive brands toward electrification?

Q4. Why have some luxury brands stepped back from or abandoned their electrification commitments?

Q5. What are luxury car buyers willing to pay for an electric vehicle and how does that compare to a comparable combustion model?

Q6. How do you read the resale market and the secondary market for luxury EVs compared to equivalent combustion cars?

Q7. Where do you see the tensions between premiumization and the electric powertrain?

Q8. Does an electric luxury car actually have a lower overall carbon footprint than a comparable combustion model?

Q9. How is electrification changing the competitive landscape in luxury?

Q10. How do you see the electrification of the luxury automotive segment evolving over the next five to ten years and where do you see battery technology going beyond today's lithium-ion?

A.2 Overview of Interview Experts

The following provides a brief thematic summary of each of the eighteen expert interviews, organized by expert code. Each summary follows the structure of the interview guide and captures the key positions expressed by the respondent. All experts participated voluntarily under conditions of informed consent and full anonymization. No personal names, employer names, or other identifying details are disclosed. The expert codes E1 to E18 used here correspond to those used throughout Chapter 3.3 and 4.1.

Summary of Interview: E1
Sales management, luxury automotive (Middle East).

E1 defined a luxury car around scarcity, brand heritage, craftsmanship and the full ownership experience: “rarity is the heart of luxury” and price is a necessary identifier rather than the substance of the category. EU and Chinese fleet regulation were named as the dominant electrification drivers, with seven to nine year development cycles forcing brands to commit to powertrain strategies long before market signals materialize. Low-volume luxury manufacturers have somewhat more regulatory latitude than mass-market OEMs.

The 2023 to 2024 retreat by Lamborghini and the weak reception of premium electric sports cars were read as direct demand evidence. Heavy EV discounts were interpreted as a negative market signal that the luxury segment is closely watching. Buyers are prepared to pay full luxury prices for desirable cars, but at equal pricing combustion remains preferred and residual values are weaker for electric vehicles, which depreciate faster as the technology evolves.

On brand identity, perceived quality, craftsmanship and the symbolic weight of internal combustion remain central; storytelling must extend to the electric powertrain, ideally supported by European hand assembly. Charging convenience away from home was named as a practical luxury problem.

On competition, new entrants are not yet perceived as genuine luxury and Rimac was described as too niche. Ferrari was praised for resisting technology hypes and protecting heritage values. Over five to ten years, EVs will remain a meaningful but minority share of the luxury portfolio, with substantial growth more plausible toward 2050 than 2030. Smaller manufacturers without scale R&D are most exposed.

Summary of Interview: E2

Brand & marketing management, luxury and premium automotive (Europe).

E2 distinguished true luxury from premium and argued that brand identity, customer relationship depth and storytelling are the decisive differentiators of luxury rather than product specifications alone. Luxury appears in extroverted (statement-making) and introverted (understated) forms; both rely on rarity and individuality that mass production dilutes.

The main electrification drivers were regulation, technology subsidies, perceived environmental necessity and societal pressure such as the Fridays for Future movement. Without political mandate, the industry would default to the most profitable powertrain. Sport-luxury brands face the strongest tension because the emotional core of the product (sound, mechanical character, visceral feedback) cannot yet be electrically reproduced.

On willingness-to-pay, customers increasingly notice that EVs are cheaper to service and maintain but are still priced at parity, which damages trust. The used market for electric luxury cars was described as collapsing because battery degradation and replacement risk make ownership uncertain; leasing has become the rational default.

On sustainability, E2 was skeptical of net lifecycle benefits, citing lithium mining, water impacts and downstream behavior (such as EV owners flying privately). Chinese competitors were viewed as a serious strategic threat: shorter development cycles (around one year versus four to six in Europe) and a clear lead in software, infotainment and connectivity at significantly lower price points. The five to ten year outlook is a multi-technology portfolio (hybrid, biofuel, hydrogen, BEV) rather than a single dominant powertrain.

Summary of Interview: E3

Management consulting, luxury automotive (international).

E3 described luxury as "delivering a dream" built on quality, perfection, craftsmanship, mystery and rarity, using the analogy of red versus white diamonds: equally beautiful, but very differently priced because of scarcity. Ultra-luxury was argued to enjoy significantly more strategic latitude in pacing the electric transition than sport-luxury or premium-luxury brands.

Legislation was identified as the paramount driver of electrification; the torque and refinement of electric motors are intriguing but secondary. Without a regulatory mandate, OEMs would not invest in new powertrains on the business case alone.

The retreat from earlier electrification plans was traced to weaker than expected consumer appetite and politically softened timelines. Ultra-luxury aligns naturally with EV characteristics (serenity, refinement) while sport-luxury brands suffer most because their identity is tied to engine character. Residual values for luxury EVs are structurally lower and the secondary repair ecosystem for batteries does not yet exist.

On competition, ultra-luxury brands are partly protected by heritage, bespoke offerings and brand storytelling, whereas premium brands are genuinely exposed to EV-native entrants. The five to ten year picture is one of gradual but accelerating electrification as battery range approaches 500 to 700 miles and fast charging reaches 15 to 20 minutes, although seven year development cycles mean decisions made today only reach the market toward 2029 to 2031.

Summary of Interview: E4

Sales & brand management, luxury automotive (Middle East).

E4 defined luxury through intentionality in design, heritage and membership in a brand lineage rather than through price alone. Gulf clients were described as among the most discerning luxury buyers globally, curating rather than merely consuming high-end products. The Gulf perspective shaped a strongly experiential reading of the segment.

Regulation, sustainability expectations from younger high-net-worth clients, technology maturity and brand relevance were named as the main electrification drivers. The retreat from earlier commitments was attributed to over-ambitious 2021 to 2022 timelines, slower demand growth in the Gulf, the United States and Southeast Asia, customer resistance, and the high capital cost of converting combustion platforms to credible EVs.

Ultra-high-net-worth buyers are value sensitive rather than price sensitive: they will pay a premium for an EV when the proposition is coherent (range, charging, technology), but a half-hearted EV at a 20 percent premium is punished. Resale markets for luxury EVs are more fragile than for equivalent combustion cars because of battery uncertainty, fast technology cycles and limited confidence in long-term ownership costs.

The central brand tension was described as sensory: combustion has been the centerpiece of luxury theatre for over a century, and luxury EVs must construct a new acoustic and tactile identity. Chinese entrants such as NIO and Li Auto are lowering barriers in the near-luxury and luxury space, but heritage, craftsmanship and bespoke relationships remain difficult to replicate. The five to ten year outlook is one of coexistence rather than replacement, with hybrids and selective BEVs alongside combustion for as long as regulation and demand allow.

Summary of Interview: E5

Sales management, luxury and premium automotive (Europe / Asia).

E5 defined luxury through three conditions: uniqueness in the industry, demand exceeding supply, and customer recognition of the brand as luxury. Regulatory pressure was identified as the most powerful electrification driver: the EU 2035 ban on new combustion cars and Chinese ICE registration restrictions effectively force a global luxury electrification commitment for any brand seeking access to China. Younger generations are an emerging purchase driver, with technology increasingly framed as the new luxury differentiator. ESG pressure from institutional investors on parent groups was named as an important behind-the-scenes mechanism.

The retreat from earlier electrification plans was attributed to a mismatch between political ambition and demand reality: weak luxury EV sales, growing Chinese competition and the

absence of solved fundamentals (infrastructure, residual values, charging). Smaller brands without a large group platform face existential capital risk in over-investing in EV infrastructure for a customer base that is not demanding it.

Luxury buyers will accept a 10 to 20 percent premium for an EV over an equivalent combustion car, but resistance grows sharply where residual values collapse (the example given was the Porsche Taycan losing 40 percent of its value within a few years). The traditional luxury price logic, built on hand-crafted interiors and combustion engineering artistry, is being eroded as instant torque, silent acceleration and very fast acceleration figures become table stakes rather than differentiators.

On competition, Chinese brands such as NIO and Zeekr, designed as luxury EVs from the ground up with vertically integrated battery supply chains and fast software cycles, were named as the real disruptors. Beyond lithium-ion, solid-state batteries (around 2027 to 2028 production at Toyota) were highlighted as the decisive next step, with silicon anodes already moving toward production. The five to ten year outlook emphasizes continued luxury branding, design and craftsmanship as core differentiators while range and technology remain catch-up areas.

Summary of Interview: E6

Marketing & customer management, luxury and hypercar segment (Europe).

E6 offered group-level insight into how brand positioning differs across sub-segments within a major automotive conglomerate, from mainstream electric vehicles to hypercar nameplates, and described how customer relationship and event-marketing data inform electrification decisions. Luxury was treated as a spectrum from premium (BMW, Mercedes), through mid-luxury (Porsche) and into ultra-luxury (Ferrari, McLaren, Aston Martin), defined primarily by price and performance.

Government pressure (particularly in the EU) and a younger customer cohort with rising openness to EVs were named as primary drivers, while batteries remain incompletely sustainable and hydrogen is still exploratory. The hypercar segment was described as conservative: a customer base that values mechanical complexity and engine sound remains reluctant to embrace EVs, which is why brands such as Bugatti retain combustion while sister brands (Rimac) build EV-native hypercars.

Willingness-to-pay for luxury EVs was characterized as significantly lower than for equivalent combustion cars; even within Porsche, the Macan (electric) is priced below the Cayenne

(combustion). Residual values were described as a critical problem because annual technology jumps make existing EV models feel quickly obsolete, undermining the investment logic on which luxury cars often rely.

On competition, BYD was named as having understood EVs earlier than European OEMs and as exploiting an incumbent capability lock-in (an innovator's dilemma in which the ICE base prevents a clean pivot). Ultra-luxury was seen as relatively insulated by heritage; the more pressing risk is shrinking access to the Chinese and US markets. The medium-term outlook is one of mandated electrification with premium brands moving first and supercars/hypercars later or in a parallel EV-native form.

Summary of Interview: E7

Technical / R&D, luxury and premium automotive (Europe).

E7 provided an engineering perspective on the current state of battery and fast-charging technology. Luxury was defined as comfort across all dimensions (chassis, powertrain, interior materials, fit and finish) rather than as raw performance.

Portfolio completeness was named as a primary driver: missing a luxury EV today closes options ten years from now. Secondarily, electric powertrains are inherently smooth, quiet and responsive, which maps well onto a luxury comfort definition. The retreat from earlier electrification commitments was linked to an older luxury customer cohort that is emotionally bound to large complex combustion engines, and to a perception that the simpler architecture of an EV does not yet justify the same premium price.

Residual values were described as the most complex problem in the EV ecosystem: unlike combustion vehicles, EV health depends on charging behavior (DC versus AC), state of health is now formally readable, and pricing accordingly is still maturing. This uncertainty makes leasing the default form of access.

On competition, Asian and Chinese EV-only manufacturers concentrate development know-how on a single technology and are setting new infotainment, connectivity and feature standards (rear-seat displays, heated and cooled seats becoming default). Heritage alone is insufficient to compete on this dimension. The five to ten year outlook is gradual rather than disruptive: EV technology trickles up from volume into luxury, while infotainment becomes a major battleground, partly to bridge remaining charging waits.

Summary of Interview: E8

Sales management, luxury automotive (Middle East).

E8 argued that genuine luxury requires a combination of a six-figure price threshold, authentic brand heritage and compelling brand storytelling, and drew a clear distinction between premium products wearing expensive badges and brands that deliver a truly exclusive ownership experience. Luxury is also relative to a customer's frame of reference.

Regulation (EU CO_2 standards and proposed urban combustion bans) was identified as the principal forcing mechanism behind the 2019 to 2020 BEV pivot, alongside genuine early-adopter demand for performance EVs at the upper end and a temporary pandemic-driven supply squeeze. Once regulation softened, consumer demand for BEVs in luxury fell noticeably.

The recent retreat across brands (Bentley moving its non-urban portfolio to hybrid, Porsche canceling the electric Cayman, Lamborghini halting full BEV plans, with Ferrari as an exception driven by independent CO_2 compliance) was framed as a return to brand DNA wherever regulators allow it.

Willingness-to-pay is materially higher only where tax incentives apply (Monaco, Mauritius, Pakistan, Egypt, Scandinavian markets). Otherwise, the WTP uplift for a luxury EV is limited to early adopters and rule-breakers. Residual values for BEVs and PHEVs in the luxury segment are systematically weaker than for collectible combustion cars.

On brand identity, the ownership experience (order journey, handover, events, community) remains the decisive luxury differentiator that premium brands cannot match, while range anxiety is overstated for luxury sports cars. The real tension is the loss of distinctive engine character: electric motors sound similar across all price levels, and manufacturers have not yet articulated what makes a high-end electric motor recognizably premium. Chinese luxury EVs were described as dominant in China on features and technology; western brands struggle to defend a clear competitive position there.

Summary of Interview: E9

Independent retail and advisory, luxury and hypercar segment (Europe).

E9 expressed strong and consistent skepticism about electrification in the ultra-luxury context across all thematic clusters, arguing that ultra-luxury customers buy primarily for mechanical emotion, sound, driving character and sensory authenticity, all of which the current electric powertrain struggles to deliver.

Electrification was characterized as having been driven almost exclusively by political subsidies and lobbying networks rather than by genuine market demand. Personal visits to

bauxite, lithium and rare-earth mining regions led to a sharp ecological and humanitarian critique of the upstream supply chain.

The brand-level retreat (named example: the Rolls-Royce Spectre) was attributed to weak ultra-luxury demand and softening regulation. Residual values for luxury EVs were judged structurally weak because technology cycles resemble those of consumer electronics: a luxury EV is often perceived as obsolete within two years.

On the symbolic dimension, the loss of engine character, the homogenization of electric motors across price segments and concerns over connected-car data collection were all cited as eroding the luxury proposition. Chinese new entrants were described as generating media attention but limited real penetration in the genuine ultra-luxury customer base.

The five to fifteen year outlook is that ultra-luxury manufacturers are already pivoting back toward combustion where regulation allows; long development cycles slow reversal, but the trajectory was characterized as a return to refined combustion rather than a continued BEV expansion.

Summary of Interview: E10

Dealership sales & product, luxury and premium automotive (Asia).

E10 provided retail-level evidence from a major South Asian premium dealership. Luxury was described as a holistic alignment of detail, material quality, features and performance that creates an emotional sense of belonging.

In India, government initiatives (tax benefits and a target of 30 percent electric vehicles on the road by 2030) are the principal electrification drivers, supported by Mercedes-Benz local production and export from India. Adoption is constrained by underdeveloped charging infrastructure and persistent range anxiety even for cars with around 500 kilometers of nominal range.

The retreat from earlier electrification ambitions was traced to the emotional and sensory deficit of an electric supercar: high-performance buyers expect V8 or V12 sound, acceleration and the visceral experience of a powerful engine. If an EV removes these elements while still costing crores of rupees, the purchase logic breaks down.

Indian buyers will only accept an EV when it is materially cheaper than the comparable combustion alternative. At price parity there is no purchase consideration, including in the super- and hyper-luxury tiers, because customers are not buying to save fuel costs. Residual

values in India are very weak: 40 to 50 percent depreciation within one year of ownership is realistic for luxury EVs, compared with 70 to 80 percent retention for petrol or diesel cars at similar prices.

On sustainability, EVs have higher production emissions but no tailpipe emissions in use; the lifecycle outcome depends on usage and grid. New entrants such as Tesla, BYD and VinFast are entering the Indian luxury segment with technology-rich products. The five to ten year outlook is a parallel offering of combustion and electric versions of the same car, with rapid hypercharging (charging in around ten minutes) as the breakthrough required to lift adoption.

Summary of Interview: E11

Management consulting, luxury and premium automotive (Americas).

E11 described the US electrification push as government-induced rather than demand-driven and noted that virtually every major brand is now actively reversing earlier aggressive EV commitments as federal tax credits are rolled back and fleet sales prove insufficient to sustain momentum. Luxury today was defined less by the vehicle itself than by the surrounding ecosystem: dealership experience, hospitality and personalized service.

Three to four years of generous US tax credits made EV "the hot thing" before the political environment shifted and 2030 to 2035 mandates were walked back. In Europe, stricter regulation and better charging infrastructure supported faster adoption, but the structural demand has not followed. Porsche was cited as the clearest example of an over-investment in EV R&D whose return has not materialized.

On willingness-to-pay, an apples-to-apples MSRP comparison still places EVs roughly USD 10,000 above comparable combustion cars in the United States, which destroys the cost-benefit case for most buyers. The secondary market for luxury EVs was described as poor, with battery replacement anxiety and rapid technology obsolescence (range and software jumping each year, while an equivalent combustion luxury car remains substantively unchanged for seven years) as the principal drivers.

The luxury versus EV tension was framed structurally: electric powertrains are similar across all segments, so the luxury premium becomes harder to defend on engineering grounds alone. On sustainability, E11 was skeptical of EV lifecycle claims, citing mining intensity and unsolved end-of-life battery handling. On competition, Chinese brands are reshaping the broader Asian luxury market and European OEMs are losing position in China partly because of retaliatory tariffs. The five to fifteen year outlook is contingent on a major technological

breakthrough (such as solid-state batteries); absent that, EV share in luxury was expected to fall significantly.

Summary of Interview: E12

Marketing and sales, luxury and premium automotive (Americas).

E12 provided an emerging-market perspective on how luxury automotive demand develops as economies mature, describing how international luxury brands established credibility with local clientele in southern Brazil over several decades and how brand-heritage narratives translate differently in that market. Luxury was defined primarily as predictability and reliability of experience.

Electrification was characterized as making sense for practical mobility (commuting, family use, service vehicles) but as a poor fit for emotional luxury and sports cars. Customers are not yet buying premium EVs because they feel good driving them; the push toward electrification was framed as industry- and regulation-driven rather than rooted in genuine luxury-customer desire. Sports cars in particular are bought for engine sound, combustion feel and emotion.

Willingness-to-pay for an electric sports car at parity with a combustion version was judged very low. In Brazil, high import and tax burdens make all cars expensive: Chinese EVs are competitive up to around USD 40,000 (200,000 reais), but above that price point established luxury and combustion brands dominate because buyers in that bracket are not motivated by fuel savings.

On sustainability, lifecycle EV advantages were acknowledged with the qualification that battery production is itself emissions-intensive. The five to ten year outlook is coexistence rather than replacement, possibly around 80 percent electric and 15 to 20 percent combustion in volume, with combustion cars becoming an increasingly expensive status product for wealthy buyers because of taxes and scarcity. Generational change (Generation Z and Alpha preferring mobility as a service) was named as a longer-term factor that will reshape luxury demand.

Summary of Interview: E13

Independent retail and advisory, luxury and hypercar segment (international).

E13 argued that several luxury brands moved too aggressively and too early into full electrification commitments without adequately accounting for the emotional attachment buyers hold to combustion sensory experience and mechanical character. Luxury was defined as the combination of craftsmanship, rarity, emotion, brand heritage, performance and

exclusivity, where desire and a sense of specialness cannot be reduced to technical specifications.

Regulation, political requirements, brand image and long-term strategy were named as the main electrification drivers, while EVs do offer genuine technical advantages (instant torque, silence, design freedom) that must nevertheless fit a brand's DNA. The retreat from earlier commitments was attributed to weaker than expected demand and to underestimating the emotional dimension of luxury car ownership.

Buyers in this segment will pay significant sums for an EV only when it feels exclusive and desirable; the electric powertrain alone does not justify a premium. The resale market for luxury EVs was described as significantly more difficult than for combustion equivalents because of rapid technology evolution and uncertainty about long-term desirability. Limited-production combustion cars often retain a stronger emotional and financial value.

On sustainability, lifecycle benefits depend strongly on grid mix, battery production and length of ownership; many luxury cars are driven very little, which complicates the public narrative. Electrification was described as massively reshaping competition because new manufacturers can suddenly compete without decades of combustion engineering; solid-state batteries and improved energy density were named as longer-term levers. The five to ten year outlook is a parallel development in which luxury daily-driver EVs grow while emotional combustion and limited-production hybrid models remain central to the collector market.

Summary of Interview: E14

Sales management, luxury and premium automotive (Europe).

E14 provided direct customer-facing evidence that buyers in the sport-luxury segment ask detailed and increasingly sophisticated questions about residual values, total cost of ownership and charging practicality before committing to an electric model. Luxury was defined as a vehicle that is top of the range in performance, design and interior execution, priced clearly above competitors.

Fleet CO_2 compliance was named as the most important electrification driver, alongside genuine early demand for an electric sports car. The retreat that followed was attributed to a combination of high write-offs, early reliability issues at a EUR 150,000 price point, severe residual-value losses, and the loss of early customers who, after disappointment, did not return for a second EV.

Two-year-old EV lease returns were cited as concrete evidence: cars with a EUR 140,000 to 150,000 list price reappeared in the used market at around EUR 70,000, a catastrophic experience for the first buyers. Range and charging time were judged no longer to be primary obstacles; the persistent issue is emotional, namely the loss of mechanical feel and acoustic character.

On lifecycle CO_2, an internal benchmark of around 160,000 kilometers before an EV breaks even with an equivalent combustion car was cited, while typical luxury customers sell at 50,000 to 60,000 kilometers, meaning the break-even is rarely reached. On competition, Asian manufacturers are setting an increasingly high standard at roughly half the price. The medium-term outlook is continued but smaller-scale luxury EV production with a focus on completing current platforms before initiating the next technology shift.

Summary of Interview: E15

Technical / R&D, luxury and premium automotive (Europe).

E15 defined the luxury threshold at approximately EUR 120,000 to 150,000 and annual volumes of around 5,000 units and described CO_2 fleet regulation and the broader industry decarbonization agenda as the structural background drivers behind luxury EV investment. Electric powertrain dynamics (torque, performance) also support the luxury proposition.

Willingness-to-pay at parity with combustion was judged feasible at the ultra-luxury tier, where the additional manufacturing cost of an EV is not the decisive lever. Residual values for luxury EVs are currently weak because rapid generation jumps in range and performance compress used-car prices, although the issue is expected to ease as generation gaps stabilize.

The luxury versus EV tension was framed as concentrated in the sport-luxury segment, where engine character is culturally embedded, while ultra-luxury sedans and SUVs face minimal tension. Lifecycle CO_2 advantages of EVs are real and will grow as upstream manufacturing electrifies.

On competition, electrification lowers technical barriers to entry but does not automatically translate into ultra-luxury credibility; heritage, image, design, durability and brand trust remain demanding hurdles. The five to ten year outlook is continued EV growth in luxury, no near-term market-dominant alternative to lithium-ion, and a mixed portfolio in sport-luxury that may include e-fuels for the very top tier.

Summary of Interview: E16

Senior management, R&D, luxury and premium automotive (Europe).

E16 was directly responsible for the development of flagship electric models at a leading European OEM and provided an inside-out perspective on how EU regulatory timelines translate into specific platform investment decisions and product roadmaps. Luxury was described as fulfilling the aspirations of customers accustomed to luxury, with regional variation in how that expectation is expressed.

Regulatory CO_2 pressure remains the structural starting point, but software-defined architectures, central computing and over-the-air updates are now self-reinforcing drivers of further electrification. A clear distinction was drawn between genuine retreat (most visible in the United States, where political shifts force write-offs) and slower-than-planned scaling at incumbent European luxury manufacturers, who are not abandoning EVs.

Willingness-to-pay was framed in terms of customer segments: about ten percent are convinced EV evangelists, about ten percent are committed combustion buyers, and around eighty percent decide on the basis of fit and value. Luxury customers pay for materials, infotainment and innovation rather than for the powertrain as such. Residual values were viewed positively for larger vehicles, as battery longevity is now exceeding expectations and small-car incentives that depressed European resale values do not apply at the luxury end.

On the symbolic dimension, abundant electric torque erodes traditional performance differentiation, while emotional brand identity becomes harder to translate to an electric platform. On competition, Chinese players are eroding the historical premium of an ICE heritage, although design, package and brand trust remain decisive gatekeepers. On battery technology, the more interesting near-term innovations are likely to come from autonomous and very fast charging rather than from a step change in chemistry; solid-state batteries were viewed with measured caution. The five to ten year outlook is that luxury keeps combustion longest, with ultra-luxury as the final holdout.

Summary of Interview: E17

Senior management, R&D, luxury and premium automotive (Europe).

E17 offered the most consistently optimistic view of EV-luxury compatibility across all thematic clusters, arguing that electric powertrain characteristics (acoustic refinement, immediate torque response and smooth power delivery) are natural complements to the comfort and refinement traditions of luxury. Luxury was defined as a vehicle that meets customer expectations completely and consistently exceeds them.

EVs were described as aligned with the luxury experience because they deliver quietness, comfort and responsiveness; the company's early electric models from 2013 already demonstrated this fit. Customer sustainability awareness has shifted from CO_2 fleet compliance to a holistic Paris-aligned climate strategy.

Some competitors lack stamina and adjust their EV strategy downward as broader EV euphoria recedes, particularly in the United States, but the multi-technology strategy (combustion, hybrid and electric in parallel) was described as preserving strategic flexibility. Willingness-to-pay at price parity is realistic; at the ultra-luxury tier, drivetrain cost differences are not the deciding factor.

On sustainability, EVs lower lifecycle CO_2 emissions, especially when charged on a clean grid, with manufacturing CO_2 typically amortized within around a year for a large luxury EV used at normal annual mileage. On competition, market entry barriers have fallen, and Chinese and digital-native new entrants are visible in the luxury EV segment, illustrated by the volume of luxury EVs presented at recent Beijing auto shows. The five to ten year outlook is broad EV penetration across most individual mobility, with luxury fit remaining strong; e-fuels were named as a niche option for heritage-bound sports-luxury enthusiasts.

Summary of Interview: E18

Sales & marketing management, luxury and premium automotive (Europe).

E18 described how customer attitudes toward electric vehicles have shifted materially over the past five years, noting that early resistance is giving way to conditional acceptance, particularly among buyers who have had direct experience with capable EV technology in a neighbor or family member. Luxury was defined as the combination of experience, comfort, innovation and premium material execution that produces a sense of being special.

Three reinforcing drivers were identified: the product experience itself (quiet, fast, composed driving), a shift in customer perception (range anxiety is increasingly a habit rather than a real constraint, given 800V architectures, very long ranges and short fast-charging times), and improvements in technology transparency, particularly meaningful battery warranties. Test drives are often the moment when skepticism converts into interest.

Willingness-to-pay at parity is realistic when the overall package is convincing; promotional elements such as free charging help but are not decisive. Residual-value confidence rises with battery durability and credible warranties.

The central brand tension is that EV acceleration is available in much cheaper vehicles, so the luxury premium must be defended through design, materials, software, personalization and brand narrative rather than through raw performance. Artificial V8 or V12 acoustic substitutes were judged inauthentic. On sustainability, EVs were described as having a lower lifecycle CO_2 footprint, with manufacturing penalties offset by in-use savings as grids decarbonize.

On competition, Asian and Chinese manufacturers were described as bringing rapid development speed, sophisticated digital integration, dense feature sets and aggressive pricing. The five to ten year outlook is steady electric growth supported by regulation and continued battery progress, with European luxury brands compelled to differentiate increasingly on software, comfort and digital integration rather than on powertrain heritage alone.

Appendix B: Survey Material

B.1 Survey Questions Overview

Table B.1 lists the survey items used in the quantitative analysis. The code column matches the variable names used in the R analysis script and referenced in Chapter 4.2. Items marked as reverse coded were recoded before scale construction.

Table B.1.1: Survey questionnaire

Code	**Question / Item**	**Answer Format**	**Analytical Use**
Q1.1	Informed consent	Yes / No gate question	Exclusion
Q1.3	Luxury brand familiarity	5-point ordinal scale	Control
Q2.0	Car ownership, lease, or regular access	Single-select categorical	Control
Q2.1	Primary drivetrain	Single-select categorical	Control
Q2.2	Luxury automobile ownership/regular use	Single-select categorical	Subgroup
Q2.3	Most attractive luxury car brands	Multi-select, up to three	Brand appeal
Q2.4_1	Personal automobile interest	5-point ordinal scale	Control / focal predictor
Q3.1_1-Q3.1_8	Luxury attribute importance items	5-point importance scales	Symbolic / Brand
Q3.2	Motivation for luxury goods	Single-select categorical	Consumer context

Q4.0	Perceived drivers of luxury electrification	Multi-select, up to three	Direct driver evidence
Q4.1	Awareness of EU 2035 ban	Single-select categorical	Regulatory context
Q4.2_1-Q4.2_4	Regulatory statements	5-point Likert; Q4.2_3 reverse coded	Regulatory scale
Q5.1_1-Q5.1_5	Luxury-EV consumer/market statements	5-point Likert; Q5.1_4 reverse coded	Consumer / Market
Q5.2	Combustion V8/V12 versus fully electric choice	5-point bipolar choice	Direct preference
Q5.3_1-Q5.3_2	Sustainability credibility/trend statements	5-point Likert; Q5.3_2 reverse coded	Consumer / Market
Q5.4	Strongest status signals of a luxury EV	Multi-select, up to two	Direct status evidence
Q5.5	Acceptable luxury-EV price level	Single-select categorical	Direct price evidence
Q6.1_1-Q6.1_5	Technology/competition statements	5-point Likert; Q6.1_2 reverse coded	Technology / Competition
Q6.3	Charging issues as purchase deterrent	5-point deterrence scale	Technology barrier
Q7.1_1-Q7.1_5	Sound, mechanical feel, and iconic-brand statements	5-point Likert; Q7.1_2/Q7.1_4/Q7.1_5 reverse coded	Symbolic / Brand
Q36	Attention check	Required response: Agree	Exclusion
Q7.2	Reaction to fully electric favorite brand from 2030	5-point reaction scale	Brand response
Q7.3	Preferred luxury-carmaker drivetrain mix	Single-select categorical	Brand strategy

Q8.1_1	Likelihood to buy/lease a luxury EV in next five years	5-point Likert	Dependent variable
Q8.2	Most credible luxury EV providers	Multi-select, up to three	Brand credibility
Q8.3	Expected luxury automotive segment in 2035	Single-select categorical	Future expectation
Q9.1-Q9.5	Age, gender, net worth, country, education	Demographic items	Sample profile / controls

Note: The overview follows the final Qualtrics export and the R analysis script. Items marked as reverse coded are transformed before scale construction.

B.2 Survey Analysis: Statistical Output

The appendix reports direct R output as tightly cropped images. Small output tables are placed side by side where this preserves readability; wider tables and analytical plots are shown individually. Outputs already presented in the main text are not duplicated unless the appendix needs the underlying detailed R table.

Sample Profile

Table B.2.1: Age distribution.

```
Age Distribution
==================
Category n   pct
------------------
18-24    64 39.750
25-34    70 43.480
35-44    8  4.970
45-54    3  1.860
55-64    12 7.450
65+      4  2.480
------------------
```

Note: This output supports the sample-profile statement that the cleaned cohort is strongly concentrated in the 18-34 age range.

Table B.2.2: Gender distribution.

```
Gender Distribution
============================
Category           n   pct
----------------------------
Female             60 37.270
Male               98 60.870
Non-binary / Other 1  0.620
Prefer not to say  2  1.240
----------------------------
```

Note: This output supports the sample-profile statement that the cohort is male-skewed.

Table B.2.3: Estimated personal net worth.

Category	n	pct
EUR 1 - 5 million	9	5.590
EUR 250,000 - EUR 999,999	13	8.070
EUR 50,000 - EUR 249,999	42	26.090
Less than EUR 50,000	63	39.130
More than EUR 5 million	3	1.860
Prefer not to say	23	14.290
	8	4.970

Note: This output documents the gap between the sample's financial profile and actual luxury-car purchasing power.

Table B.2.4: Country distribution.

Category	n	pct
Austria	7	4.350
Brazil	1	0.620
Czech Republic	1	0.620
Denmark	1	0.620
France	1	0.620
Germany	126	78.260
Hong Kong (S.A.R.)	1	0.620
Indonesia	1	0.620
Italy	3	1.860
Monaco	1	0.620
Netherlands	3	1.860
Norway	2	1.240
Portugal	4	2.480
South Korea	3	1.860
Spain	1	0.620
Switzerland	3	1.860
United States of America	2	1.240

Note: This output supports the sample-profile statement that respondents are concentrated in Germany.

Table B.2.5: Education distribution.

Category	n	pct
Bachelor's degree	80	49.690
Doctoral degree	3	1.860
Master's degree	49	30.430
Other	4	2.480
Prefer not to say	7	4.350
Secondary school or equivalent	14	8.700
Vocational training / apprenticeship	3	1.860
	1	0.620

Note: This output reports respondents' highest education level and contextualizes the academic profile of the sample.

Table B.2.6: Car ownership or regular access.

Category	n	pct
I regularly use a car owned by family, partner or employer	53	32.920
No, I do not currently have regular access to a car	38	23.600
Yes, I lease a car	15	9.320
Yes, I own a car	55	34.160

Note: This output shows whether respondents own or regularly access a car.

Table B.2.7: Current primary vehicle drivetrain.

Category	n	pct
Fully electric (BEV)	15	9.320
Gasoline or diesel (ICE)	95	59.010
Mild or full hybrid (HEV)	8	4.970
Not applicable - I do not currently own, lease or regularly use a car	35	21.740
Plug-in hybrid (PHEV)	8	4.970

Note: This output provides context for respondents' prior exposure to electrified drivetrains.

Table B.2.8: Luxury automobile ownership experience.

Category	n	pct
No, and I do not plan to	80	49.690
No, but I plan to within the next 5 years	30	18.630
Yes, currently	27	16.770
Yes, in the past	24	14.910

Note: This output distinguishes luxury owners and non-owners, a key subgroup in the later analysis.

Table B.2.9: Luxury brand familiarity.

Category	n	pct
Not familiar	11	6.830
Slightly familiar	6	3.730
Somewhat familiar	38	23.600
Familiar	58	36.020
Very familiar	48	29.810

Note: This output shows how familiar respondents are with luxury automotive brands.

Table B.2.10: Personal automobile interest.

Category	n	pct
Very low	21	13.040
Low	27	16.770
Moderate	40	24.840
High	28	17.390
Very high	45	27.950

Note: This output reports the control variable that later becomes the only significant focal predictor in the controlled model.

Direct Survey Evidence

Table B.2.11: Motivation for luxury goods.

Category	n	pct
Both equally	19	11.800
I want to belong to an aspired-to group	15	9.320
I want to own things others do not have	19	11.800
Neither - I buy for myself	108	67.080

Note: This supplementary output documents the motivational profile behind luxury consumption.

Table B.2.12: Most attractive luxury car brands overall.

```
Most Attractive Luxury Car Brands
=============================================================
Choice                                    n  pct_of_respondents
-------------------------------------------------------------
Porsche                                 112        69.570
Mercedes-Maybach / AMG                   58        36.020
BMW M                                    50        31.060
Ferrari                                  46        28.570
Rolls-Royce                              36        22.360
Audi RS                                  36        22.360
Aston Martin                             32        19.880
Bentley                                  26        16.150
Lamborghini                              25        15.530
Other                                     9         5.590
Lucid / NIO / Chinese luxury-EV brand     4         2.480
-------------------------------------------------------------
```

Note: This output is the general brand-appeal counterpart to the luxury-EV credibility provider table.

Table B.2.13: Awareness of EU 2035 ban.

```
Awareness of EU 2035 Ban
=========================================
Category                             n   pct
-----------------------------------------
Fairly well informed                47 29.190
Heard of it, but know few details 59 36.650
Hearing of it for the first time  10 6.210
Not well informed                   28 17.390
Very well informed                  17 10.560
-----------------------------------------
```

Note: This output supports the regulatory-driver discussion in Chapter 4.2.

Table B.2.14: Choice between combustion and electric variant.

```
Choice Between Combustion and Electric Variant
=====================================================
Category                                        n   pct
-----------------------------------------------------
Both are equally attractive                     11 6.830
I clearly prefer Variant A (Combustion V8/V12) 54 33.540
I clearly prefer Variant B (Fully electric)    26 16.150
I lean towards Variant A                        37 22.980
I lean towards Variant B                        33 20.500
-----------------------------------------------------
```

Note: This output reports the direct combustion-versus-electric preference item.

Table B.2.15: Acceptable price level for luxury EV.

```
Acceptable Price Level for Luxury EV
============================================================
Category                                                 n   pct
------------------------------------------------------------
Same price                                              66 40.990
Significantly less (more than 20% discount expected) 16 9.940
Somewhat less (5–20% discount expected)                 42 26.090
Somewhat more (5-20% premium acceptable)                37 22.980
------------------------------------------------------------
```

Note: This output reports the price level respondents consider acceptable for a luxury EV.

Table B.2.16: Strongest status signals of luxury EV.

```
Strongest Status Signals of Luxury EV
=================================================================================
Choice                                                   n  pct_of_respondents
---------------------------------------------------------------------------------
Technological avant-garde / pioneer status              88       54.660
Ecological responsibility                               57       35.400
Belonging to a progressive, urban elite                 39       24.220
None of the above - an EV is not a status signal for me 39       24.220
Access to exclusive software / app ecosystems           33       20.500
High price despite reduced mechanical complexity        10       6.210
---------------------------------------------------------------------------------
```

Note: This multi-select output documents how respondents interpret luxury-EV status.

Table B.2.17: Charging issues as luxury EV deterrent.

```
Charging Issues as Luxury EV Deterrent
======================
Category      n   pct
----------------------
Not at all    5  3.110
Slightly      7  4.350
Moderately   33 20.500
Strongly     60 37.270
Very strongly 56 34.780
----------------------
```

Note: This output supports the technology-barrier discussion.

Table B.2.18: Reaction to fully electric brand announcement.

```
Reaction to Fully Electric Brand Announcement
============================
Category          n   pct
----------------------------
Very negative     13 8.070
Somewhat negative 56 34.780
Neutral           43 26.710
Somewhat positive 23 14.290
Very positive     26 16.150
----------------------------
```

Note: This output reports the brand-response item for an exclusively electric announcement.

Table B.2.19: Preferred luxury-carmaker drivetrain mix.

```
Preferred Luxury Carmaker Drivetrain Mix
========================================
Category                           n   pct
----------------------------------------
Combustion as long as possible 12 7.450
Hybrid/combustion              27 16.770
Balanced                       67 41.610
Mostly electric                41 25.470
Fully electric                 14 8.700
----------------------------------------
```

Note: This output reports the drivetrain portfolio respondents prefer over the next ten years.

Table B.2.20: Most credible luxury EV providers.

```
Most Credible Luxury EV Providers
=============================================================
Choice                                  n  pct_of_respondents
-------------------------------------------------------------
Porsche                                 64       39.750
Mercedes-Maybach / AMG                  59       36.650
BMW M                                   51       31.680
Lucid / NIO / Chinese luxury-EV brand 44       27.330
Rolls-Royce                             37       22.980
Audi RS                                 29       18.010
None of the Above                       19       11.800
Bentley                                 11       6.830
Lamborghini                             9        5.590
Aston Martin                            8        4.970
Other                                   8        4.970
Ferrari                                 7        4.350
-------------------------------------------------------------
```

Note: This output supplements the brand-credibility comparison in the main text.

Table B.2.21: Expected luxury automotive segment in 2035.

```
Expected Luxury Automotive Segment in 2035
==================================
Category                   n   pct
----------------------------------
Mostly combustion          3  1.860
Mostly hybrid/combustion 23 14.290
Balanced                 84 52.170
Mostly electric          46 28.570
Fully electric           5  3.110
----------------------------------
```

Note: This output reports respondents' forward-looking segment expectation.

Table B.2.22: Open 'other' responses.

Question	Response	n
Other attractive luxury brand	Jaguar	2
Other attractive luxury brand	Brabus	1
Other attractive luxury brand	McLaren	1
Other attractive luxury brand	Mclaren	1
Other attractive luxury brand	keine	1
Other attractive luxury brand	none	1
Other attractive luxury brand	range rover	1
Other perceived electrification driver	Just making a LOUD sound	1
Other perceived electrification driver	Verbote	1

Note: Open responses are included to show whether respondents added relevant categories beyond the fixed options.

Construct Items and Reliability

Table B.2.23: Descriptive statistics for Likert items.

Construct	Item	Short_label	Mean	SD	Median	Min	Max
Consumer/Market	Q5.1_1	EV signals avant-garde mindset	3.370	0.930	4	1	5
Consumer/Market	Q5.1_2	EV appears socially responsible	3.550	1.080	4	1	5
Consumer/Market	Q5.1_3	EV premium price supports luxury	2.060	0.870	2	1	4
Consumer/Market	Q5.1_4	Too much sustainability reduces exclusivity	2.630	1.300	2	1	5
Consumer/Market	Q5.1_5	EV as identity and lifestyle	3.220	1.110	3	1	5
Consumer/Market	Q5.3_1	Luxury must be sustainable today	3.210	1.140	4	1	5
Consumer/Market	Q5.3_2	Sustainability is short-term trend	2.430	1.260	2	1	5
DV	Q8.1_1	Luxury EV purchase likelihood	1.900	1.170	1	1	5
Regulatory	Q4.2_1	EU regulation as key driver	3.870	0.940	4	1	5
Regulatory	Q4.2_2	Non-electrifying brands outdated	3.110	1.340	3	1	5
Regulatory	Q4.2_3	Combustion models seem authentic	3.360	1.220	3	1	5
Regulatory	Q4.2_4	Relaxed rules slow EV shift	3.990	0.930	4	1	5
Symbolic/Brand	Q3.1_1	Craftsmanship	4.430	0.800	5	1	5
Symbolic/Brand	Q3.1_2	High price	2.870	1.120	3	1	5
Symbolic/Brand	Q3.1_3	Exclusivity	2.940	1.340	3	1	5
Symbolic/Brand	Q3.1_4	Brand heritage	3.750	1.080	4	1	5
Symbolic/Brand	Q3.1_5	Emotional driving experience	3.980	1.100	4	1	5
Symbolic/Brand	Q3.1_6	Performance	4.140	0.960	4	1	5
Symbolic/Brand	Q3.1_7	Personalisation	3.590	1.180	4	1	5
Symbolic/Brand	Q3.1_8	Sustainability	2.480	1.260	2	1	5
Symbolic/Brand	Q7.1_1	Engine sound essential	3.320	1.300	3	1	5
Symbolic/Brand	Q7.1_2	Simulated sound credible substitute	2.250	1.190	2	1	5
Symbolic/Brand	Q7.1_3	Mechanical feel important	3.170	1.240	3	1	5
Symbolic/Brand	Q7.1_4	Sports brands iconic without ICE	3.160	1.310	4	1	5
Symbolic/Brand	Q7.1_5	Ultra-luxury iconic without ICE	3.640	1.050	4	1	5
Technology/Competition	Q6.1_1	EV-native brands can be luxury	2.660	1.170	2	1	5
Technology/Competition	Q6.1_2	Chinese EVs not true luxury	3.380	1.230	4	1	5
Technology/Competition	Q6.1_3	Software and digital features matter	3.320	1.110	4	1	5
Technology/Competition	Q6.1_4	Range is not decisive	2.500	1.200	2	1	5
Technology/Competition	Q6.1_5	Heritage brands must preserve feel	3.940	0.970	4	1	5

Note: This output reports item-level means before scale aggregation.

Table B.2.24: Alpha-if-item-deleted output.

Construct	Item	raw_alpha	Raise_by	Recommendation
Regulatory	Q4.2_1_num	0.280	-0.030	Retain
Regulatory	Q4.2_2_num	0.090	-0.220	Retain
Regulatory	Q4.2_3_rev	0.210	-0.090	Retain
Regulatory	Q4.2_4_num	0.340	0.040	Retain
Consumer/Market	Q5.1_1_num	0.580	-0.060	Retain
Consumer/Market	Q5.1_2_num	0.550	-0.090	Retain
Consumer/Market	Q5.1_3_num	0.710	0.060	Review item
Consumer/Market	Q5.1_4_rev	0.620	-0.020	Retain
Consumer/Market	Q5.1_5_num	0.650	0.010	Retain
Consumer/Market	Q5.3_1_num	0.540	-0.110	Retain
Consumer/Market	Q5.3_2_rev	0.560	-0.090	Retain
Technology/Competition	Q6.1_1_num	0.260	-0.180	Retain
Technology/Competition	Q6.1_2_rev	0.340	-0.100	Retain
Technology/Competition	Q6.1_3_num	0.270	-0.160	Retain
Technology/Competition	Q6.1_4_num	0.370	-0.060	Retain
Technology/Competition	Q6.1_5_num	0.570	0.140	Review item
Symbolic/Brand	Q7.1_1_num	0.650	-0.060	Retain
Symbolic/Brand	Q7.1_2_rev	0.710	0	Retain
Symbolic/Brand	Q7.1_3_num	0.670	-0.040	Retain
Symbolic/Brand	Q7.1_4_rev	0.690	-0.030	Retain
Symbolic/Brand	Q7.1_5_rev	0.700	-0.020	Retain
Symbolic/Brand	Q3.1_1_num	0.700	-0.020	Retain
Symbolic/Brand	Q3.1_2_num	0.710	0	Retain
Symbolic/Brand	Q3.1_3_num	0.680	-0.030	Retain
Symbolic/Brand	Q3.1_4_num	0.670	-0.040	Retain
Symbolic/Brand	Q3.1_5_num	0.680	-0.030	Retain
Symbolic/Brand	Q3.1_6_num	0.690	-0.030	Retain
Symbolic/Brand	Q3.1_7_num	0.690	-0.030	Retain
Symbolic/Brand	Q3.1_8_num	0.790	0.070	Review item

Note: This output supports the scale-retention decisions and replaces the mislabeled draft appendix output.

Table B.2.25: Exploratory scale descriptives.

Exploratory Scale Descriptives

Scale	Mean	SD	Median	Min	Max
regulatory_scale	3.400	0.640	3.250	1.750	5
consumer_market_scale	3.190	0.630	3.290	1.290	4.430
technology_competition_scale	3.010	0.630	3	1.800	5
symbolic_brand_scale	3.350	0.550	3.460	1.540	4.540
luxury_ev_purchase_likelihood	1.900	1.170	1	1	5

Note: This table summarizes the exploratory construct scales after item coding and reliability checks.

Table B.2.26: All perception items ranked by mean score.

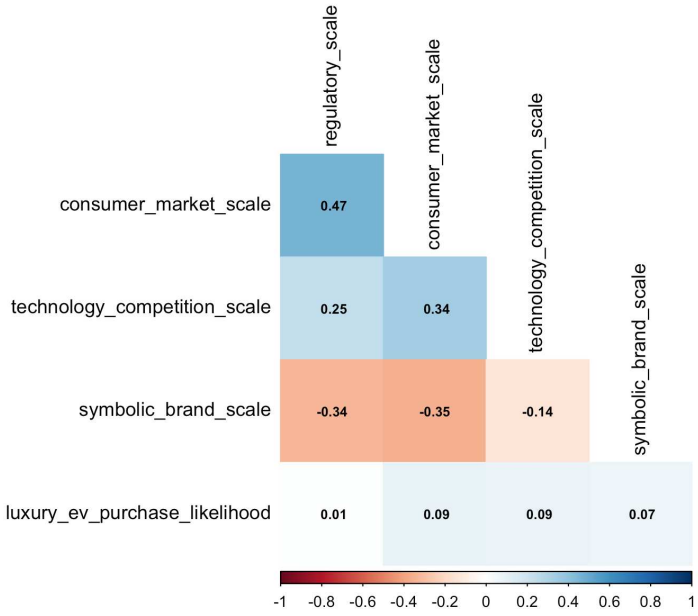
All Items Ranked by Mean Score

Construct	Short_label	Mean	SD	Median
Symbolic/Brand	Craftsmanship	4.430	0.800	5
Symbolic/Brand	Performance	4.140	0.960	4
Regulatory	Relaxed rules slow EV shift	3.990	0.930	4
Symbolic/Brand	Emotional driving experience	3.980	1.100	4
Technology/Competition	Heritage brands must preserve feel	3.940	0.970	4
Regulatory	EU regulation as key driver	3.870	0.940	4
Symbolic/Brand	Brand heritage	3.750	1.080	4
Symbolic/Brand	Ultra-luxury iconic without ICE	3.640	1.050	4
Symbolic/Brand	Personalisation	3.590	1.180	4
Consumer/Market	EV appears socially responsible	3.550	1.080	4
Technology/Competition	Chinese EVs not true luxury	3.380	1.230	4
Consumer/Market	EV signals avant-garde mindset	3.370	0.930	4
Regulatory	Combustion models seem authentic	3.360	1.220	3
Symbolic/Brand	Engine sound essential	3.320	1.300	3
Technology/Competition	Software and digital features matter	3.320	1.110	4
Consumer/Market	EV as identity and lifestyle	3.220	1.110	3
Consumer/Market	Luxury must be sustainable today	3.210	1.140	4
Symbolic/Brand	Mechanical feel important	3.170	1.240	3
Symbolic/Brand	Sports brands iconic without ICE	3.160	1.310	4
Regulatory	Non-electrifying brands outdated	3.110	1.340	3
Symbolic/Brand	Exclusivity	2.940	1.340	3
Symbolic/Brand	High price	2.870	1.120	3
Technology/Competition	EV-native brands can be luxury	2.660	1.170	2
Consumer/Market	Too much sustainability reduces exclusivity	2.630	1.300	2
Technology/Competition	Range is not decisive	2.500	1.200	2
Symbolic/Brand	Sustainability	2.480	1.260	2
Consumer/Market	Sustainability is short-term trend	2.430	1.260	2
Symbolic/Brand	Simulated sound credible substitute	2.250	1.190	2
Consumer/Market	EV premium price supports luxury	2.060	0.870	2

Note: This output supplements the narrative ranking of traditional and sustainability-related luxury attributes.

Correlation, Regression and Diagnostics

Figure B.2.27: Pearson correlation matrix.



Note: This correlation matrix shows bivariate relationships among the construct scales and the dependent variable.

Table B.2.28: Pearson correlations.

Variable	Comparison	r	p	Significance
regulatory_scale	consumer_market_scale	0.470	0	p < .001
regulatory_scale	technology_competition_scale	0.250	0.002	p < .01
regulatory_scale	symbolic_brand_scale	-0.340	0	p < .001
regulatory_scale	luxury_ev_purchase_likelihood	0.010	0.940	
consumer_market_scale	regulatory_scale	0.470	0	p < .001
consumer_market_scale	technology_competition_scale	0.340	0	p < .001
consumer_market_scale	symbolic_brand_scale	-0.350	0	p < .001
consumer_market_scale	luxury_ev_purchase_likelihood	0.090	0.252	
technology_competition_scale	regulatory_scale	0.250	0.002	p < .01
technology_competition_scale	consumer_market_scale	0.340	0	p < .001
technology_competition_scale	symbolic_brand_scale	-0.140	0.070	
technology_competition_scale	luxury_ev_purchase_likelihood	0.090	0.281	
symbolic_brand_scale	regulatory_scale	-0.340	0	p < .001
symbolic_brand_scale	consumer_market_scale	-0.350	0	p < .001
symbolic_brand_scale	technology_competition_scale	-0.140	0.070	
symbolic_brand_scale	luxury_ev_purchase_likelihood	0.070	0.372	
luxury_ev_purchase_likelihood	regulatory_scale	0.010	0.940	
luxury_ev_purchase_likelihood	consumer_market_scale	0.090	0.252	
luxury_ev_purchase_likelihood	technology_competition_scale	0.090	0.281	
luxury_ev_purchase_likelihood	symbolic_brand_scale	0.070	0.372	

Note: This R table provides the numerical correlation coefficients, p-values and significance labels behind the matrix.

Table B.2.29: Regression models with robust standard errors.

Model	Term	Estimate	Robust_SE	t_value	p_value	N	R2	Adj_R2	Significance
Full	(Intercept)	0.183	1.025	0.178	0.859	161	0.025	0	
Full	regulatory_scale	-0.053	0.176	-0.301	0.764	161	0.025	0	
Full	consumer_market_scale	0.225	0.156	1.438	0.152	161	0.025	0	
Full	technology_competition_scale	0.124	0.159	0.782	0.435	161	0.025	0	
Full	symbolic_brand_scale	0.240	0.159	1.515	0.132	161	0.025	0	
Controlled	(Intercept)	0.172	1.083	0.159	0.874	157	0.133	0.054	
Controlled	regulatory_scale	-0.019	0.171	-0.111	0.911	157	0.133	0.054	
Controlled	consumer_market_scale	0.307	0.161	1.901	0.059	157	0.133	0.054	
Controlled	technology_competition_scale	0.077	0.155	0.498	0.619	157	0.133	0.054	
Controlled	symbolic_brand_scale	-0.128	0.201	-0.639	0.524	157	0.133	0.054	
Controlled	age_group25-34	-0.036	0.200	-0.179	0.859	157	0.133	0.054	
Controlled	age_group35+	0.046	0.292	0.159	0.874	157	0.133	0.054	
Controlled	gender_groupMale	-0.098	0.209	-0.469	0.640	157	0.133	0.054	
Controlled	education_groupGraduate degree	-0.160	0.212	-0.753	0.452	157	0.133	0.054	
Controlled	luxury_owner_groupNon-Owner	-0.066	0.204	-0.322	0.748	157	0.133	0.054	
Controlled	car_access_groupRegular car access	0.048	0.224	0.214	0.831	157	0.133	0.054	
Controlled	ev_user_groupEV/PHEV user	0.358	0.277	1.292	0.199	157	0.133	0.054	
Controlled	Q1.3_num	0.071	0.102	0.691	0.491	157	0.133	0.054	
Controlled	Q2.4_1_num	0.249	0.107	2.318	0.022	157	0.133	0.054	p < .05

Note: This output compares the regression models used to assess whether the theoretical constructs predict EV purchase likelihood.

Table B.2.30: Controlled model: standardized focal coefficients.

term	estimate	std.error	statistic	p.value	conf.low	conf.high
regulatory_scale_std	-0.011	0.095	-0.112	0.911	-0.198	0.177
consumer_market_scale_std	0.169	0.101	1.678	0.095	-0.030	0.367
technology_competition_scale_std	0.043	0.085	0.506	0.613	-0.125	0.211
symbolic_brand_scale_std	-0.062	0.098	-0.628	0.531	-0.256	0.133
Q2.4_1_num_std	0.300	0.117	2.558	0.012	0.068	0.531

Note: This table gives the numeric values behind the controlled coefficient plot in Chapter 4.2.

Table B.2.31: MLR assumption-check summary.

Model	RESET_p	Breusch_Pagan_p	Shapiro_p	Max_VIF	Influential_cases
Full model	0.971	0.177	0	1.449	7
Controlled model	0.023	0.298	0	1.503	12

Note: This diagnostic summary reports the main multiple linear regression assumption checks.

Subgroup and RQ-Focused Analyses

Table B.2.32: T-tests by luxury ownership experience.

T-Tests by Luxury Ownership Experience

statistic	t_df	p_value	alternative	estimate	lower_ci	upper_ci	Variable	Cohens_d
-2.120	91.820	0.040	two.sided	-0.230	-0.450	-0.020	Regulatory	-0.370
-2.020	86.550	0.050	two.sided	-0.220	-0.440	0	Consumer/Market	-0.360
-0.890	86.200	0.370	two.sided	-0.100	-0.330	0.120	Technology/Competition	-0.160
3.540	107.510	0	two.sided	0.310	0.140	0.480	Symbolic/Brand	0.580
1.140	91.580	0.260	two.sided	0.230	-0.170	0.630	DV	0.200

Note: This output compares luxury owners and non-owners on selected survey measures.

Table B.2.33: ANOVA by age group.

ANOVA by Age Group

term	df	sumsq	meansq	statistic	p.value	Outcome
age_group	2	1.104	0.552	1.847	0.161	Symbolic/Brand
Residuals	158	47.242	0.299			Symbolic/Brand
age_group	2	0.965	0.482	0.351	0.705	DV
Residuals	158	217.445	1.376			DV

Note: This output tests age-group differences for Symbolic/Brand and purchase likelihood.

Table B.2.34: Tukey post-hoc tests by age group.

Tukey Post-Hoc Tests by Age Group

Comparison	diff	lwr	upr	p adj	Outcome
25-34-18-24	-0.050	-0.274	0.174	0.858	Symbolic/Brand
35+-18-24	-0.239	-0.536	0.058	0.140	Symbolic/Brand
35+-25-34	-0.189	-0.482	0.104	0.281	Symbolic/Brand
25-34-18-24	-0.139	-0.619	0.341	0.773	DV
35+-18-24	0.047	-0.590	0.684	0.983	DV
35+-25-34	0.186	-0.443	0.815	0.765	DV

Note: This output reports the post-hoc comparisons following the age-group ANOVA.

Table B.2.35: Spearman correlations with purchase likelihood.

Spearman Correlations: Items x Purchase Likelihood

Item	Construct	Short_label	rho	p_val	Sig
Q5.1_1	Consumer/Market	EV signals avant-garde mindset	0.169	0.032	p < .05
Q5.1_5	Consumer/Market	EV as identity and lifestyle	0.165	0.037	p < .05
Q3.1_5	Symbolic/Brand	Emotional driving experience	0.148	0.060	n.s.
Q3.1_7	Symbolic/Brand	Personalisation	0.143	0.070	n.s.
Q5.1_4	Consumer/Market	Too much sustainability reduces exclusivity	0.125	0.115	n.s.
Q6.1_4	Technology/Competition	Range is not decisive	0.106	0.181	n.s.
Q7.1_1	Symbolic/Brand	Engine sound essential	0.106	0.179	n.s.
Q4.2_3	Regulatory	Combustion models seem authentic	0.097	0.222	n.s.
Q4.2_1	Regulatory	EU regulation as key driver	0.090	0.256	n.s.
Q6.1_3	Technology/Competition	Software and digital features matter	0.085	0.285	n.s.
Q7.1_2	Symbolic/Brand	Simulated sound credible substitute	0.081	0.309	n.s.
Q7.1_3	Symbolic/Brand	Mechanical feel important	0.076	0.336	n.s.
Q5.3_2	Consumer/Market	Sustainability is short-term trend	0.072	0.362	n.s.
Q5.1_3	Consumer/Market	EV premium price supports luxury	0.060	0.450	n.s.
Q5.3_1	Consumer/Market	Luxury must be sustainable today	-0.055	0.485	n.s.
Q3.1_2	Symbolic/Brand	High price	-0.054	0.493	n.s.
Q5.1_2	Consumer/Market	EV appears socially responsible	0.053	0.507	n.s.
Q3.1_8	Symbolic/Brand	Sustainability	0.051	0.522	n.s.
Q6.1_5	Technology/Competition	Heritage brands must preserve feel	0.039	0.625	n.s.
Q7.1_5	Symbolic/Brand	Ultra-luxury iconic without ICE	0.035	0.662	n.s.
Q4.2_4	Regulatory	Relaxed rules slow EV shift	-0.034	0.669	n.s.
Q3.1_3	Symbolic/Brand	Exclusivity	0.031	0.698	n.s.
Q3.1_1	Symbolic/Brand	Craftsmanship	-0.026	0.746	n.s.
Q6.1_1	Technology/Competition	EV-native brands can be luxury	0.023	0.775	n.s.
Q3.1_4	Symbolic/Brand	Brand heritage	0.022	0.777	n.s.
Q7.1_4	Symbolic/Brand	Sports brands iconic without ICE	0.020	0.797	n.s.
Q4.2_2	Regulatory	Non-electrifying brands outdated	0.018	0.820	n.s.
Q6.1_2	Technology/Competition	Chinese EVs not true luxury	0.001	0.987	n.s.
Q3.1_6	Symbolic/Brand	Performance	-0.001	0.992	n.s.

Note: This output reports item-level associations with EV purchase likelihood.

Table B.2.36: EV vs. combustion preference by luxury ownership.

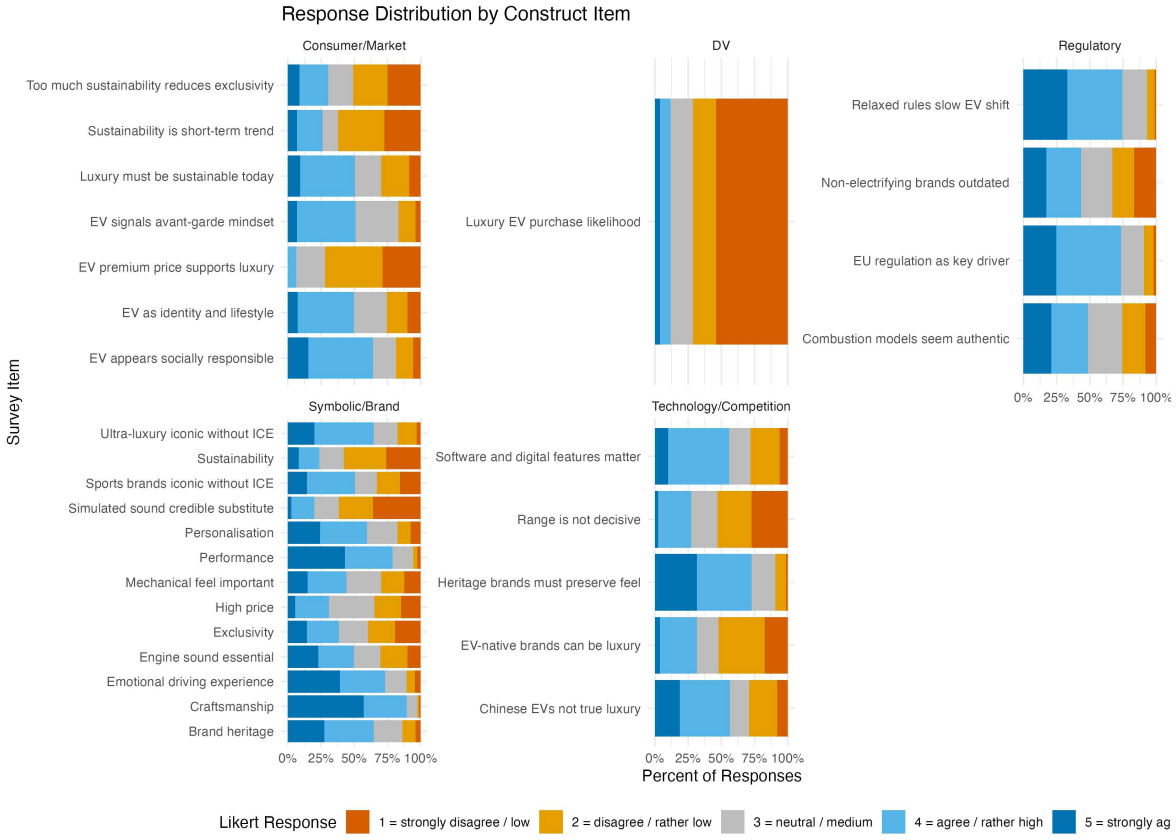
EV vs Combustion Preference by Luxury Ownership

Ownership	Preference	n	Pct
Luxury Owner	Combustion	37	72.500
Non-Owner	Combustion	54	49.100
Luxury Owner	EV or equal	14	27.500
Non-Owner	EV or equal	56	50.900

Note: This table cross-tabulates drivetrain preference by luxury ownership experience; chi-square result: chi2(1) = 7.803, p = 0.005.

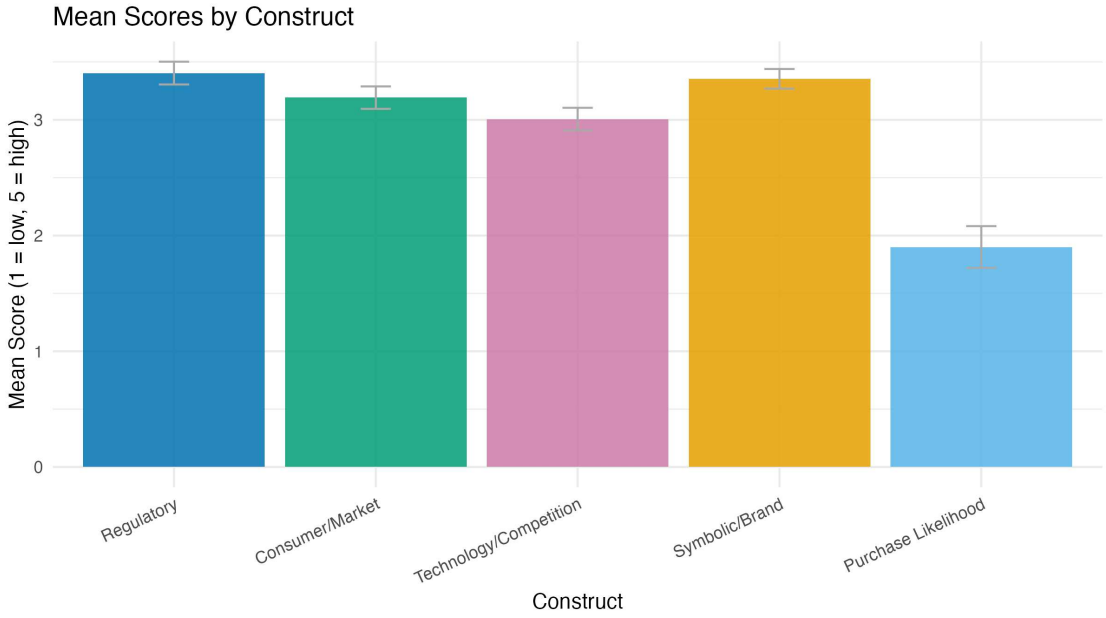
R Plots

Figure B.2.37: Likert response distributions by construct.



Note: This stacked Likert plot shows the response distribution for construct items.

Figure B.2.38: Exploratory construct means.



Note: This plot compares exploratory construct means descriptively.