A Work Project presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

The Impact Of The 2035 Internal Combustion Engine Ban On Strategic Adaptation And Global Competitiveness Of German Automotive Companies

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A Work Project carried out on the Master in Finance Program, under the supervision of:

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17-12-2024

Abstract

The EU's 2035 ban on new ICE vehicles forces Volkswagen, BMW, and Mercedes-Benz to shift R&D toward electrification, stabilize material supply, expand charging infrastructure, and meet evolving consumer expectations. Through interviews, policy analyses, and industry reports, this study reveals policy-driven innovation, financial pressures, and competition shaping their strategies. Volkswagen scales platform efficiency, BMW maintains flexible propulsion, and Mercedes-Benz leverages premium branding and software-defined features. Despite financial and operational hurdles, opportunities emerge through battery innovations, circular economies, and partnerships with suppliers and energy providers. The ICE ban catalyzes structural change, encouraging synergistic mandates, incentives, and engagement to secure sustainable, competitive leadership.

Keywords: *Internal Combustion Engine Ban, Strategic Adaptation, R&D, Regulatory Influence, Automotive Market Dynamics, Comparative Case Study: Germany and Norway*

Acknowledgements

I am grateful to Professor Fouad Hashem for his invaluable guidance and support. My thanks also go to colleagues and peers for their constructive feedback, and to my family and friends for their unwavering encouragement. Lastly, I appreciate NOVA SBE for providing the essential resources and data that made this study possible.

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019, and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722, and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. Introduction

The global automotive industry stands at a pivotal crossroads as electrification, autonomous driving, and digital connectivity reshape vehicle design, production, and distribution. Environmental considerations, driven by international climate targets and domestic policies, have intensified these shifts. Among these efforts, the European Union's (EU) planned 2035 ban on new internal combustion engine (ICE) vehicles marks a watershed moment (European Commission 2021; ACEA 2024). For German automakers Volkswagen, BMW, and Mercedes-Benz this regulatory transition poses formidable challenges. Renowned for engineering excellence in combustion engines, these firms must now pivot toward battery-electric propulsion, software-defined platforms, and stricter sustainability metrics (Campbell 2022; Helbig et al. 2020). Meanwhile, global competition increases as China's early electric vehicle (EV) supply chain investments yield cost advantages, while European consumers increasingly prioritize environmental impact, total ownership costs, and charging infrastructure availability (Feng and Zhang 2021; Lutsey and Nicholas 2019).

Although the 2035 ICE ban sets a clear regulatory endpoint, achieving compliance and strategic renewal remains complex. Europe's EV ban, reliance on imported raw materials, and uneven charging networks compound operational and financial pressures (Ziegler et al. 2021; Roland Berger 2023). Existing literature on EV adoption and decarbonization rarely addresses how top-down mandates intersect with entrenched industrial structures and evolving consumer expectations. Understanding these complexities is critical for policymakers, industry leaders, and scholars intent on reconciling climate objectives with sustainable economic outcomes.

Two central research questions frame this thesis:

1. *How is the 2035 ICE ban shaping the strategic adaptations of German automakers, and which factors most influence their ability to meet regulatory goals?*
2. *In what ways do policy frameworks, consumer behaviors, supply chain constraints, and global competition interact to determine Europe's transition to electric mobility?*

Before examining the literature review, it is essential to establish the ICE ban's historical and legislative context. The European Union's directive to end new ICE vehicle sales by 2035 emerged gradually, following years of policy debate, technical assessment, and stakeholder negotiation (European Parliament 2023). Between 2017 and 2019, environmental NGOs and several member states pressed for firm phase-out dates aligned with the Paris Agreement, though no precise targets were initially set. The 2019 European Green Deal and subsequent technical studies in 2020 paved the way for binding measures. By July 2021, the European Commission's Fit for 55 package proposed that from 2035 onward, all new passenger cars and vans sold in the EU emit zero CO_2 (European Commission 2021). During 2021–2022, debates in the European Parliament and Council refined the proposal. Some advocated synthetic fuels or transitional allowances, while others urged stricter interim goals. In early 2023, a final compromise confirmed the 2035 deadline with minimal exemptions, yet periodic reviews would track infrastructure, material supply, and market conditions, permitting adjustments if needed (European Parliament 2023). Now legally binding, this once-aspirational vision has become a regulatory mandate, compelling German automakers to reorient their strategies, supply chains, and R&D priorities. The ICE ban is not merely a compliance target; it is a catalyst for structural renewal. As the forthcoming Literature Review will show, grasping the policy's evolutionary arc and inherent flexibility is essential for

understanding how top-down regulation, global competition, and evolving consumer expectations converge to shape Europe's automotive landscape.

2. Literature Review

2.1 Theoretical Foundations

The EU's plan to end sales of new ICE vehicles by 2035 exemplifies how strict environmental rules can trigger major technological shifts. Schumpeter's "creative destruction" implies that when old technologies become untenable, firms must embrace new solutions—in this case, electric drivetrains, digital platforms, and sustainable supply chains (Schumpeter 1942; Aghion et al. 2016). Historically, strong environmental mandates have forced rapid industrial adaptation, making speed and flexibility essential for long-term competitiveness (Bresnahan and Trajtenberg 1995; Jänicke 2005).

Within the EU's *Fit for 55* strategy, aiming for substantial carbon reductions by 2030 and climate neutrality by 2050 (European Commission 2021), the ICE ban stands as a top-down policy designed to spur innovation. The real options theory helps explain firm behavior under uncertainty: investing in a range of solutions—such as Battery electric vehicles (BEVs), hybrids, and hydrogen—allows quick shifts if conditions change (Dixit and Pindyck 1994; Amram and Kulatilaka 1999; BMW Group 2023). The Porter Hypothesis adds that well-crafted environmental regulations can enhance, not just impose, competitiveness by encouraging innovation (Porter and Van der Linde 1995; Ambec et al. 2013). Empirical evidence shows that tighter EU emissions standards coincided with more EV-focused R&D and patenting, enabling firms to enter emerging markets sooner (Nishitani and Kokubu 2020).

2.2 Policy-Driven Innovation, Infrastructure, and Financial Pressures

The ICE ban reshapes core automotive competencies. German automakers—long focused on perfecting combustion engines—must now direct R&D toward battery-electric propulsion, hydrogen fuel cells, and software-defined vehicles (Geels 2020; Bohnsack et al. 2020). Data

indicates that stricter emission rules often coincide with surges in EV-related patents and new models, linking policy and innovation (ICCT 2019; ICCT 2022).

Yet these shifts occur amid cost pressures and supply uncertainties. Demand for lithium, cobalt, and nickel has pushed battery pack costs up over 20% since 2019 (BloombergNEF 2021; Feng and Zhang 2021). Europe holds under 10% of global battery cell production, relying heavily on Asian imports (Alves Dias et al. 2018; McKinsey & Company 2022). Such dependence exposes automakers to price swings and potential shortages. Experts propose vertical integration, long-term contracts, and recycling programs that could supply 20–30% of Europe's metals by 2030, stabilizing costs and reducing import reliance (Helbig et al. 2020; Bai and Sarkis 2021).

Charging infrastructure is equally crucial. Studies suggest that having roughly one public charger per ten EVs significantly improves consumer confidence (EAFO 2022). As of mid-2023, Germany had about 1.2 million BEVs (KBA 2023) and roughly 85,000 public charging points (BNetzA 2023)—one charger per about fourteen EVs, missing the 1:10 deemed as optimal. Additionally, ADAC tests in 2023 found that around 8% of inspected chargers were temporarily non-operational, eroding trust (ADAC 2023). Public-private partnerships, standardized charging systems, and renewable energy integration remain key strategies to reduce range anxiety and ensure that top-down mandates align with actual market uptake (Bai et al. 2021; Neaimeh et al. 2017; Helms et al. 2016).

Overlapping regulations, such as Euro 7 standards, add complexity. Automakers must still improve ICE engines while racing to develop zero-emission technologies (Darnall et al. 2008; Ziegler et al. 2021). Analysts estimate this dual compliance could raise short-term costs by 15–20%, straining capital and strategic clarity (Roland Berger 2023; Schiavone et al. 2018).

2.3 Comparative Policy Approaches: Germany vs. Norway

Comparative studies show that varying policy mixes strongly influence EV adoption

(Figenbaum 2017; Sovacool et al. 2020). While Germany has relied heavily on the ICE ban and previously offered moderate purchase subsidies of about €6,000–€9,000 for BEVs—now ended as of 2023—Norway employs a more stable and generous incentive structure that deeply reshapes the cost dynamics in favor of EVs.

Central to Norway's approach is its decision to remove the 25% value-added tax (VAT) and waive registration taxes on EVs, effectively reducing their purchase prices by roughly €10,000–€20,000 compared to similar ICE cars (Norwegian Ministry of Finance 2022; TØI 2022). This substantial, long-term reduction in upfront costs stands in contrast to Germany, where subsidies were both lower and temporary, and are now incidentally no longer available (Reiner et al. 2021; BAFA 2023). Without ongoing incentives or significant tax breaks, German buyers must contend with less favorable price conditions, while Norway's stable, substantial tax exemptions fundamentally shift the cost balance, making EVs consistently more attractive than ICE vehicles (Reiner et al. 2021; BAFA 2023; Norwegian Ministry of Finance 2022; TØI 2022).

Infrastructure availability further distinguishes the two countries' policy outcomes. Norway maintains about one public charger per 8–10 EVs, ensuring that drivers have reliable access to charging across a broad geographic range (EAFO 2022; Statens Vegvesen 2023). This dense network significantly reduces range anxiety, a critical barrier for many first-time EV buyers. Germany, by comparison, offers about one charger per fourteen EVs as of mid-2023, and consumer tests conducted by ADAC show that around 8% of inspected chargers were temporarily out of service, eroding consumer trust (KBA 2023; BNetzA 2023; ADAC 2023). Scholars emphasize that when infrastructure is abundant, consistent, and reliable, consumers adopt EVs more readily (Bai et al. 2021; Neaimeh et al. 2017; Helms et al. 2016). In Norway's case, the well-functioning charging network and easy availability of stations are integral components of its successful EV ecosystem, while Germany's sparser, sometimes

unreliable infrastructure limits how effectively the ICE ban translates into real-world uptake (EAFO 2022; Statens Vegvesen 2023; ADAC 2023)."

Non-monetary benefits also play a key role in Norway's strategy. Reduced tolls, discounted ferry fares, and bus lane access make EV ownership more convenient, saving drivers time and money in daily commuting (Figenbaum 2017; Sovacool et al. 2020). These everyday perks "normalize" EV usage, cultivating positive social norms and reinforcing the perception that EVs are a sensible choice beyond environmental considerations alone. In Germany, fewer such everyday advantages exist, leaving the ICE ban as a relatively isolated measure without an equally robust set of incentives and behavioral nudges. Without these complementary policies, the ban struggles to motivate consumers as effectively as Norway's multi-pronged approach.

Recent analyses reinforce these observations. Ruf et al. (2023) argue that sustained, transparent incentives and consistent policy signals strengthen consumer trust, making EV purchases feel less risky and better aligned with both environmental and economic goals. Norway's stable tax exemptions, reliable infrastructure, and user-friendly policies have not only accelerated EV adoption but also ingrained EVs into its automotive culture. By 2022, Norway's comprehensive measures propelled EVs to over 80% of new car sales, while Germany's more fragmented approach—even before subsidies ended—only managed to reach around 18–20% EV share (European Automobile Manufacturers Association 2022; EAFO 2023). (See Appendix, Figure 4) visually illustrates Norway's progression, highlighting key policy milestones that enabled its early and sustained leadership in EV adoption.

Comparing the composition of new passenger car sales in Germany and Norway (Figure 1 and Figure 2 see Appendix) visually confirm these trends. Drawing on data from the Kraftfahrt-Bundesamt (KBA) for Germany and Statens Vegvesen/OFV for Norway, these

figures show Norway's swift and decisive shift away from petrol and diesel toward battery-electric cars. In contrast, Germany's market, while diversifying beyond petrol and diesel, made slower progress in achieving high BEV penetration. Norway's stable policy framework and strong consumer incentives drove a smooth and steady rise in BEV adoption, whereas Germany's progress remained more incremental and sensitive to changing subsidies and less comprehensive support measures (Ruf et al. 2023; European Automobile Manufacturers Association 2022; EAFO 2023).

In summary, the Germany-Norway comparison underscores the importance of sustained, generous incentives, abundant and reliable charging infrastructure, and user-friendly policies that become routine parts of everyday life (Figenbaum 2017; Sovacool et al. 2020; Ruf et al. 2023). Norway's holistic, persistent approach transforms ambitious mandates into tangible, market-level success, while Germany's more limited and now less subsidized framework has yet to replicate such rapid, broad-based EV adoption (European Automobile Manufacturers Association 2022; EAFO 2023; Reiner et al. 2021). This contrast highlights how stable policies and consistent incentives—not just bans or short-lived subsidies—are essential to guiding industries and consumers through the transition to electric mobility (International Energy Agency 2023).

2.4 Strategic Responses, Digital Transformation, and Workforce Re-Skilling

German automakers adopt varied strategies to manage these pressures. Volkswagen pursues scale and open innovation to lower costs and speed development cycles (Volkswagen Group 2023; Chesbrough and Bogers 2014). BMW hedges its bets by investing in multiple propulsion technologies, allowing quick realignment if some solutions advance faster (Ambrosini et al. 2009; BMW Group 2023). Mercedes-Benz focuses on premium EVs with advanced software, hoping brand equity and technical sophistication maintain profit margins (Mercedes-Benz Group 2023; Lichtenthaler 2009).

However, product changes alone are insufficient. Workforce re-skilling is crucial as engineers shift from ICE specialization to software engineering, battery chemistry, and systems integration (Perez 2020; Thun et al. 2021). McKinsey estimates up to 30% of R&D staff may need retraining to fully exploit EV and digital opportunities, ensuring firms keep pace with evolving demands (McKinsey & Company 2023).

2.5 Challenges in Scaling Electrification: Consumer Knowledge, Aftermarket Services, and Global Competition

Consumer acceptance remains pivotal. Surveys show many potential buyers misunderstand total ownership costs, battery life, and charging convenience (Lutsey & Nicholas 2019; Peters & Dütschke 2019). Without clearer communication and public education, even strong infrastructure and incentives may not fully unlock EV demand.

Electrification also reshapes the aftermarket, shifting from mechanical repairs to software updates, predictive maintenance, and battery refurbishment. This evolution opens data-driven revenue streams from extended warranties and second-life battery uses (Nykvist and Nilsson 2019; Slowik et al. 2020; Burke et al. 2020; Ojanen et al. 2023). Digitalized services can stabilize profits as hardware margins fluctuate (Iansiti and Lakhani 2014).

Global competition intensifies these challenges. Chinese EV makers, backed by state subsidies and integrated supply chains, pressure European firms on cost and production speed (DW 2023; Fitch Ratings 2024). Tesla's rapid software integration and iterative production improvements set demanding benchmarks for cost and performance (Geels 2020). Some estimates show Chinese suppliers hold a 20–30% cost advantage, pushing European automakers to form strategic alliances and scale EV portfolios faster than planned (BloombergNEF 2021).

2.6 Opportunities for Strategic Competitiveness: Circular Economy, Data-Driven Services, and Scenario Planning

Despite obstacles, literature identifies key opportunities. Embracing circular economy principles—through recycling and closed-loop sourcing—could supply 20–30% of Europe's battery metals by 2030, reducing dependency and cost risks (Bai and Sarkis 2021; Kirchherr et al. 2017; Helbig et al. 2020).

Digital transformation extends beyond the vehicle. Automakers can use AI and connectivity to offer personalized services, predictive maintenance, and dynamic pricing, potentially raising profit margins (Zott & Amit 2010; Iansiti and Lakhani 2014). Scenario planning, guided by forecasts from McKinsey or BCG, helps firms prepare for various policy, market, and technological futures, lowering risks tied to supply uncertainties and shifting consumer tastes (McKinsey & Company 2023; BCG 2024).

2.7 Strategic Adaptation, Collaboration, and Policy Synergy

Ultimately, scholars agree that long-term success depends on integrated approaches. Automakers must form multi-stakeholder partnerships—aligning with battery suppliers for stable materials, joining charging providers to reassure consumers, and collaborating with software firms to enhance user experiences (Chesbrough 2010; Perez 2020; ICCT 2022).

Policy synergy is equally vital. When bans or emissions standards coincide with steady incentives, consumer education, workforce training, and strong infrastructure, top-down mandates can foster genuine innovation and public acceptance (Figenbaum 2017; Sovacool et al. 2020).

3. Methodology

This qualitative, exploratory study examines how the European automotive industry is adapting to the European Union's planned 2035 ban on new ICE vehicles. Given the complexity of this transition—encompassing technological, supply chain, regulatory, and consumer dimensions—a qualitative approach using semi-structured interviews provides the depth needed to understand the processes and perspectives shaping these changes. Secondary

materials, including EU policy documents, industry reports, and statistical data from authorities such as Kraftfahrt-Bundesamt (KBA) and the European Automobile Manufacturers Association (ACEA), complement the interviews, offering empirical context and enabling data triangulation.

3.1 Data Collection Methods

Semi-structured interviews served as the core data source, allowing focused yet flexible discussions on topics including R&D shifts, compliance challenges, supply chain integration, consumer sentiment, and market competition. Open-ended questions gave participants room to highlight unanticipated issues and provide nuanced insights. Additionally, secondary sources—European Commission directives, consulting firm analyses (e.g., McKinsey, Roland Berger), think tank studies (e.g., Agora Verkehrswende), and academic literature (Bohnsack et al. 2020; Geels 2020)—as well as EV adoption data from the European Alternative Fuels Observatory (EAFO) and ACEA, supported and contextualized the qualitative findings.

3.2 Sampling and Selection of Interviewees

A purposive sampling strategy targeted professionals central to Europe's EV transition. Initially, 87 potential participants were contacted via email and LinkedIn, receiving an overview of the study's aims. Ultimately, 12 industry experts agreed to participate, all requesting anonymity. To reduce redundancy and ensure a coherent narrative, the sample was consolidated so that each organization or stakeholder group was represented by one key individual. The final set of participants included a Head of R&D at Volkswagen, offering insights into adapting large-scale production and platform innovation; a Senior Analyst at the European Battery Alliance (EBA), clarifying supply chain and capacity-building efforts; a Deloitte analyst contributing a strategic consulting perspective bridging policy and manufacturing; one Bosch representative reflecting supplier transitions from ICE to EV technologies; a senior executive at Umicore illuminating raw material sourcing, sustainability,

and circular economy potential; a Policy Advisor at DG Move providing an institutional policy viewpoint; a Head of Government Affairs at Mercedes-Benz illustrating the challenges of preserving premium positioning under new rules; a Regulatory Affairs Specialist at BMW balancing diverse propulsion approaches; a Production Manager at Li-Cycle emphasizing recycling and stabilizing supply; a representative from the European Consumer Organisation (BEUC) highlighting consumer cost and education concerns; one Ionity representative stressing charging infrastructure demands; and a Senior Policy Consultant at Agora Verkehrswende placing industry changes within broader sustainable mobility scenarios. Collectively, these participants represent automakers, suppliers, policymakers, consumer advocates, and infrastructure enablers, capturing the multifaceted pressures and opportunities arising from the ICE ban.

3.3 Interview Procedure

All interviews were conducted remotely using secure video conferencing. Sessions lasted approximately 20–30 minutes, following a semi-structured guide that ensured coverage of core themes while allowing participants to elaborate on areas they considered most relevant. This approach provided an optimal balance between consistency and flexibility, enabling in-depth exploration of key issues.

3.4 Data Management and Ethical Considerations

Before each interview, participants received an information sheet detailing the study's purpose, confidentiality measures, and ethical standards. Informed consent was obtained, and participants had the right to withdraw at any time. Interviews were recorded with permission, transcribed verbatim, and anonymized to protect identities. Data were stored securely, and the study adhered to institutional ethical guidelines and data protection laws.

3.5 Data Analysis

Thematic analysis guided data interpretation. Transcripts were iteratively coded to identify

recurring patterns related to strategic adaptation, supply chain resilience, compliance challenges, consumer preferences, and business model evolution. NVivo software assisted in organizing and comparing data excerpts, enhancing the rigor of the analysis. Secondary data, including EV registration statistics and think tank reports, supplemented the qualitative insights. Triangulation ensured that emerging themes from interviews aligned with external indicators and established research, thereby strengthening the credibility and dependability of the findings.

4. Results

4.1 R&D Investment & Technological Shifts

The 2035 ICE ban has prompted European automakers to significantly increase R&D budgets directed toward EV technologies as illustrated in Figure 3 in the appendix. This was emphasized by the Volkswagen Head of R&D, who noted a near-total shift toward BEVs, digital platforms, and partnerships with technology firms. However, multiple industry experts and stakeholders interviewed—such as the Senior Analyst at the EBA and the Deloitte analyst—cautioned that Europe's attempts to foster a homegrown battery industry are faltering. According to these interviewees, Europe's industry faces critical delays and cancellations in battery manufacturing projects, with the EBA Senior Analyst stating: "Out of the 16 planned European-led battery factories, 11 have been delayed or cancelled, indicating the difficulties our region faces in scaling up production."

In parallel, interviewees underscored that Asian players, such as China's CATL and South Korea's Samsung SDI, continue to advance unimpeded. As the Deloitte analyst explained, "Ten out of thirteen Asian-led battery projects in Europe remain on track, underscoring their grip on the sector and the competitive disadvantage facing Western automakers." These setbacks, interviewees said, result from Europe's late start in battery technology adoption and

the longstanding dominance of Asian suppliers who offer advanced expertise and competitive pricing.

Beyond the manufacturing bottlenecks, R&D challenges persist. The Bosch Representative, for instance, acknowledged that while European automakers focus on vertical integration and software-defined vehicles, the complexity and standardization of EV technologies push R&D costs higher. The Senior Executive at Umicore also highlighted that Europe's lag in battery competencies places additional strain on research budgets, as companies race to match the quality, cost, and scale that Asian manufacturers have spent years perfecting.

4.2 Evolving Regulations: Compliance Pressures and Strategic Shifts

The necessity to comply with stringent emissions regulations—magnified by the 2035 ICE ban—has accelerated the pivot toward electrification. However, multiple interviewees, including the Policy Advisor at DG Move and the Head of Government Affairs at Mercedes-Benz, described how Europe's automakers, having been slow to shift away from profitable gasoline and diesel engines, now scramble to meet regulatory requirements with insufficient local battery supply. As the DG Move Policy Advisor noted, "European automakers' late start in EV technology left them struggling to establish reliable domestic battery production, making compliance not only a technical challenge but also a strategic vulnerability."

Interviewees stressed that this vulnerability is heightened by China's entrenched dominance, supported by subsidies and soft loans. The Bosch Representative stated, "If supply crunches or geopolitical tensions arise, Europe's dependence on foreign battery tech puts European automakers at a real disadvantage." Some experts, like the Senior Policy Consultant at Agora Verkehrswende, also emphasized the broader environmental and economic implications: "Our hopes of creating a self-sustaining green economy that challenges China's position are at risk.

Without domestic battery capabilities, we undermine our own environmental and industrial policy goals."

Attempted countermeasures, such as EU tariffs on Chinese EV imports, were viewed skeptically by these experts; the Volkswagen Head of R&D explained, "Tariffs might help in the short term, but they risk retaliation that could limit access to the Chinese market, which remains critical for our revenue." Meanwhile, the Regulatory Affairs Specialist at BMW noted that slowing EV sales and wavering electrification plans could weaken Europe's long-term position: "Falling behind technologically is dangerous, because once Europe loses ground in regulatory compliance and sustainable production, catching up becomes even harder."

4.3 Raw Material and Supply Chain Challenges

Interviews with the Bosch Representative, the Senior Executive at Umicore, and the Production Manager at Li-Cycle emphasized Europe's heavy reliance on imported raw materials and foreign expertise as a central barrier to developing a resilient EV supply chain. The Senior Executive at Umicore observed, "Europe missed the early opportunity to build a domestic battery supply chain. Now, high energy costs, a shortage of skilled technicians, and complex manufacturing processes leave us trailing behind established Asian players."

The bankruptcy of Northvolt—once heralded as Europe's prime candidate for a local champion—highlight these issues. The Production Manager at Li-Cycle noted, "If our most prominent startup faces cost and quality problems, it's a clear sign of deep capability gaps." Multiple interviewees viewed Northvolt's bankruptcy as symbolic of Europe's difficulty replicating the finely perfected production methods of Asian manufacturers.

Automakers are reassessing their timelines. The Regulatory Affairs Specialist at BMW stated, "Without secure, cost-competitive supply chains, weak EV demand and canceled battery

orders are inevitable." The Head of Government Affairs at Mercedes-Benz mentioned halted battery plants in Germany, Italy, and the UK's Britishvolt collapse as eroding bargaining power and investor confidence, driving automakers to seek external technology just to remain competitive.

The Bosch Representative stressed that battery manufacturing involves refining over a thousand processes, a skillset Asian firms have perfected over decades. Labor shortages and high energy costs add complexity. The Deloitte analyst warned, "Without enough skilled technicians, even the best strategy falls short."

Interviewees advocated recycling and vertical integration to lessen reliance on imported materials. The Senior Analyst at EBA noted that recycling critical materials can stabilize supply chains and cut costs, though it won't entirely close the gap with Asia. The same EBA Senior Analyst cautioned that North America's growing support for battery investments could lure companies away: "We risk becoming a secondary market, dependent on imports and vulnerable to supply shocks," they said.

The strategic implications are significant. The Senior Policy Consultant at Agora Verkehrswende linked Europe's green economy goals to local supply chain resilience, warning that every failed project makes catching up harder. The Volkswagen Head of R&D added, "We need common effort—industry, policymakers, and researchers—to match the scale, efficiency, and expertise of our Asian competitors."

4.4 Consumer Sentiment and Market Dynamics

Consumer sentiment has emerged as a critical, complex factor influencing EV adoption in Europe. Interviewees from BEUC, Ionity, and major automakers emphasized that affordability, infrastructure readiness, brand trust, and perceived long-term value shape consumers' willingness to embrace EVs.

The BEUC Representative noted that high upfront costs deter many buyers, especially as subsidies decline in places like Germany. Without financial incentives, price-sensitive consumers—particularly in rural areas—often postpone EV purchases. Infrastructure shortfalls further exacerbate this hesitancy. According to the Ionity Representative, while urban charging networks are improving, rural drivers still face limited public charging options and persistent range anxiety, leading them to stick with familiar ICE vehicles.

Knowledge gaps also play a role. The BEUC Representative revealed that many buyers remain unaware of EVs' long-term cost benefits, a problem compounded by mixed media coverage and insufficient consumer education. Meanwhile, the Volkswagen Head of R&D explained that delays and bankruptcies (e.g., Northvolt) prompt some customers to question the competitiveness of European brands, pushing them toward Asian imports perceived as more advanced and affordable.

Regional differences add complexity: well-coordinated policies and infrastructure have spurred rapid adoption in Norway and the Netherlands, while in Germany, weaker incentives slow the transition. The Regulatory Affairs Specialist at BMW warned that as Chinese automakers introduce affordable, feature-rich EVs, European consumers increasingly doubt whether they are overpaying for underperforming local brands, pressuring European automakers to reduce costs, enhance technology, and better communicate value.

In sum, consumer sentiment reflects an intricate interplay of cost, convenience, trust, and infrastructure. Low enthusiasm and sluggish sales reinforce supply chain challenges, discouraging large-scale local production and innovation. Without decisive measures to align consumer incentives, supportive policies, and industry efforts, Europe risks deepening its reliance on foreign suppliers and delaying its EV transition.

4.5 Strategic Responses of German Automakers

The Volkswagen Head of R&D spoke about the company's efforts in vertical integration and strategic alliances, referencing the importance of controlling more of the value chain internally. Still, the Volkswagen Head of R&D admitted, "The complexity revealed by recent setbacks like Northvolt's bankruptcy shows that building a reliable, cost-effective local battery supply is not straightforward. Demand has dropped off in some segments, and we're being forced into unprecedented cost cutbacks. Without drastic measures, it's becoming close to impossible to match the lower prices and rapid innovation cycles of new rivals."

The Regulatory Affairs Specialist at BMW mentioned their diversified propulsion strategy (BEVs, hybrids, hydrogen) as a hedge against uncertainty, but also conceded, "Our flexible approach won't solve the fundamental issue: we still depend heavily on foreign suppliers for the cells themselves." Meanwhile, the Head of Government Affairs at Mercedes-Benz emphasized the premium segment's need for quality and reliability, pointing out that achieving this often means partnering with Asian firms for technology and cost competitiveness. "Without their input," the Mercedes-Benz representative said, "our ambitions for local European production might never materialize, especially as cost pressures mount."

Across all interviews, experts and company officials agreed that while collaborative efforts—such as ACC's battery factory in France or Verkor's upcoming plant—represent steps forward, they still struggle with cost, complexity, and competition. The Senior Analyst at EBA concluded, "If we fail to establish a robust domestic supply chain and continue to lag behind in key technologies, Europe's automakers will remain reliant on foreign technology. In response, many are already seeking deeper partnerships with Asian manufacturers to secure critical know-how and ensure steady supply. However, these partnerships also highlight our dependency and raise the question of whether we can ever fully catch up.

5. Discussion

This study set out to examine how the 2035 ICE ban is reshaping the strategies and operations of German automakers and the broader European automotive ecosystem. Initially framed as a policy-driven push toward electrification, the research revealed a complex interplay of factors: beyond the ban itself, automakers face entrenched supply chain vulnerabilities, evolving consumer sentiment, intensifying global competition, and challenges in translating R&D investments into market-ready innovations. Interviews with industry professionals, supported by literature and policy documents, suggest that the ICE ban is not an isolated driver of change but one node in a network of interrelated pressures. In practice, the ban exposes underlying structural issues and late strategic moves, making it clear that policy alone cannot ensure a stable, sustainable transition.

5.1 Regulatory Impact and Strategic Adaptation

The 2035 ICE ban aims to align the automotive sector with EU climate objectives, a move echoing the Porter Hypothesis (Porter & Van der Linde 1995). Ideally, setting a firm end-date for internal combustion technologies should encourage rapid innovation and market readiness for zero-emission solutions. Yet multiple interviewees expressed doubts that the ban, as a standalone measure, provides the right balance of incentives and support. A Policy Advisor at DG MOVE acknowledged that, while the ban emerged from stakeholder consultations, its ambitious timeline places automakers under immense pressure to comply swiftly. The Regulatory Affairs Specialist at BMW argued that the ICE ban may have been a strategic misstep, imposing tight deadlines without offering parallel measures—such as consumer incentives, robust charging infrastructure deployment, or financial relief—that could buffer the shock of this rapid transition.

The Norwegian approach to EV adoption illustrates a more holistic policy toolkit. Instead of relying solely on mandates, Norway pairs high taxes on ICE vehicles with generous subsidies, extensive charging networks, and broad public awareness campaigns, fostering a bottom-up market "pull" rather than a top-down "push" (Figenbaum 2017; Sovacool et al. 2020). By contrast, the EU's singular focus on a ban risks feeling punitive if not accompanied by measures that help automakers and consumers navigate change more smoothly. A more graduated timeline or a blend of mandates and incentives might have allowed German automakers to reallocate R&D, secure supply chains, and build consumer trust at a more measured pace, reducing the upheaval currently observed.

5.2 R&D and Technological Evolution

At the heart of this transformation is a massive redirection of R&D spending. Automakers now focus on battery chemistries, software-defined vehicles, and autonomous capabilities, recognizing that technology has evolved from a competitive differentiator into a baseline expectation (Zhu et al. 2020; Bohnsack et al. 2020). Interviews with Bosch and other industry insiders emphasized the urgency of producing modular, cost-effective EV components that can be adapted across multiple platforms. This reorientation requires mastering new skill sets, forging novel supplier relationships, and accelerating learning curves in areas historically outside European automakers' core competencies, such as semiconductors and advanced software.

However, European automakers' late start magnifies the challenge. Tesla and Chinese competitors began investing in EV technologies and battery manufacturing well before Europe grasped the full strategic importance of domestic cell production. As one interviewee noted, this delayed reaction meant that while European companies continued selling profitable ICE models, firms like BYD—originally a battery-maker for cellphones—introduced their first electric car in 2008. Meanwhile, European automakers' reluctance to

pivot quickly prevented them from capitalizing on early EU initiatives launched in 2017 to fast-track local battery production. As a result, when the ICE ban began to bite, Europe lagged behind, saddled with entrenched path dependencies (David 1985; Nelson & Winter 1982) and faced with the tough task of catching up to established global leaders.

5.3 Supply Chain Complexities

Europe's reliance on imported raw materials and foreign expertise compounds these late-mover disadvantages. Interviewees from Umicore and Li-Cycle underscored how geopolitical risks, price volatility, and export restrictions hinder stable EV production. China's dominance in battery value chains, supported by state subsidies and potentially non-commercial financing structures, enables Chinese automakers and suppliers to offer competitive pricing strategies that European manufacturers struggle to match. This scenario places German car makers in a precarious position: just as the ICE ban urges them to electrify at scale, their supply chains remain beholden to external cost and availability pressures.

To mitigate these vulnerabilities, stakeholders are considering closed-loop recycling systems, vertical integration, and strategic partnerships with material specialists. While recycling and local production offer medium- to long-term stability (Bai & Sarkis 2021), these measures cannot instantly offset the years of head start enjoyed by competitors. Thus, the ICE ban's firm deadline amplifies the urgency: failing to secure reliable, cost-effective supply chains could stall electrification goals and erode the intended environmental and industrial advantages of the policy.

5.4 Consumer Sentiment and Market Dynamics

No matter how visionary the policies or how sophisticated the technologies, the success of the EV transition hinges on consumer acceptance. Interviews with BEUC and Ionity representatives highlighted multiple consumer concerns: high upfront prices, diminishing

subsidies, fragmented charging infrastructure, and persistent knowledge gaps about total cost of ownership. Although EV operating costs are often lower than those of ICE vehicles, the initial sticker shock and uncertain access to convenient charging deter many potential buyers (Lutsey & Nicholas 2019; Peters & Dütschke 2019).

The ICE ban's rigid timeline risks reinforcing these concerns if consumers perceive a looming "cliff edge" where affordable, accessible EVs remain scarce. Targeted incentives, transparent educational campaigns, and robust infrastructure investments—particularly in rural areas—can counteract this effect. Rather than leaving buyers feeling coerced, well-designed support mechanisms can transform the ban into an aspirational endpoint, showing consumers tangible reasons to embrace electrification before the 2035 cutoff.

5.5 Global Competitiveness and Long-Term Viability

On the global stage, European automakers now face formidable competition from firms that acted decisively and early. While Europe hesitated, China moved swiftly to invest in domestic EV industries, scale production, and develop cost advantages. As an interviewee stated, Europe's slow pivot when Chinese companies were already perfecting battery manufacturing and rolling out EVs means that German car makers must now compete in a space where cost leadership and manufacturing efficiencies are largely spoken for.

Yet there are ways forward. European brands have historically excelled in engineering quality, brand prestige, and luxury features. Reinventing these strengths for the EV era could mean focusing on sustainability, digital integration, software-defined services, and circular supply chain strategies that resonate with increasingly eco-conscious consumers. Premium EV offerings by Mercedes-Benz and BMW's exploration of multiple propulsion technologies, including hydrogen, are examples of attempts to carve out unique value propositions. Moreover, research by BCG (2024) suggests that automakers can diversify revenue streams

and enhance resilience by developing subscription models, data-driven services, and integrated mobility solutions—focusing less on hardware margins and more on continuous value delivery to customers.

5.6 Future Scenarios and Recommendations

Looking ahead, a holistic policy and business approach is essential. Policymakers may refine the ICE ban's implementation by blending it with consumer incentives, infrastructure investments, and second-hand EV market support, following Norway's template. This could transform the ban from a blunt instrument into a more balanced framework that encourages organic EV adoption.

At the industry level, interviewees stressed the need to look beyond conventional revenue models. Insights from BCG suggest that automakers can thrive by investing in service-oriented business models—such as data-driven subscriptions, mobility-as-a-service platforms, and OTA (over-the-air) updates—alongside robust software and analytics capabilities. One interviewee advocated embracing these digital ecosystems as a way to differentiate from low-cost competitors and create ongoing revenue streams. Meanwhile, battery refurbishment, recycling, and second-life applications can stabilize materials supply and reduce reliance on volatile global markets. Alliances with energy companies, tech firms, and recyclers would not only strengthen supply chain resilience but also enable automakers to tap into emerging profit pools in energy storage and aftersales services.

6. Conclusion

This thesis set out to examine how the European Union's 2035 ICE ban is reshaping the German automotive industry, compelling established manufacturers—such as Volkswagen, BMW, and Mercedes-Benz—to adapt quickly and comprehensively. What began as a regulatory directive targeting emissions has revealed far more than a simple compliance

challenge. Instead, the ban has acted as a catalyst, exposing structural vulnerabilities, demanding innovative supply chain solutions, and prompting a critical reevaluation of traditional business models.

The research underscored several key dynamics at play. First, the ICE ban's stringent deadline intensified efforts to reallocate R&D resources from familiar combustion technologies toward BEVs, hydrogen fuel cells, and software-defined platforms. While these shifts are crucial for meeting policy goals, Europe's comparatively late start in building a robust domestic battery supply chain and developing digital capabilities placed its automakers at a disadvantage vis-à-vis competitors who embraced electrification earlier, such as Chinese EV firms and Tesla. Caught off-guard by the rapid acceleration of environmental mandates, German automakers now struggle to catch up in areas like semiconductor integration, advanced battery chemistries, and cost-efficient manufacturing techniques.

Second, the transformation of the automotive landscape is not merely technological. The research highlighted the centrality of charging infrastructure, consumer incentives, and educational campaigns in bridging the gap between policy ambition and market behavior. Unlike Norway's incentive-driven model, which aligned consumer interests with environmental objectives, Germany's regulatory-heavy approach has, thus far, not produced the same swift uptake in EV adoption. This suggests that mandates alone are insufficient: holistic frameworks that combine regulations with tangible benefits and supportive ecosystems can better nurture organic market shifts.

Third, the thesis illustrated how the ICE ban accelerates a departure from hardware-centric revenue streams toward digital, service-oriented business models. Automakers now consider subscription services, mobility-as-a-service solutions, over-the-air updates, and data-driven offerings to capture ongoing value beyond the initial vehicle sale. Circular economy

principles—especially battery recycling and second-life applications—emerged as critical long-term strategies to stabilize raw material supplies, reduce environmental footprints, and strengthen resilience against geopolitical risks and price volatility.

Taken together, these findings directly address the research questions guiding this thesis. The first question—how the ICE ban shapes strategic adaptations—finds that while the ban propels German automakers to innovate and reallocate resources, it also exposes vulnerabilities that must be urgently resolved through policy support, consumer engagement, and industry alliances. The second question—how policy frameworks, consumer behaviors, supply chain constraints, and global competition interact—reveals that no single lever is sufficient. Rather, synchronized efforts from policymakers, industry stakeholders, and consumers are necessary to translate top-down mandates into genuine market readiness and sustainable competitiveness.

Despite these challenges, the situation is not without promise. European automakers retain deep engineering expertise, strong brand heritage, and a legacy of quality and innovation. By leveraging these strengths and aligning them with sustainability, digital integration, and flexible propulsion strategies, they can differentiate themselves in a crowded global marketplace. Partnerships with energy providers, technology firms, recyclers, and policymakers are essential to forging integrated, future-proof solutions. Meanwhile, policymakers have opportunities to refine the ICE ban's implementation by blending mandates with incentives, stable subsidy frameworks, and infrastructural investments, thereby converting a top-down directive into a more collaborative, market-friendly roadmap. In doing so, both industry and policymakers can ensure that the ICE ban not only meets its environmental targets, but also fosters a resilient, innovative, and globally competitive European automotive sector in the long run.

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Appendices

Figure 1: Norwegian new passenger car sales by type

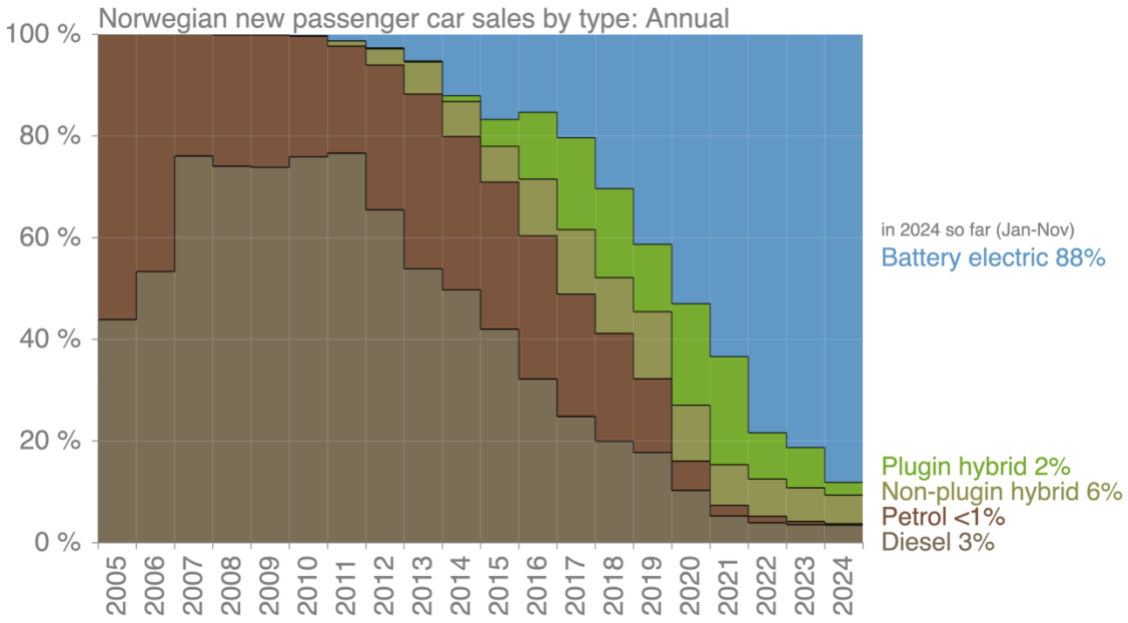


Figure 2: German new passenger car sales by type

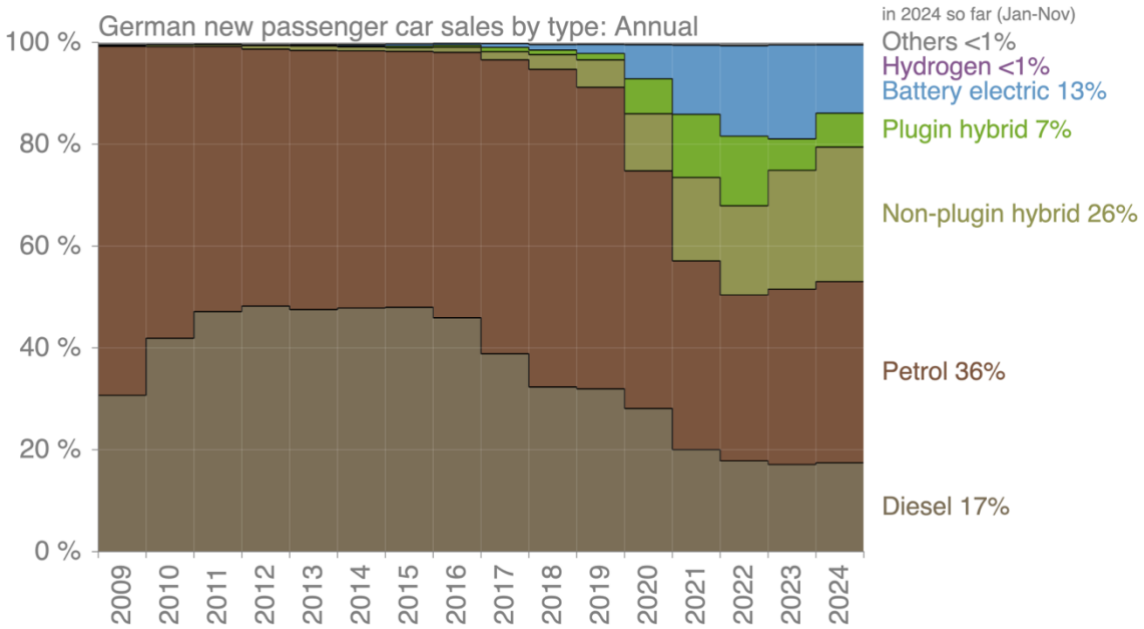


Figure 3: Research & Development Expense of VW, Mercedes-Benz and BMW

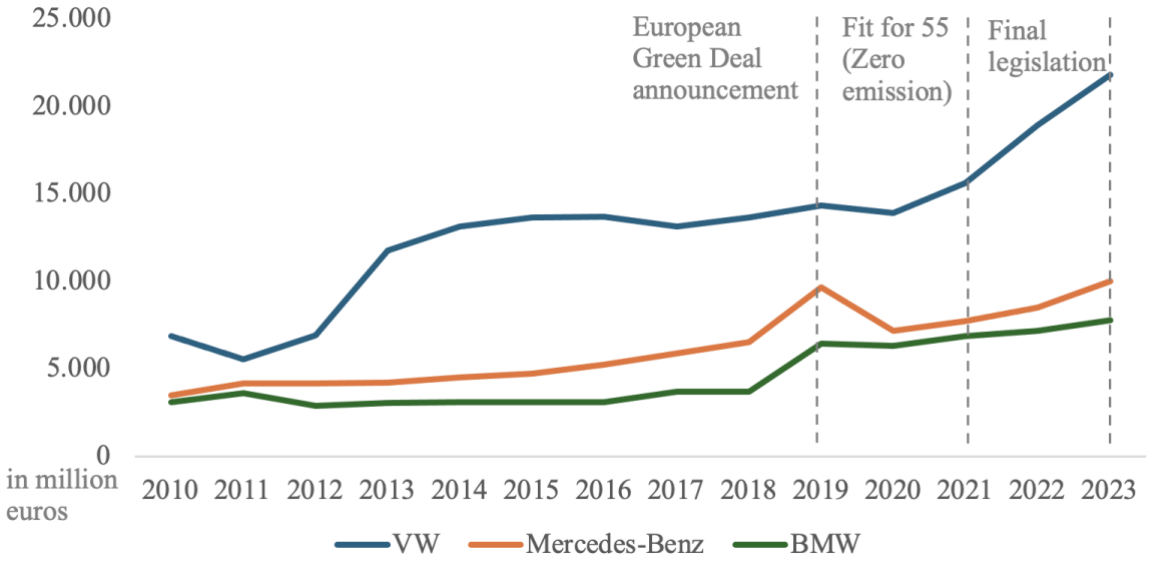
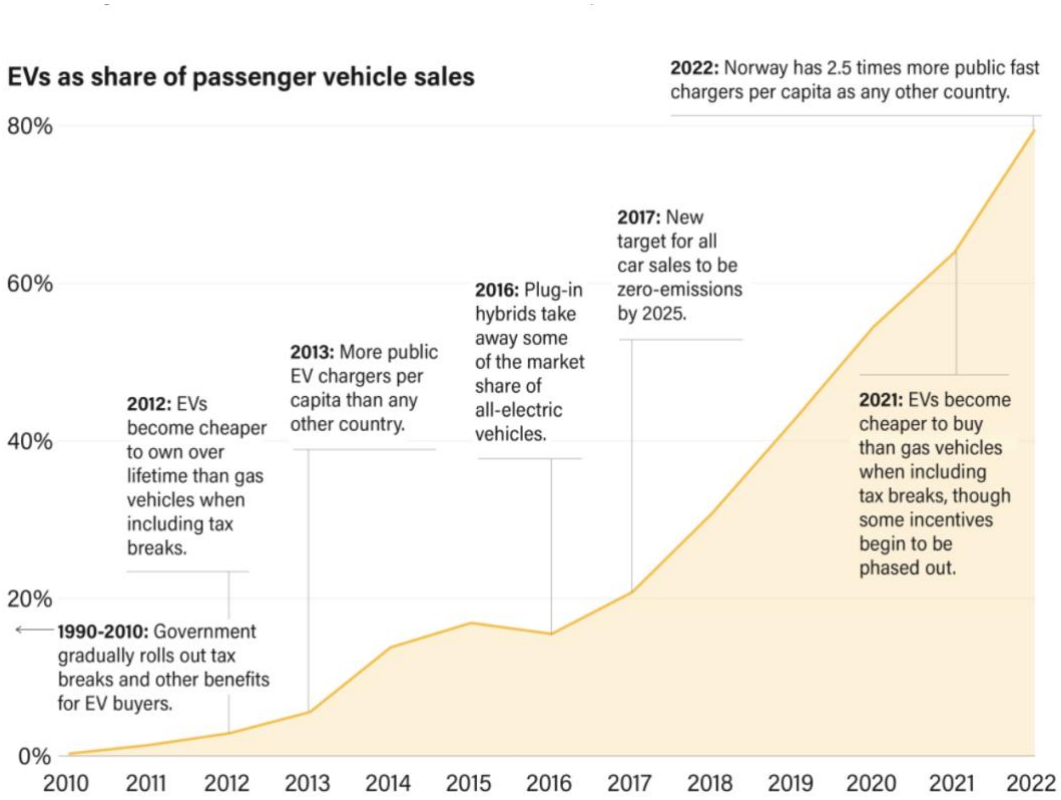


Figure 4: Norways EV share and their longterm strategy



Appendix I: Interview Transcripts

Interview 1
Company: Volkswagen
Position: Head of R&D

Interviewer: Thank you for agreeing to speak with me today. To start, could you briefly describe how the 2035 ICE ban has influenced your R&D priorities at Volkswagen?

Volkswagen Head of R&D (VW): Certainly. The 2035 ICE ban has been a pivotal regulatory milestone, prompting us to re-examine our long-term strategy and shift substantial portions of our R&D budget toward battery-electric vehicles, digital platforms, and partnerships with technology firms. Where we once focused heavily on refining combustion engines, we've now made a near-total pivot to EV-related technologies, acknowledging that zero-emission mobility will soon be a baseline market expectation.

Interviewer: Could you clarify what this shift looks like on a practical level? For example, how have your research teams changed their focus?

VW: Previously, a significant portion of our engineering talent worked on incremental improvements to diesel and petrol engines. Now, those same teams are dedicated to advancing battery chemistries, power electronics, and software-defined vehicles. We're hiring more software developers, battery specialists, and data analysts, and we rely increasingly on digital simulation tools to compress development cycles. Our test facilities have also evolved—fewer ICE test benches, more battery test cells, and more sophisticated software-in-the-loop simulations for EV drivetrains and autonomous features

Interviewer: It sounds like a complex reorientation. What challenges have emerged in implementing these changes, particularly related to the battery supply chain?

VW: The battery supply chain represents one of our biggest hurdles. While efforts are underway to establish local manufacturing capacity in Europe, Asia—especially China and South Korea—dominates cell production. They have the scale, quality, and cost advantages that we are still struggling to match. We've seen planned European battery projects face delays or cancellations, and we've been forced to ramp up R&D under intense time pressure. This late start means we're learning as we go, trying to catch up with competitors who've been refining their processes for years.

Interviewer: How do these supply chain vulnerabilities affect your R&D approach?

VW: They make it more urgent and multifaceted. Beyond simply improving battery performance, we must consider manufacturing scalability, cost engineering, and forging strong partnerships for technology transfer. Vertical integration is appealing, but that demands even broader expertise. Mastering thousands of interdependent manufacturing steps, as Asian firms have done, is no small feat. Our R&D now extends beyond traditional automotive engineering into areas like materials science, factory automation, and global logistics—elements we once considered peripheral now lie at the heart of our strategic planning.

Interviewer: Beyond batteries, what about the shift toward software-defined vehicles you mentioned?

VW: Software-defined vehicles form the other key pillar of our transformation. EVs and advanced driver assistance systems bring connectivity, over-the-air updates, and autonomous capabilities. Our R&D teams now focus on complex software stacks, cybersecurity, AI-driven data analytics, and user experience design. Traditionally, once a model launched, its features were relatively fixed. Now, we must think like a tech company, continuously updating and improving functionalities over the vehicle's lifespan. This requires new workflows, closer collaboration with tech partners, and a willingness to iterate frequently.

Interviewer: Has this shift increased R&D costs and complexity?

VW: Undoubtedly. Both battery technologies and software integration push us into territories where our experience is limited. Hiring software engineers, investing in data infrastructures, managing predictive analytics, and integrating rapidly changing technologies all raise costs. The steep learning curve demands more capital up front, and we must maintain Volkswagen's quality and reliability standards while evolving into a more agile, digitally oriented organization. It's a challenging balance.

Interviewer: Given these pressures—supply chain constraints, new technology demands, and higher costs—how confident are you that Europe's industry, and Volkswagen specifically, can remain competitive?

VW: Confidence must be measured. We face formidable competitors who started earlier and now benefit from refined processes and established ecosystems. However, the ICE ban provides a clear endpoint that forces innovation and collaboration. We're investing aggressively in advanced battery technologies, exploring vertical integration options, and forming strategic alliances. If industry, policymakers, and research institutes coordinate effectively, Europe can build the scale, efficiency, and technical expertise to close the gap. It's not guaranteed, but we're committed to meeting these challenges head-on.

Interviewer: Finally, do you see any particular strategy or solution that could help bridge the current gap in battery manufacturing and technological expertise?

VW: It will require a concerted, long-term effort. R&D investments are necessary, but supportive policies that encourage local production, workforce skill development, and technology transfer are equally important. Deeper partnerships—both within Europe and internationally—can accelerate knowledge-sharing and efficiency gains. By aligning industry strategies, regulatory frameworks, and educational initiatives, we can gradually match the

capabilities of established Asian suppliers. The ICE ban sets the direction; now we must ensure that every stakeholder moves in harmony to transform that regulatory impuls into sustainable competitive advantage.

Interview 2
Company: European Battery Alliance (EBA)
Position: Senior Analyst

Interviewer: Thank you for joining me today. Your insights are crucial for understanding the challenges in Europe's battery sector.

EBA Senior Analyst (EBA): Thanks for having me Philipp. I appreciate the opportunity to clarify some of the complexities we're facing in building a strong European battery supply chain.

Interviewer: Let's start with the big picture. The 2035 ICE ban is pushing automakers toward electrification, but we've seen that many planned European battery factories are delayed or canceled. How would you characterize Europe's progress so far?

EBA: Ambitious on paper, but tough in reality. Of the 16 planned European-led battery factories, 11 have been delayed or canceled. That statistic alone shows how challenging it is to achieve scale quickly. Europe wants to reduce import dependence and build local capabilities, but we're playing catch-up under enormous time pressure.

Interviewer: What factors are causing these setbacks—technology, policy, cost, or something else?

EBA: It's a mix. Asia—especially China and South Korea—refined their battery manufacturing over decades, achieving cost, quality, and volume advantages. Europe, starting

much later, must compress that learning curve dramatically. High energy costs, a shortage of skilled technicians, and the complexity of the manufacturing processes all add friction. On the policy side, while there is support, it can feel fragmented. We need consistent, long-term strategies rather than short-term measures.

Interviewer: Given these hurdles, what does this mean for Europe's broader environmental and economic goals?

EBA: Without reliable, affordable batteries, Europe remains dependent on imports, which undermines both the economic resilience we're aiming for and our environmental ambitions. Building a truly self-sustaining green economy depends on localizing these core technologies. Falling behind here jeopardizes intellectual property gains, R&D momentum, and future competitiveness. Simply put, if we don't master battery production, we weaken our position in the EV era.

Interviewer: Some suggest tariffs or other trade measures could help. Is that a viable path?

EBA: Tariffs might offer short-term relief but risk long-term harm. Retaliation can limit market access, and without a strong internal foundation, protective barriers just delay the problem. Instead, we should focus on scaling our know-how, improving efficiency, and partnering with established leaders to transfer technology more smoothly. This isn't about isolating ourselves; it's about getting better at what we need to do.

Interviewer: Are there any areas that give you hope for Europe's battery ambitions?

EBA: Yes. Recycling and vertical integration are promising. Europe's regulatory stance on sustainability can foster advanced recycling methods, helping us recover critical materials and stabilize supply chains. If industry, policymakers, and researchers work together—through stable incentives, long-term training, and coherent strategies—Europe can build on its industrial heritage and gradually bolster its battery sector.

Interviewer: So it's about a long-term commitment, stable policies, and continuous skill development rather than quick fixes?

EBA: Exactly. The ICE ban sets a deadline, but building a world-class battery supply chain is a marathon, not a sprint. One-off subsidies or short-lived incentives won't suffice. We need an environment where investors trust long-term returns, where talent development is ongoing, and where each new project learns from the previous one. Coordination and consistency over decades, not just years, is the key.

Interviewer: Considering the current challenges, how confident are you that Europe can eventually close this gap?

EBA: I'm cautiously optimistic. Europe has a strong engineering tradition, excellent research institutions, and a market leaning more toward sustainability. If we harness these strengths—pairing stable policies with steady investment in skills and forging genuine partnerships—then, over time, we can narrow the gap. It won't be quick or easy, but I believe incremental progress is possible and, ultimately, transformative.

Interview 3
Company: Deloitte
Position: Analyst

Interviewer: Thank you for taking the time to speak with me. Given your background in both battery manufacturing and automotive supply chains, I'm looking forward to your insights.

Deloitte Analyst (DA): Happy to help. The EV transition in Europe involves more than just technology adoption—it's about overhauling production, logistics, and strategic partnerships across the board.

Interviewer: From your vantage point, how has the 2035 ICE ban shaped the strategic decisions European automakers are making, particularly in terms of supply chains?

DA: The ICE ban sets a firm regulatory endpoint that pushes automakers to secure reliable, cost-competitive EV components, especially batteries. This urgency compels them to re-evaluate supplier relationships, consider vertical integration, and explore joint ventures. Essentially, they need to adapt rapidly or risk losing further ground to established Asian competitors who lead in cost, quality, and scale.

Interviewer: Europe's late start in battery technology seems to be a recurring challenge. How does this lateness complicate efforts to build a domestic supply chain?

DA: Significantly. Asian cell manufacturers have spent decades refining their processes, achieving both cost and quality advantages. Europe, starting later, must compress that entire learning curve. High energy costs, talent shortages, and fragmented policies make it even tougher. Delays and cancellations of planned European battery plants further erode confidence, creating a cycle where fewer successes mean less expertise and less investor trust.

Interviewer: How do these uncertainties affect automakers' R&D and investment priorities?

DA: If there's no stable, affordable battery supply, automakers must invest R&D into catching up—improving cell chemistries, understanding scalable production techniques, and forming technical alliances. This can shift focus from pure innovation to defensive measures. While software-defined vehicles and digital platforms matter, many firms find themselves diverting resources into ensuring basic battery supply security, slowing down other potential advancements.

Interviewer: Is vertical integration the main solution, or are there other strategies to help Europe close the gap?

DA: Vertical integration offers control but demands broad expertise and capital. A balanced approach might involve partnerships with experienced cell producers or investing in recycling technologies to stabilize material inputs. Over time, recycling can reduce reliance on imports and help lower costs. Ultimately, it's about building a supportive ecosystem, not relying on any single quick fix.

Interviewer: Can Europe's sustainability focus become a strategic advantage in battery production and supply?

DA: Potentially, yes. Rigorous environmental standards can encourage advanced recycling and closed-loop supply chains. If Europe excels at recovering critical materials, it reduces exposure to raw material price swings. But that requires long-term alignment—policymakers, industry players, and research institutions must work together. If that happens, Europe can gradually strengthen its manufacturing base and reduce dependency.

Interviewer: Considering these supply chain difficulties, how does this affect Europe's broader environmental leadership and industrial resilience goals?

DA: Without stable, cost-effective battery supplies, Europe remains reliant on imports, losing opportunities to generate IP and build future-ready capabilities. Environmental leadership and industrial autonomy are interconnected. To continuously lower emissions and secure strategic independence, Europe must produce core EV components locally. If it can't, it risks undermining the very green economy vision it aims to champion.

Interview 4

Company: Bosch

Position: Supply Chain Manager

Interviewer: Thank you for agreeing to speak with me. As a key supplier in the automotive sector, Bosch's perspective on Europe's EV transition is invaluable.

Bosch Representative (BR): I'm pleased to share what I can. Bosch sits at the intersection of multiple value chains—combustion-era components, new EV technologies, and software integration—so we see both the opportunities and the struggles this shift entails.

Interviewer: Let's start with R&D priorities. How has the 2035 ICE ban influenced the way Bosch and its automotive clients approach R&D?

BR: The ICE ban has accelerated the pivot toward battery-electric and software-defined systems. Companies are pouring substantial R&D resources into EV technologies, but this goes beyond just changing an engine to a motor. There's complexity in battery cell chemistry, thermal management, power electronics, and, importantly, the software stacks that now define much of a vehicle's functionality. As a supplier, we must adapt to these evolving requirements and help our partners navigate new technical standards.

Interviewer: The findings suggest that as companies focus on vertical integration and software-defined vehicles, R&D costs rise. Can you elaborate on why that happens?

BR: Certainly. Historically, automakers and suppliers worked within a relatively stable set of hardware parameters. Now, with EVs, we're dealing not only with novel hardware—batteries, complex electronics—but also rapidly evolving software platforms that must remain updatable over the vehicle's lifespan. Achieving standardized, cost-effective EV technologies requires deep expertise across a broader range of fields. Hiring software engineers, collaborating with tech firms, and testing integrated systems all inflate R&D budgets. It's not

just about building a good battery; it's about ensuring that battery interacts seamlessly with advanced power electronics and a sophisticated operating system.

Interviewer: How does Europe's late start in battery technology factor into these rising R&D costs?

BR: Asia's established players have spent years refining manufacturing and process optimization, achieving impressive cost efficiencies and quality levels. Europe, starting from behind, must invest heavily in R&D to catch up. This includes not just learning best practices in cell production but also mastering the thousands of interdependent steps involved. Without that internalized expertise, each incremental improvement can be costly and time-consuming. Essentially, Europe is paying a premium in R&D because it must compress decades of learning into a shorter timeframe.

Interviewer: Some interviewees mentioned that Europe's heavy reliance on imported raw materials and foreign expertise complicates efforts to build a resilient EV supply chain. From your vantage point, how does this affect Bosch and the broader ecosystem?

BR: It creates uncertainty and vulnerability. Without local material sources or domestic manufacturing scaled at competitive costs, European companies remain exposed to supply crunches and geopolitical risks. For Bosch, this means we must maintain flexible supplier networks and invest in understanding battery materials more deeply. The goal is to reduce dependency and stabilize the supply chain, but that requires R&D into alternative materials, recycling processes, and improved production techniques. These all add complexity—and cost.

Interviewer: Given these challenges—higher R&D spending, complexity in scaling production, and reliance on imports—how can Europe realistically close this gap?

BR: There's no single silver bullet. Vertical integration might help some automakers gain control over critical components, but it's not easy to develop world-class cell manufacturing capabilities overnight. Partnerships with established Asian cell producers or investing in advanced recycling technologies can help. Meanwhile, policy frameworks that provide stable, long-term incentives for research and talent development will be necessary. Progress may be incremental, involving many small wins rather than a single dramatic breakthrough.

Interviewer: As a supplier, Bosch stands to play a bridging role. What do you think suppliers like you can contribute to this effort?

BR: Suppliers can offer specialized expertise, diversify sourcing strategies, and accelerate technology transfer. We already work closely with various stakeholders—automakers, tech firms, material providers—to align on standards and find cost-saving measures. By sharing best practices and promoting more modular, standardized solutions, we can help the industry achieve scaling effects sooner. Suppliers also have a stake in ensuring that local production matures, as it reduces lead times, uncertainty, and costs for everyone involved.

Interviewer: Finally, how confident are you that Europe can navigate these challenges and become competitive in the EV era?

BR: Confidence must be balanced with realism. The learning curve is steep, the timelines are tight, and the stakes are high. Europe's engineering tradition, research institutions, and sustainability goals are advantages, but capitalizing on them requires sustained commitment. Without consistent policies, ongoing skill development, and steady improvements in manufacturing efficiency, the region may find itself perpetually playing catch-up. Still, I believe that with patience, strategic partnerships, and a willingness to invest in long-term solutions, Europe can gradually carve out a more robust and self-sufficient position in the global EV landscape.

Interview 5

Company: Umicore

Position: Head of Public Relations

Interviewer: Thank you for joining me. Given Umicore's role in battery materials, your insights on how the 2035 ICE ban affects Europe's battery supply chain will be crucial.

Umicore: Thank you. Umicore is at the core of the EV materials ecosystem, so the ICE ban's implications for local production, material sourcing, and competitive positioning are very much on our radar.

Interviewer: The ICE ban sets a clear regulatory deadline for phasing out combustion engines. How does that timeline influence your strategic decisions and R&D focus?

Umicore: The ICE ban essentially puts a timer on the combustion era, forcing us and our partners to accelerate investments in battery technologies. Without the luxury of incremental learning over decades, Europe must quickly develop capacity and know-how as 2035 approaches. For Umicore, that means intensifying R&D into advanced cathode materials, refining production processes, and exploring next-generation chemistries sooner than we might have otherwise.

Interviewer: Europe missed an early opportunity to build a domestic battery supply chain, and now must catch up under regulatory pressure. What challenges does this create?

Umicore: The missed window means that, as the ICE ban deadline looms, Europe is scrambling to match the cost, quality, and scale of Asian suppliers. We're trying to replicate decades of learning in a short span. High energy costs, skilled labor shortages, and complex

manufacturing processes all drive up expenses. Each delay or factory cancellation now feels more critical, eroding investor confidence at exactly the moment we need it most.

Interviewer: How does this urgency, imposed by the ICE ban, affect Umicore's role as a materials supplier?

Umicore: We must be more proactive. Historically, a materials supplier might wait for stable demand before scaling up. Now, with the ICE ban accelerating the shift, we invest in R&D to improve material purity, reduce costs, and enhance performance before local production lines fully mature. We form deeper partnerships with automakers and cell manufacturers, ensuring that when mass EV production ramps up, we can deliver materials at the right cost and quality. Waiting passively isn't an option under these timelines.

Interviewer: Many suggest recycling and vertical integration to reduce reliance on imports. Does the ICE ban make these strategies more urgent?

Umicore: Absolutely. The ICE ban demands a stable, sustainable supply chain for EV components. Recycling helps recover critical materials, stabilizing supply and potentially lowering costs, while vertical integration might give some firms more control over production. Both strategies can mitigate risks stemming from Europe's late start. The ban's fixed endpoint intensifies the need to implement these solutions effectively and without delay.

Interviewer: There's a concern that North America's growing support for battery investments might lure companies away. With the ICE ban nearing, how can Europe remain attractive?

Umicore: North America's incentives do pose a threat. If Europe doesn't match or at least provide stable frameworks aligned with the ban's objectives, firms might choose more predictable environments elsewhere. To stay appealing, Europe must offer clear, long-term incentives, credible R&D funding, and workforce training aligned with the ICE ban's

pressure. If not, critical projects and expertise could migrate to regions that appear more committed and consistent.

Interviewer: Ultimately, the ICE ban aims to foster a greener, more resilient economy. What's needed to ensure Europe doesn't stay behind?

Umicore: A long-term, coherent effort among industry, policymakers, and research institutions is essential. The ICE ban gives a target date, but meeting it requires scaling pilot projects, standardizing best practices, and supporting steady improvements in cost and quality. Aligning EV battery R&D and manufacturing expansion with the ban's urgency could transform initial disadvantages into strengths. Without unwavering commitment, Europe may struggle to compete with established global leaders.

Interviewer: Are you confident Europe can achieve a competitive, stable battery ecosystem before the ICE ban fully takes effect?

Umicore: "Confident" might be too strong. I'd say cautiously hopeful. Europe has engineering talent, research networks, and a growing appreciation for sustainability. If we leverage these now, given the ban's urgency, incremental gains can accumulate. Still, the gap is large and time is short. Unless Europe embraces the ICE ban's sense of urgency, delivering on policies, funding, training, and partnerships that reduce costs and build expertise, it risks remaining reliant on external sources as the clock counts down to 2035.

Interview 6

Company: DG MOVE

Position: Policy Advisor

Interviewer: Thank you for taking the time to speak with me today. Your work at DG MOVE has placed you right in the middle of Europe's efforts to guide the automotive industry through the 2035 ICE ban. I'm looking forward to hearing your perspective.

DG MOVE Policy Advisor (DG MOVE): I'm happy to share what I can. The 2035 ICE ban is a major piece of the puzzle as we shift toward sustainable transport, and it's something we've spent a great deal of time shaping and refining. It's not just a policy on paper—it's a catalyst for change.

Interviewer: The ICE ban sets a firm deadline for phasing out conventional combustion engines. How does that shape your approach when working with automakers and other stakeholders?

DG MOVE: The deadline creates a sense of urgency and clarity. We've learned from past experiences that without a concrete target, the transition can stall in endless debate. By saying, "No new ICE vehicles after 2035," we're giving the industry a very clear direction. It's ambitious, yes, but also intended to push everyone—manufacturers, suppliers, policymakers, consumers—to move forward in sync. We aim to support the industry with funding, policy guidance, and infrastructure initiatives to ease the adaptation, not just leave them to struggle alone.

Interviewer: Some industry voices have mentioned that Europe was late to invest in battery technology and local manufacturing, making it harder to catch up under these new rules. How do you see it from your side?

DG MOVE: It's true that we're starting behind well-established players in Asia who've had decades to perfect their supply chains and refine battery production. This late start does pose challenges—higher costs, steeper learning curves, and the need for rapid skill development. But the ICE ban can actually help. It acts as a nudge, or perhaps a strong push, encouraging everyone to invest more aggressively in R&D, build local capacity, and form strategic partnerships. We hope this collective effort will produce innovative solutions to close the gap more quickly than if we had continued without a firm deadline.

Interviewer: Consumers play a key role in making the ICE ban successful. How is the Commission ensuring that the shift to EVs is not just technically feasible, but also appealing and accessible to ordinary drivers?

DG MOVE: Affordability and convenience are absolutely central. We're supporting member states in offering purchase incentives, and we're investing in widespread charging networks, especially in regions that remain underserved. The aim is to give potential EV buyers confidence that they can travel easily and charge without hassles. We're also working on interoperability standards, so drivers don't encounter confusing incompatibilities when crossing borders. The idea is that by the time ICE vehicles phase out, consumers won't miss them—they'll have reliable, comfortable, and cost-effective EV alternatives.

Interviewer: What about the resilience of Europe's supply chains, particularly for batteries and materials? Many fear ongoing dependency on imports unless we move very quickly.

DG MOVE: You're right. We recognize that the entire EV ecosystem—raw materials, battery cells, assembly lines—needs bolstering. That's why we're encouraging recycling initiatives, supporting pilot projects for local mining and processing, and using policy tools to foster stable partnerships. The ICE ban's definitive timetable helps manufacturers and investors plan with more certainty: they know that by a certain year, EV demand will dominate. If Europe

can secure not only the technology but also reliable material flows, we build long-term resilience and reduce vulnerability to geopolitical shifts or market fluctuations outside our borders.

Interviewer: Some worry that imposing a strict deadline could cause instability or even push automakers and suppliers toward more attractive markets, like North America. How do you address that concern?

DG MOVE: It's a fair question. Other regions are indeed launching their own incentives and support measures. Our approach is to create an environment where innovation thrives, costs come down, and skilled labor is readily available. The goal is not just to set rules, but to make Europe an appealing place for long-term investment in green technologies. Through funding mechanisms, streamlined regulations, and support for education and training, we want industry players to see Europe not as a place of constraints, but as the best place to develop tomorrow's mobility solutions.

Interviewer: Looking beyond 2035, what's your vision for the future of mobility in Europe, once the ICE ban is in full force?

DG MOVE: By then, we hope to have an integrated, climate-neutral transport system. Electric vehicles will be common, but we're also looking to advance connected and autonomous transport, greater use of shared mobility services, and stronger integration with renewable energy grids. Essentially, we want to go beyond just "no more combustion engines." We envision a dynamic ecosystem where vehicles are smarter, cleaner, and seamlessly fit into the broader energy and transport network. The ICE ban lays the groundwork, but our ambitions stretch well beyond a single deadline.

Interviewer: Given the complexity of all this, how confident are you that Europe can align these policies, investments, and technological advances in time?

DG MOVE: We're realistic—it's a big lift. But we're not doing this in isolation. The ICE ban and related policies are just one part of a comprehensive strategy involving research funding, infrastructure development, training programs, and continuous dialogue with industry. If we remain flexible where needed, offer stable, long-term incentives, and keep everyone focused on the end goal, I believe we can meet these challenges. There may be bumps along the way, but the direction is clear, and with sustained effort, Europe can lead the world in sustainable mobility.

Interview 7
Company: Mercedes-Benz
Position: Head of Government Affairs

Interviewer: Thank you for joining me today. As Head of Government Affairs at Mercedes-Benz, you're closely involved in navigating the 2035 ICE ban and its implications. Could you share how this regulatory milestone has influenced your company's strategic decisions?

Mercedes-Benz (Head of Government Affairs): Thank you for having me. The 2035 ICE ban isn't just a policy marker—it's a fundamental shift that forces us to rethink the future of luxury mobility. We've always defined ourselves by craftsmanship, innovation, and performance, and now we must express those values through zero-emission technologies. This has prompted more aggressive R&D investments in advanced battery systems, charging solutions, and software-defined features. We're not simply swapping engines for motors; we're using the ban as a catalyst to ensure that high-end comfort and cutting-edge engineering remain at the heart of our electric vehicles.

Interviewer: The ban gives a strict timeline. How do you balance the urgency it creates with the need to maintain Mercedes-Benz's identity as a premium brand?

Mercedes-Benz: One of my key roles involves working with policymakers to ensure that ambitious targets—like the ICE ban—are met with supportive frameworks. The countdown to 2035 means we must accelerate development, but also ensure that environmental goals don't come at the cost of our luxury heritage. By engaging with regulators, we encourage long-term policies that help industry scale battery production, fund charging infrastructure, and train the workforce. This environment lets us build EVs that deliver the elegance, comfort, and advanced technology our customers expect. The ban sets the pace, and we use it to refine our approach rather than dilute it.

Interviewer: Europe's late start in domestic battery technology complicates things. How does this influence your supply chain strategies from a government affairs standpoint?

Mercedes-Benz: Being late to the battery game means higher initial costs, tougher learning curves, and a need for robust policy support. Through regular dialogue with authorities, we advocate for incentives that encourage local cell manufacturing, recycling programs, and research collaborations. Our message is that stable, predictable conditions not only allow automakers like Mercedes-Benz to establish reliable supply chains but also foster a thriving ecosystem where material sourcing, process optimization, and final assembly can evolve together. It's about creating a stage where everyone can perform better, not just buying time or quick fixes.

Interviewer: The consumer dimension is crucial. How do you ensure that, by the time the ICE ban is fully effective, luxury EVs aren't just a regulatory response but also something consumers genuinely desire?

Mercedes-Benz: We're emphasizing that policy-driven changes must go hand in hand with practical solutions. From a government affairs perspective, this means pushing for policies that expand charging infrastructure, simplify cross-border travel, and encourage green energy

availability. If consumers find it easy to charge their vehicles anywhere, if their range worries diminish, and if costs feel justified by the overall experience, they'll be more inclined to embrace EVs. Meanwhile, internally, we ensure that every electric Mercedes doesn't just meet a standard—it provides a serene cabin, intuitive interfaces, and exceptional craftsmanship. With supportive policies and thoughtful engineering, the EV shift should feel natural, not forced.

Interviewer: With global competitors, especially from Asia, having a head start, how can Europe—and Mercedes-Benz—remain competitive under the pressure of the ICE ban?

Mercedes-Benz: Competition is indeed intense. But Europe has its strengths: engineering prowess, a strong research infrastructure, and a policy environment that's increasingly supportive of sustainable transport. By working with governments to align regulations with industry needs, we ensure that automakers can innovate in areas like battery recycling, advanced electronics, and AI-driven services. Mercedes-Benz uses this backdrop to differentiate itself through quality and personalization. Our hope is that by 2035, we're not just meeting European standards—we're setting global benchmarks for what a luxury EV can be.

Interviewer: The ban is firm, but real-world challenges may arise. Do you see any flexibility from policymakers if unforeseen obstacles appear?

Mercedes-Benz: The 2035 target is clear, but there's recognition that some refinements may be necessary along the way. My sense is that policymakers want to stay responsive. If certain supply chain or infrastructure hurdles prove unavoidable, we may see some measured adjustments. However, the overarching mission—rapid decarbonization—won't vanish. Our role is to bring data-driven solutions and pragmatic suggestions to the table, ensuring that any

changes are informed and keep us moving towards cleaner mobility without derailing progress.

Interviewer: Finally, as the 2035 deadline approaches, do you believe Europe can realistically honor the ambitions of the ICE ban while allowing a premium brand like Mercedes-Benz to thrive—and even flourish?

Mercedes-Benz: I'm mindful of the enormity of the task. Meeting the ICE ban's requirements isn't just about hitting a mark on a calendar; it's about orchestrating a massive industrial and cultural transformation. Yet, Europe isn't starting from scratch—we have world-class researchers, a tradition of engineering excellence, and a political environment increasingly aligned around sustainability. This creates fertile ground for deep, long-term collaborations. If we make meaningful investments in talent, streamline infrastructure planning, and stabilize supply chains with genuine innovation, the continent can evolve into a more self-reliant hub for advanced EV production.

For Mercedes-Benz, it means we're not just surviving under these new rules, but actually pushing the envelope—developing premium EVs that offer unmatched refinement, intelligence, and emotional appeal. If all parties—governments, industries, research institutes—remain committed for the long haul, I believe the result can be something truly distinctive: zero-emission vehicles that aren't merely compliant with regulations, but also redefine automotive luxury on a global stage.

Interview 8

Company: Agora Verkehrswende

Position: Senior Policy Consultant

Interview with Senior Policy Consultant, Agora Verkehrswende

Interviewer: Thank you for speaking with me. Agora Verkehrswende takes a broad view of mobility transformation. With the 2035 ICE ban approaching, how does this regulatory target influence Europe's route toward sustainable transport?

Senior Policy Consultant (Agora Verkehrswende): The ICE ban is a bold punctuation mark in Europe's long narrative of industrial evolution. Instead of drifting gradually, the continent now has a firm deadline, prompting everyone to rewrite their strategic playbooks. By specifying the "end date" of new combustion vehicles, it compels policymakers, automakers, suppliers, and citizens to grapple with what comes next. This policy doesn't just tweak emissions standards—it demands a profound rethinking of what it means to move people and goods cleanly, efficiently, and, importantly, under real-world constraints. It's less about incremental change and more about forging a new identity for the automotive sector in a carbon-constrained era.

Interviewer: Many critics note that Europe's relatively late start in refining battery technologies makes achieving the ban's goals tougher. Do you think Europe can still engineer a comeback?

Agora Verkehrswende: "Comeback" is an interesting term. Europe never truly left the stage; it simply focused on other strengths for too long while others excelled in battery-centric expertise. Now, the continent must sprint to accumulate the know-how that Asia developed step-by-step over decades. Is it tough? Without question. But the ICE ban galvanizes action and directs resources where they're needed. If robust policies foster more agile research

collaborations, encourage recycling as a material strategy, and stabilize market conditions to lower risk for new entrants, Europe can swiftly elevate its capabilities. It will require embracing discomfort—learning fast, adjusting standards, and acknowledging that some processes need to be reinvented from scratch.

Interviewer: The consumer dimension often gets overshadowed by technical debates. How does the ICE ban guide efforts to ensure that everyday drivers, not just experts, embrace electric vehicles wholeheartedly?

Agora Verkehrswende: One might think of the ICE ban as a stage director who insists on a new kind of performance—electric, digital, and responsive. To convince everyday motorists, policies must ensure that these EVs aren't just compliant with some distant rule, but tangibly better than their predecessors in daily life. That means integrating charging infrastructure into people's routines—at workplaces, in apartment complexes, along less-traveled highways—and making sure costs are transparent and stable. The ICE ban doesn't magically produce enthusiastic consumers; it sets the deadline that makes developing user-friendly ecosystems urgent. The trick is ensuring that, by 2035, EVs aren't just permissible choices but logical, appealing ones that drivers choose because they prefer them, not just because the law says so.

Interviewer: Some worry Europe could become overly dependent on imported battery materials and technologies. How might policy frameworks counter such vulnerability, especially with the clock ticking?

Agora Verkehrswende: Vulnerability arises when you rely on a few distant suppliers with specialized processes honed over years. The ICE ban's timeline adds pressure to mitigate that dependence swiftly. Policies can encourage localized innovation hubs, support industrial symbiosis—for instance, linking recycling facilities with manufacturing plants—and push for stringent sustainability and ethical sourcing standards. Rather than chasing self-sufficiency in

a simplistic sense, Europe can cultivate resilience: diversifying material sources, refining recycling loops, and setting quality benchmarks that reward efficiency. The ban's ultimate success hinges on turning potential weaknesses into incentives for smarter, greener industrial policy. It's less about isolation and more about shaping supply chains that respect both human rights and environmental limits.

Interviewer: The policy environment must be somewhat flexible if certain milestones prove unexpectedly hard to reach. How can Europe maintain credibility while adapting?

Agora Verkehrswende: Flexibility doesn't mean retreating from ambition. Instead, it can involve fine-tuning measures as we learn from experience. If supply chain hiccups emerge or infrastructure rollouts lag, policymakers can adjust timetables for specific sub-goals, inject targeted subsidies, or revise training programs for engineers and technicians. The ICE ban provides a firm endpoint, but within that framework, intelligent policy recalibration keeps the project honest and achievable. Credibility stems from transparent decision-making—explaining why an adjustment is needed and ensuring it doesn't sabotage the climate objectives. Smart adaptation shows maturity, not weakness.

Interviewer: If we look beyond 2035, does the ICE ban set Europe up as a global leader in sustainable mobility, or is it simply one step among many?

Agora Verkehrswende: The ban is a major scene-changer, but global leadership won't be bestowed by one policy alone. It's a strong catalyst, compelling innovation and systemic changes that could position Europe at the forefront of zero-emission mobility. Yet, leadership requires more than meeting a deadline; it involves continuous refinement of technologies, nurturing an intelligent regulatory environment, and sustaining an inclusive dialogue with industry and society. If Europe can translate the impetus of the ICE ban into enduring strengths—like robust domestic value chains, superior recycling protocols, top-tier battery

R&D, and consumer trust—then this policy marker could indeed help Europe claim a genuine leadership role. Ultimately, the ban sets the direction, but it's the hard work before and after 2035 that will define Europe's standing on the global stage.

Interview 9
Company: BMW
Position: Regulatory Affairs Specialist

Interviewer: Thanks for sitting down with me today. As the Regulatory Affairs Specialist at BMW, you're directly involved in interpreting and responding to policies like the 2035 ICE ban. Could you tell me how that ban is shaping your company's strategic moves?

BMW (Regulatory Affairs Specialist): It's good to talk. The 2035 ICE ban sets a definitive endpoint that we can't ignore. For BMW, it doesn't just push us to develop more electric models; it forces us to question how our entire product strategy, from supply chains to consumer outreach, will function in a zero-emission context. We've tried a flexible propulsion approach—investing in hybrids, BEVs, hydrogen—anticipating that markets would evolve at their own pace. But this ban draws a hard line, leaving less room for hedging. Now we must accelerate the electrification curve under tighter time constraints, all while trying to maintain the brand's reputation for performance and driving pleasure.

Interviewer: Europe's lag in scaling up domestic battery production and technology poses a challenge. How does that factor into BMW's thinking?

BMW: Let's be candid: Europe's late start in battery expertise and manufacturing infrastructure magnifies our vulnerabilities. While we can refine software, tweak designs, and

even experiment with advanced chemistries, we remain reliant on foreign suppliers for critical cells. That's not just a technical inconvenience; it undercuts our ability to control costs, ensure consistent quality, and scale production predictably. The ICE ban's deadline means we have less time to gradually improve local supply chains. Instead, we must press for rapid capacity-building—something that's never easy when learning curves are steep and the competition is seasoned.

Interviewer: From your vantage point in regulatory affairs, how can policy frameworks help mitigate these issues?

BMW: Policy can't wave a magic wand, but it can create more stable conditions for long-term investment. For instance, we need well-coordinated incentives that encourage domestic battery cell manufacturing and recycling. Clear standards, predictable funding mechanisms, and simplified permitting processes could help reduce our dependency on imports. In the meantime, we're pushing for regulations that make it easier to invest in training programs for skilled technicians and support R&D partnerships. The ICE ban is a forcing function, yes—but without parallel policies that nurture an industrial ecosystem, we risk meeting the letter of the law while struggling with high costs and supply uncertainties.

Interviewer: The consumer perspective matters too. By 2035, EVs must feel both natural and desirable. How does BMW plan to ensure that its electric offerings resonate with drivers who might be skeptical?

BMW: If we've learned anything, it's that no mandate can force genuine consumer enthusiasm. To earn that trust, EVs must be seamlessly integrated into daily life. For BMW, that means ensuring adequate range, reliable charging infrastructure, and intuitive digital experiences. The ICE ban escalates these priorities: we must collaborate with charging providers, advocate for faster infrastructure rollout, and refine battery durability. Without

these concrete improvements, skepticism won't vanish. The challenge is to convert regulatory deadlines into tangible user benefits—quiet rides, low running costs, a responsive driving feel—so buyers choose EVs because they appreciate what they offer, not just because regulations box them in.

Interviewer: Global competition, especially from regions that started earlier on EV components, looms large. How does the ICE ban position BMW and Europe as a whole in this competitive landscape?

BMW: Honestly, we're on the back foot. Established battery leaders in Asia hold cost and quality advantages built over decades. Europe now must achieve in ten years what others fine-tuned over much longer periods. The ICE ban heightens this urgency, demanding we close gaps swiftly. We believe Europe can leverage its engineering talent, R&D networks, and sustainability-focused market to differentiate. But this will require policymakers and industry leaders to synchronize efforts more tightly—aligning regulations, incentives, and R&D agendas. Without such synergy, we risk producing EVs that meet emissions targets but can't match rivals on price, availability, or performance.

Interviewer: Could there be room for adjusting the ban's details if some milestones prove harder to hit than expected?

BMW: Flexibility might exist on the margins—perhaps in allowing some niche technologies or giving certain sectors slightly more time. But no one should bank on the core deadline shifting dramatically. Policymakers see the ICE ban as pivotal for hitting climate targets, so while they might refine certain policies, the overall direction isn't likely to soften. Our job is to engage regulators, present data on realistic timelines, and suggest modest policy tweaks if absolutely necessary. Still, we must plan as if the 2035 date is set in stone.

Interviewer: As we look toward 2035 and beyond, do you see Europe emerging stronger from this transformation, or is it at risk of permanent disadvantage?

BMW: That depends on how we respond collectively. The ICE ban strips away the comfort of gradual evolution, forcing a radical retooling. If Europe can translate this pressure into well-orchestrated strategies—supporting local cell production, investing consistently in R&D, expanding charging networks comprehensively—then we might come out more resilient. BMW, for its part, aims to keep refining EV experiences so they feel intrinsically "BMW"—engaging to drive, high-quality, technologically advanced. Success isn't guaranteed; it must be earned by tackling steep learning curves and forging durable alliances. If we treat the ban as a turning point that demands better execution rather than just rule-following, Europe might not only survive but grow into a formidable leader in sustainable mobility.

Interview 10
Company: Li-Cycle
Position: Production Manager

Interviewer: Thank you for taking the time to talk with me today. Li-Cycle has been making a name for itself by closing the loop in the battery supply chain. As a Production Manager, you're closer to the day-to-day reality of recycling operations. How do you see the 2035 ICE ban influencing your work?

Production Manager (Li-Cycle): Thanks for having me. What's interesting is that the ICE ban, while aimed at automakers, trickles down through the entire value chain. By setting a deadline for phasing out combustion engines, it signals that EV battery demand will skyrocket—and not just incrementally, but exponentially as we approach that cutoff. For us

on the ground, it means we must be ready to handle more end-of-life battery volume and do it efficiently. It puts a timer on how fast we need to refine our processes, expand capacity, and ensure consistent material recovery, so that when the wave of EVs—then inevitably future used batteries—hits, we're not playing catch-up.

Interviewer: Europe, in particular, seems to face challenges due to its late start in battery tech and manufacturing. How does Li-Cycle's presence in Europe help address this?

Li-Cycle: Europe's late start can feel like a handicap, but it also motivates rapid solutions. Our new facilities, like the Spoke in Germany, position us closer to the heart of the European automotive scene. By processing battery materials locally, we reduce the reliance on distant supply routes that may face geopolitical or logistical hiccups. The ICE ban urges European automakers to rely on stable, greener supply chains—and that includes recycled feedstock. Being on European soil means we can deliver critical materials more promptly and sustainably. Essentially, we offer a local antidote to latecomer syndrome, helping Europe find its footing more quickly.

Interviewer: Many talk about recycling as a key component of a circular economy. But on a practical level, how does the ICE ban push Li-Cycle to refine its operations?

Li-Cycle: The ban sets a finite timeline—no more ICE vehicles after 2035—so the shift to EVs isn't a slow drift; it's a known deadline. For us, that clarity means we must keep improving our technology to efficiently extract lithium, cobalt, and nickel and reintroduce them into the battery manufacturing loop. We can't afford inefficiencies: the closer we get to 2035, the more every lost kilogram of material matters. So we invest in process optimization, better sorting, and scaling up capacity. The ban indirectly says, "Don't wait—there's a surge of EV batteries coming eventually, and you'll need to handle them sustainably and cost-effectively."

Interviewer: With global competition heating up, including well-established Asian players and North American incentives, how does Li-Cycle ensure it remains a reliable partner for European automakers?

Li-Cycle: We focus on what we do best: recycling technology that actually works at scale, delivered locally. Being predictable and consistent is crucial. Automakers can't gamble on a recycling partner that can't meet their volume or quality needs, especially as the ICE ban nears and everyone scrambles to secure materials. By setting up in Europe, partnering with battery makers and OEMs, and demonstrating that we can handle complex chemistries and large volumes, we build trust. We also share feedback with policymakers about what regulations encourage efficient recycling. Our operational reliability, plus Europe's push for sustainability, makes us a stable player rather than a wildcard.

Interviewer: Can you talk about how evolving regulations—like the EU's Battery Directive—interact with the ICE ban to shape your day-to-day work?

Li-Cycle: Regulations like the Battery Directive give us benchmarks and efficiency targets, making sure we're recovering a certain percentage of materials. When combined with the ICE ban, it's a one-two punch: the ban ensures a massive EV market, and the directive ensures that this market must embrace a circular model. For us, that means we're not just meeting a rising demand for recycled materials—we're doing it under frameworks that require accountability and transparency. Day-to-day, that might mean stricter quality checks, more detailed reporting, and ongoing improvements in separation and refining techniques. There's a real sense that these policies are racing alongside us, setting higher standards as we grow.

Interviewer: Looking ahead, how do you envision Li-Cycle's role as the industry matures post-2035?

Li-Cycle: After 2035, the EV market should be well-established. By then, first-generation EV batteries will be coming back in large numbers for recycling. We aim to be the go-to solution, not just a backup option. If we do our job right—constantly improving yield rates, lowering energy use, and ensuring material purity—we'll be integral to a stable, circular ecosystem. Automakers won't have to worry about raw material volatility as much, since recycled feedstock will be a known quantity. If the ICE ban was about ushering in the EV era, then our long-term role is about making that era sustainable and self-sufficient. In a way, we'll help ensure the EV wave doesn't peak and crash—it becomes a steady, renewable cycle of resources.

Interview 11
Company: BEUC
Position: Director

Interview with BEUC Representative

Interviewer: Thank you for speaking with me today. BEUC focuses on the consumer perspective, especially amid big shifts like the 2035 ICE ban. From your vantage point, how is this policy affecting the mindset of the average European driver?

BEUC Representative: I appreciate the opportunity to share our views. The ICE ban sets a clear endpoint for traditional combustion vehicles, and that's changed how everyday consumers think about cars. It's not just another environmental measure; it's a line in the sand telling people, "By this date, the market will look entirely different." While some consumers welcome the change, many feel uncertain. They wonder if EVs will truly become affordable, if charging will be convenient, and if the industry can deliver on promises without leaving regular folks—especially those in rural areas—behind.

Interviewer: Affordability often emerges as a major sticking point. BEUC's internal analyses have pointed out specific issues, right?

BEUC Representative: Yes, our team—such as our Market Strategist—has consistently noted that high upfront costs deter many buyers. This problem intensifies as subsidies decline in certain countries, like Germany. Without financial incentives, price-sensitive consumers, particularly in less urbanized regions, tend to postpone EV purchases. Even though EVs can offer lower operating costs over time, that initial price tag is a big roadblock. The ICE ban amplifies the urgency to address this: if by 2035 consumers must choose electric, they'll need purchase conditions that don't feel like a financial gamble.

Interviewer: Infrastructure also plays a crucial role. How does the ICE ban influence the infrastructure narrative, and what has BEUC found?

BEUC Representative: Infrastructure determines whether the transition is smooth or stressful. According to both our internal surveys and discussions with stakeholders, charging access—especially in rural and suburban areas—lags behind the ideal. Without a robust network of public chargers, drivers fear running out of power mid-journey. Although the ICE ban demands a swift shift to EVs, consumers won't magically accept this future if it's inconvenient. Our Senior Policy Expert pointed out that many consumers remain unaware of EVs' full long-term cost benefits, in part because they can't imagine painless charging routines. To secure public buy-in, policymakers must ensure that charging becomes as routine as filling up at a corner gas station used to be.

Interviewer: You mentioned knowledge gaps. Are these related to environmental concerns or something else?

BEUC Representative: Environmental questions are front and center. Many consumers wonder about battery production's carbon footprint or worry about battery disposal. Without

clear, accessible information, they may doubt whether EVs are truly cleaner across their entire lifecycle. Our findings show that knowledge gaps persist because consumer education has lagged behind policy ambition. Mixed media coverage, limited outreach, and insufficient consumer-facing guidance mean people can hesitate. The ICE ban sets a definitive timeline, so we must bridge these knowledge gaps quickly. Transparent data on battery sourcing, recycling programs, and lifecycle emissions can reassure consumers that EVs represent a genuinely greener choice.

Interviewer: So even with the ICE ban in place, you're saying regulation alone can't carry the day?

BEUC Representative: Precisely. Regulation like the ICE ban creates a framework and a sense of urgency, but it doesn't automatically solve affordability, infrastructure, or communication challenges. Consumers need tangible improvements to trust this transition: stable incentives for those who aren't wealthy early adopters, better financial support for lower-income households, and steady investments in charging infrastructure. Without these supportive measures, the ban may feel punitive, as if it's forcing people into EVs before the market is ready. Conversely, if we pair regulation with practical consumer benefits—reliable charging, transparent pricing, accessible second-hand EV markets—people will adopt clean mobility because it's desirable, not just mandated.

Interviewer: If we look forward, what are the key drivers of successful EV adoption in Europe?

BEUC Representative: We see a few priorities. First, dramatically improving the availability and reliability of charging infrastructure—fast chargers along major routes, curbside chargers in residential areas, and easy payment systems. Next, addressing affordability head-on. That might involve targeted subsidies for those who need them most, or policies that encourage

competitive EV pricing. And finally, providing straightforward, comprehensible information. People need to understand not just how EVs help cut emissions, but also how their running costs, maintenance, and battery health can be managed over the vehicle's life. The 2035 ICE ban sets the end date for combustion sales; making EVs feel like an upgrade instead of a compromise is how we ensure consumers embrace that future.

Interview 12
Company: Ionity
Position: Head of Infrastructure Development

Interviewer: Thanks for joining me today. Ionity's mission to build a comprehensive charging network across Europe feels more urgent as we approach the 2035 ICE ban. How does that regulatory deadline shape your daily strategic decisions?

Ionity Representative: Thanks for having me. The 2035 ICE ban essentially sets a countdown clock for when EVs should be the norm, not the exception. For us, that means we can't just expand at a leisurely pace; we've got to accelerate network deployment, especially along key travel corridors. This end-date tells us there's no time for half-measures. Whether we're scouting highway locations or planning rural expansions, we're always aware that the market will demand fast, reliable charging sooner rather than later. By the time the ban kicks in, no one should be worried about where they'll plug in—urban or rural.

Interviewer: Speaking of rural areas, earlier findings suggest that while urban charging is improving, rural drivers still face limited public charging options and persistent range anxiety. How is Ionity tackling that disparity?

Ionity: That's one of our biggest challenges. Urban centers often have better economics—high utilization justifies the investment. Rural zones are trickier: fewer drivers means slower ROI, and infrastructure costs can feel disproportionate. Still, we can't ignore them. We know that if people believe EVs only work in cities, adoption will stall. The ICE ban's deadline raises the stakes: we want to ensure drivers across Europe, not just in major cities, feel comfortable making the switch. We're focusing on strategic points—like main roads connecting out-of-the-way regions—to build a skeletal network first. Over time, as EV adoption grows, we can fill in more detailed coverage. It's about giving people confidence, showing them that even less-traveled routes won't leave them stranded.

Interviewer: Ionity's network is backed by multiple automakers. How do these partnerships influence your approach, especially under the pressure of the ICE ban?

Ionity: Having major automakers like BMW, Mercedes-Benz, and Volkswagen on board gives us better insight into drivers' evolving needs and future vehicle technologies. It's not just about financing; it's about anticipating capacity requirements, desired charging speeds, and user interfaces that reduce friction. With the ICE ban pushing everyone to step up, our automaker partners' input helps us tailor infrastructure deployment to real consumer patterns. They tell us where their upcoming EV models will sell best or what charging experiences customers crave. That synergy makes it easier to pick ideal sites and speed up installations, so when the ban hits, EV drivers find consistent, high-quality charging experiences right away.

Interviewer: Europe's regulatory environment is complex, with each country having its own approach. Has the ICE ban prompted more policy alignment that benefits Ionity's expansion, or does fragmentation still slow you down?

Ionity: We're seeing signs of improvement. The ICE ban, by setting a Europe-wide standard, nudges governments to harmonize some rules—at least in spirit. Still, it's not uniform; some

countries are more proactive, offering subsidies or streamlining permits. Others still require endless paperwork that drags projects out. With the deadline looming, we hope regulators realize that every bureaucratic hurdle delays EV adoption. More standardized guidelines and cross-border cooperation would let us expand faster. We need a policy landscape that acknowledges the urgency and removes unnecessary bottlenecks. If everyone's serious about meeting that 2035 target, easing the red tape is a must.

Interviewer: How does Ionity address consumers' lingering concerns about charging times and complexity, given the ICE ban's push for mass EV adoption?

Ionity: We're working to make charging feel less like an obstacle and more like a quick pit stop. Ultra-fast charging technology is key—charging in 10 to 15 minutes can transform EV ownership, making it feel less like a compromise. We're also rolling out Plug&Charge features, so drivers just plug in and go, without juggling cards or apps. The ban sets a finite horizon: by then, if charging still feels cumbersome, some potential EV buyers might hesitate. So we're engineering simplicity and speed into our stations. The idea is that when the ban arrives, EV drivers will be too busy enjoying seamless charging to miss petrol pumps.

Interviewer: Given the capital-intensive nature of charging infrastructure, how do partnerships beyond automakers—like energy companies or local governments—play into Ionity's strategies?

Ionity: They're crucial. Collaborations with energy firms help us secure green electricity and manage grid demands, which will grow as EV fleets expand. Local governments can speed up permitting or suggest strategic locations that serve communities better. The ICE ban's timeline increases pressure on all of us—no one wants to be the bottleneck that slows down EV adoption. By sharing costs, expertise, and data, we can roll out stations more efficiently

and balance economic viability with the need for widespread access. It's a team effort, really. The whole ecosystem must move in tandem.

Interviewer: As we approach that 2035 benchmark, what's Ionity's vision for the charging landscape post-ban?

Ionity: By 2035, we hope the question of "Can I charge there?" barely crosses anyone's mind. The ICE ban's spirit is that zero-emission vehicles become the default choice. For that to happen, drivers must find fast, reliable chargers at regular intervals—just like they used to find fuel stations. Over the next decade, we'll focus on scaling up and refining technologies like dynamic load management, so the grid can support higher EV volumes without strain. We also want to integrate renewable energy sources into our stations, ensuring sustainability runs end-to-end. If we get this right, the post-ban era won't just meet legal requirements; it'll feel like a natural, well-prepared evolution of European mobility.