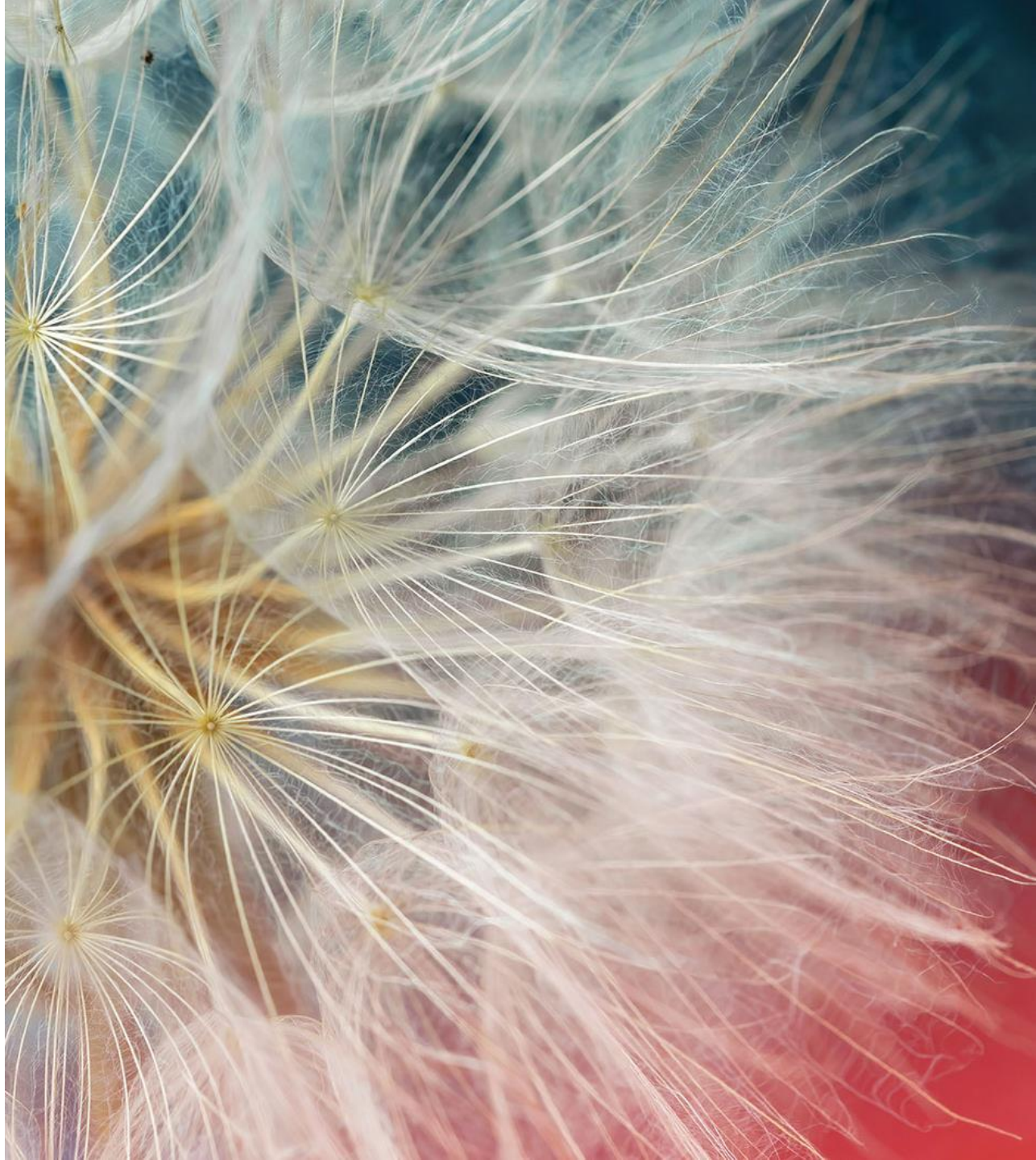
QUANTIFYING THE COMPETITIVE EDGE

COMPREHENSIVE REPORT

ECONOMIC AND INDUSTRIAL IMPACT OF EUROPE'S HEAVY-GOODS VEHICLE ELECTRIFICATION BY 2035

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Glossary

Acronym	Meaning
AFIR	Alternative Fuel Infrastructure Regulation
BET	Battery Electric Truck
CAPEX	Capital Expenditure
CAGR	Compound Annual Growth Rate
CCS	Combined Charging System
CPMS	Charge Point Management System
CPO	Charge Point Operator
CPS	Current Policies Scenario
DC	Direct Current
DNO	Distribution Network Operator
DSO	Distribution System Operator

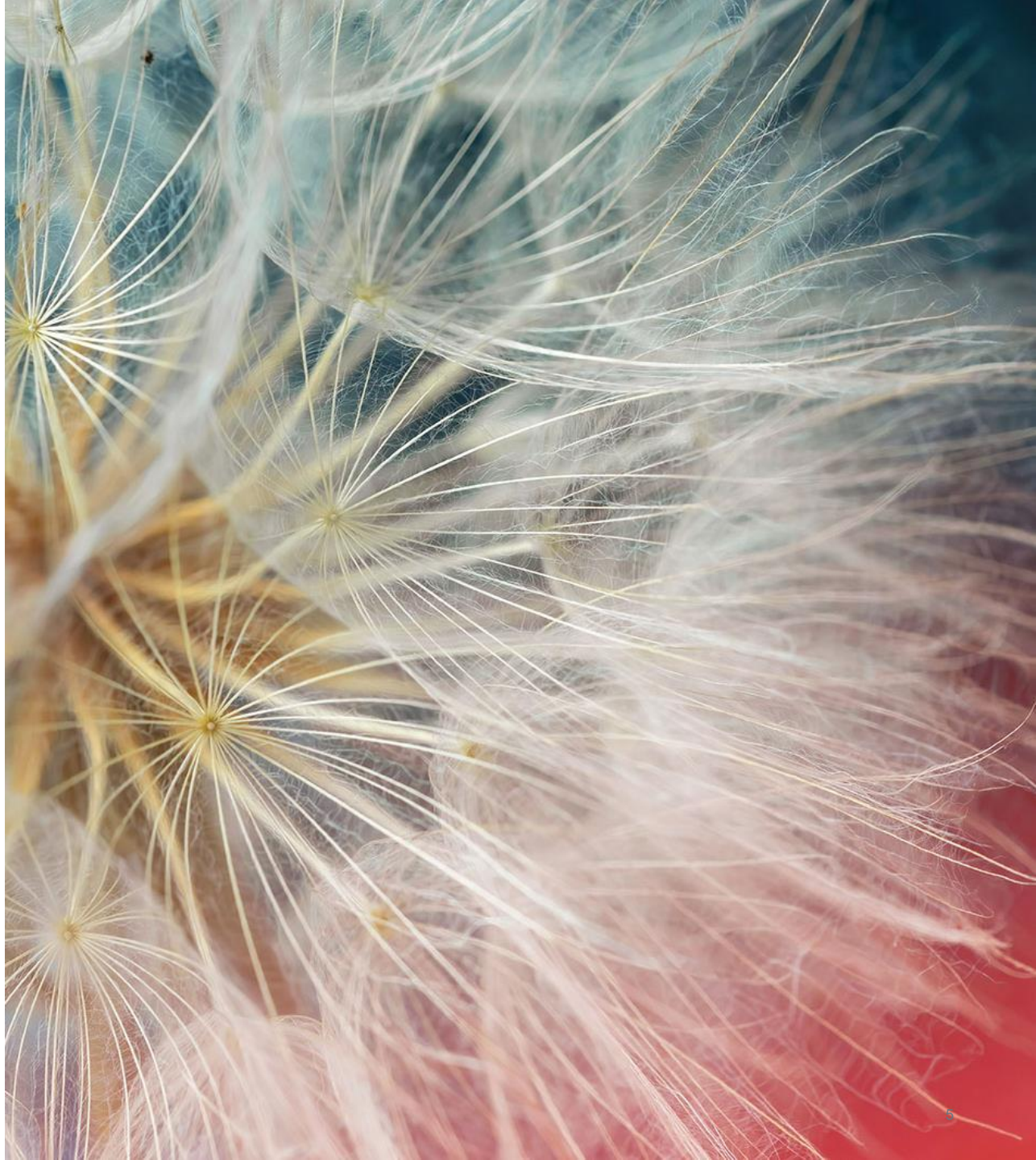
Acronym	Meaning
eMSP	e-Mobility Service Provider
EU	European Union
EV	Electric Vehicle
GVA	Gross Value Added
HGV	Heavy Goods Vehicle
HPC	High-Power Charging
ICE	Internal Combustion Engine
IEA	International Energy Agency
LAPS	Low Ambition Policies Scenario
MCS	Megawatt Charging System
MRO	Maintenance, Repair and Overhaul

Glossary

Acronym	Meaning
N3	EU Vehicle Category for Goods Vehicles with a Maximum Mass Exceeding 12 Tonnes
OEM	Original Equipment Manufacturer
OPEX	Operating Expenditure
OTA	Over-the-Air
R&D	Research and Development
SLA	Service-Level Agreement

Acronym	Meaning
SME	Small and Medium-Sized Enterprise
STEPS	Stated Policies Scenario
TCO	Total Cost of Ownership
TEN-T	Trans-European Transport Network
TSO	Transmission System Operator
V2G	Vehicle-to-Grid

1. EXECUTIVE SUMMARY



Europe must lead the shift to electric trucks to capture its competitive gains

Europe's transition to electric heavy-duty transport is an industrial opportunity that must be seized. The EU enters this transition with major strengths: a world-leading truck manufacturing base, an established network of suppliers and logistics operators, and significant capabilities across energy, charging, software and services. The question for the decade ahead is therefore not simply whether Europe electrifies its heavy-duty fleet, but whether **Europe captures the economic and industrial value created by that transition**.

In this study, two pathways to 2035 are compared. An accelerated electrification scenario (*STEPS)* combines timely delivery of stated electrification commitments with industrial policies supporting stronger EU supply-chain localisation. Whereas, the slower scenario (*LAPS)* assumes slower electrification and weaker localisation, with greater import dependence.

The analysis indicates that delivering on Europe's current electrification policy ambition delivers the greatest increase in annual value added across Europe's heavy-duty transport ecosystem, reaching as much as **€9.1 billion more every year.** At the same time, faster electrification will displace **around 21 billion litres of diesel by 2035,** keeping more money in the EU economy and reducing its exposure to volatile fossil fuel imports.

Global competition is intensifying

The global transition towards zero-emission trucking is advancing rapidly, irrespective of the pace of European market development. Competition in zero-emission trucking and its supply chains is accelerating rapidly. China's rapid scale-up of zero-emission trucks, battery production and critical-material processing demonstrates both the speed of the transition and the scale of the opportunity. In H1 2026, China already took more than 90% of global zero-emission truck sales (SFC/BNEF 2025).

The strategic implication is clear: **Europe will need to compete effectively for the value generated by the transition to zero-emission trucking, or risk seeing an increasing share of that value captured by other global markets**.

Electrification creates opportunities across an entire ecosystem: from batteries, electric powertrains and vehicle assembly to charging hardware, grid infrastructure, software, energy management, electricity supply, maintenance and logistics.

On top of EUR 2.5 billion from electric truck manufacturing and EUR 3.4 billion from freight transport, the study finds that charging, grid work electricity supply, and electric maintenance alone would represent an additional EUR 3.1 billion.

Ultimately, the opportunity is greatest when Europe captures more of the value chain at home, particularly in strategic areas such as batteries. Strengthening European battery production and other key capabilities will keep more of the value created by electrification in Europe, supporting economic value and future-proof jobs across the wider industrial ecosystem.

The report assesses

- **How electrification reshapes** revenue and gross value added across the HGV ecosystem, capturing the decline in diesel manufacturing, growth in electric trucks and their supply chains, and changes in freight operations, maintenance and energy services.
- **How Europe can build** on its established industrial strengths to compete in electric trucks and their supply chains, retaining more manufacturing value added within the EU and strengthening its position in domestic and export markets.
- **Which policy, investment and delivery conditions** are needed to realise these benefits, including a stable electrification policy framework, industrial measures supporting competitive European production, and timely charging and grid infrastructure.

Delivering on current EU policy ambition and strengthening EU supply chains will create more value in Europe

€9.1bn

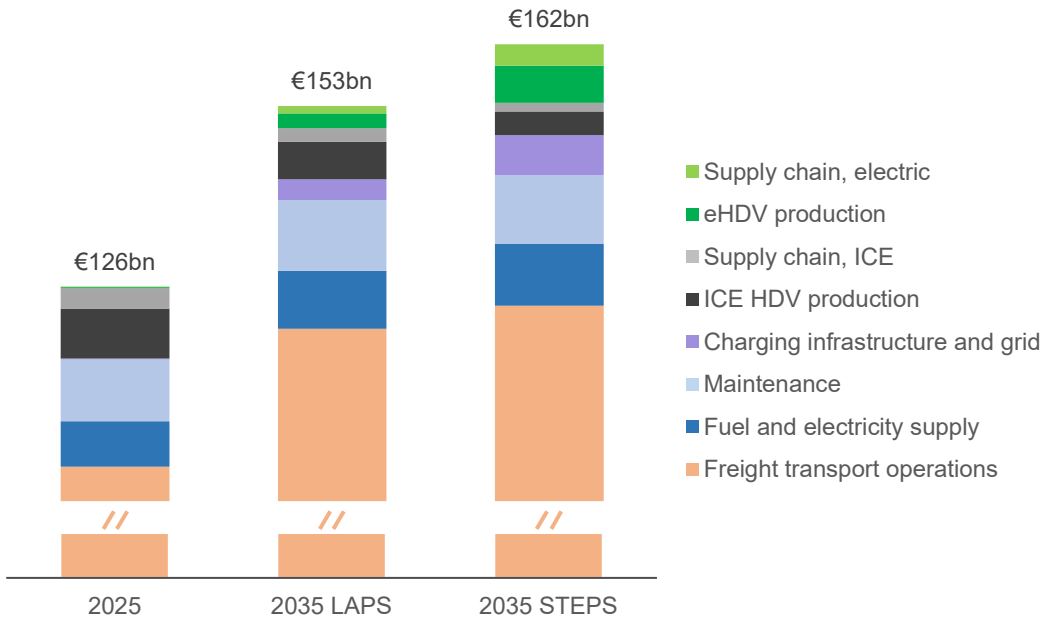
Additional annual EU GVA in 2035 across the HGV ecosystem, accelerated electrification pathway

€2.5bn
Truck manufacturing and its suppliers
+24% vs slower scenario

€3.1bn
Maintenance, energy supply, charging and grid services
+14% vs slower scenario

€3.4bn
Freight transport operations
+3% vs slower scenario

Annual EU gross value added across the HGV ecosystem (€bn)



Summing up the data:

- **The accelerated pathway delivers net industrial growth.** New electric activity more than offsets declining diesel manufacturing and supplier activity. Under the slower scenario, it largely replaces the losses.
- **The opportunity extends beyond manufacturing.** Charging, electricity supply and grid services also contribute to value creation.
- **Europe can build on its established truck industry.** Capturing the opportunity requires European firms to scale and remain internationally competitive.
- **Overall gains are unevenly distributed.** Suppliers, workers and regions dependent on diesel technologies may face adverse impacts even as the overall ecosystem expands.
- **Both scenarios include growing freight activity.** The difference between the two shows the additional value associated with their different electrification and localisation assumptions.

Electrification strengthens energy security, with delivery and localisation determining how much value Europe captures

A stronger freight sector means a more resilient Europe

Road transport accounts for around **two-thirds of EU oil demand**, making it one of Europe's largest remaining sources of imported fossil-fuel dependence. The economic implications are even more acute for road freight, where 80% of EU businesses are SMEs and play a critical role in European supply chains.

Electrification does more than change the technology powering Europe's trucks: **it shifts domestic supply chains from dependence on volatile imported oil towards greater reliance on more efficient European energy.**

The study shows that the stronger pathway could replace around 21 billion litres of diesel by 2035, nearly twice the volume displaced under the slower scenario. Under this pathway, electric trucks would also need around 60% less energy than the diesel they replace due to their greater efficiency.

However, without stronger domestic value capture, Europe risks electrifying its transport system while exporting too much of the industrial dividend.

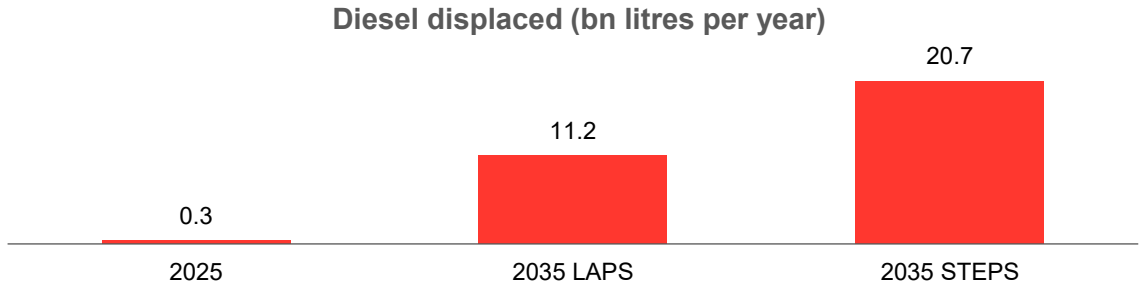
Today, only around 8% of the battery cells used in electric trucks sold in Europe come from EU-domiciled manufacturers; under the study's stronger pathway that share would reach 35% by 2035. **Realising the full resilience benefits of electrification will, therefore, require significantly strengthening key European supply chains**.

21bn litres

Deisel demand displaced by electric trucks in 2035 under the accelerated electrification scenario.

€12bn

Avoided annual oil imports, representing 4.6% of the €260bn in annual fossil-fuel import savings the Commission proejects for 2040.



Summing up the data:

- Lower diesel demand reduces exposure to imported oil and redirects part of freight-energy expenditure towards European electricity supply.
- Despite this displacement, growing freight demand limits the reduction in total diesel consumption to around 5% below today's level under the accelerated electrification pathway.

Ambition must be matched by the conditions to deliver it

Europe is making progress. Zero-emission heavy trucks now account for around 2.4% of new registrations, up from 1.4% in the first half of 2025, with sales nearly doubling year-on-year in the first quarter of 2026 (ICCT). Yet the market remains at an early stage and progress is geographically uneven.

Closing this gap will require less advanced markets to learn from and replicate the approaches of Member States that are already succeeding in putting the enabling conditions for electric truck deployment in place.

Capturing this opportunity requires coordinated progress across the key enabling conditions. The CO_2 Standards provide important direction and market signals, but they must also be matched by wider enablers. Fleet operators need zero-emission trucks to work economically and operationally, which means tackling the total cost of ownership (TCO) through affordable electricity, carbon pricing, accessible financing and appropriate fiscal and road-charging frameworks, while ensuring charging infrastructure is enabled by grid and permitting procedures.

It also means strengthening European value chains where they remain exposed, particularly batteries and critical materials.

Turning the transition into an economic opportunity

The barriers facing electric trucks today are real and should not be underestimated. Addressing them will require coordinated progress across transport, energy, infrastructure and industrial policy, alongside sufficient certainty for companies to invest and for fleet operators to assess the business case for electrification.

As the global market for electric heavy-duty transport develops, Europe has an opportunity to capture a greater share of the associated industrial and economic value. The extent to which it does so will depend not only on the level of ambition, but also on how effectively the practical barriers to deployment are addressed.

This report examines these issues from an economic perspective, assessing the potential benefits for Europe and the conditions that could enable them to materialise.

Three pillars for capturing the benefits

Stable & coherent policies support industrial investment

- **Maintain long-term policy certainty.** Give investors strong, stable policy signals to be able to commit capital at scale for electrification.
- **Close the electric–ICE truck business case gap.** Use affordable energy, ETS II, procurement incentives, toll exemptions and technical adjustments to lower fleet operators' costs and support the switch.
- **EU and national measures are equally important.** They must reinforce each other to ensure more coherent incentives and TCO calculations across the Single Market.

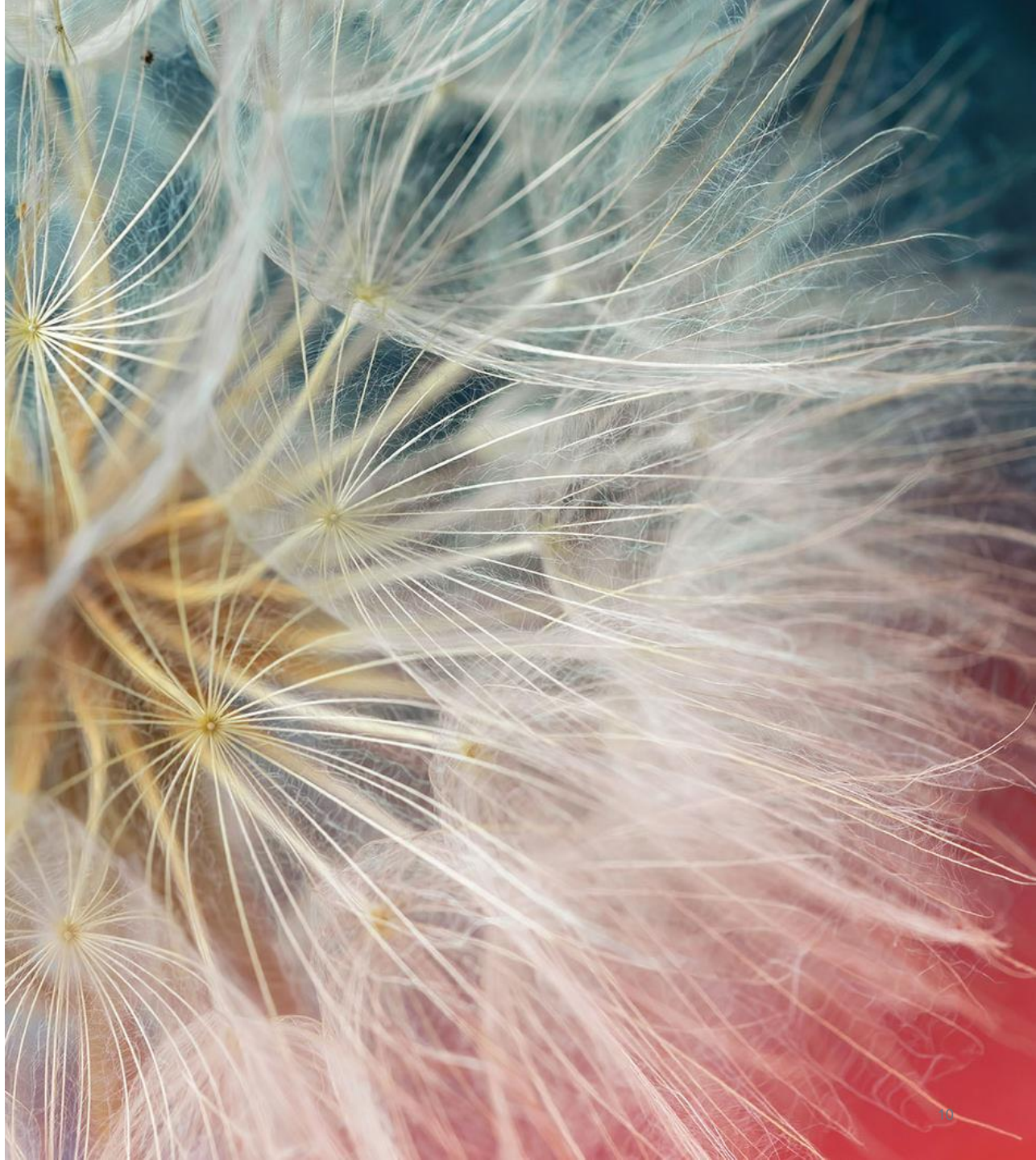
Timely grid and charging deployment support vehicle uptake

- **Expand and modernise grids.** Invest early, coordinate planning and speed up permitting and connections to improve access.
- **Derisk high-power charging investment.** Coordinate rollout on freight corridors, at logistics hubs and depots.

Stronger European production helps retain more value

- **Support European batteries and components.** Stronger EU production capacity would help Europe capture more of the transition's manufacturing value added. This requires a more complete EU industrial policy, including output-based production support for scaling-up local battery and compontent manufacturing.

2. CONTEXT AND STUDY OBJECTIVES



HGV electrification is rising on the policy agenda. The debate, centred on barriers and enabling conditions, should be informed by economic impact and competitiveness aspects

The EU policy and industry debate centres around the speed and conditions for electric heavy-goods vehicles deployment and related charging capacity.
It stops short of setting out the value of electrification to Europe in economic and industrial terms – this is the question this report sets out to answer for the first time.

BARRIERS ARE OFTEN CITED

Draghi Report 2024

The conditions for the electrification of heavy-goods vehicles (HGV), requiring more powerful chargers, are still more complicated.

ACEA 2026

Zero-emission vehicles represented 2% of heavy truck registrations in 2025; insufficient infrastructure and a fragile business case continue to constrain uptake.

GENERIC INDUSTRIAL STAKES ARE MENTIONED

Commission Work Programme

The EU intends to improve electric-charging deployment, including dedicated fast-charging points for heavy-goods vehicles.

Industrial Accelerator Act 2026

Union content requirements are framed as supporting economic security, resilience and climate objectives.

What the evidence supports

Policy-makers and industry are paying closer attention to the transition, but the discussion still turns on the conditions needed for deployment rather than on the value at stake.

Evidence gap

The transition's policy and industrial relevance is well established; what is missing is the answer to one question: what is HGV electrification actually worth to Europe?

Quantifying the value of HGV electrification means looking across the whole ecosystem, which today starts from a diesel-dominated and infrastructure-constrained baseline

The value at stake is spread across four interdependent groups, shown here with the activities each performs. The indicators beneath each group show where that part of the ecosystem stands in 2025 – the baseline against which the two scenarios are assessed.

Manufacturing

- Battery and powertrain production
- Component supply
- Vehicle assembly and integration
- Software and connectivity development
- Charging-interface engineering
- Aftersales and servicing

- **95%** of EU27 truck registrations were diesel in 2025; ZE HGV reached **2.4%** of new sales in H1 2026[1]
- The EU accounted for around **34%** of global diesel N3 truck exports by value in 2025, and around **28%** by volume[2]

Supply is still overwhelmingly diesel.

Transport operations

- Freight demand and contracting
- Freight forwarding and brokerage
- Road haulage operations
- Fleet and energy management
- Maintenance and repair
- Resale and end-of-life handling

- **3.1 million N3 HGV** operated in the EU in 2025[3]
- **80%** of EU road-freight businesses are SMEs[4]

Demand is fragmented and cost-driven.

Charging infrastructure

- Charging hardware manufacture
- Power electronics supply
- Civil and electrical construction
- Chargepoint operation and management
- Payment, reservation and roaming services
- Site acquisition and real estate

- **Around 2,500 public charging points served HGVs in Europe by mid-2026**[4]
- **2-3% of high-power charging sites** were physically accessible to HGV[5]

Progress needs to be made to ensure a comprehensive European network.

Energy

- Electricity supply and generation
- Demand forecasting and corridor planning
- Grid connection and capacity upgrades
- Network reinforcement
- Tariffs, metering and flexibility services

- **80% of HGV charging** takes place at private sites, concentrating electricity demand at depots[6]
- **Charging-infrastructure permitting can take 3-18 months**, slowing deployment[7]

Depot grid connection is a binding constraint.

Sources: 1. ACEA (2026), McKinsey (2025); 2. UN Comtrade, WSP analysis; 3. ACEA (2025), Eurostat, WSP analysis; 4. EAFO, https://alternative-fuels-observatory.ec.europa.eu/general-information/news/april-2026-heavy-duty-vehicle-charging-data-published-eafo; 5. McKinsey (2025); 6. ACEA (2025); 7. McKinsey (2024).

Against that ecosystem and baseline, E-Mobility Europe commissioned this study to quantify what HGV electrification is worth to Europe by 2035

E-Mobility Europe and its members asked WSP to undertake a quantified economic impact assessment of HGV electrification in Europe

This covered the benefits for the different ecosystem players, providing clear, robust evidence to support decisions by policymakers, industry and investors

Objectives of the study



Ecosystem level analysis

Break down economic and competitiveness dynamics by industrial component in the HGV ecosystem

Analyse technological, financial and policy trends shaping the development of each component



Headline economic impact

Quantify the total economic impact of HGV electrification in the European economy by 2035

Assess implications for EU competitiveness and global positioning

Deliver clear, high-level indicators to support a compelling narrative



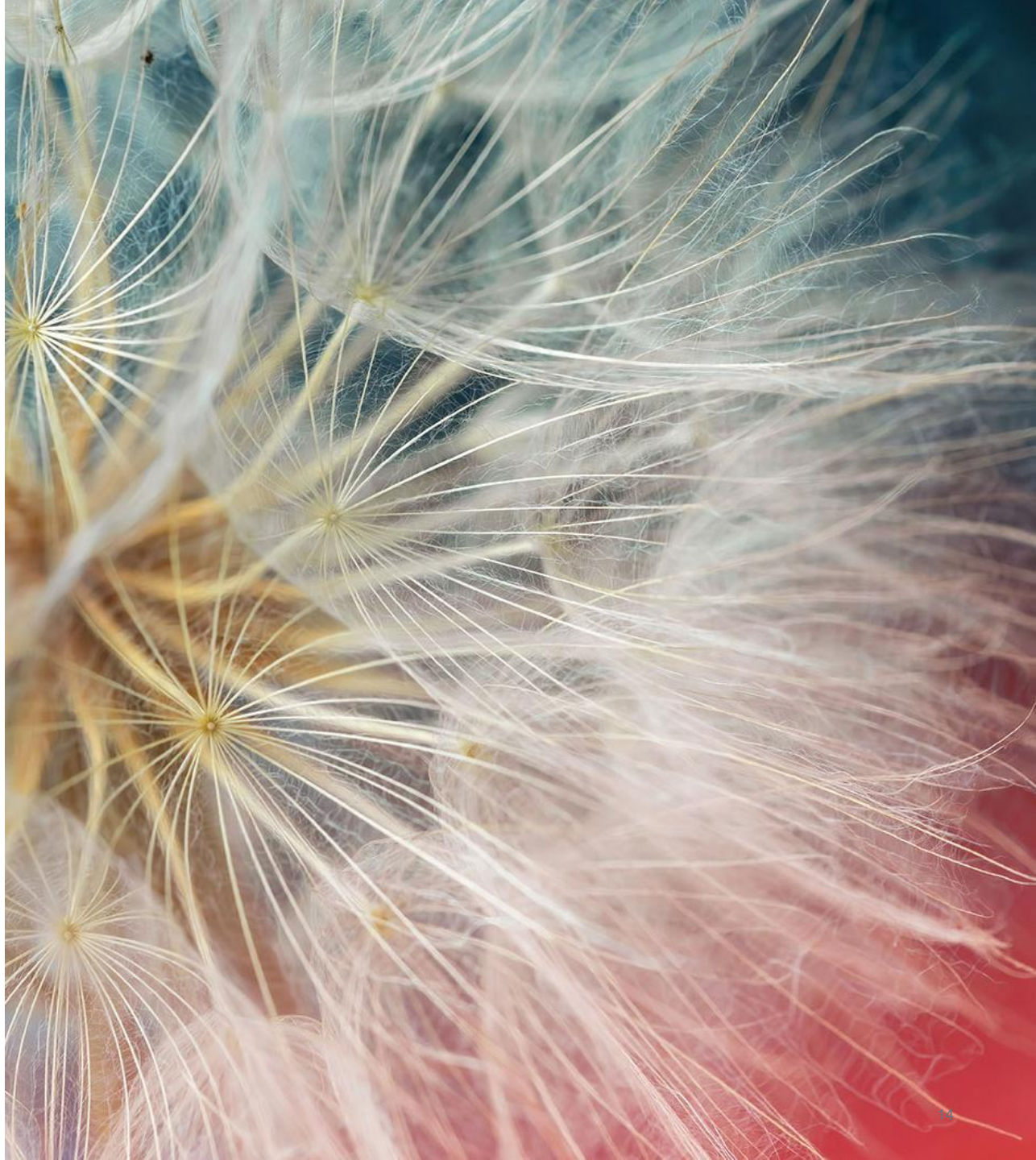
Policy and investment implications

Identify key policy levers supporting fast HGV electrification to unlock the economic benefits for Europe

Highlight investment opportunities and risks for key stakeholders

Provide clear and actionable recommendations to EME and members

3. SCENARIO DEFINITION



We compare two policy scenarios for EU heavy-goods vehicle electrification across eight dimensions to 2035

Our study compares two scenarios for EU heavy-goods vehicle (HGV) electrification to 2035, assessed across eight dimensions.

STEPS - Stated policies and high EU value capture

Electrification uptake follows stated policies, combined with high success in supply-chain localisation and EU value capture.

LAPS - Low success scenario

Conservative / modest pathway: minimum compliance and persistent implementation delays.

The eight dimensions – each one is assessed under both scenarios

1. Electrification uptake & speed
2. Infrastructure rollout
3. EU manufacturing share
4. Battery supply chains
5. Critical raw materials
6. Export performance
7. Regulatory environment
8. TCO / economic attractiveness

Each dimension is assessed on three levels: **current situation**, **forecasts** from the literature, and **implications** for the two scenarios.

Terminology: ZEV / ZET cover battery-electric and hydrogen fuel-cell HGV; BET (battery-electric) is the project focus, and most heavy-goods uptake to 2035 is expected to be battery-electric.

STEPS combines stated-policy electrification uptake with strong EU supply chains and value capture. LAPS assumes slower uptake and greater import dependence.

Each driver below is set at a different level in the two scenarios, and those settings are the inputs to every estimate in this report.

KEY DRIVER	STEPS — higher success	LAPS — conservative trajectory
HGV electrification uptake	**High:** ~15-20% of fleet and ~50-70% of new sales by 2035	**Moderate:** uptake constrained, no high penetration by 2035
Infrastructure rollout	**Enabling:** scales ahead of demand; grid upgrades and high-power charging	**Constrained:** AFIR minimum network; depot dominates; grid/permitting slow rollout
EU manufacturing share	**Strong:** EU OEMs keep domestic ZEV leadership and capture new value pools	**Eroding:** non-EU pressure reduces domestic value capture
Battery supply chains	**Localised:** competitive EU battery industry; lower import dependence	**Import-dependent:** reliant on imported cells (mostly Asian-HQ'd)
Critical raw materials	**Resilient:** stronger domestic processing, recycling and diversified sourcing	**Import-dependent:** reliant on imported processed materials; China-dominated refining
Export performance	**Competitive:** EU OEMs preserve a strong export position	**Eroding:** competitiveness weakens; foreign manufacturers gain global share
Regulatory environment	**Stable:** AFIR, grid, charging and industrial policy remain consistent with the targets and methodology in CO_2 Standards	**Uncertain:** Uneven implementation and/or weakening or delays to the policies intended to enable the transition
TCO / economic attractiveness	**Broad parity:** BETs reach TCO parity across most use cases by 2030 (long-haulage remaining the hardest segment)	**Limited parity:** parity in early-adopter segments; much of market favours diesel

Scenario settings are applied consistently across all model layers; figures shown later in this report follow directly from them.

1 Electrification uptake and speed

Current situation

- **The starting point – diesel is still dominating the market.** Zero-emission (ZE) HGV took a 2.4% share of new sales in H1 2026, while diesel still made up 95% of EU27 registrations in full-year 2025. (ACEA 2026)
- **But that beginning is far from uniform:** Netherlands and Sweden both already hit ZE heavy-truck shares of 10.1% in Q1 2026, even as e-truck sales stayed below 1% in around a third of EU Member States. (ACEA 2026)
- **Yet all of this is playing out in a market that is rebounding:** heavy truck registrations rose 11.1% in H1 2026 (ACEA 2026), as HDV demand tracks GDP. The 16% fall in total HGV registrations over the first three quarters of 2025 vs the 2023 peak (McKinsey 2025) was more a cyclical dip than a structural decline.
- **The business case is building, but TCO parity is not yet universal:** early adopters and a growing number of large carriers are already scaling ZE fleets, mainly in urban and regional operations, and a limited number of long-haul use cases. For the wider market, the case still depends on upfront costs, residual values, charging costs and infrastructure availability. The next step is long haul, which accounts for most HDV CO_2 emissions and is the hardest segment to decarbonise. (ICCT 2025) (McKinsey 2025)

Forecasts

The studies agree on the direction, but not the pace. Projected ZE shares of new sales by 2035 range from about a third at the cautious end to near-total at the most ambitious:

- **Central - Commission proposal (base case):** BCG/T&E (2023) modelled ZEV truck adoption based on the European Commission's proposed fleet CO_2 reduction targets (-45% by 2030 and -65% by 2035), estimating ~30% and 49% of new truck sales to be zero-emission, respectively.
- **Optimistic - BCG market perspective:** ~55% by 2030 and 77% by 2035, on falling TCO and infrastructure. (BCG/T&E 2023)
- **Optimistic - Strategy& base case:** ~75% by 2035 and 100% by 2040, on CO_2 standards and AFIR roll-out. (Strategy& 2023)
- **Optimistic - T&E high ambition case (beyond EU Commission):** ~55% by 2030 and 97% by 2035 (100% freight CO_2 reduction). (T&E 2023)
- **Conservative - IEA STEPS / CPS:** EU27 e-truck sales ~50% by 2035; broader-Europe STEPS ~36%, held back by the pace of infrastructure development. (IEA 2026)
- **Conservative - downside cases:** Strategy& delayed pathway ~35% by 2035 (~5-yr delay comparing to EU objectives); McKinsey slow case forecasts 3 percentage points short of the 2030 target, risking around EUR 2.2bn of penalties for OEMs. (Strategy& 2023) (McKinsey 2025)

Implications

STEPS — upper-bound / success	**High HGV electrification uptake:** based on WSP projections developed using our in-house modelling suite, by 2035 BETs reach ~15-20% of the fleet and ~50-70% of new sales - sizing the maximum charging, grid and capital build-out the network must be ready to support.
LAPS — conservative / modest	**Moderate HGV electrification uptake:** electrification advances only slowly and stays well short of the ambitious case - diesel keeps its grip on the fleet and high penetration is not reached by 2035.

2 Infrastructure rollout

Current situation

- **The starting point – an early stage network with significant scope for expansion**: public HGV charging infrastructure is beginning to scale, with around 2,500 public charging points available as of mid-2026, compared with more than 120,000 conventional fuel stations. (McKinsey 2025)
- **The network is progressively adapting to HGV-specific requirements:** around 2 to 3% of existing high-power (>300 kW) sites provide the space and clearance required for HGVs, meaning that the effective HGV-accessible network remains smaller than headline charging figures suggest (McKinsey, 2025). Megawatt charging (MCS) designed for long-haul operations, is also at an early stage of deployment.
- **Depot charging provides the foundation, while public charging is expanding:** 70-80% of all HGV charging activity takes place at private sites, while regional and long-haul operations increasingly rely on the expanding public network. (ICCT 2026)
- **But that reliance tracks a highly concentrated market:** nearly 80% of battery-electric truck registrations sit in just five Member States. Demand has landed first where TCO and infrastructure work. (ACEA 2025)
- **Grid development will be an important enabler of further scale-up:** The permitting alone can take 3 to 18 months, and some operators wait multiple years for an electric connection to the depot. (McKinsey 2024) (IEA 2026)

Forecasts

The studies agree on the need, but not the speed. Required truck charging points by 2035 range from about ten thousand in the low success scenarios to several hundred thousand in the ambitious ones:

- **Pessimistic - compliance-led, depot-centric:** IEA CPS sees global HGV charging stock reach around 11 million units by 2035, but depot charging still represents around 99% of units. (IEA 2026)
- **Central - AFIR baseline delivered:** one charging hub every 60 km on the TEN-T core network by 2030, yielding around 7.5 GW of public power; AFIR supports a -65% CO2 path, but under the -45% proposal the network could be around 41% underutilised. (T&E 2023) (ICCT 2025)
- **Optimistic - infrastructure ahead of demand:** ICCT/Fraunhofer ISI project annual truck charging demand of around 100 TWh by 2035 and more than 200 TWh by 2045 under a supportive-policy scenario. Depots account for over 70-80% of it, and demand stays concentrated in a limited number of locations, led by Germany, France, the UK, Spain and Italy. (ICCT 2026)

Implications

STEPS — upper-bound / success	**Enabling:** scales ahead of demand; grid upgrades and high-power charging
LAPS — conservative / modest	**Constrained:** AFIR minimum network; depot dominates; grid/permitting slow rollout

3 EU manufacturing share

Current situation

- **The starting point – a large, consolidated European base:** the sector enters the transition from strength. The medium- and heavy-goods value chain generated ~EUR 75bn of GVA in 2022, including ~EUR 29bn from OEMs, ~EUR 29bn from Tier 1/2 suppliers (ZF, Continental, Knorr-Bremse), the rest in adjacent activities. (BCG 2023) (T&E/BCG 2023)
- **And it is held by a European core**: five OEM groups – Daimler Truck, Traton (Scania/MAN), Volvo Group, PACCAR (DAF) and IVECO – account for more than 98% of EU heavy-lorry production, with plants across DE, NL, BE, FR, SE, ES and IT. (EC 2023) (Profundo 2026)
- **That dominance persists today, but only in diesel:** EU OEMs still capture the majority of domestic sales, yet China already took more than 90% of global ZE truck sales in H1 2026 (SFC/BNEF 2026; McKinsey 2025). That market is dominated by domestic manufacturers (ICE and BEV), where European OEMs hold less than 1% share.
- **So the question is whether this diesel base will transfer to zero-emission or erode:** a strong incumbent position in diesel offers no guarantee in new value pools. (BCG 2023) (McKinsey 2025).

Forecasts

The studies agree on the risk, not its size: how much of the EU truck value chain Europe keeps as non-EU competition intensifies.

- **Upside - EU retains leadership:** BCG/T&E high-ambition path: EU OEMs and suppliers move early into new ZEV value pools, holding non-EU market share in the EU to around 2% by 2035 (BCG Scenario III, import-only). (BCG 2023) (T&E/BCG 2023)
- **Central - Commission proposal / base case:** EU retains a majority of the value chain, but a slower ZEV ramp-up enables non-EU producers to build a foothold in cost-sensitive segments (between BCG Scenario III and Scenario I). (BCG 2023)
- **Downside - value-pool erosion:** BCG Scenario I (fully localised non-EU production) sees non-European players capturing around 11% of the EU truck market by 2035. (BCG 2023)
- **Demand-side risk:** 73% of EU fleet operators would consider a Chinese brand, either at price parity (32%) or with a cost advantage of more than 10% (41%), so any persistent cost gap creates lost for EU capture. (McKinsey 2025)

Implications

STEPS — upper-bound / success	**Strong:** EU OEMs keep domestic ZEV leadership and capture new value pools
LAPS — conservative / modest	**Eroding:** non-EU pressure reduces domestic value capture

4 Battery supply chains

Current situation

- **The starting point – Europe imports most of its batteries for HGV:** In 2025, around 70% of BET sold in the EU used cells from firms headquartered in China, Japan or South Korea, and the EU held only around 6.5% of global lithium-ion cell capacity. (IEA 2026) (Draghi 2024)
- **Localisation is low at the pack level, but even lower at the cell level:** Daimler, Volvo, Scania and MAN assemble packs locally but still source cells from Asian suppliers (e.g. Daimler LFP from CATL, NMC from LG Chem and SK). (SFC/BNEF 2025) (IEA 2026)
- **The main reason is cost:** Chinese battery pack prices ran around 35% below European levels in 2025, up from a 25% gap in 2022, reflecting economy of scale, vertical integration and lower input costs. (IEA 2026)
- **Thus, the dependency is self-perpetuating:** a persistent unit-cost disadvantage keeps EU OEMs importing cells, which suppresses domestic scale. The vicious circle that can be broken if Europe closes the cost gap or accepts the additional costs associated with public intervention during the ramp-up phase. (IEA 2026)

Forecasts

The studies agree on the existence of the gap, but not on Europe's ability to close it: whether by developing a local cell industry, or remaining dependant on imports.

- **Pessimistic - structural cell deficit:** APC UK sees Europe shift from near-balance around 2030 to a structural cell deficit by 2035, as the gigafactory pipeline fails to keep pace with the long-term ramp. (APC UK 2026)
- **Central - partial localisation:** Strategy& projects around 450 GWh of global truck battery demand by 2030 (13% of automotive demand) - enough to justify truck-specific chemistries, but cell imports remain dominant while pack localisation improves. (Strategy& 2024)
- **Optimistic - EU battery champion:** BCG/T&E model Europe securing around 230 GWh of ZEV-truck cell capacity by 2035, matched to the 400,000 BETs produced annually. The EU would thereby meet the majority of its own cell requirements for HGV. (T&E/BCG 2023) (BCG 2023)

Implications

STEPS — upper-bound / success	**Localised:** competitive EU battery industry; lower import dependence
LAPS — conservative / modest	**Import-dependent:** reliant on imported cells (mostly Asian-HQ'd)

5 Critical raw materials

Current situation

- **The starting point – The EU position is weak upstream, and weaker midstream:** The EU's share of global production of most critical raw materials sits below 7%, and its midstream position is weaker still. (Draghi 2024)
- **China leads the midstream position:** China controls around 90% of lithium refining and 97% of anode active-material processing. Thus, even for diversified mining activities, the process always involves a transformation stage controlled by China. (Draghi 2024) (SFC/BNEF 2025)
- **Recycling cannot yet reduce the gap:** hydrometallurgical refining capacity, needed to turn recycled 'black mass' back into battery-grade material, is still too thin to give to the EU the ability to reduce its dependence. (SFC/BNEF 2025) (APC UK 2026)
- **And this dependence is risky for the EU:** since 2023 China has introduced export licensing for gallium, germanium and graphite, with measures introduced in December 2024 adding US bans and tighter EU end-use reviews. (IEA 2025)
- **New chemistries are not yet mature enough:** sodium-ion and manganese-rich cathodes shift the resource base but are more China-concentrated still. China makes around 95% of high-purity manganese sulphate, so switching chemistry does not close the gap. (IEA 2025)

Forecasts

The studies agree on the exposure, not on whether Europe escapes it: large-scale diversification and recycling, or enduring dependence on intermediate stages of the value chain

- **Pessimistic - persistent supply-demand gap:** the IEA sees non-China producers meeting only around half of remaining global battery-metal and rare-earth demand by 2035, keeping Europe exposed to Chinese-controlled midstream capacity. (IEA 2025)
- **Central - partial diversification:** global recycling capacity grows around 2.5 times by 2030, but a hydrometallurgical refining bottleneck persists, so recycled black mass cannot re-enter battery-grade supply chain on a large scale. (SFC/BNEF 2025) (APC UK 2026)
- **Optimistic - CRMA benchmarks delivered:** the Critical Raw Materials Act sets 2030 benchmarks of at least 10% domestic mining, 40% processing and 25% recycling, assuming full implementation and streamlined permitting. (Draghi 2024) (IEA 2025)

Implications

STEPS — upper-bound / success	**Resilient:** stronger domestic processing, recycling and diversified sourcing
LAPS — conservative / modest	**Import-dependent:** reliant on imported processed materials; China-dominated refining

6 Export performance

Current situation

- **The starting point – a positive export position:** the sector enters from strength. EU OEMs hold a combined market share of more than 80% across Europe and the Americas, and the sector is a structural net exporter, with a EUR 5bn annual trade surplus, with more than a third of EU-produced lorries sold worldwide. (McKinsey 2025) (EC 2023)
- **But that leading position is already declining:** between 2017 and 2022, EU vehicle exports fell 16% in unit terms, an erosion that happened before the ZEV shift. (Draghi 2024)
- **In the ZEV segment, the results change:** China took more than 90% of global ZE truck sales in H1 2026, backed by a mature battery supply chain and pack prices more than 50% below European levels (~USD 90/kWh vs ~USD 190/kWh). (SFC/BNEF 2026)
- **The sector is repositioning itself:** EU presence in China, the world's fastest-growing ZEV market, remains marginal, while Scania has invested around EUR 2bn in a new Chinese facility built to export half its output to Asia-Pacific, a sign that the centre of gravity is moving. (EC 2023) (IEA 2026)

Forecasts

The studies agree on the threat, but differ on whether Europe will defend its export position or cede market share to Chinese competitors.

- **Pessimistic - shrinking export markets:** local-content requirements in more than 20 countries and the slowdown of the North-American ZEV market reduce the potential market for EU exports. (Draghi 2024) (McKinsey 2025)
- **Central - pressure without collapse:** the EU keeps a trade surplus and a premium-ICE lead, but loses ZEV share to Chinese OEMs in third markets where price and TCO drive purchase decisions.
- **Optimistic - technology leadership:** A rapid scale-up of zero-emission vehicles (ZEVs) in the domestic market funds R&D, narrows the battery cost gap, and preserves global technological leadership as well as the EU's role in standard-setting. (McKinsey 2025) (Draghi 2024)

Implications

STEPS — upper-bound / success	**Competitive:** EU OEMs preserve a strong export position
LAPS — conservative / modest	**Eroding:** competitiveness weakens; foreign makers gain global share

7 Regulatory environment

Current situation

- **The starting point – the thresholds are fixed by the law:** Revised HGV CO_2 standards (ratified May 2024) mandate -45% by 2030, -65% by 2035 and -90% by 2040 vs 2019, alongside the AFIR regulation. (ICCT 2024) (TU Wien 2026)
- **However, the regulatory framework is difficult to navigate:** around 13,000 EU acts were adopted between 2019 and 2024, creating compliance obligations that weigh most heavily on a sector where SMEs account for approximately 80% of businesses. (Draghi 2024) (EC 2023)
- **And the incentives pointing in the same direction are disparate:** Eurovignette road-toll discounts stay concentrated in a few Member States such as Germany and Austria, so the price signal reinforcing the mandate is uneven across the single market. (ACEA 2025) CAPEX incentives and e-credits apply in several Member States, but remain fragmented.
- **These frictions are felt at the deployment stage:** permitting lead times of 3-18 months and grid-connection queues of multiple years mean that even harmonized European rules are struggling to translate into operational assets. (McKinsey 2024) (IEA 2026)

Forecasts

Studies agree on the broad policy direction, but differ on whether implementation will be sufficiently rapid, coherent and effective..

- **Pessimistic - implementation risk dominates:** national implementation, permitting and grid capacity remain constraining factors; the Weights & Dimensions revision is not yet adopted and may not remove the payload penalty for ZETs, Energy Taxation reform is still pending, and fragmented incentives and slow permitting keep confidence at a low level. (McKinsey 2025) (ACEA 2025) (McKinsey 2024)
- **Central - review risk creates volatility:** the 2025 amendment to the HDV CO_2 standards (extra credit flexibility to 2029) and their mandatory 2027 review (incl. the role of biofuels and e-fuels) represent critical decision points; penalties for non-compliance, projected to exceed €2.2 billion by 2030, keep the transition driven by compliance requirements. (ICCT 2024) (McKinsey 2025)
- **Optimistic - stable, credible, implementable:** CO_2 standards kept on course through their review, AFIR deployed on time, and the directives requiring transposition (RED, Clean Vehicles Directive) implemented on time and consistently across Member States; permitting and grid streamlined; the CRMA and the Battery Booster Facility strengthening the industrial dimension. (TU Wien 2026) (EC 2023) (Draghi 2024)

Implications

STEPS — upper-bound / success	**Stable:** AFIR, grid, charging and industrial policy are consistent with CO_2 Standards targets
LAPS — conservative / modest	**Uncertain:** Uneven implementation and/or weakening or delays to the policies intended to enable the transition

8 TCO / economic attractiveness

Current situation

- **The starting point – TCO parity is already within reach, and improving as diesel prices rise:** around 30% of European truck sales are estimated to be TCO-competitive now, mainly urban and regional depot operations, and a limited number of long-haul operations. For the other, around 70%, diesel still holds a TCO advantage (McKinsey 2025), though the gap has narrowed as diesel prices have risen over the last year. These urban and regional use cases are the easiest to electrify but account for a much smaller share of CO_2 emissions than long-haulage, where policy support is most needed.
- **And the gap is concentrated on the purchase:** a BET costs two to three times a diesel equivalent up front, a financing challenge that hits the 80% of SMEs the hardest. (EC 2023) (IEA 2026)
- **TCO parity depends on geography:** an electric line-haul truck faces only a ~2% TCO disadvantage in Germany but ~23% in Poland, driven by electricity price, tolls, incentives and utilisation. The concept of "competitiveness" is therefore relative within the EU single market. (McKinsey 2025)
- **Two structural obstacles continue to weigh on the situation:** the residual value of used BET remains to be determined, and payload parity is still under study. (ACEA 2025)

Forecasts

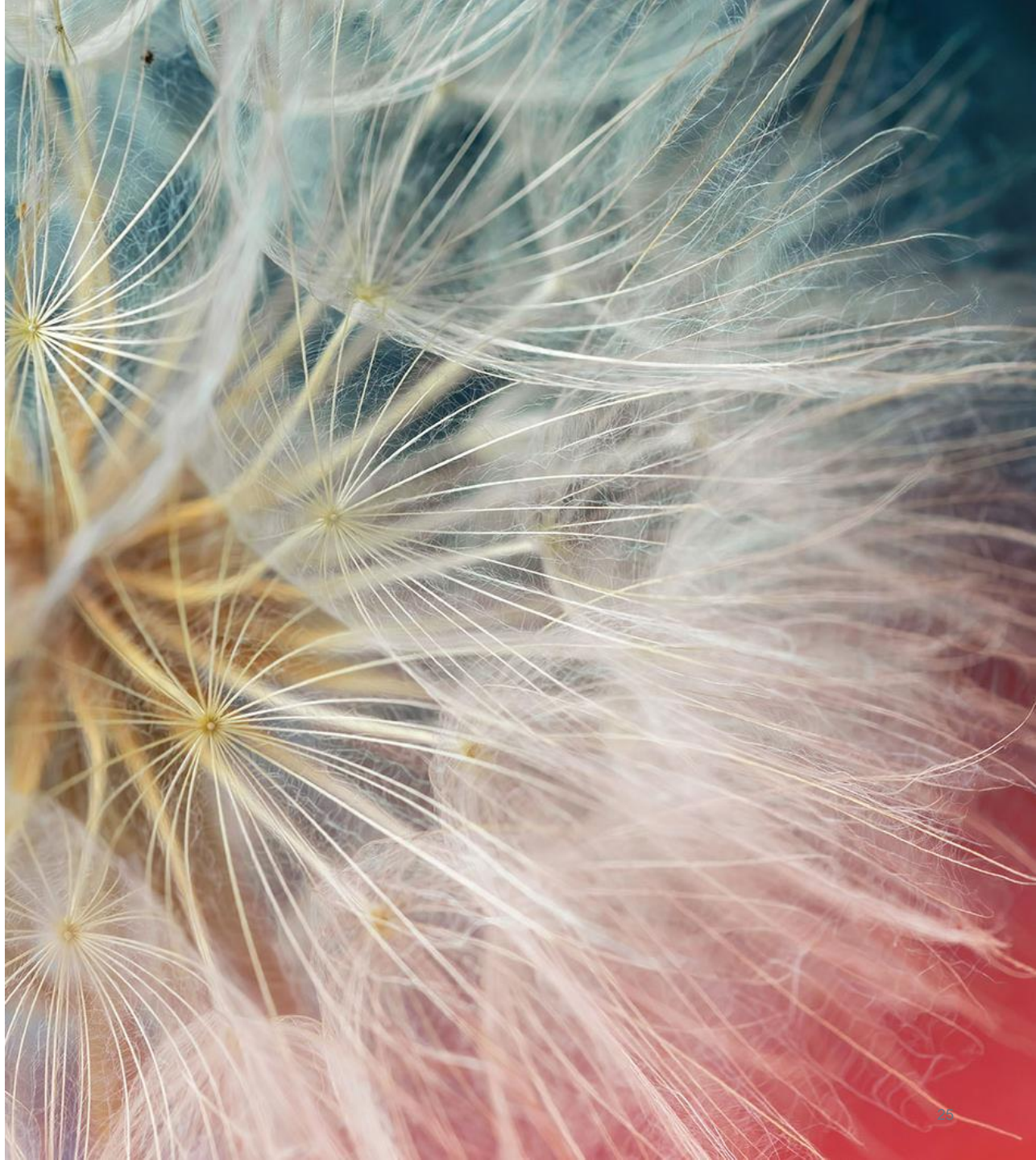
Studies agree on the ultimate outcome but not on the timeline: parity within this decade, or a break-even point pushed back to the 2040s.

- **Pessimistic - diesel remains resilient:** TU Wien 'BAU' scenario: without stronger policy signals, diesel stays the lowest-cost option across most segments and any cost-driven transition slips beyond 2050. (TU Wien 2026)
- **Central - gradual convergence, late break-even:** TU Wien 'Policy' scenario: gradual BET-diesel convergence with break-even only in the 2040s; fuel-cell parity between 2035 and 2040 and only at very high utilisation. (TU Wien 2026) (T&E/TNO 2022)
- **Optimistic - broad parity by the late 2020s:** some studies converge on parity between 2025 and 2030 (urban/regional from 2025, heavy long-haul 2026-2027); TU Wien 'Accelerated' scenario sees BETs lowest-cost across all segments between approximately 2025 and 2030. (IEA 2026) (BCG 2023) (TU Wien 2026)

Implications

STEPS — upper-bound / success	**Broad parity:** BETs reach TCO parity across most use cases by 2030 (long-haulage remaining the hardest segment)
LAPS — conservative / modest	**Limited parity:** parity in early-adopter segments; much of market favours diesel

4. METHODOLOGY



A sequential economic model traces HGV electrification from vehicle and infrastructure rollout to value added in Europe

Electrification does not simply swap one type of truck for another. It builds activity in batteries, charging and the grid while eroding it in engine manufacturing, servicing and fuel supply.

The study assesses these effects together, in a defined sequence of layers, so each figure traces back to the assumption behind it.

It starts with the assets actually deployed, puts a market value on them, establishes how much of that value is captured in the EU, and converts the result into value added.

Coverage spans vehicles, batteries, charging, grid, logistics and energy, so gains in one part of the chain offset losses in another.

The sections that follow present estimates for physical deployment, EU captured revenue and export opportunities, gross value added and energy security; detailed assumptions for market value and EU capture sit in the appendix.



L1 Physical deployment

Physical rollout of fleet, infrastructure and energy assets



L2 Market value

Domestic market demand = *Physical deployment × unit revenue*



L3 EU capture

Domestic turnover = *Domestic market demand × EU localisation rate*



L5 Economic impacts

GVA = *Captured turnover × GVA-to-turnover multiplier*



L6 Energy demand & security impacts

Fuel and electricity demand = HGV activity × energy consumption factors



L4 Export opportunities

Export turnover = *EU HGV export baseline × growth/scaling factor*

The analysis was conducted in constant 2025 euros.

Stakeholder engagement strengthened the evidence base and validated the study results

WHY WE ENGAGED

To test the robustness of sector cost assumptions, understand risks and scaling challenges, and ensure that the final findings reflected market experience across the electric-truck ecosystem.

Workshops

4 sector workshops

1.5-hour virtual sessions combining context setting, discussion, live polling and synthesis.

OEMs | 1 July 2026
Fleet operators | 6 July 2026
CPOs | 15 July 2026
Grid operators | 23 July 2026

In addition to the workshops, we conducted two bilateral interviews with an OEM and an energy management firm.

Advisory board meetings

Advisory Board

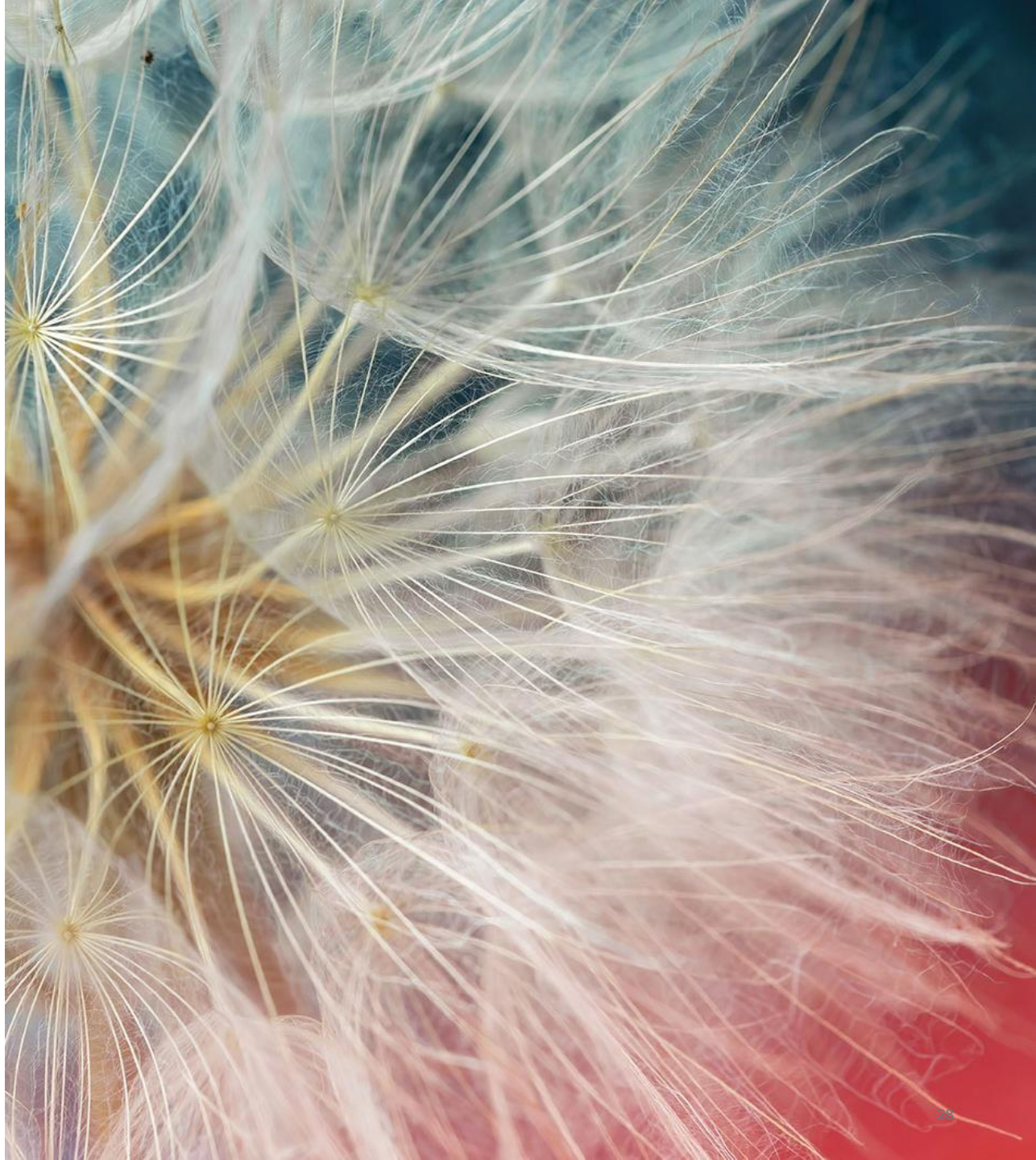
A representative group reviewed and challenged assumptions, flagged risks and helped keep the work aligned with strategic priorities.

4 meetings held via Teams:
1 kick-off (27 May 2026)
2 interim meetings (22 July and 17 September)
1 final workshop (13 October)

What this delivered

- Provided data inputs
- Refined sector cost assumptions
- Validated key risks and scaling constraints
- Identified converging and differing stakeholder views
- Strengthened the relevance and credibility of the final results

5. PHYSICAL DEPLOYMENT:
FLEETS, INFRASTRUCTURE, AND ENERGY ASSETS



PHYSICAL DEPLOYMENT | SECTION SUMMARY

STEPS deploys around twice the BET, batteries and chargers of LAPS, yet four in five HGV on the road in 2035 are still diesel

This section covers the first layer of the model: the physical rollout of vehicles, batteries, charging points and grid capacity on which every later estimate depends. The slides that follow take each of the five areas below in turn, comparing LAPS and STEPS on what is deployed each year to 2035; these volumes are the input to the market value, EU capture and value-added estimates in later sections.

VEHICLE SALES

BET share: 65% (STEPS) vs 32.5% (LAPS)

166k BET units a year under STEPS against 83k under LAPS. Total N3 volume is stable in both, so diesel sales fall from 243k to 90k (STEPS) or 173k (LAPS); substitution, not contraction.

BATTERIES & SUPPLY

Packs: 124 GWh/yr (STEPS) vs 62 GWh (LAPS)

Volumes track sales, so success doubles battery demand. Pack size rises from 530 to 748 kWh in both; prices fall to €109/kWh (STEPS) or €117 (LAPS), with EU assemblers covering up to 84%.

FLEET

Electric fleet: ~20% (STEPS) vs ~11% (LAPS)

Fleet size is the same in both scenarios (3.63m total HGVs); BET share differs. Turnover lags sales by roughly a decade, leaving ~2.9m diesel HGV in service in 2035 even under STEPS.

CHARGING DEMAND

Charging capacity: 68GW (STEPS) vs 37GW (LAPS)

By 2035, depots account for approximately 80% of total installed capacity (~55GW under STEPS). Charging assumptions are identical, so BET deployment drives the gap between scenarios.

GRID & ENERGY DEMAND

Grid: 8.8 GW/yr in 2035 and 76 TWh (STEPS)

Total BET electricity demand is 76.2 TWh a year under STEPS against 41.1 TWh under LAPS. Diversity keeps grid additions below nameplate capacity, but connection and consenting lead times bind in both scenarios.

Success scenario roughly doubles every volume

Across sales, batteries, chargers and grid capacity, STEPS is about twice LAPS. The difference is policy success and cost parity, not technical feasibility.

Fleet turnover governs displacement

Even at 65% BET sales, only ~20% of the fleet is electric by 2035 (~11% under LAPS), so around 2.9m diesel HGV remain in service in either scenario.

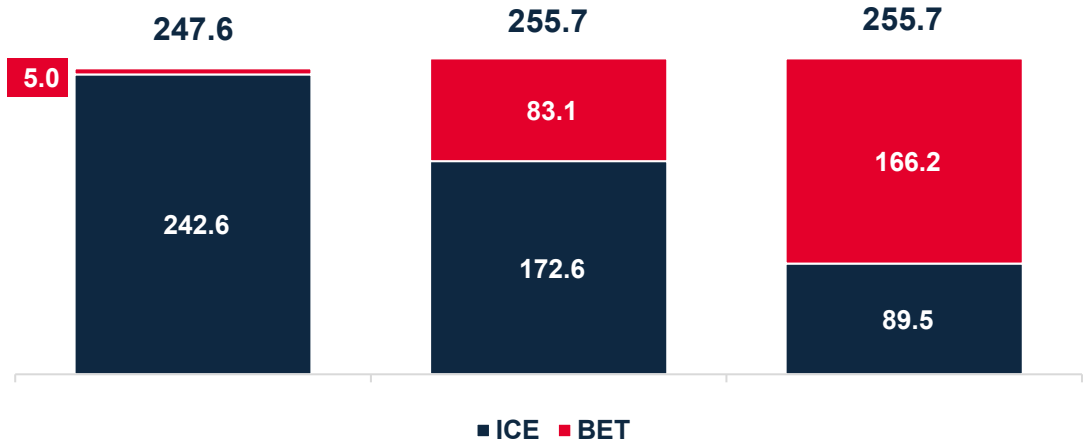
Delivery capacity binds in both scenarios

Depot connections and grid consenting take months, and years where reinforcement is needed, so build-out must begin well ahead of vehicle orders under either scenario.

Under STEPS by 2035, diesel truck sales fall by over 63% while electric truck sales see a 42% 10-year CAGR*

Total N3 sales are held broadly stable across the scenarios, so the transition shows up as substitution and not market contraction.

Annual N3 HGV sales in the EU (thousand units): ICE and BET



Method

Scenario BET share of new N3 sales is the input. 2025 is anchored to ACEA full-year registrations (243k ICE, 5.0k BET); 2035 ICE and BET volumes are taken from the WSP's proprietary vehicle stock model under each scenario, with total N3 sales moving in line with expected EU freight activity. Sources: ACEA 2025 registrations; WSP stock model; WSP analysis.

* CAGR is an endpoint average; actual uptake is expected to follow an S-Curve

KEY DRIVERS AND CONSTRAINTS

CO_2 standards set a regulatory floor, not the pace of deployment

TCO and charging infrastructure are the main BET uptake drivers. The EU-wide CO_2 standards (−65% vs 2019) set a floor under it. STEPS assumes TCO parity and infrastructure roll-out keep pace, taking BET to 65% of sales. LAPS assumes slower charging roll-out and TCO parity only in early-adopter segments, holding BET at 32.5%.

BET prices decline in both scenarios

Cheaper batteries, scale economies and intensified competition lead to cheaper BET. BET prices go from €320k to €230k / €270k. STEPS assumes TCO parity across most use cases by 2030; LAPS only in early-adopter segments.

ICE truck prices increase in both scenarios

Prices rise modestly in real terms as Euro 7 (from 2027) adds aftertreatment content. ETS2 raises diesel running costs for fleets, widening the TCO gap in BET's favour.

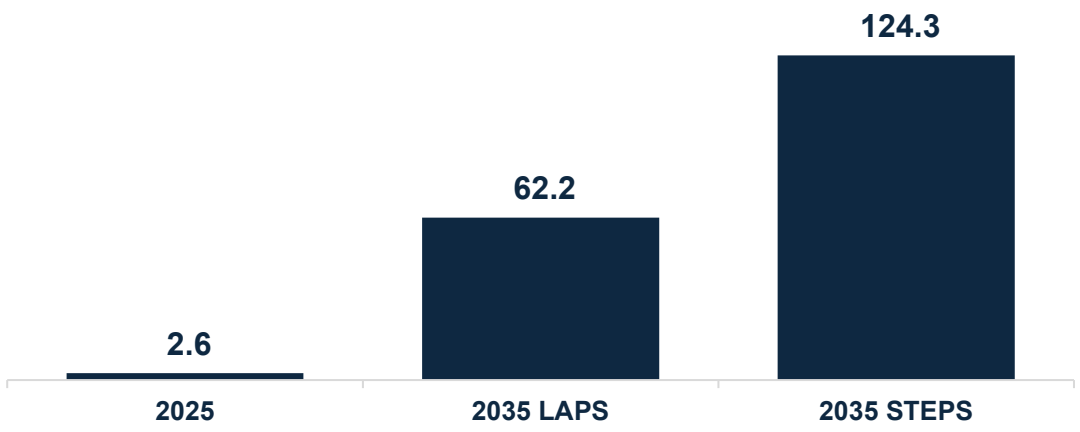
Key assumptions

Driver	2025	LAPS	STEPS
BET share of new sales	2%	32.5%	65%
ICE Truck / **BET Price (k€)**	111 / **320**	115 / **270**	122 / **230**

Battery pack deployment reaches over 124 GWh a year by 2035 under STEPS, as the pack price declines by 28%

Battery demand compounds two drivers: how many electric N3 HGVs are sold, and how large their packs are.

Battery pack capacity deployed in new N3 HGVs (GWh/yr)



WHAT DRIVES THE SHIFT

Pack sizes rise to meet long-haul range requirements

Average N3 capacity grows from 530 kWh today to 748 kWh by 2035. The increase is assumed to be the same in both 2035 scenarios.

The scenario gap comes from sales volumes

With pack size identical at 748 kWh, the difference between 62 (LAPS) and 124 GWh (STEPS) reflects the BET share of new N3 sales (32.5% vs 65%).

Pack price is expected to decrease in both scenarios

Prices fall from €151/kWh to €109 (STEPS) and €117 (LAPS) on cell chemistry, manufacturing scale and competition supporting the increase in BET sales.

Method

Capacity deployed = BET sales × average pack size. Packs average 530 kWh today (ICCT survey of 91 electric heavy tractors), scaled to 748 kWh by 2035 based on previous WSP modelling assumptions. Pack price starts at €151/kWh (US DOE 2025, Class 7-8 average at ECB rates) and falls with DfT cost-reduction factors to €117 (LAPS) and €109 (STEPS), cross-checked against BNEF. Sources: ICCT (2025); US DOE (2025); BNEF (2025); WSP modelling.

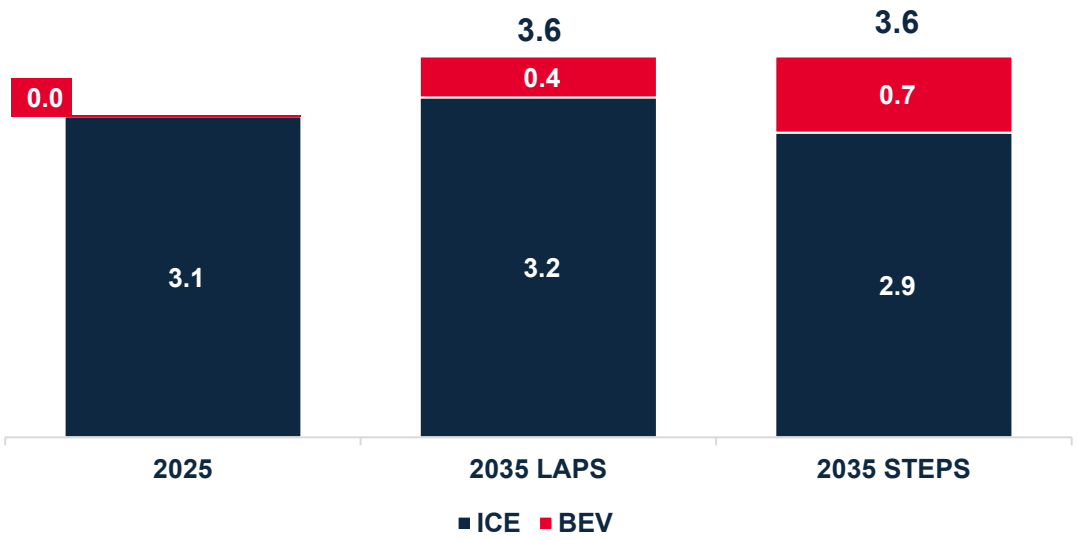
Key assumptions

Driver	2025	LAPS	STEPS
Avg. pack size (kWh)	530	748	748
Pack price (€/kWh)	151	117	109

The truck fleet turns over slowly, leaving around 2.9M diesel HGVs in operation by 2035 under STEPS against around 0.7M BETs

Fleet share lags sales share. The scenarios differ in powertrain mix, not fleet size.

N3 HGV parc by powertrain (millions of vehicles)



Method

The 2025 fleet is built bottom-up: ACEA's 6.16m EU27 HGVs >3.5t × 51.5% N3 share (Eurostat) × 96.3% diesel, with BET stock from EAFO. 2035 fleet totals derived from WSP's vehicle stock model, which applies expected survival curves so each year's parc is the previous year's fleet plus new sales less retirements. Sources: ACEA; Eurostat; EAFO; WSP stock model.

WHAT DRIVES THE SHIFT

HGVs remain in service for several years, so the fleet changes slowly

Each year's parc is the previous fleet plus new sales less retirements, following expected survival curves. BETs registered in 2030 remain a small fraction of a fleet built over the previous fifteen years.

The 2025 baseline is almost entirely diesel

N3 BETs made up less than 0.5% of the fleet in 2025, so despite reaching 65% of new sales by 2035 in STEPS, fleet penetration reaches only around 20% by 2035 (around 11% under LAPS for 32.5% of new sales).

Freight activity sets fleet size and electrification dictates the mix

The fleet grows to 3.6M in both scenarios, driven by expected variation in EU freight demand. The scenarios reallocate powertrains within that total as BET sales share increases.

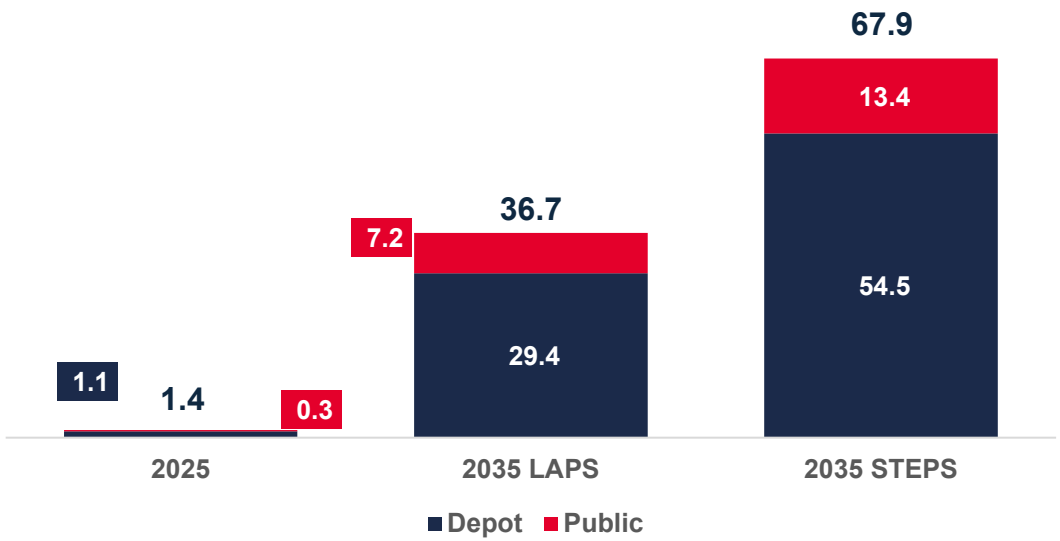
Key assumption

Driver	2025	LAPS	STEPS
BET share of fleet	<0.5%	11%	20%

Installed charging capacity reaches around 67.9 GW by 2035 under STEPS, with approximately 80% of total capacity at depots

Charge-point demand follows fleet deployment.

Installed capacity to meet BET fleet charging demand, by type (GW)



Method

Depot points = BET sales × 0.5 (one charger per two new HGV, per the CPO workshop). Public points are energy-derived: charging demand is split 70% depot / 15% public 350 kW / 15% MCS, then divided by each charger's daily throughput at 25% utilisation and 0.95 load factor. Installed capacity = points × rated power (150 kW depot, 350 kW public, 1 MW MCS). Sources: ICCT MCS study (2025); AFIR; CPO stakeholder workshop, ICCT/Fraunhofer ISI Study (Sept 2026).

WHAT DRIVES THE SHIFT

One charger for every two new HGV

Depots charge overnight, so a single 150 kW charger can serve simultaneously two vehicles across a night cycle.

Depot charging dominates HGV charging demand

The 70/15/15 split (depot / public 350 kW / public MCS) follows observed practice, with around 70-80% of HGV charging at private sites today. Public points are sized to freight-corridor demand, which is why they stay low in number even under STEPS.

Charging parameters are held constant, so volumes drive the gap

Ratios, power ratings and utilisation are identical across scenarios. The difference between both scenarios reflects BET sales growth alone.

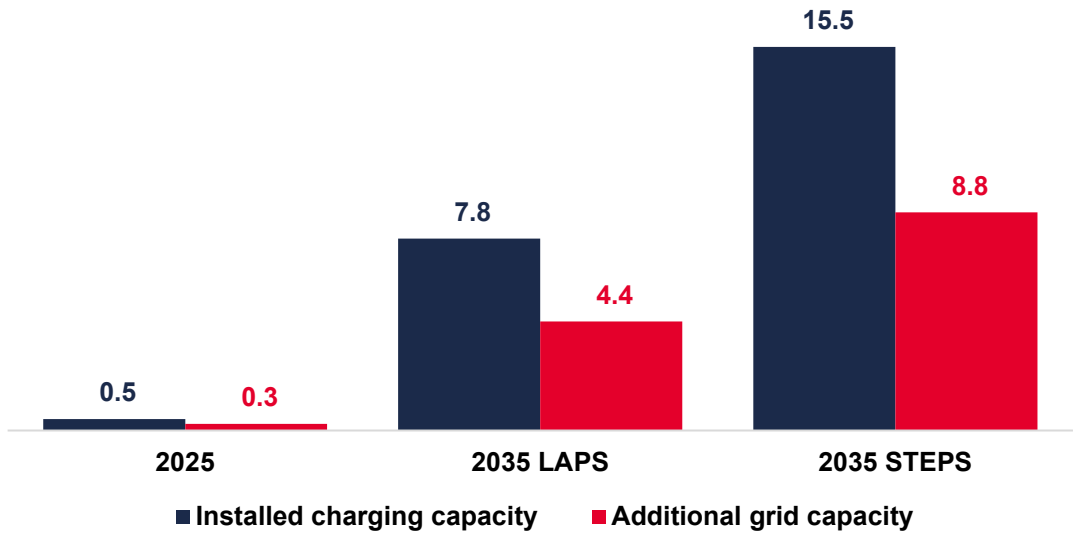
Key assumptions

Driver	2025	LAPS	STEPS
N3 BET Fleet (k Units)	15.0	392.5	727.0
BET Fleet Electricity Demand (TWh/year)	1.6	41.1	76.2

Grid additions rise to around 8.8 GW per year by 2035 under STEPS to meet rising BET sales demand, with an installed charger capacity of around 15.5 GW per year in 2035

Charger rollout becomes grid demand only after accounting for simultaneous charging demand and applying appropriate coincidence factors. The constraint is not the volume, but how fast connections can be consented and energised.

Installed annual charging capacity vs additional annual grid capacity (GW/yr)



Method

Installed charging capacity is converted to grid capacity by applying a coincidence factor to each charger type — 0.5 for depot, where smart overnight charging clips 30-55% of unmanaged peak, 0.8 for public 350 kW and 0.9 for MCS, whose connection must effectively match nameplate — and summing across the charger mix. Sources: T&E grid-integration study (2021/22); IEA (2026); McKinsey (2024); WSP analysis.

WHAT DRIVES THE SHIFT

Grid capacity is the sum of depot and public additions

Depot and public connections are converted separately and summed. Depot dominates volume, but public and MCS points draw a higher share of their rated power.

Depot charging is managed, so peak demand stays below nameplate

Smart overnight charging reduces peak demand by 30 to 55% versus unmanaged simultaneous plug-in, which maps to a coincidence factor of 0.45 to 0.7. A factor of 0.5 is applied to 150 kW depot points.

Public and MCS connections must match installed capacity

High-power corridor charging draws near-simultaneously, so the grid connection must be sized at the level of installed capacity. Factors of 0.8 for 350 kW public and 0.9 for MCS are applied.

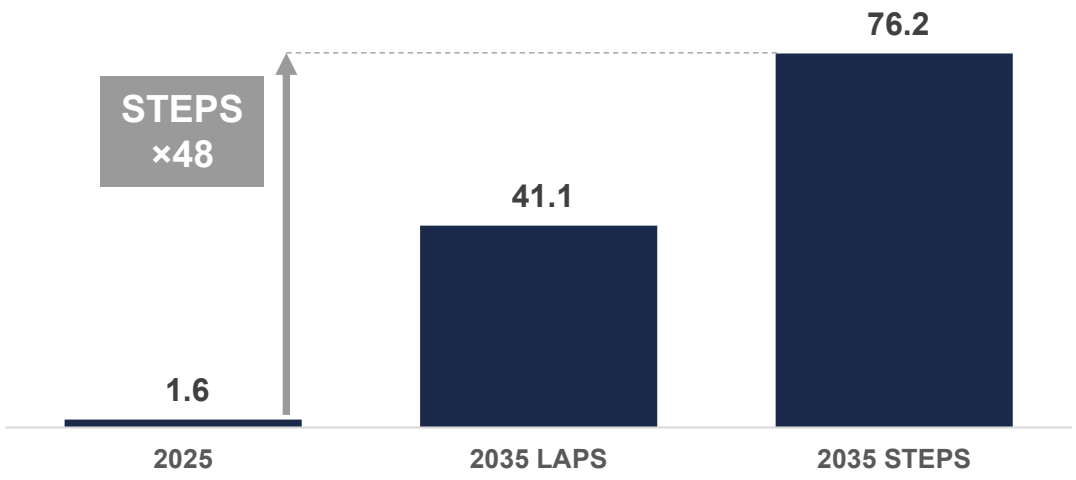
Key assumptions and rationale

Assumption (model input)	Basis and why it drives the result
Depot 150 kW: coincidence 0.5	Smart overnight charging cuts peak demand by 30-55%.
Public 350 kW: coincidence 0.8	Corridor charging is near-simultaneous.
Public MCS: coincidence 0.9	MCS grid connection must be sized at the level of installed capacity

Charging demand grows nearly 50-fold to over 76.2 TWh per year by 2035 under STEPS, and 41.1 TWh under LAPS

Electricity demand is the product of BET activity and vehicle efficiency. Mileage and efficiency are held broadly constant, so increases to BET deployment & subsequent activity drive the result.

Charging electricity demand (TWh/yr)



WHAT DRIVES THE SHIFT

Electric activity drives the growth

BET fleet activity rises from around 1.3 to 62.9 bn vehicle-km/ year under STEPS (33.9 under LAPS).

Efficiency gains are marginal over the period

BET energy intensity improves from 125 to 121 kWh/100km, identical in both scenarios, reducing demand by around 2%, against a 48-fold increase in activity.

The load is national in size but local in effect

76 TWh is a limited share of EU electricity consumption, but it concentrates at depots and along freight corridors, so local network capacity becomes a limiting factor before national supply does.

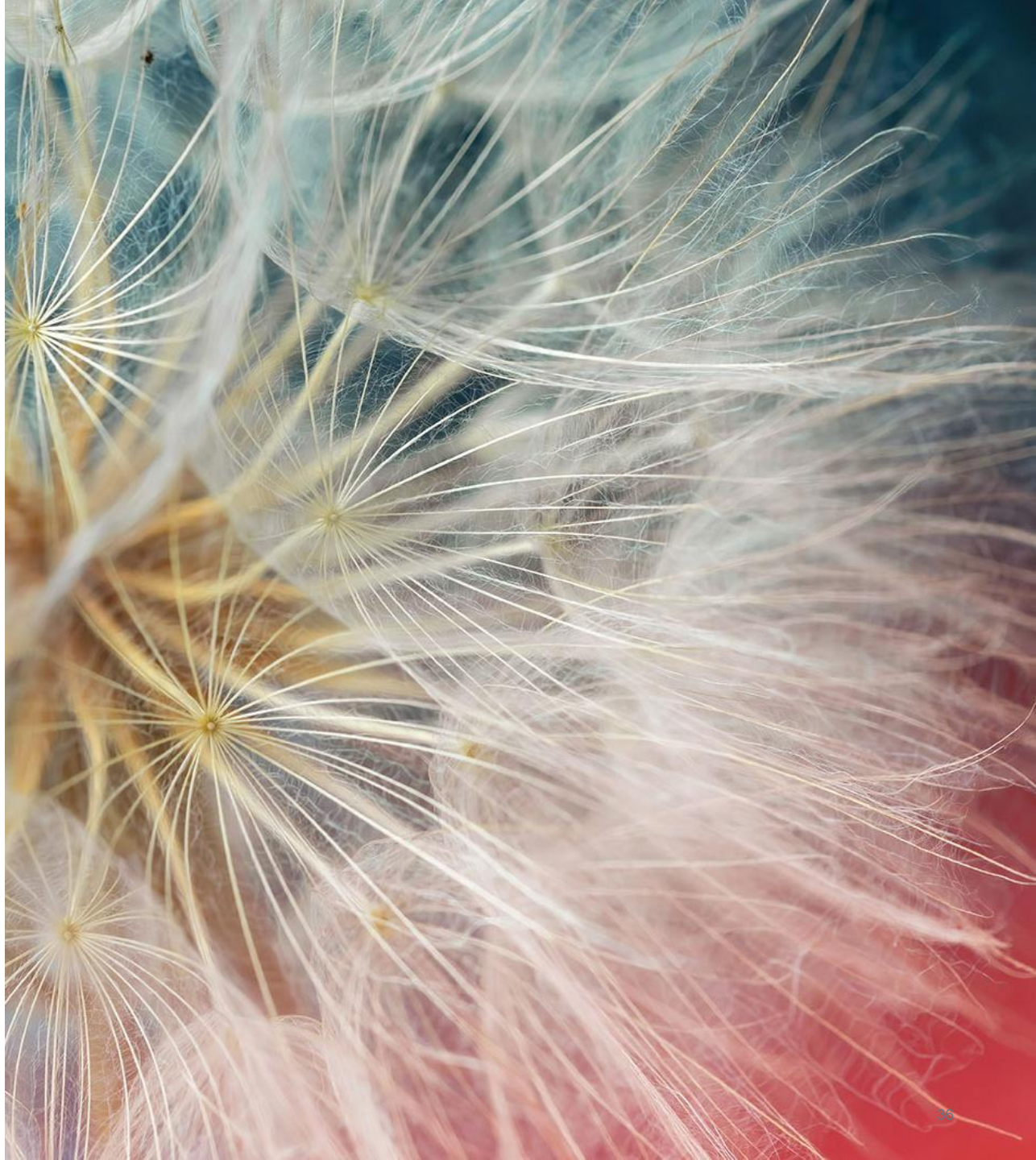
Method

Demand = BET fleet × average annual mileage (86,500 km, estimate from ICCT) × energy intensity. Intensity is 125 kWh/100km today (~midpoint of the ICCT ECTA 92-150 range, cross-checked against MAN eTruck and Designwerk trials), improving to 121 kWh/100km by 2035 as BET efficiencies improve. Sources: ICCT/Fraunhofer ISI (Sept 2026), ICCT ECTA (2025); Eurostat; MAN eTruck / Designwerk trials.

Key assumptions

Driver	2025	LAPS	STEPS
Energy intensity (kWh/100km)	125	121	121
BET HGV activity (Billion vehicle-km/year)	1.3	33.9	62.9

6. EU CAPTURED REVENUE AND EXPORT OPPORTUNITIES



EU revenue from diesel HGV production falls by around half by 2035 under STEPS, while revenue from BET, battery cells and charging hardware grows more than tenfold

Section 6 presents the third and fourth layers of the model: how much of the market value created by electrification is captured within the EU, and how much is earned through exports. The slides that follow take each of the four segments below in turn, comparing LAPS and STEPS to 2035, split between domestic and export demand.

DIESEL N3 HGV

Captured value contracts

Turnover falls 48% by 2035 under STEPS. Domestic captured revenue drops from €26.4bn to €10.7bn, while exports fall more slowly, from €13.7bn to €10.3bn. Exports therefore rise from 34% to 49% of remaining diesel turnover under STEPS.

ELECTRIC N3 HGV

The main source of growth

Turnover grows almost 21-fold to €44bn under STEPS. Domestic captured revenue rises from €1.5bn to €34.4bn and exports grow 15-fold to €9.5bn. EU manufacturers hold 90% of the domestic market under STEPS against 70% under LAPS.

EU BATTERY CELLS

Success scenario decides the outcome

STEPS delivers roughly six times the turnover of LAPS, at €4.2bn. Domestic captured revenue reaches €2.9bn against €0.4bn under LAPS, and exports €1.3bn against €0.3bn. The EU-captured share of cell value rises from 8% today to 35% under STEPS, but only 15% under LAPS.

DEPOT-CHARGING HARDWARE

Driven by EU demand

Turnover reaches €4.9bn under STEPS, around 50% over LAPS. Domestic captured revenue rises from €1.3bn to €3.0bn while exports hold at about €2.0bn in both scenarios, so the segment is driven mainly by EU demand under STEPS rather than by exports.

Diesel becomes an export business

Diesel revenue does not disappear; a growing share of it comes from exports as EU demand falls. Revenue from BET, cells and charging is earned mainly from EU customers.

Success scenario raises the EU share, not just volume

Higher success scenario increases both the size of each market and the share of it captured in the EU, most clearly in battery cells, where capture reaches 35% under STEPS against 15% under LAPS.

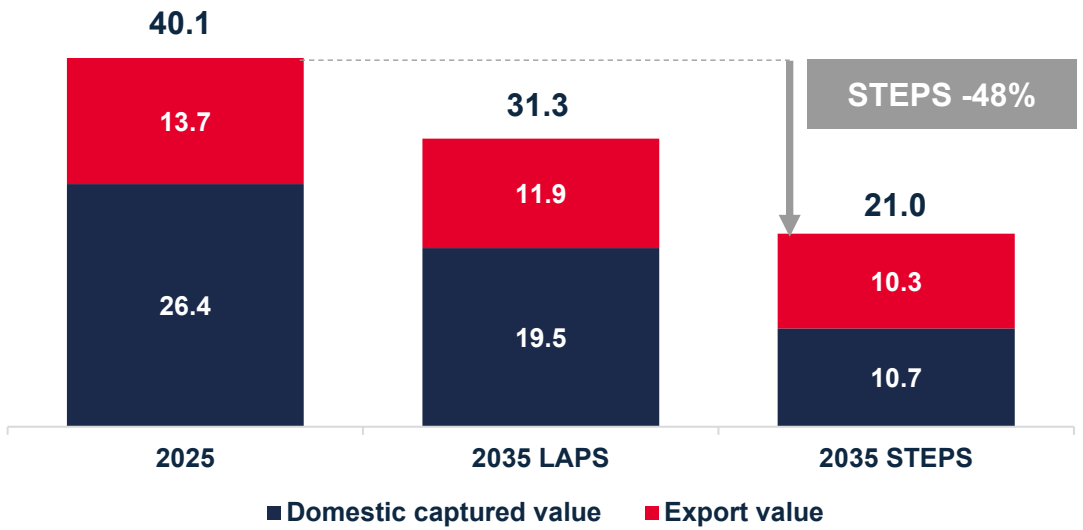
BET carry most of the value

Electric N3 turnover is an order of magnitude larger than battery cells and charging hardware combined, so where EU manufacturers build those vehicles decides how much value stays in Europe.

EU revenue from diesel HGVs falls by 48% by 2035 under STEPS, driven by a 59% decline in sales to EU customers

The remaining demand for diesel is increasingly located outside the EU, where standards do not mandate the same transition.

ICE N3 HGV turnover — domestic captured value + export value (bn€)



Method

Turnover = Domestic captured value (market value × EU OEM localisation share) + Export value (2025 UN Comtrade baseline × scenario scaling factor). Baseline: ACEA 2025 diesel HGV registrations (proxy for N3, >12t); export HS 870422/870423/870121. Full assumptions in annex. Sources: ACEA 2025; UN Comtrade; WSP Analysis.

WHAT DRIVES THE SHIFT

Domestic value falls almost proportionally with volume

Diesel N3 sales drop 63% to 90k units resulting in a 59% decline in domestic market value. The EU OEM share holds at 98%, and prices move slightly (€111k → €122k in STEPS), so the decline reflects volume mostly.

Exports hold up because diesel demand persists outside the EU

Global ZEV penetration leaves most of the world truck market on diesel in 2035, so export demand persists well beyond the EU transition. Export value falls 25% by 2035 under STEPS, against 59% domestically.

The residual business shifts in its structure

Exports move from 34% to 49% of remaining ICE turnover, making what remains of the ICE business more dependent on external demand.

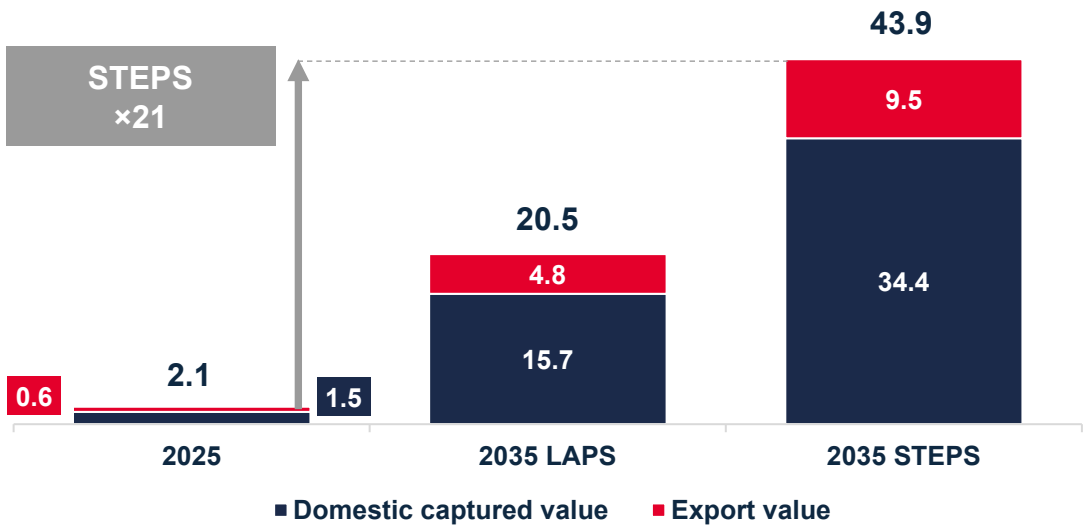
Key assumptions – ICE HGV

Driver	2025	LAPS	STEPS
EU OEM localisation share	98%	98%	98%
ICE HGV market value (bn€)	26.9	19.9	10.9
Export value vs 2025 baseline (%)	100%	87%	75%

EU revenue from BET reaches €43.9bn by 2035 under STEPS, with €34.4bn captured by EU OEMs

Volume growth drives the result in both scenarios.

Electric N3 HGV turnover — domestic captured value + export value (bn€)



Method

Turnover = Domestic captured value (BET units × average selling price × EU OEM localisation share) + Export value (2025 baseline scaled by scenario competitiveness).
Volumes: total N3 sales held broadly stable at around 250k/yr, BET units = total less ICE; prices per annex (€320k 2025 → €270k LAPS / €230k STEPS). Full assumptions in annex. Sources: Reuters (Mar 2026); ACEA 2025; WSP Analysis.

WHAT DRIVES THE SHIFT

Turnover is rising thanks to volumes, despite falling prices.

BET sales rise from 5k to 166k units under STEPS while average prices fall from €320k to €230k. Volume growth outweighs the declined in prices.

EU incumbents retain the majority of their domestic market

The 93% starting share is moderated to 90% under STEPS and 70% under LAPS. New entrants already match European manufacturers on specification and price, and what incumbents retain is brand trust and service coverage.

Export value follows the growth of the global electric truck market

The EU accounts for around **61% of global electric truck exports today** (N1+N2+N3). Exports are built from global BET truck demand, the share traded across borders, and the EU share of those exports.

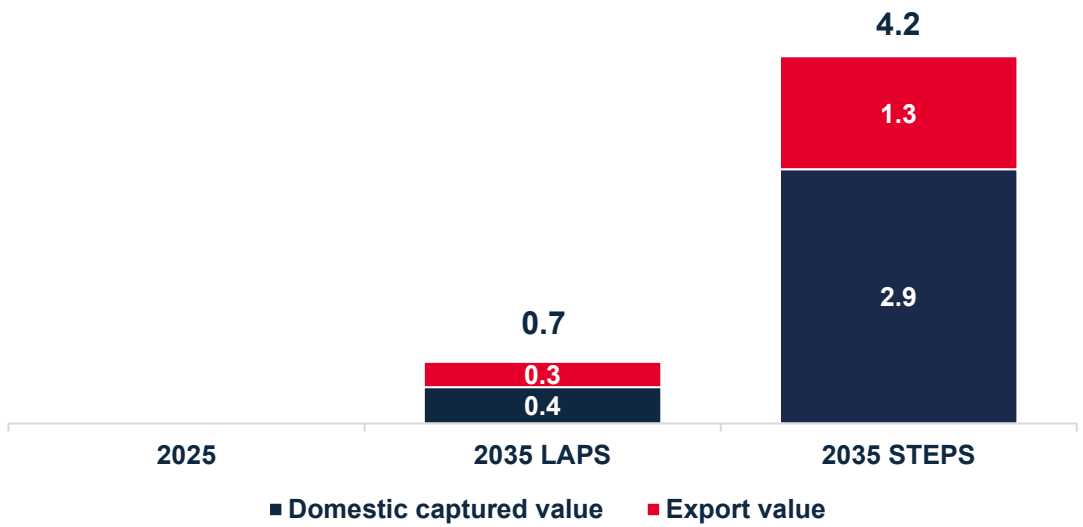
Key assumptions – BET HGV

Driver	2025	LAPS	STEPS
EU OEM localisation share	93%	70%	90%
BET market value (bn€)	1.6	22.4	38.2
Export value vs 2025 baseline	100%	×8.8	×16.5

EU revenue from battery cells reaches €4.2bn by 2035 under STEPS, with €2.9bn captured through domestic production

Cell production in the EU starts from virtually zero in 2025, the situation in 2035 therefore depends on the capacities established in the meantime.

EU battery cell turnover — domestic captured value + export value (bn€)



Method

Turnover = Domestic captured cell value + export value of EU-manufactured cells. Cell demand follows BET volumes and pack energy content; EU-located cell capacity sets the share produced in Europe, with exports arising only where capacity exceeds domestic demand. Vehicle markets and prices per annex. Full assumptions in annex. Sources: ICCT/Ricardo (2022); ERM (Mar 2026); WSP Analysis.

WHAT DRIVES THE SHIFT

EU cell localisation is the limiting variable

The EU-domiciled share of cells demand rises from 8% to 35% under STEPS (15% under LAPS). STEPS assumes stronger industrial policy and delivery of the EU-owned gigafactory pipeline. LAPS reflects the realisation rate of announced European capacity.

Exports are what remains after domestic demand is met

EU production is estimated as installed capacity times utilisation. Whatever exceeds domestic truck-battery demand is reported as potential gross exports, using a **15% share** of EU truck-battery production exported for both scenarios.

Demand and localisation drive the results

Battery demand doubles between LAPS and STEPS (from 62 to 124 GWh a year), while the EU-domiciled share of cells rises from 15% to 35%. The two effects multiply, which is what produces the sixfold turnover gap.

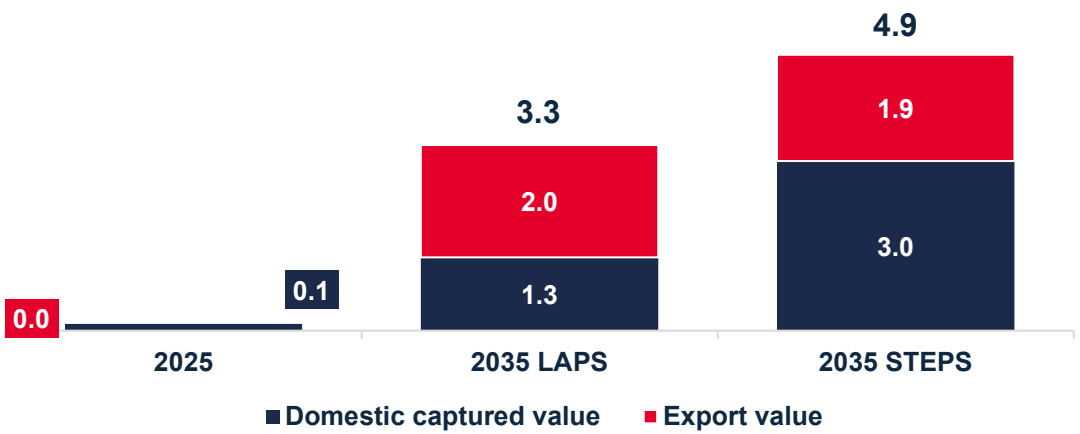
Key assumptions – Battery cells

Driver	2025	LAPS	STEPS
Domestic captured cell share	8%	15%	35%
Truck share of EU production (%)	-	3%	9%
EU Total battery production (GWh)	-	702	1105

EU revenue from depot-charging hardware reaches €4.9bn by 2035 under STEPS, driven by stronger domestic demand

Global demand for charging stations varies little between scenarios; therefore, deployment in the EU accounts for the difference.

Depot charging hardware turnover — domestic captured + export values (bn€)



Method

Turnover = Domestic captured value (depot charging hardware installed in the EU) + export value of EU-manufactured hardware. Depot hardware demand follows BET fleet growth and the 70% depot share of heavy truck charging; charge-point volumes and unit hardware prices per annex. Full assumptions in annex. Sources: ACEA 2025; WSP Analysis.

WHAT DRIVES THE SHIFT

EU suppliers hold a strong position in depot charging

Seven of the ten largest European HGV charging operators are EU-domiciled, covering around 80% of stations. STEPS preserves this value. LAPS reduces it to 60%, where compliance-led deployment leaves room for non-EU suppliers to compete.

Exports follow global depot-charger demand, not EU success

Export value is built from global truck depot-charger additions, the 24% share traded across borders, and a 21.5% EU share of global charger exports. Global demand moves little between scenarios, which is why exports stay near €2bn in both.

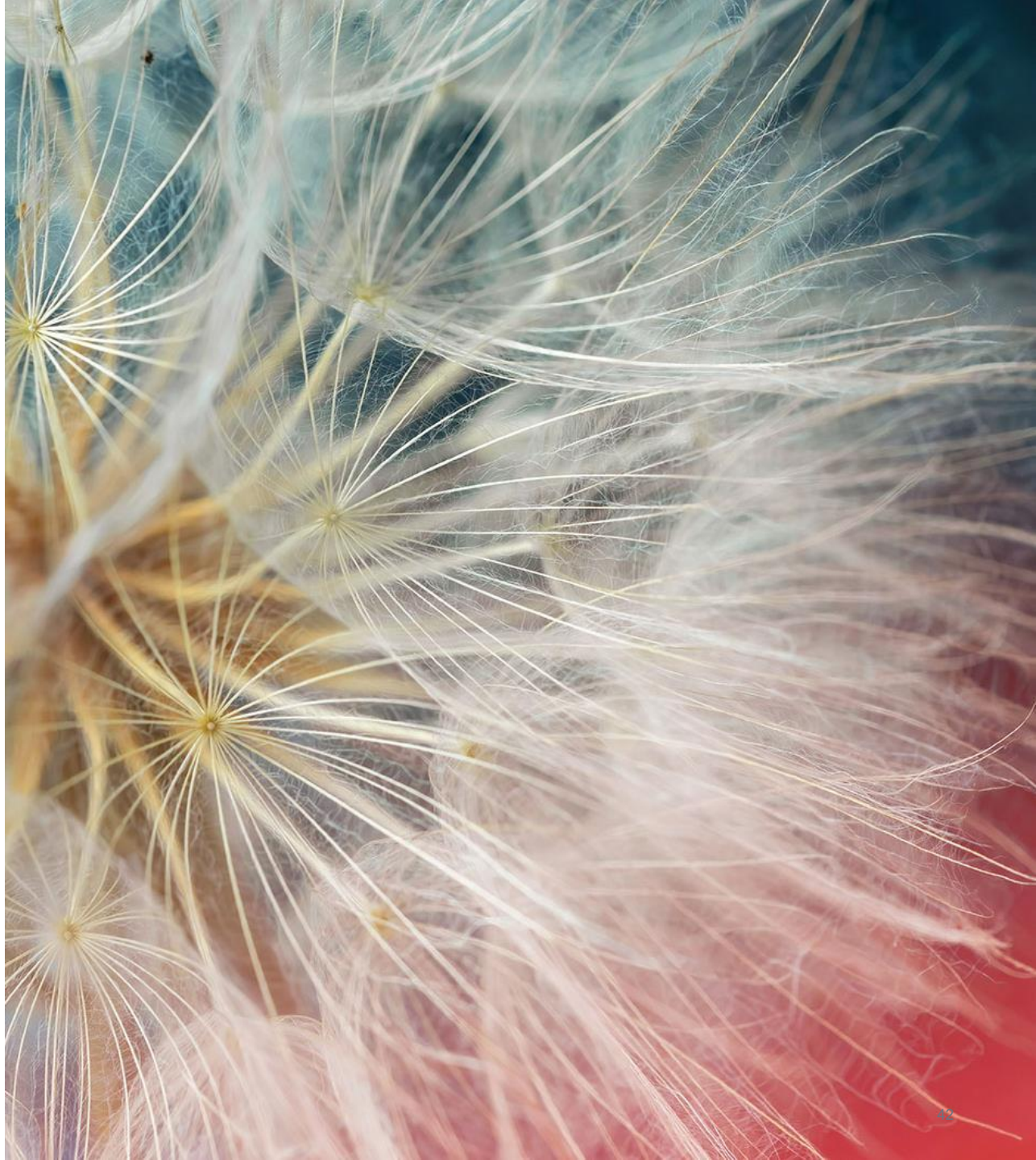
Domestic demand is what separates the scenarios

Exports are broadly fixed, so the entire €1.6bn turnover gap comes from EU deployment. Domestic value moves from 39% to 61% of turnover.

Key assumptions – Depot-charging hardware

Driver	2025	LAPS	STEPS
Domestic captured share	80%	60%	80%
Global truck depot charger net additions (units/yr)	-	730k	800k

7. ECONOMIC IMPACTS OF HGV ELECTRIFICATION:
GROSS VALUE ADDITION ACROSS THE SUPPLY CHAIN



The key finding: EU27 HGV-related GVA reaches €164.2bn under STEPS against €155.1bn under LAPS — a delta of €9.1bn a year by 2035

Section 7 converts the market and captured-value results of the previous sections into gross value added (GVA): turnover less the cost of bought-in goods and services, i.e. the value actually created in the EU economy. Both scenarios grow from €128.4bn today, but higher success adds a further €9.1bn of annual GVA — the difference higher success makes to the EU economy.

WHAT GVA MEASURES

Value created, not money moved

GVA is turnover less intermediate consumption: what remains to pay wages, taxes and profits. It is the sum of GVA across all sectors that makes up GDP, so it measures the economic footprint of the HGV transition rather than the size of its transactions.

WHY WE USE IT

Comparable across the value chain

Turnover double-counts when a cell is sold to a pack maker and again inside a truck. GVA strips out those purchased inputs, so freight operators, OEMs, battery makers and charging providers can be added together and compared on the same basis.

HOW IT IS BUILT

Sector ratios applied to turnover

GVA is calculated by applying sector-specific GVA-to-net-turnover ratios, based on Eurostat structural business statistics, to the turnover estimated for each activity, separately for ICE and electric, and adjusted by scenario where margins shift.

STEPS VS LAPS: THE DELTA

Where the €9.1bn delta arises

Freight transport operations: €122.3bn in LAPS vs €125.7bn in STEPS (+€3.4bn); charging and downstream services: €22.2bn vs €25.3bn (+€3.1bn); OEMs and upstream supply chain: €10.7bn vs €13.3bn (+€2.5bn).

+€9.1bn a year is what success scenario is worth

Both scenarios grow, but STEPS delivers €164.2bn against €155.1bn under LAPS by 2035 — a 5.9% higher annual GVA, equivalent to more than the whole of today's downstream value pool.

The delta is concentrated in new activities

Charging, grid work and electric manufacturing generate almost all of the gap, while freight operations, at 77-79% of total GVA, differ little between scenarios.

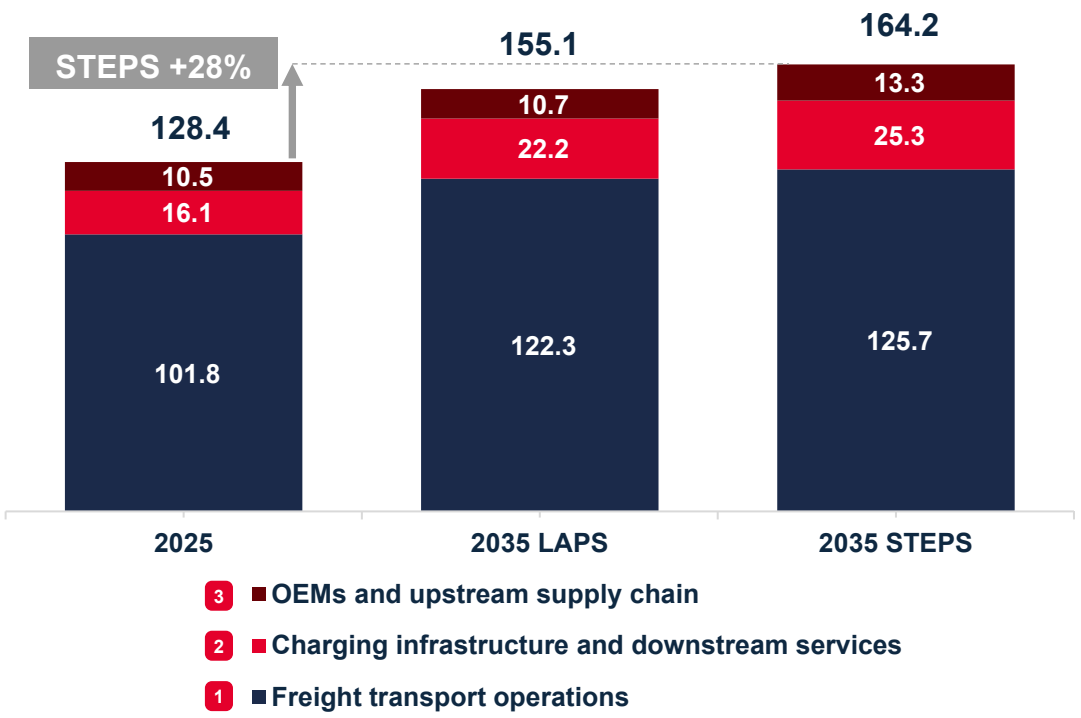
Success scenario raises capture, not just volume

The gap comes from where production is located and how much of each euro of turnover is retained in the EU, most visibly in battery cells and electric vehicle assembly.

EU HGV-related GVA rises from about €128bn today to €164bn in STEPS, as €24.7bn of new electric value pools outweigh a €15.6bn contraction in diesel-related activity

Activity growth lifts the total in both scenarios: the fleet grows from 3.1m to 3.6m vehicles whatever the powertrain. Electrification adds to that total and changes who captures it, worth €9.1bn of GVA between LAPS and STEPS.

EU27 HGV-related GVA — N3 truck ecosystem (€bn)



KEY CONCLUSIONS

Freight operations hold most of the value

Logistics stays at around 77-79% of the total in both scenarios and differs by €3.4bn between LAPS and STEPS.

Manufacturing is a reallocation, not a windfall

ICE production loses €2.8bn under STEPS while electric vehicle, battery and charging-equipment production adds €8.2bn. Under LAPS the weaker electric build-out offsets less of the ICE decline, leaving manufacturing GVA €2.5bn lower.

New downstream activity carries the upside

Electricity supply, charging and grid work reach €25,3bn under STEPS against €22,2bn under LAPS, a €3.1bn difference.

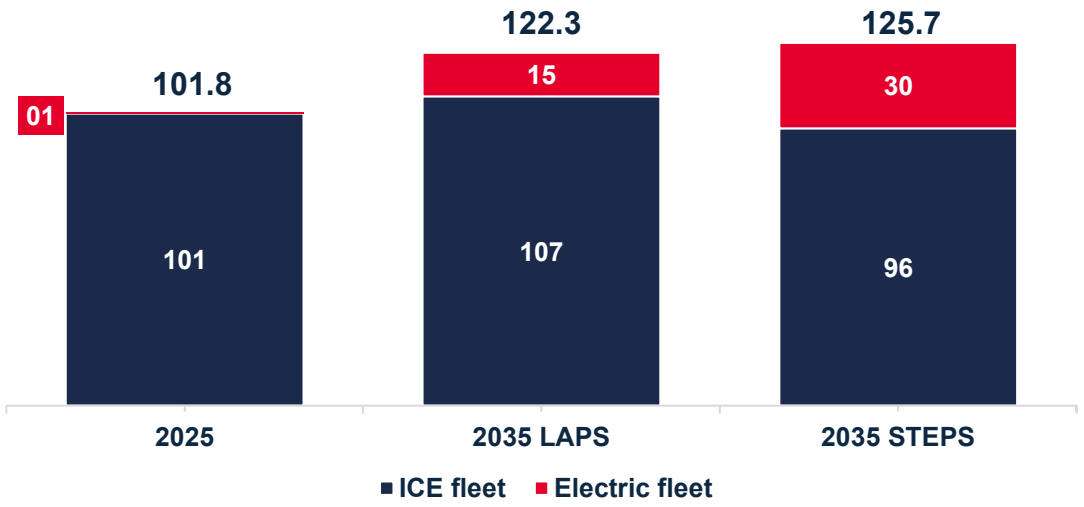
Method

GVA = turnover less intermediate consumption, applied to each activity of the N3 ecosystem. Freight operations cover road haulage; manufacturing covers vehicle production and upstream supply; downstream covers energy supply, charging infrastructure and grid work. Sector GVA ratios from Eurostat structural business statistics. Sources: Eurostat; WSP analysis.

Freight transport operations remain the backbone of HGV-related value added, growing under both scenarios as electric haulage replaces diesel within the segment

The scenarios differ little in size here: vehicle-km are the same in both, so the €3.4bn gap arises from the electric share of activity and the higher GVA margin of electric operations.

1 **EU27 HGV-related GVA — Freight transport operations (bn€)**



Method

GVA = turnover × sector GVA-to-net-turnover ratio, applied separately to ICE and electric road freight operations. Turnover follows fleet size and vehicle-kilometres from the WSP stock model. The 2025 ratios are based on Eurostat structural business statistics, with scenario adjustments reflecting changes in sector margins. Sources: Eurostat; WSP analysis.

WHAT DRIVES THE SHIFT

Freight demand sets the size of the segment

GVA follows tonne-kilometres, and freight demand is identical in both scenarios: a 3.6m-vehicle fleet running ~314bn vehicle-km. The €3.4bn gap comes from the mix of that activity: 20% of those km are driven electrically under STEPS versus 11% under LAPS.

Electric operations convert more turnover into value added

Electricity substitutes for diesel at a lower cost per kilometre, with less maintenance. That TCO advantage leaves less revenue in intermediate consumption, lifting the GVA/turnover ratio.

Diesel operations lose volume and margin together

CO_2-differentiated road tolls and ETS2 pass-through push haulage rates up. Revenue per kilometre rises on pass-through, not margin, so the ICE GVA/turnover ratio declines by 2035.

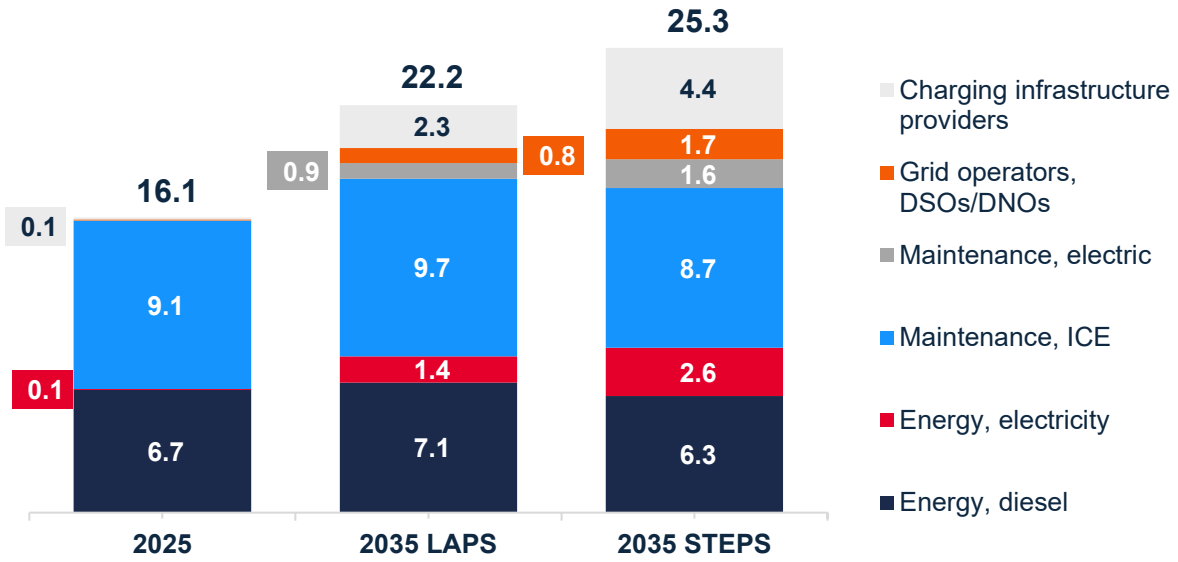
Key assumptions

Driver	2025	LAPS	STEPS
GVA/turnover ratio for ICE transport activity	32%	30%	29%
GVA/turnover ratio for Electric transport activity	35%	35%	35%

Charging and downstream services are where electrification creates genuinely new value, alongside the remaining diesel economy

Electric value pools reach €10.3bn under STEPS versus €5.4bn under LAPS, while the remaining diesel fleet sustains established energy and maintenance value in both.

2 **EU27 HGV-related GVA — Charging infras. and downstream services (bn€)**



Method

GVA = turnover × sector GVA-to-net-turnover ratio. Turnover is estimated separately for diesel and electricity supply, ICE and electric maintenance, charging hardware and installation, and grid and smart-charging services. The calculation accounts for fuel and electricity demand, charger deployment, installed charging capacity and grid capacity additions. GVA ratios are based on Eurostat structural business statistics and sector-specific assumptions. Sources: Eurostat; WSP analysis

WHAT DRIVES THE SHIFT

Charging and grid deployment create most of the new value

Charger installation and grid activity grow from around €0.2bn today to €6.1bn under STEPS, driven by the scale of infrastructure required for the electric fleet.

Electric fleet growth creates recurring downstream activity

Electricity supply and electric maintenance reach €4.2bn under STEPS as electric vehicle activity increases, creating annual value beyond the initial infrastructure build.

Slow fleet turnover preserves diesel-related activity

Diesel supply and ICE maintenance still generate €15.0bn under STEPS, as around 80% of the N3 fleet remains diesel in 2035.

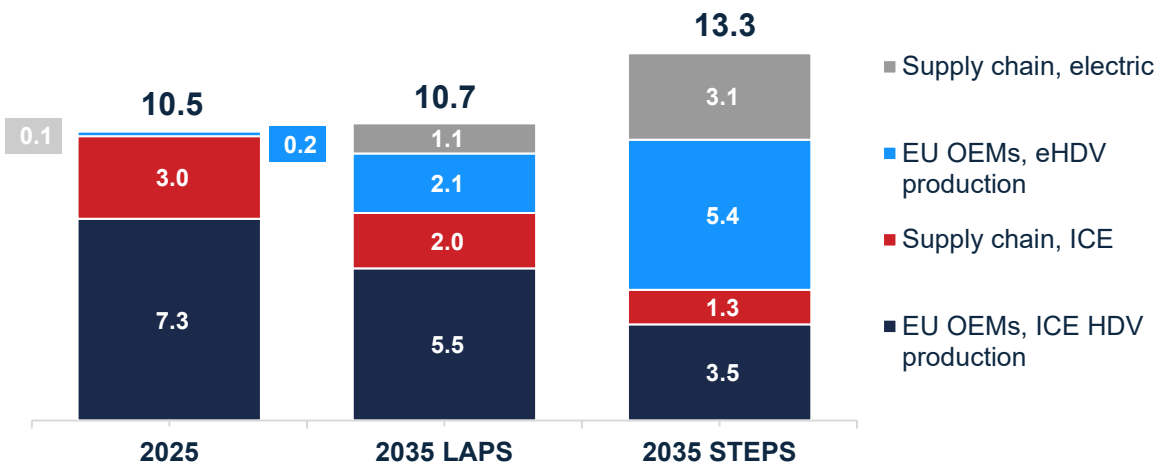
Key assumptions

Driver	2025	LAPS	STEPS
GVA/turnover ratio, ICE **/ electric maintenance**	31% / **31%**	29% / **33%**	29% / **36%**
GVA/turnover ratio, ICE **/ electricity supply**	8% / **18%**	8% / **18%**	8% / **18%**

OEMs and the upstream supply chain reallocate rather than simply grow: higher success is what allows electric production to more than offset the decline of diesel manufacturing

LAPS leaves manufacturing broadly flat at €10.7bn, as electric growth only offsets the ICE decline; STEPS lifts the electric share of segment GVA from 3% to 64%.

3 **EU27 HGV-related GVA — OEMs and upstream supply chain (bn€)**



WHAT DRIVES THE SHIFT

Value shifts from assembly to batteries and components

The battery alone accounts for 30% of an electric truck's value, and software triples its share to 3%. Electric supply-chain GVA grows from near zero to €3.1bn under STEPS, against €1.1bn under LAPS.

Each 10pp of EU market share is worth €0.5bn of GVA

EU-domiciled OEMs supply 93% of European zero-emission truck sales today. The scenarios assume they hold 90% under STEPS and 70% under LAPS, as non-EU entrants become price-competitive on comparable specifications.

Battery cells and materials remain the weakest point of EU capture

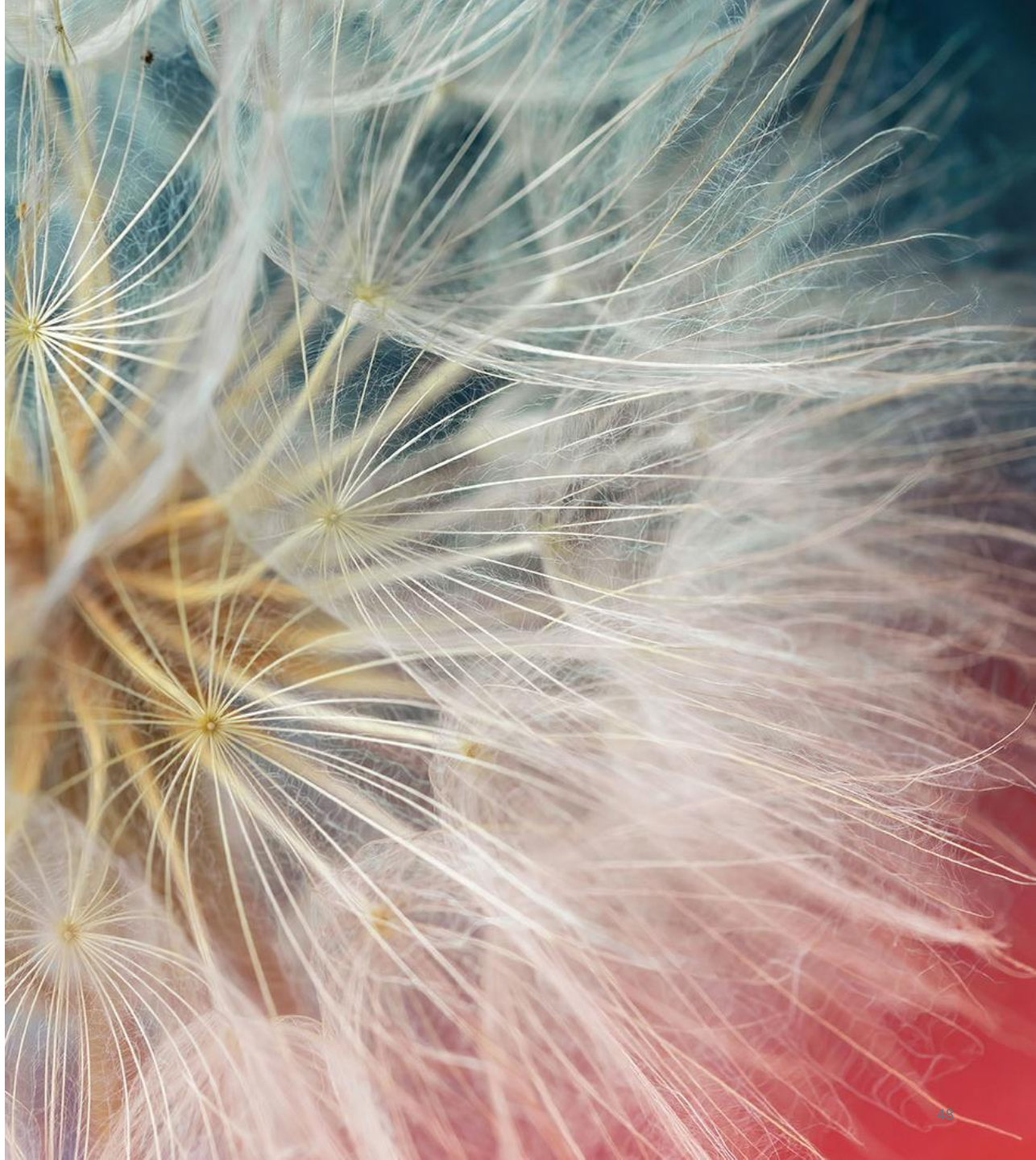
Fraunhofer ISI expects only 54–75% of announced European cell capacity to be built. EU cell capture therefore reaches 15% under LAPS and 35% under STEPS, and CAM/pCAM 25% to 55%, against today's 81% import reliance for lithium and cobalt.

Method

GVA = turnover × sector GVA-to-net-turnover ratio. Turnover is estimated separately for OEM assembly and upstream supply-chain activities, accounting for vehicle volumes, component value shares and EU localisation. The electric supply chain covers battery and non-battery components, shared vehicle components, software, battery packs, cells and materials. GVA ratios are based on Eurostat structural business statistics and sector-specific assumptions. Sources: Eurostat; WSP analysis.

Driver	2025	LAPS	STEPS
GVA/turnover ratio, ICE **/ electric OEM manufacturing**	18% / **8%**	18% / **9%**	17% / **11%**
GVA/turnover ratio, ICE **supply chain**	22%	22%	22%

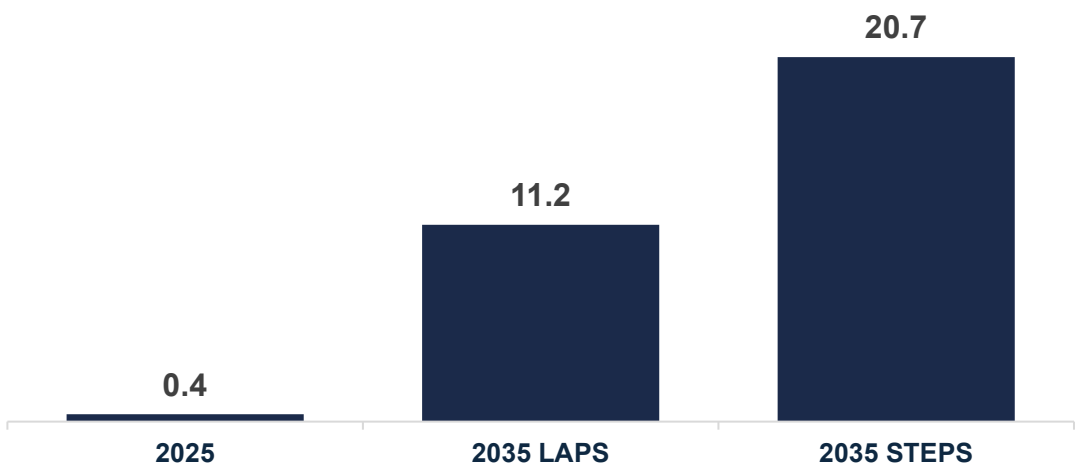
8. ENERGY DEMAND AND SECURITY



HGV electrification replaces 20.7bn litres per year of mostly imported diesel with EU-generated electricity by 2035 under STEPS, strengthening security of supply

The displaced volume nearly doubles between LAPS and STEPS; the pace of electrification therefore determines the magnitude of the gain in terms of security of supply.

Diesel displaced (bn litres/yr)



WHAT DRIVES THE SHIFT

Fleet electrification sets the volume displaced

Each electric truck is assumed to cover the same annual distance as the diesel truck it replaces. With BETs at 20% of the fleet under STEPS, electric activity reaches 62.9bn vehicle-km, each replacing 32.9 litres per 100 km.

Electric drivetrains amplify the energy benefit

Under STEPS, 76.2 TWh of electricity replaces diesel containing around 205.0 TWh of energy, as electric drivetrains convert most of their energy into motion while diesel engines lose most of it as heat.

Less diesel means lower oil imports

With over 95% of EU crude oil imported, displaced diesel translates almost directly into lower import dependence.

Method

Displaced diesel = electric vehicle-km (WSP stock model) × ICE diesel intensity of 32.9 L/100 km, assuming each electric kilometre replaces one diesel kilometre. Diesel is converted to energy at 9.91 kWh/L; electricity demand applies 121 kWh/100 km, excluding charging losses. Sources: DESNZ Conversion Factors 2026; Eurostat; WSP stock model; WSP analysis.

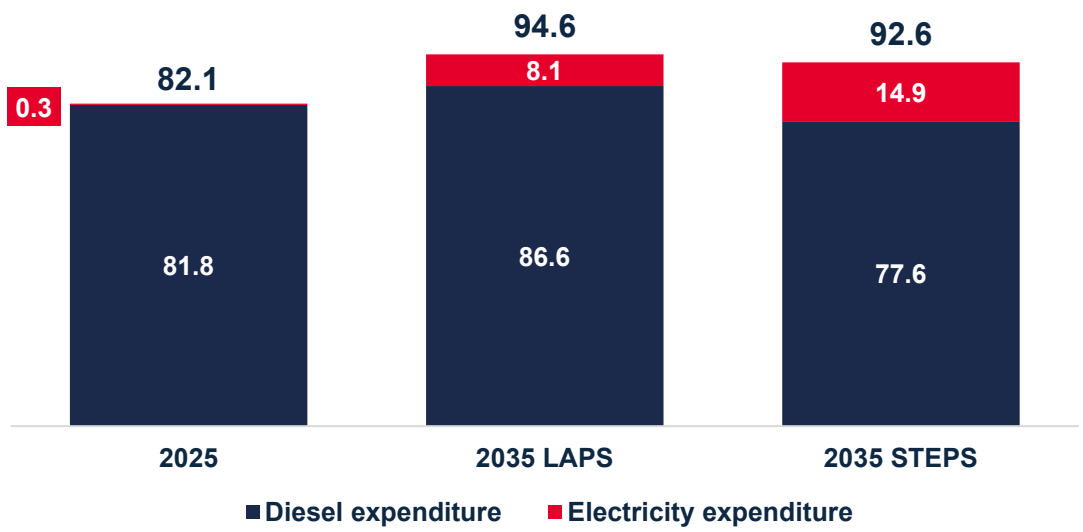
Key assumptions

Driver	2025	LAPS	STEPS
Electric-truck activity (bn vehicle-km/year)	1.3	33.9	62.9
Intensity ICE (L/100 km) **/ Electricity (kWh/100 km)**	32.9 / **125**	32.9 / **121**	32.9 / **121**

Under STEPS, €15bn a year of fleet energy spending shifts to electricity by 2035, yet diesel still accounts for 84% of the bill

Both scenarios deliver the same freight activity, so the lower bill under STEPS comes entirely from electric kilometres being cheaper to power

Fleet energy expenditure (€ bn/yr)



Method

Diesel spend = fleet diesel consumption × diesel price; electricity spend = charging demand × electricity price, excluding charging losses. Prices are held constant across scenarios, so differences reflect volumes only. Avoided diesel spend = displaced diesel volume × diesel price; the saving is avoided diesel spend less electricity spend. Sources: DESNZ Conversion Factors 2026; Eurostat energy prices; WSP stock model.

WHAT DRIVES THE SHIFT

Freight growth is offset by electrification under STEPS

Total truck activity rises by around 18% to 2035 in both scenarios. Under STEPS, BETs absorb all this growth, so diesel use falls by 5%. Under LAPS, they absorb part of it, and diesel use rises by 6%.

Electric kilometres cost less to power

At the assumed prices, an electric kilometre costs around €0.25, against €0.31 for diesel. Under STEPS, the 62.9 bn electric vehicle-km therefore save €3.4bn a year.

Spending moves from imported oil to EU electricity

Under STEPS, €19.4bn a year of diesel spending, based on mostly imported crude, is redirected to electricity largely generated in the EU.

Key assumptions

Driver	2025	LAPS	STEPS
Diesel price, net of taxes (€/L)	0.94	0.94	0.94
Electricity price, net of taxes (€/MWh)	196	196	196
Intensity ICE (L/100 km) **/ Electricity (kWh/100 km)**	32.9 / **125**	32.9 / **121**	32.9 / **121**

The transition reallocates value: up to €19.4bn/yr of energy spend moves from diesel retail and refining into electricity, charging, grid and EV manufacturing

The headline shift in fleet energy spend is only part of the distributional story: the same transition moves margin out of fuel retail, refining, ICE production and the diesel aftermarket, and into power supply, charging, grid investment and electric vehicle manufacturing. The table sets out where each value pool moves and how.

Value pool shifts by 2035 (STEPS)

Value pool	Shift	Mechanism and scale to 2035 (STEPS)
Fuel retail & distribution	▼	~20.7 bn L/yr of diesel volume lost; forecourt and bulk margins contract relative to LAPS.
Refining & oil imports	▼	Road-diesel feedstock demand falls, cutting the EU import bill and exposure to oil price volatility.
Diesel aftermarket & servicing	▼	Fewer engine and driveline parts; BET need materially less maintenance per km.
ICE production & supply chain	▼	ICE-linked GVA falls from €10.3bn to €4.8bn as diesel N3 output falls by almost two-third.
Charging-hardware manufacturers	▲	Charging rollout adds €2.6 bn/yr of GVA through growing demand for charging hardware.
Electricity supply, CPOs & eMSPs	▲	Truck electrification creates €4.2 bn/yr of GVA across electricity supply and charging services.
Grid networks & construction	▲	Reinforcement and connection capex creates a durable regulated investment pipeline, worth €1.6bn.
BET & battery production	▲	Electric-linked GVA rises from €0.3bn to €8.5bn, spread beyond vehicle assembly.
Logistics operators	▲	Energy cost moves to contracted domestic electricity: lower TCO, less price volatility.

WINNERS & LOSERS

Concentrated losses, distributed gains

Fuel retail and refining lose a €10.5-19.4 bn/yr value pool (under LAPS and STEPS respectively); gains are spread across power, charging, grid and manufacturing.

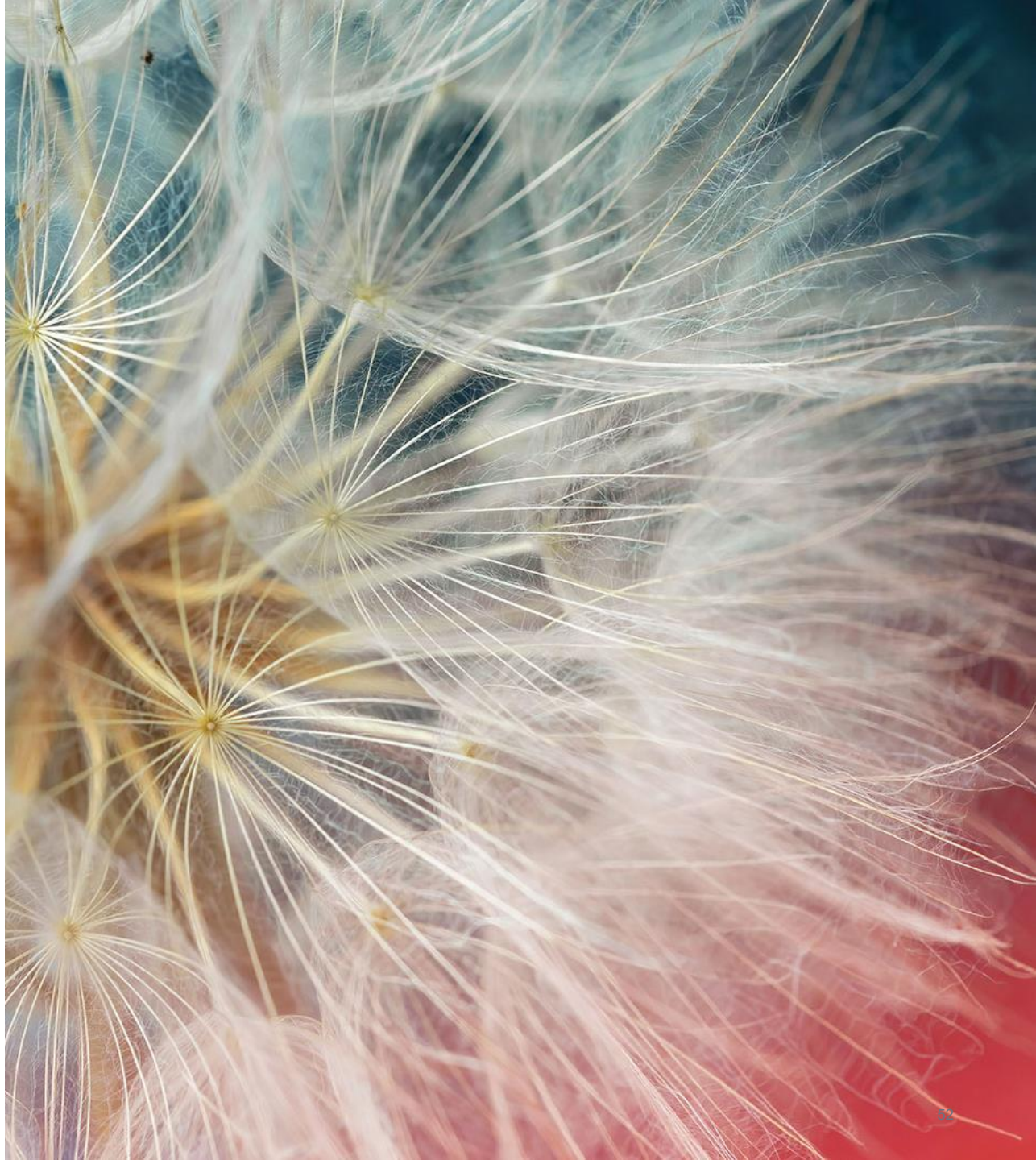
New revenue is contracted or regulated

Charging-hardware manufacturers, charging operators, eMSPs, grid operators, and electricity suppliers capture €4.6-8.7 bn/yr (under LAPS and STEPS respectively). Grid operators can expand regulated investment in network upgrades.

Operators & OEMs

Hauliers swap volatile imported diesel for electricity bought on longer-term contracts, cutting and steadying operational costs; truck and charger makers gain as diesel servicing and parts revenue shrinks.

9. CONCLUSIONS AND POLICY RECOMMENDATIONS



Europe’s competitive edge in truck electrification

A first quantified assessment of the economic competitiveness and energy-security implications of Europe’s transition

A NOVEL ASSESSMENT This study assesses Europe’s competitive edge in truck electrification as technology, policy and market dynamics accelerate in a sector with longstanding industrial strength in the EU

WITH A ROBUST APPROACH It quantifies economic competitiveness and energy-security impacts under two scenarios, slower electrification (LAPS) and faster electrification (STEPS), using a transparent economic model validated against the literature and by industry stakeholders.

What these benefits imply

01 **Leverage Europe’s industrial base.** Europe’s established HDV manufacturing ecosystem, together with its capabilities in high-power charging equipment, power electronics, software and lifecycle services, can serve the growing European market and support competitiveness in global markets.

02 **Grow new goods and services.** Charging-hardware manufacturing, installation, software, energy management, maintenance, remote diagnostics, uptime services, electricity supply and grid services can scale with the market, creating upfront and recurring European value. Quantified GVA benefits also imply jobs creation.

03 **Protect exposed value-chain links.** Batteries, processed critical minerals and selected electric powertrain components remain exposed to fierce competition, particularly from China. They need to be strengthened.

04 **Turn policy success into delivery.** Faster permitting and more predictable grid connections must be supported by anticipatory network investment, transparent capacity mapping, coordinated depot and corridor planning, future-proof site design and smart energy management. Member States and network operators should provide clearer connection procedures, milestones and timelines so that charging infrastructure can be deployed ahead of vehicle demand.

€9.1bn

Additional annual GVA under faster electrification in 2035 (STEPS vs LAPS)

€6bn

Additional avoided expenditure on diesel imports under STEPS compared with LAPS

MEMBER STATE MULTIPLIER

Member State´s implementation of EU policy framework is outside the study’s scope, but can multiply the impact by supporting local value chains, SME finance and skills, while lowering electricity and network costs in line with the Affordable Energy Action Plan.



Both pathways grow the EU truck economy, but moving faster is worth around EUR 9.1 billion a year more by 2035

Gross value added from the EU heavy truck ecosystem is around EUR 128 bn today. It reaches around EUR 155 bn in 2035 on the slower pathway and around EUR 164 bn on the faster one - roughly 21% and 28% above today respectively.

Some of this growth comes from the underlying market: between 2025 and 2035 the fleet is projected to grow from 3.1 million to 3.6 million vehicles (around +18%), and freight activity (vehicle-km) by around 18% as well.

However, both 2035 scenarios assume the same fleet size and the same freight activity, so the EUR 9.1 bn uplift is not growth. It is the value of electrifying faster, alongside a further EUR 6.0 bn a year of fleet diesel spending avoided and redirected to largely homegrown electricity.

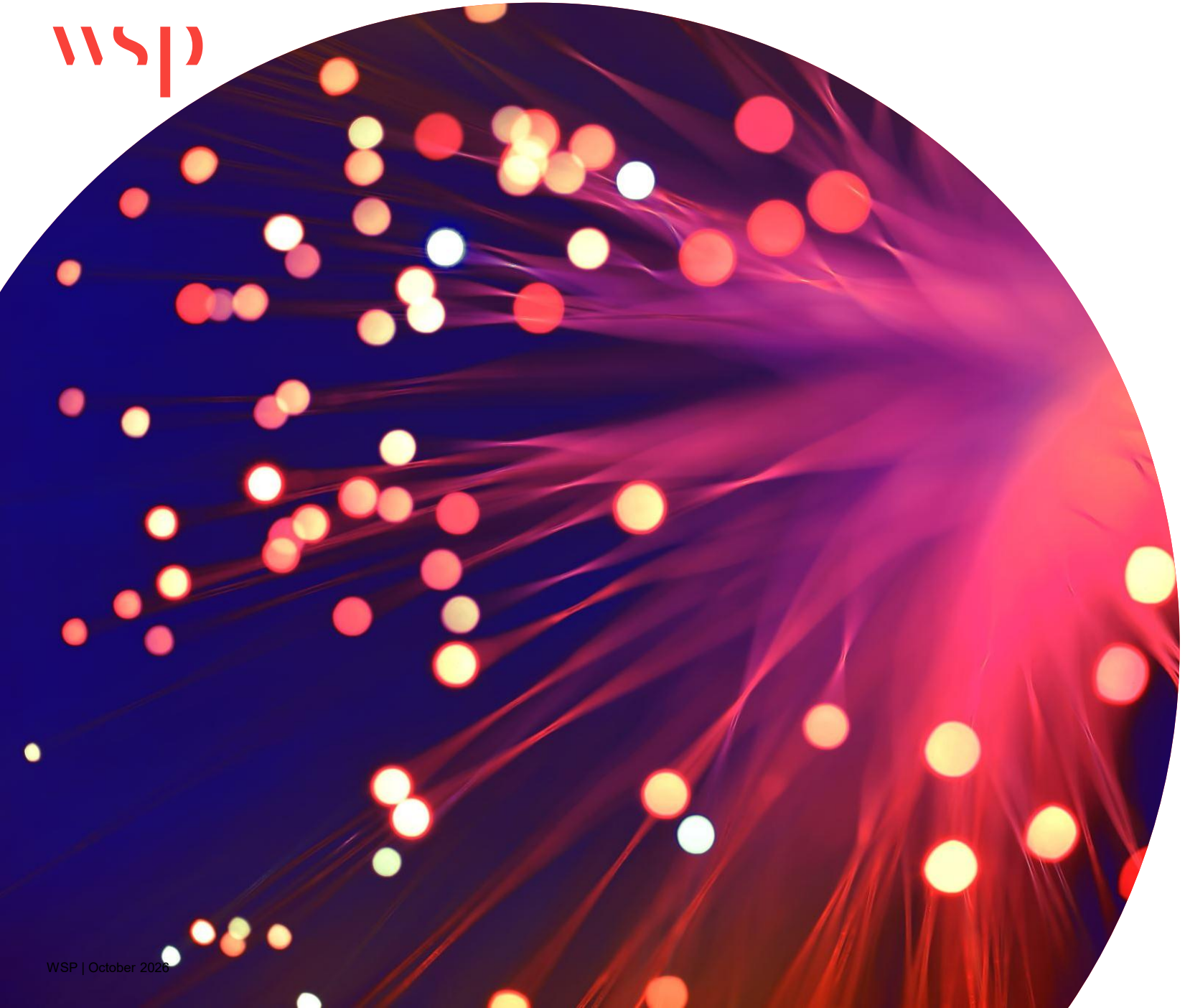


Whichever pathway Europe takes, the transition moves at the speed of grid connections and depot deployment

The faster pathway sees BET fleet energy demand reach 76.2 TWh/year in 2035, with associated charging capacity approaching 68 GW under STEPS. Delivering this expansion means securing increasingly scarce grid capacity, in competition with industry, data centres and housing.

With long grid lead times, transport projects must be sufficiently mature to secure connections while anticipatory investment brings new capacity online. Meeting EU electrification targets therefore depends on Member States, network operators and planning authorities turning those targets into timely infrastructure delivery.

That delivery also underpins the economic opportunity: by 2035, the faster pathway supports EUR 10.3 bn a year in GVA for charging, grid work, electricity supply and electric maintenance, activities with little scale today. If infrastructure lags, tighter targets risk adding compliance costs without delivering the expected emissions reductions or industrial benefits.



The value lost in a declining ICE sector is more than recovered only if industrial success is matched

Activity is not disappearing; it is moving. EU revenue from diesel trucks falls from around EUR 40 bn today to EUR 31 bn on the slower pathway and EUR 21 bn on the faster one. But stronger growth in electric vehicles and their supply chains means that GVA across OEMs and the upstream supply chain rises by around a quarter under the faster pathway, while remaining broadly flat under the slower one.

The aggregate can look benign while the distributional outcome is severe for specific regions, suppliers and skill sets, which may need transitory compensation.

The causal link: on the faster pathway every EUR 1 of ICE manufacturing value lost is replaced by roughly EUR 1.5 of electric value - on the slower pathway, only about EUR 1.1.



The energy-security benefit is nearly twice as large on the faster pathway, but only partially realised by 2035 in either case

Electrifying around 20% of the fleet on the faster pathway displaces some 21 bn litres of diesel a year, against around 11 bn on the slower one. Because freight activity grows around 18%, diesel use still falls only around 5% on the faster pathway and rises on the slower one.

The exposure also changes rather than disappears; oil dependency is partly traded for electricity system capacity and upstream materials, and the fleet still spends roughly EUR 5 on diesel for every EUR 1 on electricity.

Battery cells are where a success scenario decides whether climate policy becomes industrial value or an import bill

Cells are where Europe is weakest and where policy leverage is greatest. EU manufacturers meet around 8% of EU truck cell demand today; the model assumes around 15% by 2035 on the slower pathway and around 35% on the faster one.

That difference is worth roughly seven times the cell value captured in Europe, from about EUR 0.4 bn to EUR 2.9 bn a year. Even at 35%, more than EUR 5 bn of an EUR 8 bn EU truck-cell market still leaves Europe annually.

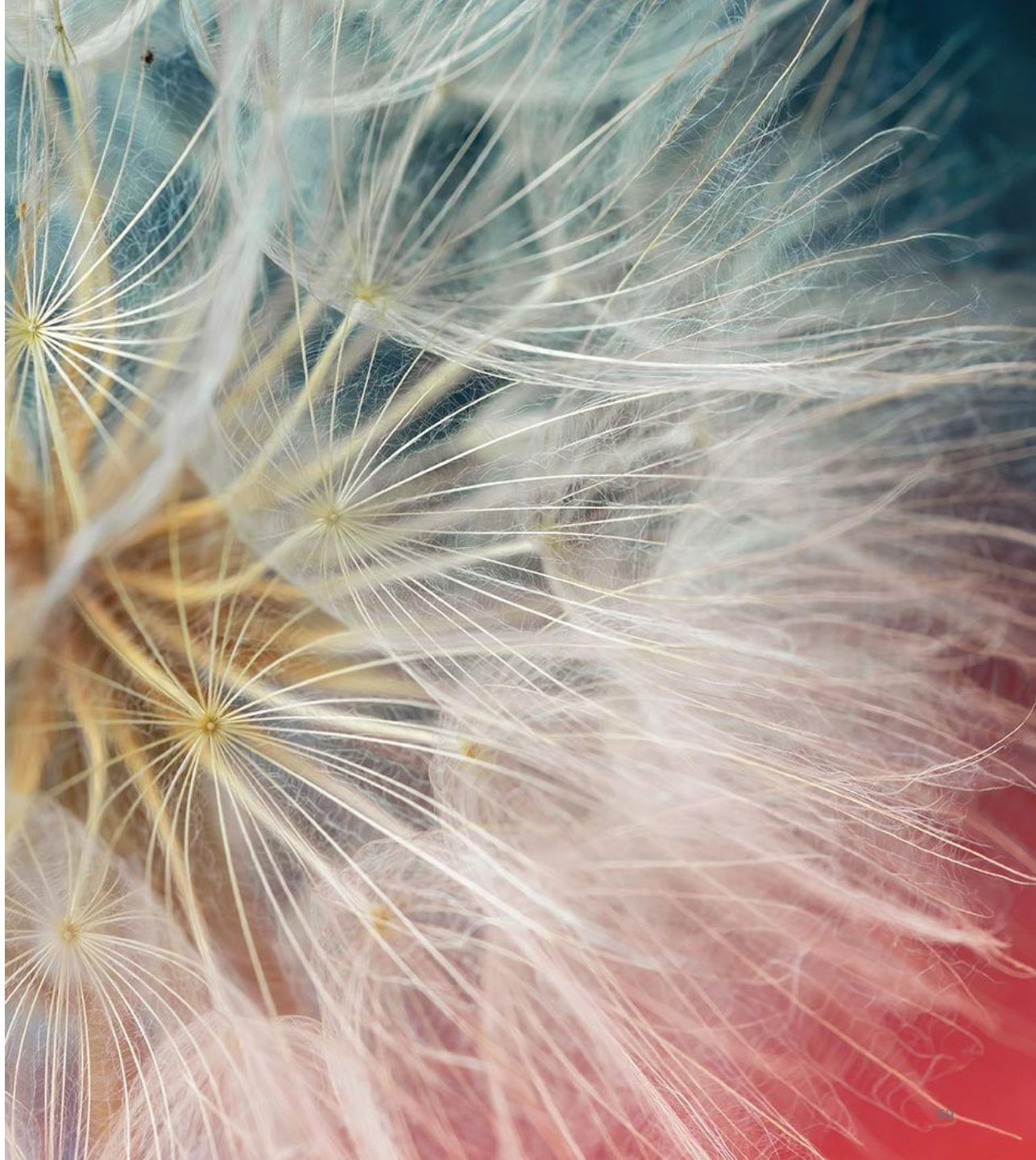
Without domestic cell capacity, faster electrification converts European climate success into demand for imported value - the emissions objective is met while the industrial dividend is exported, and dependency on oil is exchanged for dependency on a narrower supply base.

Each 10 percentage points of cell localisation is worth roughly EUR 0.8 bn a year in captured value. Nothing else in the analysis moves the industrial outcome as much.



APPENDIX 1

SOURCES USED FOR SCENARIO DEFINITION AND DETAILS OF CALCULATIONS



Sources used to create the scenarios (1/3)

Author	Year	Title	Link
ACEA	2026	HDV CO_2 amendment offers temporary flexibility, but faster review must address growing enabling conditions gap	https://www.acea.auto/press-release/hdv-co2-amendment-offers-temporary-flexibility-but-faster-review-must-address-growing-enabling-conditions-gap/
ACEA	2026	Mapping Europe's zero-emission transformation	Mapping Europe's zero-emission transformation - ACEA - European Automobile Manufacturers' Association
ACEA	2026	NEW COMMERCIAL VEHICLE REGISTRATIONS, EUROPEAN UNION	https://www.acea.auto/files/Press_release_commercial_vehicle_registrations_Q1-2026.pdf
ACEA	2025	Economic and Market Report: Global and EU auto industry — Full year 2024	https://www.acea.auto/publication/economic-and-market-report-global-and-eu-auto-industry-full-year-2024/
ACEA	2025	DECARBONISING HEAVY-DUTY ROAD TRANSPORT STATE OF THE ENABLING CONDITIONS	https://www.acea.auto/files/Decarbonising-heavy-duty-road-transport_State-of-the-enabling-conditions.pdf
ACEA	2025	VEHICLES ON EUROPEAN ROADS	https://www.acea.auto/files/ACEA_Report_-_Vehicles_on_European_roads_2025.pdf
Advanced Propulsion Centre UK	2026	Automotive industry demand forecast: Q4 2025	https://www.apcuk.co.uk/wp-content/uploads/2026/03/Q4-2025-Quarterly-Demand-Report-March-2026.pdf
Boston Consulting Group	2023	Emissions mandates will remake Europe's trucking industry	https://www.bcg.com/publications/2023/how-does-europes-shift-to-zero-emission-vehicles-impact-trucking-industry
Draghi	2024	The future of European competitiveness	https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The%20future%20of%20European%20competitiveness_%20In-depth%20analysis%20and%20recommendations_0.pdf
electrive / Milence	2025	Building Europe's largest public charging network for heavy-duty vehicles — Tobias Prenzel from Milence	https://www.electrive.com/2025/01/27/building-europes-largest-public-charging-network-for-heavy-duty-vehicles-tobias-prenzel-from-milence/
European Commission	2025	Lorries, buses and coaches	https://climate.ec.europa.eu/eu-action/transport-decarbonisation/road-transport/lorries-buses-and-coaches_en

Sources used to create the scenarios (2/3)

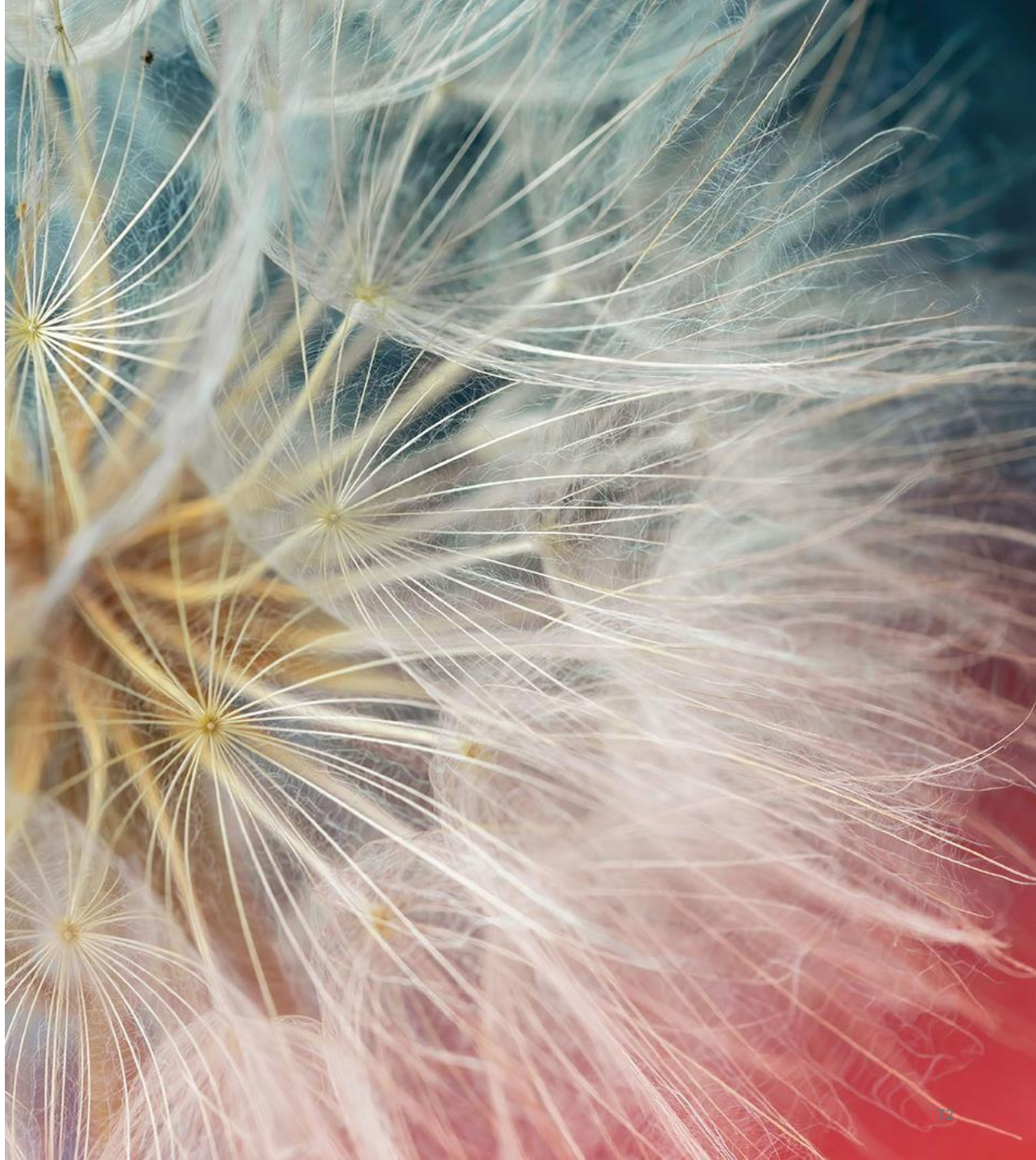
Author	Year	Title	Link
European Commission	2023	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2019/1242 as regards strengthening the CO_2 emission performance standards for new heavy-duty vehicles and integrating reporting obligations, and repealing Regulation (EU) 2018/956	https://climate.ec.europa.eu/system/files/2023-02/policy_transport_HGV_20230214_impact_assessment_en_0.pdf
European Union	2024	Regulation (EU) 2024/1610 amending Regulation (EU) 2019/1242 as regards strengthening CO_2 emission performance standards for new heavy-duty vehicles	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401610
European Union	2023	Regulation (EU) 2023/1804 on the deployment of alternative fuels infrastructure — AFIR	https://eur-lex.europa.eu/eli/reg/2023/1804/oj/eng
Global EV Data Explorer	2026	Global EV Data Explorer	https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer
Global Market Insights	2026	Electric Trucks Market Size & Share 2026–2035	https://www.gminsights.com/industry-analysis/electric-truck-market
IEA	2026	Global EV Outlook 2026	https://iea.blob.core.windows.net/assets/cf4dc532-a902-4b9c-943f-d20b9d149734/GlobalEVOutlook2026.pdf
IEA	2025	Global Critical Minerals Outlook 2025	https://iea.blob.core.windows.net/assets/ef5e9b70-3374-4caa-ba9d-19c72253bfc4/GlobalCriticalMineralsOutlook2025.pdf
IEA	2024	European Critical Raw Materials Act — policy database	https://www.iea.org/policies/17662-european-critical-raw-materials-act
ICCT	2026	Race to zero: European heavy-duty vehicle market development quarterly, January–December 2025	https://theicct.org/wp-content/uploads/2026/03/ID-565-%E2%80%93-EU-HDV-Q1%E2%80%93Q4-2025_market-spotlight_final-1.pdf
ICCT	2025	Race to zero: European heavy-duty vehicle market development quarterly, January–September 2025	https://theicct.org/publication/r2z-eu-hdv-market-development-quarterly-january-september-2025-dec25/
ICCT	2025	Charging infrastructure needs for battery electric trucks in the European Union by 2030	https://theicct.org/publication/charging-needs-battery-electric-trucks-europe-oct25/
ICCT	2024	The revised CO_2 standards for heavy-duty vehicles in the European Union	https://theicct.org/wp-content/uploads/2024/05/ID-130-%E2%80%93-EU-CO2_policy_update_final.pdf
ICCT	2023	THE EUROPEAN HEAVY-DUTY VEHICLE MARKET UNTIL 2040: ANALYSIS OF DECARBONIZATION PATHWAYS	https://theicct.org/wp-content/uploads/2023/01/hdv-europe-decarb-costs-jan23.pdf
ICCT/Fraunhofer	2026	Spatiotemporal Analysis of Electric Truck Charging Demand in Europe	Spatiotemporal analysis of electric truck charging demand in Europe - International Council on Clean Transportation

Sources used to create the scenarios (3/3)

Author	Year	Title	Link
Invest International	2026	Invest International fuels Milence's European EV truck charging expansion	https://investinternational.nl/news-items/invest-international-fuels-milences-european-ev-truck-charging-expansion/
McKinsey & Company	2025	Europe's zero-emission truck transition: Key for decarbonisation — and competitiveness	https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/europes-ze-truck-transition-key-for-decarbonization-and-competitiveness
McKinsey & Company	2024	Building Europe's electric-truck charging infrastructure	https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/building-europes-electric-truck-charging-infrastructure
Oeko-Institut & Fraunhofer	2025	Truck depot charging	https://uploads.transportenvironment.org/production/files/TE_truck-depot-charging_final-report.pdf
Profundo	2026	Investments by European truck manufacturers into zero-emission technologies	https://uploads.transportenvironment.org/production/files/EuropeanTruckCompanies2025-Final-6Jan2026.pdf?dm=1777974088
Smart Freight Centre / BloombergNEF	2026	Zero-Emission Commercial Vehicles Building Momentum	https://smartfreightcentre.org/news/13440852
Strategy&	2024	Battery-electric trucks on the rise	https://www.strategyand.pwc.com/de/en/industries/transport/truck-study.html
Strategy&	2023	European Fleet Electrification — From Electric Vehicle Sales to a Complete Fleet Transition	Fraunhofer ISI study
Transport & Environment	2026	Zero-emission trucks in Europe — the road so far	https://www.transportenvironment.org/articles/zero-emission-trucks-in-europe-the-road-so-far
Transport & Environment	2023	Addressing the heavy-duty climate problem — Addendum	https://uploads.transportenvironment.org/production/files/2023_06_climate_addendum_final.pdf
Transport & Environment	2023	Fully charged for 2030	https://www.transportenvironment.org/articles/fully-charged-for-2030
Transport & Environment / BCG	2023	Impact Assessment of the Transition to Zero-Emission Trucks in Europe	https://uploads.transportenvironment.org/production/files/20230919-Transport-Environment_EU-Truck-CO2-Standards_Final_Report_TE_vF.pdf?dm=1727704635
Transport & Energy / Milence	2025	Milence gets €111m EU funding for alternative fuel infrastructure	https://transportandenergy.com/2025/02/12/milence-gets-e111m-eu-funding-for-alternative-fuel-infrastructure/
Transport & Environment / TNO	2022	Electric trucks take charge	https://uploads.transportenvironment.org/production/files/202210_TNO_-techno_economic_uptake_potential_of_zero_emission_trucks_in_Europe.pdf?dm=1714404392
TU Wien	2026	The future of truck transport in the EU: A scenario analysis based on economic and carbon assessments	https://dadun.unav.edu/entities/publication/a8adf13b-6d6b-4bf1-8e85-dd1ed5efe592
Volvo Group / Milence	2025	Charging ahead with Milence	https://www.volvogroup.com/en/sustainable-transportation/sustainable-solutions/Shaping-the-future-of-transport/charging-ahead.html

APPENDIX 2

DETAILED ASSUMPTIONS AND INTERMEDIATE RESULTS



Illustrative ecosystem participants across the ZET value chain

Heavy Goods Vehicle OEMs

HGV manufacturers

Engineering and manufacturing of conventional and battery-electric trucks

Examples: MAN, Scania, Mercedes-Benz Trucks, Volvo Trucks, IVECO, DAF and Renault Trucks.

Electric powertrain

E-axles and e-drive, traction motors, inverters, converters and power electronics, driveline and mechanical integration

Examples: ZF, Bosch, Valeo, Dana, Continental, Schaeffler, Mahle, Marelli

Software and connectivity

OTA, telematics, energy optimisation and fleet services

Examples: Fleetboard/OMNIplus, Volvo Connect, Scania Fleet, Webfleet, Targa Telematics, RIO, PACCAR Connect

Fleet ecosystem and freight demand

Shippers and cargo owners

Shippers, freight buyers and logistics contracts influence the expectations that fleets must meet.

Examples: Nestlé, PepsiCo, Unilever, IKEA, Amazon

Freight forwarders and logistics providers

Load matching, route allocation and network nodes coordination

Examples: DB Schenker, Kuehne+Nagel, DSV, GEODIS

Maintenance and service

Repairs, tyres, inspections, parts and roadside assistance

Examples: Euromaster, TIP Group, Michelin, OEM service networks

Charging providers

Charging hardware

DC/HPC/MCS chargers, cabinets, dispensers and cooling

Examples: ABB, Alpitronic, Kempower, Efacec, Circontrol

Power electronics

Transformers, switchgear, converters and protection

Examples: ABB, Siemens, Schneider Electric, Hitachi Energy

Charging networks and management platform

Operation, monitoring, billing, load management and remote operation

Examples: Milence, Fastned, Ionity, Allego, AMPECO, Last Mile Solutions, Optimile, Driivz

Grid operators / DSOs

TSO and generators

Bulk power, system adequacy and upstream capacity

REE, RTE, Terna, TenneT, Amprion and National Grid deliver transmission-network operation.

Demand forecasts, capacity maps and corridor planning

EU planning: ENTSO-E, ACER, DG ENER
National: RTE, TenneT, Terna, Red Eléctrica, Elia, 50Hertz, Amprion
Distribution: EU DSO Entity, Enedis, E-Distribuzione, UK Power Networks

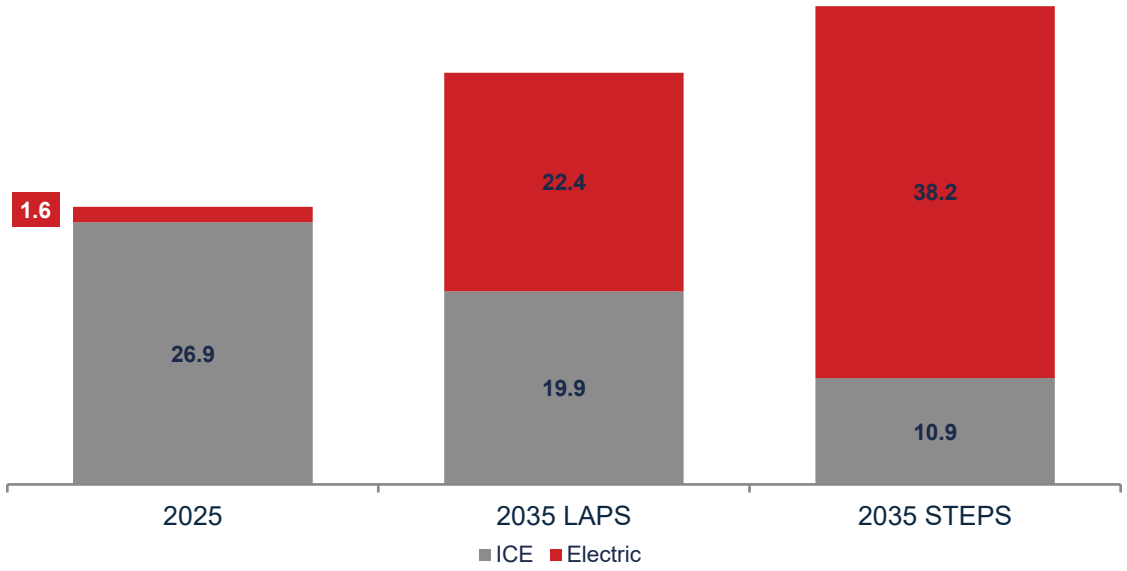
Equipment and demand interface

ABB, Siemens Energy, Schneider Electric and Prologis connect network capacity to operational demand.

EU market for ICE and electric N3 HGVS

HGV sales are the foundation of the market. With diesel HGV prices edging up on Euro 7 and ETS2 costs while BET prices fall sharply on cheaper batteries and scale, value shifts decisively from diesel to electric as the fleet turns over. The market grows in both scenarios, but the faster price convergence under STEPS brings the crossover forward.

EU market value of N3 ICE and electric HGV sales (€bn/yr)



KEY PRICE ASSUMPTIONS

ICE HGV: €111,000 average price baseline (2025)

Market-based estimate excl. VAT from 2026 listings for new Euro 6 diesel tractor units above 12t across DAF, MAN, Mercedes-Benz and Volvo.

ICE prices edge up to 2035

Euro 7 from 2027 adds aftertreatment content and ETS2 costs are partly passed through; unit-cost diseconomies grow as volumes fall.

BET: €320,000 average price baseline (2025)

Reuters (March 2026) European average for electric heavy freight HGV, applicable to N3 goods vehicles above 12t.

Electric prices fall sharply to 2035

Battery-cost declines, scale economies and Chinese competition drive costs down, with BETs already near TCO parity in much of Europe.

Average selling price (€ per vehicle, excl. VAT)

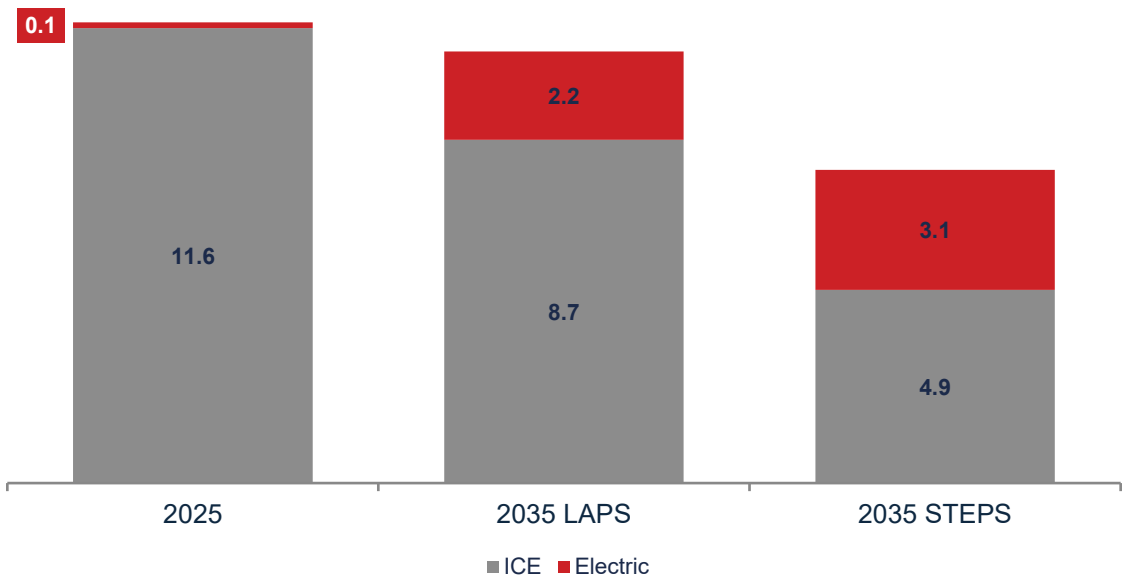
Key variable	2025	LAPS 2035	STEPS 2035
ICE N3 HGV	€111,000	€115,000	€122,000
Electric N3 HGV	€320,000	€270,000	€230,000

Sources: Baseline - truck1.eu and planet-trucks.com listings (2026); Reuters (Mar 2026); ERFT TCO study. LAPS/STEPS - WSP analysis.

EU market for N3 HGV powertrain components

Powertrain value depends on how much of the vehicle price sits in the driveline. Because the electric drivetrain is assumed to be a far smaller share of price than a diesel driveline, and that share falls further under STEPS as motor and power-electronics costs come down, the value available to powertrain suppliers shrinks as the fleet electrifies.

EU market value of powertrain components for N3 ICE and electric HGVs (€bn/yr)



KEY VALUE-SHARE ASSUMPTIONS

ICE powertrain: 43% of HGV price (2025)

ICCT/Ricardo's eTruck Virtual Teardown puts the ICE powertrain at 43% of total diesel HGV cost.

Euro 7 lifts the ICE share to 2035

Euro 7 from 2027 modestly raises powertrain and aftertreatment content: 44% under LAPS and 45% under STEPS.

Electric drivetrain: 9% of price (2025)

ERM's March 2026 BET pricing report: £27,000 powertrain on £285,000 total cost, excluding the battery.

Scenarios diverge by 2035

LAPS 10% as slow volumes limit drivetrain cost cuts; STEPS 8% as EU scale and TCO parity push motor and power-electronics costs down.

Powertrain share of total vehicle selling price

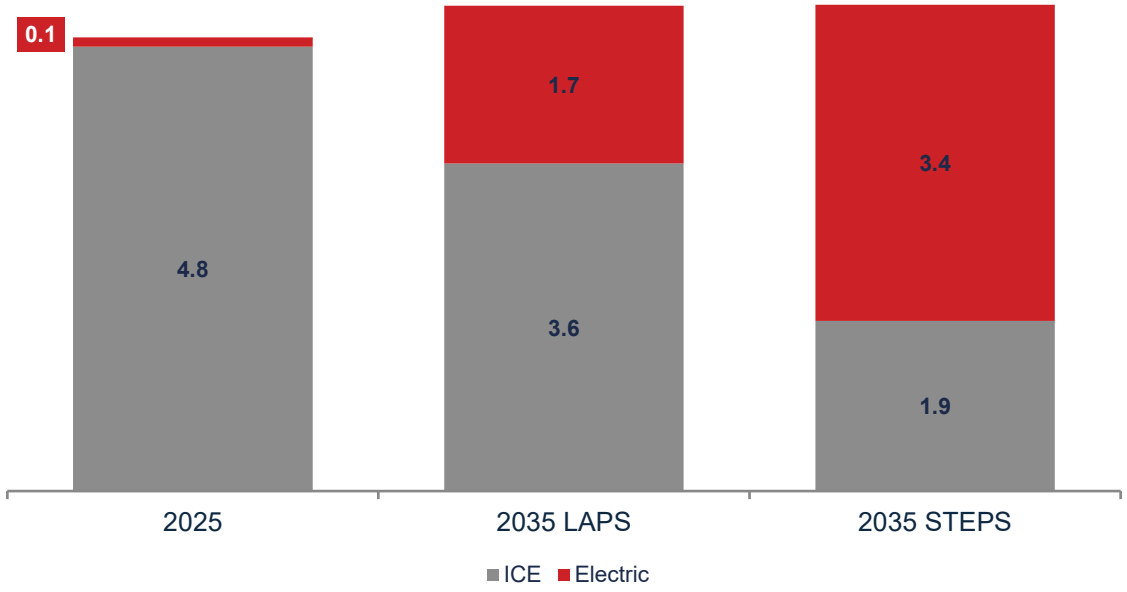
Key variable	2025	LAPS 2035	STEPS 2035
ICE powertrain share	43%	44%	45%
E-axle, motors & power electronics	9%	10%	8%

Sources: Baseline - ICCT/Ricardo eTruck Virtual Teardown (2022); ERM BET upfront pricing report (Mar 2026). LAPS/STEPS - WSP analysis.

EU market for N3 HGV shared components

Shared components are common to both technologies, and their underlying cost is assumed to be broadly unchanged. Value lost as diesel HGV sales fall is therefore recovered as electric sales rise. The segment stays largely stable in both scenarios.

EU market value of shared components for N3 ICE and electric HGVs (€bn/yr)



KEY VALUE-SHARE ASSUMPTIONS

ICE shared components: 18% (2025)

ICCT/Ricardo's eTruck Virtual Teardown puts non-powertrain glider parts (chassis, cab, body and harnesses) at 18% of HGV cost.

ICE share broadly stable to 2035

Edges down slightly as powertrain and aftertreatment content rises: 18% under LAPS and 17% under STEPS.

Electric shared components: 6% (2025)

The ICCT/Ricardo's eTruck Virtual Teardown holds the glider cost constant; set against the higher electric selling price it equals a 6% share.

Electric share rises to 2035

With shared-component costs stable, falling total electric truck prices lift the share to 8% under LAPS and 9% under STEPS.

Shared-component share of total vehicle selling price

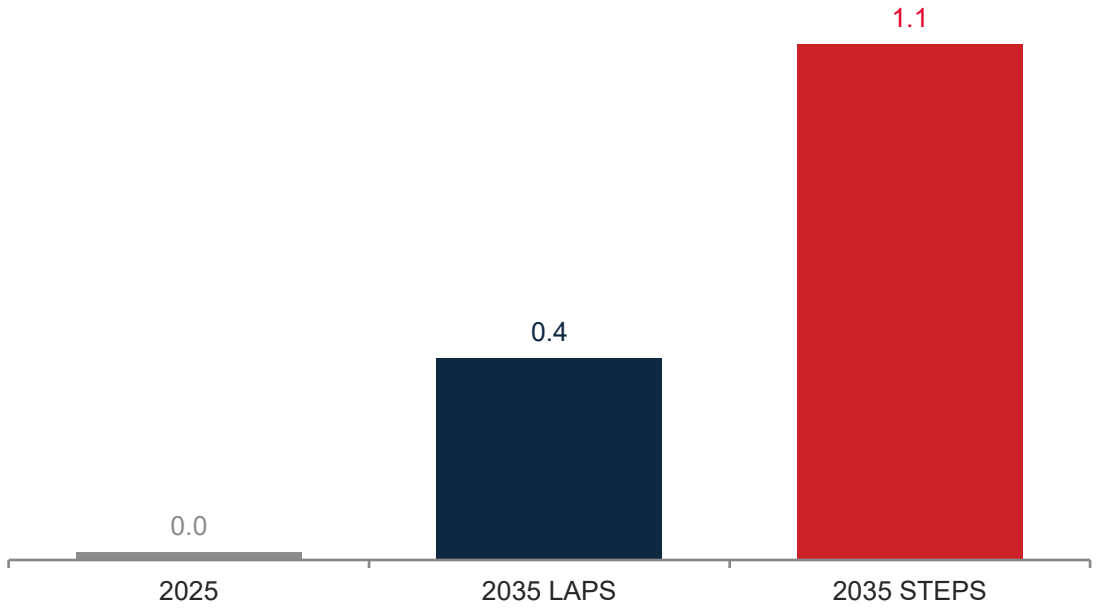
Key variable	2025	LAPS 2035	STEPS 2035
ICE HGV	18%	18%	17%
BET	6%	8%	9%

Sources: Baseline - ICCT/Ricardo eTruck Virtual Teardown (2022). LAPS/STEPS - WSP analysis.

EU market for N3 HGV software and digitalisation

Software is a small share of BET value today, but increasing connectivity is assumed to lift content per truck substantially. That rising share applied to a rapidly growing electric fleet compounds into steep growth, strongest under STEPS where both digitisation and adoption move fastest..

EU market value of OTA software and digitalisation for N3 BET (€bn/yr)



KEY VALUE-SHARE ASSUMPTIONS

Software: 1% of vehicle price (2025)

McKinsey's software and electronics outlook implies ~€3,322 of content per vehicle, or ~1% of the €320,000 BET price.

Content rises with digitisation

Connected services and OTA updates lift software content to 2% under LAPS and 3% under STEPS.

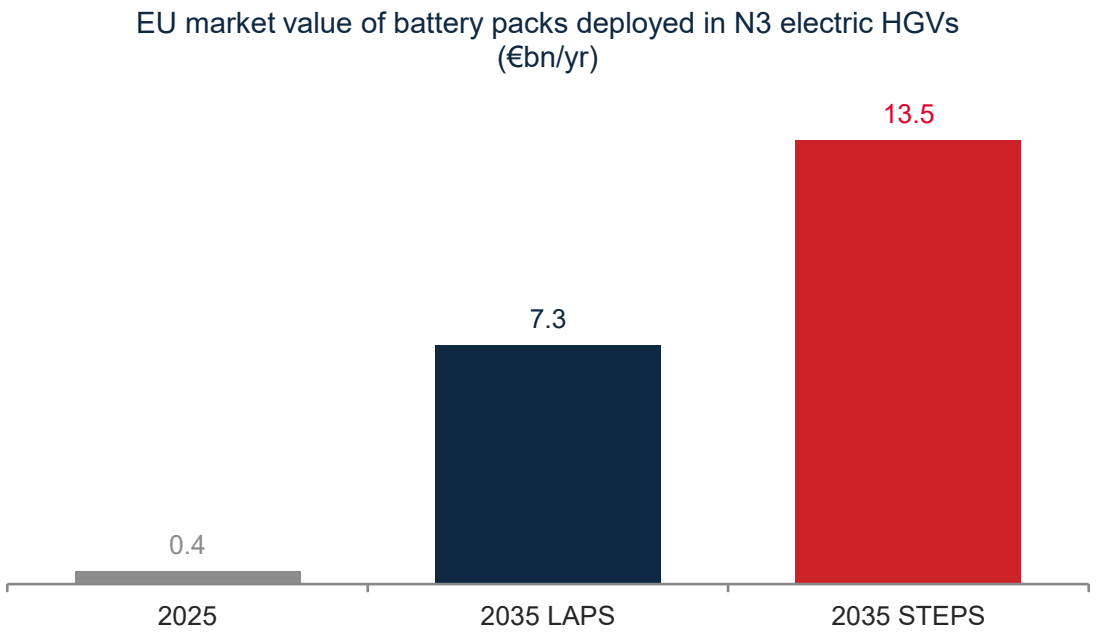
Software share of total BET selling price

Key variable	2025	LAPS 2035	STEPS 2035
OTA software & digitisation	1%	2%	3%

Source: Baseline - McKinsey automotive software and electronics landscape (2024). LAPS/STEPS - WSP analysis.

EU market for N3 HGV battery packs

Batteries are the defining cost of a BET. Continued declines in pack prices, driven by falling cell costs and scale, pull the market value down, but the volume of HGVs being electrified pulls it up far harder. Growth is substantial under both scenarios and strongest where deployment is fastest.



KEY PRICE ASSUMPTIONS

Pack price: €151/kWh (2025)

DOE's January 2025 cost report averages Class 7 tractor, Class 8 transit and regional packs at $172/kWh, converted at €1 = $1.1394.

Packs keep getting cheaper to 2035

BNEF records a 93% fall since 2010 and −8% in 2025; expected battery cost reductions from previous WSP modelling give €117/kWh under LAPS and €109/kWh under STEPS.

Average battery pack price (€ per kWh)

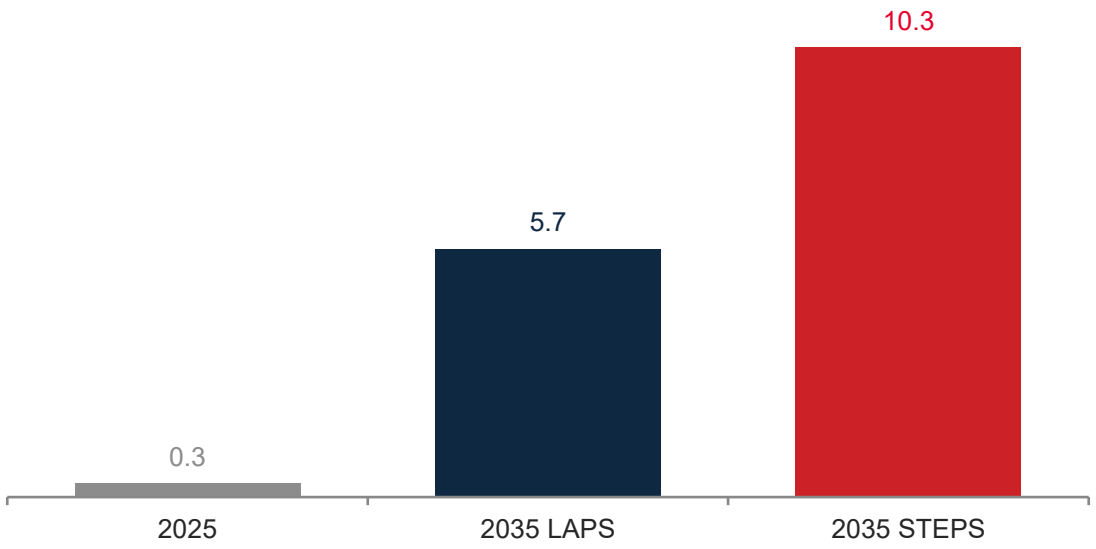
Key variable	2025	LAPS 2035	STEPS 2035
Battery pack price	€151	€117	€109

Sources: Baseline - US DOE incremental purchase cost report (Jan 2025). LAPS/STEPS - BNEF battery price survey (2025).

EU market for N3 HGV battery cells

Cells account for most of what a pack is worth, so this market follows the pack market closely. Because improving cell-to-pack integration is assumed to trim the cell share over time, cell value grows slightly slower than the packs containing it. The scenario spread otherwise mirrors the pace of electrification.

EU market value of battery cells deployed in N3 electric HGVs (€bn/yr)



KEY VALUE-SHARE ASSUMPTIONS

Cells: 80% of pack price (2025)

BloombergNEF's 2025 Battery Price Survey puts BET battery cells at 80% of total battery pack price.

Cell share eases to 2035

Cell-to-pack integration improves, trimming the cell share to 78% under LAPS and 76% under STEPS.

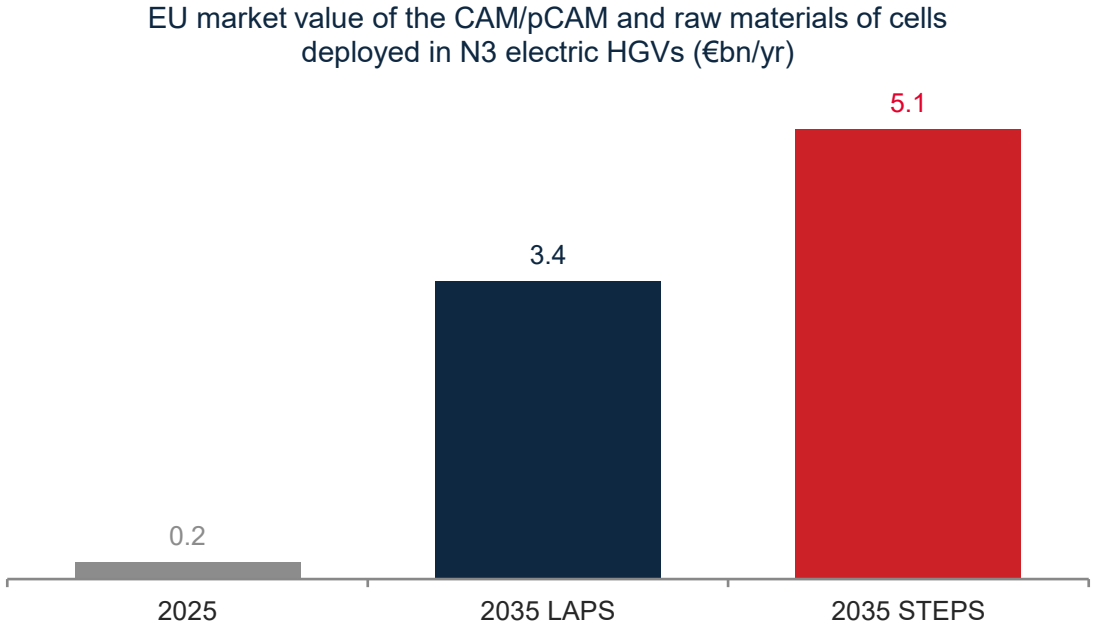
Cell share of total battery pack price

Key variable	2025	LAPS 2035	STEPS 2035
Battery cell	80%	78%	76%

Source: Baseline - BloombergNEF 2025 Battery Price Survey. LAPS/STEPS - WSP analysis.

EU market for N3 HGV cell materials

Materials sit at the base of the battery chain. The scenarios pull against each other here: STEPS delivers a far larger cell market but assumes a materially lower material share as EU processing and recycling capture value further up the chain, while LAPS holds the share high on continued import dependence.



KEY VALUE-SHARE ASSUMPTIONS

Raw materials: 59% of cell cost (2025)

Fastmarkets' NCM-811 breakdown sums material inputs to 58.5%; ACEA's supply-chain fact sheet corroborates ~60% for active materials.

Scenarios diverge sharply by 2035

LAPS holds at 60% with continued import dependence; STEPS falls to 50% as EU cell manufacturing, processing and recycling capture more value.

CAM/pCAM and raw material share of total cell cost

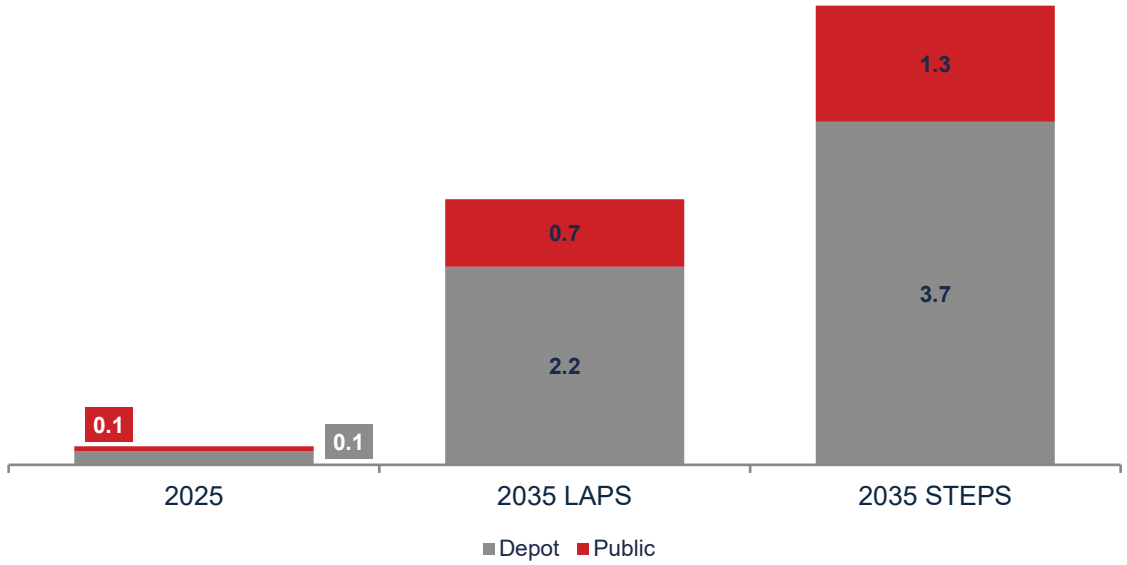
Key variable	2025	LAPS 2035	STEPS 2035
CAM/pCAM & raw materials	59%	60%	50%

Sources: Baseline - Fastmarkets Battery Cost Index (2024); ACEA EU battery supply chain fact sheet (2025). LAPS/STEPS - WSP analysis.

EU market for N3 HGV charging hardware

Charging hardware demand is set by the fleet it serves. Unit prices fall in both scenarios as volumes build and megawatt charging scales, but deployment grows much faster, so the market expands regardless. The assumed charging mix keeps depot the larger of the two segments throughout.

EU market value of depot and public charging infrastructure serving N3 BETs (€bn/yr)



KEY PRICE ASSUMPTIONS

Depot charger: €60,000 per unit (2025)

Midpoint of EU Energy's €40,000–€80,000 hardware range for 150 kW DC chargers, the average depot speed assumed in Part 1.

Depot unit prices fall on volume

Volume-driven €/kW declines are partly offset by the shift to 400 kW+ depot units: €52,000 under LAPS and €45,000 under STEPS.

Public charger: €290,000 per unit (2025)

Blend of a €150,000 350 kW unit and a €429,000 1 MW MCS proxy, on the 50/50 DC ultra-fast/MSC public split assumed in Part 1.

MCS drives the steepest falls

Scaling MCS volumes lower the blended public unit price to €250,000 under LAPS and €215,000 under STEPS.

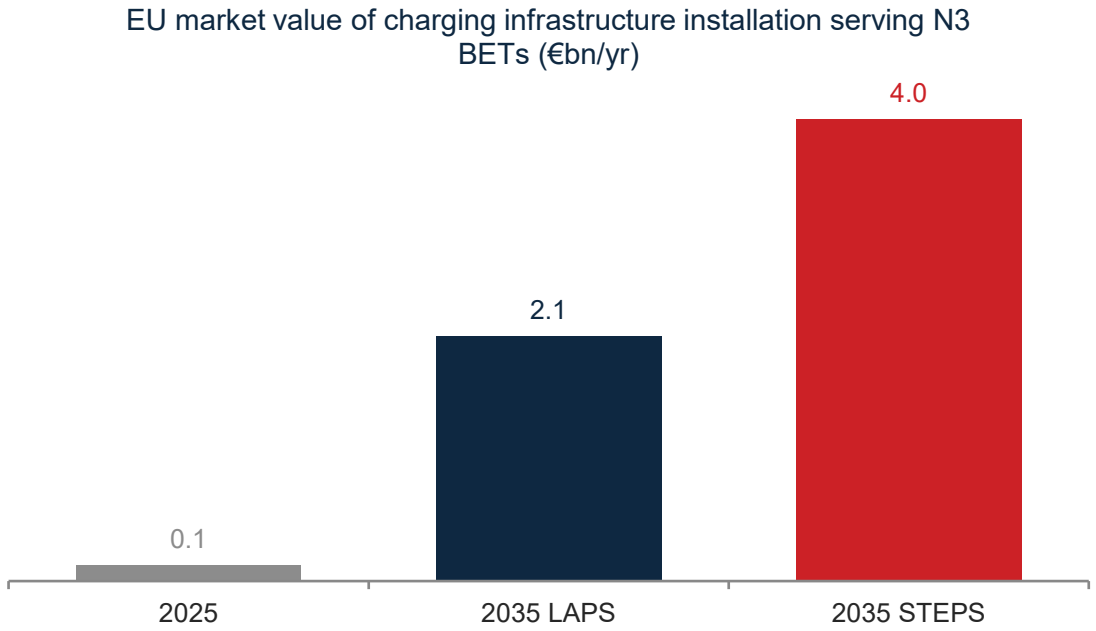
Average charging hardware unit price (€)

Key variable	2025	LAPS 2035	STEPS 2035
Depot charger (150 kW)	€60,000	€52,000	€45,000
Public charger (350 kW/MCS)	€290,000	€250,000	€215,000

Source: Baseline - EU Energy charger hardware cost breakdown (2026). LAPS/STEPS - CPO workshop.

EU market for charging installation and commissioning

Because installation is labour-intensive, costs are assumed to fall only slowly even with modular and prefabricated build, so the market tracks the pace of deployment almost directly. It ends up comparable in scale to the hardware market itself.



KEY COST ASSUMPTIONS

Installation: €285m per GW (2025)

Midpoint EU Energy installation costs give €267/kW at 150 kW and €357/kW at 350 kW and MCS, weighted 80/10/10 per the Part 1 charging mix.

Modular build cuts costs to 2035

Installation is labour-intensive and sticky, but prefabricated and modular units bring it to €270m/GW under LAPS and €255m/GW under STEPS.

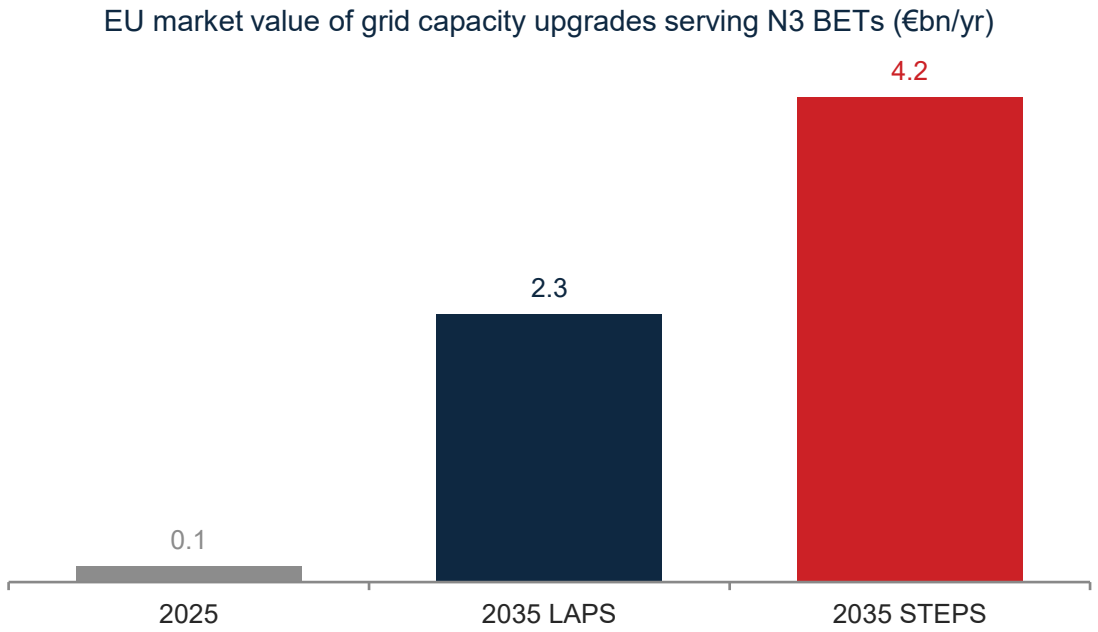
Installation and commissioning revenue (€ per GW)

Key variable	2025	LAPS 2035	STEPS 2035
Installation & commissioning	€285m	€270m	€255m

Source: Baseline - EU Energy charger hardware cost breakdown (2026). LAPS/STEPS - CPO workshop.

EU market for N3 HGV grid connection upgrades

Grid connection is the enabling investment behind the network. The scenarios partly offset: LAPS deploys less but at higher per-GW cost as congestion and permitting delays persist, while STEPS deploys more at lower cost as grid planning and anticipatory investment take effect.



KEY COST ASSUMPTIONS

Grid upgrades: €500,000 per MW (2025)

Average of EU Energy's site-level envelope (€0.51bn/GW) and the UC Davis distribution-grid estimate (€0.46bn/GW).

Congestion and permitting set the path

LAPS holds costs at €520m/GW on persistent congestion; STEPS eases to €470m/GW as grid action plans and anticipatory investment take effect.

Derived from two independent estimates

EU Energy implies €510/kW at a 500 kW site; UC Davis/PNAS implies €456m/GW. Averaging gives €500,000 per MW.

Grid connection and transformer upgrade cost (€ per GW)

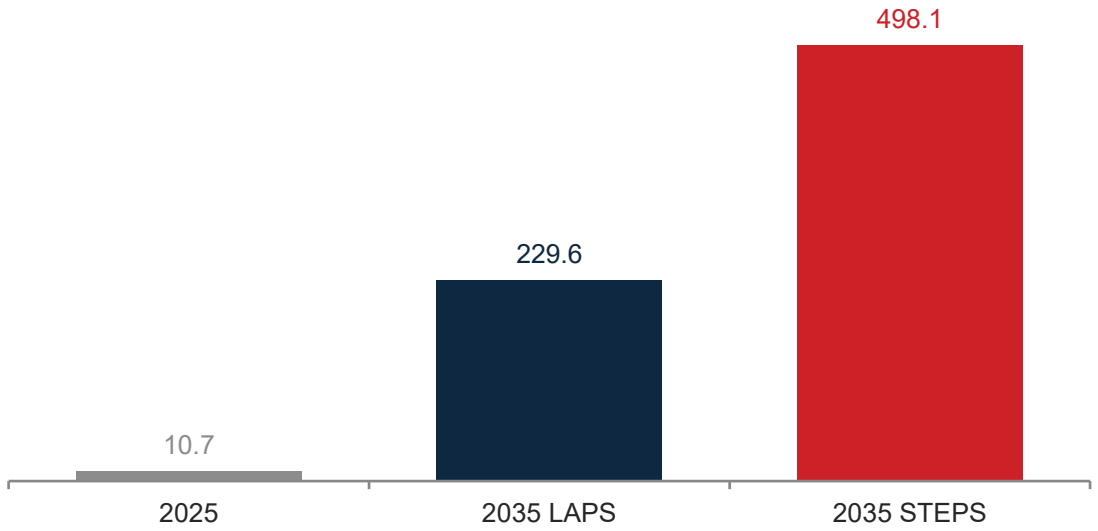
Key variable	2025	LAPS 2035	STEPS 2035
Grid connection & transformer	€500m	€520m	€470m

Sources: Baseline - EU Energy EV charging cost breakdown (2026); UC Davis / PNAS distribution grid study. LAPS/STEPS - WSP analysis.

EU market for smart charging and grid integration

Smart charging is the smallest segment here but the fastest growing. It gains twice over, from a larger grid investment programme and from an assumed rising share of that spend going to flexibility and digital integration. Both effects are stronger under STEPS.

EU market value of smart charging and grid integration serving N3 BETs (€m/yr)



KEY VALUE-SHARE ASSUMPTIONS

Smart charging: ~8% of grid spend (2025)

Indicative baseline triangulated from the CPO workshop site-cost breakdown (~10% supporting infrastructure) and Nature Energy (2026).

Flexibility services scale to 2035

Digital flexibility and V2G markets growing at ~22–34% CAGR lift the share to 10% under LAPS and 12% under STEPS.

Share triangulated from two evidence points

CPO workshop puts supporting infrastructure at ~10% of site cost, and Nature Energy (2026) finds smart charging delivers up to 4.5% annual system-cost savings.

Smart charging share of total grid upgrade cost

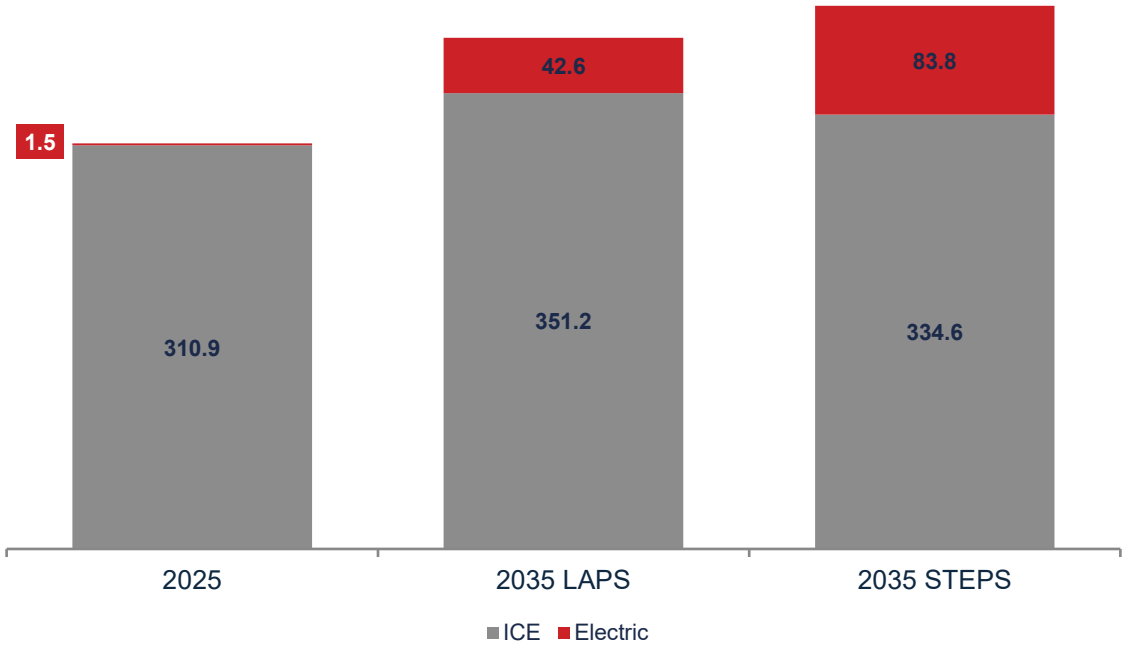
Key variable	2025	LAPS 2035	STEPS 2035
Smart charging & grid integration	8%	10%	12%

Sources: Baseline - CPO workshop site-cost breakdown; Nature Energy (2026). LAPS/STEPS - WSP analysis.

EU market for N3 HGV freight revenue

Freight revenue is the money moving through the sector and dwarfs the equipment markets. CO2-differentiated tolls, driver-cost inflation and ETS2 pass-through lift rates per kilometre in both scenarios. Because revenue is assumed to be powertrain-agnostic, the scenarios change who earns it rather than how much there is to earn.

EU market value of freight revenue from N3 ICE and BETs (€bn/yr)



KEY REVENUE ASSUMPTIONS

ICE freight revenue: €1.18/vkm (2025)

IRU and Logifie put all-in cost for a 40t HGV at €0.50–2.00/km, giving ~€1.50/km of revenue on loaded kilometres; adjusting for 21.6% empty running gives €1.18 per vehicle-km.

Tolls and carbon costs push rates up

CO_2-differentiated road charges, driver-cost inflation and ETS2 pass-through lift adjusted rates to €1.25/vkm under LAPS and €1.33/vkm under STEPS.

Electric revenue set equal to ICE

Freight revenue is powertrain-agnostic, shippers pay for delivery, not drivetrain, so no green premium is currently modelled.

Same trajectory to 2035

Electric rates follow the ICE path at €1.25/vkm under LAPS and €1.33/vkm under STEPS.

Freight revenue (€ per vehicle-km, adjusted for empty running)

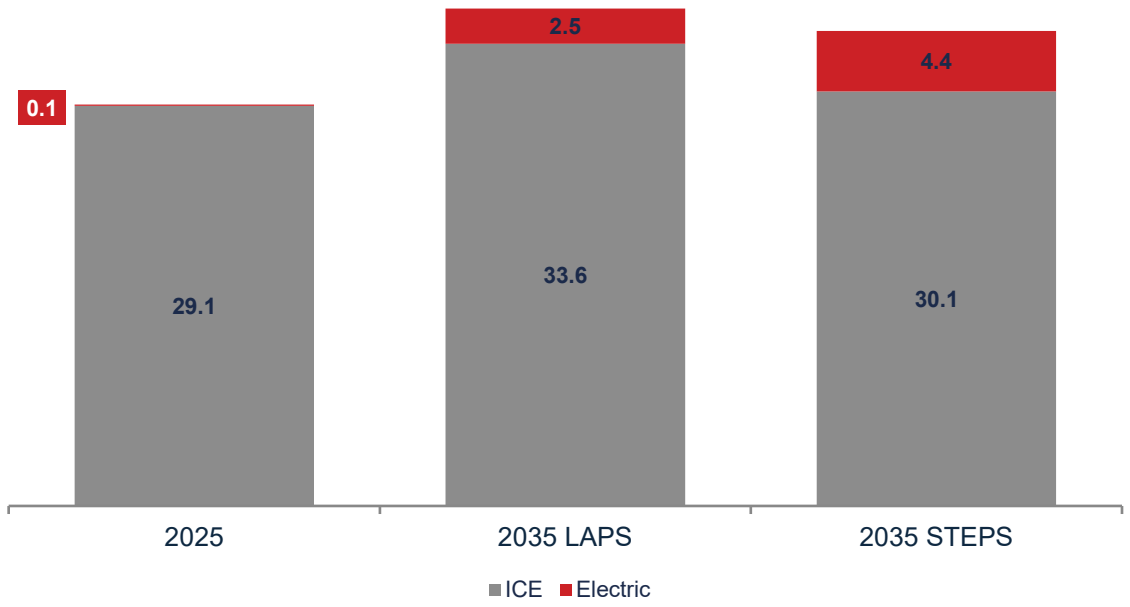
Key variable	2025	LAPS 2035	STEPS 2035
ICE N3 HGV	€1.18	€1.25	€1.33
Electric N3 HGV	€1.18	€1.25	€1.33

Sources: Baseline - Logifie truck operating cost per km (2026); IRU road freight rate data; Eurostat empty-running share (21.6%, 2024). LAPS/STEPS - WSP analysis.

EU market for N3 HGV maintenance and repair

Maintenance spend rises overall but its composition changes. Euro 7 complexity is assumed to raise upkeep for the residual diesel HGV fleet, while electric service costs fall further as servicing networks mature. Faster electrification under STEPS therefore shifts spend towards the cheaper powertrain and lowers the total bill.

EU market value of the maintenance and repair of N3 ICE and BETs (€bn/yr)



KEY COST ASSUMPTIONS

ICE maintenance: €0.11/km (2025)

Logifie's truck cost calculator puts maintenance plus tyres in a €0.07–0.14/km range for a 40t HGV.

Euro 7 raises ICE upkeep

Added complexity lifts diagnostics and parts costs for the residual ICE fleet to €0.12/km under both LAPS and STEPS.

Electric maintenance: €0.08/km (2025)

DOE and industry evidence show BET maintenance 25–40% below diesel, with fewer moving parts and regenerative braking.

The gap widens as EV servicing matures

Electric costs fall further to €0.075/km under LAPS and €0.07/km under STEPS.

Maintenance and repair cost (€ per km)

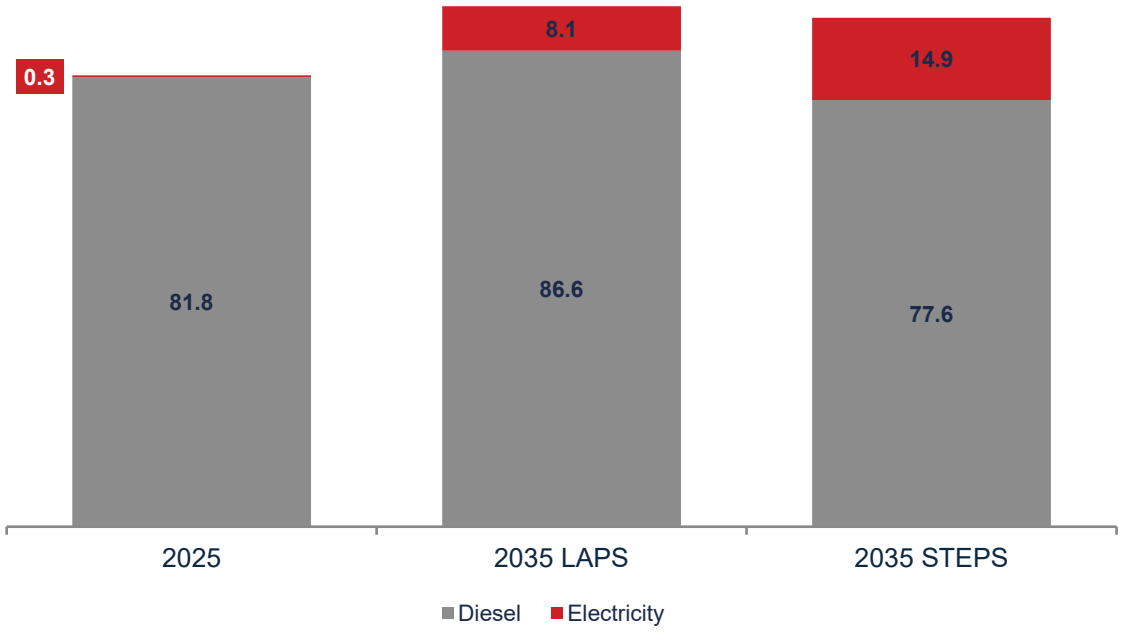
Key variable	2025	LAPS 2035	STEPS 2035
ICE N3 HGV	€0.11	€0.12	€0.12
Electric N3 HGV	€0.08	€0.075	€0.07

Sources: Baseline - Logifie truck operating cost calculator; US DOE and industry BET maintenance evidence. LAPS/STEPS - WSP analysis.

EU market for N3 HGV fuel and electricity prices

Energy is the largest ongoing operating cost. With the pre-tax diesel price and the blended charging electricity price both held flat in real terms, the outcome is driven entirely by fleet composition rather than by prices. STEPS moves more of the spend off fuel and onto the grid.

EU market value of diesel (ICE) and electricity (BET) used to fuel N3 HGVs (€bn/yr)



KEY PRICE ASSUMPTIONS

Diesel: €0.94 per litre, pre-tax (2025)

The €1.70/L EU average pump price (EC Weekly Oil Bulletin), net of 21.8% VAT and €0.458/L excise duty, gives an underlying product cost of €0.94/L.

Underlying diesel price held flat to 2035

Held at €0.94/L in real 2025 terms under both scenarios; ETS2 allowance costs are excluded as they transfer to the public sector rather than fuel-sector turnover.

Electricity: €196 per MWh, pre-tax (2025)

An 70% depot / 30% public charging mix blends the H2-2025 EU non-household price of €151.1/MWh with public charging at €300/MWh, giving a blended price of €195.77/MWh.

Electricity price held flat in real terms

€196/MWh is applied across all scenarios to 2035, reflecting downward pressure from renewables and storage offset by uncertainty over future network and system charges.

Fuel and electricity price assumptions (diesel pre-tax)

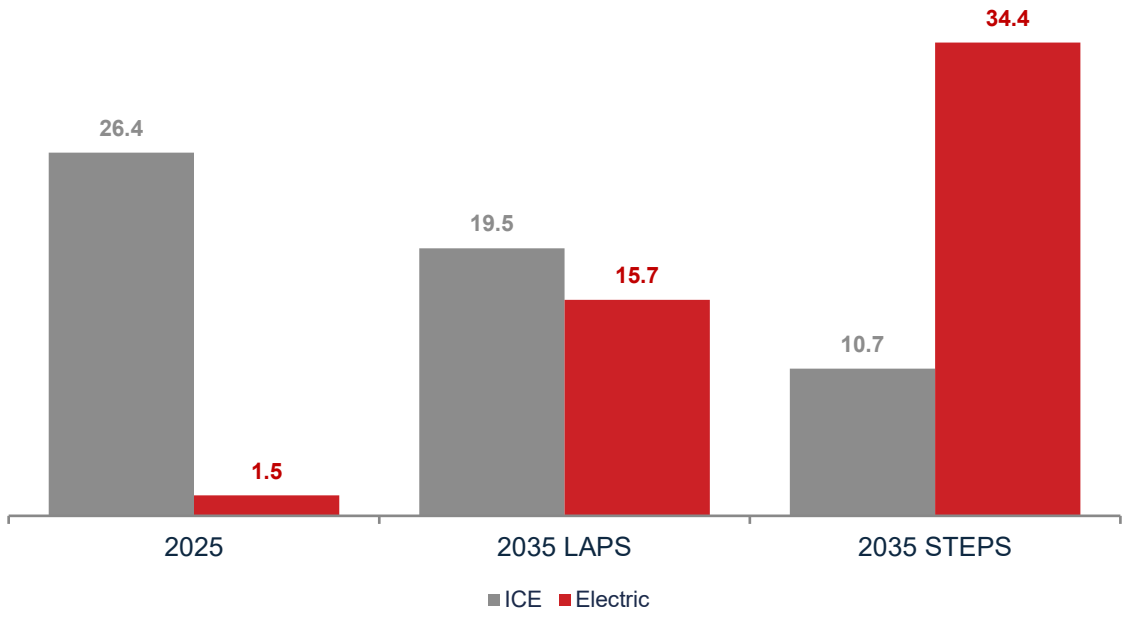
Key variable	2025	LAPS 2035	STEPS 2035
Diesel, pre-tax (€/litre)	€0.94	€0.94	€0.94
Charging electricity (€/MWh)	€195.77	€195.77	€195.77

Sources: Baseline - EC Weekly Oil Bulletin; EU VAT and diesel excise duty rates; Eurostat non-household electricity prices (H2-2025); BNEF. LAPS/STEPS - WSP analysis.

Domestic capture of the EU market for ICE and electric N3 HGVs

EU manufacturers hold the diesel N3 market almost completely and that is assumed to persist, so the contest is over the electric N3 market: new entrants gain ground under LAPS, while policy certainty lets incumbents defend their position under STEPS.

EU market value of N3 ICE and electric HGV sales captured by EU domiciled OEMs (€bn/yr)



KEY MARKET-SHARE ASSUMPTIONS

ICE: EU OEMs hold 98% (2025)

ICCT's EU heavy-goods market studies show European manufacturers account for 98% of conventional EU HGV production, with little non-EU penetration.

Residual ICE stays European

The 98% share is held constant across both LAPS and STEPS to 2035, reflecting a mature, consolidated ICE market where entrenched EU OEM incumbency persists regardless of the pace of electrification.

Electric: EU OEMs hold 93% (2025)

ICCT's Q1–Q4 2025 EU HGV market spotlight puts EU-domiciled OEMs at ~93% of EU BET sales above 12 tonnes.

Electric share hinges on scale-up

LAPS: slower electrification and weaker EU scale-up open the door to price-competitive new entrants, giving a 70% downside share. STEPS: faster growth and policy certainty let incumbents defend 90%.

EU-domiciled OEM share of the EU N3 HGV market

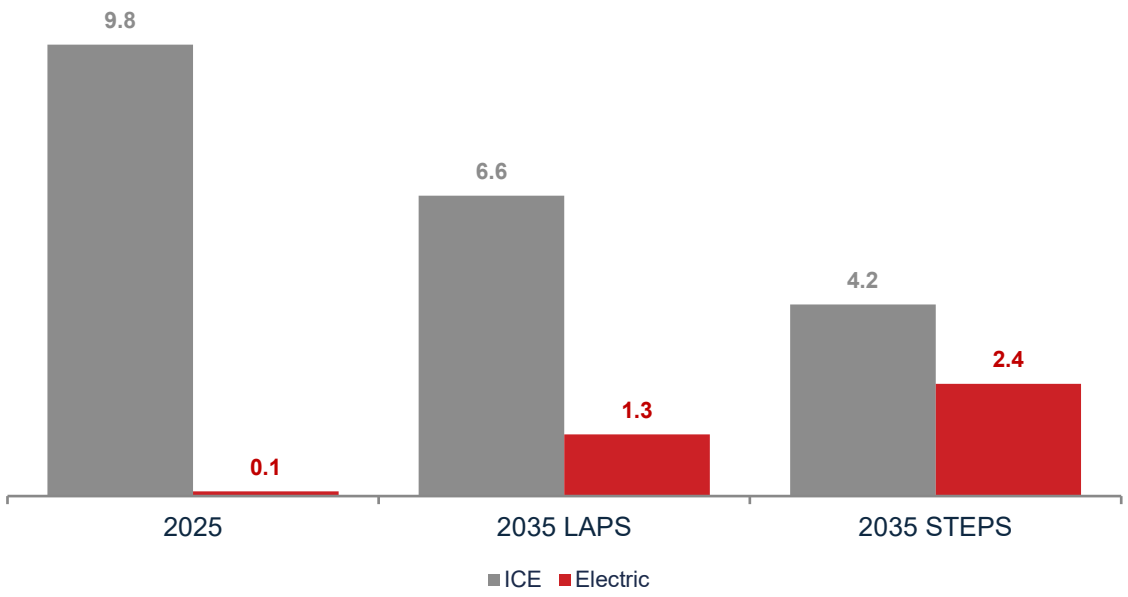
Key variable	2025	LAPS 2035	STEPS 2035
ICE N3 HGV	98%	98%	98%
Electric N3 HGV	93%	70%	90%

Sources: Baseline - ICCT EU HDV market development (2023) and Q1–Q4 2025 EU HDV market spotlight. LAPS/STEPS - T&E impact assessment of the transition to zero-emission trucks; T&E/AVS new electric entrants study.

Domestic capture of EU N3 HGV powertrain supply

Powertrain is the one part of the chain where European capture falls in both scenarios. The diesel driveline market that EU suppliers dominate shrinks faster than electric components replace it, and the assumed drop in ICE localisation under LAPS compounds this. Stronger electric localisation under STEPS softens but does not reverse the decline.

EU market value of powertrain components for N3 ICE and BET captured by EU domiciled suppliers (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

ICE powertrain: 85% EU-supplied (2025)

Daimler, TRATON and DAF run integrated European engine and driveline production; PRODCOM component data implies a lower ~69%, so 85% is used as a moderated estimate.

ICE supply localisation by scenario

LAPS falls to 75% on continued component-level import exposure; STEPS holds at 85% as the smaller residual diesel market concentrates in vertically integrated EU supply chains.

Electric components: 70% EU-supplied

PRODCOM data on traction motors above 75 kW used as proxy for e-axles, motors and power electronics

Localisation depends on volumes

LAPS falls to 60% with weaker EU scale-up and more imported drivetrain components; STEPS rises to 80% as motor, e-axle and power-electronics production localises with volume.

EU-domiciled supplier share of EU component demand

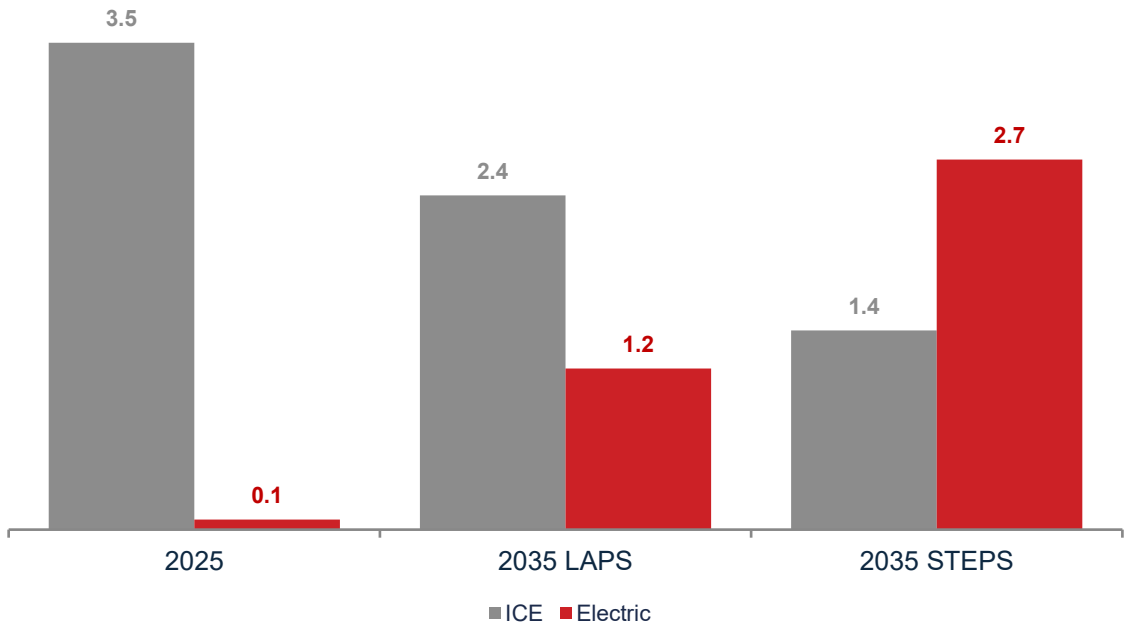
Key variable	2025	LAPS 2035	STEPS 2035
ICE powertrain	85%	75%	85%
Non-battery electric powertrain components	70%	60%	80%

Sources: Baseline - Daimler Truck, TRATON and DAF production disclosures; Eurostat PRODCOM database. LAPS/STEPS - WSP analysis.

Domestic capture of EU N3 HGV shared component supply

Shared component supply is already substantially European. Because the parts are common to both technologies, the assumptions move the share only modestly either way, with non-EU OEMs bringing their own suppliers under LAPS and production localising under STEPS. It remains one of the steadier positions in the chain.

EU market value of shared components for N3 ICE and BET captured by EU domiciled suppliers (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

Shared components: 73% EU-supplied

IEA Global EV Outlook 2026 (Fig. 7.8) shows EU-domiciled suppliers meet ~73% of EU chassis demand, used as a proxy for shared vehicle components.

Broader truck market proxy

The figure covers vehicles above 3.5t rather than N3 specifically, so it is applied in the absence of an N3-level breakdown.

Scenarios move only modestly

LAPS falls to 68% as non-EU OEMs entering the EU bring established supplier relationships; STEPS rises to 78% as chassis, cab and frame production localises with EU OEM strength.

EU-domiciled supplier share of shared component demand

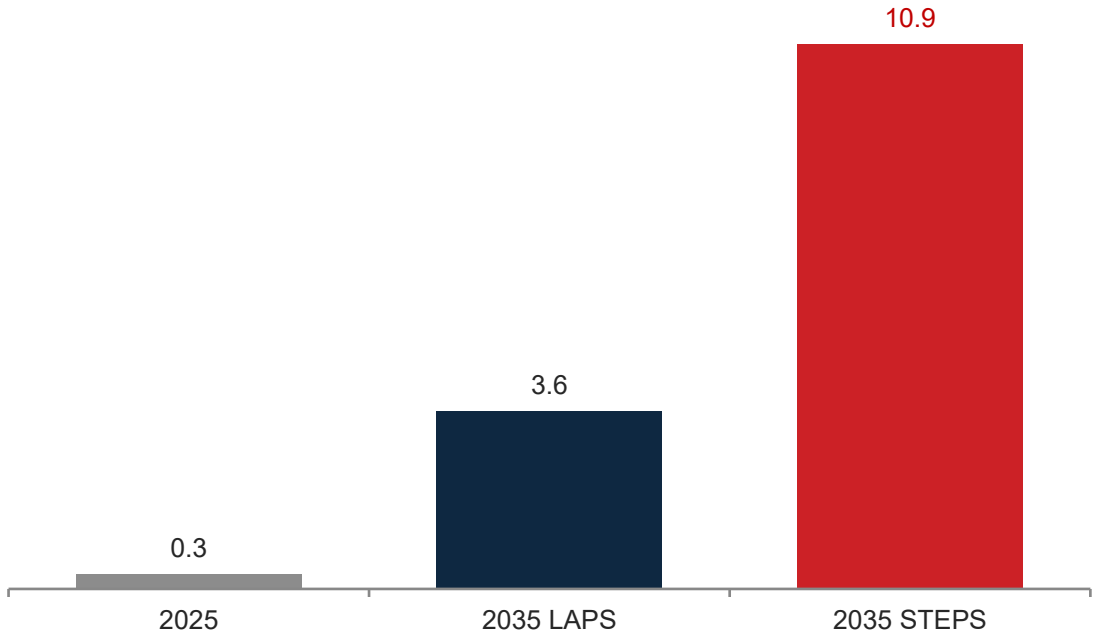
Key variable	2025	LAPS 2035	STEPS 2035
Shared components (glider)	73%	68%	78%

Sources: Baseline - IEA Global EV Outlook 2026, Figure 7.8. LAPS/STEPS - WSP analysis.

Domestic capture of EU N3 HGV battery pack assembly

Pack assembly is an established European capability. Because the assumed EU OEM share and the assumed localisation rate move together in each scenario, their effects compound rather than offset, producing a wide range of outcomes between weaker localisation under LAPS and fuller OEM integration under STEPS.

EU market value of battery packs deployed in N3 BETs captured by EU domiciled assemblers (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

Pack assembly: 74% EU-domiciled (2025)

EU OEMs hold ~93% of the electric N3 HGV market; applying an 80% pack-assembly localisation rate gives 74%.

European assembly already in place

Volvo Trucks in Ghent, Scania in Södertälje and MAN in Nuremberg all assemble packs in Europe today.

LAPS: 49% on weaker localisation

A 70% EU OEM share and a 70% localisation rate give 49%, reflecting slower supply-chain development and greater reliance on externally supplied pack systems.

STEPS: 81% as OEMs integrate

A 90% EU OEM share and a 90% localisation rate give 81%, with European OEMs pulling pack assembly into domestic production.

EU-domiciled share of EU battery pack demand

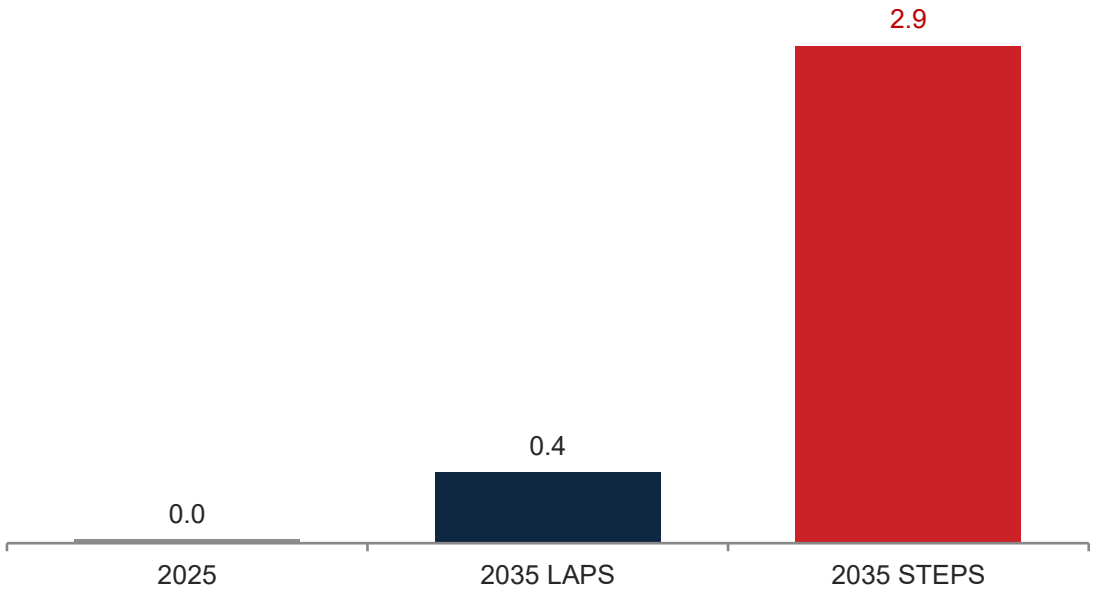
Key variable	2025	LAPS 2035	STEPS 2035
Battery pack assembly	74%	49%	81%

Sources: Baseline - Volvo Group, MAN and T&E disclosures on European pack assembly; ICCT EU OEM market shares. LAPS/STEPS - WSP analysis.

Domestic capture of EU N3 HGV battery cell supply

Cells are the weakest link today and carry the greatest upside. Whether the announced European capacity pipeline is actually delivered is what separates the scenarios: capacity attrition keeps localisation marginal under LAPS, while a delivered and extended pipeline transforms it under STEPS. This is the single largest swing factor in domestic capture.

EU market value of battery cells deployed in N3 BETs captured by EU domiciled cell OEMs (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

Cells: only 8% EU-made (2025)

IEA Global EV Outlook 2026 indicates ~8% of BETs sold in the EU in 2025 used cells from EU-domiciled manufacturers: the weakest link in the chain.

LAPS: 15% as scale-up lags

Fraunhofer ISI finds only 54–75% of announced European capacity is likely to be realised, with European-owned projects over-represented among cancellations, so localisation grows only modestly.

STEPS: 35% on a delivered pipeline

Benchmark Mineral Intelligence puts European-owned capacity at ~30% of Europe's 2030 pipeline; realising it and expanding to 2035 lifts the EU-domiciled share to ~35%.

EU-domiciled share of EU battery cell demand

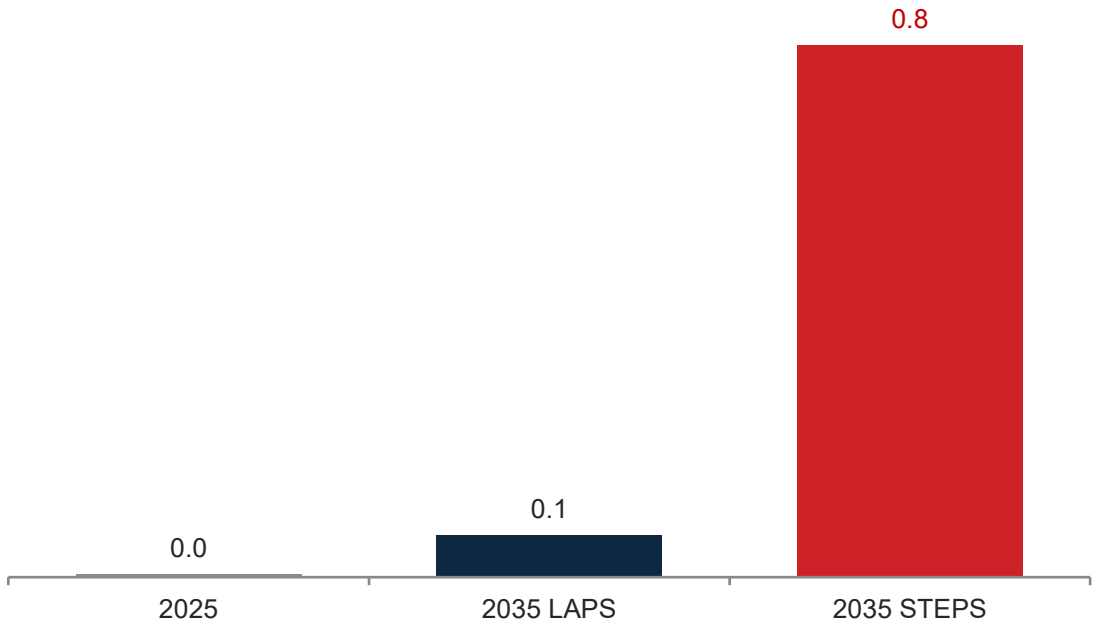
Key variable	2025	LAPS 2035	STEPS 2035
Battery cells	8%	15%	35%

Sources: Baseline - IEA Global EV Outlook 2026, Figure 7.8. LAPS/STEPS - Fraunhofer ISI European cell capacity analysis; Benchmark Mineral Intelligence.

Domestic capture of EU battery material supply

Material supply is where Europe is most import-dependent, with lithium and cobalt most exposed. Under LAPS, reliance on imported processed materials and China-dominated refining keeps capture low. Under STEPS, delivering the CRMA extraction, processing and recycling benchmarks combines a larger market with a far higher domestic share.

EU market value of the CAM/pCAM and raw materials of cells deployed in N3 BETs captured by EU domiciled producers (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

Materials: ~40% EU-supplied (2025)

ACEA import-reliance data implies EU supply shares of 69% nickel, 19% cobalt, 4% manganese and 19% lithium; the NMC-811 cathode mix gives 57.5%, moderated to 40% for lithium dependence.

LAPS: 25% as demand outpaces supply

Continued reliance on imported processed materials and China-dominated refining, with CRMA benchmarks only partly delivered and lithium and cobalt most exposed.

STEPS: 55% on processing and recycling

CRMA benchmarks (10% extraction, 40% processing, 25% recycling) are delivered and built on, though full autonomy is not reached.

EU-domiciled share of CAM/pCAM and raw material demand

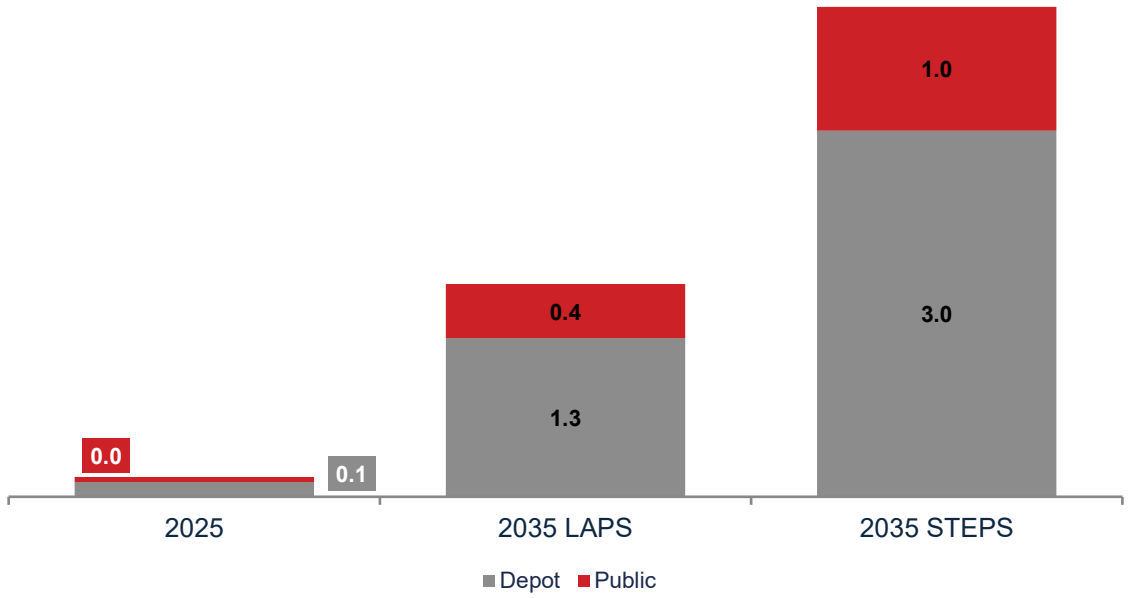
Key variable	2025	LAPS 2035	STEPS 2035
CAM/pCAM & raw materials	40%	25%	55%

Sources: Baseline - ACEA EU battery supply chain and import reliance fact sheet. LAPS/STEPS - EU Critical Raw Materials Act benchmarks; WSP analysis.

Domestic capture of EU charging hardware supply

Charging hardware is one of the stronger European positions today. Faster rollout is not unambiguously helpful: the assumptions hold that a larger, faster-growing market also attracts more non-EU competition, so the EU share is eroded under LAPS and only held flat under STEPS. Deployment volume still outweighs that erosion.

EU market value of depot and public charging infrastructure serving N3 BETs captured by EU domiciled suppliers (€bn/yr)



KEY SUPPLY-SHARE ASSUMPTIONS

Public charging hardware: 80% EU-supplied

EAFO data for November 2025 covers 2,988 European HGV charging stations; of the 1,935 with operator data, 1,573 are run by EU-domiciled companies (~80%).

Depot hardware follows the public-charging benchmark

Due to the private nature of the depot market, the 80% public figure is applied to depot hardware supply as a considered expert judgement.

LAPS: 60% as rollout stays compliance-led

Slower deployment beyond minimum AFIR requirements limits EU supplier scale-up and leaves more room for lower-cost non-EU competitors.

STEPS: 80% held flat on a larger market

Faster deployment also attracts more non-EU suppliers, offsetting EU scale-up, so EU capture is held at its 2025 level.

EU-domiciled supplier share of charging hardware demand

Key variable	2025	LAPS 2035	STEPS 2035
Depot charging hardware	80%	60%	80%
Public charging hardware	80%	60%	80%

Sources: Baseline - European Alternative Fuels Observatory HDV charging infrastructure data (Nov 2025). LAPS/STEPS - WSP analysis.

Exports of ICE and electric trucks: detailed calculations and assumptions

ICE N3 HGV exports

EU ICE exports = (global truck exports today − global BET exports 2035) × EU ICE retention share

Item	LAPS	STEPS	Source / justification
Global extra-EU truck exports, 2025	**1,077,903**	**1,077,903**	UN Comtrade 2025. Diesel trucks >5t and road tractors; electric trucks >3.5t and road tractors. Intra-EU trade excluded.
Global extra-EU BET exports, 2035	**266,808**	**315,318**	From the BET export module (block 2): electric trade displaces part of the diesel export pool.
EU share of extra-EU ICE exports, 2025	**27.7%**	**27.7%**	UN Comtrade (including diesel tractors).
Retention of current EU position	**100%**	**90%**	LAPS: ICE demand stays strong abroad and EU OEMs keep capacity and networks. STEPS: capacity shifts to BETs and OEMs deprioritise ICE export markets.
EU ICE retention share	**28%**	**25%**	
EU ICE exports (units/yr)	**224,367**	**189,853**	Global diesel pool shrinks as other markets electrify.

Electric N3 HGV (BET) exports

EU BET exports = global BET demand × cross-border trade share × EU share of global BET exports

Item	LAPS	STEPS	Source / justification
Global electric truck sales, 2035	**1.1m**	**1.3m**	IEA Global EV Data Explorer, trucks >3.5t (CPS used for LAPS).
Cross-border trade share	**24.3%**	**24.3%**	Extra-EU ICE truck exports (971k) ÷ global ICE truck sales (4.45m × 90% to align >3.5t with >5t). Held constant.
EU share of global BET exports	**7.5%**	**12.5%**	The EU holds 61.5% of global electric truck export value today (N1-N2-N3, very small market). Share assumed to fall as Chinese OEMs scale; higher under STEPS as EU OEMs build domestic scale.
EU BET exports (units/yr)	**20,011**	**39,415**	Around one-tenth of EU ICE exports in 2035.

Sources: UN Comtrade (HS 870422, 870423, 870121, 870460, 870124); IEA Global EV Data Explorer (2026). Retention and EU export shares: WSP analysis.

Export of batteries and charging hardware: detailed calculations and assumptions

Battery cell exports (truck batteries)

EU cell exports = EU capacity × utilisation × truck share of output × share exported

Item	LAPS	STEPS	Source / justification
EU total battery capacity (GWh)	**1,138**	**1,300**	EPRS (2025) for LAPS. New Automotive for LAPS.
Capacity utilisation	**61.7%**	**85.0%**	IEA Global EV Outlook 2026. 85% taken as maximum utilisation and applied to STEPS.
EU total battery production (GWh)	**702**	**1,105**	Calculation.
Truck share of EU output	**3.0%**	**9.4%**	LAPS: conservative share (IEA 2025), as global truck-battery growth is China-led. STEPS: IEA global truck share (10.5%) × EV share of battery use (90%).
EU truck-battery production (GWh)	**21.1**	**104.2**	Calculation.
Share of truck-battery output exported	**15%**	**15%**	Assumption, both scenarios. No cell exports in 2025 given China's market dominance.
EU cell exports (GWh/yr)	**3.2**	**15.6**	Potential gross exports; realised exports may be lower.

Depot charging hardware exports

EU charger exports = global depot charger demand × cross-border trade share × EU share of exports

Item	LAPS	STEPS	Source / justification
Global truck depot charger net additions (units/yr)	**730k**	**800k**	IEA Global EV Outlook 2026: global stock rises from 1.3m (2025) to 8.6m (LAPS) / 9.3m (STEPS) in 2035, spread over 10 years.
Cross-border trade share	**24%**	**24%**	Same as HGVs (block 2).
EU share of global charger exports	**21.5%**	**21.5%**	UN Comtrade 2025, electrical static converters used as proxy. Held constant.
EU charger exports (units/yr)	**38,072**	**41,723**	Global demand varies little, so exports barely differ.

Sources: UN Comtrade (HS 870422, 870423, 870121, 870460, 870124); IEA Global EV Data Explorer (2026). Retention and EU export shares: WSP analysis.