

Learning Handbook on Incentives on e-Mobility



Co-funded by the European Union under project ID 1012128. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Technical information

Project Acronym	PROSPECT CUBE
Project Name	Capacity Building for Local and Regional Authorities
Grant Agreement No.:	101212861
Topic:	LIFE-2024-CET-LOCAL
Type of Actions:	LIFE-PJG (LIFE Project Grants)
Project Coordinator:	Institute for European Energy and Climate Policy (IEECP)
Website url:	https://h2020prospect.eu/

About the project

PROSPECT aims to strengthen the capacity of local and regional authorities (LRAs) across Europe to implement sustainable energy and climate actions by reducing reliance on public funding and increasing the use of innovative financing schemes (e.g., one-stop-shops, energy agencies, energy communities). The project offers a peer-to-peer Capacity Building Programme (CBP) tailored to the needs and time constraints of LRAs, available in multiple languages and structured in adaptable learning modules. Through large-scale outreach, including very small and remote LRAs, PROSPECT CUBE acts as an entry point to EU programmes and financing opportunities for authorities with limited experience in the field.

PROSPECT CUBE builds upon two successful Horizon 2020 initiatives: PROSPECT (2017–2020) and PROSPECT+ (2022–2025).

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.

Copyright message

This report, if not confidential, is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0); a copy is available here: <https://creativecommons.org/licenses/by/4.0/>. You are free to share (copy and redistribute the material in any medium or format) and adapt (remix, transform, and build upon the material for any purpose, even commercially) under the following terms: (i) attribution (you must give appropriate credit, provide a link to the license, and indicate if changes were made; you may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use); (ii) no additional restrictions (you may not apply legal terms or technological measures that legally restrict others from doing anything the license permits).

Table of Contents

Contents

1. Introduction	6
1.1. Purpose of this handbook	6
1.2. Target audience	7
1.3. How to use this handbook	7
2. Understanding the e-mobility landscape	8
2.1. What is e-mobility?	8
2.2. Planning principles for urban e-mobility	10
2.2.1. Integrating e-mobility within the A-S-I framework	10
2.2.2. Translating the A-S-I framework into coordinated policy action	11
2.2.3. Main stakeholders involved	13
2.3. Why e-mobility matters? Benefits and added value for LRAs	14
2.3.1. Benefits for cities	15
2.3.2. Defining success and the value proposition	16
3. Incentivising e-mobility adoption	18
3.1. The “Push – Pull” approach	18
3.2. Types of incentives	20
3.2.1. Financial and fiscal incentives	20
3.2.2. Regulatory incentives	21
3.2.3. Operational and “soft” incentives	21
3.2.4. Information, awareness and technical support	22
3.3. National implementation models	22
3.3.1. Norway and the Oslo model: The “tax-exemption” strategy	23
3.3.2. The Netherlands and the Amsterdam model: The “infrastructure-led” strategy	24
3.3.3. Germany and the Berlin/Hamburg model: The “subsidy-to-scale” strategy	26
3.3.4. France and the Paris model: The “financial circularity” strategy	28
4. Setting up a transition pathway: A quick step-by-step guide	31
4.1. Structuring the e-mobility journey: key steps for LRAs	32
4.2. Structuring the e-mobility journey: A practical checklist for LRAs	35
5. Case study: Blended financing for e-mobility in Valladolid (Spain)	36
6. Critical conditions influencing e-mobility adoption	38
6.1. Drivers and success factors	38
6.2. Barriers and limitations	38
6.3. Key risk dimensions	39
6.4. Synthesis of critical conditions affecting the transition pathway	39
7. Summary of key takeaways	41

List of Figures

Figure 1. Key pillars of the e-mobility mobility ecosystem	9
Figure 2. The Avoid–Shift–Improve (A-S-I) framework for sustainable urban mobility planning.	11
Figure 3. Translating the A-S-I framework into a comprehensive	11
Figure 4. Benefits enabled by e-mobility in cities.....	14
Figure 5. High-level roadmap for planning, implementing, and scaling e-mobility transitions.	31
Figure 6. Blended financing and incentive model for e-mobility deployment in Valladolid (REMOURBAN)	36

List of Tables

Table 1. Indicative measures for a comprehensive e-mobility transition strategy across the A-S-I pillars	12
Table 2. Main stakeholders actively involved in the e-mobility adoption.....	13
Table 3. Indicative KPIs for e-mobility targets aligned with EU policy frameworks	16
Table 4. Key market barriers to e-mobility adoption	18
Table 5. Types of e-mobility incentives	20
Table 6. National implementation model - Norway.....	23
Table 7. Municipal implementation - Oslo.....	24
Table 8. National implementation model - The Netherlands	25
Table 9. Municipal implementation - Amsterdam.....	26
Table 10. National implementation model - Germany.....	27
Table 11. Municipal implementation - Berlin/Hamburg	28
Table 12. National implementation model – France.....	29
Table 13. Municipal implementation – Paris	30
Table 14. Summary of critical conditions influencing e-mobility transition.....	39
Table 15. Comparative overview of national e-mobility implementation models proved effective in practice	43

List of abbreviations

Abbreviation	Description
AFIR	Alternative Fuels Infrastructure Regulation
A-S-I	Avoid-Shift-Improve framework
BEV	Battery Electric Vehicle
CAPEX	Capital Expenditure
CEF	Connecting Europe Facility
CINEA	European Climate, Infrastructure and Environment Executive Agency
CO₂	Carbon Dioxide
CO₂/km	Carbon Dioxide per kilometre
CPO	Charge Point Operator
EREs	Emissiereductie-eenheden (Emission Reduction Units)
ERDF/CF	European Regional Development/Cohesion Funds
EU	European Union
EV	Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
GHG	Greenhouse Gas
HEV	Hybrid Electric Vehicle
HOV	High-Occupancy Vehicle
HPC	High-Power Charging point
ICEV	Internal Combustion Engine Vehicle
kg	Kilogram
km/h	Kilometres per Hour
KPI	Key Performance Indicator
kWh	Kilowatt-Hour
LEZ	Low-Emission Zone
LRA	Local and Regional Authority
MaaS	Mobility as a Service
MS	Member State
MSP	Mobility Service Provider
OCPI	Open Charge Point Interface
NO_x	Nitrogen Oxides
OSS	One-Stop-Shop
PM_{2.5}	Particulate Matter ($\leq 2.5 \mu\text{m}$)
PHEV	Plug-in Hybrid Electric Vehicle
PPP	Public-Private Partnership
SCF	Social Climate Fund
SECAP	Sustainable Energy and Climate Action Plan

SME	Small and Medium-sized Enterprise
SUMP	Sustainable Urban Mobility Plan
TCO	Total Cost of Ownership
TEN-T	Trans-European Transport Network
TOD	Transit-Oriented Development (TOD)
VAT	Value Added Tax
V2G	Vehicle-to-Grid
ZEZ	Zero-Emission Zone
ZFE	Zone à Faibles Émissions (Low-Emission Zone)

1. Introduction

While mobility brings many benefits for citizens and the economy, it also imposes significant environmental and societal costs. Across Europe, transport sector remains a primary source of greenhouse gas (GHG) emissions and urban air pollution, with road traffic alone accounting for over 70% of all sector-related emissions. Mitigating these impacts has therefore become a central priority for European Union (EU) and its climate and transport policy frameworks.

Notably, the European Commission's [Sustainable and Smart Mobility Strategy](#) sets a definitive roadmap to guide the sector's transition towards a resilient, climate-neutral future. However, the ultimate success of this EU-wide vision relies heavily on local and regional authorities (LRAs). As the crucial link between high-level policy and real-world execution, LRAs can play a vital role in translating national and EU objectives into concrete, context-specific measures, directly shaping how sustainable mobility solutions are implemented within their territories.

In this context, electric mobility (e-mobility) stands out as a highly effective pathway, and a range of supporting instruments is now available for LRAs to accelerate its adoption. Among these, innovative financing and business models, supported by a strategic mix of targeted incentives, such as financial subsidies for electric vehicle (EV) procurement and charging infrastructure, tax advantages that lower the total cost of ownership, and regulatory measures that mandate zero-emission targets in public procurement, are paramount to facilitating the uptake of e-mobility, reaping the benefits of lower running costs while addressing high upfront capital expenditure. Furthermore, operational benefits - such as priority lane access and exemptions from urban congestion charges - provide immediate incentives for daily users. By strategically deploying these tools, LRAs are empowered to stimulate market demand and confidently lead the transition toward a clean, sustainable transport ecosystem.

1.1. Purpose of this handbook

The purpose of this handbook is to provide LRAs with a clear and practical understanding of how incentive schemes can support the transformation of urban mobility systems towards sustainability. It focuses on the main “push and pull” policy instruments that have successfully encouraged the adoption of e-mobility solutions across the EU, explaining how these measures function in practice and under which conditions they can deliver the greatest impact. In doing so, it highlights how targeted incentives - such as financial subsidies, fiscal advantages, regulatory measures and operational benefits - can help address common investment challenges as part of the broader local sustainable mobility strategies.

The handbook draws inspiration from the experience, good practices and lessons learned from the previous PROSPECT initiatives and expands this knowledge base with fresh implementation insights and recent developments from new participating cities and regions. While it cannot explore all possible approaches in detail, it aims to provide inspiration and practical guidance for LRAs seeking innovative solutions to advance their transition to e-mobility, including funding and incentive mechanisms that go beyond the use of public budgets and “classic” debt financing.

1.2. Target audience

This handbook is primarily addressed to LRAs that are planning or actively implementing measures to accelerate the deployment of e-mobility solutions within their territories. Specifically, it may serve as a highly practical resource for:

- Municipal and regional officers and decision-makers working on or overseeing sustainability, energy transition or climate neutrality initiatives.
- Urban mobility planners and transport authorities responsible for integrating zero-emission solutions into long-term transport strategies.
- Energy and climate officers tasked with meeting local decarbonisation and air quality targets.
- Public and energy agency representatives supporting the operational and financial deployment of sustainable mobility projects.

The handbook may also be relevant for to the wider network of stakeholders essential to building a thriving e-mobility ecosystem, including mobility service providers, energy utilities, infrastructure operators, and research organisations.

1.3. How to use this handbook

This handbook is designed for flexible and practical use. It can be read linearly from start to finish or consulted as a targeted reference, depending on the reader’s needs or the stage of project development.

In particular, readers can use the handbook to better understand how incentive schemes can support the uptake of e-mobility in their territories or navigate a step-by-step approach to designing, launching and managing effective e-mobility incentive programmes. They can also refer to it to anticipate the potential benefits, risks, barriers and key success factors associated with these measures, or may return to it at different stages of an e-mobility initiative as a practical reference for informed decision-making and policy development.

2. Understanding the e-mobility landscape

With the transport sector responsible for approximately 25-29% of EU's emissions (EEA, 2024, 2025), e-mobility transition is no longer a peripheral goal but a powerful low-carbon strategy to achieving climate neutrality by 2050, as set out in the [European Green Deal](#) and the [European Climate Law](#). Recognising this, several EU initiatives, including the [Fit for 55 package](#), the [Alternative Fuels Infrastructure Regulation \(AFIR\)](#), and the [Trans-European Transport Network \(TEN-T\)](#), impose concrete obligations on Member States (MS), requiring action across all levels of governance – national, regional and local.

At the local and regional level in particular, an increasing number of cities and regions have enacted urban policies in recent years to accelerate the uptake of a variety of e-mobility solutions in their territories. From targeted measures supporting the gradual phasing out of conventionally fuelled vehicles to the integration of e-mobility into their Sustainable Urban Mobility Plans (SUMPs), LRAs help embed e-mobility within broader urban sustainability strategies, ensuring that the transition is not only rapid but also socially inclusive and operationally resilient (UN-Habitat & UEMI, 2022).

Focus Box 1: Territorial differences in e-mobility adoption

The opportunities and challenges associated with e-mobility adoption vary significantly across territorial contexts. Large metropolitan areas, medium-sized cities and smaller municipalities or rural regions face distinct conditions in terms of population density, mobility demand, infrastructure availability and institutional capacity.

For example, in dense urban areas, priorities often include charging accessibility, traffic management and integration with public transport systems. In contrast, smaller or rural territories may focus more on ensuring basic infrastructure coverage, affordability and accessibility.

Recognising these differences is key to effective, context-specific e-mobility strategies.

2.1. What is e-mobility?

E-mobility refers to the transition from conventionally fuelled vehicles - primarily internal combustion engine vehicles (ICEVs) - to electric powertrains across the entire transport spectrum. While often associated with private passenger cars, in practice it encompasses a wide range of transport modes, from heavy-duty freight and public e-buses to L-category vehicles (mopeds and motorcycles), and micromobility solutions (e-bikes and e-scooters), all of which play a role in reducing cities' carbon footprints and supporting more sustainable urban mobility systems (Hunkin & Krell, 2025; IEA, 2024).

In line with the AFIR definition, a vehicle is classified as an EV, when two key criteria are met: (i) it uses an electric motor for propulsion, and (ii) it can be recharged from an external power source.

Under this definition, EVs can be grouped into the following main powertrain architectures:

- Battery Electric Vehicles (BEVs), fully powered by electricity stored in rechargeable batteries (typically lithium-ion), producing zero tailpipe emissions, particularly when powered by renewable energy.
- Hybrid Electric Vehicles (HEVs), combining an internal combustion engine with one or more electric motors to improve efficiency, while still relying on fossil fuels and lacking external charging capability.
- Plug-in Hybrid Electric Vehicles (PHEVs), combining an internal combustion engine with a rechargeable battery that can be charged externally, allowing for electric-only driving over shorter distances before switching to fuel.
- Fuel Cell Electric Vehicles (FCEVs), using hydrogen fuel cells to generate electricity, powering an electric motor and emitting only water as a by-product.

Electric vehicle means a motor vehicle equipped with a powertrain containing at least one non-peripheral electric machine as energy converter with an electric rechargeable energy storage system, which can be recharged externally. – AFIR, Article 2(22)

Beyond vehicle technology, e-mobility represents a profound systemic transformation that aligns



Figure 1. Key pillars of the e-mobility mobility ecosystem

transportation with energy systems, digital innovation and urban planning. Its potential lies in its role as a catalyst for cross-sectoral integration, where investments in low-carbon mobility technology and operations act as the essential “connective tissue” of a modern, decarbonised urban landscape (European Union, 2020).

As European cities move toward their 2050 climate neutrality targets, this integrated approach positions e-mobility not as a siloed sectoral solution, but as a critical pathway for improving the overall liveability of city centres (UN-Habitat & UEMI, 2022).

2.2. Planning principles for urban e-mobility

As e-mobility gains global momentum, its successful adoption depends on its strategic design and cohesive implementation. The following principles are key to support and guide urban policymakers and planners in their quest to navigate this transition effectively, allowing them to achieve their broader intended sustainability goals across climate, air quality, urban development, economic, institutional and policy dimensions. By adhering to these core tenets, LRAs can move beyond compliance, embedding e-mobility as an integrated pillar of sustainable and resilient urban development.

2.2.1. Integrating e-mobility within the A-S-I framework

For e-mobility to be envisaged through the lens of sustainability rather than functioning as a standalone technical fix, what is primarily required is a fundamental rethinking of the paradigm by which mobility and city planning is guided. This is often framed through the “Avoid–Shift–Improve” (A-S-I) framework, which offers a worthwhile alternative holistic approach for an overall sustainable transport system design. By focusing on the demand side rather than the typical predict-provide-manage approach¹, it prioritises city’s mobility needs beyond vehicle optimisation shaping a human-centered paradigm, where electrification supports - rather than just replaces or competes with - active and high-occupancy travel patterns, with the final objective to create more liveable cities (Bongardt et al., 2019).

As illustrated in Figure 2, the A-S-I approach follows a strict functional hierarchy, with three pillars:

- Avoiding or reducing motorised transport demand through compact, transit-oriented city and land-use planning.
- Shifting to more efficient and environmentally friendly travel modes, prioritising active (walking and cycling) and public transport;
- Improving the vehicle and fuel efficiency as well as the operational optimisation of the remaining public motorised trips.

Within it, e-mobility serves as the technical core of the “Improve” pillar, facilitating the transition to zero-emission technologies and RES deployment into the transport sector. However, its impact is truly unlocked only through cross-pillar synergies, where transport sector electrification is part of an integrated

¹ The “predict–provide–manage” approach is a traditional transport planning paradigm that dominated the 20th century. It is based on the reactive cycle of forecasting future traffic growth based on past trends (predict), building more road and infrastructure capacity to meet that expected demand (provide), and then using technology or minor regulations to handle the resulting traffic (manage). Modern planners criticise this because of often leading to induced demand and car-dependent urban sprawl (Owens, 1995).

policy package that aligns local spatial planning with national regulatory and fiscal frameworks. This is particularly relevant for LRAs, which are uniquely equipped to translate the high-level A-S-I framework into the coordinated, practical actions required for a resilient e-mobility ecosystem (UN-Habitat & UEMI, 2022).

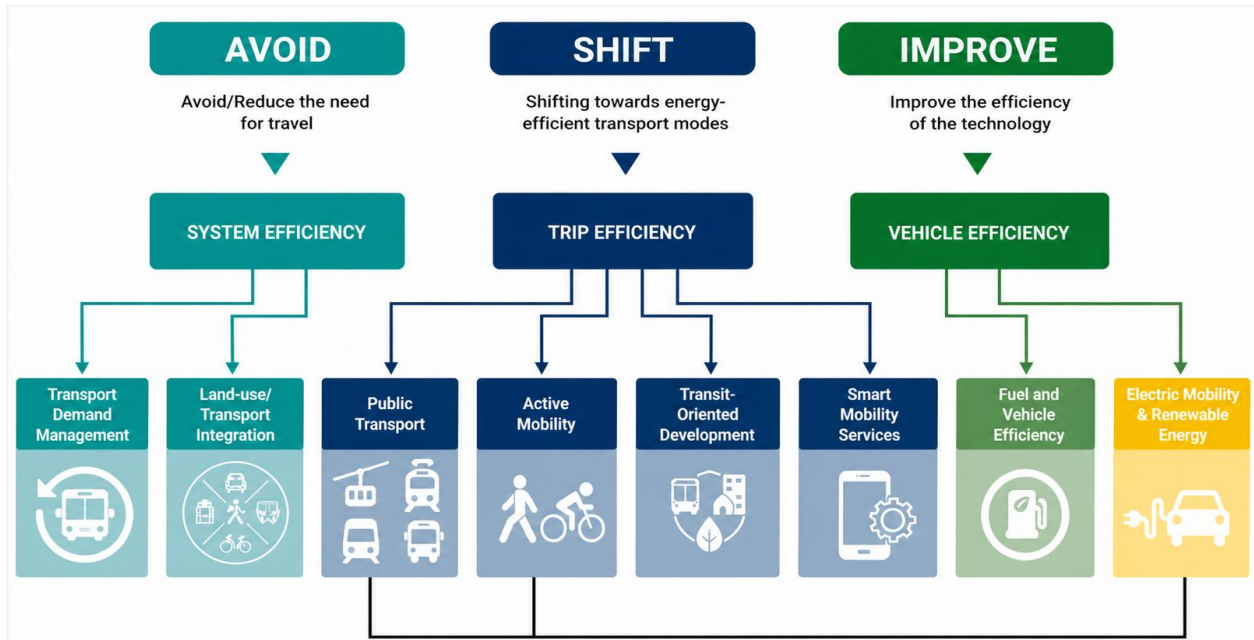


Figure 2. The Avoid-Shift-Improve (A-S-I) framework for sustainable urban mobility planning. Source: UN HABITAT & UEMI, 2022

2.2.2. Translating the A-S-I framework into coordinated policy action

Building on the A-S-I framework, the transition to e-mobility requires LRAs to move from strategic principles to coordinated, context-specific action. While EU and national policies define the overarching targets and the regulatory conditions, it is at the local level where these are translated into concrete measures that shape infrastructure development, user behaviour and market uptake. Ensuring coherence across governance levels is therefore essential to avoid fragmentation and maximise the effectiveness of interventions (Bongardt et al., 2019)

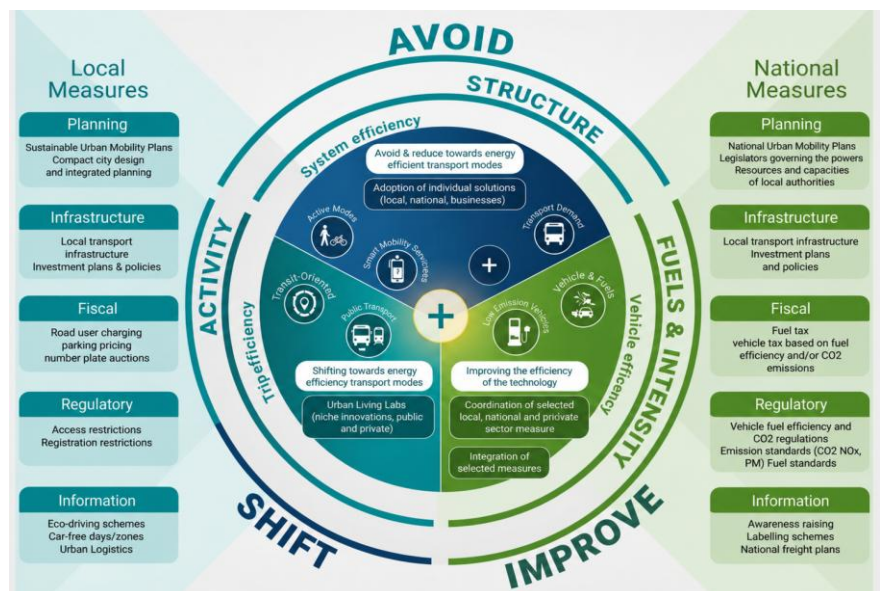


Figure 3. Translating the A-S-I framework into a comprehensive e-mobility transition strategy

In practice, this involves combining planning, regulatory, fiscal and behavioural measures into integrated policy packages. For example, urban planning tools - such as SUMP and compact city design - help reduce travel demand and promote more efficient mobility patterns. At the same time, regulatory measures (e.g. low-emission zones), fiscal instruments (such as pricing or incentives), and targeted infrastructure investments support e-mobility uptake. Aligning these with national frameworks - such as vehicle standards, taxation and funding programmes - further strengthens their impact and ensures consistency across scales (Lah, 2020).

Table 1 illustrates this operational logic, providing an indicative roadmap for LRAs to distribute efforts across the three A-S-I pillars through mutually supportive national and local actions.

Table 1. Indicative measures for a comprehensive e-mobility transition strategy across the A-S-I pillars

A-S-I pillar	Policy area	National framework	Example measures	Complementarities
Avoid	Planning	<ul style="list-style-type: none"> National mobility strategies Spatial planning frameworks 	<ul style="list-style-type: none"> SUMPs Compact urban planning Mixed land use Digital solutions (e.g. teleworking) 	Integrated planning aimed at reducing: <ul style="list-style-type: none"> travel demand overall energy use pressure on infrastructure
Shift	Infrastructure/services	<ul style="list-style-type: none"> National transport investment plans Public transport infrastructure strategies 	<ul style="list-style-type: none"> Public transport expansion Cycling infrastructure Pedestrian zones Shared mobility solutions 	Integrated planning supporting: <ul style="list-style-type: none"> multimodal systems first/last-mile connectivity
Improve	Technology/infrastructure	<ul style="list-style-type: none"> EU regulations Vehicle standards Funding schemes and programmes 	<ul style="list-style-type: none"> EV charging infrastructure deployment Fleet electrification Public procurement 	Coordinated deployment of zero-emission mobility solutions for unavoidable trips
Cross-cutting	Fiscal/regulatory	<ul style="list-style-type: none"> Tax incentives Emissions standards Fuel policies 	<ul style="list-style-type: none"> Parking pricing Low-emission and car-free zones Access restrictions Local incentives 	Fiscal and regulatory measures influencing: <ul style="list-style-type: none"> EV adoption behaviour patterns
Cross-cutting	Awareness/governance	<ul style="list-style-type: none"> National campaigns and freight plans Labelling schemes 	<ul style="list-style-type: none"> Local campaigns (e.g., car-free days) Citizen-centered planning Mobility services (MaaS), eco-driving schemes 	Awareness measures influencing: <ul style="list-style-type: none"> behaviour change user acceptance stakeholder/civic participation

2.2.3. Main stakeholders involved

The successful planning for e-mobility adoption requires the coordinated involvement of multiple stakeholders, each contributing to different parts of the value chain - from infrastructure deployment and energy provision to service delivery and user adoption. For LRAs taking a leading enabling role within this ecosystem is key to ensuring a coherent and effective transition.

Table 2. Main stakeholders actively involved in the e-mobility adoption

Actors	Typical role in implementation	Key responsibilities
LRAs	Strategic planners and coordinators	Develop local policies and strategies; manage public space; issue permits; deploy public infrastructure; coordinate stakeholders; implement local incentives.
National governments	Policy and regulatory framework setters	Define national targets; establish regulatory frameworks; design and provide incentive schemes; ensure alignment with EU directives.
Energy providers and grid operators	Energy system managers	Ensure grid capacity and stability; integrate renewable energy; support smart charging solutions; plan and manage grid upgrades.
Charging infrastructure operators (CPOs)	Infrastructure developers and operators	Install, operate and maintain public and private charging infrastructure; ensure interoperability and service reliability.
Mobility service providers (MSPs)	Service integrators	Provide digital platforms, payment systems, and mobility services, enhancing user experience and system integration
Public transport operators	Fleet operators and service providers	Electrify public transport fleets; integrate e-mobility solutions with existing services; ensure service reliability.
Private sector actors (manufacturers, developers, investors)	Technology providers and investors	Develop EV technologies and solutions; invest in infrastructure and innovation; support market development.
Financial institutions and funding bodies	Financing enablers	Provide funding, loans and investment instruments; support large-scale deployment and de-risk projects.
Citizens and end-users	Users and adopters	Adopt e-mobility solutions; influence demand patterns; participate in behavioural change.
Civil society and community organisations	Advocacy and engagement actors	Promote awareness; support public acceptance; ensure inclusiveness; represent community needs.

2.3. Why e-mobility matters? Benefits and added value for LRAs

Urban areas are at the forefront of the transition to more sustainable mobility systems, concentrating a large share of transport demand, population and economic activity, while also facing the most acute impacts of air pollution, congestion and noise. In this context, e-mobility emerges not only as a technological solution, but as a strategic pathway for LRAs to address multiple urban challenges, supporting cities in their transition towards cleaner, more efficient and liveable environments.

When embedded within integrated urban mobility strategies, e-mobility delivers a wide range of benefits that extend beyond emission reductions, contributing to environmental improvement, economic resilience and enhanced quality of life.

In this capacity, e-mobility serves as a dual-purpose strategic lever for climate action at the city level, enabling synergies between mitigation and adaptation by:

- facilitating the shift to energy-efficient, low-emission transport systems through integrated planning and electrification strategies, and
- enhancing transport system resilience to climate impacts through improved infrastructure, technology deployment and adaptive capacity (Bongardt et al., 2019).

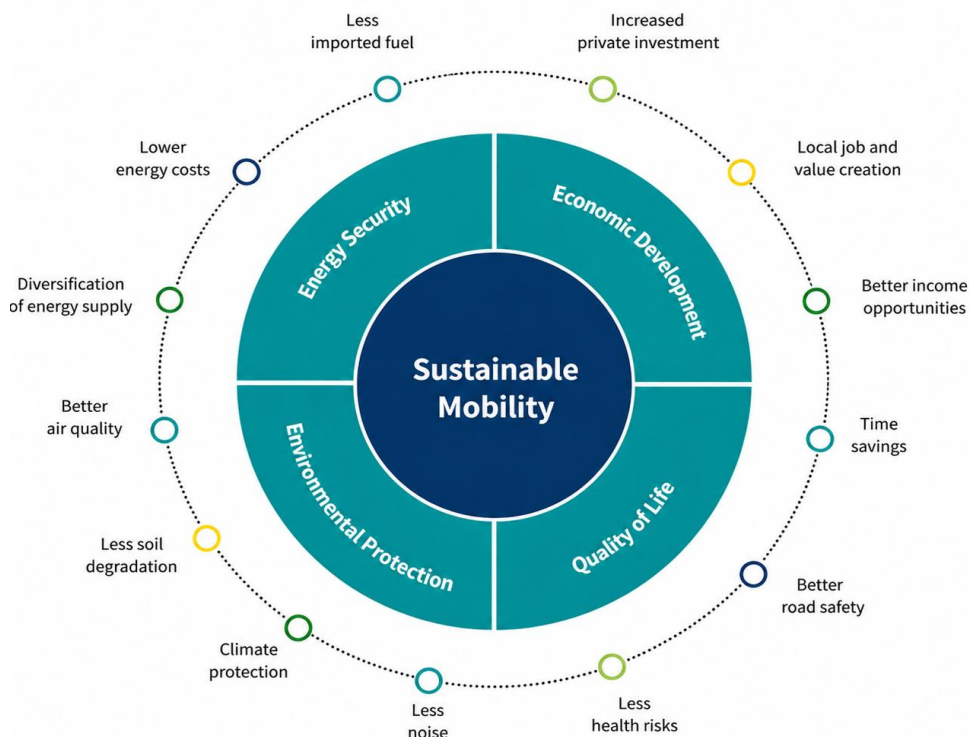


Figure 4. Benefits enabled by e-mobility in cities

2.3.1. Benefits for cities

As cities adapt their mobility systems to sustainability objectives, e-mobility emerges as a key enabling mechanism through which LRAs can deliver benefits across four main dimensions²:

I. ENVIRONMENTAL PROTECTION AND CLIMATE MITIGATION

- Decarbonisation of transport by drastically reducing GHG emissions, particularly when integrated with a carbon-neutral energy mix.
- Air quality improvement by eliminating tailpipe pollutants (such as nitrogen oxides - NO_x and particulate matter – PM_{2.5}), directly addressing the root causes of urban respiratory health issues.
- Acoustic transformation through significantly lowering ambient noise levels, particularly from public transit and freight, reclaiming the “quietude” of residential and commercial zones.
- Ecosystem preservation by mitigating the chemical and thermal footprint of traditional combustion engines (EEA, 2020; IPCC, 2023; WHO, 2018, 2024).

II. ENERGY SECURITY AND SYSTEM RESILIENCE

- Energy autonomy by decreasing reliance on imported fossil fuels, shielding local economies from global geopolitical volatility and oil price fluctuations.
- RES integration through direct use of local sources, turning cities into proactive energy hubs.
- Smart grid synergy by leveraging EV batteries as decentralised storage units (Vehicle-to-Grid – V2G) to balance demand and enhance the stability of the local power grid.
- Economic predictability by enabling lower and more stable long-term energy costs compared to the volatility of petroleum-based fuels (IRENA, 2019, 2020; WEF, 2019).

III. ECONOMIC DEVELOPMENT AND LOCAL VALUE CREATION

- Industrial innovation and new business/job opening across the e-mobility value chain.
- Green employment by stimulating job creation in high-tech maintenance, infrastructure deployment, and sustainable energy services.
- Investment attraction by positioning cities as “innovation labs”, drawing private capital and specialised talent towards clean-tech and digital mobility sectors.
- Local wealth retention by keeping energy expenditures within the regional economy, shifting from imported fuels to locally generated electricity (UN-Habitat & UEMI, 2022; UNECE, 2025).

² Further reading on global trends and impact of e-mobility: Global EV Outlook 2024 (International Energy Agency - IEA, 2024).

IV. QUALITY OF LIFE AND SOCIAL ADAPTATION

- Public health gains, including substantial long-term savings in healthcare costs due to the reduction of pollution-related chronic diseases.
- Enhanced urban safety through advanced EV platforms, which often integrate improved safety technologies, contributing to “Vision Zero” traffic safety goals.
- Multimodal connectivity and improved accessibility through the integration of e-mobility with public transit, e-bikes, and shared mobility schemes.
- Efficient urban flow through more streamlined, digitalised, and integrated transport management systems (Grieco, 2015; Ravazzoli & Torricelli, 2017; Yanocha & Allan, 2019).

2.3.2. Defining success and the value proposition

In line with relevant EU regulatory frameworks, successful e-mobility planning requires clear target-setting that transcends EV uptake alone, capturing the broader strategic impacts of transport electrification.

Table 3. Indicative KPIs for e-mobility targets aligned with EU policy frameworks

Focus area	Key Performance Indicator (KPI)	Indicative 2030 milestone	EU framework
Infrastructure	Share of population within 500 m of a public charger	100% coverage in dense urban areas	AFIR (2023/1804/EU)
	Target: Ensuring widespread access to public charging infrastructure		
Public fleet	Share of zero-emission municipal light-duty vehicles	100% of fleet	Clean Vehicles Directive (2019/1161/EU)
	Target: Leading by example through municipal fleet electrification		
Public transit	Share of zero-emission new urban bus procurements	90–100% of new fleet	Clean Vehicles Directive (2019/1161/EU)
	Target: Transitioning public transport systems to zero-emission solutions		
Economy	Jobs across e-mobility sector	+15% growth in green tech sector	European Green Deal
	Target: Supporting local value creation and growth of the e-mobility sector		
Equity	Share of social housing buildings with access to charging	100% of new or renovated units	Energy Performance of Buildings Directive (2024/1275/EU, EPBD)
	Target: Preventing a “charging divide” by ensuring fair access to charging infrastructure, particularly in residential contexts		
Public health	Reduction in NO _x and PM _{2.5} levels	40% reduction in city centre	Air Quality Directive (2024/2881/EU)
	Target: Improving air quality and reducing exposure to harmful pollutants		
Grid capacity	Public charging power output per EV	≥ 1.3 kW per vehicle	AFIR (2023/1804/EU)
	Target: Ensuring electricity system readiness to support EV uptake		

By embedding a comprehensive KPI framework into local planning, LRAs can move beyond fragmented interventions toward a more integrated and accountable urban mobility transition framework. This systematic approach helps bridge the gap between high-level policy and real-world implementation, providing public, private and civic stakeholders with a structured basis to monitor progress, optimise public spending and deliver more equitable urban outcomes. It also strengthens the credibility and investment readiness of local e-mobility strategies at a time when measurable impact has become a key prerequisite for accessing major EU funding instruments - such as the [Connecting Europe Facility \(CEF\)](#), the [Social Climate Fund \(SCF\)](#), and the [European Regional Development/Cohesion Funds \(ERDF/CF\)](#) – which increasingly condition their support on data-driven projects capable of demonstrating clear results and strong alignment with EU policy objectives.

*Tracking progress is far more than an administrative exercise;
it is a strategic enabler that helps LRAs strengthen their investment case, improve transparency,
and ensure that today's ambitions become tomorrow's resilient urban reality.*

3. Incentivising e-mobility adoption

Even the strategic vision for e-mobility is clear, its large-scale deployment remains constrained by significant financial barriers. In particular, the high upfront costs associated with zero-emission vehicles and charging infrastructure often exceed the capacity of traditional public budgets, even where long-term operational savings and a favourable total cost of ownership (TCO) are evident (de Albuquerque Felizola Romeral & Zancul, 2025). This challenge is further compounded by market uncertainties - often described as the “chicken-and-egg” dilemma - where infrastructure investment and user adoption evolve in parallel, creating delays in scaling up deployment (Hunkin & Krell, 2025; Interreg Europe, 2022; Wappelhorst et al., 2021). Moreover, limited information, technological uncertainty, and other country-specific factors strongly influence user adoption and investment decisions (Pamidimukkala et al., 2024; Qadir et al., 2024).

Table 4. Key market barriers to e-mobility adoption

Barrier	Description
The initial-cost barrier (CAPEX)	High upfront costs for EVs and charging infrastructure remain a major hurdle, as the initial investment often exceeds the financial capacity of households, businesses and public authorities despite favourable long-term cost savings.
Infrastructure-demand gap (“chicken-and-egg dilemma”)	The interdependency between vehicle uptake and charging infrastructure slows market development, as private operators hesitate to invest without sufficient demand while users are discouraged by limited infrastructure and range anxiety.
Operational, informational and behavioural gaps	Organisational and knowledge-related challenges - such as limited technical expertise, uncertainty around grid capacity, concerns about technology performance, and behavioural and awareness-related barriers affecting user adoption - can further slow the transition beyond financial constraints.

To navigate these challenges, a synergetic policy framework combining fiscal and non-fiscal measures is increasingly applied across the EU and beyond. Together with diverse public and private funding sources - such as public-private partnerships (PPP), green financing instruments and EU support programmes - this approach can positively influence the shift to sustainable mobility solutions (EIB, 2018; Kamau & Holzwarth, 2022; Martin et al., 2020; UNECE, 2025; Werland & Rudolph, 2019). This section presents the specific logic and key instruments supporting its implementation.

3.1. The “Push - Pull” approach

The “Push - Pull” approach is a comprehensive strategy for sustainable mobility that balances the promotion of clean transport modes with targeted restrictions on high-emission alternatives. It operates by deploying “pull” measures (the “carrots” of the policy toolbox) to enhance the attractiveness, affordability and

convenience of sustainable choices, while applying at the same time “push” measures (the “sticks”) to discourage the use of fossil-fuel-based transport modes (Wappelhorst et al., 2021; Werland & Rudolph, 2019).

In particular, “pull” measures include incentives that make clean technologies and sustainable transport modes more attractive to end-users by lowering barriers to entry. Such measures typically include:

- Infrastructure Investment, including the expansion of EV charging networks and the development of safe, connected cycling and walking infrastructure to ensure accessibility.
- Public transport optimisation, involving improvements in the frequency, quality, and coverage of transit systems, often supported by integrated ticketing and digital mobility platforms.
- Financial incentives, such as direct purchase subsidies for EVs, support for bike-leasing programmes, or subsidised public transport passes to reduce user cost.
- Shared mobility and urban planning, including car-sharing services and Transit-Oriented Development (TOD) to improve access through sustainable transport nodes.

On the other hand, “push” measures use disincentives and regulatory restrictions to reduce reliance on private ICEVs and discourage unsustainable transport behaviour. Common examples include:

- Financial penalties, such as congestion charges, increased parking fees, or emissions-based taxation reflecting the environmental “externalities” of polluting vehicles.
- Regulatory restrictions, including the establishment of low and zero-emission zones (LEZs/ZEZs) where high-polluting vehicles are restricted or phased out.
- Space reallocation, such as redesigning urban streetscapes by reallocating road space from cars to dedicated cycling lanes, pedestrian zones, or green public spaces.
- Traffic management measures, including lowering speed limits (e.g., 30 km/h zones) and stricter parking management to reduce the convenience of private car use.

Evidence shows that neither approach is sufficient on its own; successful transitions depend on their combined and coordinated application³ (Interreg Europe, 2022).

³ A key advantage of combining these instruments lies in their potential for financial circularity. Revenues generated from “push” measures can be reinvested into “pull” incentives, creating a self-sustaining transition pathway that reduces the long-term pressure on municipal budgets (UNECE, 2025).

3.2. Types of incentives

To effectively implement the “push–pull” logic, LRAs can deploy a diverse range of policy instruments to incentivise e-mobility adoption. These tools can be grouped into four main categories, each designed to address specific dimensions of market failure within the e-mobility ecosystem, as shown in Table 5.

Table 5. Types of e-mobility incentives

Incentive type	What it means	Typical examples	Market barrier addressed
Financial and fiscal incentives	Economic support measures that reduce upfront costs and improve the long-term affordability of e-mobility.	<ul style="list-style-type: none"> • Purchase subsidies • Tax exemptions • Eco-vouchers • Charging installation grants 	High upfront costs and cost-related barriers limiting investment and adoption.
Regulatory incentives	Legal and policy measures that shape market conditions and restrict high-emission transport.	<ul style="list-style-type: none"> • Low- and zero-emission zones (LEZs/ZEZs) • Building mandates • Public procurement requirement 	Market inertia and externalities associated with fossil-fuel-based transport.
Operational and “soft” incentives	Non-monetary benefits that improve convenience and daily usability of e-mobility.	<ul style="list-style-type: none"> • Priority lane access • Dedicated EV parking access privileges • Logistics prioritisation 	Behavioural barriers and perceived inconvenience of switching to e-mobility.
Information, awareness and technical support	Advisory and knowledge-based measures that reduce uncertainty and build user confidence.	<ul style="list-style-type: none"> • One-stop-shops (OSS) • Awareness campaigns • Technical guidance • Demonstration projects 	Information gaps, lack of awareness and technological uncertainty

The following subsections further unpack these instruments, illustrating how they can be designed and applied in practice.

3.2.1. Financial and fiscal incentives

Financial and fiscal incentives are primarily designed to bridge the price disparity between EVs and ICEVs. These measures act as the primary “Pull” factor, improving the TCO for the end-users (de Albuquerque Felizola Romeral & Zancul, 2025; Kamau & Holzwarth, 2022; Werland & Rudolph, 2019).

IMPLEMENTATION. LRAs can implement financial incentives by providing direct grants for vehicle purchases or rebates for the installation of private charging points in residential buildings. On the fiscal side, they can use regional powers to offer exemptions from registration taxes, annual circulation fees, or introduce “eco-vouchers” for e-micromobility. In either case, effective implementation often requires “tiered” support - prioritising high-mileage users such as taxis and delivery fleets, or low-income households through “social leasing” schemes - to maximise emission reductions.

CHALLENGES. The main challenge is budgetary sustainability, as direct subsidies are costly and often depend on external funding sources. There is also a risk of “deadweight loss”, where incentives are claimed by users who would have adopted e-mobility anyway. To mitigate this, schemes should include clear time limits or “sunset clauses” linked to market development milestones.

3.2.2. Regulatory incentives

Regulatory incentives act as a “push” component by reshaping the legal and operational environment of urban mobility. Unlike financial instruments, they do not necessarily require significant public expenditure, but they do demand strong political commitment and stakeholder engagement (Martin et al., 2020; Wappelhorst et al., 2021; Werland & Rudolph, 2019).

IMPLEMENTATION. The most common application is the introduction of LEZs/ZEZs, restricting access to urban centres for high-emitting vehicles. LRAs can also update building regulations to require “ready-to-charge” infrastructure in new developments. Public procurement is another powerful tool: mandating zero-emission municipal fleets creates predictable demand and supports local market development.

CHALLENGES. The main challenge is socio-political acceptability. Local businesses may fear that restricted access will hurt commerce, and residents may view building mandates as an added cost to housing. Success on clear communication and long-term planning, including phased implementation to allow stakeholders the time to proceed with their investments without facing sudden economic shocks.

3.2.3. Operational and “soft” incentives

Operational incentives focus on the “utility value” of e-mobility through non-monetary perks that make the daily use of EVs more convenient and time-efficient than driving an ICEV (Hunkin & Krell, 2025; Interreg Europe, 2022; Wappelhorst et al., 2021).

IMPLEMENTATION. These measures typically involve the strategic management and use of urban assets, such as roads and parking. Common examples include granting EVs access to bus or high-occupancy vehicle (HOV) lanes to bypass traffic, as well as providing reserved “EV-only” parking in premium city-center locations. Some cities also offer “Green Logistics” priorities, giving electric delivery vans exclusive access to loading zones during peak hours.

CHALLENGES. The greatest challenge is the “Success Paradox”. As EV adoption increases, measures such as bus lane access may create congestion or reduce the efficiency of public transport. LRAs should therefore monitor implementation closely and be prepared to phase the measures out once e-mobility and EV use become the “new normal” for the city.

3.2.4. Information, awareness and technical support

Information-based measures address the “soft” barriers of uncertainty, range anxiety, and technical complexity. Many potential adopters are held back not by cost, but by a lack of trust in the technology or a lack of knowledge regarding how to install charging points (Pamidimukkala et al., 2024; Qadir et al., 2024; UNECE, 2025).

IMPLEMENTATION. LRAs act as a knowledge orchestrator by establishing One-Stop-Shops (OSS)-centralised helpdesks (physical or digital) where citizens and businesses can receive unbiased advice on vehicle ranges, subsidy applications, and certified installers. Public demonstration projects, such as “test-drive” events using the municipal fleet, also play a role in “de-risking” the technology in the eyes of the public.

CHALLENGES. The challenge lies in technical neutrality and keeping information up to date in a rapidly evolving market. LRAs must ensure that their staff are sufficiently trained to explain complex topics like grid integration and smart charging, and that digital tools (like charger maps) are integrated with real-time data to be truly useful for citizens.

3.3. National implementation models

While the “push-pull” approach provides a common strategic framework, its implementation varies across countries depending on how national and local authorities combine regulatory measures, financial incentives and infrastructure investments. As a result, across Europe, leading frontrunners have adopted distinct implementation models, reflecting different strategic priorities - ranging from tax-based incentives and infrastructure-led approaches to financially self-sustaining mechanisms. These models demonstrate how tailored policy mixes can effectively address market barriers and accelerate e-mobility adoption (Ardiyok & Canbeyli, 2020; UNECE, 2025; Wappelhorst et al., 2021).

To illustrate these dynamics in practice, the following subsections examine a selection of high-performing national “policy toolboxes” alongside representative municipal examples, exemplifying how strategic frameworks are translated into concrete actions at the city level. The intention is to offer practical guidance for LRAs in identifying the specific policy levers - whether fiscal, regulatory, or operational - that best align with their region’s unique profile (Martin et al., 2020; Martins et al., 2024).

3.3.1. Norway and the Oslo model: The “tax-exemption” strategy

Norway represents the global benchmark for e-mobility adoption, driven by a long-term and consistent policy approach centered on robust fiscal “pull” measures. The national strategy is architected to ensure that EVs are not merely a sustainable alternative but the most economically rational choice for end-users. By aggressively dismantling the primary barrier of high upfront CAPEX - most notably through exemptions from the 25% VAT and registration taxes - Norway achieved early price parity between EVs and ICEVs (OECD, 2022).

These fiscal incentives are complemented by a comprehensive infrastructure roadmap and operational benefits that address the “range and charge anxiety”. This includes a nationwide fast-charging network ensuring full territorial coverage and privileged access to urban transit infrastructure. In doing so, the Norwegian model has facilitated a near-complete market transition, providing a blueprint for how a “subsidy-to-parity” model can trigger mass-market shifts.

Table 6. National implementation model - Norway

Category	Policy instrument	Implementation details
Fiscal (Pull)	VAT exemption	<ul style="list-style-type: none"> • 25% VAT exemption on EV purchases (with caps for high-end vehicles); • Since 2023, the exemption applies only to the first 500,000 Norwegian Krone (NOK) of the purchase price.
Fiscal (Pull)	Registration tax exemption	<ul style="list-style-type: none"> • Full exemption from CO₂- and NO_x purchase taxes; • A weight-based component applies only to the portion exceeding 500kg.
Fiscal (Pull)	Ownership taxation	<ul style="list-style-type: none"> • Reduced annual traffic Insurance tax for EVs; • 20% reduction in the taxable base for company car benefits-in-kind.
Infrastructure (Pull)	National charging network	The government-funded “Enova” programme ensures the deployment of high-power fast-charging stations at least every 50km along all main roads.
Operational (Pull)	Traffic privileges	Reduced tolls/ferry fees (max 70% of ICEV rate) and bus lane access.
Regulatory (Push)	National target	100% zero-emission new passenger car and light van sales target by 2025.

At the municipal level, Oslo reinforces the national framework through targeted regulatory and operational interventions. The city’s model (the “Oslo model”) is characterised by a sophisticated multi-level governance approach that addresses high-density urban challenges, such as limited private parking and grid constraints. By combining “push” measures (e.g. differentiated toll pricing within the city’s toll ring) with localised “pull” incentives (e.g., residential charging subsidies), Oslo ensures that national policy goals are effectively translated into city-level deployment (EUROCITIES, 2025; WEF, 2018).

Table 7 outlines the main policy instruments supporting e-mobility in Oslo.

Table 7. Municipal implementation - Oslo

Category	Policy instrument	Implementation details
Financial (Pull)	Residential subsidies	Up to 20% subsidy for housing cooperatives to install shared charging infrastructure for residents.
Infrastructure (Pull)	Public charging network	Extensive municipal charging network (>2,600 points) with a “request-a-charger” programme for high-density districts.
Operational (Push/Pull)	Toll differentiation	Differentiated rates in the city toll ring: <ul style="list-style-type: none"> • Higher charges for ICEVs. • EVs capped at 70% of the standard rate
Operational (Push/Pull)	Priority access	<ul style="list-style-type: none"> • Dedicated parking/charging access for EV fleets. • Bus lanes access restricted to EVs with +1 passenger during rush hours.
Regulatory (Push)	Taxi electrification mandate	Requirement for all taxis within Oslo city limits to be zero-emission to maintain a license (effective 2025).
Regulatory (Push)	Zero-emission construction	Municipal procurement requirement: all city construction sites must be fossil-free or emission-free.

Focus Box 2: Key insight from the Norwegian model – What LRAs can learn?

The Norwegian model demonstrates how strong and consistent fiscal incentives, combined with supportive infrastructure and local operational measures, can rapidly accelerate e-mobility uptake and EV competitiveness.

Its importance lies in the dynamic policy adjustment - as incentives are gradually recalibrated, shifting from full exemptions to reduced rates and refining operational perks to ensure long-term fiscal sustainability as the market matures.

3.3.2. The Netherlands and the Amsterdam model: The “infrastructure-led” strategy

The Netherlands represents a leading example of an infrastructure-driven approach to e-mobility, particularly optimised for high-density urban environments. Unlike Norway’s strong reliance on fiscal incentives, the Dutch model prioritises accessibility, grid integration and regulatory steering to facilitate market uptake. It is specifically designed to address critical infrastructure barriers, most notably the “garage-less” constraint, a major deterrent to EV adoption in densely populated areas where many residents lack access to private parking.

To overcome this, a demand-driven “charging-on-request” approach is applied, allowing residents to request the installation of a public charging point near their home and ensuring that infrastructure deployment aligns with actual user needs rather than speculative planning (EAFO, 2026b; van den Hoed et

al., 2019). At the same time fiscal instruments play a critical role in accelerating fleet electrification, particularly in the corporate sector.

As the market matures, the Netherlands is gradually transitioning from direct purchase subsidies to self-sustaining market-based mechanisms (Kaplanović & Tanja Živojinović, 2022; Martins et al., 2024; Schub et al., 2025). By 2026, this shift is exemplified by the Emission Reduction Units (EREs)⁴, whereby EV users can generate revenue by selling CO₂ reduction certificates to fuel suppliers, turning each kWh of clean charging into a tradable asset (Blokhuis, 2026; NEa, 2026; van der Veen et al., 2025).

Table 8. National implementation model - The Netherlands

Category	Policy instrument	Implementation details
Infrastructure (Pull)	Demand-driven charging	“Charging at request” system providing installation of public poles for residents without private parking
Infrastructure (Pull)	Heavy-duty charging support	Subsidies for ultra-fast charging infrastructure specifically for logistics and freight (SPULA programme)
Infrastructure	National interoperability	<ul style="list-style-type: none"> • Full roaming across charging networks; • Single card access nationwide (OCPI standard).
Financial (Pull)	ERE market mechanism	EV owners earn approximately €0.10/kWh by selling CO ₂ reduction certificates (EREs) to fuel suppliers.
Fiscal (Pull)	Vehicle taxation	<ul style="list-style-type: none"> • 30% discount on road tax until 2028 for MRBs. • Fixed purchase fee replacing the previous total exemption, for BPMs.
Corporate (Pull)	Company car taxation	Phased transition to a standard 22% rate for new EV registrations (Bijtelling)
Regulatory (Push)	National climate targets	100% zero-emission new car sales by 2030.

At the municipal level, Amsterdam serves as the laboratory for combining infrastructure accessibility with aggressive regulatory “push” measures. To achieve its “Clean Air 2030” goal, the city has implemented ZEZ/LEZs for logistics, mandating that all new commercial vans and trucks entering the city center must be zero-emission as of 2025. This is complemented by “soft” measures, such as scrappage schemes and the continued expansion of public charging infrastructure or the [Zero Emission Region Amsterdam \(ZERA\)](#) initiative - a regional collaborative event series - and the [Logistiek020](#) platform, which provides SMEs with technical advice and transition funding (City of Amsterdam, 2023).

⁴ As of January 1, 2026, the Netherlands officially replaced the old energy-based HBE system with the ERE system (in Dutch: Emissiereductie-eenheden). This was done to comply with the EU’s RED III directive, shifting the focus from the volume of renewable energy to the actual GHG savings achieved. For the main ERE regulation (in Dutch) refer to NEa (Dutch Emissions Authority, [here](#)).

Table 9 outlines the main policy instruments supporting Amsterdam’s zero-emission mobility transition.

Table 9. Municipal implementation - Amsterdam

Category	Policy instrument	Implementation details
Infrastructure (Pull)	Charging at request	<ul style="list-style-type: none"> Local execution of the national system; Free installation of public charging points for “garage-less” residents.
Financial (Pull)	Scrappage schemes	Grants of €1,000 - €1,500 for low-income residents to replace old diesel vehicles with EVs or e-bikes.
Operational (Pull)	Parking incentives	Priority parking permits and dedicated loading zones for zero-emission commercial vehicles.
Information (Soft)	Advisory support	Regional office providing logistics planning and subsidy guidance to local SMEs (ZERA/Logistiek 020).
Information/Regulatory	Building facilitation	Simplified legal procedures for installing chargers in apartment buildings via notification rather than a board vote (VvE notification).
Regulatory (Push)	ZEZs	Mandatory zero-emission transition for commercial vehicles in the city center and in designated urban areas.

Focus Box 3: Key insight from the Dutch model – What LRAs can learn?

A defining feature of the Dutch model is its strong focus on system integration and user convenience. Through measures such as full interoperability across charging networks and simplified installation procedures, it reduces both technical and administrative complexity for end-users, highlighting the importance of removing structural constraints that limit access to e-mobility in dense urban contexts. In doing so, the model demonstrates how prioritising infrastructure accessibility - combined with targeted regulatory measures - can effectively enable large-scale e-mobility uptake without long-term reliance on direct subsidies.

3.3.3. Germany and the Berlin/Hamburg model: The “subsidy-to-scale” strategy

Germany’s approach to e-mobility reflects its role as a major automotive manufacturing hub, combining strong industrial policy with targeted financial incentives. Initially centered on direct purchase subsidies, the German model has progressively evolved towards infrastructure expansion and system-level support, enabling large-scale adoption. This evolution highlights the necessity of implementing robust regulatory frameworks and incentive policies to overcome market-related and infrastructure challenges (EAFO, 2026a; UNECE, 2025)

At the national level, early deployment was driven by generous financial incentives, such as the Umweltbonus, aimed at bridging the upfront cost gap between EVs and ICEVs. More recently, the focus has

shifted towards ensuring long-distance usability and system reliability through major infrastructure investments, most notably the [Deutschlandnetz programme](#), which supports the rollout of high-power charging hubs across the country. In parallel, Germany has maintained fiscal incentives - such as long-term vehicle tax exemptions and favourable company car taxation - to support both private and corporate uptake (Martins et al., 2024; NOW GmbH, 2026; Schub et al., 2025).

A distinctive feature of the German model is the introduction of the “E-license plate”, a non-fiscal incentive that enables municipalities to offer localised benefits such as free parking or access to restricted lanes, thereby linking national policy with local implementation. Furthermore, recent policy developments emphasise scalability and social inclusion through income-based subsidies, ensuring that e-mobility transition is accessible beyond early adopters and contributes to a broader societal shift (Ardiyok & Canbeyli, 2020; EAFO, 2026b).

Table 10. National implementation model - Germany

Category	Policy instrument	Implementation details
Financial (Pull)	Socially scaled bonus (Umweltbonus/ updated schemes)	<ul style="list-style-type: none"> • Tiered grants (€3k–€6k) based on household income; • Capped at €80k–€90k annual income.
Fiscal (Pull)	Vehicle tax exemption	<ul style="list-style-type: none"> • Long-term exemption or reduction of annual vehicle tax for registered EVs by end of 2025; • 50% permanent reduction based on weight for new registrations.
Fiscal (Pull)	Company car taxation	Reduced taxable benefit rates for company EVs.
Fiscal/Corporate (Pull)	Turbo depreciation	40%-75% deduction of company EVs’ value in the first year of purchase.
Operational (Pull)	E-license plate system	Enables municipalities to grant non-fiscal benefits (parking, lane access) to identified EVs.
Infrastructure	Deutschlandnetz	Federal roll-out of 9,000 high-power (HPC) fast-charging points across >1,000 sites, ensuring coverage every 15–30km on motorways.
Regulatory (Push)	Charging mandate	Requirement for large fuel station operators to provide fast-charging infrastructure.

At the municipal level, cities like Berlin and Hamburg build on this framework focusing on infrastructure concentration. Rather than dispersing low-power chargers, these cities have prioritised the development of high-capacity charging hubs in strategic urban locations to replicate the “fuelling experience” and reduce urban search times. Furthermore, they actively lead by example through massive public sector fleet electrification - such as Berlin's commitment to a 100% zero-emission bus fleet by 2030 - demonstrating the feasibility of high-density e-mobility at scale (Mubiru, 2025).

Table 11 outlines the main policy instruments supporting e-mobility transition in Berlin and Hamburg.

Table 11. Municipal implementation - Berlin/Hamburg

Category	Policy instrument	Implementation details
Infrastructure (Pull)	Charging hubs	Strategic shift to centralised HPC hubs in high-density districts to replicate the “fuelling experience”.
Infrastructure/ Public sector	Fleet electrification	<ul style="list-style-type: none"> • Transitioning 1,400+ buses to 100% zero-emission; • Rollout of “bottom-up” pantograph charging at 36 terminal stops (Berlin).
Operational (Pull)	E-plate privileges	Free or discounted parking at metered street spaces in high-demand zones for EVs with E-license plates for the maximum permitted duration (Hamburg).
Operational (Pull)	Bus lane access	Access for electric taxis and car-sharing fleets into selected bus lanes to bypass congestion.
Financial (Pull)	SME fleet grants	Local-specific grants for local businesses to: <ul style="list-style-type: none"> • electrify commercial vans, and • install private charging infrastructure.
Information (Soft)	e-Information platforms	Real-time availability and transparent pricing for >3,000 public charging points via integrated digital platforms and live mapping tools (e.g., viz.berlin.de)
Regulatory (Push)	Space reallocation	Systemic conversion of on-street parking spaces into “EV-only” charging and shared mobility zones.

Focus Box 4: Key insight from the German model – What LRAs can learn?

The German model highlights a phased transition from subsidy-driven market activation to infrastructure-led system integration.

It demonstrates how early financial incentives - combined with large-scale investment in charging infrastructure and strong regulatory support - can enable long-term scalability, system integration and broader social inclusion.

3.3.4. France and the Paris model: The “financial circularity” strategy

France offers a distinctive model based on financial circularity, combining strong fiscal “push” and “pull” measures within a self-sustaining system. At the core of this approach lies the “Bonus–Malus” mechanism, a “feebate” system where penalties imposed on high-emission vehicles directly fund incentives for low-emission alternatives. This structure ensures that the transition is partially self-financed, reinforcing the “polluter pays” principle while reducing long-term reliance on the national budget (EAFO, 2026a; UNECE, 2025).

At the national level, the model has evolved to prioritise industrial sovereignty and social equity. Subsidies are tied to a strict “Environmental Score”, which evaluates the carbon footprint of a vehicle’s entire

production cycle, including battery manufacturing and logistics. Furthermore, France has addressed the affordability gap through its flagship “Social Leasing” programme, which allows low-income households (taxable income \leq €15,400) to lease a new European-made EV for as little as €100 per month. The underlying intention is to reduce the financial barriers associated with EV adoption and broaden access to clean mobility, thereby addressing some of the demographic challenges identified in recent research (Ardiyok & Canbeyli, 2020; EAFO, 2026a).

Table 12. National implementation model – France

Category	Policy instrument	Implementation details
Fiscal (Push)	CO ₂ and weight malus	Progressive penalty tax on high-emission vehicles (up to very high levels for heavy emitters). <ul style="list-style-type: none"> • Penalties trigger at 108g CO₂/km and 1,500kg weight. • Maximum combined penalty capped at €80,000.
Financial (Pull)	Ecological bonus	Purchase subsidies for EVs. <ul style="list-style-type: none"> • Tiered grants up to €7,000 for low-income households; • Restricted to vehicles with high environmental scores.
Financial (Pull)	Scrappage scheme (conversion premium)	<ul style="list-style-type: none"> • Financial support (grants of up to €5,000) for replacing old ICEVs with EVs. • Highly targeted toward low-income commuters.
Infrastructure (Pull)	Advenir programme	National grants covering up to 50% of installation costs for charging points in multi-unit dwellings and SME lots.
Social (Pull)	Social leasing	<ul style="list-style-type: none"> • EV leasing (~€100/month) for low-income commuters. • Includes a state contribution of up to €6,000 to cover the initial deposit.
Regulatory (Push)	National LEZs	Mandatory expansion of LEZs in all urban areas with >150,000 inhabitants by 2025/2026.

At the municipal level, Paris provides a notable example of how financial circularity principles can be embedded in urban mobility policy. The city has implemented a phased LEZ (Zone à Faibles Émissions - ZFE) roadmap, progressively restricting the circulation of the most polluting vehicles, including pre-2011 diesel vehicles (Crit'Air 3), during weekdays. This regulatory “push” is complemented by an equally ambitious “pull” strategy aimed at encouraging more sustainable mobility choices. Indicative measures include the tripling of parking fees for heavy SUVs owned by non-residents, creating a financial disincentive for larger and more polluting vehicles, alongside the reallocation of road space to a 1,000 km cycling network that expands access to active mobility options (Métropole du Grand Paris, 2026).

Overall, the Paris integrated approach illustrates how cities can combine regulatory measures, pricing signals and investments in sustainable mobility infrastructure to discourage the use of high-emission vehicles while simultaneously providing attractive multimodal alternatives to accelerate the transition towards a cleaner,

more efficient and more inclusive urban mobility system (Heddebaut, 2017; Martin et al., 2020). An overview of the main policy instruments supporting it is given in [Table 13](#).

Table 13. Municipal implementation – Paris

Category	Policy instrument	Implementation details
Financial (Pull)	Local support schemes (Conversion bonus)	Municipal “top-up” grants for residents replacing old ICEVs with EVs and micromobility.
Operational (Push/Pull)	Parking regulation	Increased parking fees for high-emission and heavy non-resident vehicles in the city center.
Infrastructure (Pull)	Metropolitan charging network	> 2,700 charging points with unified access and night-time “resident” rates for “garage-less” owners.
Urban planning	Space reallocation	Massive reallocation of car-dedicated space to create protected cycling “highways” (Vélopolitain).
Regulatory (Push)	LEZ (ZFE) roadmap	Phased ban of diesel (2024) and petrol vehicles (by 2030) within the metropolitan area (Crit'Air 3 ban).

Focus Box 5: Key insight from the French model – What LRAs can learn?

A key feature of the French model is its ability to integrate economic incentives with long-term regulatory certainty, creating a predictable framework for both consumers and investors.

By clearly signalling the progressive phase-out of polluting vehicles while simultaneously supporting the transition through targeted subsidies, the model combines fiscal disincentives with financial incentives to establish a financially sustainable pathway.

This approach demonstrates how aligning economic signals with regulatory ambition can drive long-term market transformation and accelerate the transition to e-mobility.

4. Setting up a transition pathway: A quick step-by-step guide

While national and local contexts vary, experience from LRAs suggests that developing a transition pathway to e-mobility requires a clear, coherent and flexible framework that aligns local priorities with broader policy objectives, while remaining responsive to shifting market dynamics and technological breakthroughs. At the same time, multiple roadmaps - either market-driven or policy-led - open distinct “policy windows” for local and regional governments seeking to foster e-mobility adoption within their respective territories. Even so, common implementation patterns are observed, outlining a high-level roadmap for LRAs to advance these unique opportunities or leverage them effectively (UNECE, 2025).

Rather than prescribing a single model, this high-level roadmap reflects a shared recognisable logic evident across contexts and organises the transition to e-mobility into a sequence of six interconnected steps - from vision setting and contextual analysis to implementation, monitoring, and scaling.



Figure 5. High-level roadmap for planning, implementing, and scaling e-mobility transitions.

The roadmap is inherently data-driven, enabling LRAs to actively shape their e-mobility pathway drawing on evidence-based insights and responding to evolving market trends. In doing so, they can ensure that their efforts deliver the environmental, economic, and social benefits sought through e-mobility (EURELECTRIC, 2026; European Commission, 2024).

4.1. Structuring the e-mobility journey: key steps for LRAs

This section structures the e-mobility journey outlining the key steps of the high-level roadmap, providing a practical reference point for LRAs. Rather than a rigid blueprint, it is intended as flexible and practical guidance, allowing them to tailor the approach to their specific contexts.

Step 1 – Define strategic vision and political commitment

Before implementation begins, LRAs should establish a clear strategic direction for e-mobility, firmly embedded within broader climate, energy and mobility objectives and backed by strong political ownership. Key actions typically include:

- integrating e-mobility adoption within existing transport and climate strategies
- setting clear, measurable targets (e.g. EV uptake, emissions reduction, infrastructure coverage)
- ensuring cross-departmental political endorsement and long-term commitment

A shared strategic vision creates the conditions for coordinated action, policy continuity and long-term investment confidence.

Step 2 – Assess local context and system readiness

Successful planning depends on a realistic understanding of local mobility conditions, infrastructure readiness and institutional capacity. This step helps LRAs ground the transition in local realities and identify critical enabling conditions and constraints. Key actions typically include:

- analysing mobility patterns, emissions profiles, user needs and infrastructure gaps,
- assessing grid capacity and RES integration potential,
- mapping stakeholders actively across the transport and e-mobility ecosystem,
- evaluating internal capacities, available resources and implementation risks.

A robust local assessment helps ensure that e-mobility measures remain feasible, targeted and responsive to actual local needs.

Common pitfalls to avoid:

- Insufficient understanding of mobility demand and user behaviour
- Overlooking infrastructure constraints or grid limitations
- Underestimating internal implementation capacity and coordination needs.

Step 3 – Identify barriers and priority areas

Building on the previous analyses, this step involves identifying the factors slowing down e-mobility uptake and prioritise areas where action can deliver the greatest impact. Key actions typically include:

- identifying financial, infrastructural, regulatory and behavioural barriers,
- assessing market gaps, including infrastructure-demand mismatches,
- prioritising strategic sectors such as public fleets, charging infrastructure or urban logistics.

Understanding where and why the transition slows down is essential for designing targeted and proportionate policy responses.

Common pitfalls to avoid:

- Addressing isolated symptoms instead of systemic barriers
- Overlooking behavioural and awareness-related challenges
- Insufficient prioritisation across competing actions

Step 4 – Design integrated policy packages

E-mobility deployment requires coordinated policy mixes combining regulatory (“push”) and incentive-based (“pull”) measures with a coherent implementation framework. This typically requires LRAs to:

- select financial, regulatory, operational and informational instruments,
- align incentives with broader regulatory frameworks,
- tailor measure deployment based to local market conditions, user needs and urban density,
- coordinate with market and energy stakeholders.

Well-balanced policy packages help create the enabling conditions needed for large-scale e-mobility adoption.

Common pitfalls to avoid:

- Over-reliance on a single type of instrument and fragmented or uncoordinated policy design
- Infrastructure deployment disconnected from actual demand patterns

Step 5 – Secure financing and define implementation mechanisms

A stable financial and organisational framework is essential to support implementation, reduce investment risks and enable long-term scaling. In practice, this involves LRAs:

- identifying diverse funding sources (public budgets, EU funds, PPPs, private investment),
- defining implementation and risk-sharing models
- building partnerships with private sector actors (e.g. CPOs, energy providers)

*Strong financing structures help accelerate deployment
while improving market confidence and investment readiness.*

Common pitfalls to avoid:

- Weak long-term financial planning/over-reliance on short-term subsidies
- Insufficient mobilisation of private capital and partnerships

Step 6 - Implement measures, monitor progress and scale up

Implementation should follow a phased and adaptive approach, combining continuous monitoring with regular policy adjustment and long-term institutional integration. Maintaining momentum and scaling impact typically requires LRAs to:

- define robust KPIs and monitoring frameworks to evaluate performance
- adjust their strategies based on data-driven (monitoring) results,
- reinvest resources and embed effective measures more widely, into their long-term planning,
- strengthen institutional capacity and coordination.

*Continuous monitoring and adaptive management are essential to transform pilot actions
into a sustained and system-wide e-mobility transition.*

Common pitfalls to avoid:

- Weak monitoring and evaluation systems
- Delayed policy adjustments or failure to scale successful measures
- Treating e-mobility as a short-term project rather than a structural transition

4.2. Structuring the e-mobility journey: A practical checklist for LRAs

To support practical application, the checklist below helps LRAs translate the key steps presented earlier into concrete actions, from early-stage planning to implementation and evaluation.

Step 1 – Strategic direction and political support

- Has a clear long-term ambition for e-mobility been defined in line with climate and mobility goals?
- Are concrete targets established (e.g. vehicle uptake, emissions reduction, infrastructure coverage)?
- Is there strong political backing and coordination across relevant departments?

Step 2 – Understanding local conditions and readiness

- Is there a comprehensive picture of mobility demand, emissions, and user behaviour?
- Have infrastructure availability and spatial constraints been assessed?
- Has the capacity of the local energy system been examined?
- Are key actors, governance structures, and internal resources clearly mapped?

Step 3 – Identifying challenges and setting priorities

- Have the main obstacles to e-mobility uptake been clearly identified?
- Are priority areas or target segments defined (e.g. municipal fleets, logistics, charging hotspots)?
- Are actions prioritised based on expected impact and feasibility?

Step 4 – Designing a coherent policy mix

- Is there a well-balanced combination of regulatory and incentive-based measures?
- Are instruments tailored to local market conditions and user profiles?
- Do measures work together in a consistent and complementary way?
- Are inclusiveness and accessibility considerations taken into account?

Step 5 – Enabling deployment and mobilising resources

- Is there a clear plan for rolling out charging infrastructure based on anticipated demand?
- Are infrastructure plans aligned with energy system capabilities?
- Are funding sources diversified (e.g. public funds, EU programmes, private investment)?
- Are delivery models, partnerships, and responsibilities clearly defined?

Step 6 – Tracking progress and scaling up

- Are performance indicators and monitoring tools in place?
- Is there a mechanism for reviewing progress and adjusting measures when needed?
- Are successful actions expanded and integrated into long-term strategies?
- Is there a framework to sustain investments and ensure continuity over time?

5. Case study: Blended financing for e-mobility in Valladolid (Spain)

The REMOURBAN initiative in Valladolid (Spain) was developed to accelerate the transition to low-carbon transport systems by addressing key barriers such as high upfront costs and limited EV adoption. At its core, the approach combines EU funding with local public resources and operational measures to deliver targeted incentives that support e-mobility uptake.

GENERAL CONTEXT. The REMOURBAN project (2015–2020), funded by Horizon 2020, introduced an integrated urban regeneration approach in Valladolid, with a particular focus on the FASA district. The initiative combined EE measures with the large-scale deployment of EV infrastructure, embedding e-mobility within a broader strategy that also included building retrofits and smart city digital solutions.

HOW INCENTIVES WERE APPLIED. Through REMOURBAN, the city council of Valladolid applied a blended financing model, pairing EU funding with its own local resources, to introduce incentives that stimulated a shift in mobility habits. The approach targeted high-impact professional sectors and supported the transition to e-mobility through infrastructure investment and public fleet modernisation.

These measures were embedded within a broader urban regeneration strategy that included building retrofits and smart city digital solutions, maximising the overall environmental impact.

The total capital expenditure reached €3.99 million, with annual operating costs of €200,000. The model achieved a payback period of around 10 years, with infrastructure assets asset lifetimes of 12 to 15 years.

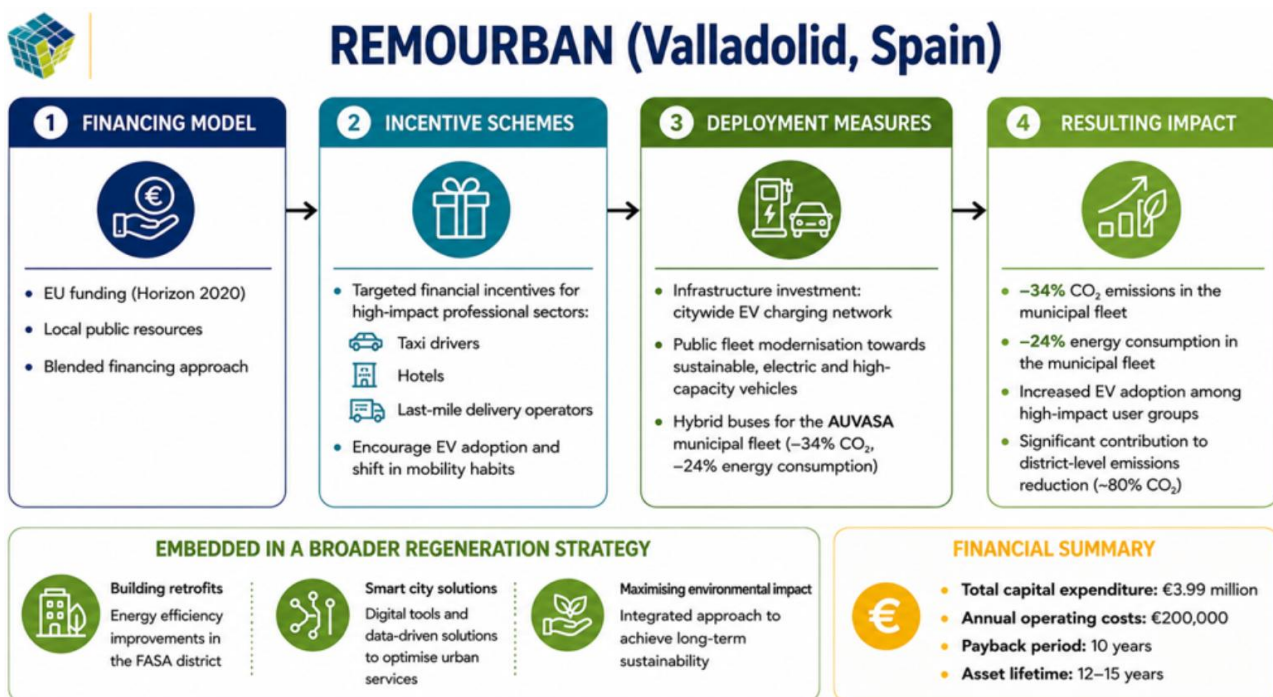


Figure 6. Blended financing and incentive model for e-mobility deployment in Valladolid (REMOURBAN)

KEY TAKEAWAY. In the case of Valladolid, the strategic blending of EU and local public funding played a key role in lowering investment barriers and enabling project implementation, while linking financial support with targeted operational measures ensured that e-mobility incentives translated into measurable results. The approach also proved scalable and replicable, particularly when embedded within broader urban regeneration strategies and aligned with EE objectives and citizen engagement.

READ MORE ABOUT THIS PROJECT. For deeper insights on the REMOURBAN project and how it was applied in Valladolid visit the [REMOURBAN website](#). In addition, find and download the [case study factsheet](#) on the [PROSPECT Stories webpage](#).

For further information of the supporting agency's role in sustainable energy and mobility management visit the official [Valladolid City Council \(Innolid\) website](#).

The PROSPECT [inventory of success Stories](#) provides LRAs with a practical and peer-validated reference base, helping translate strategic planning into structured and operational financing approaches.

6. Critical conditions influencing e-mobility adoption

The transition to e-mobility is not merely a product of technical deployment; it is shaped by the complex interplay of policy, institutional, financial, and technical pillars that determine how a strategy translates effectively into operational reality. While pathways are inherently context-dependent, long-term success depends on the agility required to sustain positive drivers and proactively mitigate the barriers and systemic risks that arise during implementation.

6.1. Drivers and success factors

Key enabling conditions supporting e-mobility transition include:

- Strong political commitment and leadership, ensuring long-term continuity and cross-departmental alignment.
- Clear strategic vision and policy coherence, linking e-mobility with broader climate and energy goals.
- Integrated policy design, combining regulatory (“push”) and incentive-based (“pull”) measures.
- Sustainable financing and funding mechanisms, supporting upfront investments and long-term deployment.
- Infrastructure and grid readiness, aligning charging deployment with energy system capacity.
- Effective governance and coordination structures, enabling cross-sectoral collaboration across transport, energy and urban planning.
- Reliable data and monitoring systems, supporting evidence-based decisions and adaptive policy refinement.
- Stakeholder engagement and market readiness, including private sector participation and user acceptance.
- Institutional capacity and technical expertise, enabling effective planning and implementation

6.2. Barriers and limitations

Several structural and operational challenges may affect or slow down the pace of transition to e-mobility, including:

- Fragmented governance and lack of coordination across sectors and administrative levels.
- Insufficient or unstable funding, limiting infrastructure deployment and incentive schemes.
- Grid constraints and infrastructure gaps, slowing down large-scale adoption.
- High upfront costs and limited affordability, particularly for end-users and small operators.
- Regulatory complexity or misalignment, creating uncertainty for investors and stakeholders.

- Limited data availability, affecting planning accuracy and monitoring effectiveness.
- Behavioural barriers and low awareness, reducing user uptake.
- Institutional capacity gaps, particularly in smaller LRAs.
- Over-reliance on short-term or isolated measures, limiting systemic impact.

6.3. Key risk dimensions

To support a successful e-mobility transition, LRAs should actively manage the following key risks:

- Financial risk, linked to insufficient funding, cost overruns, or ineffective incentive schemes.
- Infrastructure risk, arising from mismatches between charging deployment and actual demand.
- Grid and energy system risk, including capacity constraints and integration challenges.
- Policy and regulatory risk, due to changing priorities or unstable policy frameworks.
- Operational risk, including delays in implementation or coordination failures.
- Market risk, related to slow technology uptake or private sector disengagement.
- Data and monitoring risk, affecting the ability to evaluate progress and adjust policies.
- Continuity risk, where successful measures are not scaled or embedded into long-term planning.

6.4. Synthesis of critical conditions affecting the transition pathway

Table 14 below synthesises the key critical conditions - drivers, barriers, and risk dimensions - influencing e-mobility transition pathways and highlights practical mitigation measures to support effective implementation. It provides a consolidated overview to inform both strategic planning and operational decision-making by LRAs.

Table 14. Summary of critical conditions influencing e-mobility transition

Dimension	Key drivers or enabling factors	Common barriers or risks	Mitigation measures and practices
Political & strategic alignment	<ul style="list-style-type: none"> • Strong political commitment and leadership • Clear strategic vision • Integration into broader policy frameworks (e.g. SUMP, SECAP) 	<ul style="list-style-type: none"> • Shifting political priorities • Weak ownership across departments • Lack of long-term vision 	<ul style="list-style-type: none"> • Formal political endorsement • Clear strategic targets and roadmaps • Regular reporting and alignment with policy frameworks
Governance & coordination	<ul style="list-style-type: none"> • Clear roles and responsibilities • Cross-sectoral coordination (transport, energy, planning) • Stakeholder engagement 	<ul style="list-style-type: none"> • Fragmented governance structures • Limited interdepartmental coordination • Weak stakeholder involvement 	<ul style="list-style-type: none"> • Defined governance structures and coordination mechanisms • Dedicated task forces • Structured engagement processes

Policy design & regulatory framework	<ul style="list-style-type: none"> • Integrated “push-pull” policy mix • Alignment between incentives and regulation • Context-specific policy design 	<ul style="list-style-type: none"> • Over-reliance on single instruments • Policy misalignment or inconsistency • Regulatory uncertainty 	<ul style="list-style-type: none"> • Coherent policy packages combining instruments. • Regular policy reviews and adjustments • Alignment with market conditions and demand
Financial framework	<ul style="list-style-type: none"> • Availability of public and private funding • Diversified financing sources (EU, national, PPPs) • Financial sustainability of incentives 	<ul style="list-style-type: none"> • Insufficient or unstable funding • Over-reliance on subsidies • Limited private sector mobilisation 	<ul style="list-style-type: none"> • Blended financing approaches • Long-term financial planning • Risk-sharing mechanisms and investment incentives
Infrastructure & energy system	<ul style="list-style-type: none"> • Strategic infrastructure planning • Alignment with demand and urban density • Grid readiness and energy integration 	<ul style="list-style-type: none"> • Infrastructure gaps or poor spatial planning • Grid capacity constraints. • Lack of interoperability 	<ul style="list-style-type: none"> • Demand-driven infrastructure deployment • Coordination with grid operators • Standards for interoperability and user accessibility
Technical & data capacity	<ul style="list-style-type: none"> • Availability of reliable data and baselines • Monitoring and evaluation systems • Internal technical expertise 	<ul style="list-style-type: none"> • Limited data availability or quality • Weak monitoring systems • Capacity gaps within LRAs 	<ul style="list-style-type: none"> • Robust data collection and monitoring frameworks • Use of digital tools and KPIs • Capacity-building and technical support
Market development & user uptake	<ul style="list-style-type: none"> • Increasing technology maturity • Private sector engagement • User awareness and acceptance 	<ul style="list-style-type: none"> • High upfront costs • Behavioural resistance • Limited market readiness 	<ul style="list-style-type: none"> • Targeted incentive schemes • Awareness campaigns and user engagement • Support for fleets and early adopters
Implementation & scaling	<ul style="list-style-type: none"> • Phased implementation and pilot testing • Adaptive management approaches • Integration into long-term planning 	<ul style="list-style-type: none"> • Delays in implementation. • Failure to scale successful measures • Short-term or fragmented action 	<ul style="list-style-type: none"> • Clear implementation roadmaps • Continuous monitoring and feedback loops. • Scaling and institutionalisation of successful measures

7. Summary of key takeaways

WHAT IS E-MOBILITY? E-mobility refers to the transition from conventional, fossil-fuel-based transport systems to electrified mobility solutions across all transport modes, including private vehicles, public transport, freight, and micromobility. Beyond a technological shift, it represents a systemic transformation linking transport, energy systems, and urban planning to enable low-emission, efficient, and integrated mobility.

WHAT DRIVES E-MOBILITY AND WHAT HOLDS IT BACK? The transition to e-mobility is driven by a combination of interrelated factors. Commonly, these include:

- Climate and environmental imperatives, including EU decarbonisation targets and air quality standards.
- Technological advancements, improving vehicle performance, battery efficiency, and charging solutions.
- Policy and regulatory frameworks, such as emissions standards, low- and zero-emission zones, and public procurement rules.
- Economic opportunities, including innovation, job creation, and local value creation.
- Energy system integration, enabling renewable energy uptake and smart grid solutions.

HOW CAN LRAS INCENTIVISE E-MOBILITY UPTAKE? The “push–pull” approach is a key policy mechanism for accelerating e-mobility adoption by combining incentives that encourage uptake with measures that discourage high-emission alternatives.

- “Pull” measures focus on making e-mobility more attractive, affordable, and accessible - though instruments such as financial incentives (e.g. subsidies and tax benefits), infrastructure deployment, and operational advantages like preferential parking or access
- “Push” measures aim to reduce the attractiveness of conventional fossil-fuel vehicles - through regulatory and pricing instruments, such as low- and zero-emission zones, congestion charges, parking restrictions, and emissions-based taxation.

Individually, these measures can have limited impact. However, when applied together, they create a reinforcing effect, shaping both market conditions and user behaviour.

For LRAs in particular, the effectiveness of the approach depends on achieving the right balance between encouragement and restriction, ensuring that incentives are supported by clear regulatory signals and aligned with infrastructure availability. In many cases, revenues generated from “push” measures can be reinvested into “pull” incentives, contributing to a more financially sustainable transition pathway.

WHAT MAIN TYPES OF INCENTIVES CAN LRAs USE WITHIN THE “PUSH–PULL” APPROACH? Within the “push–pull” approach, LRAs deploy a diverse portfolio of incentives designed to dismantle market barriers and stimulate demand. These typically include:

- Financial and fiscal incentives, which provide direct economic support to reduce upfront costs and improve affordability (e.g. purchase subsidies, tax exemptions, grants for charging infrastructure).
- Regulatory incentives, which introduce policy and legal measures to restrict high-emission vehicles and shape market conditions (e.g. LEZs/ZEZs, public procurement requirements, building mandates.)
- Operational incentives, which offer non-monetary benefits that enhance the convenience and usability of e-mobility in everyday use (e.g. preferential parking, access to restricted areas, priority lanes)
- Information and advisory (“soft”) measures, which address awareness, knowledge gaps, and behavioural barriers (e.g. OSSs, awareness campaigns, technical guidance, demonstration projects).

When strategically applied, these “push–pull” mechanisms form a cohesive ecosystem of interventions, ensuring that regulatory measures are complemented by financial and practical support, and helping to de-risk the transition for both market actors and end-users.

WHEN E-MOBILITY INCENTIVES ARE MOST EFFECTIVE? E-mobility incentives are most effective when integrated within a broader sustainable mobility strategy, rather than treated as a standalone solution. The A–S–I framework provides a structured approach to achieving this integration by prioritising systemic change across three complementary pillars:

- A – “avoid” or reducing the need for motorised travel through compact urban planning, digital solutions, and demand management.
- S – “shift” or promoting more sustainable modes, such as public transport, walking, cycling, and shared mobility.
- I – (“improve”) or enhancing the efficiency and environmental performance of remaining transport modes through electrification and clean technologies.

Within this framework, e-mobility plays a central role in the “Improve” pillar, enabling the transition to zero-emission transport. However, its full benefits are realised only when it is implemented in synergy with the “Avoid” and “Shift” pillars.

For LRAs, this means that incentives for e-mobility should not only support vehicle electrification, but also reinforce broader sectoral objectives. In doing so, they can ensure that electrification contributes to a

more efficient, inclusive, and sustainable urban mobility system, rather than simply replacing conventional vehicles with electric ones.

WHAT POLICY APPROACHES HAVE PROVEN EFFECTIVE IN PRACTICE – AND WHAT CAN LRAs LEARN? While no single model for e-mobility integration is universally applicable, different European countries have adopted distinct policy approaches highlighting key pathways that can be adapted to local contexts, depending on institutional capacity, market maturity and policy objectives.

Table 15. Comparative overview of national e-mobility implementation models proved effective in practice

Country	Strategic approach	Core policy mix	Key strength	Key lesson for LRAs
Norway	Fiscal-led transition	Strong tax exemptions, operational perks, national charging network	Rapid market uptake driven by strong economic incentives	Consistent fiscal incentives can accelerate uptake but must evolve with market maturity
Netherlands	Infrastructure-led approach	Dense public charging network, demand-driven deployment, regulatory support	High accessibility in dense urban environments	Removing practical infrastructure barriers can enable large-scale uptake without long-term reliance on subsidies
Germany	Subsidy-to-scale transition	Early subsidies, large-scale infrastructure investment, regulatory support	Scalable and system-integrated approach	Combining financial incentives with infrastructure expansion can support long-term scalability and inclusiveness
France	Financial circularity model	Bonus-malus system, subsidies, strong regulatory framework	Self-sustaining financing mechanism	Aligning fiscal disincentives with incentives can enable a financial sustainable and predictable transition pathway

References

- Ardiyok, S., & Canbeyli, A. (2020). How Europe Promotes Electric Vehicles? A Brief Insight on Best Practices. *Mondaq*. ([Link](#))
- Blokhuis, D. (2026). The Carbon Shift: Navigating the Netherlands' New ERE Market. *AFS Energy*. ([Link](#))
- Bongardt, D., Stiller, L., Swart, A., & Wagner, A. (2019). *Sustainable Urban Transport: Avoid-Shift-Improve (A-S-I)*. ([Link](#))
- City of Amsterdam. (2023). *Zero-Emission Mobility in Amsterdam Implementation Agenda 2023-2026*. ([Link](#))
- de Albuquerque Felizola Romeral, P. A., & Zancul, E. (2025). Total Cost of Ownership of Electric Vehicles: A Synthesis of Critical Factors. *The Journal of Engineering*, 2025(1). ([DOI](#))
- EURELECTRIC. (2026). *Fleet forward. Powering the transition to electric mobility. Eurelectric policy recommendations*. ([Link](#))
- EUROCITIES. (2025). *Oslo powers a zero-emission future*. ([Link](#))
- European Alternative Fuels Observatory - EAFO. (2026a). *France*. ([Link](#))
- European Alternative Fuels Observatory - EAFO. (2026b). *Germany*. ([Link](#))
- European Alternative Fuels Observatory - EAFO. (2026c). *Netherlands*. ([Link](#))
- European Commission. (2024). *Sustainable urban mobility planning and monitoring*. ([Link](#))
- European Environment Agency - EEA. (2020). *Transport: increasing oil consumption and greenhouse gas emissions hamper EU progress towards environment and climate objectives*. ([Link](#))
- European Environment Agency - EEA. (2024). *Climate. Sustainability of Europe's mobility systems*. ([Link](#))
- European Environment Agency - EEA. (2025). *Greenhouse gas emissions from transport in Europe*. ([Link](#))
- European Investment Bank - EIB. (2018). *Financing innovation in clean and sustainable mobility. Study on access to finance for the innovative road transport sector*. ([Link](#))
- European Union. (2020). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Powering a climate-neutral economy: An EU Strategy for Energy System Integration. COM/2020/299 final*. ([Link](#))
- Grieco, M. (2015). Social sustainability and urban mobility: shifting to a socially responsible pro-poor perspective. *Social Responsibility Journal. Emerald Group Publishing Limited*, 11(1), 82–97. ([DOI](#))
- Heddebaut, O. (2017). *The evolution of public transport contracts in France*. ([Link](#))
- Hunkin, S., & Krell, K. (2025). *E-mobility: Infrastructure, procurement and acceptance. A policy brief from the Policy Learning Platform for a greener Europe*. ([Link](#))
- International Energy Agency - IEA. (2024). *Global EV Outlook 2024: Executive summary*. ([Link](#))
- Interreg Europe. (2022). *A Policy Brief from the Policy Learning Platform on Low-carbon economy*. ([Link](#))

- IPCC. (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]*. ([Link](#))
- IRENA. (2019). *Innovation outlook: Smart charging for electric vehicles*. ([Link](#))
- IRENA. (2020). *Rise of renewables in cities: Energy solutions for the urban future*. ([Link](#))
- Kamau, K., & Holzwarth, S. (2022). *Funding, financing and procurement guide*. ([Link](#))
- Kaplanović, S., & Tanja Živojinović, T. (2022). Financial Incentives for Electric Vehicles Adoption: Experiences and Evidences from European Countries. *International Journal for Traffic and Transport Engineering*, 12(4), 491–500. ([DOI](#))
- Lah, O. (2020). National and Local Level Policy Coherence for Sustainable Mobility Transitions. In Müller B. & Meyer G. (Eds.), *Towards User-Centric Transport in Europe 2. Lecture Notes in Mobility*. Springer. ([DOI](#))
- Martin, B., Pestiaux, J., Schobbens, Q., Emmrich, J., & Hagemann, M. (2020). *A radical transformation of mobility in Europe: Exploring the decarbonisation of the transport sector by 2040. Explorative scenario and related policy packages*. ([Link](#))
- Martins, E. C. S., Lépine, J., & Corbett, J. (2024). Assessing the effectiveness of financial incentives on electric vehicle adoption in Europe: Multi-period difference-in-difference approach. *Transportation Research Part A: Policy and Practice*, 189. ([DOI](#))
- Métropole du Grand Paris. (2026). *La Zone à Faibles Emissions métropolitaine*. ([Link](#))
- Mubiru, I. (2025). Investigating the involvement of public transport authorities in MaaS developments. *Transportation Research Interdisciplinary Perspectives*, 29. ([DOI](#))
- National Centre for Charging Infrastructure - NOW GmbH. (2026). *Promotion of climate-friendly mobility*. ([Link](#))
- Nederlandse Emissieautoriteit - NEa. (2026). *Energy for Transport 2022-2030*. ([Link](#))
- OECD. (2022). *Norway's evolving incentives for zero-emission vehicles*. ([Link](#))
- Owens, S. (1995). From 'predict and provide' to 'predict and prevent'? Pricing and planning in transport policy. *Transport Policy*, 2(1), 43–49. ([DOI](#))
- Pamidimukkala, A., Kermanshachi, S., Rosenberger, J. M., & Hladik, G. (2024). Barriers and motivators to the adoption of electric vehicles: A global review. *Green Energy and Intelligent Transportation*, 3(2). ([DOI](#))
- Qadir, S. A., Ahmad, F., Al-Wahedi, A. M. A. B., Iqbal, A., & Ali, A. (2024). Navigating the complex realities of electric vehicle adoption: A comprehensive study of government strategies, policies, and incentives. *Energy Strategy Reviews*, 53. ([DOI](#))
- Ravazzoli, E., & Torricelli, G. P. (2017). Urban mobility and public space. A challenge for the sustainable liveable city of the future. *The Journal of Public Space*, 2(2), 37–50. ([DOI](#))
- Schub, H., Plötz, P., & Sprei, F. (2025). Electrifying company cars? The effects of incentives and tax benefits on electric vehicle sales in 31 European countries. *Energy Research & Social Science*, 120. ([DOI](#))

- UN-Habitat & UEMI. (2022). *Integration is key: The role of electric mobility for low-carbon and sustainable cities*. ([Link](#))
- UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE - UNECE. (2025). *Electrification of mobility. Lessons learnt from the ECE region*. ([Link](#))
- van den Hoed, R., Maase, S., Helmus, J., Wolbertus, R., el Bouhassani, Y., Dam, J., Tamis, M., & Jablonska, B. (2019). *E-mobility getting smart with data*. ([Link](#))
- van der Veen, R., van Grinsven, A., Manna, K., Schrotten, A., van den Toorn, E., & van Dam, K. (2025). *Price Effects of the ERE System*. ([Link](#))
- Wappelhorst, S., Hall, D., Nicholas, M., & Lutsey, N. (2021). *Analyzing Policies to Grow the Electric Vehicle Market in European Cities*. ([Link](#))
- WEF. (2018). *The Oslo model: how to prepare your city for the electric-vehicle surge*. ([Link](#))
- WEF. (2019). *A Vision for a Sustainable Battery Value Chain in 2030. Unlocking the Full Potential to Power Sustainable Development and Climate Change Mitigation*. ([Link](#))
- Werland, S., & Rudolph, F. (2019). *Top Guide: Funding and financing of Sustainable Urban Mobility Measures*. ([Link](#))
- World Health Organisation - WHO. (2018). *9 out of 10 people worldwide breathe polluted air, but more countries are taking action*. ([Link](#))
- World Health Organisation - WHO. (2024). *Ambient (outdoor) air pollution*. ([Link](#))
- Yanocha, D., & Allan, M. (2019). *The Electric Assist: Leveraging E-bikes and E-scooters for More Livable Cities*. ([Link](#))



PROSPECT



LinkedIn: Capacity building for cities
and regions | PROSPECT+

Website: <https://h2020prospect.eu/>



Co-funded by the
European Union.