

Project deliverable D7.2

# Innovation plan and process



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Editor/Lead author	Emin Aliyev (ERTICO - ITS Europe)				
Co-authors	Andrew Winder, Martina Ferrara Snider (ERTICO-ITS EUROPE)				
Peer reviewers	Pekka Koponen (FVH - Forum Virium Helsinki), Michael Toumbas (EVP - EV Power)				
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## EXECUTIVE SUMMARY

This Innovation plan and process (D7.2) aims to set up a structured, strong but also flexible mechanism and related processes, which will cover all the project's activities throughout the entire project lifetime, in order to ensure that high levels of innovation are maintained, as expected and described in the Grant Agreement (GA) of the ePowerMove project. The document sets strong baseline for future developments, innovation processes including on how to proceed with monitoring. This will help to deliver Final Innovation Plan report (D7.3) in Month 41 (May, 2028). This deliverable is a key initial output from Task 7.3, "Innovation Management," and is linked with the Task 6.4 Exploitation and roll out plan and Task 5.1 Business models for planning mass deployment.

The ePowerMove project aims to design flexible, scalable, and interoperable bidirectional smart and slow-charging solutions for electric vehicles (EVs). It seeks to reduce infrastructure costs, optimise global energy usage by integrating advanced charging technologies and intelligent grid energy control, and enhance system efficiency while supporting renewable energy integration. The project is driven by social innovation, affordability, and user acceptability, with real-world demonstrations in Helsinki, Klagenfurt, and Nicosia focusing on cost reduction, new business models, and grid compatibility, respectively.

Over the course of 42 months, the ePowerMove consortium will develop, test, and validate 5 technical innovation areas (including 11 technology elements) and 4 non-technical innovations (described in section 1.1.2 of the project's Grant Agreement, Description of Action [DoA]). These innovations will be demonstrated and assessed in three European pilots as abovementioned to empower the global optimiser. This optimiser will enhance the overall efficiency of slow chargers, the grid, and EVs.

Given the high value of innovations expected in this projects output, the above-mentioned innovative areas (IAs) have been identified to be developed within the project's duration, bearing in mind possibilities of new innovations that could arise in due course of the project's lifecycle. It is of utmost importance therefore to monitor the processes during which these innovations shall be developed, together with the various technology elements (TEs) and products to accompany the necessary innovation outputs for the development of the ePowerMove charging technologies.

This document, D7.2 Innovation plan and process, sets up a productive flexible methodology to monitor and keep track of the project's innovative activities throughout the project lifecycle. This will also ensure that any unforeseen or unexpected risks that may impact the development and implementation of the proposed innovations are carefully monitored as per the monitoring guidelines put in place by the ePowerMove partners, to ensure high impact and achievement of the project's goals.

The Innovation plan and process provides "guidelines" for the implementation of the project's objectives, e.g.:

- Regular track record keeping of the state-of-art (SoA) of the project innovations under development, communicated via the innovation leaders and product owners.
- Ensuring that the Innovation Areas are developed under favourable conditions considering all risks and implementing agile and holistic mitigation techniques to support its attainment.
- Encourage the identification and promotion of new innovations arising during the project development process.

Execution of the Innovation plan and process shall be conducted via a formal process lead by ERTICO as per the GA. ERTICO has appointed an Innovation Manager, who will lead the Innovation Board (IB), being the team of partners involved in this task, comprising of the technical manager (VTT), all WP leaders (UTU, UCY, LEEDS, AVERE) and product owners (as agreed in the innovation solutions identification table by the partners).

## LIST OF ABBREVIATIONS AND ACRONYMS

Acronym	Meaning
AFIR	Alternative Fuels Infrastructure Regulation
CINEA	European Climate, Infrastructure and Environment Executive Agency
CA	Consortium Agreement
CPO	Charge Point Operator
DSO	Distribution System Operator
DoA	Description of the Action
DT	Digital Twin
EC	European Commission
eMSP	electric Mobility Service Provider
EU	European Union
EV	Electric Vehicle
GA	Grant Agreement
IA	Innovation Area
IB	Innovation Board
IE	Innovation Element
IM	Innovation Management
IPR	Intellectual Property Rights
KPI	Key Performance Indicator
KER	Key Exploitable Result
NTI	Non-Technical Innovation
OEM	Original Equipment Manufacturer
SoA	State of the Art
RES	Renewable Energy Sources
TE	Technology Element
TRL	Technology Readiness Level
V2G	Vehicle-to-Grid
WP	Work Package

# 1 INTRODUCTION

## 1.1 Project introduction

As electric vehicle (EV) markets continue to grow rapidly, ensuring affordable, accessible, and efficient charging infrastructure is critical to supporting mass adoption. The ePowerMove project designs flexible, scalable, and interoperable bidirectional smart and slow-charging solutions that adapt to diverse regional power systems and evolve with technology and policy, reducing infrastructure costs while being less intrusive. The project optimises global energy usage by combining advanced charging technologies and intelligent grid energy control to enhance system efficiency and support the increasing share of renewable energy. Social innovation, affordability, and user acceptability drive the project's developments, ensuring solutions meet real-world needs across diverse socio-cultural and economic contexts.

The ePowerMove project demonstrates its innovative non-intrusive, efficient and slow-charging solutions across three key locations, each addressing a critical aspect of EV charging and integration. In Helsinki, Finland, the focus is on reducing infrastructure costs and enhancing user experience. Klagenfurt, Austria, explores new business models to drive sustainable e-mobility, while Nicosia, Cyprus, optimises grid compatibility and energy flow management. Together, these real-world demonstrations ensure that ePowerMove delivers scalable, cost-effective, and user-centric charging solutions that support the mass adoption of EVs across Europe.

ePowerMove works to ensure the seamless integration of slow, smart and bidirectional charging into the energy system, making EVs a valuable asset in sustainable energy management. The project also focuses on developing advanced user-centric applications, ensuring friendly and efficient access to charging infrastructure. Additionally, ePowerMove explores scalable planning and mass deployment models. The project builds on proven models from previous EU-funded projects, providing a scalable, flexible, and interoperable architecture that aligns with a variety of regional power systems and Vehicle-to-Grid (V2G) technologies. By exploring new business and usage models, the project aims to accelerate policy interventions and mass deployment strategies for widespread EV adoption. By creating a flexible, scalable, and interoperable architecture, the project will contribute to reducing greenhouse gas emissions and fostering sustainable urban e-mobility, supporting the EU's electrification and decarbonisation goals.

For more information on the project, see <https://epowermove.eu>.

## 1.2 Overview of the Project's Innovation Management

The Innovation Management (IM) of ePowerMove will establish a structured yet flexible Innovation Plan and Process to manage and monitor the development of innovations across the project lifecycle as stated in the GA:

The Innovation Board (IB) will play a central role by identifying and promoting additional innovations that arise during the work in various WPs and monitoring any related Intellectual Property Rights (IPRs).

The IB will also assess the potential of project outputs throughout the project's lifetime and ensure synergies with the exploitation task (T6.4) to maximise impact.

An Innovation plan and process is reported in D7.2 (M7, July 2025: this deliverable), while its implementation and consolidation into a Final Innovation Report will be delivered in D7.3 (M41, May 2028).

The objective of IM is to ensure coherent and efficient monitoring of all innovation elements, including:

- Co-design and user acceptance (WP1, WP4)
- Low cost smart charging, applications and business models (WP2, WP5),
- System design and integration for smart synergy with the grid (WP3).

Furthermore, the IM process will remain dynamic and adaptive, ensuring that new opportunities for innovation such as technological, social, or regulatory are captured and documented during the project lifecycle. By linking to exploitation, dissemination, and policy recommendations, IM will help secure the long-term sustainability and replicability of ePowerMove innovations, products and overall outcomes.

## 1.3 Target Audience

D7.2 Innovation plan and process is issued as a public document to ensure transparency on how ePowerMove organises and governs its innovation activities. The report outlines the processes and mechanisms put in place to guide the identification, monitoring, and advancement of innovations, while establishing a structured yet adaptable framework to support their development across the project's duration.

Considering the project's ambitions in delivering cost-effective, interoperable, bi-directional charging solutions, seamless integration with the grid, and high levels of user acceptance, it is essential that the wider public as well as professional stakeholders gain insight into how these innovations will be managed to support the project's objectives.

In this sense, the report also serves as a reference point for external stakeholder groups including policymakers, municipalities, energy operators, mobility providers, SMEs, and research communities who are interested in the different technological, societal, and market-related dimensions of ePowerMove innovations.

## 1.4 Document Structure

The D7.2 Innovation plan and process report is organised into four main sections, complemented by an Executive Summary at the beginning of the document.

Section 1 introduces the innovation management aspects of the ePowerMove project, outlining its objectives, scope, and expected outcomes.

Section 2 presents the Innovation Strategy, Plan, and Process, including the context, methodology, and monitoring framework established to ensure effective identification, development, and tracking of innovations. This section also elaborates on the project's key innovation elements and how they contribute to achieving the expected results.

Section 3 addresses Intellectual Property Rights (IPR) management, ensuring that ownership, protection, and use of project results are clearly defined and properly monitored.

Section 4 describes the assessment framework for managing innovations throughout the project lifecycle, ensuring alignment with project objectives and supporting exploitation opportunities.

The report draws on inputs from all technical activities of the ePowerMove project and creates strong synergies with WP6 on communication, dissemination, and exploitation to ensure consistency and maximise impact.

References and annexes are provided at the end of this document.

## 2 INNOVATION PLAN AND PROCESS

The ePowerMove project is working to deliver advanced, user-centric, and sustainable EV charging solutions. Its goals ranging from bi-directional and interoperable charging technologies to smart grid integration and enhanced user acceptance require a coordinated approach to managing innovation. The project benefits from a diverse consortium of technology companies, energy providers, municipalities, research institutes, and academic partners, ensuring that innovations are developed efficiently and their impact maximized across multiple markets. Innovation in ePowerMove is approached as a structured and dynamic activity. Drawing on Peter F. Drucker's insights ("Innovation and Entrepreneurship," 1985), the project treats innovation as a disciplined process that produces tangible outputs while being closely linked to societal and market needs.

Given the collaborative nature of ePowerMove, Henry Chesbrough's "Open Innovation" (2003)<sup>1</sup> framework is particularly relevant. By encouraging knowledge sharing, co-development, and joint problem-solving among partners, the project can accelerate the creation and deployment of new solutions, while capturing the full potential of contributions from diverse stakeholders.

In line with the EC's Innovation Union initiative (EC, 2010)<sup>2</sup>, innovation is also framed as a strategic driver for sustainable growth, integrating technology development with ecosystem support, stakeholder engagement, and exploitation planning. For ePowerMove, this means that innovations are not only developed technically but also positioned to be scalable, replicable, and aligned with broader European sustainability and mobility objectives.

To manage this effectively, ePowerMove has established **a set of innovation management processes and monitoring mechanisms**. These define **responsibilities, timelines, risk mitigation strategies, and tracking of the state-of-the-art (SoA)**, ensuring that all project innovations are systematically developed, evaluated, and aligned with both project goals and expected outcomes.

### 2.1 Innovation Management Strategy and Plan

The ePowerMove innovation management strategy and plan establishes a structured framework to guide the development, implementation, and exploitation of the project's innovations. It covers the full innovation lifecycle from identifying challenges and understanding user requirements, to exploring technical solutions, developing new approaches, and implementing them effectively across the project.

This strategy ensures that all technical and societal aspects are carefully considered, particularly in relation to the **deployment of low cost, smart, bidirectional, and interoperable EV charging solutions** in diverse European contexts. By integrating knowledge of **market needs, user expectations, and emerging technology trends**, the strategy strengthens the potential impact of the project's innovations.

To achieve this, the ePowerMove innovation management plan follows four core processes:

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<sup>1</sup> 1 H. Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology, Boston: Harvard Business School Press, 2003.

<sup>2</sup> European Commission, Innovation Union: A Europe 2020 Initiative, COM(2010) 546 final, Brussels, 2010. Available: [https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication\\_en.pdf](https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf)

1. **Identification, validation, and governance of innovation activities** – establishing clear responsibilities for innovation oversight, including monitoring progress, approving new concepts, and ensuring alignment with project goals.
2. **Analysis of the current and emerging State of the Art (SoA)** – examining technological trends, best practices, and opportunities related to the project’s technology components, and understanding how these innovations can meet the requirements of diverse European mobility and energy markets.
3. **Structured monitoring of all innovation solutions** – continuously tracking progress, identifying technical or operational challenges, and defining corrective measures to maintain project momentum and ensure successful outcomes.
4. **Evaluation and recommendations for future exploitation** – assessing the results of innovation activities, identifying lessons learned, and providing guidance for scaling, replication, or further development beyond the project.

This strategy is informed by Henry Chesbrough’s Open Innovation framework (2003), which emphasizes collaboration across organisational and disciplinary boundaries to maximise the value of innovation, and by the European Commission’s Innovation Union initiative (2010), which highlights the importance of aligning innovation activities with European competitiveness and sustainability goals. Additionally, principles from ISO

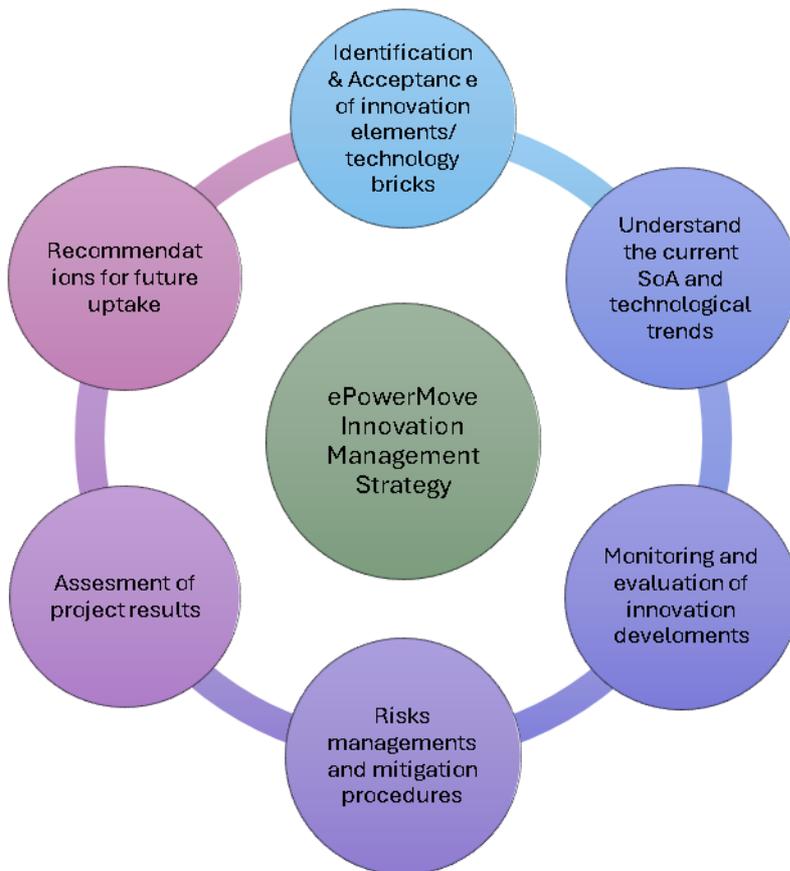


Figure 1 ePowerMove Innovation Management Strategy

**56002:2019 (Innovation Management System)**<sup>3</sup> have been integrated to ensure that processes are systematic, measurable, and continuously improved.

By combining these approaches, the ePowerMove innovation strategy (*see also Figure 1*) not only structures the management of technical and process innovations but also maximizes their **societal, environmental, and market impact**, reinforcing the project's position as a driver of sustainable and user-focused mobility solutions.

## 2.2 Structure and responsibilities

In line with the ePowerMove GA and DoA, the Coordinator - **ERTICO** appoints an **Innovation Manager** to lead the **Innovation Board**. The IB includes the Coordinator, Technical Manager (VTT), and all Work Package leaders (UTU, UnivLEEDS, UCY, AVERE – E-Mobility Europe). The IM reports directly to the IB and communicates key innovation-related points to the consortium through **Core Management Team and General Assembly** meetings.

Together, the **IM and IB** are responsible for overseeing the project's innovation process. Their main responsibilities include:

- Developing and maintaining the **Innovation plan and associated processes** for ePowerMove.
- Identifying innovations arising from **high-potential project activities** and key deliverables.
- Recognising and promoting **additional innovations** emerging during the project lifecycle.
- Monitoring all **Intellectual Property Rights (IPRs)** associated with the project.
- Continuously tracking **market, technology, and policy trends** relevant to low cost and smart EV charging and V2G solutions.
- Assessing **risks and deviations**, auditing innovations against their **SoA and Technology Readiness Level (TRL)** at the start and end of the project, and measuring outcomes against defined KPIs.
- Ensuring that **IAs and TEs** that are approved are fully implemented and integrated within the project.
- Maintaining a focus on innovation during various project **meetings, workshops, and consultations** across all activities.
- Implementing measures to create **favorable conditions for innovation**, and coordinating with exploitation tasks to maximise the **impact and uptake of innovations**.

This structure guarantees that ePowerMove maintains a coherent, proactive, and adaptive approach to innovation management, ensuring that technical, societal, and market-oriented innovations are successfully delivered and exploited.

## 2.3 Context and rationale

The adoption of EVs depends critically on the **availability, convenience, and accessibility of charging infrastructure**. While home charging has proven effective in increasing EV uptake in residential areas, urban environments with limited private parking face unique challenges. **Kerbside and on-street charging**

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<sup>3</sup> International Organization for Standardization, ISO 56002:2019 – Innovation Management System – Guidance, ISO, Geneva, Switzerland, 2019.

infrastructure becomes essential not only for residents but also for visitors, ensuring equitable access to clean mobility solutions.

Current EV charging infrastructure is highly **fragmented**. Regional, national, and global actors operate with differing service registration, payment methods, and user interfaces. This heterogeneity hampers a consistent **user experience** and limits interoperability across charging networks. Although the **Alternative Fuels Infrastructure Regulation (AFIR)** encourages simplified payments for slow chargers, technology providers still determine the methods, leaving gaps in standardisation and accessibility. For certain users, including people with disabilities, current infrastructure presents significant barriers. Lack of accessible wayfinding, inadequate placement of chargers, suboptimal socket heights, and insufficient lighting can make EV charging difficult or unsafe. ePowerMove addresses these challenges by **designing inclusive, user-friendly, and well-illuminated charging solutions** that enhance safety and usability for all.

Beyond accessibility, the project leverages the **flexibility potential of large EV fleets**. While smart charging is increasingly implemented, **V2G technology** remains underexploited. With the growing availability of V2G-capable vehicles and emerging standardisation, ePowerMove aims to unlock **bi-directional energy flows**, enabling EVs to support both **distribution system operators (DSOs)** and **transmission system operators**. Challenges such as grid code compliance, vehicle validation, and operational safety are addressed collaboratively with vehicle OEMs (Original Equipment Manufacturer), DSOs, and other stakeholders.

The main actions in ePowerMove include:

- **Developing low-cost, user-friendly charging solutions** that can be deployed at scale.
- **Creating grid and consumer level controllers** to manage congestion, optimise local renewable energy usage, and reduce charging costs.
- **Designing new business models** with DSOs to monetise controllable discharges while sharing benefits across the value chain, including end users.
- **Piloting V2G chargers with compatible vehicles**, collecting data on operational requirements, and validating interoperability for mass deployment.
- **Collaborating with vehicle OEMs and DSOs** to ensure compliance with grid codes, safe discharging, and reliable control of V2G operations.
- **Developing digital twin models** to predict aggregated EV flexibility and assess the impact on distribution grids at larger scales.

By focusing on **cost optimisation, user acceptance, and interoperability**, ePowerMove ensures that V2G solutions are not only technically feasible but also economically attractive. Charging solutions are evaluated considering installation costs, operating costs, user convenience, and battery wear, while providing clear **monetary benefits** to participants. The project also integrates lessons into **policy and standardisation discussions**, contributing to a more coherent and sustainable EV ecosystem.

Through these efforts, ePowerMove aims to **advance the SoA in multiple IAs**, from smart and bi-directional charging to user-centric service design, while facilitating **wide-scale adoption of sustainable and flexible EV infrastructure** across Europe.

## 2.4 Innovation areas and Technology elements

As defined in the GA, a set of technical and non-technical innovations (5 technical IAs and 4 non-technical innovations) has been identified for development and implementation throughout the ePowerMove project lifecycle. Each of IAs are also divided into their corresponding TEs. These innovation areas are designed to address the project's objectives in smart and bi-directional charging solutions, including both hardware and software components, and to support the integration of EVs into the grid.

The IAs are intended to contribute to the creation of innovative products and solutions that will enable the project to achieve its expected outcomes. They provide a structured framework to monitor progress, track technological developments, and guide the implementation of innovations from concept to deployment.

Below is the proposed structure for the Innovation Area table (see Figure 2).

Innovation areas (IA)	Related Technology Elements(s) (TE)	Product	Product Leader	SoA market before	SoA market after

**Figure 2** ePowerMove Template Innovation element table (structure)

Annex 1 of this report provides a detailed overview of the Innovation Areas for the ePowerMove project. For each IE, the table presents the corresponding IAs and TEs, the expected products or solutions to be generated, the assigned product leader/owner, and the current and target SoA.

Each Technology Element is linked to its TRL at the start of the project, as well as the expected TRL at project completion. This TRL assessment by Innovation Manager supports the IB in making informed decisions regarding the development, maturation, and integration of specific bricks, ensuring that progress aligns with the latest technological advances.

In addition, monitoring the TRL for each TE allows the IB to implement effective risk identification and management, identifying potential deviations early and defining corrective measures to keep the project on track. This structured approach ensures that innovations are systematically developed, verified, and validated within the project lifecycle.

For ePowerMove, TRL definitions shall follow the standard EU Horizon methodology:

- TRL 1 – Basic principles observed
- TRL 2 – Technology concept formulated
- TRL 3 – Experimental proof of concept
- TRL 4 – Technology validated in lab
- TRL 5 – Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – System prototype demonstration in operational environment
- TRL 8 – System complete and qualified
- TRL 9 – Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

**Figure 3** Technological Readiness Levels

Also, it is worth noting that the specific TEs are linked to specific tasks that contribute to their development, also ensured by various TE leaders and contributors towards its development. They are monitored in periodic intervals in the IB meetings, and progress reported by the leaders on the current SoA on the evolution of each specific brick.

TEs	Tasks	Leader	Partners	TRL start/end	SoA start/end	Status/risk/ mitigation	Progress

**Figure 4** Template Technology Elements table (structure)

Details of the technology elements are presented in Annex 2.

The IB would ensure that all the IAs and TEs mention in both annexes above shall be coherently developed and implement according as in the GA.

## 2.5 Innovation Monitoring in ePowerMove

Innovation activities in ePowerMove are systematically monitored on a quarterly and yearly basis to ensure progress, mitigate risks, and align outputs with project objectives. Monitoring is performed across all IAs and TEs as well as for deliverables with high innovation potential.

### Monitoring Aspects:

Each monitoring cycle evaluates key aspects of the project’s innovation development:

- **Main Developments:** Monitoring of progress in technical, operational, and user-centric innovations, including new prototypes, tools, or software components.
- **TRL Progress:** Tracking the advancement of each Technology Element from its initial TRL to the targeted TRL at the end of the project.
- **Delays and Issues:** Identification of any deviations, obstacles, or bottlenecks affecting development timelines or technical feasibility.
- **Status Assessment:** Evaluation of overall performance and risk using a three-color monitoring system:
  - **Green** – Innovation is progressing satisfactorily, meeting planned objectives.
  - **Orange** – Moderate concerns or minor delays that require attention but are manageable.
  - **Red** – Significant issues or critical delays that demand immediate corrective action.

### Monitoring Process and Reporting:

During each monitoring cycle, the IB, led by the Innovation Manager, reviews all IAs and TEs, assigning **colour codes** to efficiently communicate status and prioritise interventions. Monitoring updates are presented and discussed at the Core Management Team sessions and General Assembly meetings, ensuring transparency and alignment across all project partners. The results of these monitoring activities are summarised in the Final Innovation Report (D7.3) at the end of the project, providing a comprehensive overview of innovation achievements, TRL progression, risk management, and lessons learned.

### Added Value:

The structured innovation monitoring approach in ePowerMove provides several key benefits. It ensures that the project’s innovation objectives are achieved within the planned timeline, keeping development on track and aligned with the overall goals. By continuously tracking progress and identifying potential obstacles early, the framework enables the consortium to detect and mitigate risks proactively, preventing delays or technical setbacks. At the same time, monitoring maintains a close alignment between technical developments, user

needs, and evolving market or policy requirements, ensuring that innovations are not only feasible but also relevant and impactful. Finally, the insights gained from this structured process support informed decision-making regarding the exploitation, replication, and scaling of innovations beyond the project lifecycle, maximizing the long-term benefits and real-world impact of ePowerMove’s outcomes.

### Current Status:

At the moment of submission of this deliverable, the detailed innovation monitoring management framework is still under discussion. The full framework is expected to be finalised in the second half of 2025 in collaboration with all IB members and subsequently implemented across the project. Since this document focuses primarily on the innovation strategy and plan, it does not present the complete monitoring framework. Nevertheless, it provides a first indication of the monitoring approach, highlighting key aspects, methods, and reporting mechanisms. As the project progresses, particularly regarding the development of key technical activities and the advancement of project innovations, the monitoring framework and its implementation will be further refined to ensure effective tracking, assessment, and management of all innovation outputs.

## 2.6 High-Potential Innovation Deliverables and Their Monitoring

The various **TEs** within ePowerMove have both **direct and indirect links** to multiple project activities, as the development of these elements, their associated tasks, and resulting products spans across nearly all WPs. These elements are highly interconnected with several **strategic deliverables**, which serve as key milestones in tracking innovation progress, technical achievements, and market-readiness of the solutions. The deliverables listed in the table below represent **high innovation potential**, either because they introduce novel technical solutions, advance bi-directional V2G capabilities, enable smart grid integration, or involve real-world pilot demonstrations and validation. Monitoring these deliverables is essential not only to assess TRL progression but also to identify emerging challenges, potential deviations, and opportunities for improvement across the project lifecycle. For example, the development of the prototype EV supply equipment (D2.1), the physically and visually less intrusive bidirectional charger (D2.2), and the novel installation methods (D2.3) are critical in establishing a robust and user-friendly charging infrastructure. Their technical validation (D2.4) ensures that these solutions meet functional, safety, and interoperability requirements before deployment. Similarly, deliverables from WP3 such as grid and charging/prosumer management solutions (D3.2) and predictive digital twin models (D3.3) provide the technological backbone for optimising energy flows, enabling smart charging, and integrating EVs as flexible grid assets. Their system-level validation (D3.4) confirms the practical efficacy of these innovations under realistic conditions. The pilot-related deliverables (D4.2 – D4.4) capture real-world performance, user acceptance, and operational feasibility, while business modelling and proliferation studies (D5.1 and D5.3) translate technical innovations into economically viable and scalable solutions. By systematically monitoring these strategic deliverables, the ePowerMove consortium ensures that innovations are developed coherently, evaluated rigorously, and aligned with both technical and market requirements, enabling effective exploitation, replication, and scaling beyond the project’s lifetime.

Del. N°	Deliverable Name	Lead Partner	Due Date
2.1	Prototype EV Supply Equipment	UTU	M20
2.2	Physically and visually less intrusive bidirectional AC charger	UTU	M20
2.3	Novel installation methods	UTU	M20

Del. N°	Deliverable Name	Lead Partner	Due Date
2.4	Technical validation of the solutions	VTT	M24
3.1	Design and development of a Grid-Charing-RES	UL	M15
3.2	ePowerMove Grid and charging/prosumer level management solutions	UCY	M22
3.3	Predictive DT models	LEEDS	M23
3.4	Results of system-level technical validation of the developed solutions	VTT	M24
4.2	Pilot site descriptions and demonstrations	UCY	M34
4.3	Data consolidation and dashboard design	EVP	M36
4.4	The ePowerMove data analysis and impact assessment	LEEDS	M38
5.1	Business models	UL	M41
5.3	Proliferation modelling and uptake evaluation	LEEDS	M41

**Figure 5** ePowerMove high innovation potential deliverable list

### 3 IPR MANAGEMENT

IPR management within ePowerMove has been **formally addressed and embedded** in the project framework through the GA and CA. These foundational documents clearly define the **guiding principles for ownership, security, and use of intellectual property**, ensuring that all consortium partners understand their rights and obligations. In general, results are **owned by the party that generates them**, while any **jointly developed results** are governed according to the stipulations of the GA. The GA and CA also clearly describe mechanisms for the **transfer of ownership**, licensing arrangements, and access rights, providing a robust legal framework for both internal use and future commercialisation of project outputs.

To ensure transparent and efficient monitoring of all IPR-related matters, a **dedicated online document** has been established in the project’s **SharePoint platform**. This document serves as a **centralised IPR register**, capturing all relevant information for innovations generated during the project, including IAs, TEs, and resulting products. The register allows partners to track the status of each innovation, from initial declaration to protection and potential exploitation.

IPR, Patent and Licence list								
id	IPR Type [Existing / New ]	Declaration date	Inventor (name, company)	Status [granted / pending]	Title	Patent Link	ePowerMove IN# or T#	Comment

Figure 6 ePowerMove IPR template

This online tool ensures that all IPR activities are systematically recorded, continuously updated, and easily accessible to the consortium. It supports proactive management, enabling the Innovation Board (IB) to oversee the protection of foreground IP, assess the potential for patents or licenses, and coordinate exploitation strategies. In addition, it facilitates risk management, preventing conflicts or overlaps in ownership, and ensuring that all innovations are developed and exploited in alignment with the project’s strategic goals. By combining a **clear legal framework with an interactive monitoring system**, ePowerMove ensures that innovations are **protected, traceable, and effectively leveraged**, maximising their technical, commercial, and societal impact.

## 4 IMPLEMENTATION AND COORDINATION OF INNOVATION MANAGEMENT

Given the high intensity and strategic importance of the innovations in ePowerMove, a robust framework for implementation, coordination, and assessment is essential. This framework ensures that all innovation activities are tracked coherently, verified against project objectives, and aligned across the consortium. It also allows timely corrective measures to address any deviations that could affect the outcomes or impact of the project. The practical implementation of the innovation management strategy includes:

- **Defining the Innovation Management Approach:** Establishing the IB and identifying the IAs and TEs as outlined in the GA.
- **Planning and Communication:** Coordinating innovation-related activities across WPs and communicating updates consistently with all consortium partners through dedicated IM calls.
- **Consortium Alignment:** Engaging all partners in discussions at General Assembly meetings to address unexpected challenges and ensure a unified approach to innovation development.
- **Continuous Monitoring:** Collecting inputs from TEs owners through shared online tools, tracking progress, and discussing results in dedicated IB meetings.
- **Innovation Assessment:** Applying a set of structured indicators to evaluate progress, technical performance, and potential deviations, ensuring that innovations meet planned objectives.
- **Integration with WPs:** Collaborating closely with all WPs and tasks that contribute to the development of project innovations, ensuring a coherent and efficient workflow.
- **Reporting:** Documenting progress, development, and implementation of innovations in the Final Innovation Plan (D7.3), providing a comprehensive overview of achievements and lessons learned.

This approach guarantees that ePowerMove innovation management is not only strategic but also operationally effective, facilitating smooth execution, proactive risk mitigation, and alignment with both technical and market objectives.

## 5 CONCLUSIONS

The ePowerMove Innovation plan and process provides a structured and adaptive framework to manage, monitor, and support all project innovations, ensuring that they are developed in alignment with the project's objectives. By defining clear roles, responsibilities, and processes, the plan enables systematic tracking of IA and TE, ensuring integration across all WPs and consistency with the project's technical, operational, and strategic goals.

The ePowerMove project addresses key barriers to EVs adoption, focusing on the deployment of user-friendly, low-cost, and bi-directional charging solutions, integration with the power grid, and optimisation of renewable energy use. Key innovations include smart and controllable EV chargers, grid and prosumer-level management solutions, predictive digital twin models, and scalable V2G integration, which collectively enable efficient, flexible, and sustainable EV charging infrastructure. These innovations are designed to ensure interoperability, enhance user acceptance, and unlock the potential of EV fleets for grid flexibility.

This deliverable, D7.2, outlines the strategy and methodology employed by the IB and consortium partners to guide the development of these innovations. The document identifies the central IAs and TEs, including charging hardware, software platforms, control algorithms, and monitoring tools, which are essential to achieving the project's objectives of cost-efficient, reliable, and scalable smart charging solutions.

A dedicated online repository for monitoring and updating development phases ensures transparency, collaboration, and continuous progress tracking throughout the project lifecycle. While some aspects of the monitoring framework are still being finalised, this deliverable provides a first comprehensive indication of the approach, including key aspects, methods, and reporting mechanisms.

D7.2 serves as a living document, guiding the consortium in innovation management while being continuously refined to reflect project evolution. It also supports the exploitation and roll-out planning, feeding directly into business models, policy recommendations, and scaling strategies. By combining strategic planning, operational monitoring, and robust IPR management, ePowerMove is positioned to deliver impactful, technically advanced, and user-centric solutions, contributing to the wider adoption of EVs, smart charging systems, and sustainable energy integration across Europe.

## 6 REFERENCES

1. Chesbrough, H. (2003). Open Innovation: The New Imperative for Creating and Profiting from Technology. Harvard Business School Press.
2. European Commission (EC). (2010). Europe 2020 Flagship Initiative: Innovation Union. Brussels: European Commission.
3. ISO 56002:2019. Innovation Management System – Guidance. International Organization for Standardization.
4. ePowerMove Grant Agreement and Description of Action (DoA).
5. ePowerMove Consortium Agreement.

## 7 ANNEXES

### 7.1 Annex 1: ePowerMove project Innovation Areas

IN-X	Innovation Area (IA)	Technology elements (TE-XY)	Product	Product name & description	Product leader	SoA market before	SoA market after
IN-1	Non-intrusive EV chargers	<p><b>TE - 1.1</b> Less physically intrusive AC EV charger</p> <p><b>TE - 1.2</b> Less visually intrusive AC EV charger</p>	YES	<p><b>TE-1.1</b> Physically less intrusive chargers</p> <p><b>TE-1.2</b> Visually less intrusive chargers</p>	TBD	<p><b>TE-1.1</b> Built urban environments must design their charging solutions based on currently available commercial solutions</p> <p><b>TE-1.2</b> Built urban environments must design their charging solutions based on currently available commercial solutions and accept the visual constraints dictated by the charging devices</p>	
IN-2	Low-cost EV chargers	<p><b>TE - 2.1</b> EV Supply Equipment for low-cost and fast installation in built urban environments</p> <p><b>TE - 2.2</b> Optimised AC EV charger design for built urban environments</p>	YES	<p><b>TE-2.1</b> Installation components and cabling accessories more suitable for such environments for low-cost and fast installation of AC EV chargers by radically reducing excavation, repaving and other civil work costs.</p> <p><b>TE-2.2</b> AC EV charger design optimally compatible with novel installation methods and novel EV Supply Equipment providing low-cost and fast installation of AC EV chargers in such environments, with mechanics and electromechanics</p>	TBD	<p><b>TE - 2.1</b> High installation costs due to excessive civil and installation works when installing chargers in built urban environments with currently common installation components and accessories.</p> <p><b>TE - 2.2</b> Currently widely available AC EV chargers do not provide especially thought low-cost and fast installation in built environments in multiple aspects.</p>	

IN-X	Innovation Area (IA)	Technology elements (TE-XY)	Product	Product name & description	Product leader	SoA market before	SoA market after
				designed especially for such sites.			
IN-3	Smart multi-level platform for synergy with the Grid	<p><b>TE - 3.1</b> A multi-level synergetic framework with seamless data-exchange to co-manage Grid, RES and EV charging</p> <p><b>TE - 3.2</b> Forecasting load flow analysis tool to schedule charging limitations for grid-friendly integration</p> <p><b>TE - 3.3</b> Real-time and cost-effective flexibility controller to relieve grid congestion</p>	YES	<p><b>TE-3.1</b> ePowerMove will develop a synergistic multi-level co-management framework, which will enable each entity (e.g., DSOs, prosumers, EV owners, and charging points) to manage its resources effectively to meet its own objectives</p> <p><b>TE-3.2</b> In order not to have to reject charging or RES connections or to be able to connect them in low-cost manner way in the project ePowerMove a multilevel DSO analysis tool is going to be put in place.</p> <p><b>TE-3.3</b> Through the synergistic framework (P04), grid operators will gain near-real-time insights into the flexibility volumes of each prosumer and EV charging station for managing congestion in local ancillary services markets (existing or sandboxing).</p>	TBD	<p><b>TE-3.1</b> Prosumers equipped with PVs, battery systems, and EV charging points are today seeking ways to manage their resources efficiently</p> <p><b>TE-3.2</b> The current legal situation on pilot sites obliges the DSO to enable the full supply including EV charging and feed-in (PV)</p> <p><b>TE-3.3</b> Commercially available EV chargers, such as AUTEL,</p>	

IN-4	Smart integration with RES	<p><b>TE - 4.1</b> A smart integration system of rooftop solar panels and EV charging as an energy community</p> <p><b>TE - 4.2</b> Controller for optimised scheduling of resources/charging to reduce electricity cost and for real -time activation of flexibility according to DSO requests</p>	YES	<p><b>TE-4.1</b> Solar energy storing to EVs and sharing through energy community model is piloted in the project. Energy community model is used for distributing daytime solar panel produced energy for on-street EV chargers. EV battery stored energy is used through V2G for other customers in the evening and nighttime – a procedure which is economically compensated for EV owners. Novelty lies in utilising the energy community model across housing co-operatives, with shared ownership.</p> <p><b>TE-4.2</b> A novel prosumer/charging-level optimisation-based controller will be developed, featuring two main operational modes to manage local resources and charging.</p>	TBD	<p><b>TE-4.1</b> Currently solar power is often used as a daytime additional energy source without systematic energy storage to EVs – and without possibility to transfer it back to grid from the EV batteries.</p> <p><b>TE-4.2</b> Existing adaptive charging tools use model predictive control to cut electricity costs under variable time-of-use tariffs, focusing solely on the power exchange/capacity limitations of individual consumers.</p>
IN-5	Interoperable user-centric Apps with analytical and predictive capability	<p><b>TE- 5.1</b> An application combining the needs of the users and the electricity network capabilities</p> <p><b>TE- 5.2</b> Users' free choice of eMSP with the same innovative charging features provided by CPO</p>	YES	<p><b>TE-5.1</b> EV charging takes into account on one hand the state of the electrical network, the prediction of the energy consumption and production and on the other hand offers to users a bi—directional service that takes into account the users' needs (how much and when should be the battery in the EV available).</p> <p><b>TE-5.2</b> The CPO creates the new innovative charging features in such a way that users are</p>	TBD	<p><b>TE-5.1</b> Arrival and departure times and some information about users' own behaviour can be entered in some eMSP applications but the charging does not take into account the state of the electricity network and the bi-directional capability/option.</p> <p><b>TE-5.2</b> The flexibility features and the new innovative services of the chargers are often</p>

				free to choose their eMSP. CPO makes system compatible for different eMSPs. CPO backend platform will provide bi-directional charging API capabilities for an easy implementation of this feature into eMSP users mobile apps.		offered by the same entity (acting as CPO and eMSP) or there is only cooperation between two companies.
NTI-1	Improved usability of the charger and mobile applications for special needs' group based on accessibility and Universal Design	Not applicable	NO	NA	TBD	
NTI-2	Social inclusivity of physical and digital designs	Not applicable	NO	NA	TBD	
NTI-3	Enhanced user acceptability of EV chargers amongst all community clusters through co-design	Not applicable	NO	NA	TBD	
NTI-4	Social Innovation	Not applicable	NO	NA		

## 7.2 Annex 2 Technology Elements

TE #	TE	I N O L I N K	Techno Elements development task(s) & responsible			TRL @start	SoA @ start of project	TRL @end	SoA @ end of project
			Task(s)	TB Leader (Partner-name)	Contributors				
TE - 1.1	Less physically intrusive AC EV charger		Task 2.2 (or all WP2?)	UTU	ERTICO, VTT, IGL, ATECH, AVANT, MET	5	Built urban environments (especially densely populated areas) must design their charging solutions based on currently available commercial solutions and physical constraints dictated by the charging devices.	7	
TE - 1.2	Less visually intrusive AC EV charger		Task 2.2	UTU	ERTICO, VTT, IGL, ATECH, AVANT, MET	6	Those that may cause unwanted visual elements into already built environments and no optimisation of accessibility and usability.	8	
TE - 2.1	EV Supply Equipment for low-cost and fast installation in built urban environments		Task 2.2	UTU	ERTICO, VTT, IGL, ATECH, AVANT, MET	5	High installation costs due to excessive civil and installation works when installing chargers in built urban environments with currently common installation components and accessories.	7	

TE #	TE	I N O L I N K	Techno Elements development task(s) & responsible			TRL @start	SoA @ start of project	TRL @end	SoA @ end of project
			Task(s)	TB Leader (Partner-name)	Contributors				
TE - 2.2	Optimised AC EV charger design for built urban environments		Task 2.2	UTU	ERTICO, VTT, IGL, ATECH, AVANT, MET	5	Currently widely available AC EV chargers do not provide especially thought low-cost and fast installation in built environments in multiple aspects.	7	
TE - 3.1	A multi-level synergetic framework with seamless data-exchange to co-manage Grid, RES and EV charging		Task 3.1	UL	UNIVLEEDS, VTT, IGL, UTU, KNG, AVANT, UCY, PAP, EVP, EAC, ERTICO	5	Prosumers equipped with PVs, battery systems, and EV charging points are today seeking ways to manage their resources efficiently within variable pricing or net-billing environments and under highly uncertain demand/generation patterns.	7	