

ELU_2025_003 ASSET CONNECTIVITY API SOLUTION

TECHNICAL ANNEX

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1. Introduction

1.1 Enovos Luxembourg

Enovos is the main energy supplier in Luxembourg.

Enovos' mission is based on two essential pillars: on one hand, the supply of electricity, natural gas, and renewable energies to a wide range of customers, including industrial companies, SMEs, and private households. On the other hand, the development of projects in the field of renewable energies.

Enovos is present, either directly or through subsidiaries or participation, across the entire value chain, from energy production to the supply of the final consumer.

1.2 Context summary

Through the mission of supplying energy to consumers in Luxembourg, Enovos is committed to innovate and provide adequate products and services. This includes developing pioneering products associated with various energy assets as well as ensuring a seamless customer journey.

The development of a product with tariffs tailored for EV users charging at home associated with enhanced charging features in MyEnovos app is one of the current initiatives. This offer will feature time of use electricity tariffs and functionalities such as smart charging, charges steering, and e-mobility KPI within the MyEnovos app.

A Proof of Concept (PoC) for EV integration was initiated for a select group of users on November 28, 2024. The feedback and insights obtained during the PoC phase have been instrumental in shaping the enhancement roadmap as a public launch is anticipated between the end of 2025 and the beginning of 2026.

In the long run, Enovos is seeking to expand these initiatives to other products and other assets to ensure a 360 monitoring, optimization and control of their energy ecosystem.

As a critical part of current and future developments and assets integration, Enovos is currently seeking a main qualified **API supplier** to develop and maintain the integration required for developing innovative energy solutions, controlling assets like EVs, inverters, batteries and heat pumps, with the public launch of EV integration in MyEnovos app leading the way. Enovos is engaged in various topics related to assets, and we will not work exclusively with the selected actor on asset connectivity. Enovos may potentially contract with another supplier for specific use cases and/or technical needs.

2. Context and objectives

2.1 Background

The energy market is undergoing a rapid transformation as households increasingly adopt solar panels, batteries, heat pumps, and electric vehicles. Traditional consumption patterns are evolving, resulting in higher and more volatile electricity demand, shifting peak load dynamics, and growing levels of self-consumption. These developments are fundamentally reshaping the way energy is produced and consumed, putting traditional energy supply models under pressure.

To stay aligned with this shift, energy suppliers must design new products and pricing structures tailored to emerging energy uses. Consumers are seeking more flexible and cost-effective solutions, along with tools that enable them to better monitor, optimize, and control their energy consumption.

The first initiative in this direction was the development of the customer portal and MyEnovos app in July 2024, essentially used to access invoices, manage contracts, monitor energy consumption or production and contact customer service.

2.1.1 Time of use electricity tariff: naturstrom drive

In March 2025, the naturstrom drive tariff for EV users charging at home was live, enabling the future development of optimization features in MyEnovos app.

The naturstrom drive tariff is a Time-of-Use tariff structure that empowers B2C customers to select from various charging time windows, each with distinct pricing. This approach offers customers the potential to benefit from more favorable rates for charging their electric vehicles. By shifting their use to more advantageous or off-peak hours, customers may achieve cost savings.

Naturstrom drive offers four daily tariffs, allowing customers to maximize savings by charging their EVs and programming their consumption during low-demand hours.

- **Midnight to 6AM:** 25% cheaper than the base naturstrom home rate – Ideal for overnight EV charging at the lowest cost.
- **6AM to 5PM (Monday to Friday):** Base rate applies – Providing consistency during regular daytime hours.
- **5PM to Midnight:** 6% more expensive than the base rate – Encouraging a shift away from high-demand periods.
- **Weekends, 12PM to 5PM:** 25% cheaper rate – Extra opportunities for smart, cost-effective EV charging and home energy savings.

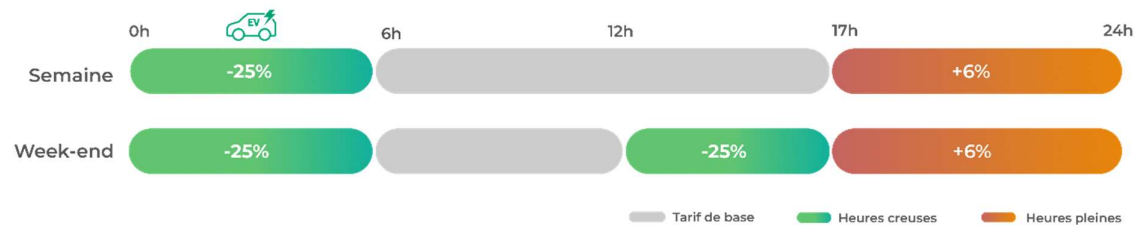


Figure 1: Naturstrom drive tariff

2.1.2 Proof of Concept of EV integration

In anticipation of the implementation of the “naturstrom drive” tariff targeting EV users, a PoC for integrating EVs in MyEnovos app with charging optimization and monitoring features was initiated for a selected group of users in November 2024.

2.1.2.1 Concept

The PoC focused on integrating the first EV management and steering features into the MyEnovos mobile app, enabling control and seamless interaction between users, their EVs, and their energy contracts.

The PoC concerned a selection of Enovos employees with EV or PHEV charged at home. Around 35 people with different car brands participated in the PoC.

The main objectives of the PoC were to:

- Test the stability and performance of the API for electric vehicle (EV) connectivity.
- Test the steering of charge and available statistics
- Evaluate the limitations on information and features available per car brand and car model
- Have a better understanding of important features to offer in MyEnovos app based on feedback

And the main implemented features included:

- **EV onboarding:** users were able to register their EV at a location linked to their electricity contract within the MyEnovos app. A location is defined as an address where the user has an electricity consumption, production, or gas contract.
- **"My Equipments":** a new dedicated section in the app allowed users to manage all their energy-related equipment associated with their location.
- **Smart scheduling:** users were able to define charging times based on the Naturstrom Drive tariff to optimize their charging costs.
- **Home charging History:** users were able to track and review their charging sessions at home, gaining insights into past consumption and trends.

2.1.2.2 Screenshots/Mockups

EV Onboarding and “my equipments”

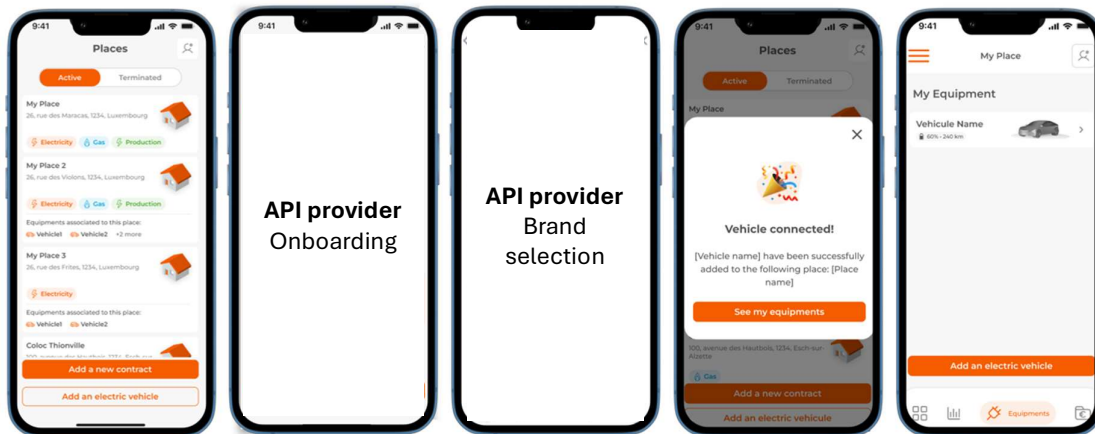


Figure 2: EV PoC – Onboarding

Smart scheduling and charging history

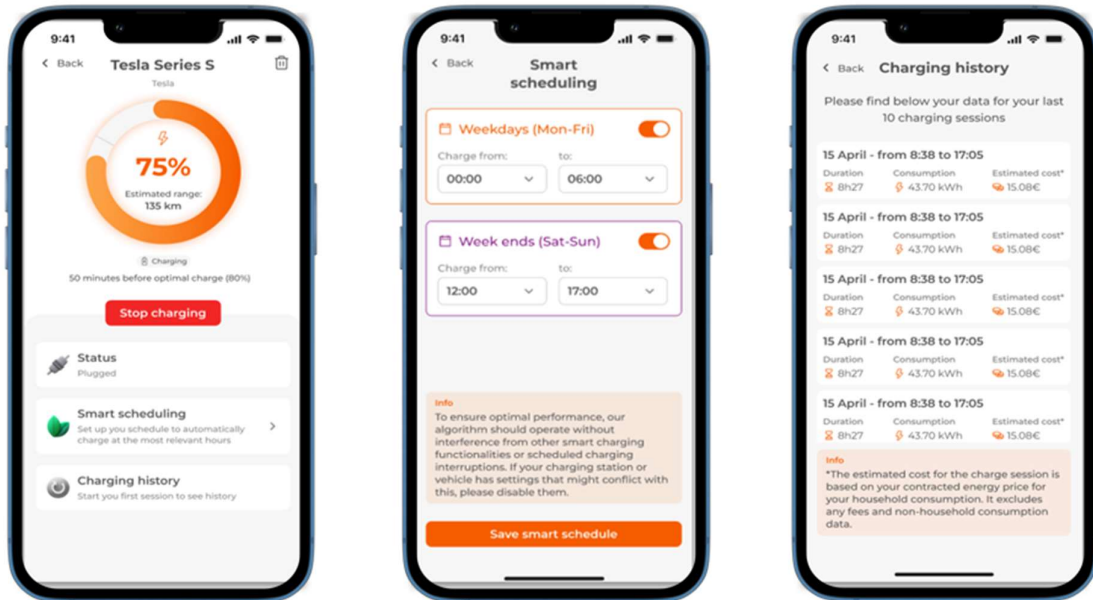


Figure 3: EV PoC - Smart scheduling and charging history

2.2 Long term objectives

2.2.1 Full rollout of EVs integration

The feedback and insights obtained during the EV PoC phase have been instrumental in shaping the enhancement roadmap for the public launch of EV features in MyEnovos app.

2.2.1.1 Functionalities to implement

The goal of the full rollout is to refine the integration of EVs in MyEnovos app by implementing bug corrections, new or improved functionalities and UX/UI optimization following PoC feedback

A **public launch** is anticipated **between the end of 2025** and the **beginning of 2026** for all **Naturstrom Drive tariff subscribers**. A preliminary release is planned early July 2025 for a panel of 200 “test” users.

The main functionalities currently under development for the release include:

- **Smart charging instead of smart scheduling** to automatically optimize energy costs based on the naturstrom drive tariff without requiring the user to take action
- **Statistics** to enable the monitoring of electricity consumption and cost as well as savings realized thanks to smart charging features and naturstrom drive tariff
- **Error messages and sad paths management** for handling issues arising with the use of the app
- **Informative paths** such as tutorials for the first use of smart charging
- **Notification system** to warn users in different contexts such a successful onboard, a completed charge,...
- **FAQ** to educate users about the functionalities of the app
- **Customer feedback** option to let users escalate issues or bug encountered with the app
- **Charging data analytics** to suggest optimal times for energy-intensive activities, such as running appliances or charging electric vehicles, when electricity rates are lower.
- **Overall** enhanced UX/UI

2.2.1.2 Screenshots/Mockups

Onboarding

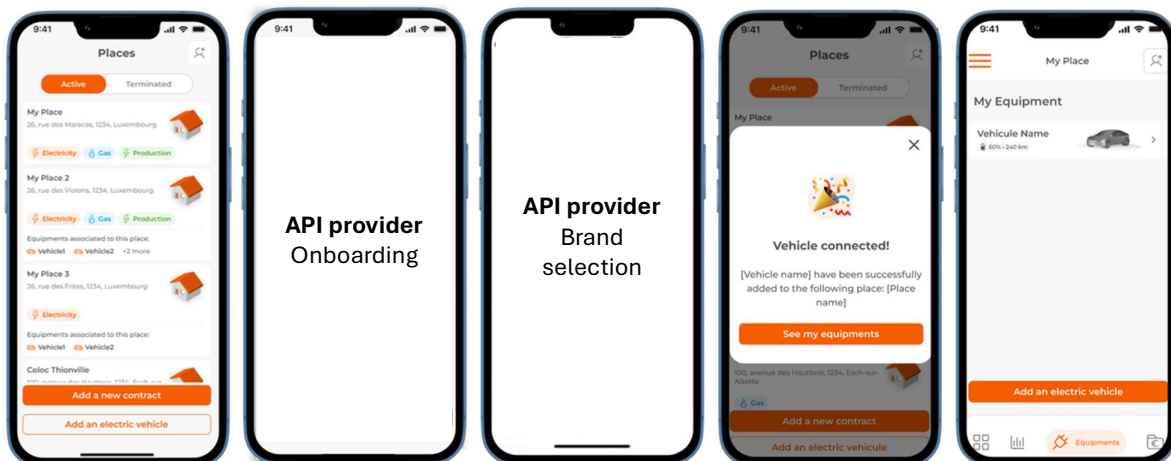


Figure 4: EV full rollout - Onboarding

Smart charging and statistics

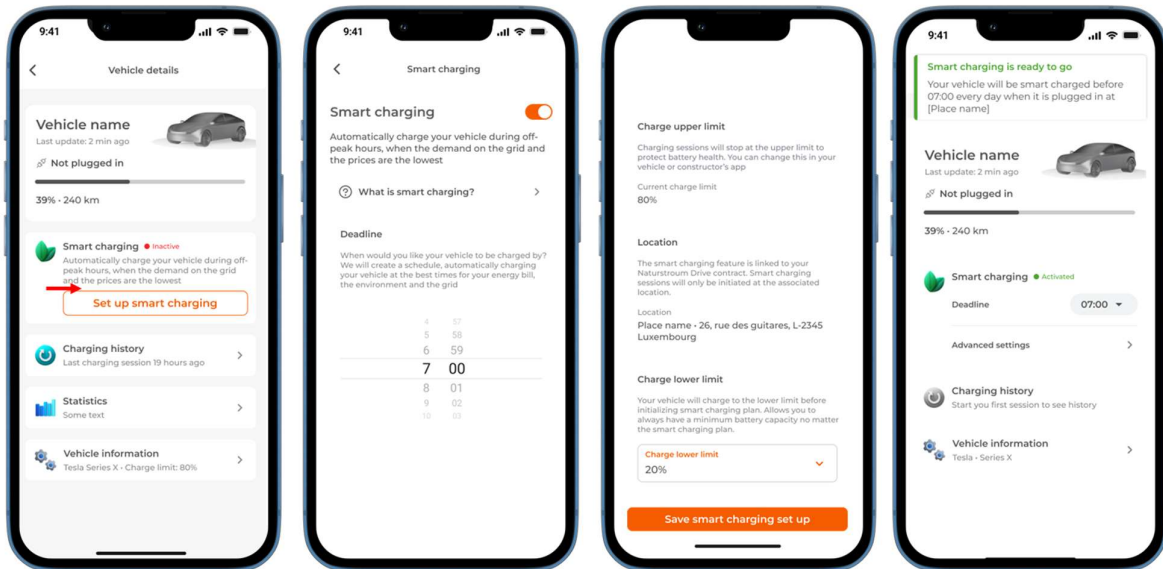


Figure 5: EV full rollout - Smart charging

Charging statistics and history

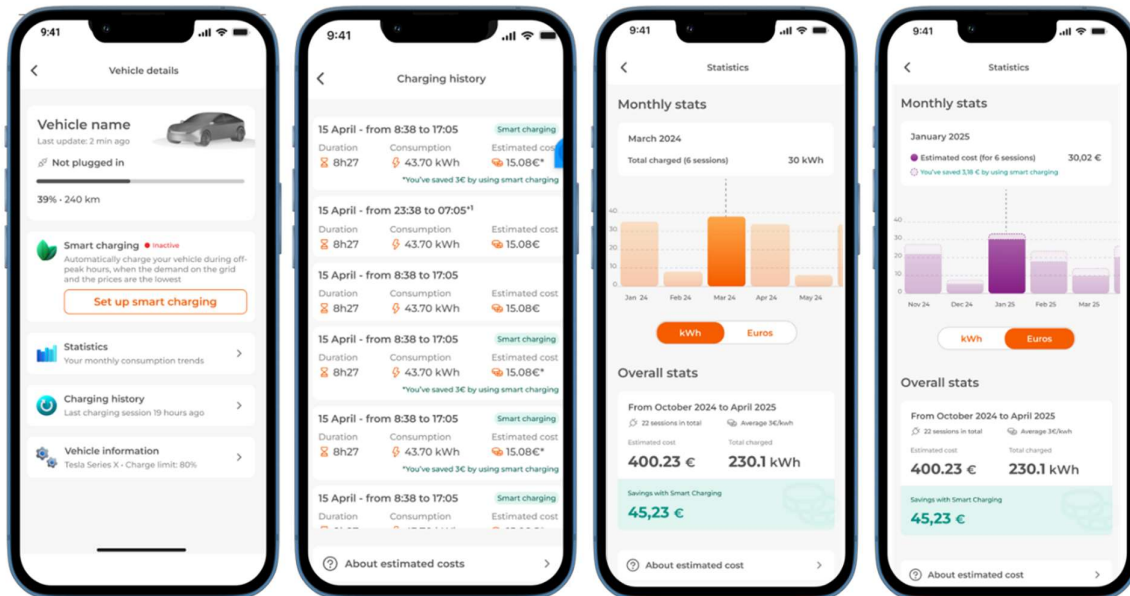


Figure 6: Charging statistics and history

2.2.1.3 Audience of the full rollout of EVs integration

Based on the expected increase in the number of EVs and in the proportion of owners subscribing to a Naturstrom Drive contract with a compatible vehicle, we expect around 3.500 vehicles onboarded on the MyEnovos App by 2028.

Year	Number of connected EVs	Comment
2025	0	Full rollout end of 2025 or beginning of 2026
2026	1750	Steady increase in the first year of service
2027	2600	Flat increase as of the 2 nd year with ≈800 new users per year
2028	3500	Idem

Table 1: Expected growth of EVs

2.2.2 Beyond EVs integration

In the long run, Enovos is seeking to expand this kind of initiative to other products and assets to provide clients with cost effective energy solutions and empower them to control, optimize and monitor their whole energy ecosystem.

Key assets and functionalities to be developed in the long run will include:

- Integration and control of **new assets** (PVs, wallboxes, solar inverters, heat pumps, batteries, thermostats)
- New energy tariffs
- **EV smart solar charging**
- Local optimization functionalities (**HEMS**)
- Vehicle-to-grid (**V2G**)
- Decentralized assets **aggregation** and **virtual power plant** creation
- **Multi-market** optimization (day ahead, intraday, balancing market...)

2.3 RFP objectives

As Enovos develops products and services that require the connection and control of local assets, reliable communication with these assets must be ensured.

This RFP invites **qualified API suppliers to develop and maintain the required integration framework** and to **support Enovos in realizing its vision** for innovative energy solutions.

This integration framework will enable Enovos to connect and manage a range of energy assets, including electric vehicles (EVs), photovoltaic systems, wallboxes, inverters, thermostats, batteries, and heat pumps.

It will serve as a key enabler for realizing the vision described in section 0 and detailed in section 0, with the initial focus on the EV use case. This first phase will concentrate on enhancing the MyEnovos app by incorporating smart charging functionalities, laying the groundwork for the broader integration of other energy products and assets in subsequent phases.

To support Enovos in achieving these objectives, the API provider will be expected not only to deliver robust technical integration solutions but also to assume an advisory and support role.

The provider will bring its expertise and experience to help improve the product, advise on development strategies, and offer ongoing support throughout the development process. Acting as a **facilitator**, the provider should ensure the availability of sufficient documentation and structured support to enable Enovos to progress efficiently with its initiatives.

3. Scope of Work

3.1 Responsibilities of Enovos and the supplier

3.1.1 Enovos

In this collaboration, Enovos will play a key role in driving the success of the API integration projects. As a key stakeholder, Enovos is committed to executing a range of responsibilities that are essential for achieving the project's objectives. These responsibilities include:

- **Project oversight:** Enovos will manage the development of the MyEnovos app, ensuring both frontend and backend components meet project objectives.
- **Requirements and alignment:** Enovos will define clear requirements and expectations for the API integration, ensuring alignment on scope and deliverables.
- **Data and access:** Enovos will provide necessary data, system access, and permissions for the supplier to perform tasks effectively.
- **Communication:** Enovos will maintain timely communication and provide constructive feedback to support smooth project execution.
- **Performance evaluation:** Enovos will monitor and evaluate the API integration to ensure it meets business requirements and delivers expected outcomes.
- **Compliance and support:** Enovos will ensure compliance with industry standards and provide training and support for effective API utilization.

3.1.2 Supplier

As an API supplier, the Supplier plays a crucial role in empowering Enovos with advanced technological capabilities. By delivering robust and versatile API solutions, the Supplier is responsible for addressing several key areas that are vital for Enovos' operational success and strategic objectives. These responsibilities include:

- **Data integration:** Supplier's APIs facilitates the integration of energy data into Enovos' systems, allowing them to access and utilize information seamlessly for various applications.
- **Real-time data access:** Enovos can access real-time energy data through Supplier's APIs, enabling to monitor consumption, performance, and other metrics instantly.
- **Reliability:** Supplier maximizes the stability and performance of API integrations to enable seamless data exchange and reliable optimization functionalities.
- **Customization:** Supplier offers APIs that can be tailored to meet specific Enovos needs, providing flexibility in how data is accessed and used.
- **Scalability:** Supplier's APIs are designed to scale Enovos' needs, accommodating growing data volumes and expanding functionalities and assets' compatibility as required.
- **Security and compliance:** Supplier ensures that its APIs are secure, protecting sensitive energy data and maintaining client confidentiality while ensuring compliance with all relevant regulations and standards.
- **Support and documentation:** Supplier provides comprehensive documentation and support for its APIs, advising and assisting Enovos in implementation, improvements and troubleshooting.

3.2 Requirements

3.2.1 Functional requirements

3.2.1.1 Assets capabilities

The solution provider must offer connectivity—and, where applicable, control—for a set of assets that will be the focus of upcoming developments at Enovos.

Mandatory requirements

The solution provider must cover at least the following set of prioritized assets:

- EVs
- Wallboxes
- Solar inverters
- Batteries

Evaluated requirements

The supplier will provide a detailed list of compatible assets in the offering, specifying whether each device can be connected and controlled using the proposed solutions. This should be accompanied by planned developments and a roadmap for the near future.

a. EVs

Based on the detailed Luxembourgish fleet of vehicle models available in the **Annex 1¹**, the supplier will provide the number of vehicles in Luxembourg that can technically be connected with a maximum reliability and full capabilities.

The **detailed features available per model and per brand** will be provided in the **green cells of the sheets “1. EVs - Models” of the Annex 1**. Only the models with more than 100 units present in Luxembourg are represented to limit the workload, which represents about 78 models and 80% of the total fleet.

Brand	Model	Fleet in Luxembourg	Connection reliability	Vehicle data (SoC, location...)	Charging and smart charging capabilities	(Smart) charging statistics (volume, cost, savings...)	Comment
Brand	Model	Number of vehicles of that model in Luxembourg market (only those with more than 100 units)	Max = stable with quick response times; Medium = some instability, and/or high response times; Low = frequent issues of stability and/or response time	Yes = APIs available to retrieve vehicle data No = not available	Yes = APIs available to control (smart)charge No = not available	Yes = APIs available to retrieve statistics No = not available	Additional comment (ongoing development, future partnerships or other relevant information)
Example brand 1	Example model 1	3000	Max	Yes	Yes	Yes	Model compatibility under improvement with OEM, operational by June
TESLA	MODEL 3	2520					
TESLA	MODEL S	230					
TESLA	MODEL X	123					
TESLA	MODEL Y	2419					
VOLKSWAGEN	GOLF	133					
VOLKSWAGEN	ID.3 PRO 150 KW	565					
VOLKSWAGEN	ID.3 PRO S 150KW	181					
VOLKSWAGEN	ID.3 PRO 150KW	223					
VOLKSWAGEN	ID.4 PRO 150 KW	428					
VOLKSWAGEN	ID.4 PRO 210KW	420					
VOLKSWAGEN	ID.3 PRO 150 KW	223					
VOLKSWAGEN	ID.3 PRO 210KW	238					
VOLKSWAGEN	UP!	275					
BMW	i3	137					
BMW	i4 EDRIIVE35	236					
BMW	i4 EDRIIVE40	625					
BMW	i4 M50	155					
BMW	i5 EDRIIVE40	177					
BMW	iX1 EDRIIVE20	253					
BMW	iX1 EDRIIVE30	492					
BMW	iX2 EDRIIVE20	281					

Figure 7: Annex 1 - Sheet “1. EVs – Models”

b. Wallboxes

The supplier will provide the list of models of wallboxes that can technically be connected and controlled with maximum reliability and full capabilities.

The **details per model** will be provided in the **sheet “2. Wallboxes” of the Annex 1**.

¹ Excel document provided with the RFP: “ELU_2025_003 Asset connectivity API solution - Annex 1”

3.2.1.2 Functionalities

The supplier will detail in the offer the functionalities that are currently covered with the proposed solution.

Mandatory requirements

The solution provider must cover the existing EV PoC requirements and additional requirements related to the full rollout of EVs integration and to future initiatives.

The supplier will **explain in detail** how each of these functionalities is processed:

1. **Seamless asset onboarding process**
2. **Real-time data access** such as SoC, location, range... for all assets
3. **Start and stop charging for EVs, wallboxes and batteries**
4. **Smart charging for EVs, wallboxes and batteries** to automatically optimize energy costs based on the naturstrom drive tariff without requiring the user to take action. A seamless integration of the naturstrom drive tariff data must be ensured².
5. **Solar charging of EVs and batteries** to optimize the autoconsumption of produced energy.
6. **Access to asset-related statistics** in order to enable analytics on Enovos side (e.g. number of connected assets, client retention, success rate of connections,...), and to support the development of client-facing KPIs, such as electricity consumption monitoring, cost tracking, and savings achieved through smart charging features and energy tariff optimization.
7. **Notification and error management** system designed to inform users in various contexts — such as successful onboarding, completed charging sessions, errors, or alerts related to energy tariffs. It will also provide clear guidance when issues occur during asset onboarding, charging, or other critical processes.

For each functionality, the provider must supply **sufficient information and illustrative examples** to clearly explain the implemented solution and allow for an assessment of its relevance. This may include, where applicable, a detailed **algorithm** description, the current **development stage**, the type of **assets concerned**, **evidence of use** by other clients, **code** samples, **APIs** specifications, and other supporting materials.

The mandatory requirements will only be validated if the description is both complete and supported by accurate examples for each functionality.

Evaluated requirements

The supplier will provide details about the functionalities proposed that match long terms Enovos' ambitions:

1. **Maximum power setting for EVs and wallboxes**
2. **Aggregation of assets**
3. **Complete Home Energy Management System**
4. **Multi-market optimization**
5. **Demand response**
6. **Virtual Power Plants (VPPs)**
7. **Vehicle-to-Grid (V2G)**

For each fulfilled secondary requirement, the provider must supply **sufficient information and illustrative examples** to clearly explain the implemented solution and allow for an assessment of its relevance. This may include, where applicable, a **detailed algorithm description**, the current **development stage**, the **type of assets concerned**, **evidence of use** by other clients, **code** samples, **APIs** specifications, and other supporting materials.

² For now, the existing tariff is this time of use tariff but we envision to integrate such solution with other type of energy tariff as dynamic tariff based on EPEX.

The points will only be awarded if the description is both complete and supported by accurate examples for each use case.

3.2.1.3 Partnership model

The supplier will explain in the offer how the relationship with manufacturers is structured and how it guarantees reliable connection to vehicle data.

Mandatory requirements

As official partnerships are a way of ensuring futureproof and reliable connections to assets, the supplier will demonstrate at least one existing official partnership with manufacturers of EVs.

Sufficient information must be provided to clearly illustrate the existence of the partnership or an ongoing formalisation process.

Evaluated requirements

Beyond this minimum required, the number of official partnerships will be evaluated.

Detailed explanations will be provided on how asset capabilities and compatibilities are addressed, maximized, and planned to evolve, with a particular emphasis on partnership strategies with manufacturers.

a. EVs

The supplier will list the type of relationship with each EV brand and provide more explanation if relevant.

Brand	Partnership model Specify the nature of the relationship with the brand and the approach to maximize compatibility	Comment
<i>Example brand 1</i>	<i>Non-official partnership with OEM</i>	<i>No discussion at this stage</i>
TESLA		
VOLKSWAGEN		
BMW		
FIAT		
MERCEDES		
RENAULT		
AUDI		
PEUGEOT		
HYUNDAI		
MG		
OPEL		
MINI		
KIA		
SKODA		
VOLVO		
SMART		
CITROEN		
POLESTAR		
FORD		
PORSCHE		
CUPRA		
DACIA		
JEEP		
BYD		
HONDA		

Figure 11: Annex 1 - Sheet "5. Partnership model - EV"

b. Other assets

For other assets than EVs, the supplier will list the partnerships per type of asset and brand.

3.2.2 Technical requirements

3.2.2.1 Integration

The supplier will explain in the offer how the solution proposed is built and how it can integrate with the current ecosystem of Enovos (Customers front ends, backend API, Webhooks, health checkers...).

Mandatory requirements:

The solution provider must offer a compatible solution with Enovos' current ecosystem. The supplier will explain in detail how each of these critical elements is addressed and how the proposed solution is a match:

a. Compatibility

- The API must allow seamless integration with our existing ecosystem (e.g., CRM, mobile applications, etc.).
- It must be compatible with market standards (API, OAuth2.0, etc.).
- It should be able to push assets events into our system.
- It should offer a solution, to be integrated in our front ends, to facilitate onboarding of users (SDK or authentication page).

b. Architecture and protocols

- It should be disclosed what provider hosts the cloud services and in which region.
- The API must be built on a scalable and cloud-native architecture.

c. Supported data format

- It should support the standard format: JSON.

d. Scalability and hosting

- The API must be hosted on secure cloud infrastructures (AWS, GCP, Azure, etc.).
- It must support auto-scaling based on workload.
- All adopted cloud services must support high levels of data portability, allowing for seamless data transfer in and out of the service to prevent vendor lock-in and ensure operational flexibility.

e. Performance

- All cloud services must be governed by comprehensive SLAs that clearly define performance metrics, including availability, response times, and protocols for service disruptions, ensuring alignment with our operational needs.

The mandatory requirements will only be validated if the description is both complete and supported by accurate illustrations for each requirement.

Evaluated requirements

The supplier will provide details about extra integration elements that can ease the integration process:

- Ability to handle real-time data streams

The points will only be awarded if the description is both complete and supported by accurate illustrations for each requirement.

3.2.2.2 Security

The supplier will specify in the offer how the proposed solution meets Enovos' standards in terms of security and how it complies with relevant regulations.

Mandatory requirements

The solution provider must offer a solution matching a set of mandatory security standards. The supplier will explain in detail how each of these critical elements is addressed and how the proposed solution is a match:

a. Security

- Implementation of rate limiting and API throttling mechanisms to prevent abuse.
- All exchanges must be encrypted (e.g., TLS 1.2/1.3).
- Sensitive data must be anonymized or pseudonymized when necessary.
- Services in this category are required to follow the self-assessed CCM Lite (CAIQ Lite) framework provided by the Cloud Security Alliance (CSA) or provide an equivalent (e.g.: SOC2, ISO27001, ...).

b. Access management and authentication

- Support for modern authentication standards (OAuth 2.0, OpenID Connect, etc.).
- Ability to manage access levels based on user roles.
- Possibility for Enovos to roll API token autonomously

c. Compliance

- The solution should comply with data protection regulations (GDPR)
- Provide detailed access to the consent details provided by users
- Cloud service should be hosted in Europe

The mandatory requirements will only be validated if the description is both complete and supported by accurate illustrations for each requirement.

Evaluated requirements

The supplier will provide details about extra integration elements that can optimize the security of the solution:

- Multiple API tokens to ensure smooth roll

The points will only be awarded if the description is both complete and supported by accurate illustrations for each requirement.

3.2.2.3 Support

The supplier will specify in the offer how the technical solution is supported by sufficient documentation and how the supplier provides an advisory role in addition to the solution itself.

Mandatory requirements

The solution provider must offer a set of critical support elements to facilitate the implementation process. The supplier will explain in detail how each of these critical elements is addressed and how the proposed solution is a match:

a. Monitoring

- Activity logs must be accessible via a dashboard.
- Real-time monitoring and alerting capabilities.
- Escalation processes for technical issues related to API.

b. Documentation

- All cloud services must provide clear documentation. This documentation must include all necessary information, such as service owners, dependencies on other services or systems, specific security criteria, authentication methods, and any other relevant information that would be necessary for the development team.
- Easily accessible APIs library and related documentation
- Easily accessible and up to date list of compatible devices with associated functionalities.

c. Support and maintenance

- Technical incident management
- Customer support
- Extensive FAQ and advice
- Dev testing environment
- Dedicated resources for business and technical support with regular follow-ups

The mandatory requirements will only be validated if the description is both complete and supported by accurate illustrations for each requirement.

Evaluated requirements

The supplier will provide details about extra support elements that can facilitate the implementation process:

- Monitoring: Alerting on issues via push requests API
- Provide a dynamic solution for accessing the list of compatible devices and functionalities to automatically enable a filtering on Enovos side and prevent users attempting connecting incompatible devices.

The points will only be awarded if the description is both complete and supported by accurate illustrations for each requirement.

3.2.3 Price

The provider will fill in the **green cells** of the table provided in the **sheet “6. Price” of the Annex 1** with the different **components of its pricing structure** and with the **total price calculated** based on the hypothesis of the future **expect growths of assets/users**.

The supplier can propose different pricing options.

Option 1					
Pricing structure	Amount and units		Detailed explanations		
Fix fees					
Variable fee (per asset)					
Other (specify)					
Option 2					
Pricing structure	Amount and units		Detailed explanations		
Fix fees					
Variable fee (per user)					
Other (specify)					
Option 3					
Pricing structure	Amount and units		Detailed explanations		
Fix fees					
Variable fee (specify)					
Other (specify)					
Total					
Price	2025 (4 months)	2026	2027	2028	Total
Hypothesis: assets	0	2000	4000	6000	/
Hypothesis: users	0	1538	3077	4615	/
Option 1					
Option 2					
Option 3					

Figure 13: Annex 1 - Sheet “6. Price”