Interreg Danube Region

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D.3.1.2: Policy brief solution for the peak load reduction and energy self-sufficient prosumers

Document Content

SO 3 / Title:	Transferring of the results and policy support activities
Activity 3.1 Downstreaming and upstreaming engagement for proper implementation of Directive	Each country again activates the focus groups and ASP to jointly interface, the results will be displayed and the solutions will be easier to identified. The video of the pilots can be presented to them as well. PPs and other key players are involved in the online solution-deployment joint process. It encourages collective brainstorming to generate ideas on the best solution. LP and PP10 leads the active discussion between PPs and stakeholders to develop the joint solutions on the pilot actions. Pilot site partners will propose solution derive from the feasible pilot actions. After the pilot action implementation and based on the evaluation (D.1.3.1) and D.3.1.1 each country jointly with partners from another country prepares a policy brief solution containing: technical requirements, financial schemes for repetition, the advantages for energy prosumers from the sectors (economic, domestic, public) and indirect target groups (energy regulators, distributors, etc.), proposal on the optimisation of the pilot action which will be reflected in the solution approach. It includes also the decisions on needed improvements in energy management to be done; technical conclusions for local/regional pilot upscale; how to start with and how to implement tested pilot approaches/solutions in the new areas and how to properly implement the Directive in each involved county. Communication activities refer to the production of the e-version of the policy brief solution for the dissemination purposes. It is prepared by LP.
Deliverable:	**D.3.1.2**
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Executive summary and the context

Electricity systems in Slovenia and the wider region are facing an increasing challenge: **rising peak loads** and mounting pressure on local grids, coupled with the need to integrate more renewable energy and electric vehicles without undertaking costly grid upgrades. Although photovoltaic systems and e-mobility are expanding rapidly, electricity demand is becoming more concentrated over time, which is creating congestion, higher costs and risks to grid stability. This makes **flexibility and reducing peak loads** a key priority for municipalities, organisations and policymakers.

The Slovenian pilot project shows that these issues can be resolved by taking a **smart, integrated approach to energy management**. The pilot tested how existing renewable assets — photovoltaic generation, battery storage, buildings and electric vehicle charging — can be connected into one coordinated system. Rather than treating electric vehicles as passive consumers, the pilot explored their potential as active flexibility resources to help balance consumption, reduce peaks and maximise the use of locally produced renewable electricity. The results confirm that smart, bidirectional charging can improve grid stability, lower energy costs and strengthen energy independence.

The policy brief's key conclusion is that **reducing peak load is not just a technical niche issue**, but also a strategic enabler of the energy transition. Based on Slovenian experience, the following four recommendations stand out as being transferable:

- prioritise flexibility measures (smart charging, storage, demand-side management) alongside renewable deployment;
- integrate peak load management into municipal energy and climate strategies;
- involve grid operators, regulators and users early in the process; and
- support integrated, modular solutions rather than isolated technologies.

Reducing peak load is important because electricity demand is increasing due to the electrification of transport, heating and industry, while renewable energy generation is more variable. Without flexibility, the grid becomes a bottleneck, slowing down the deployment of renewables and increasing costs for everyone. Flexibility services and demand-side management enable the use of more renewable energy locally, reduce the need for grid reinforcement and improve affordability.

The Slovenian pilot is closely linked to wider policy frameworks, including SECAPs, national energy and climate plans, EU climate and energy legislation, RED III and the EU Green Deal. Importantly, the challenges addressed are not limited to one pilot site. They are shared by cities, rural areas, SMEs, farmers and households in Slovenia and beyond. This makes reducing peak load a regional and transnational priority that requires coordinated policy support and the rapid replication of proven approaches.

Local context – Slovenian pilot action

*The Slovenian pilot addresses a key challenge faced by many municipalities and organisations: **how to reduce electricity peak loads while increasing the use of locally produced renewable energy**. With the growing uptake of photovoltaic systems and electric vehicles, existing low-voltage grids are under increasing pressure, especially during peak demand periods. At the same time, renewable electricity is often not fully used locally due to limited flexibility.*

*To respond to this challenge, the pilot tested an **integrated smart energy management approach** that connects photovoltaic generation, battery storage, building energy use and electric vehicle charging into one coordinated system. The core idea was to move beyond isolated technologies and demonstrate how **flexibility measures**, such as smart and bidirectional charging, can actively support buildings and reduce peak demand.*

*The pilot was implemented at a real-life site with existing renewable infrastructure, allowing the solution to be tested under everyday operating conditions. Electric vehicles were explored not only as consumers of electricity, but also as **potential flexibility resources** that can support buildings during high-demand periods. This approach helps smooth consumption peaks, increase self-consumption of renewable energy and reduce dependence on the grid.*

Peak reduction measure - solution overview

Peak load reduction through smart use of existing renewable assets

Rather than focusing on single technologies or one local pilot, the solution focuses on smart energy management that links renewable electricity production with flexible electricity consumption. It brings together smart charging infrastructure, photovoltaic (PV) systems, digital control tools and flexible consumption patterns to create an integrated approach. The core idea is to use locally produced renewable electricity as soon as it is available, rather than feeding it uncontrollably into the grid or relying on grid electricity during peak demand hours.

As demonstrated by the pilot, a smart charging system connected to an existing PV installation can act as a flexibility tool, consuming, storing, or shifting electricity according to local production and grid conditions. Importantly, this approach does not require new large-scale investments. This makes it particularly relevant for existing PV systems whose support schemes have expired, as new business and operational models are needed to ensure that renewable assets remain economically and systemically valuable.

At a broader level, the solution tackles peak load issues by reducing simultaneous demand and levelling out consumption patterns. This reduces stress on local and national grids, helping grid operators to avoid or postpone costly grid reinforcements. At the same time, it enables greater integration of renewable energy sources, as more locally produced electricity is used on site rather than being curtailed or exported during periods of peak generation.

From economic and environmental perspectives, the solution delivers multiple co-benefits. Energy users benefit from lower electricity costs, since self-consumed renewable electricity is usually cheaper than electricity from the grid. CO_2 emissions are reduced as fossil-based peak electricity is replaced by locally produced renewable energy. Public budgets and grid operators also benefit from avoided infrastructure investments, which improves the overall affordability of the energy transition.

The approach is highly replicable and scalable. It can be applied to public buildings, commercial facilities, residential blocks, farms, SMEs and future energy communities, regardless of the national context. It is not the specific pilot configuration that makes it transferable, but the principle of aligning renewable production, flexible demand and smart control — a solution that can be adapted across regions to strengthen energy security, resilience and system efficiency.

Key steps for implementation

It is not a single pilot that can be replicated, but rather the structured process involving strong governance, early grid and regulatory alignment, flexible technical design and clear organisational decision-making. This approach allows cities and organisations in different regions to implement peak load reduction measures that are tailored to their local conditions and policy objectives.

1. Define the problem and policy objective

Firstly, clearly identify the peak load challenge that you wish to address, such as local grid congestion, high electricity costs or limited RES integration. Agree internally that the objective is to increase flexibility and reduce peaks, rather than installing a specific technology. This approach helps to ensure political support and alignment with energy, climate and mobility policies.

2. Establish governance and responsibilities

Successful implementation requires early coordination across departments:

- **Energy/technical department** – leads technical design and grid coordination
- **Finance department** – prepares business model, incentives and lifecycle costs
- **Legal/regulatory unit** – checks compliance, permits and data rules
- **Management/political level** – approves strategy, budget and risk sharing. Clear internal mandates and decision points should be defined before technical work starts.

3. Assess feasibility and regulatory conditions

Conduct a technical and financial feasibility study covering local renewable energy potential, storage options, flexibility solutions and the impact on peak reduction. In parallel, review national and regional regulations, such as grid codes, charging rules, flexibility markets and V2G/V2B permissions. Early dialogue with the distribution system operator (DSO) is essential to confirm grid connection requirements.

4. Design the technical and organisational setup

Specify the system requirements in a way that will stand the test of time. Consider factors such as capacity ranges, interoperability, control software, cybersecurity and data access. Decide whether flexibility should be managed internally or via an aggregator. Plan organisational arrangements for operations, data usage and decision-making during peak events.

5. Secure financing and political approval

Prepare a clear cost–benefit analysis demonstrating avoided grid costs, energy savings and reductions in CO_2 emissions. Combine internal budgets with national incentives or external partners where possible. Formal political or managerial approval should cover investment, operating costs and long-term responsibilities.

6. Engage users and stakeholders early

Start engaging the community and users in the planning phase. Clear communication with building users, electric vehicle (EV) drivers and prosumers helps to ensure acceptance of smart charging or flexibility rules and avoids resistance later on.

7. Implement, monitor and adapt

Ensure proper commissioning and testing during implementation. Set up continuous monitoring of peak loads, self-consumption, costs and emissions. Maintenance agreements and regular performance reviews are essential for long-term success and expansion.

Actors and stakeholder engagement

The key lesson for replication is that solutions for reducing peak loads succeed when stakeholder engagement is systematic, inclusive and continuous. This creates shared ownership and enables faster and more reliable scaling up across borders.

Effective peak load reduction solutions require the early and coordinated involvement of a wide range of stakeholders, since no single organisation can address the grid, regulatory, financial and social aspects alone. Experience shows that stakeholder engagement must be treated as a core implementation component, rather than an additional element.

The following actors are essential in any replicable approach:

- **Distribution System Operators (DSOs)** – to assess grid capacity, connection conditions and operational constraints and to ensure that flexibility measures support grid stability rather than create new risks.
- **Regulators and competent authorities** – to clarify legal frameworks, technical standards, data rules and future pathways for flexibility solutions (e.g. smart charging, bidirectional charging, aggregation).
- **Municipalities and public authorities** – to align the solution with local energy, mobility and climate strategies and to provide political backing and legitimacy.

- **Technology providers and system integrators** – to translate policy and technical requirements into reliable, interoperable solutions and ensure cybersecurity and data transparency.
- **Energy agencies** – to provide independent technical expertise, mediate between actors and support awareness-raising and replication.
- **Financial institutions and funding bodies** – to develop viable investment and ownership models and assess long-term economic sustainability.
- **Aggregators and prosumer associations** – to represent flexible demand and supply, enable market participation and ensure user-centric design.

Stakeholders were approached using structured engagement formats, such as targeted workshops, focus groups, bilateral consultations, demonstration events and coordination meetings. These activities enabled joint problem-solving, clarification of expectations and trust-building. Additional stakeholders, such as consumer organisations, business associations, policymakers, the media and NGOs, were also involved to ensure transparency, public acceptance and the wider dissemination of lessons learned.

Early and broad involvement proved crucial. This helped to identify regulatory barriers at an early stage, align technical solutions with grid realities, secure political and organisational commitment and incorporate user needs from the outset. Most importantly, it ensured that the solution could be scaled up across regions and countries and adapted to different regulatory and market conditions.

Communication and awareness

The key lesson for replication is that communication should start early and continue throughout the implementation process. It should focus on the positive impacts rather than the technical complexity. When people can see, understand and experience the benefits, acceptance increases and resistance decreases. This communication approach supports the scaling of peak load reduction solutions across regions and countries, as well as individual pilots.

Effective communication is essential for building public acceptance, trust and political support for measures to reduce peak load. Experience shows that communication should focus less on technical details and more on clear benefits, such as lower energy costs, reduced grid stress and environmental benefits. The key principle is to provide visible, positive and continuous messaging that explains why the measure matters and how it improves everyday life.

This was achieved by communicating the solution using simple, accessible messages supported by visual and practical examples. Short videos, online interviews and visual storytelling were employed to illustrate the concept, the implementation steps and the anticipated advantages. Demonstrating the system 'in action' was particularly effective in increasing understanding and confidence. This approach can easily be replicated across regions, regardless of the technology used.

Multiple actors contributed to communication, ensuring both credibility and outreach:

- **Public authorities and municipalities** – provided legitimacy and linked the message to local energy and mobility strategies.
- **Energy agencies and consumer organisations** – translated technical benefits into user-friendly language.
- **Technology providers** – explained functionality in a simplified and transparent way.
- **NGOs, business associations and EV-related actors** – acted as multipliers to reach wider audiences.
- **Media and communication teams** – ensured consistent messaging across channels.

A mix of communication channels proved most effective:

- **Local and regional media** (press releases, interviews) to reach the general public.
- **Social media and project websites** to provide continuous updates, videos and real-life examples.
- **Public events and on-site demonstrations** to allow direct interaction with the solution.
- **Clear signage and visual materials** at pilot locations to make the solution visible in everyday settings.

Transferability and scalability

Key takeaway:
Transferability does not rely on copying a pilot scheme, but rather on replicating its conditions, governance and stepwise scaling logic. Taking a gradual approach of starting small, building trust and integrating the measure into wider planning frameworks enables reliable upscaling across regions and policy contexts.

Conditions for success

The adoption of smart charging as a measure to reduce peak loads depends on several enabling conditions. Firstly, clear regulatory frameworks are essential, particularly with regard to bidirectional charging, integration with existing photovoltaic (PV) systems and participation in flexibility markets. Without such clarity, organisations are reluctant to invest in or expand solutions.

Secondly, appropriate tariff design is crucial. Dynamic tariffs, incentives for self-consumption and reduced grid fees during off-peak periods create the economic rationale that makes smart charging viable. Thirdly, digitalisation is a prerequisite; smart metering, building energy management systems (BEMS) and interoperable software platforms are required to monitor, optimise and control energy flows in real time.

Physical and organisational conditions also matter. Organisations require sufficient space, basic grid capacity and access to PV or storage. Political will is equally important: embedding the measure in municipal or organisational energy strategies provides legitimacy, continuity and access to public funding.

Key barriers and how to overcome them

There are several barriers that can limit uptake. The most common challenge is high upfront investment costs, which can be addressed through grants, preferential loans, leasing models or public–private partnerships. Adopting open standards and ensuring future-proof technical specifications can reduce interoperability issues between technologies.

Maintenance and operational risks can be mitigated through long-term service agreements and standardised equipment. Regulatory uncertainty can be mitigated by cooperating with regulators early on and translating pilot lessons into concrete policy recommendations. Finally, low awareness among prosumers and users can be overcome by using targeted communication, holding demonstration events and providing digital tools that clearly demonstrate cost and CO_2 savings.

How the measure can be adapted and scaled

A stepwise scaling approach has proven most effective:

Step 1 – Start small:

Implement a smart charging solution in a single organisation (e.g. a municipal building, school, or company) to test technology, regulation and business models in a controlled setting.

Step 2 – Grow regionally:

Expand the solution to multiple organisations and locations, combining charging infrastructure with PV, batteries and coordinated demand. At this stage, local energy communities can emerge, increasing flexibility and resilience.

Step 3 – Integrate strategically:

Embed smart charging as a standard element of regional and national energy and mobility strategies, supported by stable funding programmes, technical guidance and flexibility-market regulation.

Core and complementary measures

The core measure is smart charging with bidirectional capability, which is integrated with PV and battery storage in order to reduce peak loads and increase renewable self-consumption. This is reinforced by additional measures such as demand-side management programmes, smart metering, digital monitoring, energy communities and dynamic pricing models.

Policy recommendations

Key message for policymakers:
The transition will not succeed through isolated pilots or single technologies. A system-based approach backed by coordinated decisions at organisational, national and EU levels is what is needed to link renewable generation, storage, smart charging and flexibility into one coherent policy framework.

Organisation level (municipalities, public bodies, companies)

Organisations play a decisive role in turning flexible concepts into action. In order to reduce peak loads, organisations should move beyond isolated investments and adopt an integrated approach to energy management, including:

- **Introduce flexibility schemes** that prioritise self-consumption of locally produced renewable energy and actively manage peak demand.
- **Allocate annual budgets** for battery storage, smart metering and digital energy management systems, rather than funding single components in isolation.
- **Designate a responsible unit or team** for flexibility and prosumer engagement, ensuring coordination between technical, financial and climate-policy departments.

- **Integrate peak load management into local energy and climate strategies**, mobility plans and public building renovation programmes.

The key lesson is that the highest system value is delivered by <u>modular, closed-loop systems that link PV, battery storage, buildings, charging infrastructure and electric vehicles</u>. In contrast, fragmented solutions quickly lose efficiency and fail to reduce grid stress.

Regional and national level

At higher governance levels, policy frameworks must allow organisations to implement such integrated solutions on a larger scale. Authorities should:

- **Adapt subsidy schemes** to support complete systems (RES + storage + smart charging), rather than single technologies.
- **Provide regulatory clarity** for bidirectional charging, storage use and participation in flexibility markets.
- **Create incentives for aggregators and energy communities**, enabling small-scale flexibility to be pooled and monetised.
- **Offer technical guidance and standardisation**, reducing uncertainty for municipalities and investors.

National funding and regulation should explicitly reward peak reduction and grid relief, not only renewable capacity installation.

EU level

At the EU level, reducing peak loads through integrated flexibility solutions directly supports strategic priorities such as the European Green Deal, RED III and the reform of the electricity market design. EU policies should:

- Ensure **cohesion and recovery funds** support large-scale deployment of storage, smart charging and digital grid solutions.
- Strengthen frameworks for **demand-side flexibility and energy communities** across Member States.
- Promote **interoperability and digitalisation** as core enablers of renewable integration and grid resilience.

Lessons learned

Key message:
Scalable peak-load reduction is not a single technical project, but rather a systemic change. Success depends on realistic planning, early coordination and the flexibility to adapt, lessons that apply across regions and national contexts.

Key challenges – what to be aware of

Implementation showed that technological solutions alone are insufficient. The main challenges were **systemic rather than technical**.:

- **Grid limitations** – low-voltage networks are often not designed for dynamic energy flows or bidirectional charging.
- **Regulatory gaps and uncertainty** – incomplete rules for V2G and flexibility services created delays and conservative decision-making.
- **Interoperability issues** – energy management systems, charging infrastructure and DSO platforms did not always communicate seamlessly.
- **Operational complexity** – maintenance responsibilities and long-term service arrangements were not always clear from the start.

Avoid the following:
- assuming that technical readiness automatically means regulatory or grid readiness
- underestimating coordination needs

What works and what does not

What works well

- Early and continuous cooperation with DSOs, regulators and technology providers
- Choosing open standards and upgrade-ready systems
- Linking charging, storage and PV through a single energy management logic
- Setting clear performance indicators (peak reduction, self-consumption, grid relief)

What does not work

- Late involvement of key actors
- Over-promising bidirectional functionality without confirmed grid capacity
- Treating maintenance and upgrades as a secondary issue
- Fragmented responsibilities inside the organisation

What would be done differently

If the process were repeated, more effort would be invested at the outset in aligning the technical standards and expectations of all parties involved. A more thorough initial assessment of grid conditions would prevent unrealistic assumptions. Engagement with stakeholders, especially regulators, DSOs and flexibility providers, would start earlier. A dedicated contingency budget for software or hardware upgrades would also be secured from the outset.

Practical takeaways for other organisations

For organisations planning similar measures, the following lessons are most useful:

- Start with **grid and regulatory reality**, not technology ambition
- Clarify roles, maintenance and data responsibilities early
- Select systems that can evolve as rules and markets develop
- Measure success clearly and communicate benefits transparently

Key findings and conclusions

Final takeaway:
The solution works, but a policy-enabled system approach is required for scaling up, not a pilot. With regulatory clarity, long-term financing and coordinated action, flexible measures can be quickly adopted and incorporated into regional and national energy strategies.

Three key messages for decision-makers

Firstly, experience confirms that flexible measures, such as smart charging combined with PV integration and storage, are realistic, cost-effective and quick to implement. These measures deliver immediate results in terms of reducing peak loads and improving grid stability, even without major grid reinforcements.

Secondly, early and structured stakeholder involvement is crucial. Projects progress faster and encounter fewer obstacles when distribution system operators (DSOs), regulators, technology providers and users are involved from the outset. Most implementation risks arise not from technology itself, but from delayed coordination and unclear roles.

Thirdly, long-term performance must be secured from the outset. Without clear maintenance responsibilities, stable financing and regulatory certainty, flexibility solutions risk underperforming or ceasing altogether.

Why this approach matters

The solution offers clear advantages that are relevant to public decision-makers:

- **Grid stability:** reduced peak loads and deferred grid investments
- **Renewable integration:** higher self-consumption and less curtailment
- **Economic benefits:** lower energy costs for users and avoided infrastructure costs
- **Social acceptance:** visible local benefits increase trust and willingness to participate
- **Climate impact:** reduced CO_2 emissions and contribution to climate targets

Effectiveness, feasibility and limitations

The findings show that, with proper preparation, smart charging and flexibility solutions are technically feasible for organisations under current conditions. The benefits are tangible in economic, environmental and social terms. However, some limitations remain:

- upfront investment needs
- incomplete regulation, especially for bidirectional charging
- interoperability gaps between systems
- dependence on political and institutional support

These constraints do not prevent replication, but they require **realistic planning and supportive frameworks**.

Suggested follow-up actions

To make sure that things continue to be sustainable in the long term and can be made bigger, the people in charge should make these things their top priorities:

- **Standardisation and digital readiness** (e.g. upgrade paths, interoperable protocols)
- **Investment in smart grids and flexibility-ready infrastructure**
- **Financial incentives for integrated, modular systems** rather than isolated components
- **Continuous monitoring (KPIs)** and gradual expansion to additional sites and users

Visuals and data - from pilot proof to scalable solution

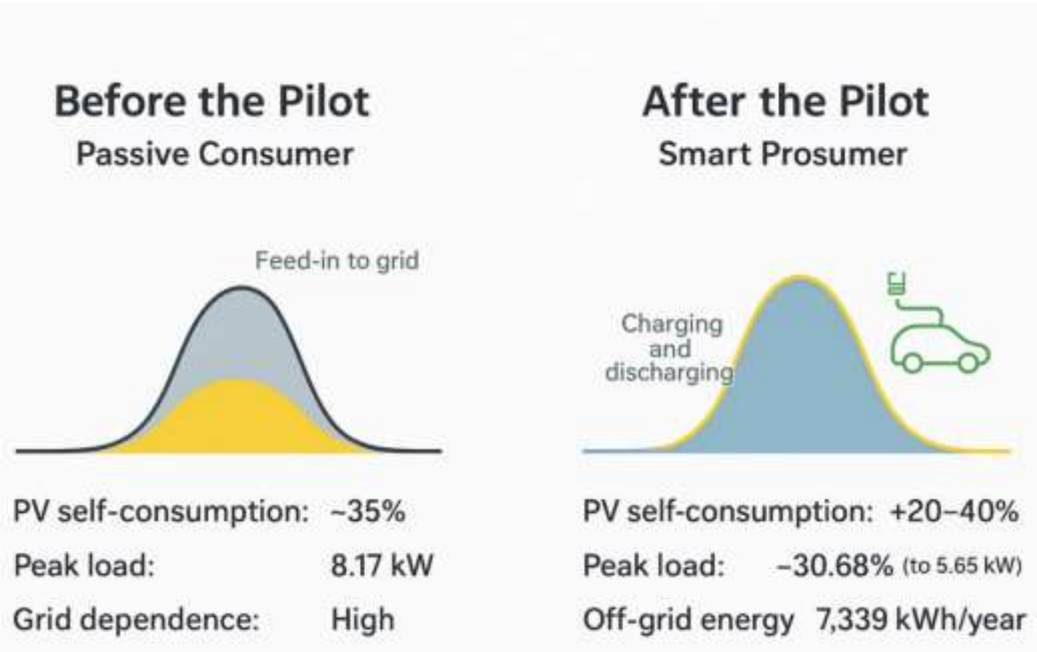
Before the Pilot – Passive Consumer

The original load profile shows a building with high demand in the evenings and low demand at midday. PV production is not aligned with consumption, resulting in uncontrolled feed-in to the grid. As the system lacks flexibility tools, prosumer engagement is minimal and it behaves like a traditional consumer with limited control.

After the Pilot – Smart Prosumer

The smart charging system enables active energy management. PV energy is used more efficiently by charging the electric vehicle during periods of high production, while discharging from the vehicle to the building reduces peak loads. This transforms the building from a passive consumer into an active prosumer, capable of shaping energy flows. Peak shaving, time-shifting of consumption and local balancing significantly increase flexibility.

PICTURE 1: Before and after PILOT



BEFORE:

The curve shape shows a typical building load profile: high consumption in the evening and low during midday. The yellow curve represents PV generation, peaking at noon.

Since consumption is low during peak production hours, surplus energy is fed into the grid without control ("Feed-in to grid").

Key indicators:

- PV self-consumption: approximately 35%
- Peak load: 8.17 kW
- High dependence on the grid and low flexibility

AFTER:

The system integrates a smart charging station, demand-side management and bidirectional energy flow (the EV both charges and discharges energy).

The load curve is smoother – peaks are reduced and production aligns better with consumption.

PV energy is also used for charging the electric vehicle, which can later feed energy back to the building ("charging and discharging").

Key indicators:

- PV self-consumption: increased by 20–40%
- Peak load: reduced by 30.68% (from 8.17 → 5.65 kW)
- Off-grid energy: 7,339 kWh/year

Direct measured results:

- Peak load reduction: –30.68% (from 8.17 kW to 5.65 kW)
- PV self-consumption increase: +20–40%
- Off-grid (self-supplied) energy: 7,339 kWh/year
- Estimated energy cost reduction: 10–25%
- Estimated CO_2 reduction: up to 30%

These KPIs demonstrate that the pilot does not only improve efficiency but also adds resilience and autonomy on the local level.

Why these KPIs matter:

KPIs show the leap from demonstration to scalable solution. They quantify:

- how much flexibility can be achieved,
- how much grid stress is reduced,
- how much local renewable energy can be absorbed,

- how much municipalities can save.

They turn a "nice experiment" into a credible, replicable model for the region.

Key impacts of the pilot demonstration:

Impact Area	Measured Result	Concrete Benefit
Peak load reduction	30.68% (8.17 → 5.65 kW)	Lower grid stress and costs
Off-grid operation	7,339 kWh/year	Increased resilience and autonomy
Renewable energy use	+20–40% PV self-consumption	Higher efficiency, lower imports
Energy costs	10–25% reduction (estimated)	Improved economic performance
CO_2 reduction	Up to 30% (estimated)	Lower environmental footprint
Replicability	Validated technical and control framework	Scalable solution for municipalities

This project facilitates a comprehensive transition from traditional, passive energy management to an advanced, data-driven, interconnected energy infrastructure. Technologically, it integrates electric vehicles, photovoltaic systems and battery storage into a unified, intelligent system with bidirectional charging. This enables the optimal use of locally generated renewable energy. From an economic perspective, it creates opportunities for cost savings and new business models, such as energy sharing and local flexibility management. From an environmental perspective, it increases the proportion of renewable energy consumed, reduces losses and contributes to lower CO_2 emissions. For the electricity grid, the project is an important step towards local balancing and peak reduction, alleviating grid stress and reducing the need for costly upgrades.

This system brings about a structural transformation: buildings evolve from passive energy consumers into smart, dynamic energy hubs that actively monitor and manage their energy flows. Users shift from being passive consumers to becoming active participants in the energy market (known as 'prosumers'), thereby strengthening the connection between the mobility and renewable energy sectors. The result is decentralised flexibility, greater community resilience and a more sustainable and stable energy ecosystem, demonstrating that smart, pilot-level solutions can become regional or national standards.

Potential impact of the V2B and V2G systems

If 10% of solar power plant owners in Slovenia adopted the V2B system, it could reduce the electricity grid load by more than 50 MW during peak demand periods thanks to the flexibility of solar energy systems.

If these owners transitioned to a V2G system, they could provide the electricity grid with support of up to 4.2 MW during peak demand periods.

It is important to consider in both projections that the number of electric vehicle users is continuously increasing and that implementation of the V2G system requires adoption of the OCPP 2.0 standard.