

Infographics for the target groups

D4.3

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Deliverable

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D4.3. Infographics for the target groups to showcase the economic benefits of V2G, using different scenarios and financial schemes, including servitisation

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Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.



Executive Summary

This document is Deliverable 4.3 Infographics for the target groups to showcase the economic benefits of V2G, using different scenarios and financial schemes with an emphasis on servitisation. The main objective of this deliverable is to showcase and provide a visual representation of the servitisation scheme applied to the different target groups, including the main advantages of this financial scheme, whilst at the same time to raise awareness and use the material created throughout the project lifetime in the dissemination and communication activities of the V2M H2020 project.

The document outlines the key messages to communicate to the target groups via the infographics created to illustrate visually the findings under *T4.2 Design of the Servitisation scheme and T4.4. Modelling the economic viability and financial schemes to the target groups.*

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Table of Acronyms

<i>Acronym</i>	Description
<i>AaS</i>	As-a-Service
<i>BaaS</i>	Battery-as-a-Service
<i>B2B</i>	Business to business
<i>B2C</i>	Business to Customer
<i>DD</i>	Due Diligence
<i>DSO</i>	Distribution system operators
<i>EE</i>	Energy Efficiency
<i>ESCo</i>	Energy Service Company
<i>ESG</i>	Environmental, Social and Governance
<i>ESS</i>	Energy Storage Systems
<i>EV</i>	Electric vehicle
<i>GAAP</i>	Generally Accepted Accounting Principles
<i>ICEV</i>	Internal combustion engine vehicle
<i>IFRS</i>	International Financial Reporting Standards
<i>RES</i>	Renewable Energy Sources
<i>SPV</i>	Special purpose vehicle
<i>TCO</i>	Total Cost of Ownership
<i>V2G</i>	Vehicle to Grid

1/ Introduction

1.1 Deliverable Structure

The deliverable is structured as follows:

- Chapter 1 is an introduction to the main objectives and the scope of the deliverable.
- Chapter 2 Infographics- description of the approach taken in choosing the key messages and integrating the findings whilst communicating the key messages to the targeted audiences.
- Chapter 3 Conclusions

1.2 Economic viability and financial schemes

The V2Market project aims to explore different business models in order to incorporate electric vehicles' (EVs) batteries in the electricity market through vehicle-to-grid (V2G) technologies.

This deliverable is part of WP4-Economic viability and financial schemes. Within this WP, the financial schemes to alleviate the upfront investment costs for the V2G infrastructure and EV's were explored and adapted to the V2G business case. The H2020 LAUNCH hybrid (EPC/servitisation) contract was translated and transposed to the Spanish legal system and adapted to reflect the V2G business model. This includes the different financial schemes considered, several economic scenarios, and their viability.

Based on the expertise that EnerSave holds regarding deployment of energy efficiency measures and extrapolating on that the market study findings, it is clear that upfront costs of the underlying EV asset is a major barrier in the large-scale adoption of various market segments.

The upfront investment costs are a major hinderance in the decision to buy an EV as 63% of consumers believe that EV's are beyond their budget¹. Considering that the EV's battery alone accounts for around Euro 10,000 which in turn represents 25 to 30% of the purchase costs, led to an in-depth analysis of the servitisation scheme. At the same time based on the findings of WP2 regarding the fears of the battery usage in a V2G scenario the servitisation model explored, assessed and modeled by EnerSave Capital included an exchange of the battery in the package offered at no extra cost (throughout the contractual period). In WP4, M&V protocols were explored and adapted to the V2G business case and the 'off-balance' sheet aspect was further assessed from a Eurostat standpoint.

¹ World Economic Forum website, <https://www.weforum.org/agenda/2020/11/what-is-servitisation-and-how-can-it-help-save-the-planet/>

1.3 Deliverable Scope

Deliverable 4.3 Infographics for the target groups to showcase the economic benefits of V2G, using different scenarios and financial schemes with an emphasis on servitisation is part of WP4 Economic viability and financial schemes for V2G.

The main objective of this deliverable is to provide a visual representation of the servitisation scheme applied to the different target groups: individuals, private and public entities. The infographics showcase the main advantages of this financial scheme, whilst at the same time raise awareness on V2G and the advantages of this technology. The newly created material shall be used throughout the remaining project lifetime in the dissemination and communication activities of the V2M H2020 project.

2/ Infographics

2.1 Modelling the economic viability and financial schemes to the target groups

The modelling of the economic viability of the servitisation scheme was done by targeting the customer typologies identified in D.2.1 Design thinking structure and materials rationale delivered in WP2 of the V2M project.

The following target groups have been identified as the most suitable candidates for a servitisation scheme whilst modeling the economic viability:

- Users of V2G technology
 - EV owners –families or individuals.
 - Private car fleet operators: such as large or heavy-duty fleets, companies that are providing cars as part of their benefit package, that are providing company cars for their employees, rental car operator, last mile delivery companies.
 - Public fleet operators: busses and vehicles belonging to the municipalities
- Service provider:
 - Aggregators: ESCo's (engaging in either or both energy service offers or EV aggregation), energy communities to the extent allowed by the legal framework, energy providers, V2G technology/software providers.

In D2.3 Value Proposition Canvas more details can be found of the proposition offered for each profile.

The servitisation of products is redefining ownership. It describes the process of creating value by adding services to the product of a given technology provider. At the same time, it is way of funding the asset in question in an innovative manner without stretching the clients balance sheet. The customer pays a fixed amount per unit of output consumed, whilst ownership of the product remains with the technology provider.

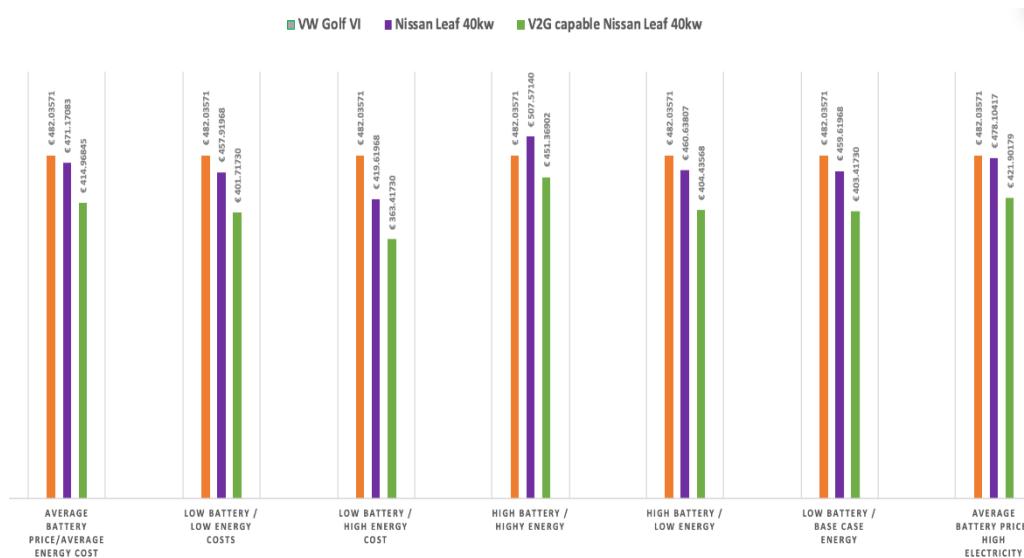
As mentioned in the Introduction section in general the upfront investment is a major stumbling block in the decision to buy an EV². If on top of the EV itself, the end client (any of the mentioned targeted group) would also need to invest in a bidirectional charging infrastructure that depending on type and brand can cost anywhere between 2500 to 4500 euro, then the total proposition becomes an expensive one.

The business proposition modeled contained a servitisation package that consisted of:

- A bidirectional charger (V2G capable), the car battery, installation, maintenance and insurance. Although the electricity is not part of the servitisation business proposition, it was a cost that was included in the calculation of the TCO (to be able to accurately assess the TCO compared to an ICEV).

Under a servitisation scheme based on a monthly payment for battery and charging infrastructure the TCO of an EV is lowered by approximately 14% to 25% versus an internal combustion engine vehicle or ICEV (depending on the scenario analyzed). Under a servitisation scheme this would be possible in case the subsidies for EVs in Spain is considered. Please see Figure 1, where the calculation for the economic viability of the servitisation scheme is presented. This was a result of Task 4.1 Economic study of different electricity and battery price scenarios and Task 4.2 Design of the servitisation scheme.

Figure 1 Monthly Total Cost of Ownership based on 6 scenarios



In Figure 1 the economic viability was assessed in 6 different scenarios including the Subsidies for EVs in Spain (including subsidies related to charging infrastructure for more details please see D 4.1):

- electricity price stability with stability of EV battery prices (1), and with decrease of battery price (2)

² World Economic Forum, <https://www.weforum.org/agenda/2020/11/what-is-servitisation-and-how-can-it-help-save-the-planet/>

- electricity price increase with stability of EV battery prices (3), and with decrease of battery price (4),
- a decrease of electricity prices, with stability of EV battery prices (5), and with decrease of battery price (6)

The structure and what precisely a servitisation package can contain is a commercial decision that the different providers will need to take based on their capacity, targets and business model.

Based on the fact that EV with V2G capabilities has a TCO that is lower compared to an ICEV under a servitisation scheme, V2G technology is enabling the EVs deployment which makes an attractive proposition especially considering that the risk for the end client is lowered due to this one-stop-shop approach. The servitisation scheme in this case proposes a one-stop-shop as it is offering an ‘all inclusive’ solution with multiple services and /or products to its end clients.

An interesting factor of the proposition modeled is, that the batteries can be replaced after 7 years (this was the time period used in the financial modelling) as such the client can have a state-of-the-art battery if he prolongs the contract with the aggregator. On the other hand, when the batteries are swapped after extensive usage, the removed batteries can be re-used for different applications as energy storage systems (ESS). Applications such as EV fast-charging, generators in schools, hospitals or similar buildings or applications. This EES adds a new streamline of cashflow for the aggregator that can charge the EES in low electricity price moments and discharges the EES during moments with a higher electricity price such as peak consumption hours³. This second life of the battery is ‘doubling the fleet’ of the aggregator and it increases its revenues, and supports the funding needs of the aggregator who can expand its services and participate to the electricity market with a larger ‘battery pool’.

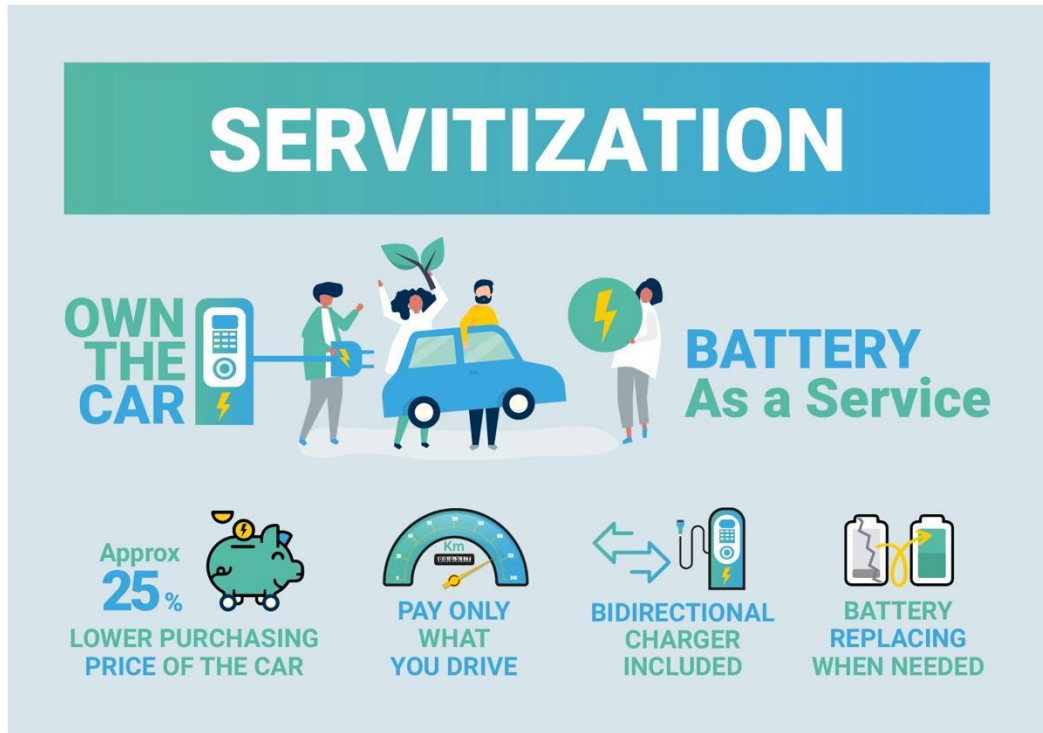
2.2 Key messages and Infographics

The first step in designing the infographics was to ensure that the terminology is being explained via a clear communication message ensuring that the other key results can be communicated accurately to the target groups.

To make sure that the correct messaging will be communicated the first infographic which was created was the one explaining what servitisation is in the context of V2G, whilst at the same time underlining the advantages of such a scheme for all the possible users. Please see Figure 2 for more details.

³ Omie, <https://www.omie.es/es/market-results/daily/daily-market/daily-hourly-price?scope=daily&date=2022-11-13>

Figure 2 Servitisation Infographic



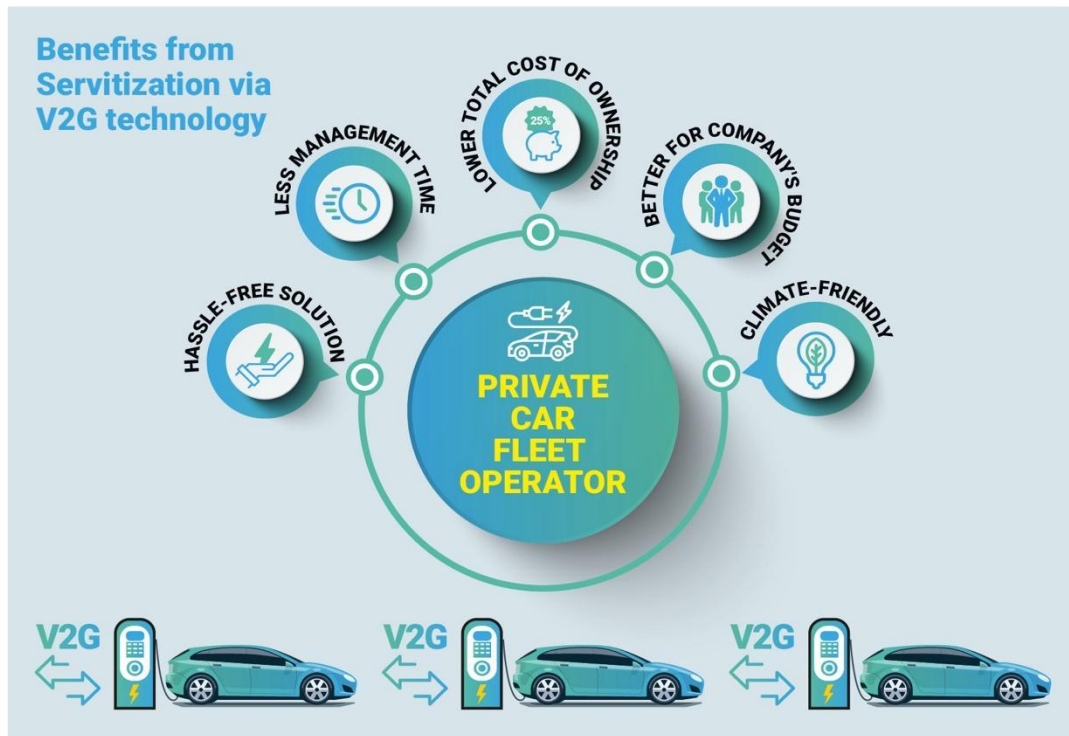
As illustrated in Figure 2 the main elements of the servitisation scheme that were included as key messages to the targeted audience are:

- the end client will own the car
- the battery is provided on as a service basis, reducing the upfront cost of the car and it is owned by the aggregator (which can be an energy company, software provider, and ESCo or any other type of structure) or the financier
- the advantages of the ‘all inclusive’ package modelled by EnerSave Capital are:
 - the lower purchasing price of an EV,
 - the payments based on a subscription basis which provides predictability,
 - the bidirectional charger included and
 - battery replacement if and when needed at the aggregator’s discretion.
- Thus, V2G becomes the affordability driver for EVs under a servitisation scheme.

As mentioned at the beginning of this report the content and structure of a servitisation package is a commercial decision that the different aggregators/ service providers will need to take based on their cost/benefit analysis, technical and financial capacity, target groups and business model.

Figure 3 is illustrating the advantages for a private car fleet operator under a servitisation scheme.

Figure 3 Private car fleet operator Infographic



The elements that were chosen to be illustrated in this infographic are the:

- **Hassle free solution:** meaning that under a servitisation scheme the installation, design and maintenance would be included and would be provided in a one-stop-shop approach
- **Less management time:** is an element that is important as the end client does not need to have any technical knowledge or skills, the user just needs to ensure that the car is being plugged in at both ends of the trip and the rest will be taken care by the aggregator/service provider.
- **Lower Total cost of Ownership:** for a private fleet operator the total cost of ownership is a crucial element because they may lack the extra funding needed to electrify their fleet or such an investment can strain their balance sheet. Under a servitisation scheme there is no upfront cost incurred for example the cost of acquiring bidirectional chargers or the fact that the cost of operating an EV fleet is cheaper than the cost of operating a fossil fuel-based fleet. All the above are enablers for converting a fossil fuel-based fleet into an EV one.
- **Better for company's budget:** as the fleet operator can provide the aggregator/service provider with a higher volume of batteries to be aggregated he can negotiate better terms and condition i.e. more money derived from the grid balancing activity
- **Climate-friendly:** in a world where climate change and energy transitions are on everyone's agenda from national Governments to the EU Commission, to be aligned with such an initiative and also to be perceived by the wide public as a green company

can create a big advantage. Furthermore, when it comes to accessing finance due to Article 8 and 9 of the Sustainable Finance Disclosure Regulation, many asset managers who will be implement the regulatory technical standards that will be effective in early 2023⁴, will prefer investing in companies aligned with these standards. The above standards are related to sustainability and ESG requirements, which is turn means that the portfolio of companies in which they will invest will need to be sustainable oriented: a green fleet is a sustainable measure. The same is also valid for the banking sector where the European Banking Authority published in early 2022 a “final draft implementing technical standards (ITS) on Pillar 3 disclosures on Environmental, Social and Governance (ESG) risks. The final draft ITS put forward comparable disclosures to show how climate change may exacerbate other risks within institutions’ balance sheets, how institutions are mitigating those risks, and their ratios, including the GAR, on exposures financing taxonomy-aligned activities, such as those consistent with the Paris agreement goals.”⁵ Meaning that the banks investment criteria and portfolio will be aligned with sustainable goals and the Environmental, Social and Governance (ESG) criteria.

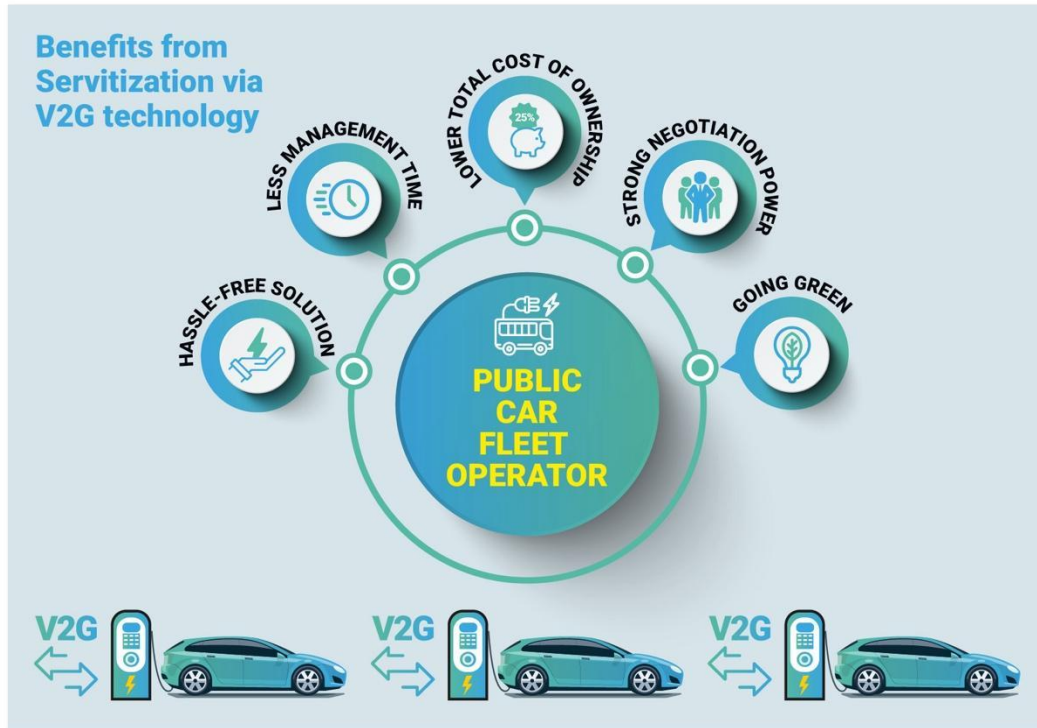
- Another important benefit of the servitisation scheme is the possible the off-balance sheet accounting treatment IFRS16 wise or under local GAAP for companies. However due to the technical nature of this information and the nature of the accounting treatment this particular information was not included in the infographic. It was considered that it would have needed extra information or definitions and the purpose of the infographic was to raise awareness and familiarize the target group with the concept of servitisation via V2G technology.

Regarding the next target group for which the servitisation model was simulated, namely the public car fleet operator. The infographic is being illustrated in Figure 4.

⁴ Morning star website, https://www.morningstar.com/en-uk/lp/sfdr-article8-article9?utm_source=google&utm_medium=cpc&utm_campaign=eu_action_plan_benelux&utm_term=sfdr_articles_8_and_9&utm_content=eu_action_plan_sitelink&gclid=Cj0KCQiAnNacBhDvARIsABnDa6_fREXT5-p-OkrGIyjYX1gZC07jPX7tXOW512IxoAfsPyPN8_dklGwaAjRKEALw_wcB

⁵ EBA official website, <https://www.eba.europa.eu/eba-publishes-binding-standards-pillar-3-disclosures-esg-risks>

Figure 4 Public car fleet operator Infographic



The elements that were chosen to be illustrated in this infographic are the:

- Hassle free solution: the same rationale is applied just like in case of the private fleet operator with the observation that this one-stop-shop approach is even more important for the public sector where public funds and financial resources might be even more strained than in the case of the private market players and solutions that are funded by 3rd parties (aggregators, financiers, ESCos, energy companies or other similar structures) will lower the pressure on the public funds.
- Less management time: Similarly, to the private fleet operator this benefit it is an important factor for the public sector as it provides a solution for the lack of human resources that is so often encountered in the public sphere and it also filling in the technical knowledge gap by reducing the needs for specialized human resources as the management is being handled by the aggregator/service provider.
- Lower total cost of ownership: Due to the pressures of the Clean Vehicle Directive from an EU level to ensure the electrification of public fleet⁶ and based on EnerSave Capital experience regarding the struggles in the adoption of EV fleet at a public level due to the lack of practical know how at the fleet operator level having been brought up in a fossil fuel powered world, the lack of funds and a lack of charging infrastructure makes the total cost of ownership a crucial element for the public car fleet operator. The fact that the total cost of ownership is lower, and the payment is on a subscription basis with no upfront cost under a servitisation scheme is a game changer for the electrification of the public fleets.

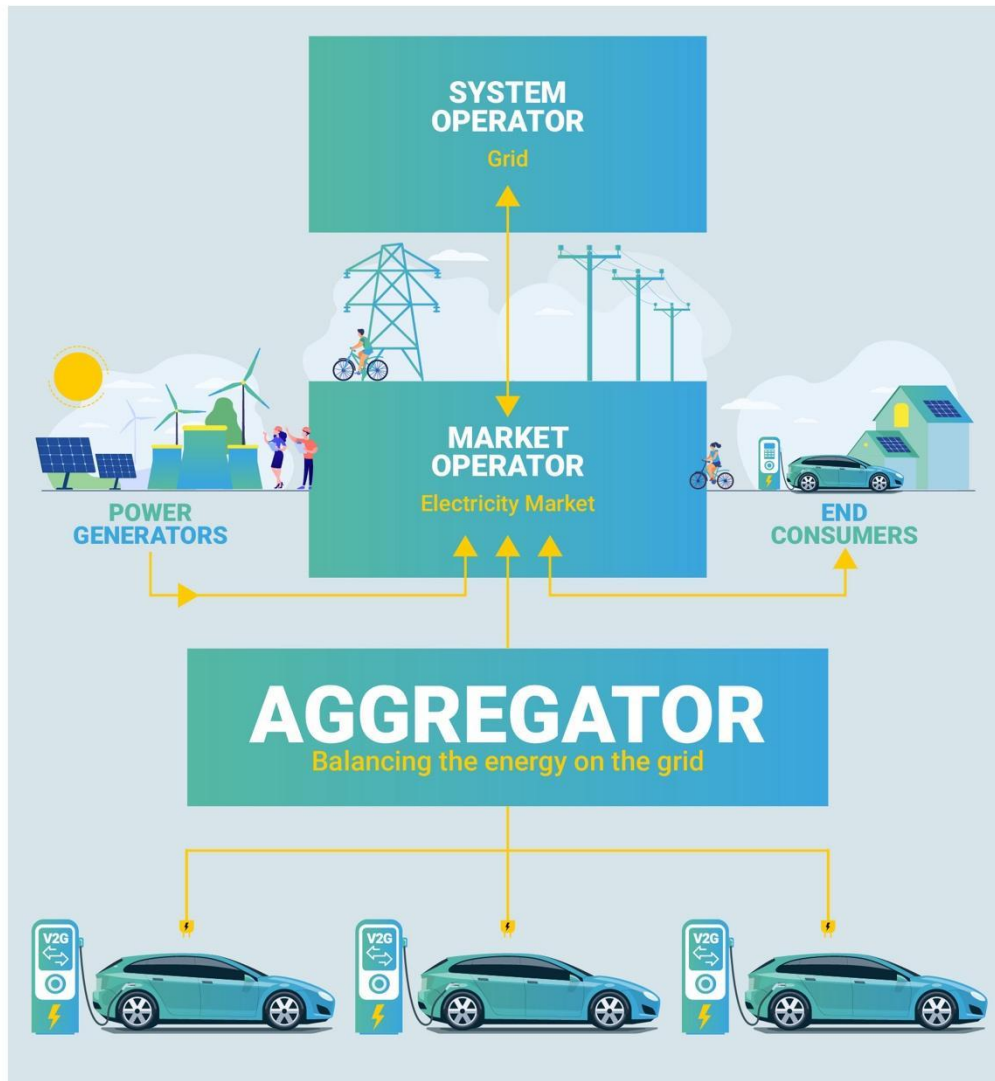
⁶ EC official website, https://transport.ec.europa.eu/transport-themes/clean-transport-urban-transport/clean-and-energy-efficient-vehicles/clean-vehicles-directive_en

- Strong negotiation power: this benefit is identical with the one described in the private fleet operator.
- Going green: the pressure of the Paris Agreement 2050 targets, the national Governments, the EU Commission with directives such as the EU Clean Vehicle Directive and local pressure to fight climate change makes the ‘going green’ element of the servitisation scheme a very important one in reaching national, regional and local climate targets by 2050. Furthermore, from a Member State standpoint the EU "Parliament and Council agreed on stricter regulation of greenhouse gas emissions in member states including less flexibility and more transparency and the allocation of GHG emissions. At an EU level the targets in percentage in terms of reduction for 2030 are ranging between 10-50%. The targets for each EU member state are based on GDP per capita and cost-effectiveness ".⁷ Each public car fleet that is electrified has a positive contribution on the emission level. However, these targets cannot be reached without investments. This is why just as in the case of the private fleet car operator when it comes to accessing finance equity or debt the standards related to sustainability and ESG requirements are essential.
- Just as in the case of companies, the off-balance sheet accounting treatment is of importance. Unlike in the case of companies which are subject to IFRS or local GAAP, for public entities the proposed scheme can be deemed as off-balance sheet subject to an alignment to the EUROSTAT guidelines (for an EPC with a servitisation scheme included). For the same rational as in the case of the private fleet operators, the possible off-balance sheet treatment subject to EUROSTAT alignment was not mentioned as it is extremely difficult subject to explain it in an image due to the fact that the topic is very technical. If not explained properly it can create more confusion. The recommendation of EnerSave in this concern is to organize a dedicated in-depth education workshop with public stakeholders to make sure that the concept is grasped, that the stakeholders can operate and use it easily.

⁷ Fit for 55: Deal on stricter rules for member states’ greenhouse gas emissions, <https://www.europarl.europa.eu/news/en/press-room/20221107IPR49205/fit-for-55-deal-on-stricter-rules-for-member-states-greenhouse-gas-emissions>

The next infographic that was designed within this deliverable was the one on the Aggregator. Figure 5 is showcasing the infographic.

Figure 5 Aggregator Infographic



In the V2G solution the aggregator is a crucial player, as without the aggregator the V2G deployment due to regulation, technical barriers, financial barriers and lack of infrastructure and know-how will be either very low or will not happen at all.

The aggregator providing a servitisation structure creates a riskless environment for individuals but this is also valid for both companies and public entities as it takes the technical burden from their shoulders and it provides them with a hassle-free one stop shop solution.

In order to enable the participation to the energy market and to provide different services such as grid balancing legal provisions and barriers need to be removed which is a very difficult task considering the EU has 27 different legal systems, which makes the EU market very fragmented one from this point of view.

In countries such as Spain individuals cannot enter into the energy market bidding exercise with the DSO due to the main following reasons: a " minimum bidding of 0,1 MWh enables the

participation of aggregated resources"⁸to the electricity market and also the financial guarantee that needs to be provided in order to participate to the electricity market trading. The above are also valid for energy communities. As stated in the EEA ‘Microgrid operators also face high regulatory complexity with respect to their responsibilities in grid management and the interaction with the local DSO.’ (EEA⁹) This is why entities such as aggregators that can propose a servitisation model are the solution that has the potential to enable the growth and the deployment of EVs with V2G capabilities on the market.

Currently, aggregators are mostly “acting for industrial and commercial consumers. Domestic consumers, and prosumers, do not have means to trade directly in the energy markets and require the services of an aggregator. Aggregators are the enablers for an active participation of prosumers and consumers in the energy markets. “¹⁰

This is why this infographic is important as it creates a visual image of what an aggregator is and where it is placed in the market.

All the infographics presented in this report can be found in Annex I in a PDF and JPG format. These will be used for dissemination purposes along the project.

2.5 Visual Identity

To ensure the consistency and identity of the material disseminated in the V2Market the same colors that were used in all the dissemination material have also been used in the illustration of the infographics.

⁸ D3.1 -Analysis of the electricity markets and its potential for integrating V2G, OMIE, pg 88

⁹ Ibidem

¹⁰ EC, <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/17066;keyword=bestres;isExactMatch=false>

3/ Conclusions

The approach taken in the design of the infographics and the messaging chosen was aligned with the key messages that the project identified in the strategy proposed in D9.1 Communication and Dissemination Plan which was to communicate to the end consumer that:

- "V2Market services will allow electricity consumers to benefit from financial savings and make it easier to acquire an EV."¹¹

This message was captured in the Servitisation infographic where the benefits of the V2G under a servitisation model and the financial benefits have been underlined. Whilst also underlining that V2G can be a driver for the EV deployment.

- "V2Market will increase clean transportation, facilitate the energy transition and give to consumers the possibility to achieve CO2 savings."¹²

This message was captured and illustrated in the Private and Public fleet operators where energy transition, CO2 savings, and clean transport is high on the agenda of both private and public entities.

- "V2Market will allow consumers, through aggregators, to play an active role in the energy market."¹³

This message was captured in the Aggregator infographic where the role of the aggregator is illustrated.

One of the key elements in the energy transition due to factors such as the mismatch between RES production and consumption sits in the scaling of V2G enabled EV's. The upscale can be achieved partly through the education of the public at large on engaging in V2G services, whilst at the same time underlying the fact that V2G participation reduces the capital outlays in the acquisition of EV's thus reducing the affordability threshold.

The uptake of V2G solutions has the ability to make consumers a part of the solution and not part of the problem.

¹¹ D.9.1 Communication and Dissemination Plan, page 7

¹² Ibidem

¹³ Ibidem

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Annex I

