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GreenCharge Project Deliverable: D8.3

Dissemination and Exploitation Plan (V2)

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About GreenCharge

GreenCharge takes us a few important steps closer to achieving one of the dreams of modern cities: a zero-emission transport system based on electric vehicles running on green energy, with traffic jams and parking problems becoming things of the past. The project promotes:

<i>Power to the people!</i>	The GreenCharge dream can only be achieved if people feel confident that they can access charging infrastructure as and when they need it. So GreenCharge is developing a smart charging system that lets people book charging in advance, so that they can easily access the power they need.
<i>The delicate balance of power</i>	If lots of people try to charge their vehicles around the same time (e.g. on returning home from work), public electricity suppliers may struggle to cope with the peaks in demand. So we are developing software for automatic energy management in local areas to balance demand with available supplies. This balancing act combines public supplies and locally produced reusable energy, using local storage as a buffer and staggering the times at which vehicles get charged.
<i>Getting the financial incentives right</i>	Electric motors may make the wheels go round, but money makes the world go round. So we are devising and testing business models that encourage use of electric vehicles and sharing of energy resources, allowing all those involved to cooperate in an economically viable way.
<i>Showing how it works in practice</i>	GreenCharge is testing all of these innovations in practical trials in Barcelona, Bremen and Oslo. Together, these trials cover a wide variety of factors: <i>vehicle type</i> (scooters, cars, buses), <i>ownership model</i> (private, shared individual use, public transport), <i>charging locations</i> (private residences, workplaces, public spaces, transport hubs), <i>energy management</i> (using solar power, load balancing at one charging station or within a neighbourhood, battery swapping), and <i>charging support</i> (booking, priority charging).

To help cities and municipalities make the transition to zero emission/sustainable mobility, the project is producing three main sets of results: (1) *innovative business models*; (2) *technological support*; and (3) *guidelines* for cost efficient and successful deployment and operation of charging infrastructure for Electric Vehicles (EVs).

The *innovative business models* are inspired by ideas from the sharing economy, meaning they will show how to use and share the excess capacity of private renewable energy sources (RES), private charging facilities and the batteries of parked EVs in ways that benefit all involved, financially and otherwise.

The *technological support* will coordinate the power demand of charging with other local demand and local RES, leveraging load flexibility and storage capacity of local stationary batteries and parked EVs. It will also provide user friendly charge planning, booking and billing services for EV users. This will reduce the need for grid investments, address range/charge anxiety and enable sharing of already existing charging facilities for EV fleets.

The *guidelines* will integrate the experience from the trials and simulations and provide advice on localisation of charging points, grid investment reductions, and policy and public communication measures for accelerating uptake of electromobility.

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Executive Summary

This deliverable (D8.3 Dissemination and Exploitation Plan (V2)) is the successor of D8.2 (Dissemination and Exploitation Plan) and outlines GreenCharge's dissemination and exploitation activities and strategy. It contains both the activities that were already carried out during the project as well as the activities that are planned after project completion.

The exploitation process of GreenCharge can be divided into six steps (some of these steps are not applicable to all of the results):

1. 1st draft of key exploitable results, intellectual property rights and exploitation plan: at the start of the project, a wide range of initial key exploitable results were identified. Initial exploitation strategies were developed and agreements on intellectual property rights have been made.
2. Development of exploitation framework: GreenCharge's exploitation activities are grounded on its exploitation framework: a framework that has been developed in order to establish a common understanding of concepts related to innovation, exploitation, dissemination and communication, and to support the planning and implementation of exploitation activities within GreenCharge.
3. Development of light business plans: in order to define the exploitation potential of GreenCharge's results, the project partners have developed a light business plan (LBP) for their results.
4. Participation in Horizon Results Booster Service – Exploitation planning: the aim of this service was to strengthen the capacity of the project (partners) in using the research results and improve the exploitation strategy.
5. Participation in Horizon Results Booster Service – Business Plan Development: the aim of this service was to assist GreenCharge's partners to bring their results closer to the market by developing an effective business plan, and by preparing to secure appropriate funding for the implementation of their project results.
6. Revision of KERs + IPR + EP document: the confidential document which covers the description of the results, the exploitation plans and intellectual property rights was revised at the end of the project. A prioritisation has been made to distinguish between *Key Exploitable Results* and *Main Results*.

As described in the 6th step of the exploitation process, GreenCharge's results have been prioritised in order to be able to make more concrete exploitation plans. This is done based on five aspects: climate for change/competitors, potential impact, willingness to exploit, partner's ranking and evaluation results. The results that were identified as *Key Exploitable Results* (and are planning to exploit their result commercially) have developed light business plans. The following results were selected as key exploitable results:

- EV Fleet and Charge Management Prototype
- Smart Energy Management Module
- KPI Calculator and Visualiser
- Simulator Tool
- Reference Architecture
- Evaluation Framework

The exploitation plans for both the key exploitable results as well as the main results are bundled in a confidential exploitation document. This document covers the following exploitation and dissemination aspects:

- Description of the result (including potential users, value proposition, competitors, etc.)
- IPR registry information (including information on ownership, access rights, use restrictions, etc.)
- Exploitation planning (including type of exploitation, exploitation strategy, dissemination means, etc.)

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List of Abbreviations

Table 0-1: List of abbreviations

Abbreviation	Explanation
API	Application Programming Interfaces
CA	Consortium Agreement
DoA	Description of Action (i.e. the formal project plan, as defined in the GA)
EP	Exploitation Plan
ESN	Energy Smart Neighbourhood
EV	Electric Vehicle
GA	Grant Agreement (i.e. the contract defining the work to be done)
HW	Hardware
IPR	Intellectual Property Rights
KER	Key Exploitable Result
LBP	Light Business Plan
SUMP	Sustainable Urban Mobility Plan
SoTA	State of the art
SW	Software
TRL	Technology Readiness Level
V2G	Vehicle-to-Grid

1 About this Deliverable

1.1 Why would I want to read this deliverable?

This deliverable provides a status report on exploitation activities and dissemination materials produced during the project and planned for the period after the end of the project. This information can be used to gain insights into what has been achieved in the project, and what can be expected after the end of the project.

The role of the deliverable depends on the audience:

1. *GreenCharge Consortium members*

- Provide an outline of the overall dissemination & exploitation strategy including relevant mechanisms and strategies for dissemination and exploitation identified. This will include after project actions and acts as a reference point for consortium members upon completion of the project.

2. *Commission services and independent reviewers of the project*

- Provide formal reporting on status of dissemination, exploitation and communications activities in the project, and;
- Provide evidence of concrete and realistic plans for long-term exploitation of results.

3. *Other external organisations and project*

- To help identify whether there is potential for cooperation with GreenCharge partners after the project. This could be of interest to external organisations and projects with an interest in EV charging, renewable energy, smart grids, smart neighbourhoods, smart mobility, smart cities or shared vehicles.

1.2 Intended readership/users

This deliverable is aimed at three main audiences:

1. Consortium members.
2. Commission services and independent reviewers of the project.
3. Other external organisations and projects, especially those with an interest in EV charging, renewable energy, smart grids, smart neighbourhoods, smart mobility, smart cities or car-sharing.

The primary audience is (1) and (2), but as a public deliverable its contents can also be made available to others.

1.3 Relationship to other documents

1.3.1 Project deliverables

This deliverable is based on inputs from the follow deliverables:

- *D1.1 Data management plan*: this deliverable describes the internal procedures for dealing with the collection and handling of data from the pilots in order to make them as open research data, including the necessary permissions for handling private data, and the necessary forms of informed consent and documentation of technical solutions for secure data storage. This data has been used as input for the confidential deliverable only (D8.3 CON).
- *D3.1 Stakeholder Analysis*: this document presents the results of the stakeholder analysis, identifying the concerns and needs from all stakeholders relevant for GreenCharge. Based on the outcomes of the Stakeholder Analysis, targeted dissemination and exploitation strategies and plans have been developed and implemented.
- *D4.2 Final Architecture Design and Interoperability Specification*: this deliverable describes the final version of the GreenCharge architecture and the specification of interfaces and protocols for interoperability.
- *D5.5-D6.4 Merged Final Evaluation Results*: this deliverable describes the final evaluation results and lessons learned from evaluation of integrated technical solutions and business model effects, both from field trials on the three pilots and from simulations.

- *D8.1 Communication Strategy and Plan*: defines target audiences and the key messages for/type of engagement needed with each group. It defines different channels and mechanisms to be used for communication and has been continuously refined during the project. Several communication channels and mechanisms identified in the Communication Strategy and Plan have also been used for dissemination purposes. D8.3 provides an overview of the communication activities carried out during the project period.

1.3.2 Confidential documentation on KERs (Key Exploitable Results)

By its nature, for commercially exploitable results at least, information about exploitation can in some cases contain information that partners wish to keep confidential for competitive or other reasons. Thus, separate, confidential documentation has been produced. Its purpose is to gather all exploitation-related information for each KER, consisting of:

1. A description of each KER – explaining what it consists of, potential users/market, what benefits it offers and which project deliverable(s) make up the result.
2. The IPR Registry data for the KER. The IPR Registry lists the owners of the KER, any limitations that may apply on project results (or background needed) for exploitation of the KER, and information of what (if any) IPR protection mechanisms are needed.
3. Exploitation Planning for the IPR, describing what type of exploitation is planned, the overall strategy, the means to be used to disseminate the results, goals and steps needed to bring about exploitation and an approximate schedule for achieving the goals. For technical results where there is a potential for commercial exploitation, “goals” will include target TRLs (Technology Readiness Levels).

While this separate documentation may include some confidential information, major parts of it will not be confidential. We nevertheless choose to class all of the documentation as “Confidential” because we consider it a major advantage to gather all information in one place and want partners to be able to free that they can include any kind of information without fear that its publication might be disadvantageous. This documentation has been continuously updated and refined as exploitation planning proceeds, so that it will always provide the latest plans for all KERs. It therefore complements both formal deliverables on exploitation planning (D8.2 and D8.3).

The separate documentation can be made available to people or organisations who have a legitimate reason to see it. The template used to collect this (confidential) information about GreenCharge’s KERs is attached as Appendix A.

1.4 Structure of the document

This deliverable contains 7 chapters and starts with an introduction to this deliverable (Chapter 1). In the 2nd chapter, GreenCharge’s overall exploitation process is briefly described. This chapter covers all the exploitation steps that will be described in further detail in another section (5.1). The 3rd chapter describes the exploitation framework that has been used for GreenCharge and forms an overview of all activities related to dissemination and exploitation, and the links between these activities. The 4th chapter gives a brief overview of GreenCharge’s IPR management and how the information on IPR has been collected and stored. Chapter 5 describes the project’s overall exploitation (section 5.1) and dissemination plan (section 5.2), including an overview of the project results. Besides the plan and activities performed during the project, this chapter also covers a brief overview of the activities planned after the project. The 6th chapter provides a summary of GreenCharge’s communication targets and whether they were achieved. The final chapter (Chapter 7) describes the conclusions of the deliverable and further work to be performed after project completion in order to achieve maximum impact.

2 Exploitation process

GreenCharge's initial exploitation strategy and process was defined in Deliverable 8.2. However, during the project this process has been adjusted in a continuous way. This chapter gives an overview of the steps defined in GreenCharge's exploitation process. The following steps have been taken to produce the exploitation plans:

1. Define the initial key exploitable results
2. Develop the exploitation framework
3. Develop light business plans
4. Participate in Horizon Results Booster Service – Portfolio Dissemination and Exploitation Strategy
5. Participate in Horizon Results Booster Service – Business Plan Development
6. Revise KER + IPR + EP document

2.1 1st draft of key exploitable results, intellectual property rights and exploitation plan

The first step in GreenCharge's exploitation process was defining the project's key exploitable results. In the project proposal, several key exploitable results (KERs) were already identified prior to the project. These KERs formed the basis for further investigating the exploitation potential during the project.

A separate, confidential, document was set up to organise the information regarding these initial KERs, corresponding intellectual property rights (IPR) and exploitation plans for these KERs. This document is also delivered to the European Commission as an attachment to the (public) Deliverable 8.2. During the project, this document was continuously revised in order to update the exploitation plans, IPR agreements and further define the steps to be taken for market exploitation.

However, since these KERs were already identified before the project start, there have been any changes in the exploitation planning for some of these KERs during the project. Although most of the identified results are delivered in line with the project plan, some of these KERs have not proved to be actually **Key Exploitable Results**. There are several reasons for this: some of the results are still at a low TRL level and therefore not ready for exploitation in the coming years, while other results are less relevant for the partners involved than previously thought. Therefore, it was needed to prioritize these results in order to make sure that the most important and relevant results developed their exploitation plan. The exploitation framework, as described in chapter 3, was developed to have a common understanding of the exploitation process and enabled the project partners to prioritize the several KERs.

2.2 Development of exploitation framework

As described above, the exploitation framework was developed to have a common understanding of the exploitation process and enabled the project partners to prioritize the several KERs. Based on this framework, further steps for exploitation of GreenCharge's results were defined. The exploitation framework is described in more detail in Chapter 3 of this deliverable.

2.3 Development of light business plans

In order to define the exploitation potential of GreenCharge's results, the project partners have developed a light business plan (LBP) for their results¹. The content of these LBPs is further described in section 5.1.4. These LBPs have been (and will be after the project) used for defining an appropriate market uptake strategy: projects partners are forced to think about which conditions need to be fulfilled to get their result successfully exploited. A dedicated exploitation workshop was held for providing insight into the concept of light business plans in December 2020. In the end, the information provided in the LBPs has been included in the confidential exploitation attachment as part of this deliverable.

¹ All partners have developed these light business plans for their results, except the partners that have changed their plans and are not planning to (commercially) exploit their results in the coming years. These partners provided a (confidential) justification explaining why they are not planning to exploit their result.

2.4 Horizon Results Booster (HRB) services

To further support exploitation, the project utilised the Horizon Results Booster (HRB) service. This is a service initiated by the European Commission. HRB in total provides three services:

1. Portfolio Dissemination & Exploitation Strategy
2. Business Plan Development
3. Go To Market

GreenCharge applied and (was accepted) to utilise the first two services. One of the key services of HRB is to arrange Exploitation Strategy Seminars (ESS). An ESS is an online workshop lead by an external expert to *brainstorm on use of project results, characterise them, identify the risks and potential obstacles for exploitation and analyse how to address them*. After the ESS, the external expert prepares a summary the results. To get experience with ESS and to ensure necessary depth of the provided analysis, the project selected a KER for the ESS. This was the *Enhanced EV Sharing Services*. The summary of the ESS provides:

- Risks Assessment and Priority Map – identifying which risks that need action
- Exploitation Roadmap – including timeline and financial costs
- Use options – how the KER can be exploited (e.g., direct, indirect, commercial, new research)

In addition, one of GreenCharge's partners (SUN) has registered itself for a booster service consisting of support and guidance for Intellectual Property Rights (IPR)², including an introduction to IP services, guidance regarding the procedures, definitions, regulations, as well as patenting, IP licensing and sale, transfer of IP, and more.

2.5 Revision of KERs + IPR + EP document

Based on the experience from the two HRB services, GreenCharge's WP8 partners together with the KER owners have worked further on a revision of the (confidential) KER + IPR + EP document. For each of the KERs, the document is updated with the latest information and exploitation plans. The KER owners have developed their own light business plan, for which they made use of the HRB templates. By doing this exercise, the partners were forced to think about concrete exploitation steps in order to bring their product to the market. In addition, by doing a risk assessment they are aware of the potential risks for exploitation.

However, during the project we have experienced that a large number of KERs has been identified at the start of the project. Since the development of the KERs has not always taken place in the same pace, some KERs are already prepared for market uptake, while others still need to be further developed before identifying concrete exploitation steps. This was the reason for prioritizing the results and selecting the results with the most exploitation potential, based on their expected impact, innovativeness, maturity and the responsible partner's willingness to exploit (see also section 3.4).

In the revised KERs + IPR + EP document the following results have been highlighted as the project's most important results (**Key Exploitable Results** instead of **Main Results**):

- EV Fleet and Charge Management Prototype (joined exploitation of ZET's car sharing service and charge management prototype)
- Smart Energy Management Module
- KPI Calculator and Visualiser
- Simulator Tool
- Reference Architecture
- Evaluation Framework

This revised document forms the final exploitation plan (including concrete exploitation steps for the years after the project ends) for the project partners.

² This booster service is part of the 3rd Horizon Results Booster Service: Go To Market.

3 Exploitation Framework

The purpose of the Exploitation Framework is to establish a common understanding of concepts related to innovation, exploitation, dissemination and communication, and to support the planning and implementation of exploitation activities in GreenCharge. The framework provided support for the following tasks:

- Defining the focus of exploitation and setting priorities. The project has identified multiple results that are potentially exploitable. The project has selected the most promising results.
- Connecting the exploitation work with other activities and deliverables in GreenCharge. Other activities provide valuable input for defining exploitation plans.
- Identifying gaps in the work done in period 1 and filling these gaps.

3.1 Background

Two documents serve as main background for specifying the framework:

- The EU IPR Brochure *Making the Most of your H2020 Project*³ clarifies the terminology and presents tools for the exploitation, dissemination and communication activities.
- The *D-cubed guide: Planning of effective dissemination*⁴ addresses a wider scope than dissemination. D-cubed focuses on understanding potential adopters and engaging them throughout a project and describes dissemination as an ongoing two-way process.

3.2 Terminology: key activities

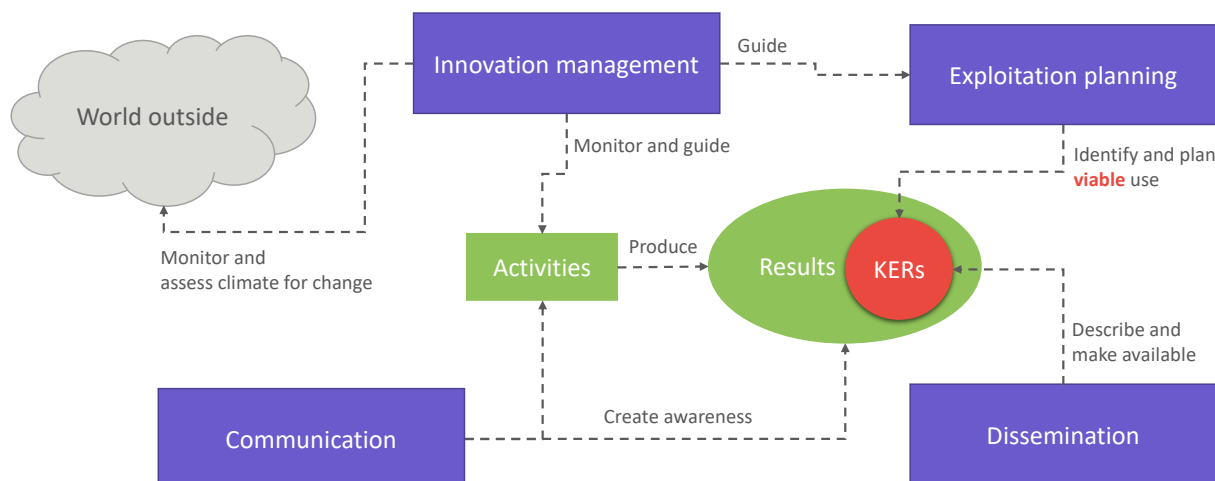


Figure 3-1: Four key activities related to exploitation

As depicted in Figure 3-1, four key activities are essential in GreenCharge’s exploitation work:

- **Innovation management (WP1)** monitors the needs of stakeholders of relevance for the project and the technological development related to these needs. It identifies gaps and competitors, and it provides advice to the project for prioritizing and developing exploitation strategies.
- **Exploitation (WP8)** simply means using project results. “Use” includes use for commercial purposes – but use is not necessarily commercial. Project results can also be used in further research, in public policymaking or other ways.
- **Dissemination (WP8)** is about describing the results and ensuring that they are available for use. Dissemination supports exploitation and targets the specific audience as defined by the exploitation

³ <https://www.euopen4business.eu/2020/making-the-most-of-your-h2020-project-4/?lang=en>

⁴ https://www.uq.edu.au/evaluationstedi/Dissemination/Planning_Guide.pdf

strategy. Depending on the type of results and the exploitation strategy, results can be made available to different users. For example, users may be peers in the research field, industry, other commercial players and policymakers.

- **Communication (WP8)** is about informing and promoting the project and its results/success, as well as collecting feedback. Communication aims at creating awareness. It targets a broader audience, and in that way is also a means to attract potential adopters of the results.

We experience in GreenCharge that dissemination and communication are often mixed up, and that the concept of “making available” (i.e., the purpose for dissemination) is not easy to grasp. Here are some examples of dissemination channels that will be used for different result types:

- Concept/theory/knowledge
 - Scientific publication
- Software systems/apps
 - Package SW and promote (commercialisation)
 - Make available open source and organize/contribute to open source community
- Software APIs
 - Standardization
- Hardware systems
 - Package HW and promote (commercialisation)
 - Make available design open source

The four key activities addressing different purposes target different audiences. Figure 3-2 depicts the audiences for each activity. Audiences are not only involved as passive listeners. They should be listened to and actively engaged in giving feedback and advice to the project and its development activities.

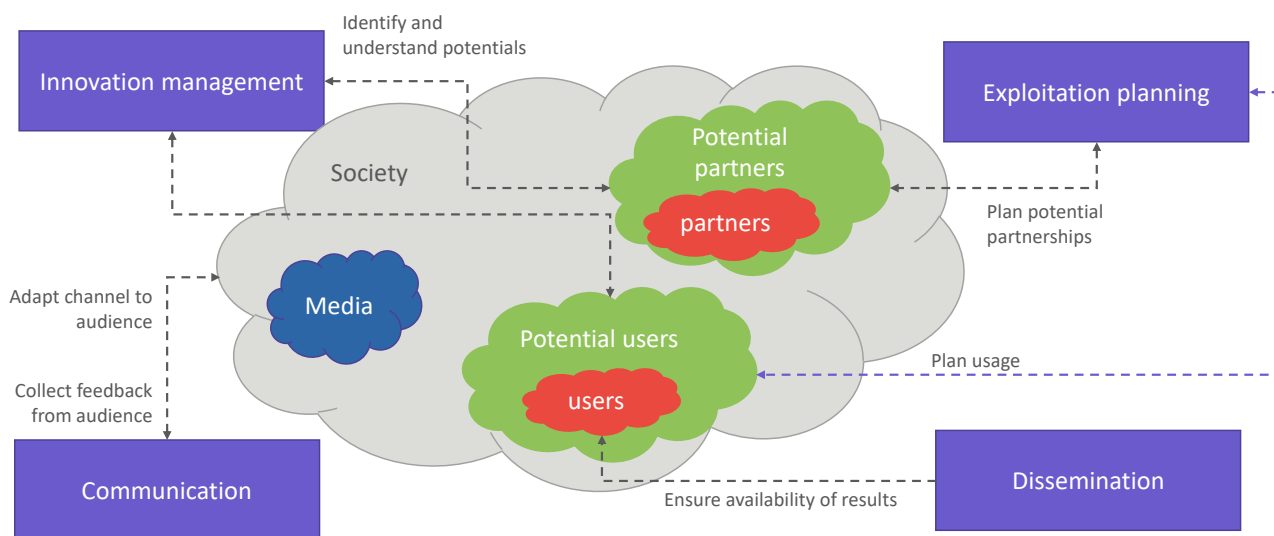


Figure 3-2: Engaging target audiences

3.3 Result, Intellectual property (IP) and Intellectual property right (IPR)

We adopt the definition of results proposed in the Brochure *Making the Most of your H2020 Project*:

Any tangible or intangible output of the action, such as data, knowledge and information whatever their form or their nature, whether they can be protected, which are generated by the action as well as any attached rights, including intellectual property rights.

For instance, results can potentially be commercially exploited. This is the case for products and services. Results can also be foundation for further research. This is the case for knowledge, basis technologies, methods and data.

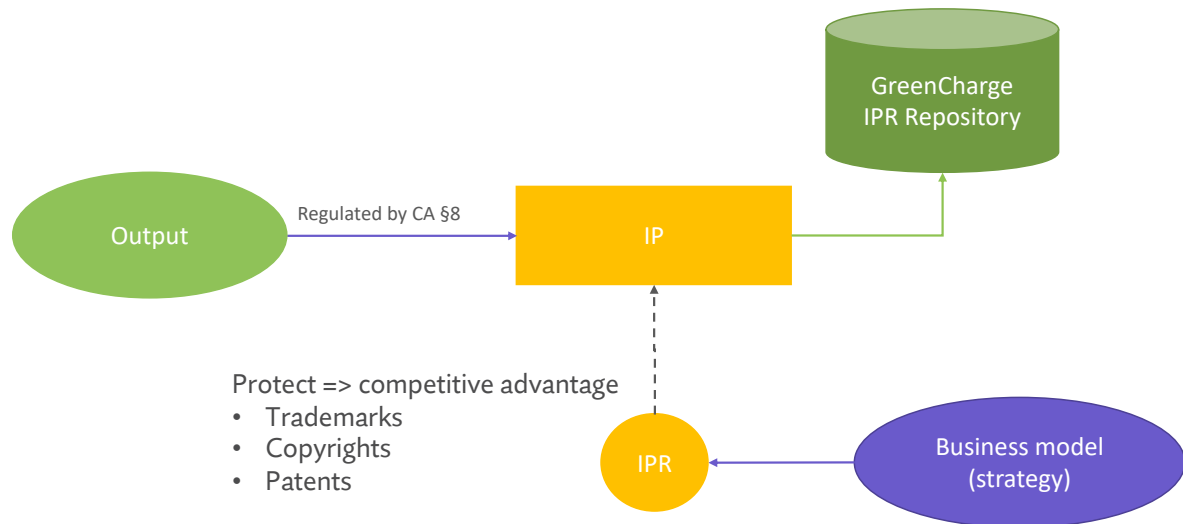


Figure 3-3: Output, IP and IPR

Intellectual Property (IP) is a property (such as an idea, invention, or process) that derives from the work of the mind or intellect. IP is fundamental for exploitation as a central concept for determining the right to exploit results. The Consortium Agreement (CA) defined rules for ownership, joint ownership (when a result is developed together by two or several partners). The CA also defines rules for the transfer of ownership.

Intellectual Property Right (IPR) regulates how IP can be used. Through IP protection, the owner can achieve a competitive advantage. Examples of protection are trademarks, copyrights and patents. There is a tight relation between business models and IPR. The strategy chosen may impact on IPR specification. For example, the access to a product may be chosen to be open if the business focus is to sell services related to the product.

Outputs generated during the project often depends on and bare built upon components brought by partners to the project. The components, the background, is identified in the CA. Related of each background, the CA include limitations and conditions for using during the project implementation, as well as limitations and conditions if the background is needed for the exploitation of project results.

The IPR Registry data serves as a tool to manage IPR of the project outputs (see also Figure 3-3). Each output is characterized by:

- the owner (s) of the output,
- any dependency on the background that might constrain exploitation,
- access rights to the output during the project
- access rights to the output after the project
- protection mechanism

The management of IPR within GreenCharge is further described in Chapter 4 of this deliverable.

3.3.1 Outputs in GreenCharge

GreenCharge is an Innovation Action (IA) where several components or services existing before the project start are being integrating during the project in order to demonstrate new capabilities. The integration requires SW extensions of the initial components and development of Application Programming Interfaces (APIs). It may also require contractual agreements between the service providers. In addition to integrated solutions, GreenCharge has also developed new results or further developed previous results. The different types are illustrated in Figure 3-4.

In the case of integrated solutions, it is relevant to consider joint exploitation of the solution. For example, the solution developed for the Oslo demo by ZET, HUBJECT and eSmart may be jointly exploited by the partners.

The alternative of exploiting the result extended for integration requires standardization of APIs. So a first step in an exploitation strategy is contributing to standardization.

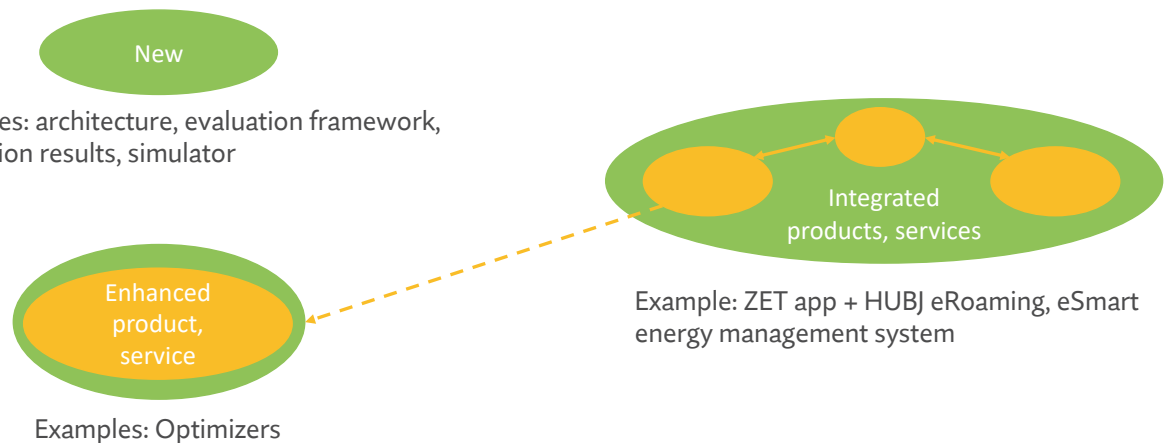


Figure 3-4: Outcomes of GreenCharge

3.3.2 Joint ownership and joint exploitation

Some of the outputs developed in GreenCharge are produced through the collaboration of several partners. In that case the owners should together agree on the exploitation strategy.

Components may be considered at different granularity level. It may make more sense to exploit a composite component than the individual parts. The owners of the different part may agree on joint ownership of the composite. A joint ownership agreement can regulate the exploitation of the composite.

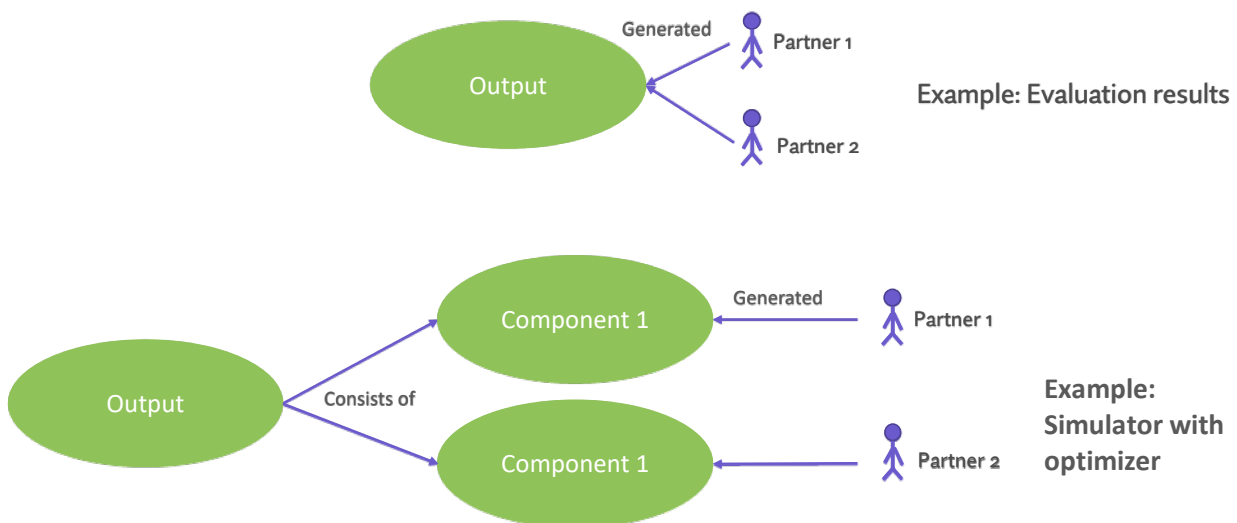


Figure 3-5: Joint ownership

IP Protection mechanisms

The most common ways to protect IP can be classified in four categories⁵:

⁵ <https://www.dennemeyer.com/ip-blog/news/what-are-the-four-types-of-intellectual-property-and-how-do-you-protect-them/>

1. Patents: exclusive rights that protect invented machines, manufactured objects, technological or industrial processes and systems.
2. Trademarks: applies to assets that serve as marketplace identifiers for organisation's brands, including, but not limited to, product or service names, logos and slogans.
3. Copyrights: exclusive right to copy and distribute a creative work, usually for a limited time. It is intended to protect the original expression of an idea, but not the idea itself.
4. Trade secrets: essential pieces of information regarding the processes, products or services of an organisation that are not intended to be published or otherwise distributed.

Although these are the most common ways to protect IP, these mechanisms are used only to a limited extent to protect the project's results. Many of the results use *creative commons licences* for protecting their IP. This is a public copyright license that enables the free distribution of an otherwise copyrighted work.⁶ These licences are used when the owner of the result wants to give other people the right to share, use, and build upon a work that the author has created. This way, a creative commons license provides result owners flexibility and protects the people who use or redistribute the result from concerns of copyright infringement as long as they abide by the conditions that are specified in the license.

Importantly as several software systems are developed in GreenCharge, we recall that software (source code) is protected by copyright if it is original (i.e., not a copy of pre-existing software). Software cannot be patented. The copyright only protects the expression of a work, not the ideas reflected in it. If the software written by a programmer depends on an algorithm specified by another party, the two results are owned separately. The specification can be exploited in another SW program. This is the case in GreenCharge of the KPI calculator where the KPI specifications (i.e., the formulas to calculate KPIs) are developed by SINTEF and the SW calculator (source code) by SUN. In that case it may however make more sense to exploit the two components jointly.

3.4 Key exploitable results (KERs)

GreenCharge has produced a large number of results with different exploitation potentials. Rather than developing business plans for each result, we have selected the most promising results. These selected results are what we call **key exploitable results**.

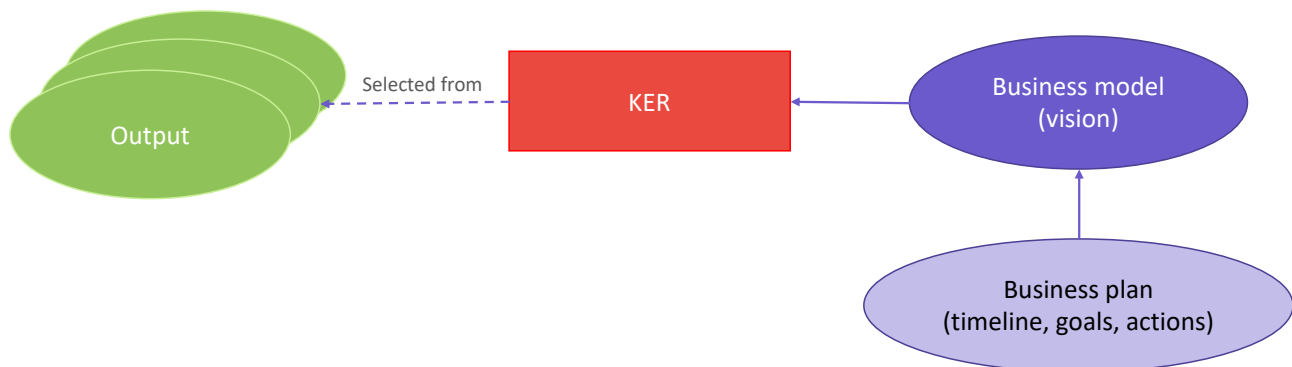


Figure 3-6: Key exploitable result (KER)

A main question is of course to define an approach for selecting the most promising results. Important factors are depicted in Figure 3-7:

- **Climate for change/competitors:** organisations are dependent on ongoing developments in the “outside world”. Activities performed by competitors, but also other less related organisations or independent trends in the world, can affect the ability to exploit the result. For example, PMC is

⁶ www.creativecommons.org

dependent on an affordable supply of 2nd life batteries. In the current situation, the supply of 2nd life batteries is limited (restriction from outside world) resulting in a barrier for exploitation on the short term.

- **Potential impact:** since the project aims at promoting sustainable e-mobility in European cities, the potential impact of exploitation of a result is an important aspect for prioritising GreenCharge's result. Expected impacts identified before the start of the project are, among others, a reduction in energy consumption peaks (due to better grid balancing) and an improved use of renewable energy (due to smart management and storage).
- **Willingness to exploit:** the partner's willingness to exploit is a very important aspect for developing a successful exploitation strategy. Since the market for smart charging of electric vehicles or energy smart neighbourhood solutions is still immature, it can occur that a partner that had initially planned to exploit a result decides to change this decision. This can be a result of a change in the outside world (as mentioned before) or a change in the company's own business strategy.
- **Partners' ranking:** since GreenCharge's consortium partners are all experienced in the e-mobility/smart charging/energy management business, we have conducted a survey during an internal project workshop in order to assess which results were seen as the most promising results. In addition, the Uptake City group was asked what they considered to be the most important results and functionalities.
- **Evaluation results:** GreenCharge's measures implemented in the three pilot cities have been evaluated for the project duration (although there was a delay in data collection due to COVID-19). These results, in terms of sustainable/technical impact and financial viability, form an important aspect for selecting the most promising project results. By using the conclusions of the evaluation process, partners will be able to see if the results actually achieve the anticipated impact, provide the anticipated benefits to its users, and are financially viable on the long term.

Based on these factors, the most promising results were selected for making more detailed exploitation plans. These Key Exploitable Results are:

- EV Fleet and Charge Management Prototype (joined exploitation of ZET's car sharing service and charge management prototype)
- Smart Energy Management Module
- KPI Calculator and Visualiser
- Simulator Tool
- Reference Architecture
- Evaluation Framework

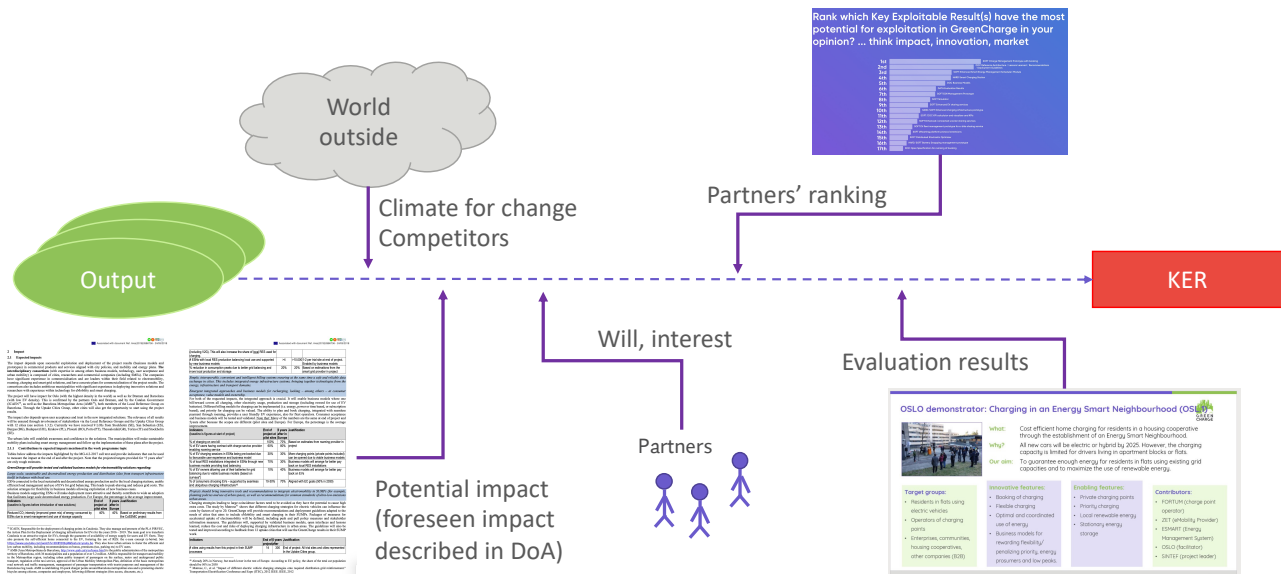


Figure 3-7: Approach for selecting KERs

3.5 Relevant other activities in GreenCharge

3.5.1 Reference Architecture

The Reference architecture developed in GreenCharge (D4.1 and D4.2) supports the understanding of the GreenCharge concept and serves as a blueprint for planning and construction of systems and system components that together realise the concept. The architecture is structured according in a set of viewpoints, some related to the concepts, the domain, some related to the technical system. The viewpoints related to stakeholders and their concerns are of interest for the exploitation planning. The stakeholder are being described with relations between them as well as main responsibilities (see Figure 3-8), and the concerns cover the drivers (motivation towards sustainable eMobility), the current situation with its barriers and the goals to be met to overcome a barrier (see example for the stakeholder “EV user” in Figure 3-9; a motivation model is provided for each stakeholder). These aspects are relevant for identifying the target user groups for a result, the partnerships that may facilitate exploitation as well as for formulating value propositions.

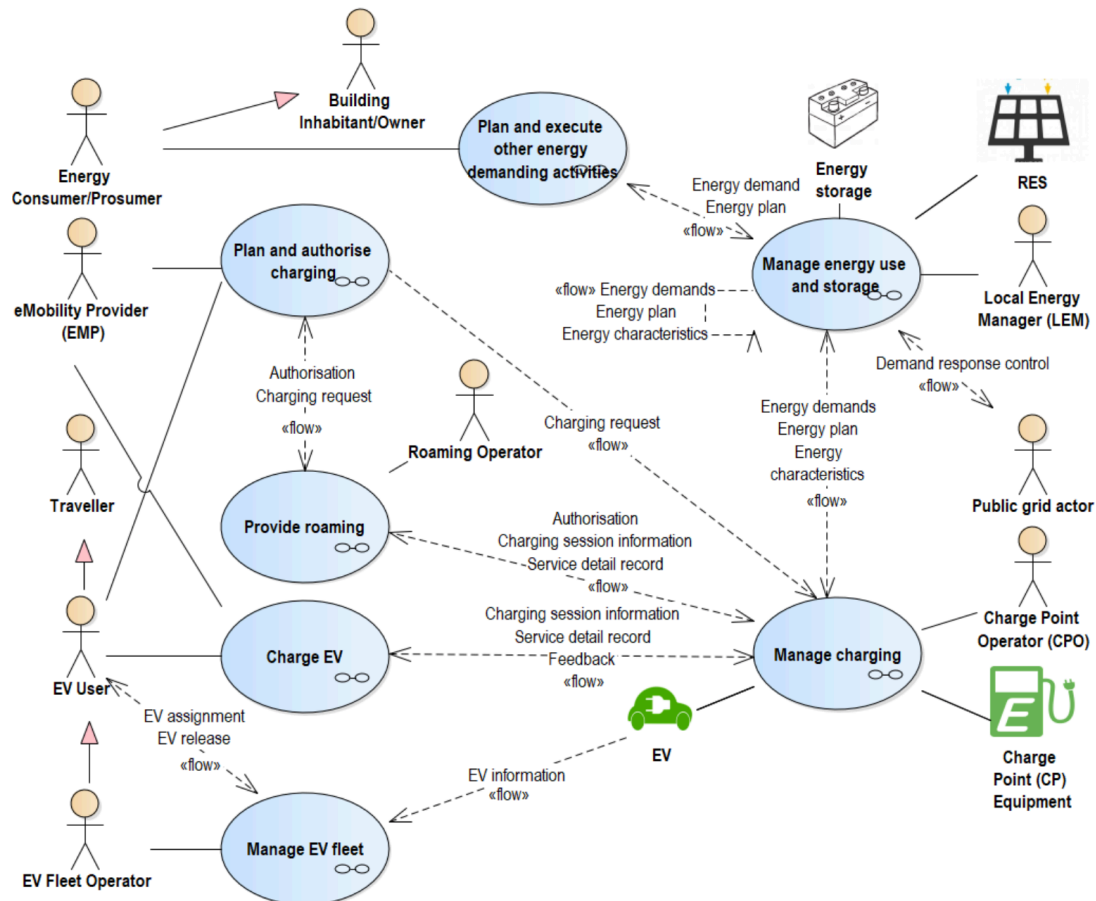


Figure 3-8: Stakeholders and overall functionalities (from D4.1)

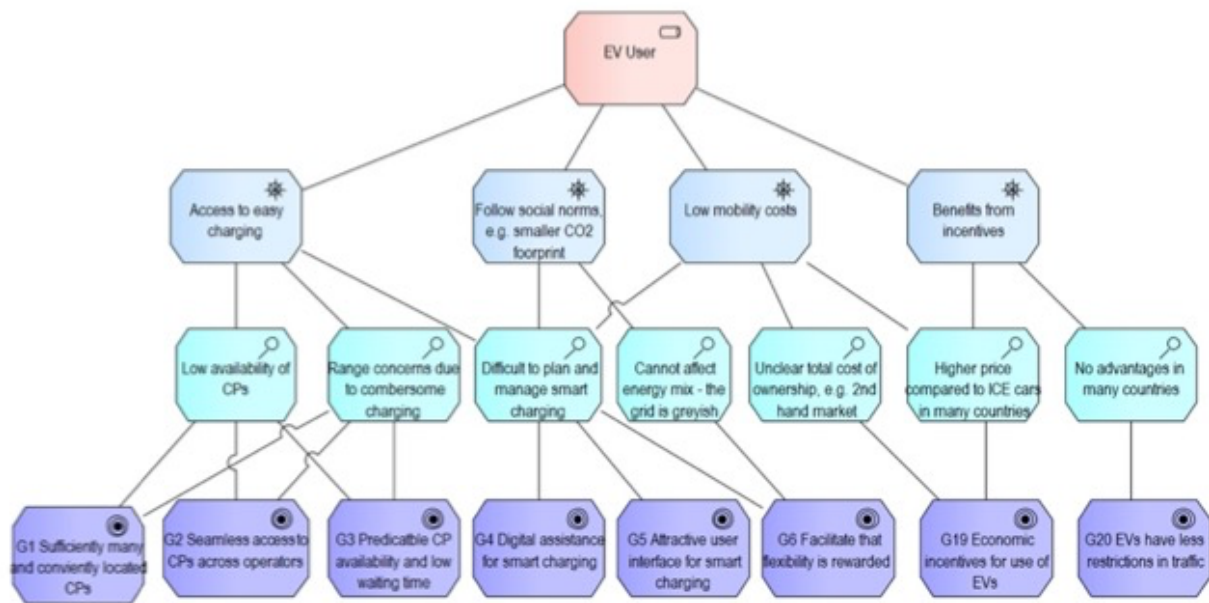





Figure 3-9: Motivation model for the EV user (from D4.1)


3.5.2 Evaluation framework and key innovation features

As part of the evaluation framework (D5.4/D6.3 and D5.5/D6.4), the key innovation features supported by the technologies and demonstrated in the demos have been thoroughly described. The key innovation features are the measures beyond the SoTA (state of the art). These key innovation features represent a competitive advantage and should be exploited when defining value propositions.

Table 3-1: Overview of measures and the demonstrated for each demonstrator (from D5.4/D6.3)

Measure group	Measure (1) – sota (2) – beyond sota	Description	Demonstrators						
			Oslo		Bremen		Barcelona		
			D1	D2	D1	D2	D1	D2	D3
EV fleets 	Shared EVs (1)	A fleet of EVs shared among several users.				D	D		D
	Shared EVs integrated with public transport (2)	A fleet of shared EVs is integrated with public transport.							D
	Shared EVs in new housing cooperative (2)	A fleet of shared EVs is available to residents in a new housing cooperative to reduce the need for parking spaces/garage				D			
Charging 	Private CPs (1)	The CP is owned and used by the CP owner or someone approved by the owner.	D		D	D			D
	Public CPs (1)	The CP can be used by the public.		D					
	Shared CPs (1)	The CP is shared with others when not needed by the CP owner.		D				D	
	Roaming (1)	EV users with a contract with one Electric Mobility Provider (EMP) can use the services of other EMPs/Charge Point Operators (CPOs).		D				D	
	Booked charging (2)	A time slot for use of a CP is booked in advance. Planned arrival and departure time and initial and target SoC are provided at booking time.		D				D	
	Battery swapping and charging (1)	Depleted EV batteries are swapped with fully charged ones.					D		
	Flexible charging (2)	Charging is done at any time within a given time window as long as the requested amount of energy is provided.	D		D		*	D	D
	Priority charging (2)	If there is not enough energy available to satisfy all charging sessions, priority sessions will be satisfied at the expense of non-priority ones.	D		D				
	Priority access to CP (1)	EV users has a prioritised access to CPs.						D	
Smart energy management 	Local RES (1)	Local renewable energy sources (RES), e.g. solar panels are exploited	D		D		*	D	D
	Local storage (1)	Energy is stored locally in stationary batteries for later use when it is advantageous.	D		D				D
	V2G (2)	Ability to exploit discharging of EVs connected for charging when possible within constraints set by user and beneficial for optimal demand profile of the building or neighbourhood. ⁷	*					*	
	Optimal and coordinated use of energy (2)	Energy demands (charging included) are coordinated with energy availability to reduce peaks and expenses. EV users' needs and other needs are considered.	D		D			D	D
Business aspects	Rewarding Eco driving (2)	The customers using shared EVs are rewarded if they accomplish Eco driving				D	D		
	Payment for sharing EVs (1)	Citizens pay for eMobility services.				D	D		*

⁷ V2G requires EVs and CPs supporting discharging and an energy management system able to exploit it. None of the demonstrators include EVs and CPs supporting V2G, so the potential impact can only be investigated in simulations.

Measure group	Measure (1) – sota (2) – beyond sota	Description	Demonstrators							
			Oslo		Bremen		Barcelona			
			D1	D2	D1	D2	D1	D2	D3	
	Penalizing priority in ESN (2)	EV users requesting priority are penalised or not rewarded	D							
	Rewarding flexibility in ESN (2)	EV users offering flexibility are rewarded. This may also include those allowing V2G.	D							
	Payment for shared CPs (2)	CP owners are compensated for offering their CPs to others.		D						
	Penalizing blocking of CP (2)	EV users not using their booked time slot (no show or very late arrival), or are connected too long (blocking) are penalised.		D				D		
	Rewarding prosumers (2)	ESN benefits from being a prosumer by means of a positive Feed-in tariff or self-consumption.	D							
	Rewarding desired consumption pattern (2)	Energy tariffs may reward lower peaks or use of energy outside peak hours. The use of energy is adapted to reduce the energy costs.	D					D		

3.5.3 Business model design and evaluation

The development of business models in WP3 is another activity relevant in the development of the exploitation strategies in WP8. D3.3 and D3.4 describe business models relevant for the sustainable replication of demo cases. The business models identify the stakeholders involved in each case, the value propositions and the revenue streams (see the orchestrator template used in D3.4 in Figure 3-10). This template is used for defining the business models as implemented in the demonstrators. Combined with the evaluation results, the business model can be further developed in order to achieve a long-term financially viable business model which makes it possible to successfully exploit the results.

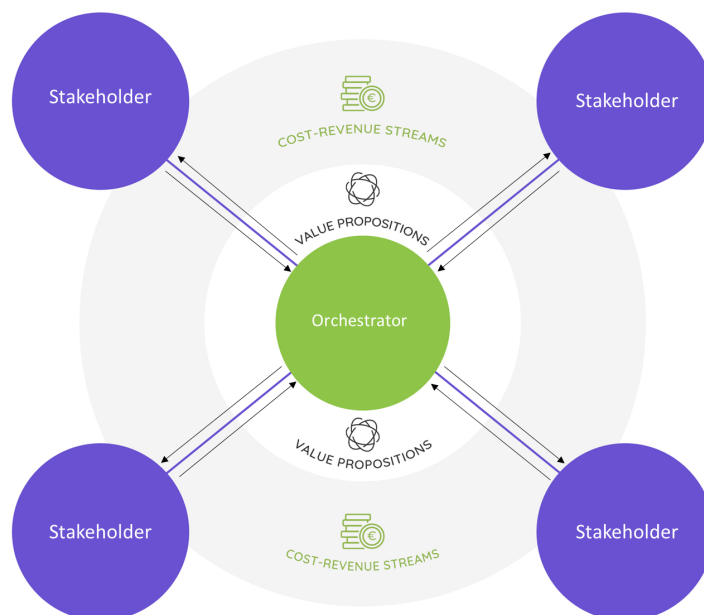


Figure 3-10: Business model canvas for marketplaces (from D3.4)

4 Management of intellectual property rights

All dissemination in GreenCharge is in accordance with applicable IPR restrictions and in accordance with the H2020 GA and as defined in the project's CA.

Central to our approach is *maintenance of an IPR Directory*. This makes explicit, for each item of IP:

- The nature of the knowledge, and its perceived potential for exploitation.
- The owner(s).
- Access rights: an indication of who is entitled to use the item during/after the project, and on what terms.
- Measures required, or in place, to ensure protection of IPR for the item.

The IPR Directory is confidential: only consortium members have access to it.⁸ An overview of the tables used for collecting and storing the IPR information (including instructions) can be found in Table 4-1.

The project is based on the following knowledge management principles:

- **Background Knowledge** (i.e. pre-existing knowledge/know-how): Agreed at the start of the project and registered in an IPR Directory.
- **Foreground Knowledge** (i.e. new knowledge generated in the project): Details of ownership and any IPR restrictions registered in IPR directory.
- **IPR Directory updates**: Workshops and other means used to regularly update and check the accuracy of the IPR directory, with full involvement of all partners.
- **Protected Dissemination**: Lightweight, effective processes will be used to ensure that results can be made available rapidly, but with due respect to any protection mechanisms that may be in place.

The IPR Directory is part of the confidential exploitation document that is provided as an Annex to this deliverable.

Table 4-1: Overview of table used for collection and storage of IPR information

IPR Registry Information	
See consortium Agreement section 8 for ownership, 9 for access rights and attachment 1 for background	
Ownership	<p>List the names of the partners contributing to the result.</p> <p>NB: In some cases. An initial definition of “Owner” is defined in the draft IPR Registry in the DoA, section 2.2.5.</p>

⁸ Of course certain aspects (e.g. title of the result, owner of the result and level of protection) included in the IPR Directory are public available in order to effectively communicate and disseminate the result.

Restrictions on use of background during project and/or for exploitation	<p>List any background provided by a partner which other partners may need access to in order to carry out their work in the project, or to exploit their own results afterwards.</p> <p>“Background” means knowledge/technology brought to the project, something that they produced outside/before the project.</p> <p>List any restrictions that may apply.</p> <p>“Restrictions” can include limitations on what can be used, how it can be used, conditions for use, or a requirement to pay for usage (e.g., pay a licence).</p> <p>NB: If any restrictions apply, they should have been defined in the project’s Consortium Agreement – so use that as a source. If no restrictions apply, state that explicitly.</p>
Access rights to results <i>during</i> project	<p>List any restrictions that may apply during the project to the use of project results by partners other than the owners.</p> <p>“Restrictions” can include simple things like “Use allowed only for work directly related to project activities”.</p> <p>NB: This refers to <u>results</u> (sometimes also referred to as “foreground”): i.e., what gets developed during the project using project funding. It is not the same as restrictions on “background” defined above.</p>
Access rights to results <i>after</i> project	<p>List any restrictions that may apply after the project to the use of project results by partners other than the owners.</p> <p>“Restrictions” can include, e.g., the requirement to have to pay a licence for use of the result, at normal commercial terms. [As for the row above: remember that this refers to <u>results</u>, not background].</p>
IPR protection mechanisms to apply outside/after project	<p>There are a wide range of choices here e.g. “None needed”, “Industrial secret”, “Patent”, “Copyright”, “Software Licence”, “Open Source [with specific licence]”, “Creative Commons Licence” etc.</p> <p>In the draft in the DoA the simple text “Restricted” was defined for many results. We would expect this to be made more specific as the project proceeds.</p>

5 Exploitation, dissemination and communication plans

As defined in the H2020 programme, **dissemination** means *making project results available* to potential users, such as peers in the research field, industry, other commercial players and policymakers). **Exploitation** simply means *using* project results. “Use” can include use for commercial purposes – but not necessarily so. Project results can also be used in further research, in public policymaking – or in many other ways. **Communication** is about *telling* other people about the project itself and its results, and potentially about listening to feedback from them.

The diagram in Figure 5-1 shows how there is interdependence between the dissemination and communication activities. The communication strategy aims to make targeted stakeholders aware of the GreenCharge project, its results and benefits, while the dissemination strategy aims to make the project results and knowledge available for the relevant stakeholders. These two strategies and their corresponding activities enable the project partners to make plans for how to bring about use of the project results. The expected impact of GreenCharge will be achieved by successful exploitation of the project results.

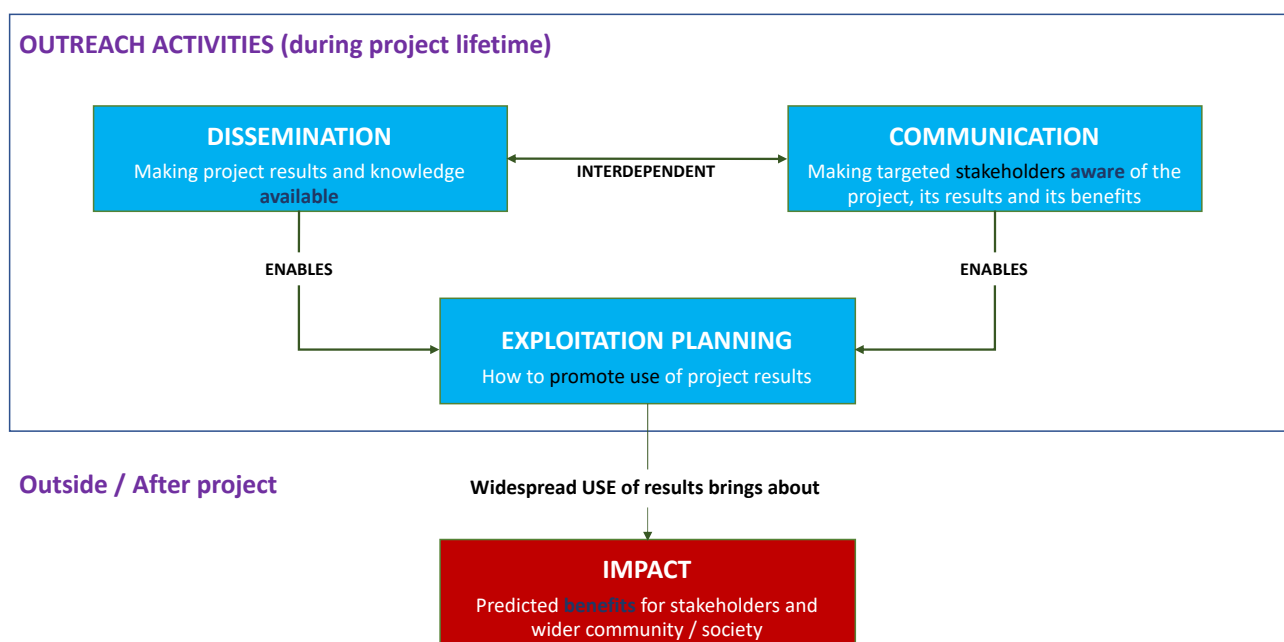


Figure 5-1: Dissemination, communication and exploitation approach⁹

GreenCharge’s stakeholder analysis

The target groups that have been used to identify relevant exploitation and dissemination mechanism are based on the outcome of the Stakeholder Analysis (D3.1). In D3.1 the most important stakeholders within and around the GreenCharge value chain and their position towards the system were identified in order to set up engagement strategies. It provides an overview of different stakeholder characteristics, stakeholder input and important relations between them.

⁹ Adapted from diagram appearing in project’s GA.

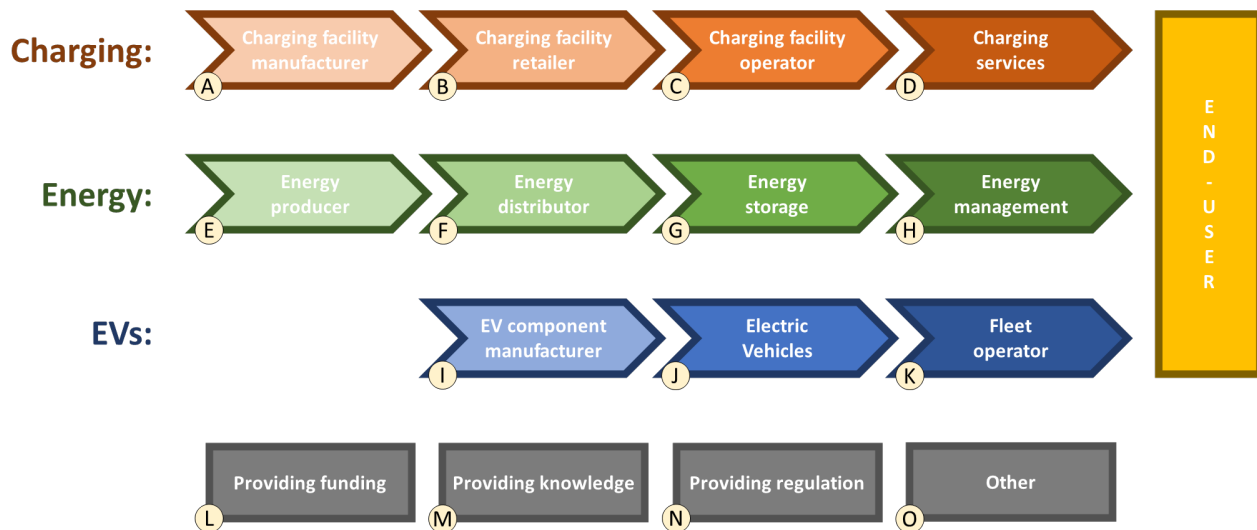


Figure 5-2: GreenCharge value chain

GreenCharge value chain

To gain insight in stakeholders' perspectives, a targeted study has been conducted on the GreenCharge value chain (see also Figure 5-2).¹⁰ The GreenCharge value chain consists of three 'primary value chains': Charging, Energy and EV. These primary value chains are supported by funding providers, knowledge providers, regulation providers, and other supporting roles. The stakeholder analysis enables GreenCharge to develop its platform in line with the opinions, needs and expertise of stakeholders in the value chains.

Main conclusions

The stakeholder analysis shows that:

- Stakeholders are familiar with energy production and smart charging concepts. However, levels of expertise differ between stakeholder roles.
- Stakeholders have positive attitudes towards the transition to local renewable energy production and smart charging.
- Stakeholders in the primary value chains are concerned with multi-actor provision, charging infrastructure utilisation, effective use of local renewable energy sources, and charging infrastructure investment. Supporting roles are most concerned about charging accessibility, integration, and fairness.
- Stakeholders indicate that knowledge providers are the organisation they most often collaborate with. Organisations in the Charging value chain are the least cooperative organisations.
- There are no obstructers in the transition towards zero emission/sustainable mobility. The supporting roles are regarded as sceptic observers, whereas the Charging value chain stakeholders are enthusiastic observers. Stakeholders in the Energy and EV value chain are key enablers in the transition. The statement that there are no obstructers should be further explored during the project because there may be external factors or actors that could form a barrier in the transition.
- There are various projects and organisations in and around the primary value chains which share interest with GreenCharge.

The approach to finding the most appropriate mechanism for dissemination and exploitation is to link stakeholder groups to the expected results of the project. Once the stakeholder groups had been targeted, it was possible to identify specific mechanisms to reach the target groups.

¹⁰ The stakeholder analysis is described in detail in D3.1 – Stakeholder Analysis.

5.1 Exploitation plan

5.1.1 Strategy and innovation potential

Innovation types and innovation potential

Figure 5-3 provides an overview of the innovation types addressed and the main relation between them. *Profit model innovations* are crucial for the success of the other innovation types. Profit model innovations are new ways to convert a value proposition into revenue (or other benefits). Examples include pay-per-use, subscription, freemium etc. An example result from GreenCharge includes the proposed business models. *Product performance innovations* (new functions and features in systems/system components and services) includes both updates to an existing offering and entirely new products. In a system perspective this can be new means of information exchange to support new or improved business models. An example result from GreenCharge includes the EV Fleet and Charge Management Prototype. *Product system innovation* appears when several products or services are bundled together to create a robust and scalable system. This will typically require that different actors agree on deploying systems and services that exchange information and work together. An example result from GreenCharge includes the Reference Architecture. *Service innovations* are changes that increase the utility, user friendliness or apparent value of an offering. Example results from GreenCharge include the KPI Calculator/Visualiser and Evaluation Framework. All the other stated innovation types (such as Network Innovations, exemplified in GreenCharge's stakeholder analysis above) will in various way impact the service.

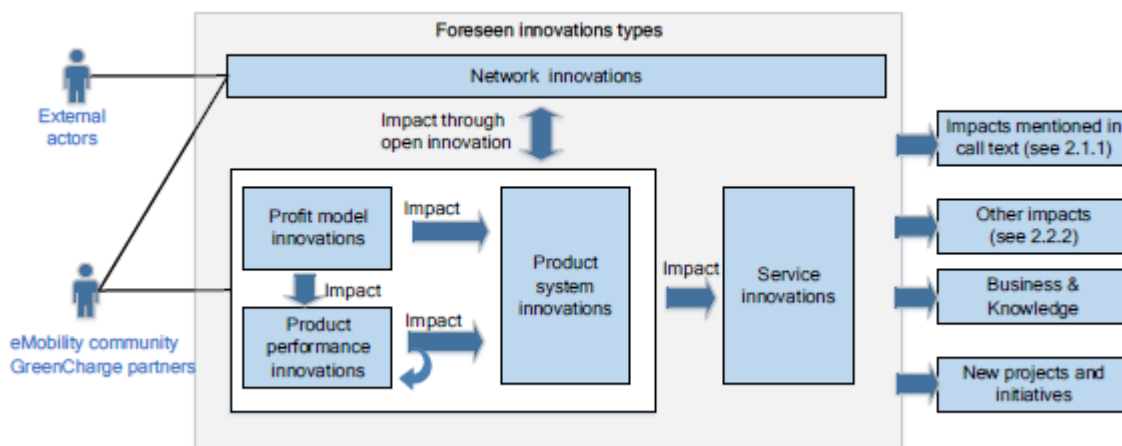


Figure 5-3: Overview of innovation potential

GreenCharge's results

In GreenCharge, a selection process has been implemented to elevate some of the project's results to *Key Exploitable Results* (KERs). These KERs are the focus of the project's exploitation planning (both during and after the project). One of the selection criteria was how the results contribute to the expected impact mentioned in call text for MG-4.2-2017 *Supporting 'smart electric mobility' in cities*:

Tested and validated business models for electromobility solutions regarding:

1. *Large scale, sustainable and decentralised energy production and distribution (also from transport infrastructure itself) in balance with local use.*
2. *Simple, interoperable, convenient and intelligent billing systems ensuring at the same time a safe and reliable data exchange in cities. This includes integrated energy infrastructure systems, bringing together technologies from the energy, infrastructure and transport domains.*

3. *Emergent integrated approaches and business models for recharging, looking – among others – at consumer acceptance, value models and ownership.*
4. *Projects should bring innovative tools and recommendations to integrate electromobility in SUMPs (for example, planning policies and use of urban space), as well as recommendations for common standards of ultra-low emissions urban areas.*
5. *On the basis of clear commitments from participants for a further Europe-wide take-up and rollout of results during and following the project are expected.*

A result could be, based on the impact assessment, elevated to a KER if:

- Contributes to at least one of the five expected impacts listed above, and
- is expected to reach TRL 7 (system prototype demonstration in operational environment) at the end of the project.

When a KER is identified, its contribution to each of expected impacts are rated High, Medium Low contribution (H, M, L).

Impact assessment

The project's results are summarised in Table 5-1. In this table the results are sorted in groups according to the type of project results as described in the DoA: Business Models (R_BM), Technology Prototypes (R_TP), Open Specification of interfaces and protocols (R_OS), Evaluation results and Lessons Learned (R_ELL) and Recommendation and Deployment Guidelines (R_RD).

Table 5-1: GreenCharge results and their contribution to the expected impact

	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
Result (main responsible in parenthesis, Resp for responsible for results that are joint ownership)	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
Results related to main project result R_TP: Technology Prototypes						
ESN Management Prototype (ESMART)	H	M	H	M	H	1: Plan and balance energy availability, storage and consumption within a local area 2: Increased data exchange 5: KER owner is already marketing this solution
Charge Management Prototype with booking (ZET)	H	M	H	L		1: Scheduled charging for balanced energy use – possible integration with energy management systems 2: Provide basis for billing 3: Support for eRoaming enables new business models (visitors) 4: Wider availability of charging might support SUMP

	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
Result (main responsible in parenthesis, <i>Resp</i> for responsible for results that are joint ownership)						
Battery Swapping management prototype (MOTIT)	M			L		1: Schedule charging to balance local use of energy 4: Efficient micro mobility
Smart Charging Station (ENCH)	M			M		1: Maximise use of renewable energy 4: Integration of power into LEV hubs
Enhanced charging infrastructure prototype (PMC)	H		M	M		1: Integration of local photovoltaic 3: Business model for second- life use of batteries 4: For development planning guidance
eRoaming platform protocol extensions (HUBJ)	L	L	H		M	1: Booking enables better forecasts for energy consumption 2: Simplifies billing of charging 3: Enables new revenue streams for charge point owners 5: KER owner is willing to share the concept with SDOs ¹¹
Enhanced scooter sharing services (MOTIT)		M	H	L	L	2, 3: Linking driver behaviour (e.g. energy consumption and charging) with rewards 4: Reduce operational costs of LEVs ¹² and fleet management can leverage SUMP measures 5: Integration in existing commercial products and services + licencing
Enhanced connected scooter services (MOTIT)		M	H	L	L	<i>Same as the above, but targeting professional end users</i>
Enhanced car sharing services (ZET)		M	M	H	H	2: Billing of EV usage 3: BM for shared Evs

¹¹ SDO - Standards Development Organisation

¹² LEV – Light electric vehicle

Result (main responsible in parenthesis, Resp for responsible for results that are joint ownership)	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
						<p>4: Provide access to cars and information about public transport (potential SUMP measures)</p> <p>5: KER owner is planning integration in existing commercial products and services, use it across European cities + provide SaaS to other companies</p>
EV fleet management prototype for e-bike sharing service (ATLAN)	M			M	M	<p>1: Remote control the e-bike chargers enable integration with energy scheduler</p> <p>4: Tracking enables integration of e-bikes in urban mobility offering</p> <p>5: KER owner plan to provide service and/or licence solution</p>
Enhanced SEM Scheduler (EUT)	H		L		L	<p>1: Optimizer to schedule switching on/off loads, store energy in batteries or export to grid</p> <p>3: Exploit demand flexibility can be a business model to reduce payback of infrastructure or participate in demand response programs, or optimize the energy price charged versus cost</p> <p>5: KER owner is willing to licence SW</p>
Smart Energy Management Module (EUT)	H	L	M	L		<p>1: Energy management and optimization</p> <p>2: When managing a (energy) community with multiple users, a EMS helps in calculating costs for every user</p> <p>3: SW to minimize energy cost</p>

Result (main responsible in parenthesis, Resp for responsible for results that are joint ownership)	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
						4: Energy management EV charging infrastructure (supporting SUMP) 5: KER owner is willing to licence SW
Simulator (SUN)	H			L		1: Simulations in support of ESN planning and validating energy management strategies 4: Might be useful for detailed deployment planning of EV charging infrastructure
KPI calculator and visualiser (SUN)				L	M	4: Used for computing and visualising effects of SUMP measures 5: Useful for scenario planning for local authorities planning EV rollout/aiming to meet certain targets e.g. climate
Distributed Stochastic Optimizer (UiO)	H			L		1: Can be used to evaluate "what if" scenarios (such as excess PV production and battery storage) in planning ESNs 4: Might be useful for detailed deployment planning of EV charging infrastructure
Results related to main project result R_OS: Open Specifications						
Reference Architecture (SINTEF)	M	M	L	H	H	1-3: Reference architecture supports systems-of-systems and integration of business models 4: This should be a reference document that is integrated into SUMP alongside WP7 recommendations 5: Certain points of this document will need to be accessible to take up audiences
Open Specification for roaming of booking (HUBJ)		M	H		H	2: Improved data exchange to support interoperability

Result (main responsible in parenthesis, Resp for responsible for results that are joint ownership)	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
						3: Leverage new business models for charge point owners 5: KER owner will share specification with SDOs
Results related to main project result R_ELL: Evaluation Results and Lessons Learned						
Open Research Data with specifications (Resp: SINTEF)			L	M		3: Knowledge about consumer acceptance 4: Can be used to scale-up project's results through simulations
Lessons learned from pilots (Resp: OSLO)			M	H	H	3: Shared experience regarding consumer acceptance and ownership models 4: Knowledge about what works and what does not work 5: Very important for replication by other cities - (best) practice is key
Results related to main project result R_RD: Recommendations and Deployment Guidelines						
eMobility in SUMP (BREMEN)	L	L		H	M	1: Through drawing links between SUMP and Sustainable Energy and Climate Action Plan (SECAP) 2: Through Mobility as a Service (e.g. further developing Bremen pilot) 4: Directly applicable to SUMP processes 5: Through Uptake Cities group
Simulation Scenarios (Resp: SUN)				H	L	4: Validation and support for decision making 5: This should help with replication to visualise certain circumstances
Evaluation KPIs for eMobility with calculation methods (Resp: SINTEF)				H	H	4: Validation and support for decision making 5: Local authorities need to add these indicators into their

Result (main responsible in parenthesis, Resp for responsible for results that are joint ownership)	Expected impact it contributes to (High, Medium, Low contribution)					How the result contributes to expected impact (5 years after project in Europe)
	1 energy	2 billing	3 BM	4 SUMP	5 take-up	
						existing systems, having them will help them be aware of success factors
Evaluation Results (Resp: SINTEF)	M	M	M	M	M	1-4: Provide guidance for deployment, identification of barriers 5: Provides proof of concept and informs lessons learnt
Results related to main project result R_BM: Business Models						
Business Model Designs (Resp: EGEN)	H	M	H	H	H	1: Reduced CO2 intensity (improved green mix) of energy consumed by (including V2G). This will also increase the share of local RES used for charging. 2. # ESNs with local RES production balancing local use and supported by new business models 3. % of EV charging sessions in ESNs being pre-booked due to favourable user experience and business model 4. # cities using results from this project in their SUMP processes 5. # of new property development projects integrating EV car sharing for reducing standard parking provision

For each of the results in the table above, an exploitation schedule has been defined in a project confidential document (as described in section 1.3.2). The exploitation planning includes means for dissemination, goals and steps needed to bring about exploitation and a schedule. For technical results the goals will include target TRLs. An example of such an exploitation schedule is shown in the table below. Contact details for responsible partners may be found on the final page of this report, for those interested in pursuing further details regarding the project's results.

Table 5-2: Example of exploitation schedule

Exploitation Schedule [example]		
Approx. Date	Goal	Actions planned to achieve goal
Aug 2020	TRL 5	Specs ready and integration into roadmap
End of project	TRL 7	Announcement of functionality

2 years after end of project	TRL 8	Support implementation
5 years after end of project	TRL 9	Discontinue old versions of product

5.1.2 Exploitation mechanisms

The selection of exploitation mechanism depends on:

- Nature of the result (e.g. product, service, knowledge)
- Motivation and strategic position of result owner (e.g., commercial company or public institution)
- result owner's existing position in relevant value chains

In addition, exploitation mechanism can be separated into direct and indirect use:

Direct use

- Commercialisation: deployment of a novel product/service (offered to the target markets)
- Contract research (new contracts signed by the research group with external clients)
- A new research project (application to public funded research programmes)
- Implementation of a new university – course (Note that a training course is a service)

Indirect use

- Assignment of the IPR
- Licensing of the IPR
- Development of a new legislation/standard
- Spin-off
- Use as input to standardisation activities

For each of the results the exploitation mechanisms were defined and included in the confidential exploitation document.

5.1.3 Lessons learned and adjustments in relation to the initial plan

As mentioned before, the project started with a wide range of potentially exploitable results. In the initial exploitation plan, no further prioritization of results was planned and each expected result was considered as a key exploitable result. During the project, it became evident that there was a large difference in exploitation potential between the results: some of the results were not mature enough for exploitation directly after project completion, other results were not financially viable at this moment.

This led us to a further prioritization of the most important results: the actual key exploitable results. For these results a more detailed exploitation plan has been developed. As described in section 3.4, the prioritization of has been done based on the following factors: climate for change/competitors, potential impact, willingness to exploit, partners' ranking and evaluation results.

5.1.4 Light Business Plans

As part of the exploitation planning the project has developed Light Business Plans (LBPs) for selected KERs. The purpose of these LBPs is both to further detail exploitation plan and attract potential investors to invest in promising solutions. The template for developing such LBPs is shown in Appendix C. The LBP describes:

- Potential markets
 - Social viability
 - Economic viability
- Market size, market growth and market potential
- Potential barriers to market penetration
- Provide necessary financial information to attract investors, including
 - Value proposition

- Costs breakdown
- Return on investment and breakeven point in time

To introduce the concept of LBPs an introductory session (kick-off) was arranged, comprising all interested project partners. Here both the template itself was presented and the process to develop and enhance these was introduced. The LBPs were developed through three iterations (draft, updated, finalised). First the individual partner provided a draft which was enhanced during a subsequent workshop (individually for each LBP). The finalisation of each LBP was done in an ad-hoc basis, either based on new knowledge acquired in the project or by new insight provided by the partners. Due to the potential confidential information included in the LBPs, they are not included in this public part of the deliverable.

5.1.5 Horizon Results Booster Services

Portfolio Dissemination and Exploitation Strategy

GreenCharge participated in the Horizon Results Booster (HRB) service on preparation of a plan for exploitation and dissemination of results. The final seminar was held on the 12th of April 2021. The aim of this service was to strengthen the capacity of the project (partners) in using the research results and improve the exploitation strategy.

At the start of this service, one KER was selected for further analysis on exploitation potential and how to create impact with this result. Within this service, the KER owner (ZET) and WP8 project partners worked together with the service provider on:

- The identification/grouping of key exploitable results;
- The first definition of the related use mode;
- The identification and mapping of risks related to the exploitation;
- Follow up actions for exploitation.

With the help of this service, ZET has further defined their KER by using the *Characterisation table* (see Appendix B). This table is designed to characterize the main aspects of a KER and includes information on, amongst others, the problem addressed by the product/service, alternative solution, unique selling points and target markets.

Besides the characterisation of the KER, the partners involved worked on a risk assessment. The results of this risk assessment and characterisation of the KER were discussed during a final seminar, which could be attended by all of the project partners. Main conclusions from this service were that:

- There was still some further research to do on the target market and competitors. A clear distinction needs to be made between customers and users of the service. A further customer segmentation has to be carried out and the problems associated with the specific market segments need to be investigated and validated, so that the proposed can be tuned to address the customer needs.
- There is a need for a further risk analysis. Various risks have not been considered in the initial risk assessment. The discussion during the seminar provided useful input for a more detailed risk analysis for ZET's KER.

After this final seminar, ZET has further worked on the risk analysis and has done further research on their competitors and target market. Since ZET decided to also participate in the 2nd Horizon Results Booster (Business Plan Development), this was an important step to continue working on a concrete business plan in the upcoming service.

Business Plan Development

After participating in the HRB service on the exploitation strategy, GreenCharge participated in the HRB service on business plan development. The aim of this service was to assist GreenCharge's partners to bring their results closer to the market by developing an effective business plan, and by preparing to secure appropriate funding for the implementation of their project results.

In this service, we continued with ZET's KER and together with the service provider a business plan was developed. This business plan includes:

- Market analysis;
- Business strategy;
- Operations plan;
- Competitor identification and analysis;
- Clear action plan and an estimation of time to market.

In addition, during this service ZET also worked further on their risk analysis (as one of the main conclusions from the first service). ZET has also used the BOSAT template¹³ in order to:

- Measure the innovation maturity of the result
- Measure the business opportunity potential of the result
- Understand strengths and weaknesses related to the exploitation of the result.

The final seminar was held on the 8th of September 2021. The final report from the service provider is not provided at the time of writing this deliverable.

Support and Guidance for IPR

SUN has registered itself for a booster service consisting of support and guidance for Intellectual Property Rights (IPR). The main aim of this service is to prepare consortium partners to take their project results to the market. This service was focused on:

- Introduction to IP services;
- Guidance regarding procedures, definitions, regulation on IPR, as well as patenting, IP licensing and sale;
- Freedom of operations – due diligence;
- Transfer of IP.

Based on the results of this booster service, SUN has filled the IPR tables for its results in the confidential exploitation document.

5.1.6 After project completion

After project completion, GreenCharge ensures that the project's results will be disseminated and exploited. This will be done in several ways, such as:

- Results will be commercially exploited. For example as an addition to an existing service or product, or as a separate new service or product. This way, GreenCharge's results will be made available to potential users and a higher impact can be achieved.
- Results will be used in future research projects. A part of the results will be used for further research (e.g. evaluation framework, open research data, etc.). This will mainly be done by the knowledge institutions involved in the project. Since the open results will be made available via multiple channels (CIVITAS, Zenodo, project website) after project completion, other knowledge institutions can also make use of these results for future research.
- Results will be implemented in everyday working practices. This is the case for among others the SUMP guidelines, evaluation results and the lessons learned from pilots. This is a way to achieve impact on the short-term. In addition, the local authorities as part of the Uptake Cities Group have developed their own e-mobility roadmap. This has been done based on the GreenCharge's experiences and recommendations which have been discussed during the Uptake Cities webinars.

¹³ This tool has been provided by the Horizon Results Booster Service and is based on the business opportunity self-assessment tool developed within BOSS and co-funded by the Erasmus+ Programme of the European Union. This tool is available at: <https://bossplatform.rect.bg.ac.rs>.

A more comprehensive overview of the detailed actions planned per result (Key Exploitable Results as well as Main Results) can be found in the confidential exploitation document.

5.2 Dissemination Plan

5.2.1 Strategy

The project's dissemination strategy focused on disseminating the results through various channels aimed at different target groups. As input for defining target groups the results of the Stakeholder Analysis (D3.1) and the overview of target audiences and messages provided in Table 2 of the Communication Strategy and Plan (D8.1) have been used.

In general, all **open** results up to now have been disseminated at the public website of the project, in newsletters and media, at meetings with industry/networks, at conferences and for target groups¹⁴. The final upcoming open results will also be disseminated at the project website and through other dissemination mechanisms as described in Table 5-3. These are the dissemination mechanisms identified during the project and at the start of the project. This table also shows the expected dissemination targets and what has been achieved at the end of the project.

In addition to the mechanisms listed in this table, dissemination also took place through participation in (digital) conferences or workgroups (for example CIVITAS ELEVATE workgroups).

Table 5-3: Dissemination mechanisms during the project

Result	Dissemination mechanism(s)/channel(s)	Expected target	Reached target
Technology prototypes	<ul style="list-style-type: none"> Commercially exploitable prototypes are or will be integrated in commercial products and services Open source prototypes are or will be published via Github (system for publication of open sources) Publications on the prototypes are or will be integrated in publications on other results 	N/A	N/A
Open specifications	<ul style="list-style-type: none"> Scientific paper (conferences or journal) 	1 scientific paper	1 scientific paper
Evaluation results and lessons learned from pilots	<ul style="list-style-type: none"> Scientific papers (conferences or journals) Open research data are or will be published as structured data 	4 scientific papers	6 scientific papers
Business models	<ul style="list-style-type: none"> Scientific paper on business models Integration in consultancy services 	1 scientific paper	1 scientific paper

Besides the dissemination channels listed in the table above, all open source results will be published at Zenodo (<https://zenodo.org/communities/h2020-greencharge/?page=1&size=20>) after completion of the project. This is a catch-all research data repository that enables researchers, scientists, EU projects and institutions to share research results, make research results citable, and search and reuse open research results from other projects.

¹⁴ Because of the COVID-19 restrictions, the physical conferences and meetings took place mainly in the first year of the project.

Zenodo is harvested by the OpenAIRE portal and hosted by the CERN cloud infrastructure. This way, it is guaranteed that these results will be available for potential users, also if the project website is no longer online.

5.2.2 Dissemination channels and tools

Several dissemination materials and tools have been produced throughout the entire course of the project. The dissemination materials are realized according to different communication needs, to various event typologies and to follow the project evolution and results. The following mechanisms have been identified as useful for dissemination purposes and will be further described in this section:

- Project website
- Social media
- (Scientific) Publications
- Newsletters
- Research Data Repository (Zenodo)
- External events
- Self-organised events

5.2.2.1 Website

The purpose of the website is to gather all information and news about the project. All promotional materials include a link to the website. It is the portal where (external) stakeholders can get information on the GreenCharge project and connect with project management. The website can be accessed through the URL www.greencharge2020.eu and was launched in December 2018. During the project, GreenCharge's public deliverables were published on the project website in order to ensure wide dissemination of results¹⁵. In addition, other (scientific) publications on project results were also published on the website (by means of a short summary and a hyperlink to the articles). An impression of the project outputs section is shown in Figure 5-4.

The GreenCharge project has proven its value as important dissemination mechanism: during the project, a total of 9,176 unique visitors have visited the project website. In total, 1,867 visitors downloaded one of the project outputs from the project website.

¹⁵ At the moment of writing this deliverable, only the public deliverables that were already approved by the European Commission are published on the website. Deliverables that still need to be approved will be published once they have been approved.



Home

About

Pilot Sites

Project Outputs

News & Events


Contact

App



Project outputs

- Deliverables
- Public Materials
- Videos
- Newsletters



The key public deliverables of the project are accessible via the table below. As soon as a deliverable has been formally released, you will be able to download it by clicking on the icon. Deliverable summaries are also provided. For work in progress, the summaries offer a preview of what will be in the deliverable. For completed deliverables, the summaries provide an executive summary of the content.

Deliverable	Publication Date
Summary of Project Achievements	Summer 2021
Download D11 Data management Plan	Spring 2019
Download D13 Innovation News & Updates	Spring 2020
2. Pilots in living labs	
	Publication Date
Download D23 Description of Oslo Pilot and User Needs	Spring 2019
Download D24 Implementation Plan for Oslo Pilot	Spring 2019
Download D25 Pilot Component Preparation for Full-scale Pilot (Oslo)	

Figure 5-4: GreenCharge website project output section

5.2.2.2 Social media

In recent years, social media have become an essential tool for communication, networking and content sharing purposes and help in realizing communication and dissemination goals of GreenCharge. Social media presence allows the project to:

- Reach relevant stakeholders;
- Establish an online presence;
- Increase GreenCharge brand awareness.

Especially the ability to reach relevant stakeholders through social media is important for GreenCharge's dissemination strategy. GreenCharge is prominently present on LinkedIn and Twitter as these channels are most relevant in the scientific and business world. The social media channels that have been used by the project are the following:

- <https://twitter.com/GreenCharge2020>
- <https://www.linkedin.com/company/greencharge-project/>

GreenCharge's dissemination activities (e.g. publications of deliverables, attendance of events) are actively promoted through these communication channels in order to reach the relevant public. For promoting GreenCharge's final conference (9th Informed Cities Forum), the social media channels were actively used to gain awareness for and during the event. This has been done by continuously showing the preparations of the event, the planned sessions and agenda, and the highlights of these sessions.

LinkedIn

LinkedIn is oriented towards the professional stakeholders in the GreenCharge three defined value chains and it is a strategic choice to disseminate on LinkedIn, as this is a platform where most of GreenCharge identified stakeholders as identified in D3.1 and D8.1 are present. Project results and events attendance have been promoted through LinkedIn in order to reach these relevant stakeholders and make GreenCharge's results available.

At the end of the project, the GreenCharge LinkedIn page had 242 followers.¹⁶ This followers mainly consist of (academic) researchers (26) and people working at (local) governments (20), information technology

¹⁶ Measured on 14th February 2022.

companies (17), and higher education (17). The largest part of GreenCharge's LinkedIn followers were based in the surroundings of Oslo (21), Barcelona (14), Berlin (10), Madrid (9), and Trondheim (9).

Twitter

Project results and events attendance are and have been promoted through Twitter in order to reach the stakeholders relevant for GreenCharge and make GreenCharge's results available. At the end of the project, the GreenCharge Twitter page had 404 followers. A total number of 258 Twitter users have retweeted a GreenCharge Twitter post.

Monitoring of online dissemination activities

To accurately measure dissemination (and communication) activities, analytics from different tools available on the internet have been used. The data provided by these tools have allowed a detailed evidence-based conclusion on the reach and impact of the dissemination activities at the end of the project. During the project, it also provided WP8 leader and project management with the ability to discover, interpret and connect meaningful patterns in data, enabling them to improve these activities and/or choose to add or change dissemination channels. Analytics allow to quantify the effect of making these additions or changes and shows a defined path of optimization that leads to better results on all fronts. Below is an overview of analytics tools. More detailed information about the impact of the completed communication and dissemination actions can be read in D8.6 (*High Impact Communication report*).

The following tools were used for monitoring purposes:

Hootsuite

Hootsuite is a social media management tool which enables users to access many social networks from one account, divide engagement activity into social networks and streams and monitor what followers are saying. Users can post updates, read responses, schedule messages, view statistics and much more. More importantly, it also allows users to collect data and create reports for multiple Twitter and LinkedIn profiles from one dashboard. It helps users to:

- Determine which posts are popular and what kind of content users should post,
- Track down the best times and days to share content,
- See how people react to content and react accordingly,
- Create a clear and interesting overview of the organization and showcase the efforts to a wide audience across multiple platforms,
- View how many people react, share and like the content being shared.

Google analytics

Google also provides specific analytics tools to give its users better insights in their websites. The four key pillars of the programme are:

- Audience (who visits the website)
- Acquisition (how do they reach the website)
- Behaviour (what do they do once they are on the website)
- Conversions (have they subscribed to a newsletter, filled out a form etc.)

The above monitoring tools have been viewed on a monthly basis to keep WP8 leader and project management up-to-date and to see whether KPIs continue.

5.2.2.3 Publications

GreenCharge has disseminated (and will disseminate after the project) its results by using the traditional means of publications in journals and at relevant international conferences/workshops. In addition, relevant industrial/interest group events and publications have been used. The following relevant publication channels have been used for dissemination purposes:

- ***Reviewed Journals (several provide open access options)***
 - Institute of Electrical and Electronics Engineers (IEEE)
 - Springer – Web, Artificial Intelligence and Network Applications (WAINA) 2020
 - Springer – Complex, Intelligent and Software Intensive Systems (CISIS) 2020

- Springer – Journal of Ambient Intelligence and Humanized Computing
- Springer – Advanced Information Networking and Applications (AINA) 2021
- Inderscience – International Journal of Grid and Utility Computing

- **Other publications**

- Open Access government (<https://www.openaccessgovernment.org/>)
- Transportation-as-a-Service magazine (www.taas.news)

In addition, project results were disseminated through blog posts on the CIVITAS website and GreenCharge’s project website.

5.2.2.4 Research data repositories

Original research data (in an anonymized form) will be documented and archived in a research data repository as open research data, and thus placed at the disposal of colleagues who want to replicate the study or elaborate on its findings. Published information will include models of user’s behaviours and results of data analysis.

Zenodo

GreenCharge will use the open research data repository *Zenodo* to comply with the H2020 Open Access Mandate¹⁷. All scientific publications, including public deliverables and public parts of underlying datasets are being uploaded to the *H2020 GreenCharge Community*¹⁸ in addition to the *European Commission Funded Research (OpenAIRE) Community*¹⁹ in Zenodo.

Zenodo is a “catch-all” open research data repository which gathers research data across all disciplinary fields. The repository is hosted and managed by CERN. All data deposited to Zenodo is stored securely in the CERN Data Centre’s cloud infrastructure. More information about data management in GreenCharge project can be read in D1.1 (Data Management Plan). By making use of Zenodo, it is guaranteed that these results will be available for potential users, also if the project website is no longer online.

CIVITAS

After project completion, GreenCharge will also disseminate its public results (deliverables as well as other project outputs) through the CIVITAS website.²⁰ In this knowledge bank, results can be stored and made available to potential users. Since CIVITAS mainly addresses cities, GreenCharge’s results can be used by cities for defining and implementing their own e-mobility solutions and roadmaps.

5.2.2.5 Newsletters

In total, six newsletters have been produced and distributed electronically to about 1500+ recipients. The last newsletter will be published at the end of February 2022. These GreenCharge newsletters have made use of the Informed Cities Newsletter. Essentially, GreenCharge has been heavily profiled (alongside other mobility projects) in the Informed Cities Newsletter, including a click-through to a separate and subordinate GreenCharge newsletter which was branded separately and contained a fuller range of stories and results dedicated to GreenCharge. In the first Informed Cities Newsletter, GreenCharge was given a significant headline slot.

The newsletters contained meaningful content for practitioners as well and assisted in promoting the GreenCharge brand and concept. The newsletter was less focused on experts in the field but more focused on building a general understanding and acceptance of e-mobility. For detailed and complex project findings and information, the newsletter has referred to deliverables hosted on the project website and other sources of information.

¹⁷ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf

¹⁸ <https://zenodo.org/communities/h2020-greencharge/?page=1&size=20>

¹⁹ <https://zenodo.org/communities/ecfunded/?page=1&size=20>

²⁰ <https://civitas.eu/projects/greencharge#knowledge-bank>

The GreenCharge newsletters have been published as follows:

- Via a link contained within the *Informed Cities* newsletter
- Via links on social media (Twitter/LinkedIn)
- Via direct ‘ad hoc’ emails to professional contacts of the consortium partners
- Via passive browsing on the newsletter page of the GreenCharge website.

A consistent structure was used for the newsletter and can be found in the Communication Strategy and Plan (D8.1). Within a limited number of issues, the newsletter must give fair treatment to the breath of subject matter of the GreenCharge project. It must also be opportunistic in terms of tying into milestones that generate newsworthy content over the course of the project.

The main themes of each of the six newsletters can be found in Table 5-4.

Table 5-4: Newsletter themes and dates of publication

Newsletter number	Focus theme	WP focus	Foreword author	Date of publication
1.	Pilot cities	WP2	Joe Gorman (SINTEF)	February 2019
2.	Business models and prototypes for cities	WP3	Arno Schoevaars (PNO Consultants)	October 2019
3.	Evaluation of measures	WP5	Beniamino di Martino (University of Campania Luigi Vanvitelli)	March 2020
4.	EV roaming	WP4	Jürgen Werneke & Arjun Subramanian (Hsubject)	September 2020
5.	Reference Architecture	WP4	Shanshan Jiang (SINTEF)	September 2021
6.	Summary and goodbye	WP1	Jacqueline Floch (SINTEF)	February 2022

5.2.2.6 Dissemination Events

Self-organised events

GreenCharge partners have self-organised several dissemination events. This includes GreenCharge’s final conference, open days and webinars.

GreenCharge conference. During year 3 of the GreenCharge project, a larger (approx. 150 participants) 3-day Informed Cities Forum has gathered project partners and Uptake Cities with a cross-European mix of participants from local governments (at least 25 cities from 15 European countries), academia, business, NGOs and other organisations, to share and contest the project outcomes and results. Coordinated by ICLEI, the consortium has dedicated one edition of the established conference series ‘Informed Cities’ to the GreenCharge project. ICLEI has co-developed the programme together with the project partners, involving also other relevant H2020 projects of the same thematic area.

The Informed Cities Forum took place from 26 to 28 October 2021 under the title: “*Repurpose. Re-charge. Re-think. Heritage and e-mobility at the crossroads*”. The conference was co-organised by GreenCharge and OpenHeritage (<https://openheritage.eu/>). Due to the Covid-19 restrictions, it was held in a hybrid way: some of the speakers physically attended the event while attendees of the event joined the event digitally. Unlike other online conferences, Informed Cities Forum was organised as an interactive, collaborative event, which made use of innovative formats.

Open days. The project planned to arrange plenary meetings approximately every 8 months, each lasting 3-4 days. These were primarily intended for coordination of work within the consortium itself. Once a year, one full day of such meetings was planned to be designated as the “open day”. A selected group of external stakeholders was invited to each open day; some time was used for presentation of the project or results of the project, but most time was used for an open dialogue between the consortium partners and the external stakeholders. The presence of most key members of the project allows the arrangement of detailed one-to-one discussions on specific topics on an *ad hoc* basis.

Unfortunately, due to the Covid-19 restrictions only two physical open days took place (in Barcelona and Bremen). The planned open day in Oslo has not been held physically due to Covid-19 restrictions. However, external participants were invited for a virtual Oslo tour showing GreenCharge’s measures implemented at the Oslo pilot site.

Webinars. GreenCharge hosted 5 webinars during the project duration. These webinars included a 30-40 minute talk by 1-2 members of the consortium on project topics. This was followed by 20-30 minutes of questions and answers by attendees. These webinars were aimed at informing the Uptake City group on project progress and results and helping them with developing their own roadmap to e-mobility. The content of these webinars can be found in Table 5-5.

Table 5-5: Webinars content and dates of publication

Webinar number	Topic	GreenCharge participants	Date
1.	Introduction to the project	ICLEI, SINTEF	September 2019
2.	Roadmap to e-mobility	ICLEI	June 2020
3.	SUMP Guidelines	ICLEI, City of Bremen	March 2021
4.	Business model design – The role of cities	ICLEI, EGEN	September 2021
5.	Summary of roadmaps and lessons learnt	ICLEI	February 2022

External events

GreenCharge has disseminated its project results at relevant international conferences/workshops. For example, the project has presented the SUMP approach at city-related events of the EC like CIVITAS Forum, Transport Research Arena (TRA) etc. In addition, relevant industrial/interest group events have been used for disseminating technical project results.

During the project, GreenCharge’s SharePoint page has been used to maintain a list of upcoming relevant events and report on the events attended by GreenCharge’s consortium partners. At the end of the project, the partners have attended 30 external events to disseminate project results and get in touch with relevant stakeholders, ranging from large conferences (e.g. CIVITAS Forum, Smart City Expo World Congress) to smaller, dedicated, workshops (e.g. CIVITAS Evaluation Impact Workshop). A list of all the events attended for dissemination (and communication) purposes is displayed in D8.6 (*High Impact Communication Report*).

5.2.3 Lessons learned and adjustments in relation to the initial plan

Although a concrete dissemination plan was developed in the first year of the project, a number of aspects have changed with regard to the implementation of this strategy:

- The main changes in the strategy were related to attending and organising physical events. Due to the Covid-19 restrictions, as from February 2020 until now, it was practically impossible to organise or attend

physical events. However, after getting used to these restrictions many digital events were organised which were also attended by GreenCharge partners. Although these digital events were a good way to cope with the Covid-19 restrictions, it is more difficult to engage with relevant stakeholders during these digital events.

These restrictions were also the reason why GreenCharge's final conference was organised in a hybrid way. The fact that the project partners were used to the restrictions at the time of the event (October 2021) made it possible to organise a successful hybrid event and reach the relevant stakeholders.

- In addition, Covid-19 restrictions at the pilot cities have caused a significant delay with regard to the project results. This is also the reason why the project was extended by 6 months. This has resulted in the fact that not many new results could be disseminated at a certain point in time. In addition, several deliverables are still awaiting their formal approval from the European Commission. Nevertheless, the project partners shall ensure that these delayed results will be disseminated through the existing dissemination channels when these are available for publication.
- At the start of the project a wide range of exploitable results was identified. As mentioned before, these results have been developed all at their own pace and some results were expected to have a higher TRL level at the end of the project than other results. The Covid-19 restrictions also caused a delay in the development of some of the expected results. First, the plan was to develop similar exploitation plans (including light business plans) for all of the results identified before. However, it turned out to be difficult to have a similar level of detail in all of the plans since not all results were equally mature. This forced the partners involved in the exploitation process to make a prioritisation and distinguish between Key Exploitable Results and Main Results.

This change in relation to the initial plan enabled the project to develop detailed exploitation plans for some of the most promising results (in terms of impact, exploitation potential, etc.), including light business plans and concrete exploitation steps to be taken in the coming years.

5.2.4 After project completion

After project completion, GreenCharge's results will be disseminated through various channels. Partners will disseminate their results via their own dissemination channels (e.g. company website, attended events, etc.). In addition, GreenCharge open results will remain available through Zenodo, the CIVITAS website and the project website (see also section 5.2.2.4).

An overview of the dissemination channels that will be used for making the results available to potential users per result can be found in the confidential exploitation document. In this document GreenCharge partners describe the mechanism(s) that will be used to make the result available. These dissemination channels range from (scientific) publications to open source software and commercial events.

6 Communication report

This section provides a brief overview of the communication activities carried out during the project. Since D8.6 (High Impact Communication Report) provides a comprehensive description of GreenCharge's communication activities and corresponding impact achieved, this section will only provide in Table 6-1 an overview of the communication targets and the results that were actually realised.

Table 6-1: Impact measurement of communication KPIs

Tools	KPI	Expected results	Realized results	KPI Reached
Website	Number of unique visits	3,000	9.176 (KPI reached)	Yes
	Number of registered for upload	500	Not been registered during project	No
	Number of downloads of content	200	1.876 4271 persons visited the page https://www.greencharge2020.eu/deliverables/ . In total, 1867 visitors downloaded one of the deliverables	Yes
	Number of subscribers for the newsletter	200	97 people are directly subscribed through the GreenCharge newsletter and GreenCharge has 1200/1500 subscribers through ICLEI	Yes
Press coverage	Number of EU wide press releases	8	10	Yes
	Number of slots/articles	12	15	Yes
Publications	Number of newsletters	6	6	Yes
	Number of scientific/technical publications	6	12	Yes
	Number of brochures spread	300	5	No
Twitter	Number of Tweets	200	169	No
	Number of followers	200	404	Yes
	Number of retweets	50	258	Yes
LinkedIn	Number of followers	200	236	Yes
	Number of unique visits	200	271	Yes
	Number of posts	18	35	Yes
YouTube	Number of project videos	1	1	Yes
	Number of webinars	3	7	Yes
	Number of views	500	1.010	Yes
	Number of subscribers	50	1	No
Networks	Number of uptake cities	12	8	No
	Number of reference groups	3	3	Yes
	Number of actors accessible through partner networks	469	Not been measured during GreenCharge	No
Events	Number of large-scale events	1	7 (Events >100 audience size)	Yes
	Number of workshops	9	23	Yes
	Number of open days	3	1 (Due to COVID-19)	No
	Number of conferences	20	25	Yes

7 Conclusions and Further work

Conclusions

During the project, GreenCharge's initial dissemination and exploitation plan has been affected by the Covid-19 restrictions. Disseminating results through events was made impossible for a short time. However, this was made possible again by the accelerated emergence of virtual events and workshops. Although this enabled GreenCharge's partners to again disseminate their results, some effects of the Covid-19 restrictions have been of longer duration. Since the implementation of the pilots was delayed, a part of the results were not as developed as planned during the project.

In order to be still able to develop concrete exploitation plans, the partners involved in the exploitation activities have prioritised GreenCharge's results based on: the climate for change/competitors, potential impact, willingness to exploit, partner's ranking and evaluation results. By making a distinction between *Key Exploitable Results* and *Main Results*, it was possible to work on more detailed exploitation plans (including light business plans) for the most promising results. This not means that for other results (*Main Results*) no exploitation plans were developed. However, this prioritisation made it possible for the consortium to have a differentiation in the level of detail provided in the exploitation plans (since it is difficult to already describe concrete exploitation actions when the product is not yet market ready).

Concluding, the GreenCharge project has resulted in a wide range of project results, covering technology prototypes, evaluation results and lessons learned, recommendations and deployment guidelines, open specifications and business models. These results will be exploited in different ways (commercial as well as non-commercial), which is described in detail in the confidential exploitation document.

Further work

For achieving the highest impact with GreenCharge's innovations and results, it is very important to ensure that its results will be made available to potential users through dissemination and exploitation activities. Several activities were already carried out in order to make these potential users aware of GreenCharge's results (for example publications, presentations at events), but most of the actual exploitation activities will take place after project completion.

For each of the results exploitation plans have been made. These exploitation plans describe the type of exploitation, exploitation strategy, dissemination means, messages to promote target audience(s) and the communication channels that will be use for promotion of the result. In addition, these plans provide insight into the exploitation actions that are planned for the years after project completion. These exploitation plans are provided in the confidential exploitation document and demonstrate GreenCharge's partners commitment to exploiting the project results.

Regarding dissemination of the results, the consortium will ensure that the public deliverables that still have to be approved will be published (after approval) on the project website and CIVITAS website. In addition, open results will be made available through Zenodo.

Appendix A – Template for collecting information about GreenCharge’s KERs

The table below has been used for collecting and grouping the (confidential) information about the exploitation strategy for GreenCharge’s KERs. The right column in the table describes the requested content per row. This table is completed for each KER in cooperation with the various project partners involved.

KER (Key Exploitable Result) Description [To be completed by partner responsible for the KER]	
Brief Description	<p>Write just a few lines to summarise what the result IS.</p> <ul style="list-style-type: none"> Describe what the problem is (customer/ societal point of view) Describe the proposed solution
Type/Format	Is it a report? A brochure? An academic paper? A project deliverable (document)? A piece of software? Hardware? A mixture of these?
Potential Users/Stakeholders/Market	<p>What types of people or organisations would want to use this result? Remember that there can sometimes be multiple “levels” of users. EG: For a piece of software: A “Lead User” could be a software company wishing to incorporate the result into some software product/tool they develop, and “End User” could be a member of the public using the tool.</p> <p><u>For results with commercial potential:</u> Include an overview of the type of market and (if possible) the potential revenue (maybe projected for different numbers of years in the future).</p>
Benefits for users/Value proposition	<p>For each user group identified above, explain why they might want to use the result, for what purpose.</p> <p><u>For results with commercial potential:</u> Describe the “value proposition” for customers.</p>
Competitors	<p>Who are your "competitors" (note: they are the ones offering "alternative solutions")?</p> <p>What are their strengths and weaknesses comparing to you?</p>
Contributing main project results	List the main results from p7/8 of DoA part B that contribute to this result (R_TP etc.).
Contributing deliverables	List the project deliverables that contribute to this result. Note that: (a) It is not necessary to list WPs, as that is clear from the deliverable number; (b) In cases where there are multiple deliverables that are in reality versions of the same thing, list only the one with latest delivery date (it should contain all information/knowledge that we consider potentially useful after the project).
Potential impact (contribution to potential impact)	<p>Describe impact in terms of growth/benefits for the society.</p> <p>See expected impacts described in DoA section 2.1</p>
IPR Registry Information	
Ownership	<p>List the names of the partners contributing to the result, with the percentage ownership of each shown in brackets. This is something that the partners need to agree about. The normal way to do so is to relate it to the number of PMs each partner has planned in the contributing deliverables.</p> <p>NB: In some cases. An initial definition of “Owner” is defined in the draft IPR Registry in the DoA, section 2.2.5.</p>

Restrictions on use of background during project and/or for exploitation	<p>List any background provided by a partner which other partners may need access to in order to carry out their work in the project, or to exploit their own results afterwards.</p> <p>“Background” means knowledge/technology brought to the project, something that they produced outside/before the project.</p> <p>List any restrictions that may apply.</p> <p>“Restrictions” can include limitations on what can be used, how it can be used, conditions for use, or a requirement to pay for usage (e.g., pay a licence).</p> <p>NB: If any restrictions apply, they should have been defined in the project’s Consortium Agreement – so use that as a source. If no restrictions apply, state that explicitly.</p>
Access rights to results <i>during</i> project	<p>List any restrictions that may apply during the project to the use of project results by partners other than the owners.</p> <p>“Restrictions” can include simple things like “Use allowed only for work directly related to project activities”.</p> <p>NB: This refers to <u>results</u> (sometimes also referred to as “foreground”): i.e., what gets developed during the project using project funding. It is not the same as restrictions on “background” defined above.</p>
Access rights to results <i>after</i> project	<p>List any restrictions that may apply after the project to the use of project results by partners other than the owners.</p> <p>“Restrictions” can include, e.g., the requirement to have to pay a licence for use of the result, at normal commercial terms. [As for the row above: remember that this refers to <u>results</u>, not background].</p>
IPR protection mechanisms to apply outside/after project	<p>There are a wide range of choices here e.g. “None needed”, “Industrial secret”, “Patent”, “Copyright”, “Software Licence”, “Open Source [with specific licence]”, “Creative Commons Licence” etc.</p> <p>In the draft in the DoA the simple text “Restricted” was defined for many results. We would expect this to be made more specific as the project proceeds.</p>
<p style="text-align: center;">Exploitation Planning [To be completed by partner responsible for the KER]</p>	
Partners involved (lead shown first)	<p>This will very often be the same as the set of partners who are “Owners” of the result. But note that:</p> <ol style="list-style-type: none"> 1. For a commercialise result, it can happen that some non-commercial partners are owners and are not involved in commercialisation, leaving that to commercial partners (perhaps receiving royalties in compensation). 2. It can happen that partners who were not involved in production of a result are nevertheless involved in activities that promote the result. The Coordinator and Dissemination Manager are very often in that position, being involved in promotional activities for the whole project. But it can apply to others too.

Type of exploitation	<p>Is it commercial exploitation? If so, will it be by selling a product, offering a service or what?</p> <p>Remember that there are many possible types of exploitation – the word really just means “use”. Results can be “used” in many different ways that are not necessarily commercial in nature. Write a few words here about what type of use is envisaged.</p> <p>Direct use:</p> <ul style="list-style-type: none"> Commercialisation: deployment of a novel product/service (offered to the target markets) Contract research (new contracts signed by the research group with external clients) A new research project (application to public funded research programmes) Implementation of a new university – course (Note that a training course is a service) <p>Indirect use:</p> <ul style="list-style-type: none"> Assignment of the IPR Licensing of the IPR Development of a new legislation/standard Spin- off
Overall exploitation strategy	Write a short summary of the overall approach to encouraging uptake of the result by target users. More details should appear below in “Exploitation Schedule”.
Dissemination means	<p>What means will be used for the result to be made available for use by its potential users?</p> <p><u>Examples:</u> Publications, report made available on web page, software made available open source, software made available as part of a larger package with licence payment, software made available as stand-alone app based on subscription licence etc.</p> <p>NB: This is <u>NOT</u> about promoting the result: it is purely about what mechanism(s) will be used to make the result available to its users.</p>
“Messages” to promote to target audience(s)	What are the key things that potential users of the result need to be made aware of in order for them to become interested in using the result? Note that different types of users form different “audiences”, and the “message” may vary from one to another.
Communication channels to use for promotion to target audience(s)	<p>For each of the “Messages” above, what is the best way to communicate it to the different types of audience?</p> <p>Web page? Academic publication? Industrial publication? Presentation at conference, workshop or other type of event? Visit them at their offices? Make use of social media?</p>

Exploitation Schedule		
Approx. Date	Goal	Actions planned to achieve goal
Between “Now”and “2 years after end of project”. The number of rows, and the timescale, may vary from result to result. Typically, 3-5.	What we want to achieve by the date. E.g., a TRL level, a certain number of users, a certain income from licences, goals linked to communication strategies.	<p>Write something to explain what <u>steps will be needed</u> to achieve the goal. Can be fairly high-level.</p> <p>Make sure you do not just focus on technical activities (realisation of a prototype, software interface, etc) but also consider the finalisation of a business plan, the protection of intellectual property, the collection of authorisations, the communication activities, all it will be needed to start implement what is in your exploitation plan.</p> <p>Only use TRL in goals for technical results. If you do use TRL: instead of just listing the number, write a few words about what needs to be achieved to attain that level for the type of result.</p>

Appendix B – Characterisation Table

KER name	
Problem	<p><i>Describe the problem you are addressing (the problem your potential users have).</i></p> <p><i>Potential users are the people, companies, organisations, etc. that you expect will use the result (and generate an impact). They are your “Customers”.</i></p>
Alternative solution	<p><i>Describe how your “customer” has solved the problem so far.</i></p>
Unique Selling Point USP - Unique Value Proposition UVP	<p><i>Describe the competitive advantages, the innovative aspects. What does your solution do better, what are the benefits considering what your user/customer wants, how does your solution solve his/her problem better than alternative solutions, what distinguishes the KER from the competition / current solutions?</i></p>
Description	<p><i>Describe in a few lines your result and/or solution (i.e. product, service, process, standard, course, policy recommendation, publication, etc.). Use simple wording, avoid acronyms, make sure you explain how your UVP is delivered.</i></p>
"Market" – Target market	<p><i>Describe the market in which your product/service will be used/can "compete", answering the following questions:</i></p> <ul style="list-style-type: none"> - <i>What is the target market?</i> - <i>Who are the customer segments?</i>
"Market" – Early Adopters	<p><i>Early adopters are the “customers” you are willing to address first. They are usually the ones that feel the problem harder than all the others. (they are not the project partners).</i></p>
"Market" Competitors	<p><i>Who are your "competitors" (note: they are the ones offering "alternative solutions")?</i></p> <p><i>What are their strengths and weaknesses comparing to you?</i></p>
Go to Market – Use model	<p><i>Explain what is your “use model”, how the KER will be put in use (made available to "customers" to generate an impact). Examples of use models: manufacturing of a new product, provision of a service, direct industrial use, technology transfer, license agreement, contract research, publications, standards, etc.</i></p> <p><i>Note training is a service.</i></p>

Go to Market - Timing	<i>What is the time to market?</i>
Go to Market – IPR Background	<i>What is the Background (type/ partner)? Provide information considering also what already agreed in the Consortium Agreement.</i>
Go to Market – IPR Foreground	<i>What is the Foreground (type/ partner)? Provide information considering also what already agreed in the Consortium Agreement.</i>

Appendix C – Template for Light Business Plans

PROBLEM OR NEEDS OF CUSTOMERS:
SOLUTION:
Value proposition: <i>A value proposition is a statement which identifies clear, measurable and demonstrable benefits consumers get when buying a particular product or service. It should convince consumers that this product or service is better than others on the market.</i>
Business model: <i>How you will make money, including the costs of production and selling, and the price that customers will pay?</i>
Target market: <i>Who is your customer and how many of them are there? How to reach these customers? It is best to define your ideal customer by starting with a broad audience and whittling down using the TAM, SAM, SOM model²¹. This also gives potential investors a clear picture of your thought process and understanding of the greater consumer market.</i>
Competitive advantage: <i>What makes you different from your competition and how will this lead to greater success, customer loyalty, etc.</i>
Management team: <i>The management structure of your business, including currently field roles, ideal candidates and any management gaps. This section is your opportunity to paint a picture of your team and showcase their finest attributes. For startups or companies that are looking to expand, there may be team members you know you are lacking. These members and their roles, and the plan to fill those holes, can also be described in this section.</i>
Financial summary: <i>Key financial metrics including profit and loss, cash flow, balance sheet, and your sales forecast. This section may be the most difficult part to condense, so try and focus on standard business ratios to get the point across. This will serve as an overview of your current business financials and projections for growth.</i>
Funding required: <i>What funding do you need in advance to bring the product to the market? What funding is needed for upscaling? A timeline can be added so that the steps to be taken and corresponding funding needed becomes more concrete.</i>

²¹ TAM = Total Addressable/Available Market > SAM = Serviceable Available Market > SOM = Service Obtainable Market. See <https://www.liveplan.com/blog/the-importance-of-tam-sam-and-som-in-your-plan/> for details

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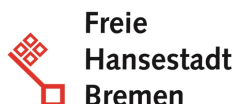
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