



D2.2: List of users and stakeholders engaged for the use cases

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Technical References

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0. EXECUTIVE SUMMARY

This document is the deliverable “D2.2 - List of users and stakeholders engaged for the use cases” of the H2020 project INCIT-EV (project reference: 875683).

This deliverable aimed at identify users for their involvement in the project use cases and stakeholders for the development of the INCIT-EV users methodology and strategies.

The main goal of the activity was the identification of the stakeholders and users categories that should be considered to contribute in the INCIT-EV project. The SEROI+ methodological approach was adopted to identify the different stakeholder groups and categories by means of an analysis and review of different sources concerning the topic of the INCIT-EV project.

This review helped to identify the four stakeholders/users key groups that are generally most influenced by the transport policies: Government, Business, Research and Civil society. Similarly, two key groups for users were identified according to two classes of EV use: Private (including early adopter, electric car owner and electric car-sharing users) and Business/Administration (including private and public sector companies).

Later, different stakeholder and user categories within each key-groups were also identified taking into account which categories can influence directly or indirectly the charging network development considering the corresponding potential role in the diffusion of electromobility and charging infrastructure.

After, a list of the most relevant entities per country have been established by means of partners contribution. This list includes entities belonging to profiles such as car manufacturers, mobility planners, technologies providers, mobility companies, construction companies, final users or policy makers.

The delivery of this deliverable is done in accordance to the description in the Grant Agreement Annex 1 Part A, with no time deviation and no content deviation from the original planning.

0.1 Acronym Table

Acronym	Definition
CPO	Charging Point Operator
CS	Charging Station
DSO	Distribution System Operator
EMP	E-Mobility Provider



Acronym	Definition
EV	Electric Vehicle
GDPR	General Data Protection Regulation
ICT	Information and Communication Technology
NGO	Non-Governmental Organization

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1. INTRODUCTION

This document is the deliverable “D2.2 – List of users and stakeholders engaged for the use cases” of the H2020 project INCIT-EV (project reference: 875683).

The deliverable D2.2 has been developed within the task T2.2 (Stakeholders and users involvement) of the INCIT-EV project aiming at engaging users for their involvement in the project use cases (WP7 and WP8) and stakeholders for the development of the INCIT-EV users methodology and strategies (T2.5).

The main goal of the activity was the identification of the stakeholders and users that should be considered to contribute in the INCIT-EV project. The activity was performed by considering existing classification of the key groups in past EU projects and considering partners' contributions thanks to experiences they gained during other similar EU, national or local projects. For this reason, according to SEROI+ methodological approach, different stakeholder groups were selected according to which sector they belong to, mainly divided in the following 4 fields: Government (respond to policy and legal framework), Research (ensure designing under quality and innovation criteria), Business (suit market needs) and Civil society (respond to societal challenges). Later, different stakeholder and user categories within each key-groups were also identified taking into account which categories can influence directly or indirectly the charging network development considering the corresponding potential role in the diffusion of electromobility and charging infrastructure. Similarly, two key groups for users were identified according to two classes of EV use: Private (including early adopter, electric car owner and electric carsharing users) and Business/Administration (including private and public sector companies). This deliverable also includes the definition of the stakeholder and users categories identified during the Task 2.2.

After, a list of the most relevant entities per country was established by means of partners contribution. This list includes entities belonging to profiles such as car manufacturers, mobility planners, technologies providers, mobility companies, construction companies, final users or policy makers. The list did not start from scratch, but it is based on the knowledge that the project consortium have on the field and previous experiences. Indeed, some EU stakeholders have been already involved during the project proposal preparation phase through Letters of Commitment.

The involvement of stakeholders and users within the project will lead to the identification of strategies to incentivize different categories of users in the use of EV and to develop network infrastructure in partners' cities where use cases will be developed. The discussion among engaged users will draw up recommendations for the elaboration of European strategies for the integrated and sustainable development of electric charging infrastructures, mobility, land use and energy. Moreover, the collaboration between users and stakeholders will foster the development of collaborative business models, in which the information sharing between the different stakeholders will lead to potential benefits for the entire system. In addition, discussion and participative work of the engaged users will draft recommendations for the elaboration of European strategies to foster electric mobility acceptance.

Additionally, stakeholders and users will be engaged during the project. In particular (T2.3), users will be involved in online questionnaires in at least 10 EU countries to uncover the users' views on electric versus fossil energy and to analyse the attributes of electric vehicles with respect to fossil vehicles and of the different charging systems.



Users will also be involved in Human-centric use cases development during all the stages of the use cases deployment within partner's cities (design, prototyping and testing) providing inputs through brainstorming sessions and hands-on approaches.



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2. STAKEHOLDERS AND USERS IDENTIFICATION

The identification of stakeholders and users to be involved in the project was based on a methodology which take into consideration the experience gained by partners in past EU projects or during other similar national or local projects related to the electromobility.

Moreover, within the proposed methodology, other sources have been analyzed by considering existing European and national documentation on electromobility projects, as well as platforms concerning the promotion of the diffusion of the electromobility through the involvement of stakeholders and users. In this reason, according to the goal of the projects presented in these documentations, the identification of the stakeholders and/or the users to be involved can be different. In other words, within each project, the stakeholder, entity or user taken into consideration depends on the goal of the project itself.

2.1 A methodology for the stakeholder/user identification

2.1.1 Stakeholder Analysis

The Stakeholder Analysis (SA) is a methodology meant at identifying stakeholders and understanding their potential role and position when developing and/or implementing a policy, program, process.

This analysis can help to recognize possible conflicts and coalitions between stakeholders, and how these, in turn, may affect the policy, program, or process in terms of geographical coverage, integration, resource availability and overall legitimacy.

With information on stakeholders, their interests and their capacity to support or oppose the INCIT-EV project, project promoters can choose how to best accommodate them, thus ensuring that project goals, like the identification of strategies to incentivize different categories of users in the use of EV and to develop network infrastructure, are realistic and sustainable.

The methodology proposed to identify the stakeholder/user is based on the SEROI+ tool and methodology (<http://seroi.plus>). The SEROI+ methodology is a three-steps approach for the identification, the engagement and the monitoring of the stakeholders.

In the first step a list of stakeholders key-groups and categories is identified through the review of existing information on documentation related to a specific topic (e.g. electromobility). The objective is the creation of a stakeholder register including all relevant entities classified according to the stakeholder key-groups and categories.

In the second step, the creation of a stakeholder engagement plan is promoted by finding the most appropriate way to engage stakeholders. A Stakeholder Engagement Plan is a formal strategy to communicate with project stakeholders to achieve their support for the project according to the level of interest.

In last step, a stakeholder monitoring register is proposed by monitoring reporting and evaluating the stakeholder engagement. It examines the usefulness of the campaign to achieve the general objective, collecting feedback and elements from stakeholders.



According to the SEROI+ methodology, the first step was used here for the identification of stakeholder/user categories to be involved in INCIT-EV project.

2.1.2 Review of existing information

Initially, different written documents (plans, programmes, studies, etc.) related to the topic of the INCIT-EV project have been analyzed. This review helped to identify potential stakeholders and users categories to support the delivery of the following project goals: the identification of potential strategies to incentivize different categories of users in the use of EV and to develop network of charging infrastructure. Examples of some documents considered are described below.

2.1.2.1 Memorandum of Understanding by SGEMS

The Sub-group to foster an Electro-Mobility Market as Services (SGEMS), for instance, elaborates a memorandum of understanding for involving stakeholders in fostering the EV costumers experience in Europe. The goal was to make customers capable of seamlessly and valuably accessing charging infrastructure for EVs, including receiving transparent information for services payment, where interoperability, as the ability to enable various systems to work together, is seen as the critical feature. In this reason, the stakeholder and users considered were:

- Electric vehicle manufacturers
- Electric Utilities (Energy Retailers and Distribution System Operators)
- Charging Point Operators (CPO)
- Technology Suppliers (e.g. charging stations, hardware, software)
- Electro-Mobility Service Providers (EMSP)
- Roaming Service Providers (RSP)
- Industrial Representative Associations
- User associations

2.1.2.2 Strategy Report of North Sea Region - Electromobility Network

Similarly, the North Sea Region Electromobility Network identified the stakeholder strategies for realizing an electric vehicle recharging infrastructure as a fundamental prerequisite to promote the diffusion of electromobility in European Nordic countries (i.e. Germany, Belgium, UK, Sweden, etc.). In fact, the realization and the operation of charging stations involve a wide variety of stakeholders for the commercial viability of EV recharging networks. In this light, the stakeholders considered in the project were:

- National government
- Local government
- Grid operators
- Electricity producers and retailers
- Traditional gas station operators
- Dedicated charging network operators and service providers



2.1.2.3 Report on the future of electromobility by Institute of Transport Economics

Further, the Institute of Transport Economics in Norway, within a national project (COMPETT) for studying and promoting the use of electric vehicle, prepared a report surveying national and regional stakeholders' experiences in electrified transport such as the regional potentials and barriers for EVs and the use of recharging facilities. The stakeholders considered were of three types, excluding ones from institutions expected to be more opposed to electromobility:

- Authorities at national, regional and local level
- Non-government organizations (NGOs) working in environmental affairs including electromobility, in road traffic and in energy issues
- Car businesses, i.e. EV importers and dealers.

2.1.2.4 Electro-mobility Platform

Considering existing platforms, the Electro-mobility one is promoting a sustainable, multimodal transport system in which people and goods are predominantly moved across land in Europe using sustainable electricity. In this platform many stakeholders are currently involved to drive the development, implementation and support for sustainable European Union policies, programs and initiatives to move people and goods by electro-mobility. The stakeholder categories as member of this European platform are:

- Electric vehicle manufacturers
- Distribution and Transmission System Operators
- Charging Point Operators (CPO)
- Technology Suppliers/Providers (e.g. charging stations, hardware, software)
- Industrial Representative Associations
- User associations

2.1.2.5 Existing scientific literature

Concerning existing scientific papers, there is a wider literature discussing the involvement of stakeholders in the diffusion of EV market, the electromobility and the charging infrastructures.

Bakker et al studied the strategies of the most relevant stakeholders with regard to the development and commercialization of electric vehicles (EVs) and their recharging infrastructure. This study relates the strategies of stakeholders to their current and future interests, as well as to their expectations with regard to EVs. The analysis was based on a series of interviews with representatives of a variety of stakeholders in the Netherlands, belonging to the following categories:

- National government
- Local governments
- Car manufacturers
- Electricity producers
- Electricity grid operator
- Oil companies
- Dedicated infrastructure provider



Wolbertus et al analyzed the disagreement about how, when and which kind of charging infrastructure should be developed and for what reasons. These reasons differ for each stakeholder, according to the different perspective on the expected future EV charging infrastructure. The study identified the different understanding of the long-term perspectives regarding the future of charging and identified the largest areas of dispute that need policy makers' attention, by considering the following stakeholder categories:

- National government
- Local governments
- Car manufacturers
- Charging point manufactures
- Charging point operators
- Service provider
- Energy utilities
- Grid operators
- Universities
- Research centers

Santos et al investigated the perceptions from experts and stakeholders and their opinions about the potential impact of incentives for the development of a quick penetration of electric vehicles in the European countries. Despite the stakeholders involved in the analysis coming from different European countries (Germany, Austria, Spain, the Netherlands and the UK), they belong to the following main categories:

- National government
- Local governments
- Public company
- Non-profit organizations
- Automotive industry
- Academic experts
- Fleet operators
- Private company

Hans et al studied the vision of different stakeholders on a transition to more environmentally friendly vehicles in Belgium to demonstrate that a significant technological change and reduction of the environmental impact of transport in the future can only be obtained in a very ambitious policy scenario. To this aim stakeholders meetings were organized considering the following categories:

- Policy makers
- Non-profit organizations
- Users
- Automotive industry



2.1.3 Develop a list of stakeholders/users key groups

A stakeholder/user is any entity or subject with a declared or conceivable interest or stake in the project development and its outcomes. The range of stakeholders/users relevant to consider for analysis varies according to the complexity of the project targets and the type of solution proposed within the project. Stakeholders can be of any form, size and capacity. They can be individuals, organizations, or unorganized groups. Stakeholders also include who will ultimately be affected – positively or negatively – by the development of the electromobility which means target users such as, for example, citizens, different social groups or professions, certain city districts, individual organizations, students, tourists.

The following list, as also pointed out by the review of the existing information, refers to the four stakeholders/users key groups that are generally most influenced by the transport policies:

- **Government:** local authorities, neighboring cities, local transport authority, traffic police, other local transport bodies, other local authority bodies, politicians, other decision-makers, partnering organizations, project managers, professional staff, emergency services, health & safety executives, European Union, Ministry of transport, other national ministries, regional government;
- **Business:** transport operators/providers, transport consultants, car-sharing companies, bike and e-scooter sharing service, bicycle rental operators, other mobility providers, national business associations, major employers, private financiers, international/national business, regional/local business, local business associations, small businesses, retailers, utility services (e.g. electric, telecoms), engineers/contractors;
- **Civil society:** national environmental NGOs, motorist associations, trade unions, media, local authority Forums, local community organizations, local interest groups, cycle/walking groups, public transport user groups, transport users, citizens, visitors, citizens in neighboring cities, landowners, transport staff;
- **Research:** research institutes, universities, training institutes, experts from other cities, research foundations.

Table 1 shows, for each of the previous key groups, why a project partner should involve them and which are their main relative interest and benefits.



Key Group	Reasons to involve	Interests/Benefits
Government	<ul style="list-style-type: none"> - Provision of access to data required - Contribution of expertise - Ensure the usefulness and relevance of the of project outcomes to policy in transport - Evaluation and approval of project outcomes - Foster dissemination of results - Promote wider adoption and replication of the project outcomes - Liaison to other entities and involvement of citizens 	<ul style="list-style-type: none"> - Reach sustainable mobility goals
Business	<ul style="list-style-type: none"> - Provision of technical expertise - Evaluation and validation of project outputs - Implementation and replication of project outputs - Foster dissemination of results among customers - Promote adoption among customers 	<ul style="list-style-type: none"> - Increased local publicity - Catching new customers
Civil Society	<ul style="list-style-type: none"> - Awareness-raising - Exercising pressure on governments and companies - Ensure policies acceptance and adoption - Evaluation and approval of policy outputs - Ensure usefulness and relevance of project outputs - Foster dissemination and adoption of project results - Networking with organizations and link to individuals 	<ul style="list-style-type: none"> - Protection from climate change impacts - Increased local publicity - Interest in using new products/services
Research	<ul style="list-style-type: none"> - Provision of access to relevant research results - Foster research - Sharing scientific expertise and provision of advice - Evaluation and approval of project outputs - Networking 	<ul style="list-style-type: none"> - Publications - New research opportunities - Networking



2.1.4 Identification of stakeholders and users categories

Within the Task 2.2 a list of stakeholders categories potentially affecting or influencing or interested in the development of charging infrastructures for the deployment of EV, and a list of users interested in using the charging infrastructure and EVs were identified

Stating the analysis performed during the methodological approach on the existing national or European project, considering the experience gained by partners in past EU projects or during other similar national or local projects related to the electromobility and considering the aim of the INCIT-EV project, the stakeholders and users categories were finally identified, according to the key-groups identified in the previous section, as represented in Table 1 and Table 2.

The stakeholders have been classified according to their belonging to one or more of the four key groups (Government, Research, Business, Civil society), and with reference to their level of involvement in the development of the network (direct involved, such as mobility planners who can, for instance, address local funds to increase the number of electric charging infrastructures in the area, or indirectly involved, such as research institutes or charging station manufactures which do not contribute directly to the development of the electric charging infrastructure network.

Table 1 – Stakeholders categories to be engaged/involved in INCIT-EV project

	Stakeholder	Key Groups			
		Government	Research	Business	Civil society
Directly involved in the network development	Local public authority (e.g. mobility planners, policy makers)	x			
	Charging Point Operator (CPO)			x	
	E-Mobility Provider (EMP)			x	
	Fuel station company (petrol stations)			x	
	Motorway company/operator			x	
	Land and parking space owner (supermarket, mall, parking area, ...)			x	
	Power grid operator (DSO)			x	
Indirectly involved in the network development	Regional public authority (e.g. mobility planners, policy makers)	x			
	National public authority (e.g. mobility planners, policy makers)	x			
	Energy (electric) utility			x	
	EV manufacturer (cars, vans, motorbikes, bikes, etc.)			x	
	Charging Station manufacturer			x	
	ICT/tech provider				
	Public Research Institute		x		
	Private Research Institute		x		
	University		x		
	Start up			x	
	Private drivers association				x
	Transport and logistic sector association			x	
	Association/Organization promoting electromobility				x
	Environmental organization				x
	Telecom operators			x	
E-mobility roaming platform operators			x		
Mobility service information providers			x		



	Stakeholder	Key Groups			
		Government	Research	Business	Civil society
Directly involved in the network development	Local public authority (e.g. mobility planners, policy makers)	x			
	Charging Point Operator (CPO)			x	
	E-Mobility Provider (EMP)			x	
	Fuel station company (petrol stations)			x	
	Motorway company/operator			x	
	Land and parking space owner (supermarket, mall, parking area, ...)			x	
	Power grid operator (DSO)			x	
Indirectly involved in the network development	Regional public authority (e.g. mobility planners, policy makers)	x			
	National public authority (e.g. mobility planners, policy makers)	x			
	Energy (electric) utility			x	
	EV manufacturer (cars, vans, motorbikes, bikes, etc.)			x	
	Charging Station manufacturer			x	
	ICT/tech provider				
	Public Research Institute		x		
	Private Research Institute		x		
	University		x		
	Start up			x	
	Private drivers association				x
	Transport and logistic sector association			x	
	Association/Organization promoting electromobility				x
	Environmental organization				x
	Telecom operators			x	
E-mobility roaming platform operators			x		
Mobility service information providers			x		



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As noticeable from Table 2, users categories were further subdivided according to the potential use of EV as private or for business and administration.

Table 2 – Users categories to be engaged/involved in INCIT-EV project

	End Users
Private use	Car households (no EV)
	Private electric car owner
	Private electric commercial vehicle owner
	Shared electric vehicle user (car-sharing, car rental, company electric fleet, school/university electric fleet, etc.)
	Tourist
Business and administration use	Retailer-shopkeeper
	Tradesperson
	Firms/businesses
	Delivery service company
	Healthcare organization
	Private security
	Public Utility (Refuse collection, energy utilities, water company, etc.)
	Public Service (Post, Police, etc.)
	Taxi company
	Ride-hailing company
	Car rental company
	EV-sharing company (cars, motorbikes, bikes, etc.)
	Public administration
Public transport company	



	End Users
Private use	Car households (no EV)
	Private electric car owner
	Private electric commercial vehicle owner
	Shared electric vehicle user (car-sharing, car rental, company electric fleet, school/university electric fleet, etc.)
	Tourist
Business and administration use	Retailer-shopkeeper
	Tradesperson
	Firms/businesses
	Delivery service company
	Healthcare organization
	Private security
	Public Utility (Refuse collection, energy utilities, water company, etc.)
	Public Service (Post, Police, etc.)
	Taxi company
	Ride-hailing company
	Car rental company
	EV-sharing company (cars, motorbikes, bikes, etc.)
	Public administration
	Public transport company

In addition, the level of interest of each entity as suggested by INCIT-EV partners is also considered. In fact, for each suggested entity to be involved in the project, partner also identified the level of interest for each of them in participating/contributing in use cases of the INCIT-EV project. This will help in the definition and identification of stakeholder engagement actions during the INCIT-EV project according to the presented methodology (SEROI+) by taking also into account the potential level of interest/influence of the stakeholders (see Table 1) in the development of a charging network for EV.

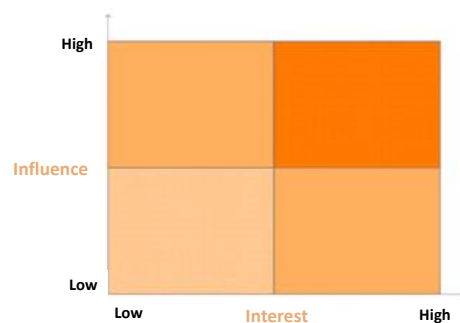


Figure 1. Example of stakeholder attribute grid.



3. STAKEHOLDERS AND USERS DEFINITIONS

According to the stakeholders and users categories identified above, the definition for each categories has been presented in the following subsections.

3.1 Stakeholders definitions

Stakeholder	Definition
Local public authority	Any government or other public administration, including public advisory bodies, at local level (e.g. mobility planners, policy makers); any natural or legal person performing public administrative functions under national law, including specific duties.
Charging Point Operator (CPO)	Company operating a pool of charging points. A CPO provides value by connecting smart charging devices to E-mobility Service Providers. A CPO is also responsible for the installation, operation and service thereof.
Electro-Mobility Provider (EMP)	Company offering an EV charging service to EV drivers. An EMP provides value by enabling access to a variety of charging points around a geographic area. Moreover it helps EV drivers find charging stations, start charging events and pay with various methods. Typically EMPs serve only registered customers, but may also enable access for unregistered users, as is sometimes mandated by local law. It also provides access to charging stations for vehicle users via charging cards or apps.
Fuel station company (petrol stations)	Company that produces fuels and clean fuels. It distributes fuels to drivers through fuel retailers and fuel stations. It maintains, operate sand services public and private fueling stations for motor vehicles.
Motorway company/operator	Company which, through a public concession, builds and manages the motorway network and collects tolls.
Land and parking space owner	Company or entity that owns land or space for parking vehicles (e.g. supermarket, mall, parking area, ...). These spaces can be inside commercial areas and can be used by customers accessing the commercial area.



Stakeholder	Definition
Power grid operator (DSO)	Company or entity managing (and sometimes owning) the electric distribution networks at local (city) level, operating at low, medium and, in some states, high voltage levels (LV, MV, HV).
Regional and National Public authorities	Any government or other public administration, including public advisory bodies, at regional/national level; any natural or legal person performing public administrative functions under national law, including specific duties.
Energy/Electric utility	Company in the electric power industry (often a public utility) that engages in electricity generation and distribution of electricity for sale generally in a regulated market.
EV Manufacturers	Company that has as a core business the construction, the selling and the distribution of electric vehicles.
Charging station manufacturers	Company that creates charging stations in which electric vehicles can recharge the battery
ICT/tech provider	Company providing ICT or technology solutions (also technical architectures) to be implemented/installed in charging stations.
Universities, Public and Private research institutes	Universities are high-level educational institutions in which academic research is done. Research institutes are organizations involved in research and development but outside of the higher education sector and often in close cooperation with users. Research institutes may specialize in basic research or may be oriented in applied.
Start up	Company or project, in the first phases of the activity, initiated to seek, effectively develop, and validate a scalable business model. Moreover, startups refer to the new businesses that intend to grow large.
Private drivers associations	Group of drivers, representing the interests of the members, created to share information and data about mobility.
Transport and logistic sector association	Associations involved in transportation and all the issues linked with, promoting and representing the interests of the members in the transport and logistic industrial sector.



Stakeholder	Definition
Association/Organization promoting electromobility	Groups developing the interest towards electric vehicle, in purchasing, usage and in renting.
Environmental organizations	Entity monitoring environment situation (in terms of air pollution, greenhouse gas emissions, etc.), and promoting actions for a sustainable development of the mobility.
Telecom operators	Companies that sell services of communication and connectivity to the Internet for most of the public chargers based on 3G, 4G or 5G data communication.
E-mobility roaming platform operators	Operators enabling electric mobility roaming by acting as an interface between a diversity of dissimilar systems.
Mobility service information providers	Providers of information about mobility and traffic congestions to travelers/drivers, for example offering geolocation services to find an available charger.



3.2 Users definitions

EV User	Definition
Private electric car owners	Owners of an electric passenger car used for personal purpose.
Private electric commercial vehicle owners	Owners of an electric car or vehicle (i.e. Light Commercial Vehicle) used to conduct business.
Car households	Owners of a conventional passenger car used for personal/family purposes.
Shared electric vehicle user	Users who use a service of car sharing or renting. The vehicle used is based on electromobility.
Tourists	Users visiting a city/town or a Country for tourism with their own car or a rented vehicle.
Retailers and Shopkeepers	Their main activity consists in selling and distributing and delivering different kind of products to customers.
Tradesperson	A worker who specializes in a particular occupation (e.g. electrician, plumber, etc.) using vehicles for business activities.
Firms/Business	Companies with fleet vehicles for business purpose.
Delivery service company	A company that sells the service of food transportation/delivery with bike riders, motorbike riders or car rider.
Ride-hailing companies	A company that matches passengers with vehicles, via website and mobile apps.
Healthcare organisation	An organization that delivers health care services to meet the health needs of target populations.
Private security	A business company, which provides security services and expertise to private and public clients.



EV User	Definition
Public Service (Post, Police, etc.)	Public entity giving a service intended to serve all members of a community. It is usually provided by government to people living within its jurisdiction. Examples of such services include the fire brigade, police, etc.
Public Utility	Public company (usually just utility) that maintains the infrastructure for a public service like electricity, water, etc. (often also providing a service using that infrastructure).
Taxi company	Any entity operating Taxi Vehicles other than as a driver and regardless of whether the vehicles are owned by the company, leased, or owned by individual members of the company.
Car rental company	Company that rents cars for short periods of time, generally ranging from a few hours to a few weeks. It is often organized with numerous local branches and often complemented by a website allowing online reservation.
EV-sharing company	Company offering members access to a dispersed network of shared electric vehicles 24-hours, 7 days a week at unattended self-service locations.
Public Administration	The set of public bodies (e.g. public administrations) that contribute to the exercise and functions of the administration of a State in matters falling within its competence.
Public transport company	Company offering the service of transportation for people with buses and other vehicles having a capacity of more than 5 people.



4. LIST OF STAKEHOLDERS AND USERS

After the identification of the different stakeholders and users categories, the following entities were identified by partners in the corresponding countries.

Country	Stakeholder group	EV user group	Organization
Estonia	E-Mobility Provider (EMP)		Eleport OÜ
Estonia		Shared electric vehicle user (car-sharing, car rental, company electric fleet, school/university electric fleet, etc.)	Elmo Rent OÜ
Estonia	Power grid operator (DSO)		Elektrilevi OÜ
Estonia	National public authority (e.g. mobility planners, policy makers)		Ministry for Economics and Communication
Estonia		Shared electric vehicle user (car-sharing, car rental, company electric fleet, school/university electric fleet, etc.)	Tesla Rent OÜ
Estonia	Regional public authority (e.g. mobility planners, policy makers)		Tallinna Linnatranspordi AS
Estonia	Land and parking space owner (supermarket, mall, parking area, ...)		Europark OÜ
Slovenia	Private drivers association		SRIP ACS+ Strategic Research Innovation Partnership in field of mobility
Slovenia	Charging Point Operator (CPO)		Petrol, d.d., E-mobility & EV charging infrastructure
Slovenia	Charging Point Operator (CPO)		Elektro Ljubljana
Slovenia	Charging Point Operator (CPO)		GEN-I, d.o.o.
Slovenia	Association/Organization promoting electromobility		Društvo E-mobilnost Slovenija
Slovenia	Association/Organization promoting electromobility		AV Living Lab d.o.o.
Slovenia	Association/Organization promoting electromobility		AV Living Lab d.o.o.
Slovenia	ICT/tech provider		DOMEL d.o.o.



Slovenia	ICT/tech provider		DOMEL d.o.o.
Slovenia	ICT/tech provider		KOLEKTOR GROUP d.o.o.
Slovenia	ICT/tech provider		TPV AUTOMOTIVE d.o.o.
Slovenia		Ride-hailing company	NOMAGO d.o.o.
Slovenia	Private drivers association		Slovenian platform for sustainable mobility
Slovenia	Local public authority (e.g. mobility planners, policy makers)		Department of Economic Activities and Transport of City of Ljubljana
Slovenia	Local public authority (e.g. mobility planners, policy makers)		Department of Economic Activities and Transport of City of Ljubljana
Slovenia	Local public authority (e.g. mobility planners, policy makers)		Traffic Sector of City of Ljubljana
Slovenia	Local public authority (e.g. mobility planners, policy makers)		City of krško
Slovenia		Public Service (Post, Police, etc.)	Post of Slovenia
Slovenia	Local public authority (e.g. mobility planners, policy makers)		City of Sežana
Slovenia	ICT/tech provider		Metron Institute
Slovenia	ICT/tech provider		Metron Institute, Battery development
Slovenia	Local public authority (e.g. mobility planners, policy makers)		City of Celje
Slovenia	Association/Organization promoting elctromobility		eZAVOD
Slovenia	University		FINI Faculty of Industrial Engineering
Slovenia	University		FINI Faculty of Industrial Engineering
Slovenia	National public authority (e.g. mobility planners, policy makers)		Ministry of Infrastructure, Sustainable mobility nad Trasnport Policy Division
Slovenia	National public authority (e.g. mobility planners, policy makers)		Ministry of Infrastructure, Sustainable mobility nad Trasnport Policy Division
Slovenia	National public authority (e.g. mobility planners, policy makers)		Ministry of Infrastructure, National coordinator of European Mobility Week)
Slovenia	National public authority (e.g. mobility planners, policy makers)		UIRS The Urban Planning Institute of the Republic of Slovenia



Slovenia	National public authority (e.g. mobility planners, policy makers)		Ministry of Infrastructure, National Traffic Management Center
Slovenia	Association/Organization promoting electromobility		Emobility.si
Slovenia	Power grid operator (DSO)		SODO, Electricity Distribution System Operator
Slovenia	Mobility service information providers		Trajnostni.org (Implera)
Slovenia	Association/Organization promoting electromobility		e-MOTICON, e-Mobility Transnational strategy for an Interoperable Community and Networking in the Alpine space
Slovenia	ICT/tech provider		Siemens
Slovenia	ICT/tech provider		Etrell
Slovenia	Association/Organization promoting electromobility		Centre of Excellence for Low-Carbon Technologies - CO NOT
Slovenia	Association/Organization promoting electromobility		Elektromobilnost, Poslovno svetovanje s.p.
Slovenia	E-Mobility Provider (EMP)		Porsche Slovenija
Netherlands	Charging Point Operator (CPO)	Private electric car owner	Total NL
Netherlands	Charging Point Operator (CPO)	Shared electric vehicle user (car-sharing, car rental, company electric fleet, school/university electric fleet, etc.)	We Drive Solar
Netherlands	E-Mobility Provider (EMP)	Firms/businesses	Greenflux
Netherlands	Local public authority (e.g. mobility planners, policy makers)	Public administration	City of Haarlem
Netherlands	Power grid operator (DSO)	Public administration	Alliander
Netherlands	Regional public authority (e.g. mobility planners, policy makers)	Public administration	MRA-Electric
Netherlands	Fuel station company (petrol stations)	Private electric car owner	BETA - Belangenvereniging Tankstationhouders
Netherlands	EV manufacturer (cars, vans, motorbikes, bikes, etc.)	Private electric car owner	Renault NL
Netherlands	Charging Station manufacturer	Private electric car owner	Alfen



Netherlands	Charging Station manufacturer	Private electric commercial vehicle owner	Enovates (Belgium - Flanders)
Netherlands	ICT/tech provider	Public transport company	PRE Power developers
Netherlands	Private drivers association	Private electric car owner	Vereniging Elektrisch Rijders
Netherlands	Private drivers association	Car households (no EV)	ANWB
Spain	Association/Organization promoting electromobility		AEDIVE
Spain	E-Mobility Provider (EMP)		FERROVIAL SERVICIOS / ZITY / WONDO
Spain	Power grid operator (DSO)		IBERDROLA
Spain		Public Utility (Refuse collection, energy utilities, water company, etc)	EMASESA
Spain	National public authority (e.g. mobility planners, policy makers)		IDAE
Spain	Regional public authority (e.g. mobility planners, policy makers)		IVACE
Spain		Public transport company	EMT
Spain	Charging Point Operator (CPO)		IBIL
Spain	Start up		BEEPLANET FACTORY
Spain	Start up		CARMETRY
Spain	Charging Station manufacturer		INGETEAM
Spain	ICT/tech provider		MAHLE
Spain	Association/Organization promoting electromobility		E-mobility
Spain	EV manufacturer (cars, vans, motorbikes, bikes, etc.)	EV-sharing company (cars, motorbikes, bikes, etc.)	Electric renting group
Spain	E-Mobility Provider (EMP)	EV-sharing company (cars, motorbikes, bikes, etc.)	Alma Mobility
France	Local public authority (e.g. mobility planners, policy makers)		Mairie de Paris
France	Regional public authority (e.g. mobility planners, policy makers)		IdFM (Ile-de-france Mobilité)
France	Regional public authority (e.g. mobility planners, policy makers)		Région Ile-de-France



France	Regional public authority (e.g. mobility planners, policy makers)		metropole Rouen
France	National public authority (e.g. mobility planners, policy makers)		DGEC
France	National public authority (e.g. mobility planners, policy makers)		DGITM
France	Charging Point Operator (CPO)		SDEE47 ou Morbihan energie
France	Charging Point Operator (CPO)		Check with Mairie de Paris
France	E-Mobility Provider (EMP)		BOLORE
France	Fuel station company (petrol stations)		TOTAL
France	Fuel station company (petrol stations)		SHELL
France	Motorway company/operator		DIRIF (DGITM)
France	Motorway company/operator		APRR
France	Motorway company/operator		EUROVIA/VINCI
France	Motorway company/operator		SANEF
France	Motorway company/operator		COLAS SA
France	Land and parking space owner (supermarket, mall, parking area, ...)		FNCCR
France	Land and parking space owner (supermarket, mall, parking area, ...)		EUROVIA/VINCI
France	Power grid operator (DSO)		RTE
France	Power grid operator (DSO)		ENEDIS
France	Energy (electric) utility		EDF
France	Charging Station manufacturer		DBT
France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		goupil
France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		RENAULT



France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		PSA
France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		TOYOTA
France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		PFA / CCFA
France	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Future electric truck manufacturer
France	Public Research Institute		IFPEN
France	Public Research Institute		VEDECOM
France	Public Research Institute		Université Gustave Eiffel (IFSTTAR)
France	Public Research Institute		EFFICACITY
France	Private Research Institute		AVL
France	Private Research Institute		LGI Consulting
France	University		instituts carnots
France	Private drivers association		AVERE France
France	Association/Organization promoting electromobility		AVERE France
France	Association/Organization promoting electromobility		ADEME
France	Association/Organization promoting electromobility		FP2M
France	E-mobility roaming platform operators		GIREVE
France	Mobility service information providers		Lyft, Le cab, Kapten, Marcel (Renault)
France	Telecom operators		Orange
France		Delivery service company	DHL
France		Public Utility (Refuse collection, energy utilities, water company, etc.)	EDF
France		Delivery service company	Carrefour, Auchan, ...
France		Public Service (Post, Police, etc.)	Groupe La poste
France		Taxi company	G7
France		Taxi company	Taxis Bleus
France		Taxi company	Alpha Taxis
France		Ride-hailing company	Uber



France		Ride-hailing company	Lyft
France		Ride-hailing company	LeCab
France		Ride-hailing company	Marcel (Renault)
France		Ride-hailing company	Kapten
France		Car rental company	BPCE car lease
France		Car rental company	Avis
France		Car rental company	Europcar
France		Car rental company	Hertz
France		Car rental company	Budget
France		EV-sharing company (cars, motorbikes, bikes, etc.)	cityscoot
France		EV-sharing company (cars, motorbikes, bikes, etc.)	Clem'
France		EV-sharing company (cars, motorbikes, bikes, etc.)	car2go
France		EV-sharing company (cars, motorbikes, bikes, etc.)	Zipcar, ZITTY (Renault)
France		EV-sharing company (cars, motorbikes, bikes, etc.)	Lime
France		Public transport company	RATP
Italy		EV-sharing companies	IREN GO
Italy		EV-sharing companies	ENEL
Italy		EV-sharing companies	BeCharge
Italy		EV-sharing companies	BlueTorino
Italy		EV-sharing companies	EnoTravel (BlueTorino)
Italy		EV-sharing companies	Route220
Italy		EV-sharing companies	Enermia
Italy		EV-sharing companies	Duferco
Italy		EV-sharing companies	Drive Now
Italy	Local public authority (e.g. mobility planners, policy makers)		Piedmont Region (Environment)
Italy	Local public authority (e.g. mobility planners, policy makers)		Metropolitan City of Turin
Italy	Energy (electric) utility		IRETI
Italy	Local public authority (e.g. mobility planners, policy makers)		City of Turin
Italy	Taxi services		Union official



Italy	Local public authority (e.g. mobility planners, policy makers)		Regione Piemonte - Direzione Trasporti
Italy	Association/Organization promoting electromobility		Fondazione Telios
Italy	Charging Station manufacturer		Bitron Industrie S.p.A.
Italy	Charging Station manufacturer		ABB
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		FCA
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		GM
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Nissan
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		JAC ITALY DESIGN CENTER
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Renault
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		PSA
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Tesla
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Cecomp
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Tacita S.r.l.
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Piaggio
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		IVECO
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Pininfarina
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		ITALCAR



Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		NITO – Nuova Industria Torinese
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Lektro Innovation S.r.l.
Italy	Start up		BeonD
Italy	Charging Station manufacturer		Repower vendite Italia
Italy	Energy (electric) utility		Enel energia
Italy	Energy (electric) utility		Duferco Energia
Italy		Public transport company	Cavourese
Italy		Taxi company	Radiotaxi
Italy		EV-sharing company (cars, motorbikes, bikes, etc.)	Impronta
Italy		Delivery service company	TNT Traco
Italy		Public Utility (Refuse collection, energy utilities, water company, etc)	AMIAT
Italy		Delivery service company	GLS
Italy		Delivery service company	C.S.B.srl
Italy	University		Politecnico Torino
Italy	Association/Organization promoting electromobility		Cives
Italy	Association/Organization promoting electromobility		SOS Logistica (promotion sustainable transport in logistic)
Italy	E-Mobility Provider (EMP)		EVWAY
Italy	EV manufacturer (cars, vans, motorbikes, bikes, etc.)		Italcar



5. CONCLUSIONS

The deliverable D2.2 aimed at identifying potential users and stakeholders in order to engage them respectively in the project use cases and in the elaboration of the INCIT-EV recommendations for drafting European strategies for the integrated and sustainable development of electric charging infrastructures, mobility, land use and energy .

Moreover, the collaboration among the stakeholders will foster the development of collaborative business models, in which the information sharing between the different actors will lead to potential benefits for the entire system. Finally, the discussion with the engaged users will support drafting recommendations for the elaboration of European strategies to increase electric mobility acceptance.

The main goal of this activity was the identification of the stakeholder and user categories impacted by the development of user centric charging infrastructures that could contribute to the project sharing their needs, experiences and expectations.

The activity was performed by considering existing classification of the key groups in past European projects and considering partners' contributions thanks to experiences they gained during other similar European, national or local projects. In this activity, the SEROI+ methodological approach was adopted to identify the different stakeholder groups and categories. Using this approach, different sources have been analyzed and reviewed by considering: existing European and national documentation on electromobility projects; platforms concerning the promotion of electromobility through the involvement of stakeholders and users; existing scientific literature discussing the involvement of stakeholders in the diffusion of electromobility and charging infrastructures.

Firstly, this review helped to identify four stakeholders/users key groups that are generally most affected by the transport policies: Government, Business, Research and Civil society. Similarly, two key groups for users were identified according to two classes of EV use: Private (including early adopters, electric car owners and electric car-sharing users) and Business/Administration (including private and public sector companies).

Then, different stakeholder and user categories within each key-groups were identified taking into account which categories can affect directly or indirectly the charging network development considering the corresponding potential role in the diffusion of electromobility and charging infrastructure.

Finally, a list of the most relevant entities per Country was established by means of the partners' contribution. This list includes entities belonging to profiles such as car manufacturers, mobility planners, technologies providers, mobility companies, construction companies, final users or policy makers. The entities has been subdivided by level of interest and influence, so that stakeholders will be engaged accordingly. Presently, the list is formed by almost 190 entities that potentially can be contacted and it will be updated during the project as expected within Task 2.2. In particular, among the others Governmental entities, Charging Point Operator, EV manufactures, E-Mobility providers, and motorway operators are stakeholders with higher level of interest. Similarly, EV-sharing companies, car rental company, public transport companies and public utility/administration are the users with higher level of interest.

Finally, the created list as well as the engagement will be performed in accordance with the GDPR rules and the findings presented in the deliverable D11.2.



The involvement of stakeholders and users within the project will lead to the identification of strategies to incentivize different categories of users in the use of EV and to develop network infrastructure in partners' cities where use cases will be developed. The discussion among engaged users will draw up recommendations for the elaboration of European strategies for the integrated and sustainable development of electric charging infrastructures, mobility, land use and energy. Moreover, the collaboration between users and stakeholders will foster the development of collaborative business models, in which the information sharing between the different stakeholders will lead to potential benefits for the entire system. In addition, discussion and participative work of the engaged users will draft recommendations for the elaboration of European strategies to foster electric mobility acceptance.



REFERENCES

- GUIDEMAP Consortium; “Successful transport decision-making A project management and stakeholder engagement handbook - VOLUME 1 - Concepts and Tools”; 2004 at https://www.eltis.org/sites/default/files/trainingmaterials/guidemaps_volume_1_colour.pdf
- Institute of Transport Economics; “The future of electromobility in Norway – some stakeholder perspectives”; 2014
- Sub-Group To Foster The Creation Of An Electromobility Market Of Services (SGEMS); “Memorandum of Understanding (MoU) fostering seamless and valuable EV customer experience in Europe”; 2017
- North Sea Region – Electric Mobility Network; “Stakeholder strategies regarding the realization of an electric vehicle recharging infrastructure”; 2013
- Platform for Electromobility at <https://www.platformelectromobility.eu>
- Office of Energy Efficiency & Renewable Energy; “Electric Vehicles: Stakeholder Solution Center” at <https://www.energy.gov/eere/electricvehicles/electric-vehicles-stakeholder-solution-center>
- Hyper-Network for electromobility (NeMo); “D1.1. Consolidated Version of the Use Cases and Actors’ requirements”; 2017 at https://nemo-emobility.eu/wp-content/uploads/sites/10/2019/12/NeMo-D1.1-Use-Cases-and-Actors_Final.pdf
- Sjoerd Bakker, Kees Maat and Bert van Wee; “Stakeholders interests, expectations, and strategies regarding the development and implementation of electric vehicles: The case of the Netherlands”; Transportation Research Part A, 66, pp 52-64,2014.
- Rick Wolbertus, Steven Jansen and Maarten Kroesen; “Stakeholders’ perspectives on future electric vehicle charging infrastructure developments”, Futures, 123, pp 102610, 2020
- Georgina Santos and Huw Davies; “Incentives for quick penetration of electric vehicles in five European countries: Perceptions from experts and stakeholders”; Transportation Research Part A, 137, pp 326-342, 2020.
- Michiels Hans, Beckx Carolien, Schrooten Liesbeth, Vernailen Stijn and Denys Tobias; “Exploring the transition to a clean vehicle fleet: From stakeholder views to transport policy implications”; Transport Policy, 22, pp 70-79, 2012.
- City of Toronto - Electric Mobility Strategy; “Stakeholder Engagement Report: What We Heard”; 2018 at <https://www.toronto.ca/wp-content/uploads/2019/06/8ff6-Stakeholder-Engagement-Report-May-23.pdf>
- Madhusudhan Adhikari, Laxman Prasad Ghimire, Yeonbae Kim, Prakash Aryal and Sundar Bahadur Khadka; “Identification and Analysis of Barriers against Electric Vehicle Use”; Sustainability,12, 2020

