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# 1 Introduction

## 1.1 Purpose

Paragrafetto che spiega il progetto

- G1 The e-Mobility Service Providers (**eMSP**) shall help the user to select the station; [W1,W2] [S1,S5]
- G2 The **eMSP** shall allow the user to book a charge; [W1,W2] [S4]
- G3 The **eMSP** shall allow the user to perform a charge; [W1,W2,W3] [S2,S6]
- G4 Charge Point Management Systems (**CPMSs**) shall handle the car charging cycles; [W1,W5,W6] [S7]
- G5 **CPMSs** shall manage the car charging stations; [W4,W5,W6] [S3, S7]

## 1.2 Scope

- W1 People charge electric cars;
- W2 People use web calendar;
- W3 People pay for the charging service;
- W4 Distribution System Operatorss (**DSOs**) supply energy to Charging Point Operatorss (**CPOs**);
- W5 Some **CPOs** own batteries;
- W6 **CPOs** decide whether to use batteries or **DSO** supplied energy;
- S1 The **eMSP** suggests the user to charge the vehicle;
- S2 The **eMSP** notifies the user when the charging process is finished;
- S3 **CPMSs** acquire information about energy prizes from **DSOs**;
- S4 The user books a charge using the **eMSP**;
- S5 The user asks the **eMSP** for suggestions about charging station;
- S6 The user pays for the service using the **eMSP**;
- S7 **CPOs** gather the energy source through the **CPMS**;

## 1.3 Definitions, Acronyms, Abbreviations

<b>eMSP</b>	e-Mobility Service Providers	<b>DSO</b>	Distribution System Operators
<b>CPO</b>	Charging Point Operators		
<b>CPMS</b>	Charge Point Management System	<b>API</b>	Application Programming Interface

## 1.4 Revision history

## 1.5 Reference Documents

## 1.6 Document Structure

## 2 Overall Description

### 2.1 Product perspective

Qui ci vanno gli scenari, UML e state diagrams

### 2.2 Product functions

#### 2.2.1 Scenarios

##### S1 User Sign up

Lucy, wanting to use the system, opens the app, she is prompted to login or register, she chooses to register herself and insert her personal info (email, password, payment information), a confirmation email is sent with a link to confirm the activation of the account, if the link is clicked in the first 15 minutes the account is activated and the sign up is successful, otherwise it is considered failed and the process must be repeated.

##### S2 User Logs in:

Lucy, after signing up, opens the app and she is prompted to insert her email, and password, if correct the login is successful and she has access to her account and the service of the app, otherwise the login is unsuccessful and must be repeated.

##### S3 User search for stations

##### S4 User book a charge

##### S5 User charge the car

##### S6 User gets charging suggestion based on his calendar

##### S7 Cpo subscribe to the system

##### S8 Cpo updates infos about its charging stations

##### S9 Cpo decide the policy to be applied

##### S10 Cpo check internal info about the selected charging station

### 2.3 User characteristics

### 2.4 Assumptions dependencies and constraints

#### 2.4.1 Assumptions

A1 Users insert correct data in the forms

A2 Le persone non trollano

## 3 Specific Requirements

### 3.1 External interfaces requirements

#### 3.1.1 User interfaces

- R1 The **eMSP** must allow the users to register (providing email, password, payment method and his infos);
- R2 The **CPMS** must allow the **CPOs** to register (providing email, password, id-station, partita iva, number of possible charging slots);
- R3 The system must allow the **CPOs** to modify the possible charging slots in their stations;
- R4 The system must verify the correctness of the identification data for the **CPOs**;
- R5 The system must allow the user to login;
- R6 The system must allow the user to choose a specific station, a timeslot;
- R7 The system must notify the user when the charging process is finished via a notification;
- R8 The **CPMS** must allow the **CPOs** to choose the mode (manual or automatic) of operation

#### 3.1.2 Hardware interfaces

#### 3.1.3 Software interfaces

#### 3.1.4 Communication interfaces

### 3.2 Functional requirements

- R1 The system must provide information () about the stations nearby;
- R2 The system must reserve a position for a user who registered for a charge through the application;
- R3 The system mustn't have collisions in the booking of charges; (non si possono registrare più di X user per timeslot sovrapposti)
- R4 The system must take the service money from the user payment method after the charging is finished;



### **3.3 Performance requirements**

### **3.4 Design constraints**

#### **3.4.1 Standards compliance**

#### **3.4.2 Hardware limitations**

#### **3.4.3 Other constraints (TODO MAYBE)**

### **3.5 Software system attributes**

#### **3.5.1 Reliability**

#### **3.5.2 Availability**

#### **3.5.3 Security**

#### **3.5.4 Maintainability**

#### **3.5.5 Portability**

### **3.6 Requirements**

#### **3.6.1 External Interface Requirements**



## 4 Formal Analysis Using Alloy



## 5 Effort Spent

### 5.1 Effort Spent

- 15/11/2022: 15:00 - 18:00 (all 3 same time)
- 16/11/2022: 08:30 - 10:00 (only 1) Emilio
- 17/11/2022: 21:00 - 23:00 (all 3 same time)
- 18/11/2022: 10:00 - 12:00 (2) Emilio, Federico
- 21/11/2022: 19:00 - 20:00 (only 1) Matteo
- 22/11/2022: 14:30 - 16:00 (only 1) Matteo
- 23/11/2022: 10:30 - 11:30 (only 1) Matteo
- 24/11/2022: 21:30 - 22:30 Matteo and Federico
- 24/11/2022: 9:00 - 9:30 Federico