Improving EV charging infrastructure in European urban areas: The USER-CHI project experience

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THE EV DRIVER'S OPINION:
EV vs CHARGING INFRASTRUCTURE

EV satisfaction

Rate your satisfaction with the use of your vehicles

Charging experience satisfaction

THE CHALLENGE

Support the accelerated deployment of EV charging infrastructure in Europe by ensuring **user satisfaction**

THE USER-CHI project in brief

USER-CHI is an industry powered, city driven and user-centric project which co-creates and demonstrates smart solutions around 7 connecting nodes of the Mediterranean and Scandinavian-Mediterranean TEN-T corridors to boost a massive e-mobility market take-up in Europe.

The consortium is composed of a balanced team of complementary organisations covering the overall value chain of the Project: research centres, technology providers and end-users.

- ✔ Duration: 2020-2024
- ✔ Budget: 17M€
- ✔ 24 partners
- ✔ Coordinator: etra I+D

OBJECTIVES

1. Design optimisation of charging networks with a user-centric approach
2. Deployment of an interoperability framework and platform
3. Scalable infrastructure roll-out by means of smart grid integration
4. Development of innovative and highly convenient charging systems
5. Demonstration of novel business and market models
6. Legal and regulatory recommendations for massive EV deployment

THE USER-CHI products

CLICK- Charging location and holistic planning kit

Stations of the future handbook

eMoBest - e-Mobility replication and best practice platform

INFRA – Interoperability framework

INCAR – Interoperability, charging and parking platform

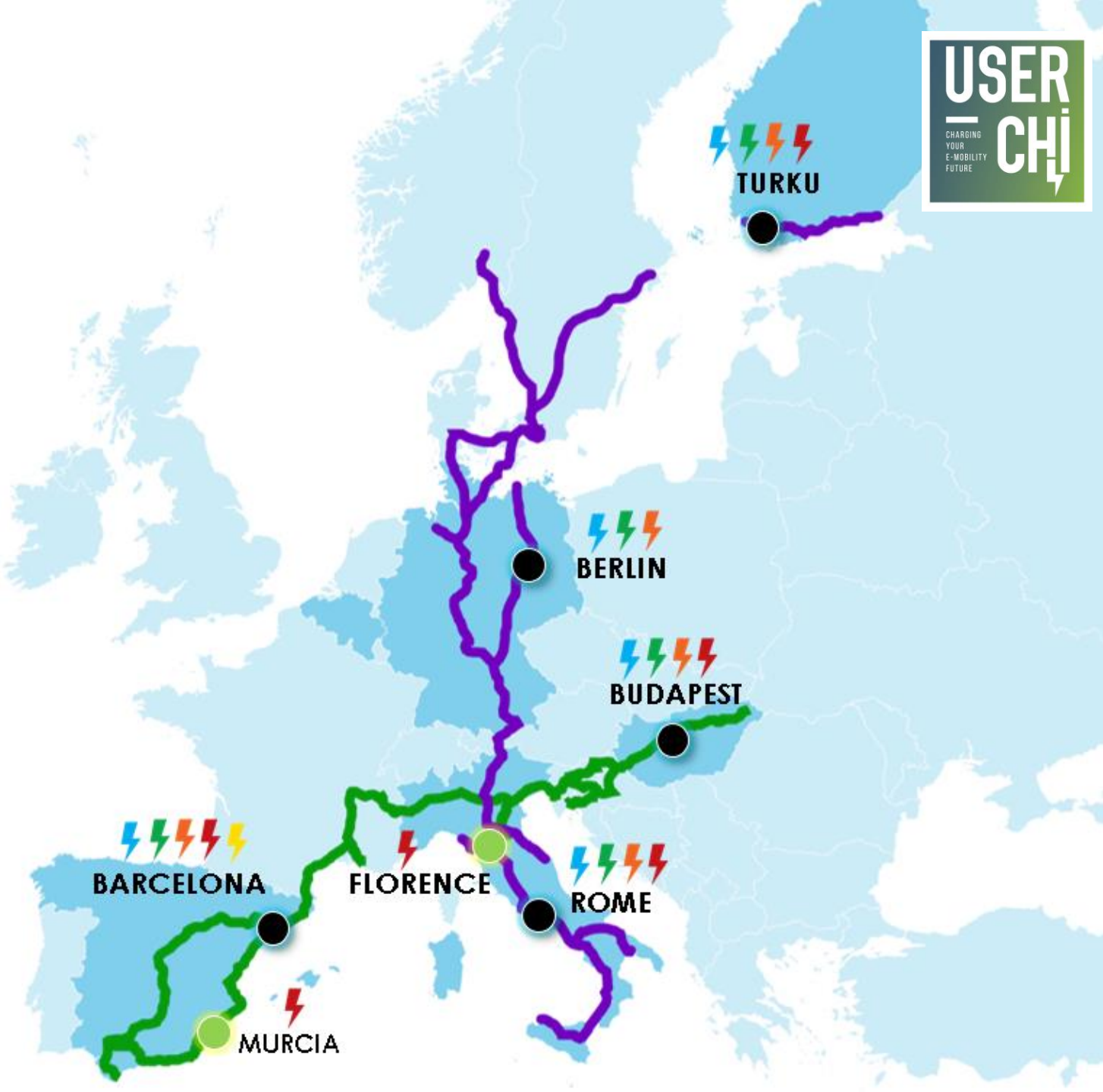
SMAC – Smart Charging tool

INSOC – Integrated solar DC charging for Light Electric Vehicles (LEVs)

INDUCAR – Inductive charging for e-cars

THE USER-CHI demo sit

- **CLICK-** Charging location and holistic planning kit
- **INCAR** – Interoperability, charging and parking platform
- **SMAC** – Smart Charging tool
- **INSOC** – Integrated solar DC charging for Light Electric Vehicles (LEVs)
- **INDUCAR** – Inductive charging for e-cars



BARCELONA product demonstration map

DEMO SITE 1. Interoperability and energy balance

Resources: AMB Fast charging points and standard charging points

CPO: AMB

EMSP: AMB

User's profile: EV drivers through the INCAR app (professionals drivers and private drivers) and some CPOs for SMAC .

Objective: To analyze the interoperability & smart charging

DEMO SITE 2. Inductive charge efficiency

Resources: Charging points in AMB parking offices (2 cars, 2 parking lots)

CPO: AMB

EMSP: AMB

User's profile: Proffestional users (AMB fleet workers)

Objective: To analyse the INDUCAR efficiency. Explore the utility functions.

DEMO SITE 3. Solar-DC e-bike charging

Resources: 1 charging station.

CPO: AMB

User's profile: Public sharing and private e-bike users.

Objective: To analyse the efficiency and utilities. Explore the user acceptance (visual impact of solar panels)

DEMO SITE 4. Holistic planning kit

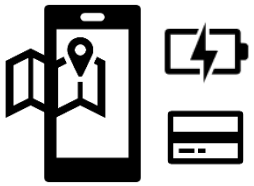
Resources: AMB staff

User's profile: Urban mobility planners

Objective: To assess the location and holistic planning kit utilities

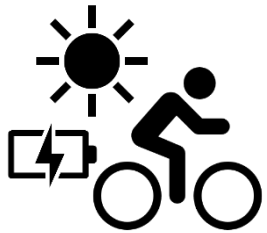
AMB Àrea Metropolitana de Barcelona

INCAR & SMAC

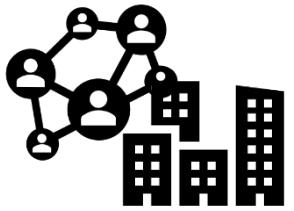


INDUCAR

INSOC



CLICK

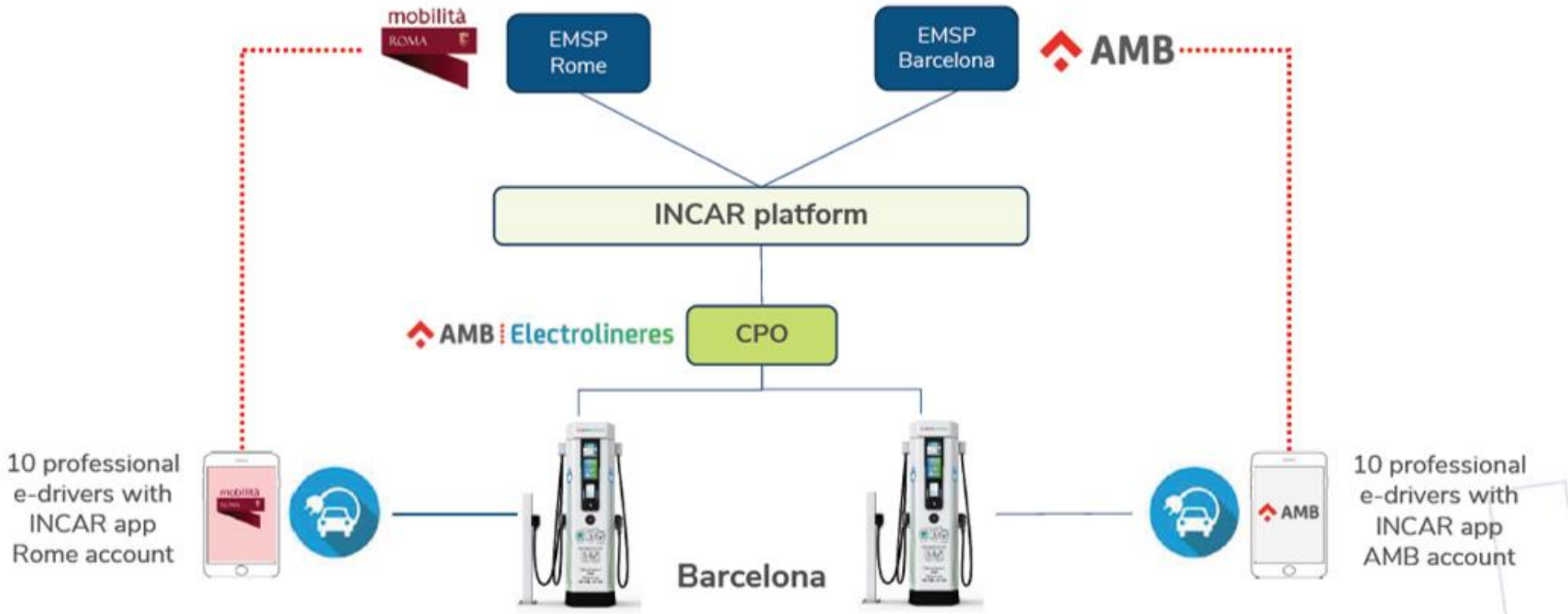


USER-CHI CHARGING YOUR E-MOBILITY FUTURE

Products to be tested

AMB demo case 1: Interoperability by INCAR

Interoperability platform



AMB demo case 2: Smart Charging by SMAC

SMAC can offer different smart charging strategies according to the user profiles and the total power available:

- At night, users stay all the night parked, and the charging station could offer long period of charge at medium or low power.
- And just the opposite during the day: users stay for a while and need high power.

The table shows an example: different charging strategies could be possible.

SMAC strategy	CHAdeMO DC	COMBO DC	Mennekes	Mennekes	Mennekes	Mennekes	Mennekes	TOTAL
day	25-50 kW max. 30 min	25-50 kW max. 30 min	3 kW max. 2 h	7 kW max. 2 h	3 kW max. 2 h	7 kW max. 2 h	3 kW max. 2 h	75 kw
night	25 kW max. 2 h	25 kW max. 2 h	7 kW max. 2 h	3 kW max. 8 h	3 kW max. 8 h	3 kW max. 8 h	3 kW max. 8 h	75 kW

Challenges:

- Tender on time
- New service provider
- Economic transactions as CP infrastructure is a free service

AMB demo case 3: Inductive charging by INDUCAR

Challenges:

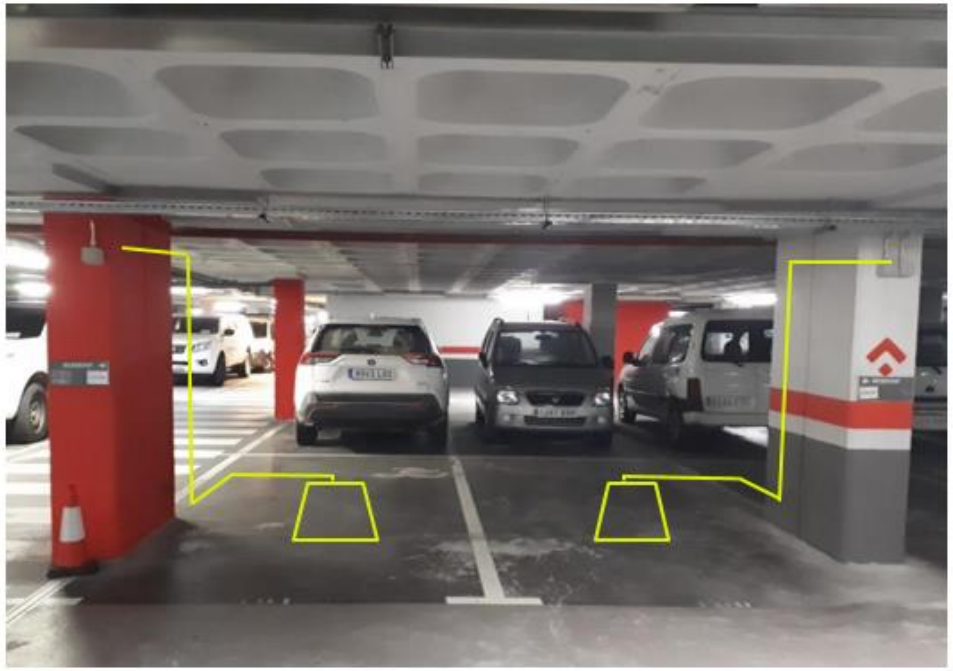
- Getting the cars (warrantees, maintenance, permanent damages, CSS, …)
- User perception of safety

Requirements:

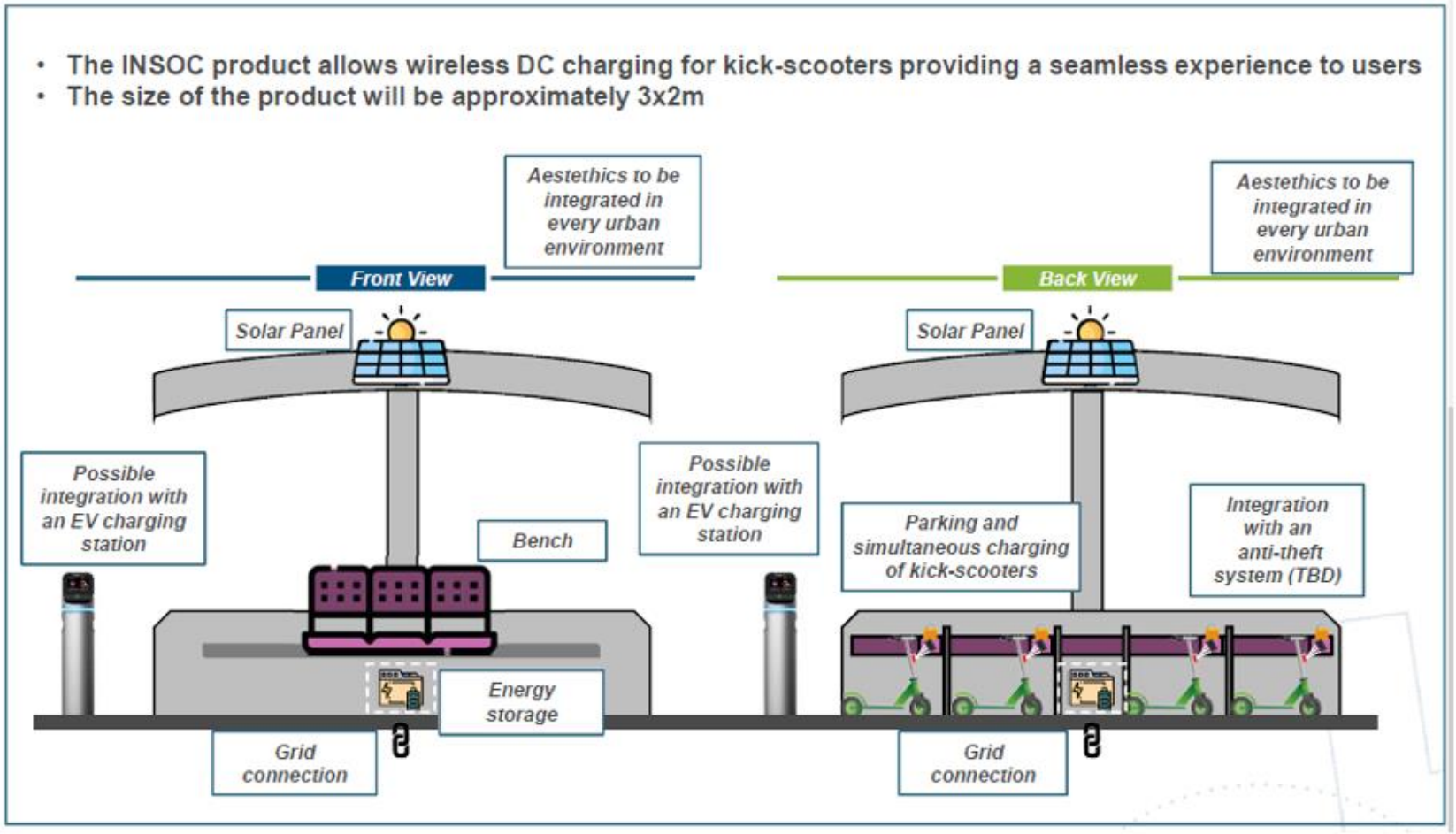
- 2 new cars (Renault Zoe CSS)
- 3G disposal in the parking lot

- 10 drivers – AMB staff
- 2 parking places equipped
- Guidance features (via screen on car/phone)
- Tender to:
  - Parking modification 3,6 kW - 230 Vca
  - Cars rental & retrofit

New installation



AMB demo case 4: Solar LEV charging by INSOC



Challenges:

- Getting the place (aesthetical integration in the urban environment)
- Getting the users. BCN does not have e-scooters sharing companies. Private users or agreements with companies.
- LEVs with DC charging option.

AMB demo case 5: EV charging planning by CLICK

- Digital nets (e.g. street network, city boundaries)
- City objectives (e.g. goals regarding charging infrastructure deployment)
- City base data (e.g. #inhabitants, area)
- City structure data (districts, statistical areas...)
- City areas usage data (POIs, special areas e.g. airports)
- Historical charging station usage data
- Traffic model

AMB Área Metropolitana de Barcelona

- Optimized location planning for new charging infrastructure,
- Recommendations for charging infrastructure development

- CLICK could confirm the on going expansion project for AMB charging network in order to spread electromobility around all the municipalities of Barcelona metropolis

10 motorbike CP (7 kW)

1 solar canopy (2x44 kW)

+ 21 slow CP (44 kW)

+ 12 solar canopy (2x44kW)

TOTAL: 80 stations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30 May - 1 June 2022

Thank you!