USER-CHI IN THE SPOTLIGHT

USER-CHI in the spotlight

- **Ángel Moya**, ETRA, USER-CHI Project coordinator
- **Juan Gimenez Pla**, Instituto de Biomecánica (IBV), Leader for user research and requirements definition activities
- **Lena Korostylova**, VMZ, Leader for demonstration activities and development of the INCAR app
- **Marisa Meta**, FIT consulting, Leader for Cross-site Evaluation and Impacts Assessment
- **Divy Gupte**, IKEM, Leader for research activities and ethics requirements

Moderated by Marion Pignel, Eurocities, Leader for communication and replication activities

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

etra I+D

VISIT USERCHI.EU

Ángel Moya - ETRA I+D
amoya.etraid@grupoetra.com

USER RESEARCH | PRODUCTS | DEMOS | EVALUATE | EXPLOIT

2020 | 2021 | 2022/23 | 2023/24 | 2024 | 2025...

5 M

BANNED 2035

Paris

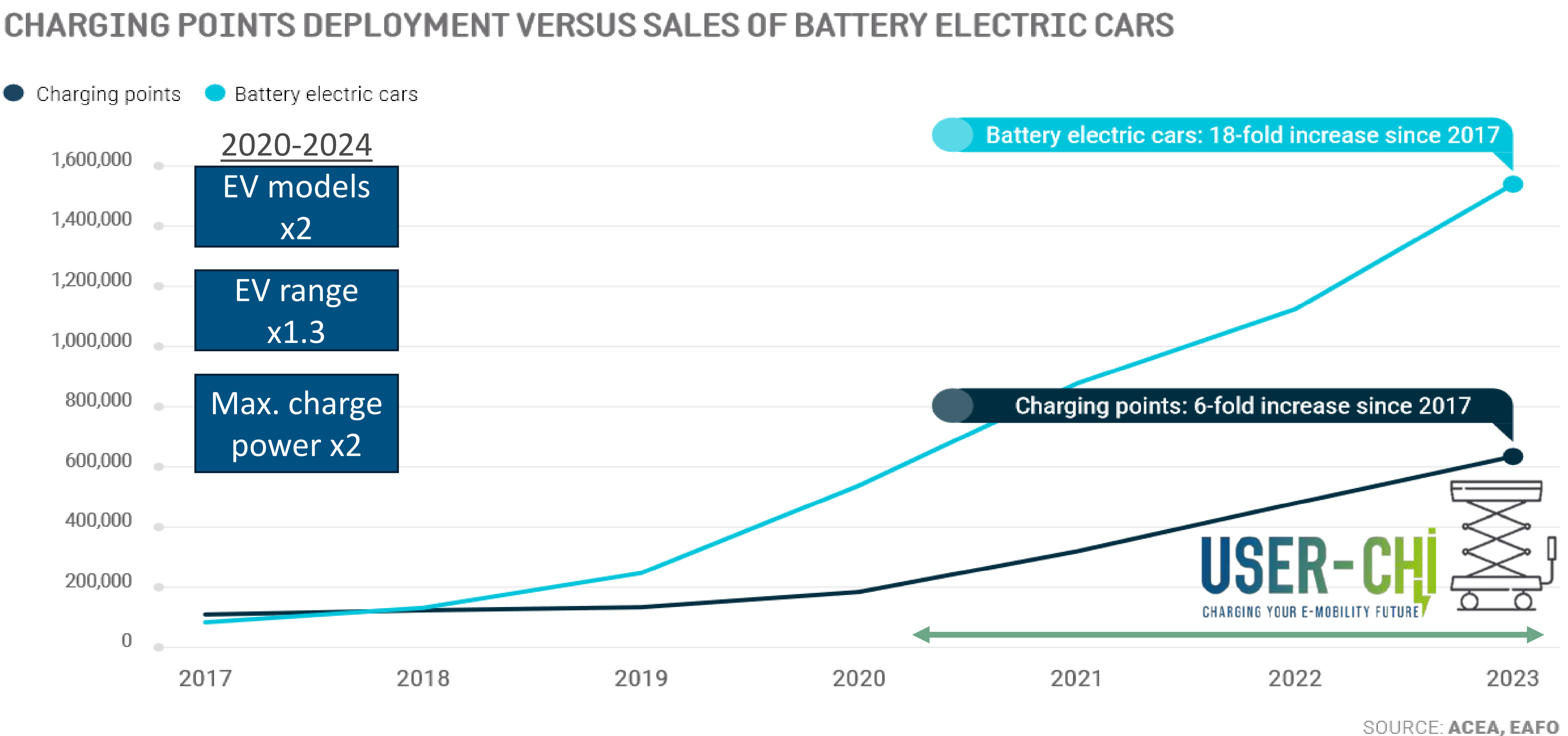
ambici Bicibox

AFIR RED EPBD

GAP | Kick-off | 8 CMs | 85 PMBs | Final event | 3 Reviews

7 Cities | 7 Techs | 3 Research | 3 Housing | 1 Standard | 1 Consulting | and more

USER RESEARCH	PRODUCTS	DEMOS	EVALUATE	EXPLOIT
2020-2021	2021-2023	2023-2024	2024	*2025…*



AFIR

- 1,3 kW / BEV
- 0,8 kW / PHEV
- 3,5M EVSE (2030)
- 40M EV (2030)

WP1: ANALYSIS OF USER NEEDS AND PATTERNS FOR REQUIREMENTS DEFINITION

FINAL MEETING – JUNE 18TH, 2024

IBV / Juan Giménez & Amparo López

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USER RESEARCH METHODOLOGY

Qualitative research

- **2. Netnography**
  621 end users, 3 EU countries (Norway, Spain, Germany)
- **3. Delphi Questionnaire**
  57 professionals, 5 EU countries (Finland, Germany, Hungary, Italy, Spain)
- **4. Field Diary**
  131 end users, 5 EU countries (Finland, Germany, Hungary, Italy, Spain)

Quantitative research

- **5. Survey**
  2,737 participants, 6 EU countries (Finland, Germany, Hungary, Italy, Norway, Spain)

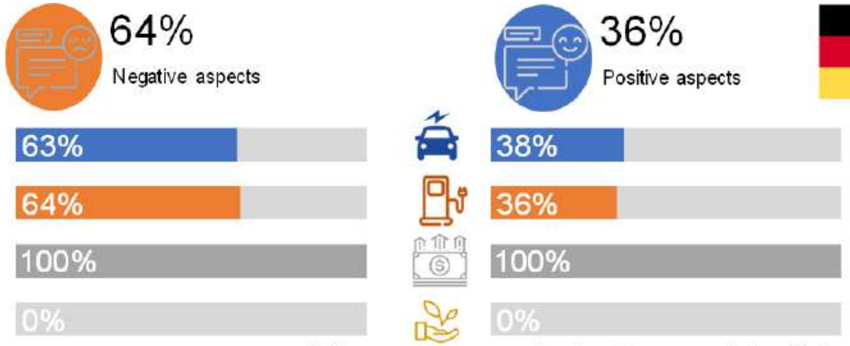
Co-Creation

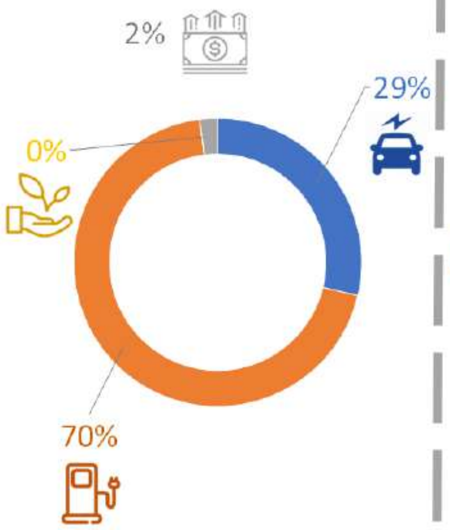
- **6. 2 Workshops**
  End users (5) & professionals (11), and professionals (30), 4 USER-CHI products: INCAR, INSOC, INDUCAR and SotF

QUALITATIVE RESEARCH RESULTS: NETNOGRAPHY

NETNOGRAPHY I. General comments

EV: user's opinions





Negative aspects

- **Malfunction** (defective harger, out of order, broken pole, rotten plug) (6)
- **To know in advance if the charger point is occupied** (3)
- The public charging and the free charging are poorly maintained or occuppied (2)
- Charging problema at communal parkings
- Charging time limitation is a problem
- To have the possibility of charging at home or at the office is a key factor
- To know in advance if the charger point works properly
- Available fast chargers for long range trips; to minimise charging pauses
- Charging cutoffs
- Lack of standarisation for charging points, paying systems, authentication systems,
- High prices for charging
- Deficient charging points network; this fact restrains EVs purchasing
- Apps failures (e.g GetCharge, Innogy)
- EVs occupying parking lots after completing the charge

- Small battery capacity; EV should have more autonomy
- No EVs with five seats (family car) at the market
- Noisy
- Range extender (REx) is very expensive
- Problems for customising seat position, as batteries are underneath
- For a 100 km trip you have to charge on route
- Little room for luggage
- Not adjusted prices, especially for family cars or not urban cars

Positive aspects

- **The charging network is sufficient in some geographical areas** (4)
- **Charging at home is a key factor**
- (3)
- Enough charging points in metropolitan areas
- Fast charging points (e.g. Ionity)
- You can transfer the PDI to the navigation system
- Charging for free at supermarkets (LIDL, Famila, Ikea, Roller)
- You can buy while charging
- If the amount of EV increases, the occupation of free chargers will also increase
- Apps like ENBW inform about charging points occupation and operative poles

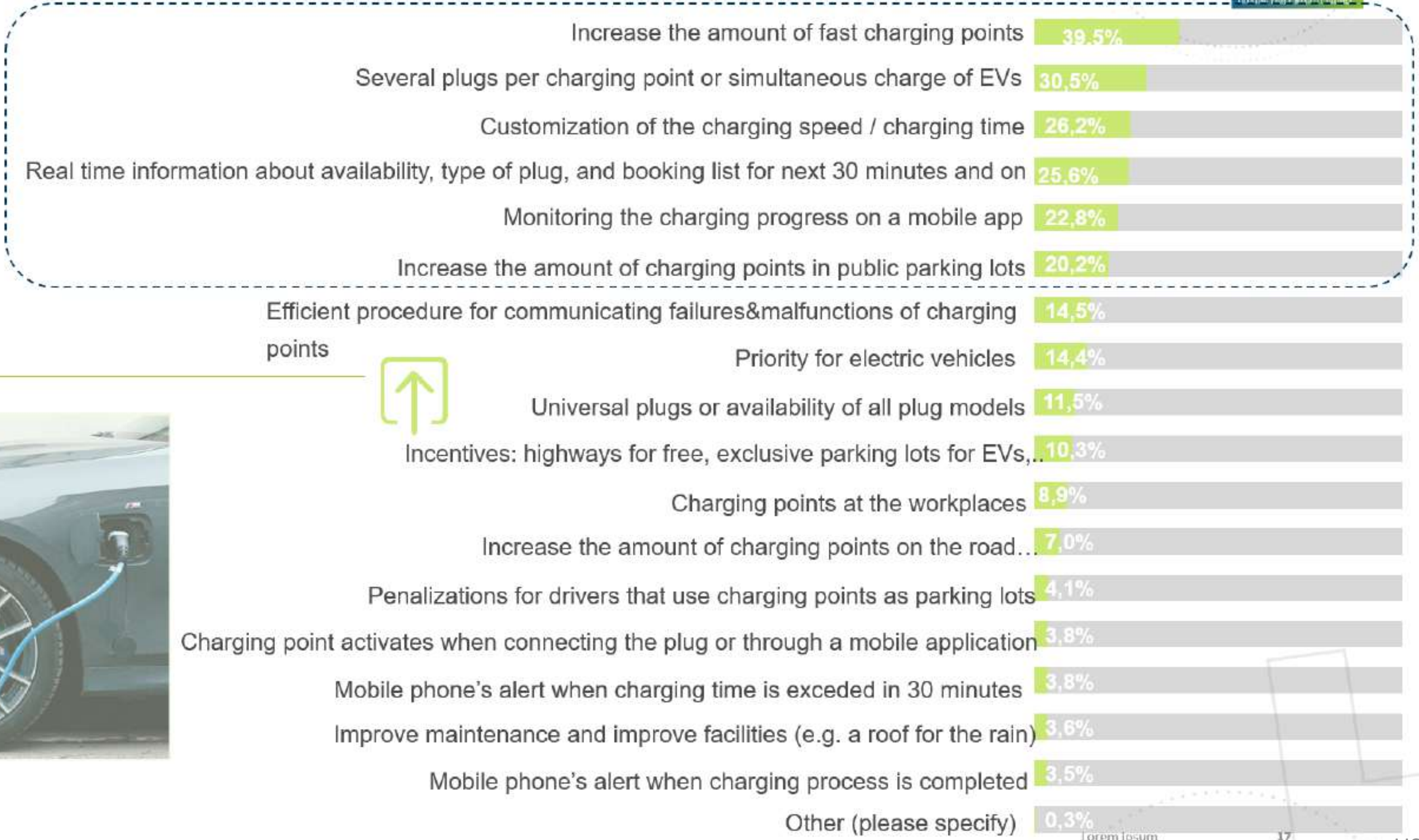
- Comfortable and satifying driving experience
- Proper relation cost-autonomy
- EVs are constantly evolving
- I would buy again an EV
- Height and internal dimensions are good
- Extension of battery capacity as an option (e.g. Rex by BMW)

Sample size (Germany)
Users: **28**
Mentioned aspects: **56**
Mentions average: **2**

Electric Vehicle | Infrastructure | Incentives / Information | Environment

QUANTITATIVE RESEARCH RESULTS: SURVEY

5. Survey (VI). Best ideas to improve the charging process



16/09/2021 Lorem ipsum 17

ACORDING TO OUR RESEARCH, CAR ELECTROMOBILITY HAS REQUIREMENTS:

MUST-BE REQUIREMENTS

- Availability of a dense charging point network in cities and in highways, including promoting the installation of charging points at drivers' home and in public parking lots. For professional drivers the city charging network is critical, while for private drivers the most critical point is charging when they arrive home, in private chargers or public chargers.
- A procedure for booking a charging point that ensures its availability when the driver arrives.

INCREMENTAL GAIN REQUIREMENTS

- Charging point status: occupied-unoccupied-in maintenance, blocked, charging, or reserved.
- Standardization of technical components and signalization.
- Paying with credit cards; contactless payment.
- Employing app utilities without subscription.
- Increase the amount of fast charging points; fast charge in highways.
- Automatic user detection in the charging point.
- Interoperability among charging points, at European level.
- A unique application for routing, booking and paying; pre-booking.

DESIRABLE REQUIREMENTS

- Additional services to perform activities when charging the battery. We could differentiate between:

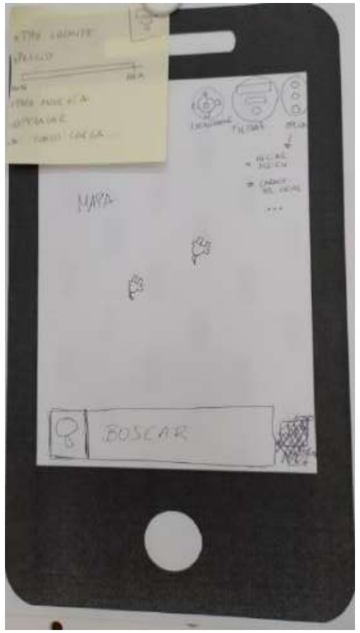
  – Services at urban charging points, like shopping malls or mobility hubs.

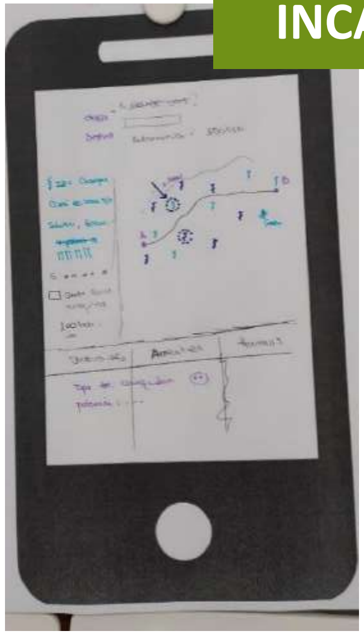
  – Services at the charging points on route, in long range trips.

- Monitoring utilities like remaining charging time, percentage of charge in real time, power limitation to obtain a lower price, different criteria for fixing fees, or service interruption alarm, are interesting features for managing the waiting time when charging.
- Sustainability: users perceive electromobility as sustainable, and this value must be present in all the charging process.

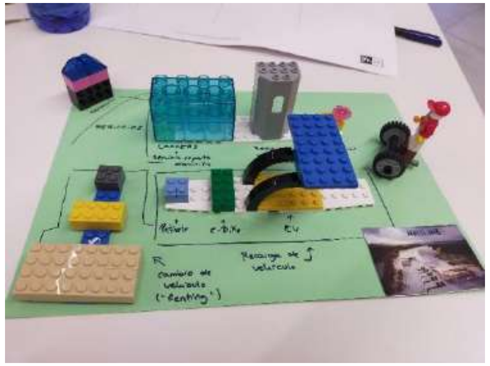
CO-CREATION WORKSHOP

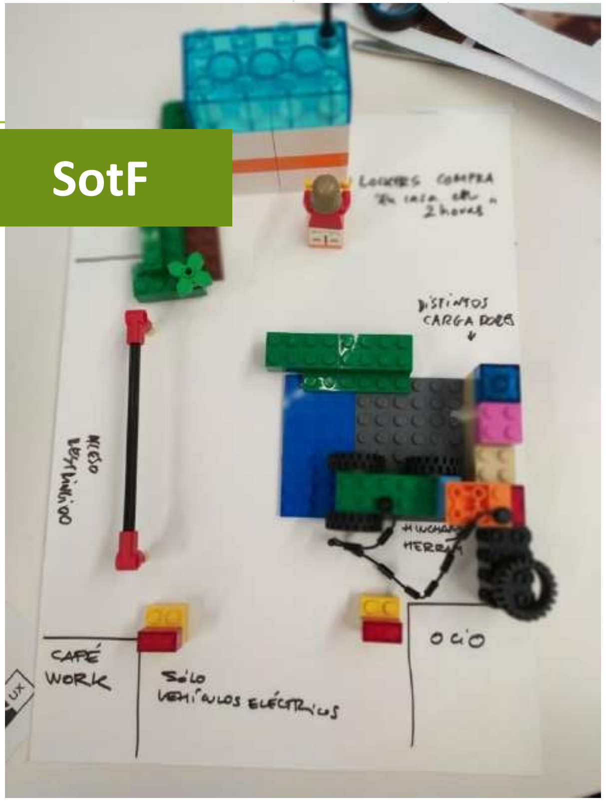
INCAR



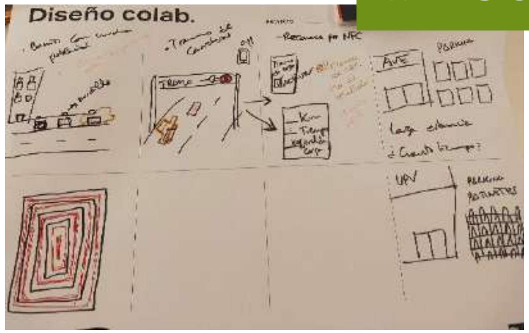


SotF



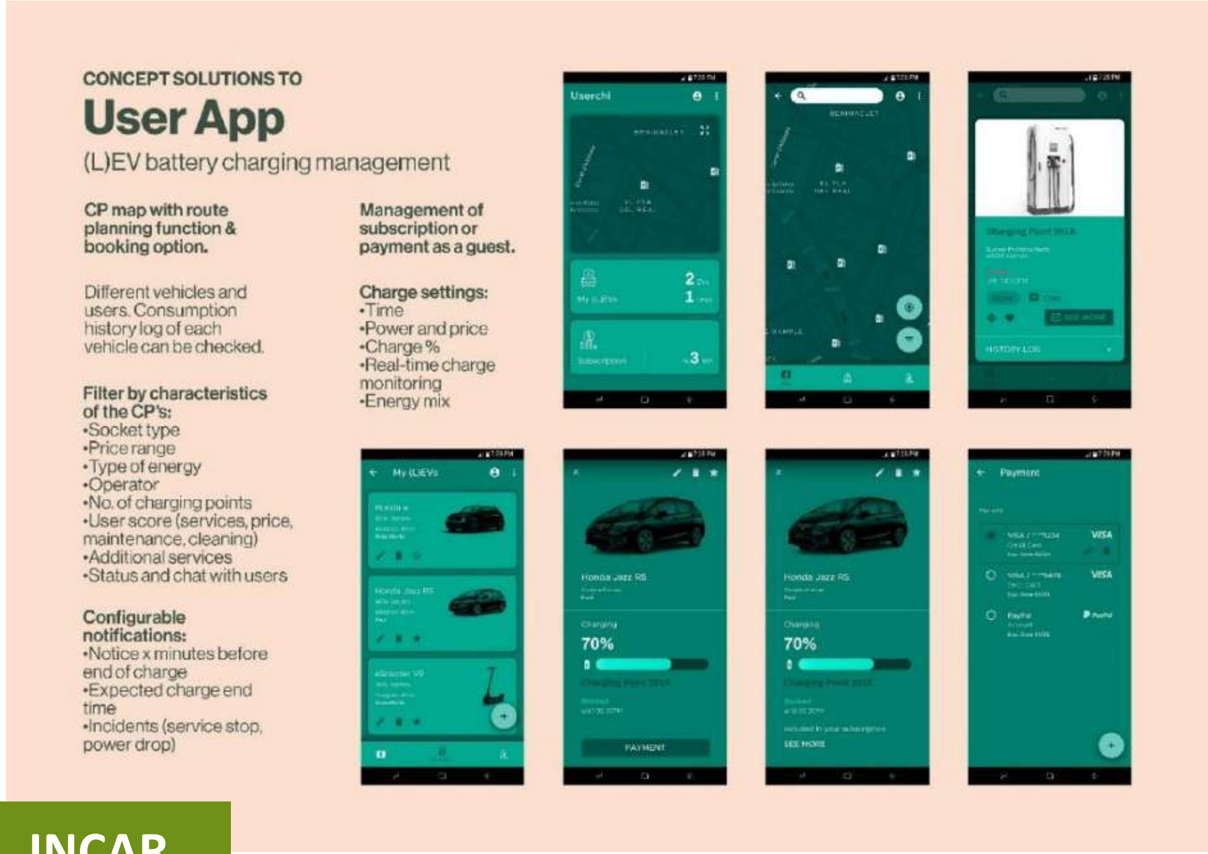


INDUCAR

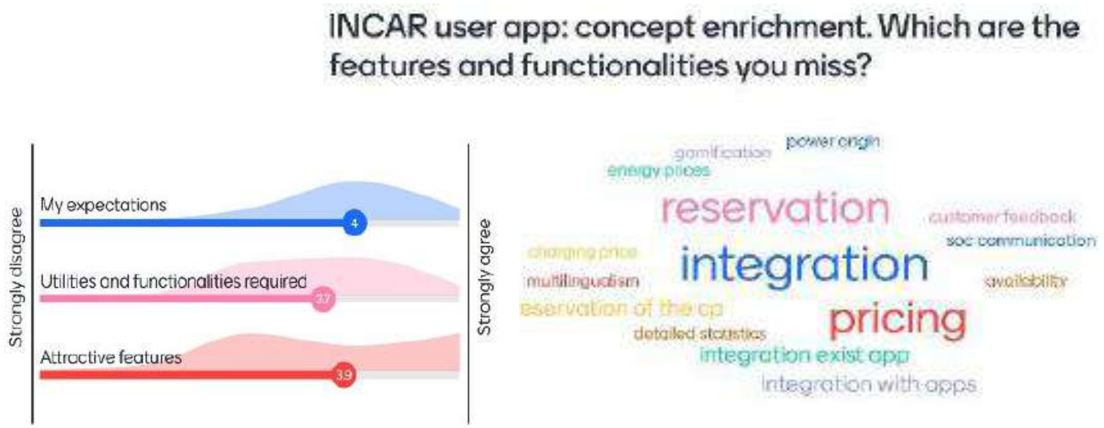


INSOC

INCAR CONCEPT DESIGN ASSESSMENT



INCAR



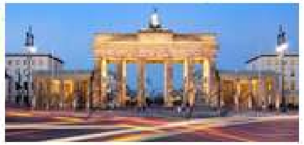
USAGE SCENARIOS TO PERFORM DEMONSTRATIONS

	Usage Scenario	USER-CHI produ
Barcelona AMB	1	INCAR
		SMAC
	2	INDUCAR
	3	INSOC
	4	CLICK
Berlin	5	INCAR
	6	CLICK
Turku	7	CLICK
	8	INSOC
	9	SMAC
	10	INCAR
Rome	11	CLICK
	12	INSOC
	13	SMAC
	14	INCAR
Budapest	15	CLICK
	16	INSOC
	17	SMAC
	18	INCAR

Usage Scenario 5. Short range demo

INCAR Usage Scenario

Gewobag resident as a potential user of the INCAR app – End User



Gewobag

User story A:

Nina is a resident of the Gewobag quarter Berlin-Mariendorf and an owner of an electric car.

After a long day at work in the office, Nina gets into her car and wants to reserve an e-park spot in her residential area before heading home.

She opens the INCAR App on her smartphone and can easily log into her account, as she is registered with qwello as an EMP of her choice.

In the map overview Nina checks the availability of the e-park spots and sees that one spot is free. As she usually uses another e-park spot, Nina checks the suitability of the connector type in the app. She makes a reservation and heads home.

After arriving at the residential parking area, Nina gets identified and the parking barrier opens. She parks her car, connects it to the charger and starts the charging process in the INCAR app. After starting the charging process Nina get information on the prices and can check the costs of parking and charging at any time in the INCAR app.

The next morning Nina opens her INCAR app to end the charging of the e-park spot before driving to work.

In the app, she receives an accounting overview/ invoice, of the electricity comsumed, the costs of the parking and charging as well as the duration of the parking

After the charging process, in the INCAR App a validation screen is activated and Nina can give feedback to some questions in the user survey. So, Nina contributes to the improvement of e-park spots in her residential area.

Before heading work, Nina checks her previous activities and compares her last bookings in the overview section

USER RESEARCH RESULTS: HIGHLIGHTS

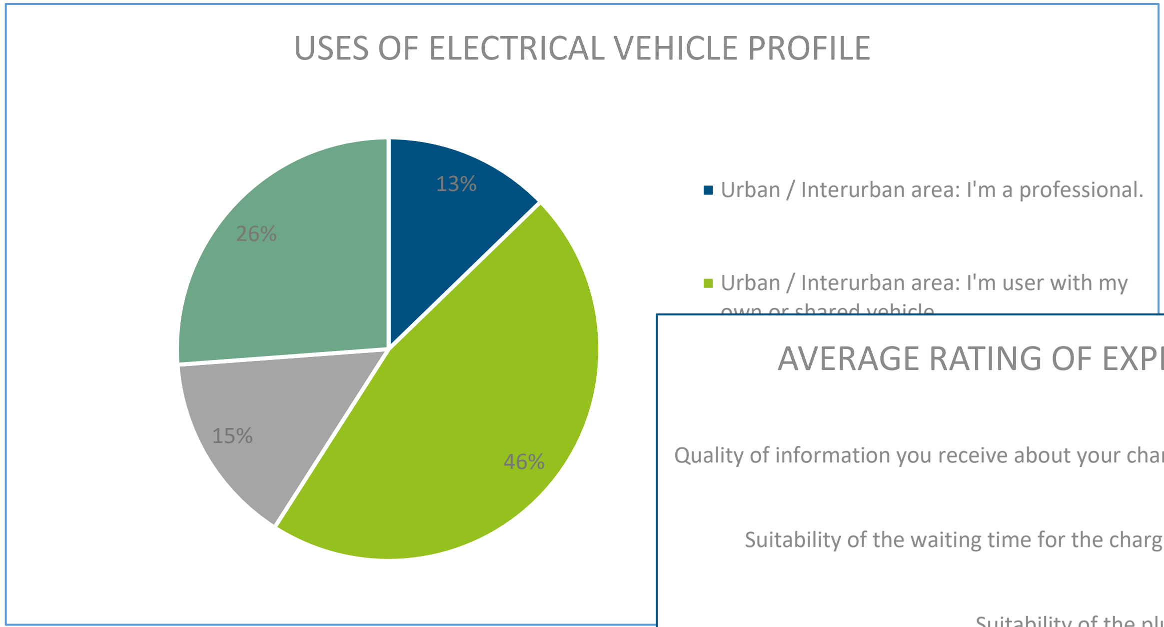
We grouped the results of qualitative and quantitative research, considering electromobility's components (EVs-Infrastructure-Apps), and according to *Kano*'s model:

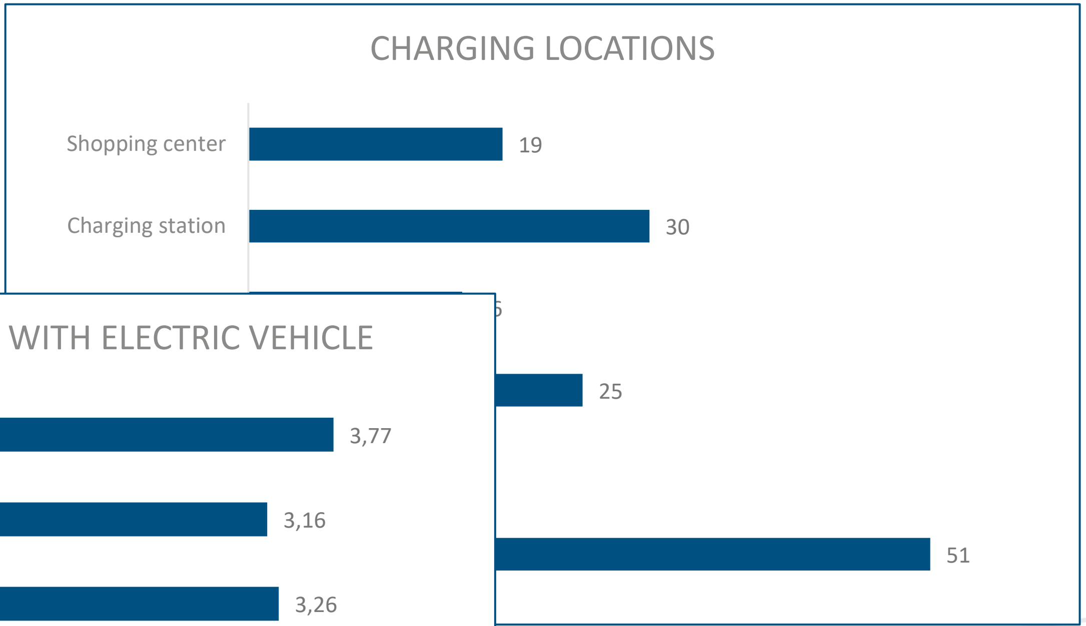
- *Must be requirements*: *must have* features for the user
- *One dimensional requirements*: features expected by the user
- *Attractive requirements*: unexpected features for the user

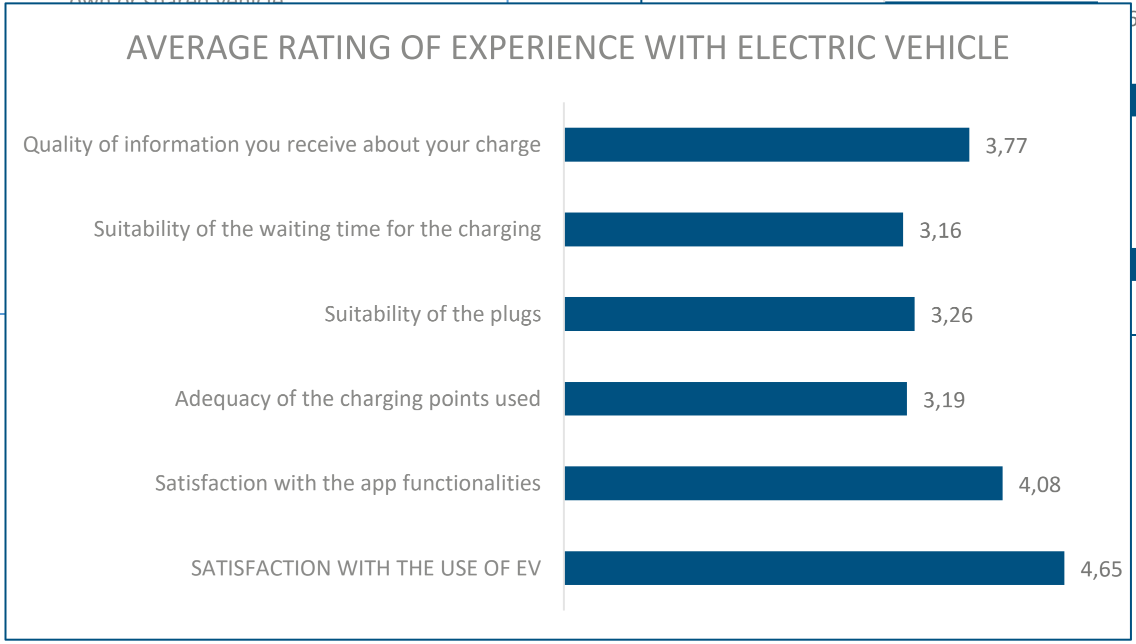
Users demand a ***higher performance charging points' network dense enough, that ensures the availability of a charging point*** once it has been booked in advance remotely. This is **a *must be requirement* of electromobility, not accomplished** by Infrastructure-Apps.

- Requirements for *CLICK*, *INCAR*, *INSOC*, *INDUCAR* and *SotF* are also presented, following the *Kano*'s model.
- Conclusions also include a sub-section for *Gender issues*

QUALITATIVE RESEARCH RESULTS: FIELD DIARY







USAGE SCENARIOS DEFINITION

Product leaders -Product cards
- **CLICK-INCAR-SMAC-INSOC-INDUCAR**
- **Product description**
- **Validation needs**

Cities
AMB-BER-BUD-ROM-TUR
- **Available facilities**
- **Interests**

Bilateral meetings
WP1 team & City

Usage scenarios proposal
- **2 review loops**

T1.1 – USAGE SCENARIOS -
IBV – (M1 – M9)

STATIONS OF THE FUTURE HANDBOOK

CONCEPT SOLUTIONS TO

Intermodal station of the future

Electric cars — eBikes — eScooters — Public transport

Services

①Chargers & ②inductive charging for EVs + vehicle maintenance + parking lot

③Chargers for LEVs

④Intermodal ticketing point

⑤Cafeteria

⑥Toilets

⑦Lockers & courier service

⑧Coworking & resting area

HOW MANY CHARGERS DO WE NEED? AND WHAT TYPE?

Although amount of chargers is quite different between Norway and Germany-Spain, Norwegians consider that the charging infrastructure is still an unsolved issue. This suggests that even in Norway the charging infrastructure has not overcome the required critical threshold, or perhaps there is something else...

NUMBER OF EV CHARGE INFRASTRUCTURE PER POPULATION

	GERMANY	NORWAY	SPAIN
Tesla Supercharger	1/1.000.000	1/70.000	1/700.000
Tesla Dest Charger	1/100.000	1/37.000	1/100.000
Charging Point	1/10.000	1/2.000	1/9.000
Connector	1/4.500	1/900	1/3.400

ELECTROMOBILITY IS ONLY A QUANTITATIVE PROBLEM, OR QUALITATIVE ASPECTS ALSO MATTER?

TRENDS IN EVs

- → Better availability of charging facilities
- → Energy saving and greener environment
- → Standardization of core components
- → Ubiquitous and environmentally friendly
- → Diversified charging modes
- → Digital and intelligent charging
- → Tighter control for safety and privacy protection
- → Charging infrastructure is a node for multi-network convergence

OUR AIM

In order to achieve the project aims, USER-CHI is focused in defining the charging infrastructures for EVs and LEVs that create value for customers, the industry and the society.

THANK YOU!

ANY QUESTIONS OR COMMENTS?

CONNECT WITH US:

Twitter: @Userchi_H2020

LinkedIn: https://bit.ly/2W7M3mW

Website: www.userchi.eu

Email: info@userchi.eu

USER-CHI
FINAL EVENT

Date: **18/06/2024**
Author: **Lena Korostylova**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

INCAR Motivation

Charging Spot Availability

Difficulty in finding available charging spots

Complex Payment Processes

Navigating through multiple payment methods and platforms

Lack of Information

Real-time information about the availability and status of charging station

Inconsistent Charging Experiences

Inconsistent charging experiences across different charging stations

Limited Interoperability

Lack of interoperability between different charging networks and platforms

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Purpose and Goals of INCAR

- Ensures availability
- Saves time
- Efficient usage
- Supports trip planning
- Helps new users

Reservation

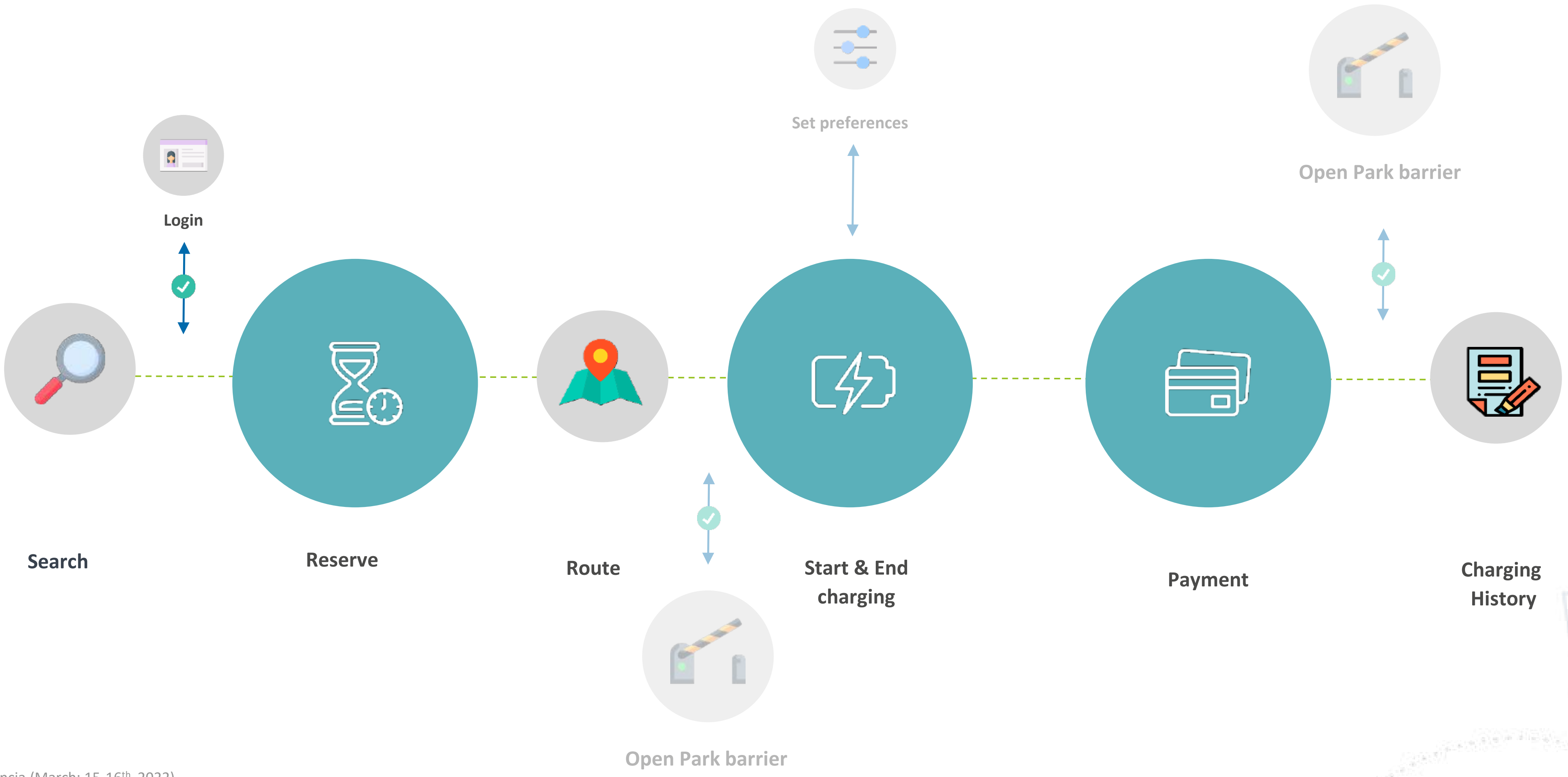
- Enhanced convenience
- Personalized settings
- More intuitive charging through one app
- Seamless and convenient charging experience,

Charging

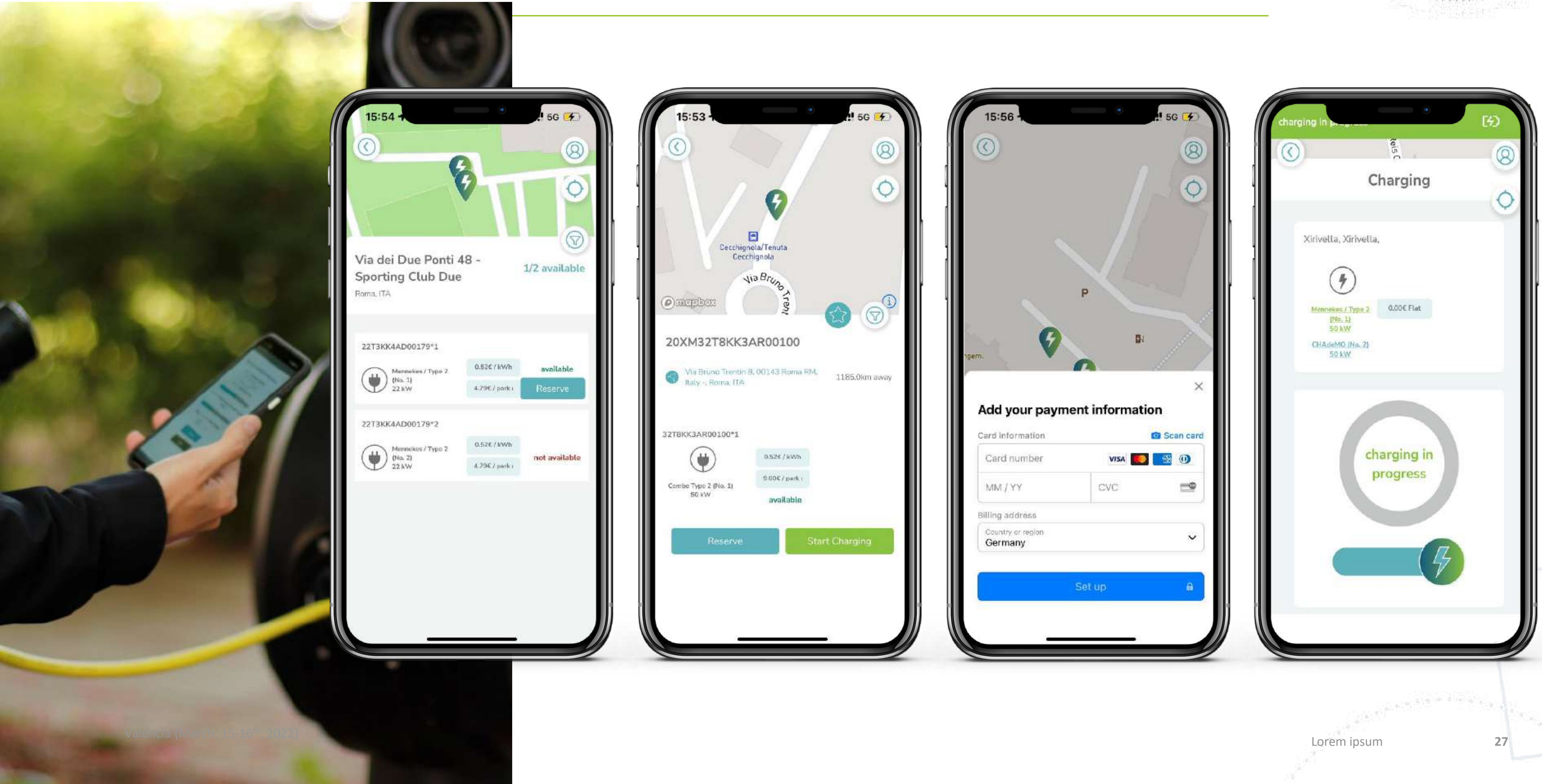
- Wider Accessability
- Unified and improved user experience
- Transparent cost and billing
- Standardization and interoperability

Payment

INCAR Functionalities



INCAR Functionalities



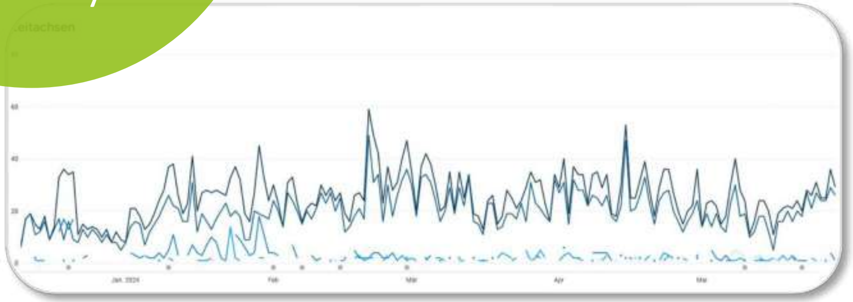
INCAR in numbers

5000
charging sessions

Support of **6 charging types** for MIV and Micro Mobility

1000
registered user

1300
charging points in 5 countries

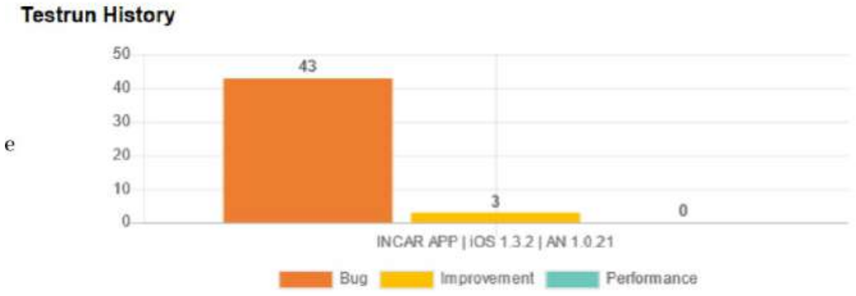


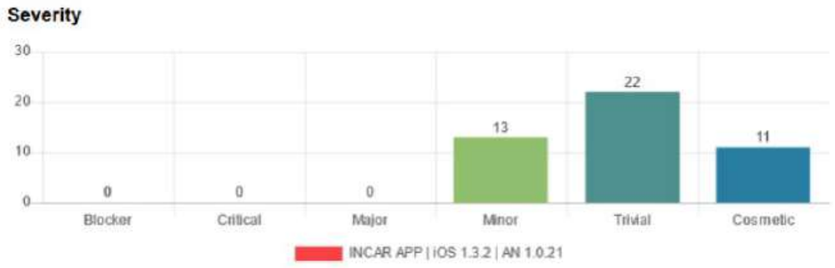
Available on **iOS** and **Android**

App in **8** languages

Learnings

App Testing





User Feedback

"Charging process without any problems - keep it up."

"Please improve payment method settings."

77% find the the charging very easy

61% users believe that INCAR improves the electric charging experience

"Charging and payment went smoothly!"

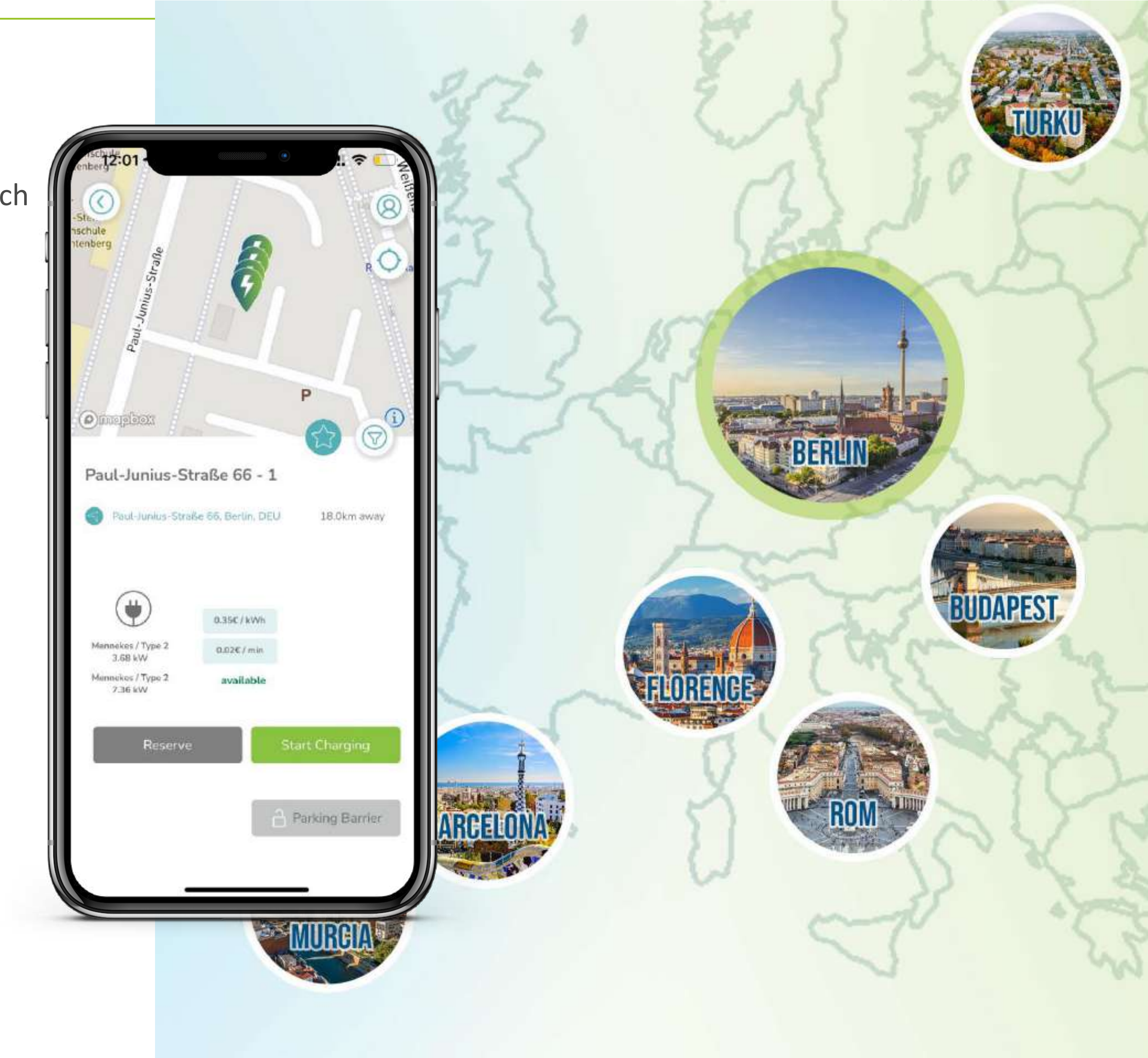
Lessons Learned and Opportunities

Optimizing OCPI2.2 Implementation:
Implementation of OCPI2.2 standards needs a structured approach from CPOs and EMSPs

Engagement and Value Creation:
Bringing more CPOs and EMSPs onto the platform

Seamless OCPI2.2 Integration:
Integrating OCPI features and aligning CPO hardware to these standards

Effective User Acquisition:
Innovative marketing strategies to effectively attract and retain a larger user base



Your Turn

Reserve, charge and pay with INCAR

Download on the App Store

GET IT ON Google Play

USER-CHI IN THE SPOTLIGHT

Insights from demo implementation and local and cross-site evaluation

Date: **18/06/2024**
Author: **Marisa Meta**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Demo implementation: who did what?

	Barcelona	Berlin	Budapest	Rome	Turku
CLICK	✓	✓	✓	✓	✓
INCAR	✓	✓	✓	✓	✓
SMAC	✓	✗	⏳	✓	✓
INSOC	✓		✗	⏳	✓
INDUCAR	✓				

Moving innovation

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Key challenges and drivers

CHALLENGES

- ➢ Regulatory frameworks
- ➢ EV market uptake
- ➢ Local data availability and quality
- ➢ Flexibility of public procedures VS innovation program timing
- ➢ Defining effective BMs for prototypes
- ➢ New product and services VS existing ones

DRIVERS

- ✓ User centric approach
- ✓ Adoption of open standards
- ✓ Strong marketing campaigns and incentives
- ✓ Commitment of local consortia

Moving innovation

Key figures on the project's achievements

- ~ *3,000 charging sessions*
- ~ *10.23 kWh per session*
- ~ *4h average duration*
- ~ *360 distinct users*

- ~ *30% energy cost reduction*
- ~ *55% CO_2 reduction*

85 EVSE installed by USER-CHI

4,610 EVSE planned with CLICK

Moving innovation

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Key figures on the project's achievements – User perspective

Table 2: General population opinion and views on battery electric vehicles

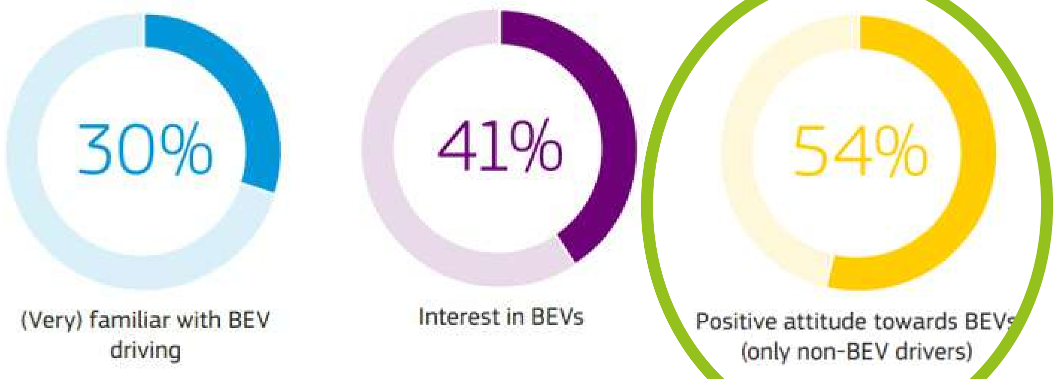
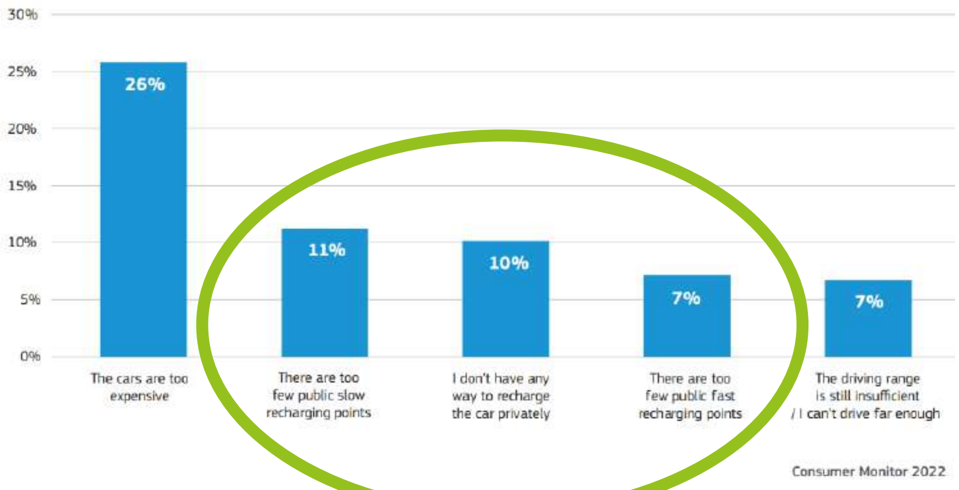


Figure 1: EU drivers' top five identified disadvantages of battery electric vehicles



✓ *195 detailed end-users feedbacks received so far*

+11% Increase of citizens attitude toward BEV

+59% EV drivers satisfaction levels

"This station is usually busy, so booking your charge is good"

"The ability to reserve ensures that you can manage the time to charge more comfortably"

"[finding] Cheap charging points is important to me"

"If it's Europe-wide, then it's good"

"The perspective of having a less invasive charging network is appealing"

THANK YOU!

USER-CHI IN THE SPOTLIGHT

Final Event in Brussels

Date: **18/06/2024**
Authors: **Divy Gupte(IKEM)**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

BaU and Long-term Impacts

Improved user experience

Technology Advancement

Policy & Regulatory Influence

Reduction in CO2 emissions

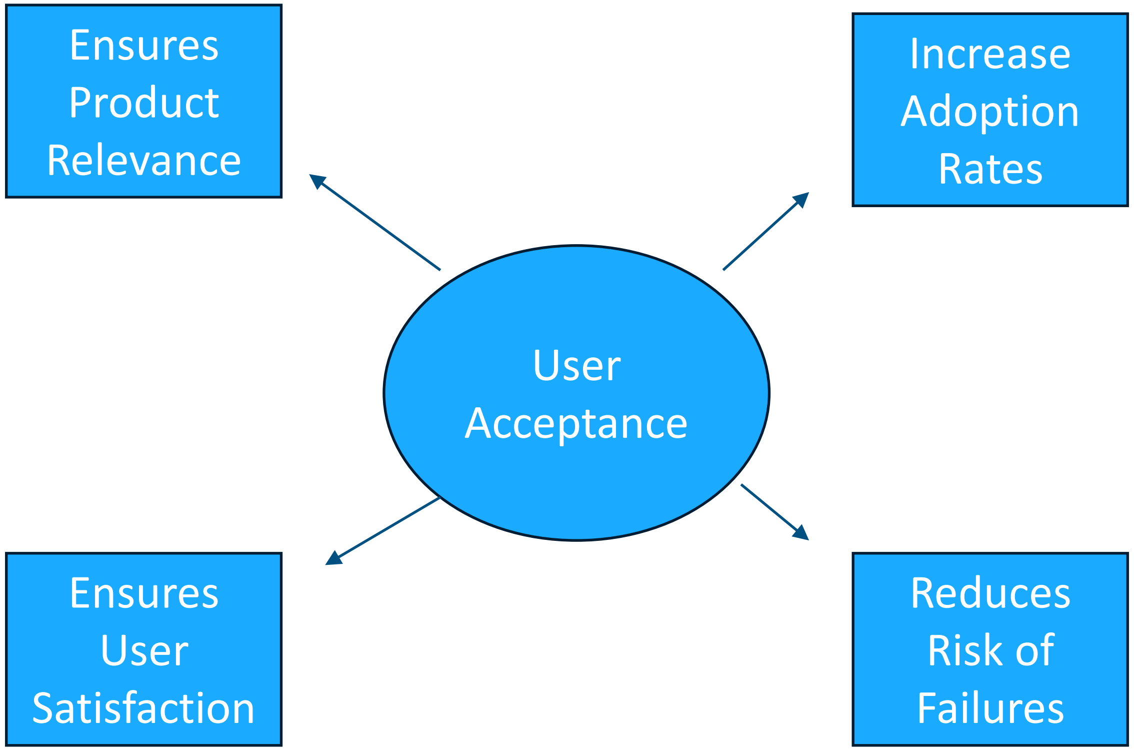
Enhanced Urban Mobility & Planning

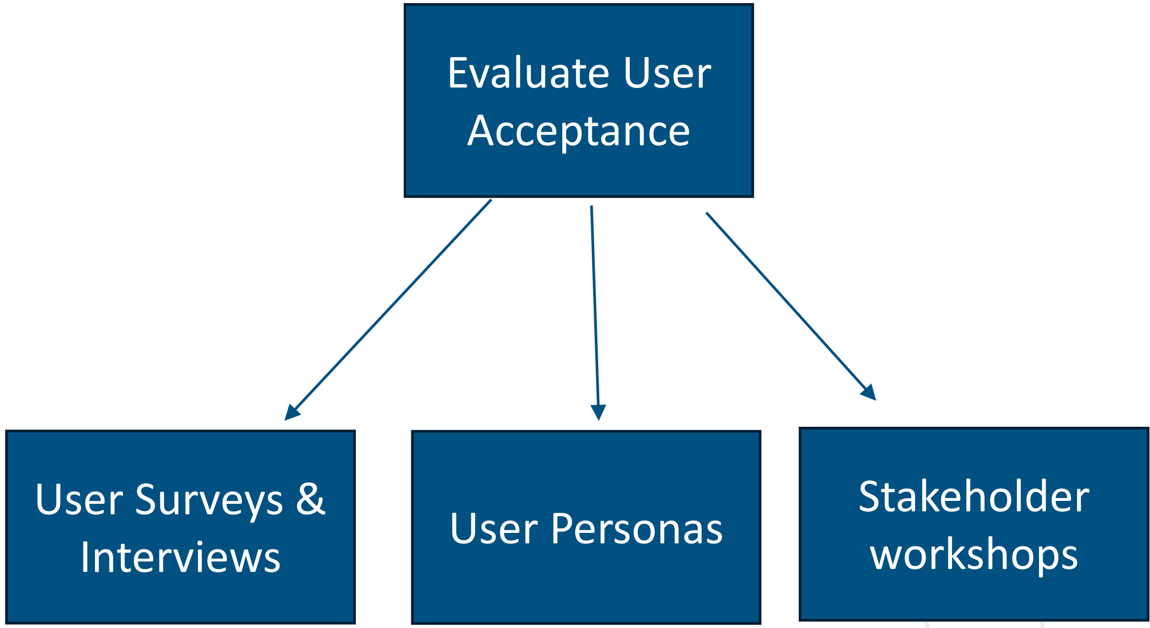
Improved Economic & Operational Efficiencies

Behavioural & Market shifts

Market & Business model Innovation

What is User Acceptance?





User Acceptance in USER-CHI

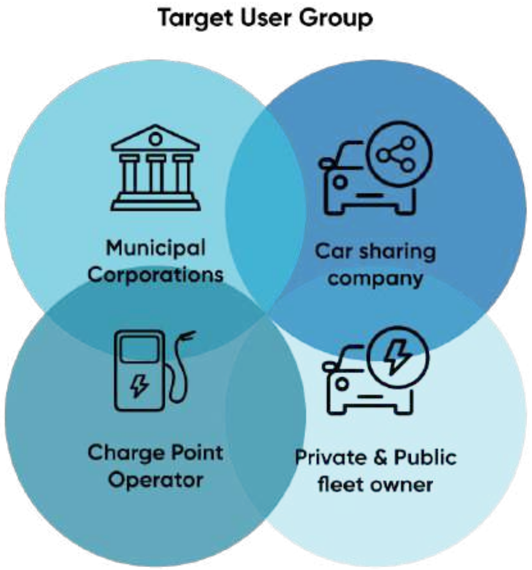
TAM Technology Acceptance Model	NPS Net Promoter Score	SUS System Usability Scale

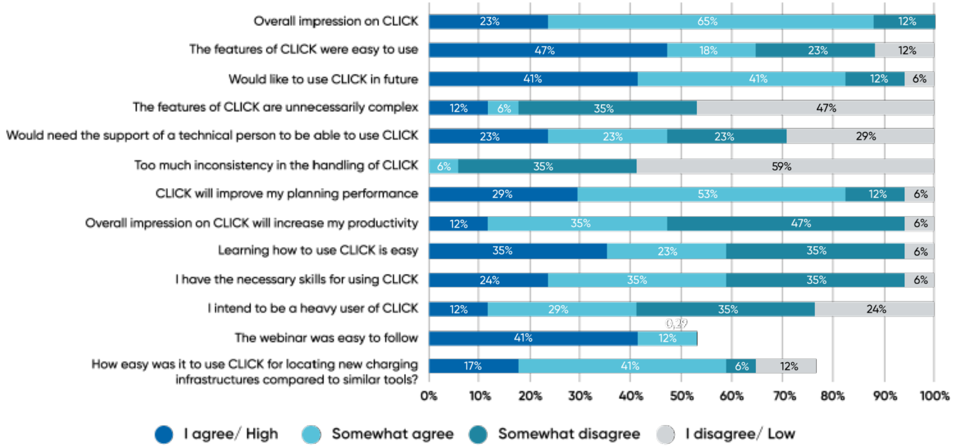
↓ ↓ ↓

Qualitative workshops & Ad hoc meetings

User Acceptance Questionnaire

Demonstration phase of CLICK





Ethics in USER-CHI

Key Ethical Activities

- Ethics Monitoring
- Gender Dimension
- Data Protection & Cybersecurity
- Accessibility

THANK YOU!

USER RESEARCH	PRODUCTS	DEMOS	EVALUATE	EXPLOIT
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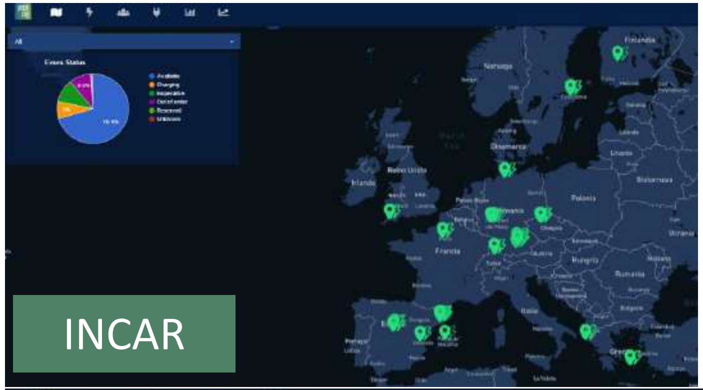
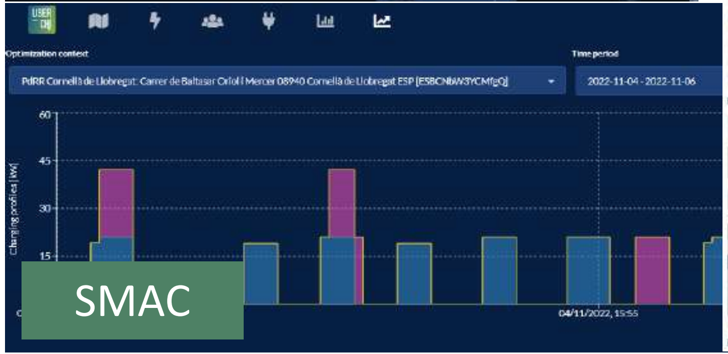
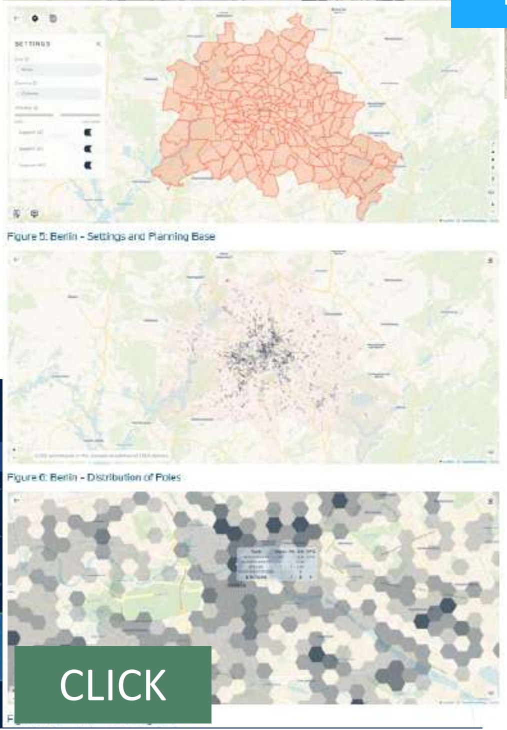
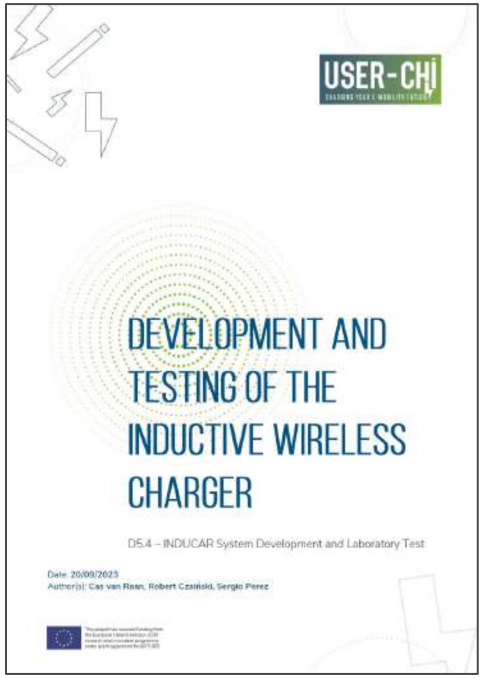
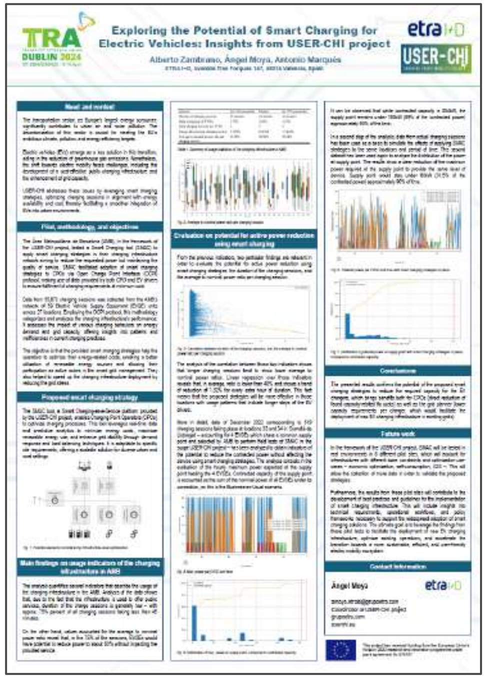


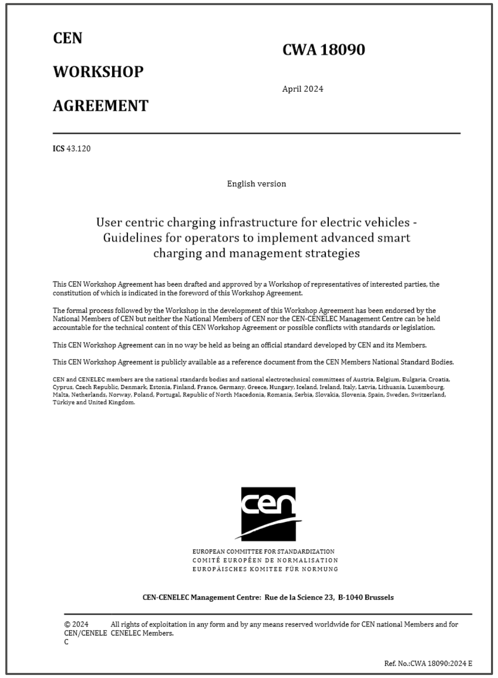




USER RESEARCH | PRODUCTS | DEMOS | EVALUATE | EXPLOIT






CEN
WORKSHOP
AGREEMENT

CWA 18090

April 2024

ICS 43.120

English version

User centric charging infrastructure for electric vehicles - Guidelines for operators to implement advanced smart charging and management strategies

This CEN Workshop Agreement has been drafted and approved by a Workshop of representatives of interested parties, the constitution of which is indicated in the foreword of this Workshop Agreement.

The formal process followed by the Workshop in the development of this Workshop Agreement has been endorsed by the National Members of CEN but neither the National Members of CEN nor the CEN-CENELEC Management Centre can be held accountable for the technical content of this CEN Workshop Agreement or possible conflicts with standards or legislation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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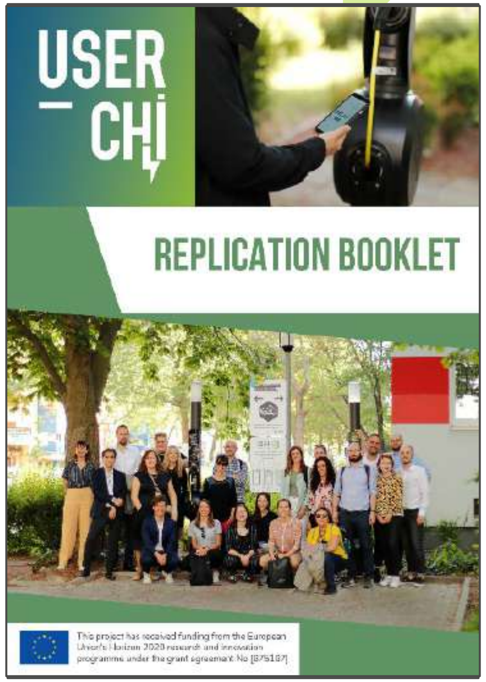


54 Deliverables

10 Scientific papers

2 CEN/CENELEC WA

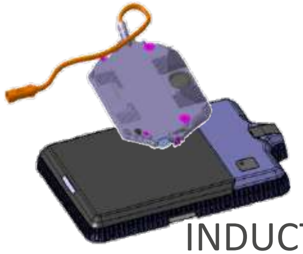
4 PODCAST EPISODES

10 WEBINARS

2 E-Mobility Plans
1 Handbook SotF
1 Technical study
1 Replication booklet

5 Peer-Learning visits, **4** SAG meetings, **3** Ethics Committees, **4** trips EV Tour…

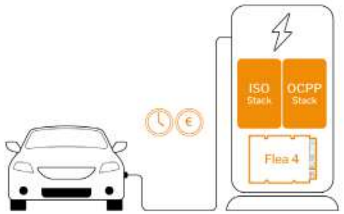
KEY LEARNINGS → NEXT STEPS

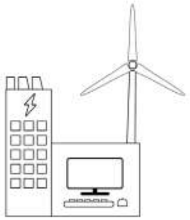


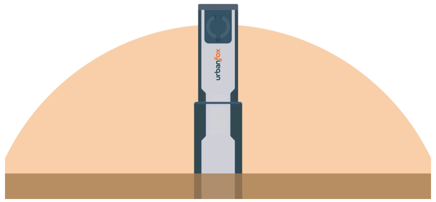
INDUCTIVE

CABLE

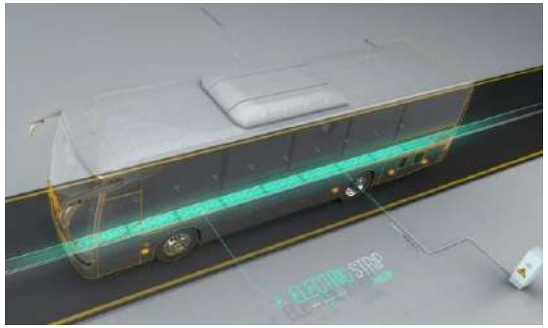
CASE + COLLARS

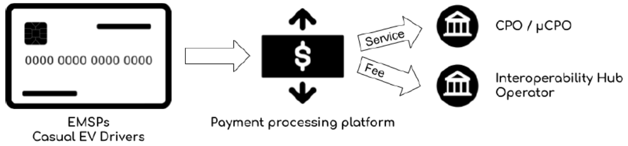






Smart charging?





Micro CPO's

Bi-directional EV-charging

THANK YOU!

PANEL DISCUSSION – CITIES IN THE SPOTLIGHT

METROPOLITAN AREA OF BARCELONA

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

USER-CHI FINAL EVENT

A GLIMPSE AT ELECTROMOBILITY EVOLUTION IN BARCELONA

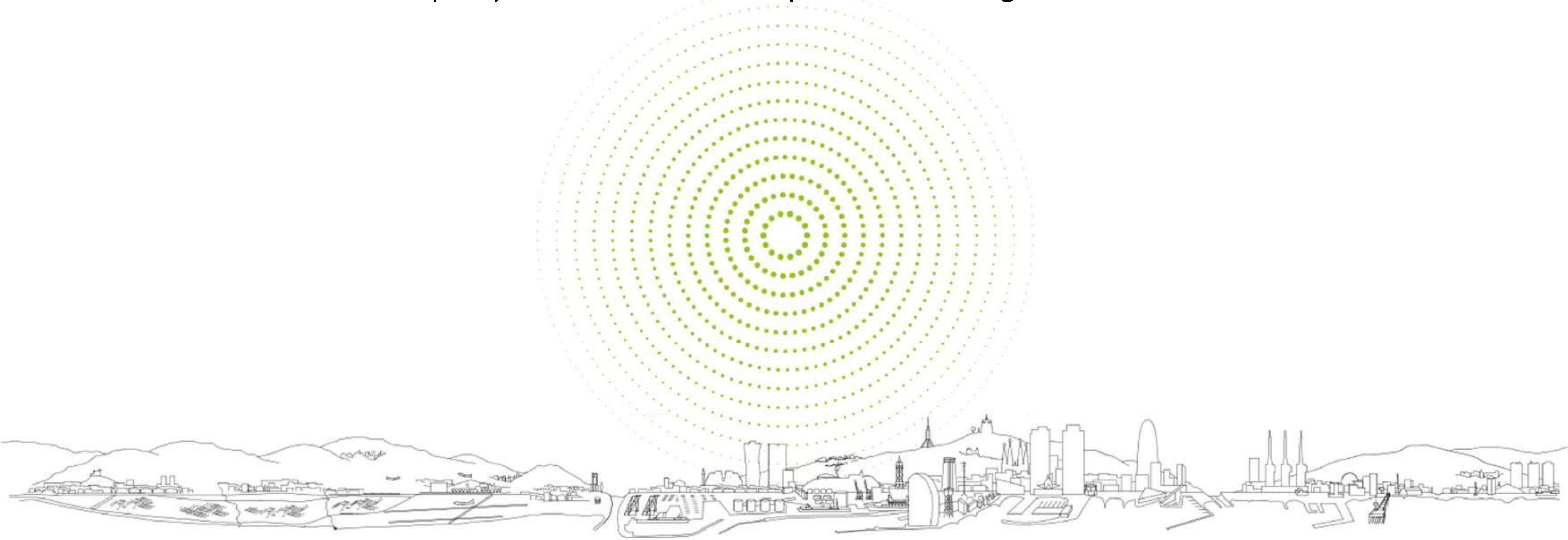
Brussels, 18th June 2024

AMB Mobilitat

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

BARCELONA

A metropolitan area with 3,35 million people
Air quality in Barcelona is not compliant with WHO guideline levels



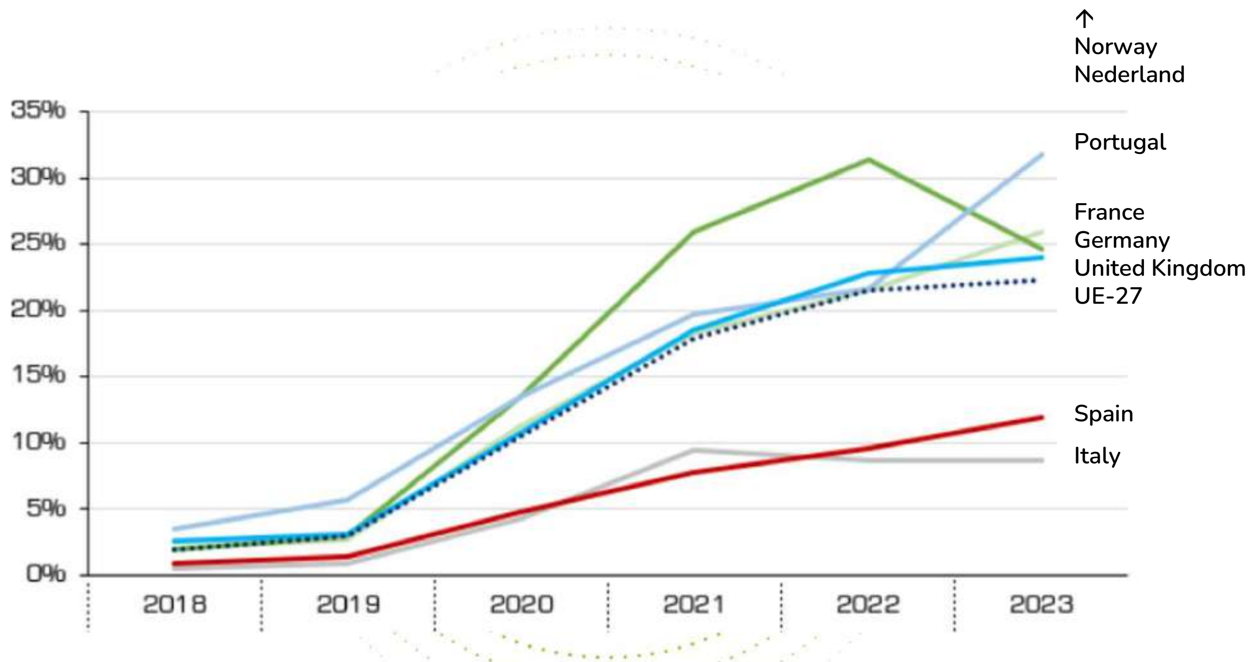
EVOLUTION OF ELECTRIC VEHICLES CHARACTERISTICS

Spain 2014		Spain 2023
Most popular BEV:		Most popular BEV:
NISSAN LEAF		TESLA Model Y and 3
Battery: 24 kWh	x 3	Battery: 60 - 80 kWh
Range: 199 km		Range: 450 - 540 km
465 units sold		12.949 units sold

EVOLUTION OF ELECTRIC VEHICLE SALES SHARE

USER-CHI

Electric vehicle (BEV+PHEV) sales share 2018-2023



Only passenger cars
AMB figures are estimated
Source: ANFAC, AMB

2014	2019	2023
AMB: 0,2% sales share	**AMB: 1,7% sales share**	**AMB: 13,8% sales share**
240 units sold	2.350 units sold	12.900 units sold

AMB Mobilitat

USER-CHI

EVOLUTION OF QUICK CHARGING EQUIPMENT

2014

50 kW

2 DC connectors

CHAdeMO+COMBO

1 AC connector

Mennekes

1 car simultaneously

350 kg

<40°

Made in France

2024

130 kW

2 DC connectors

COMBO+COMBO

2 cars simultaneously

Cable: auto retractable system

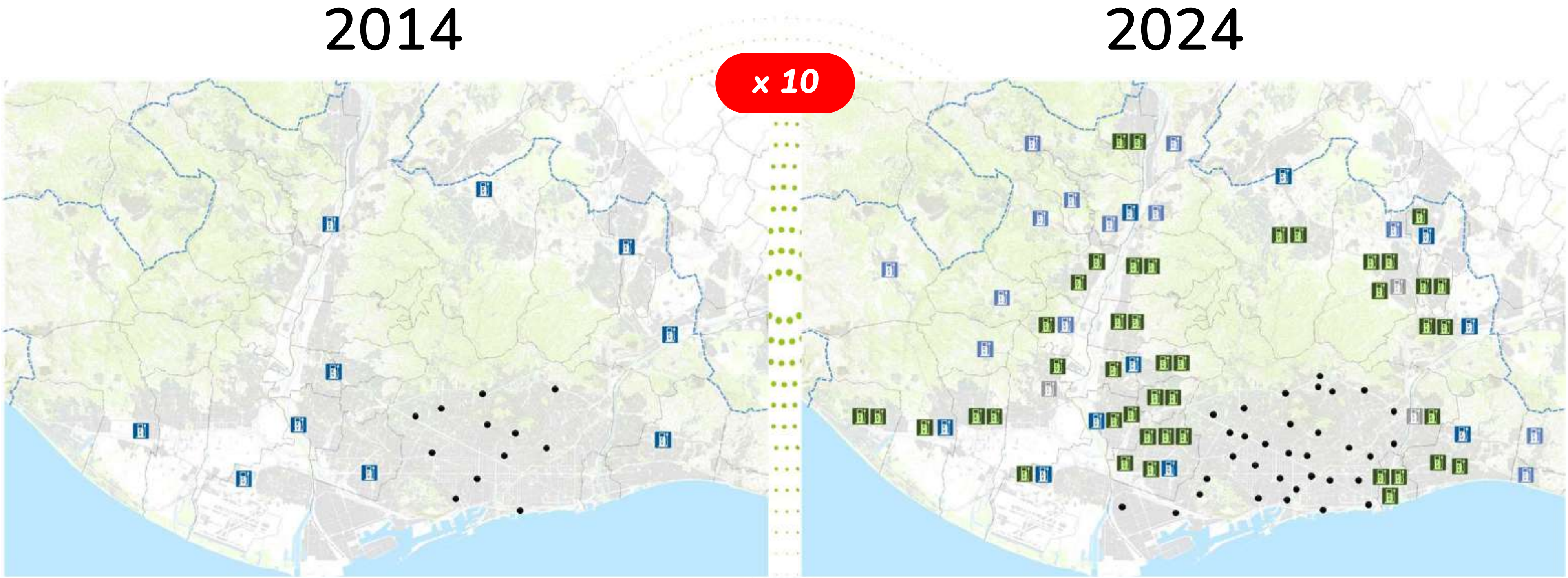
250 kg

<50°

Made in Barcelona

AMB Mobilitat

EVOLUTION OF QUICK CHARGING NETWORK



10 quick charging stations (50 kW)

63 quick charging stations (130 kW)
39 normal charging stations

TAKEAWAY FROM USER-CHI

- **Technology**

  Collaboration with carmakers and charging points producers is required (after INDUCAR and INCAR tests).

- **User centric electromobility**

  Communication with users must be simple and clear (after INCAR and INSOC tests). Need of more easy and friendly payment systems (after INCAR test).

- **Administration role**

  Benefits of collaboration with other cities. Role of local administration in electromobility? public operator versus private operators.

FUTURE PROJECTS/STRATEGIES FOR THE NEXT YEARS

- **Electromobility for freight transport**:

  Electric vans, electric trucks, fuel cell electric vehicles?
  Charging infrastructure needs? How to encourage it?

- **Macro charging stations**:

  Night charging with low power? High power in the highways? Mobility-charging hubs?

- **Mobility sharing services:**

  Sharing as a key issue to introduce electromobility (e-bikes, e-scooters, electric motorbikes, electric cars) and really reduce the passenger car fleet needed.

Thank you!

rbosch@amb.cat

AMB Mobilitat

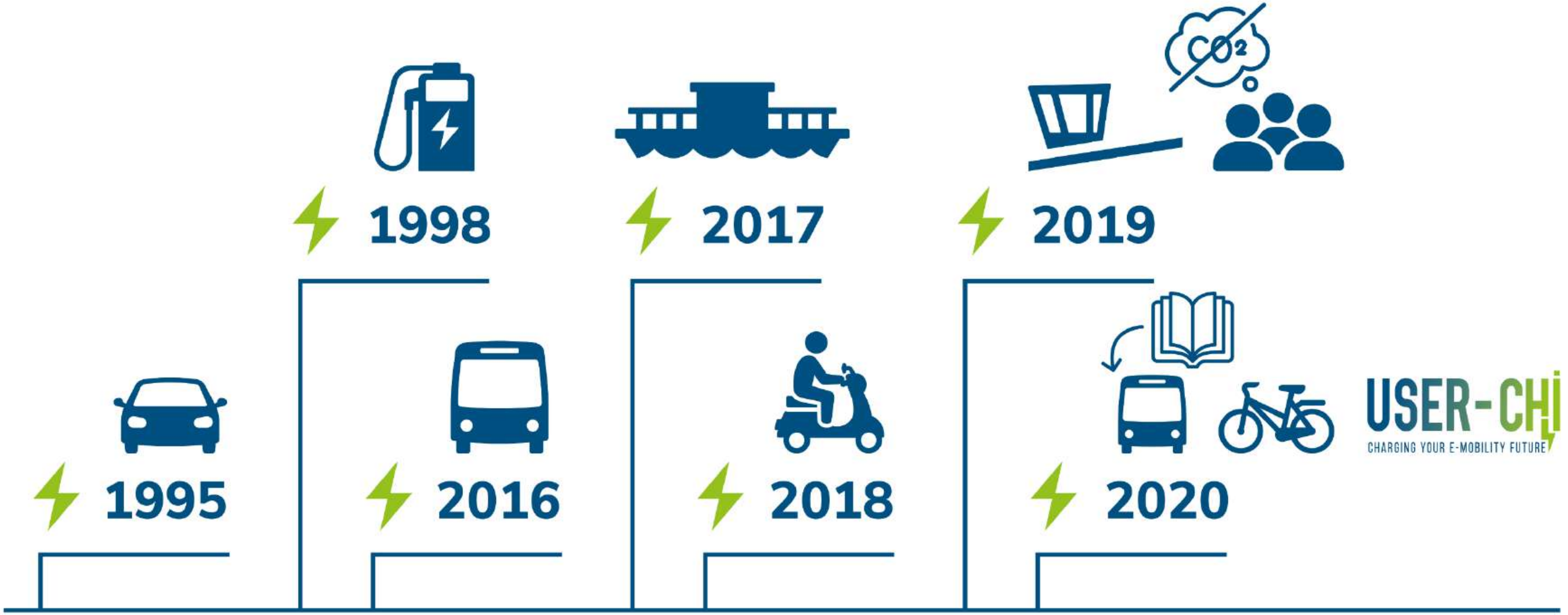
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

CITY OF TURKU

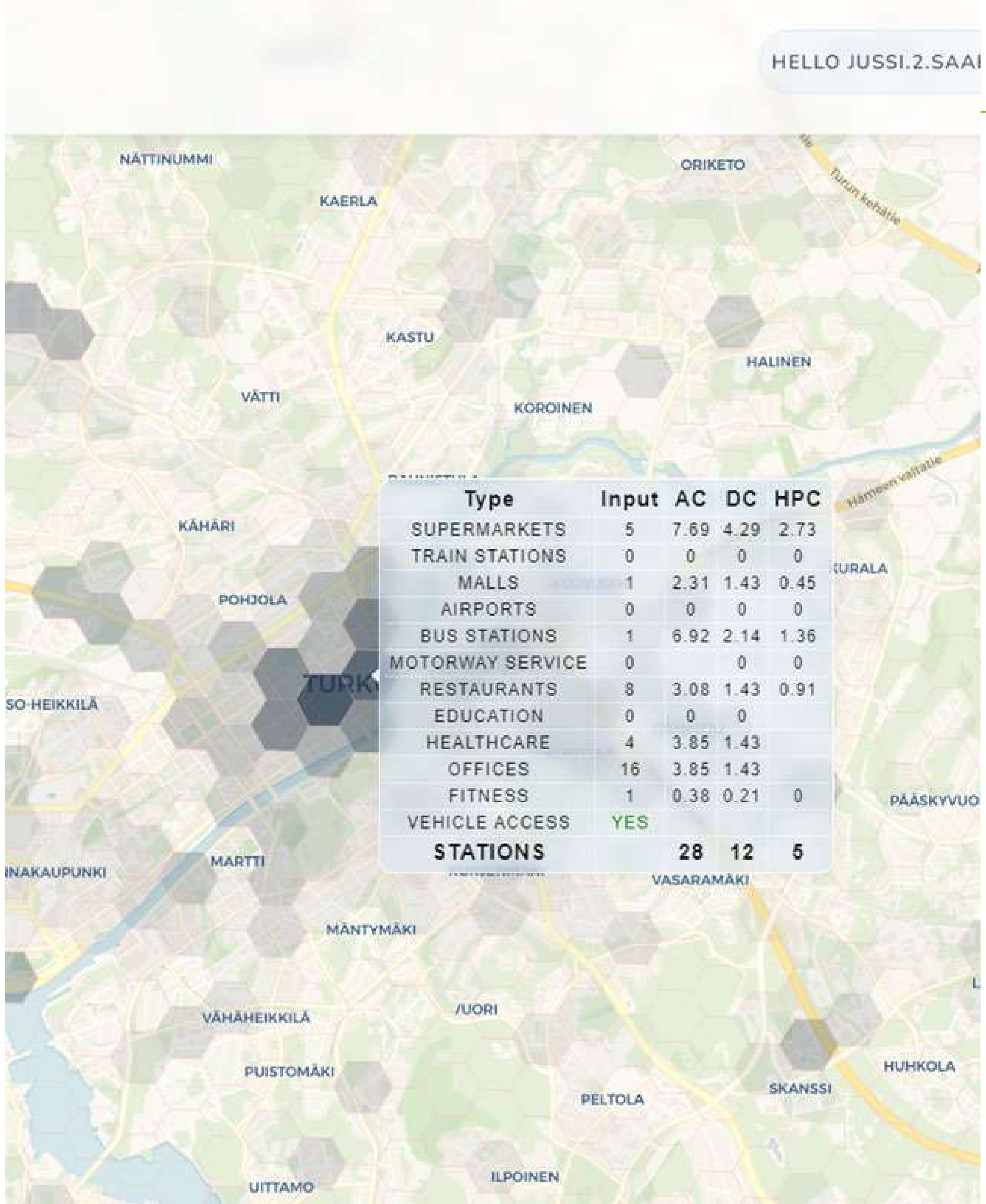
CITY OF TURKU

User-chi Final Conference 18.6.2024
Stella Aaltonen

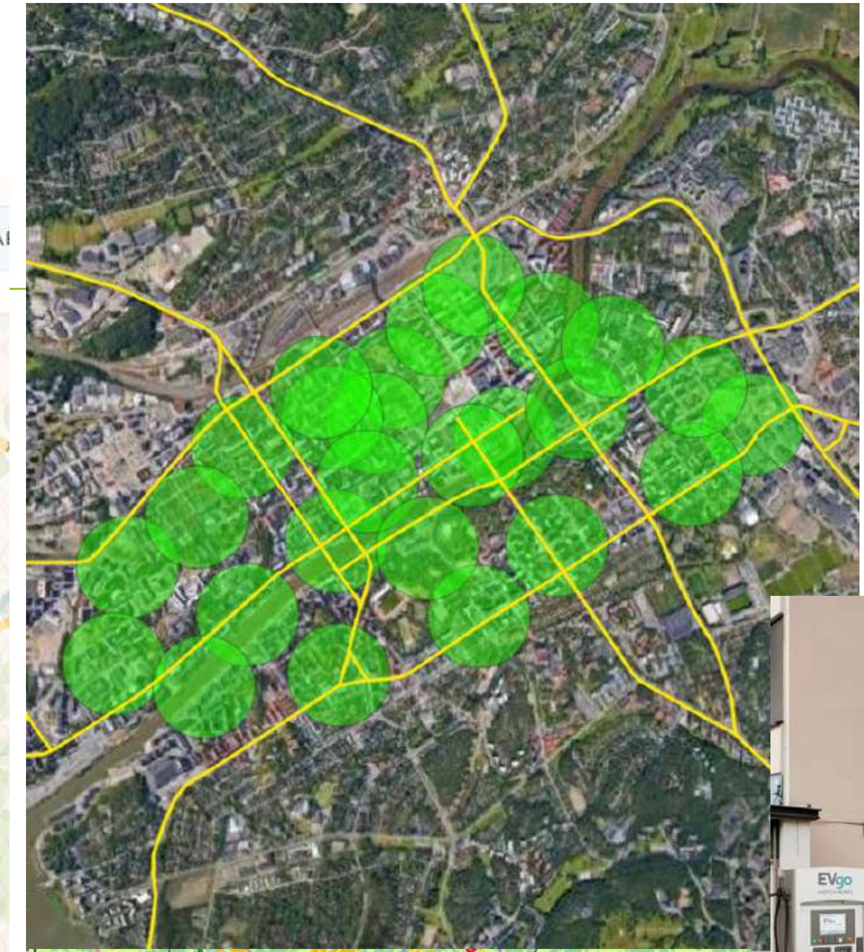
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]


1995
1998
2016
2017
2018
2019
2020
USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Turku Master plan



Type	Input	AC	DC	HPC
SUPERMARKETS	5	7.69	4.29	2.73
TRAIN STATIONS	0	0	0	0
MALLS	1	2.31	1.43	0.45
AIRPORTS	0	0	0	0
BUS STATIONS	1	6.92	2.14	1.36
MOTORWAY SERVICE	0		0	0
RESTAURANTS	8	3.08	1.43	0.91
EDUCATION	0	0	0	
HEALTHCARE	4	3.85	1.43	
OFFICES	16	3.85	1.43	
FITNESS	1	0.38	0.21	0
VEHICLE ACCESS	YES			
STATIONS		28	12	5

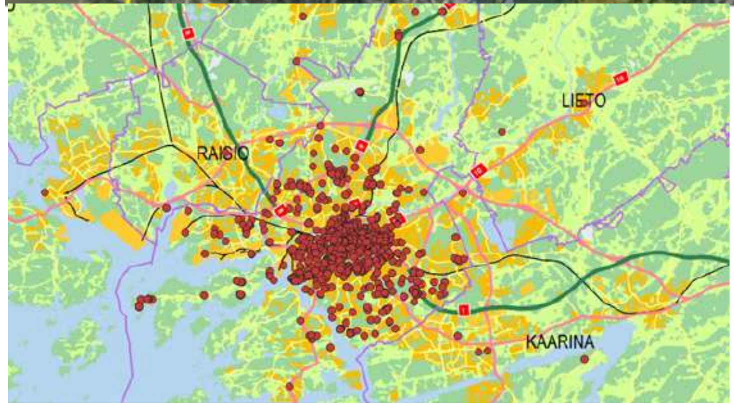



USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Turun kaupungin Sähkölatauksen Yleissuunnitelma

Suunnitelma sähkölatauksen rakentamisesta ja kehittämisestä Turun kaupungin alueella vuosille 2024–2030

Päivämäärä: 29.4.2024
Tekijä: Projektityöntekijä Jussi Saari, Turun kaupunki



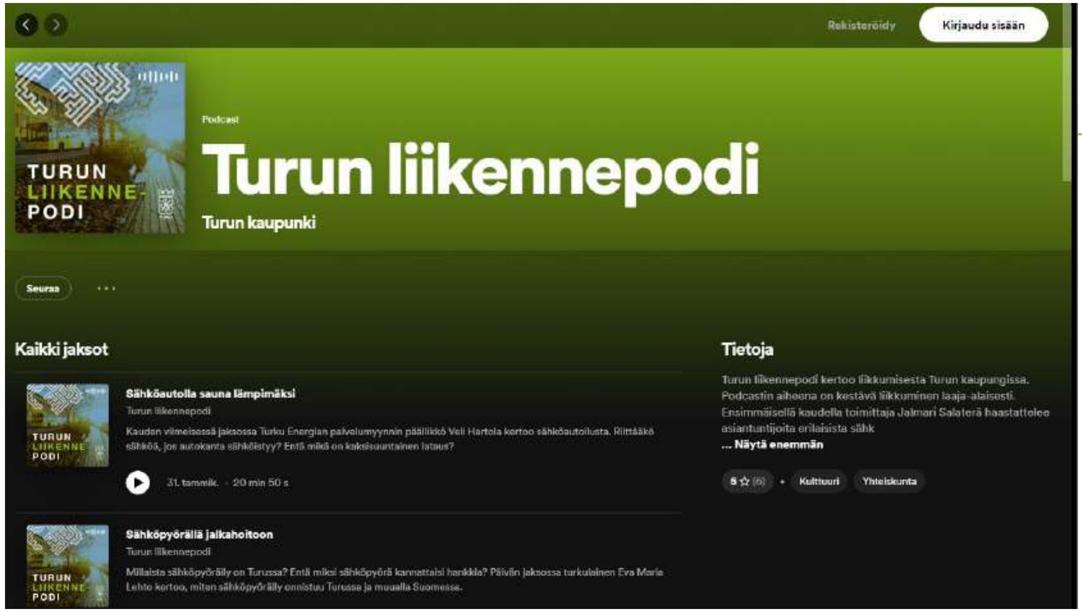
INSOC testing

Testing INSOC
Picture: Jussi Saari

Artist Heidi Vuorio
Picture: Oona Uusitalo

Bike garage
Picture: Oona Uusitalo

Turku communication on e-charging



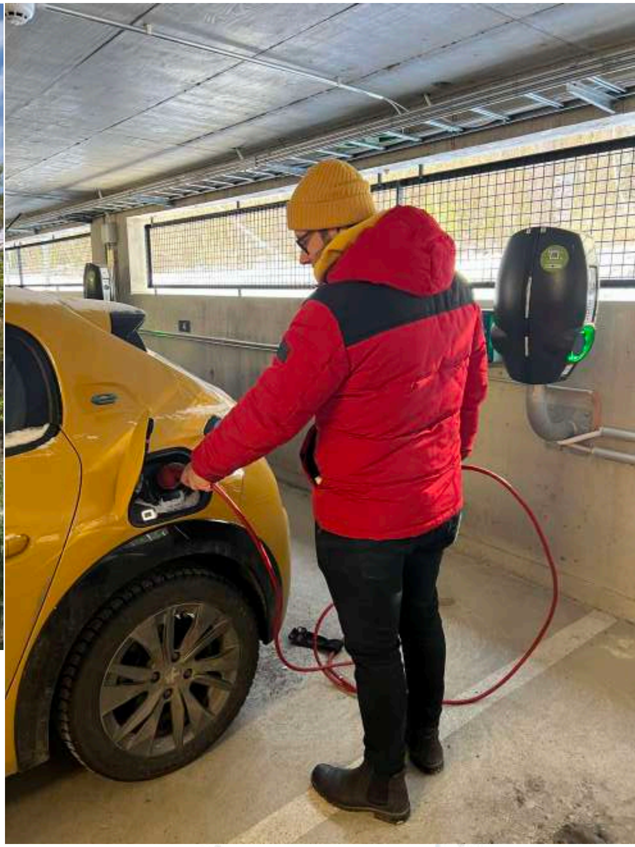
Vaso Pääskynrinne

Solar panels 30 pcs

Solar panels 30 pcs

Charging point for car sharing 22 kw

Chargers 6 pcs/22 kW



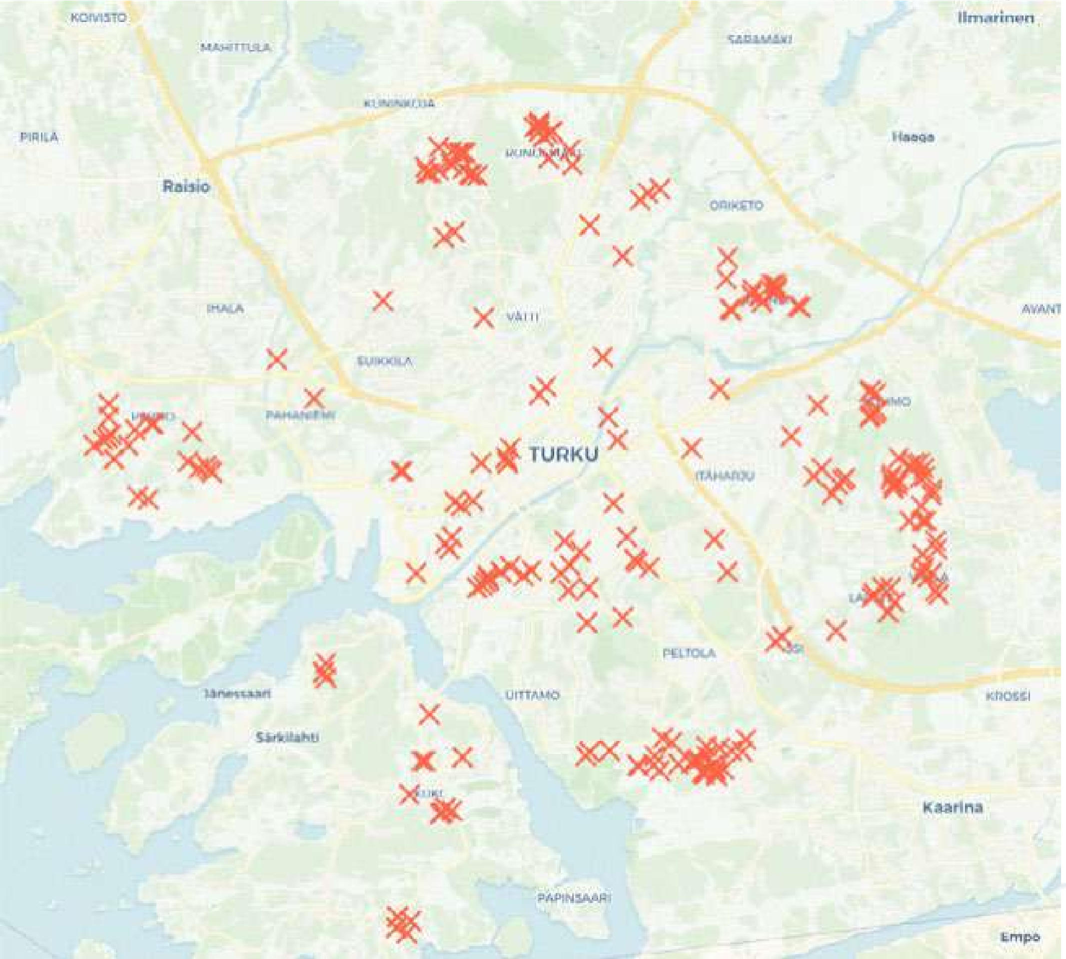
Demo sites
Pictures: Vaso

TVT – LEV e-charging

E-charging for senior scooters
Picture: Pauli Piekkari.

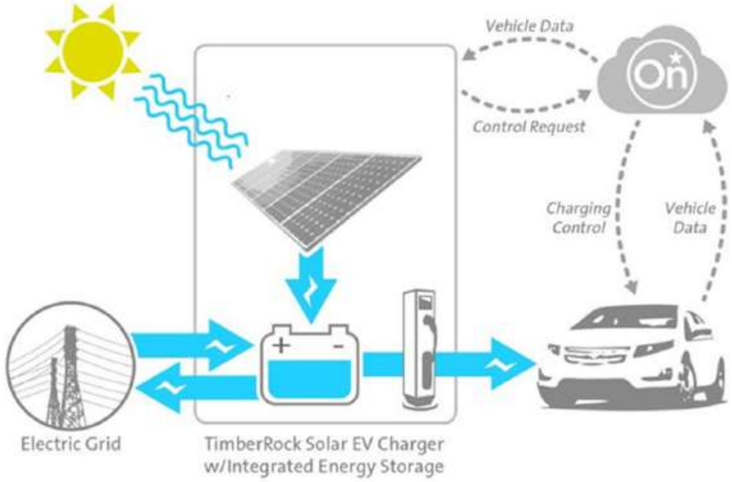
E-charging for bike batteries
Picture: Pauli Piekkari.

INSOC demonstration
Picture: Lasse Lähdemäki.



CLICK for future planning

Turku Energy charging pilots



TE demo sites
Pictures: Veli Hartola

MUNICIPALITY OF BUDAPEST

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

CITIES IN THE SPOTLIGHT: BUDAPEST

Final event

Date: **18/06/2024**
Author: **Kinga Lőcsei-Tóth**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Why e-mobility is so important?

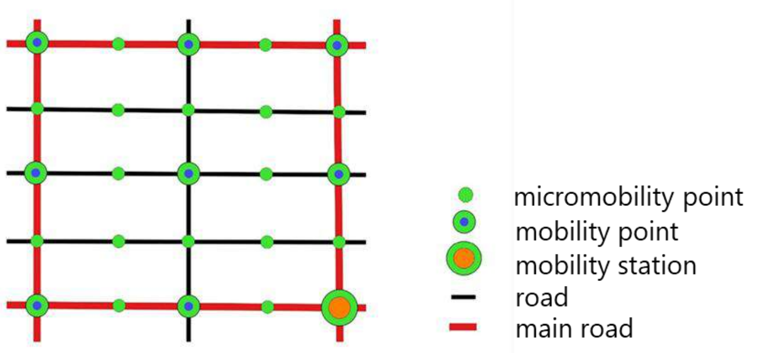
- Budapest is the centre of the country → transportation centre
- After noise pollution, **poor air quality** is the second largest environmental challenge in Budapest
- 2nd biggest emission source transport → old (diesel) vehicle fleet
- Citizen Assembly: reduce car traffic

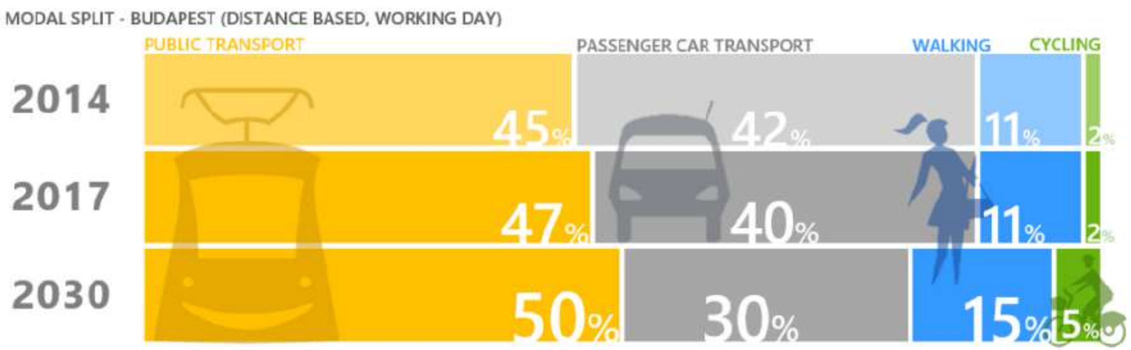
Smog in winter, credit: Soós Bertalan
Citizen Assembly on air quality, 2022

From theory to real life interventions

Mobility point concept developed with 3 service levels:

- **Micromobility Points**
- Mobility Points
- Mobility station





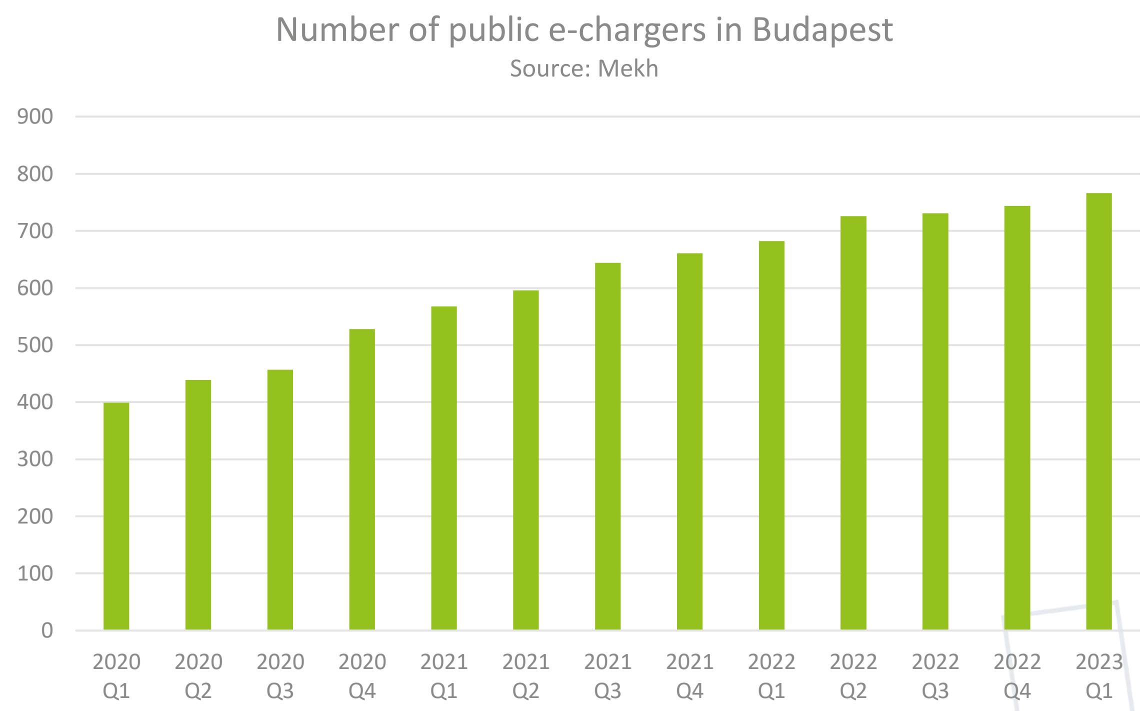
6. ábra: A BMT utaskm alapú budapesti Modal Split célkitűzés ábrája

User-chi demo: Citizen centric e-mobility points

- 4 different urban context
  - 1 TEN-T corridor (11 carsharing parking place, 2 charging spots)
  - 1 densely populated Pest side (2 carsharing parking places, 2 charging spots)
  - 1 densely populated Buda side (3 carsharing parking places, 2 charging spots)
  - 1 transition zone (2 carsharing parking places, 2 charging spots)
- Smart charging: private property of Budapest Waterworks

E-mobility strategy of Budapest

- Concept developed in 2017 for 1100 e-chargers.
- Now: 800+ public chargers, private chargers x 10 times more
- The trends changed a lot, now different focus: not only vehicle fleet but public space usage, shared mobility, better public services.
- NEW: Energy scarcity → decreasing energy dependency, RES into e-mobility
- 100 Climate neutral cities Mission
- Wider stakeholder engagement



Lessons learnt

- Rapidly changing trends: regulatory, technical, behavioural (COVID, energy crisis)
- Role of a municipality in a changing world? Public space scarcity?
- Administrative barriers, fragmented territory of electromobility
- Facing financial bottlenecks
- Operation: private investments vs. city budget
- Shifting environmental issues, ideologies (local emission vs. manufacturing)
- **Small scale pilot to city level upscale**

FUTURE? How AI envisions an e-mobility point in 2030…

THANK YOU!

CONNECT WITH US

@Userchi_H2020

www.linkedin.com/in/user-chi-project

www.userchi.eu

info@userchi.eu

CITY OF BERLIN

Senatsverwaltung
für Mobilität, Verkehr,
Klimaschutz und Umwelt

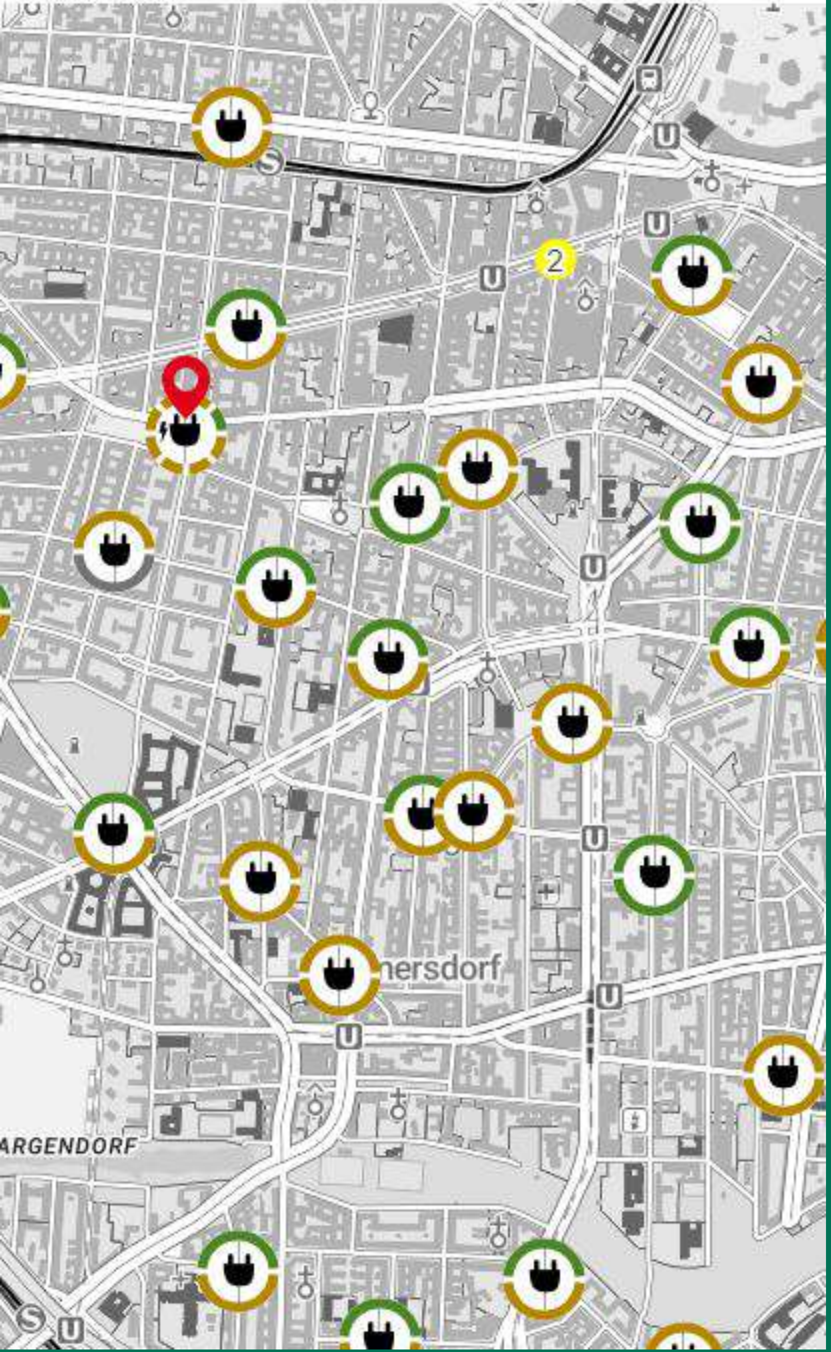
BERLIN

CHARGING INFRASTRUCTURE AND E-MOBILITY

STATUS QUO IN BERLIN
LESSONS LEARNED FROM USER-CHI

USER-CHI – Final Event
Cities in the spotlight
18th June; Brussels

DIGITALE PLATTFORM STADTVERKEHR



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BERLIN

CHARGING INFRASTRUCTURE IN BERLIN
STATUS QUO

SHARED RESPONSIBILITIES IN THE FEDERAL STATE OF BERLIN

	Public space (A)	Publicly accessible private space (B)	Private space (C)
Role of the public sector	• Approval authority • Development of the state's own charging infrastructure network • CPO-overarching concept on public ground (Berliner Modell)	• Legislature • Motivator • Economic promoter • Framer	• Legislature • Motivator • Economic promoter • Framer
Role of private actors	• CPOs • Investors	• CPOs • Investors • Property owners • Service provider • Area developer	• CPOs • Investors • Property owners • Service provider • Area developer
Examples	• Charging infrastructure on public streets	• Publicly accessible charging infrastructure on private ground (e.g. customer parking places)	• Private space • Own parking lot • Own company ground • Shared space • For various tenants • For specific users
Responsible	Senate Department for Urban Mobility, Transport, Climate Action and the Environment	Senate Department for Economic Affairs, Energy and Public Enterprises; Berlin Agency for Electromobility (eMO)	

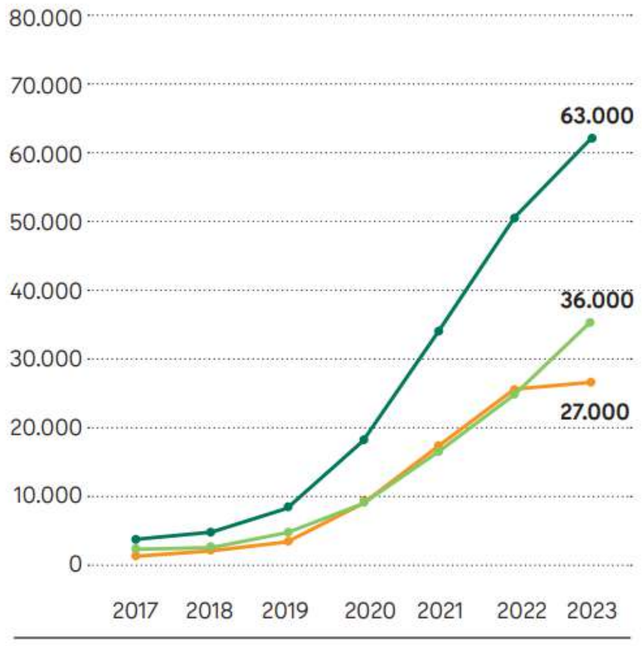
A — Berlin street law BerlStrG

A, B — AFIR

Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt BERLIN

ACTUAL NUMBERS – ELECTRIC VEHICLES / CHARGING INFRASTRUCTURE

EV - vehicle stock



BEV
PHEV
Both (BEV+PHEV)

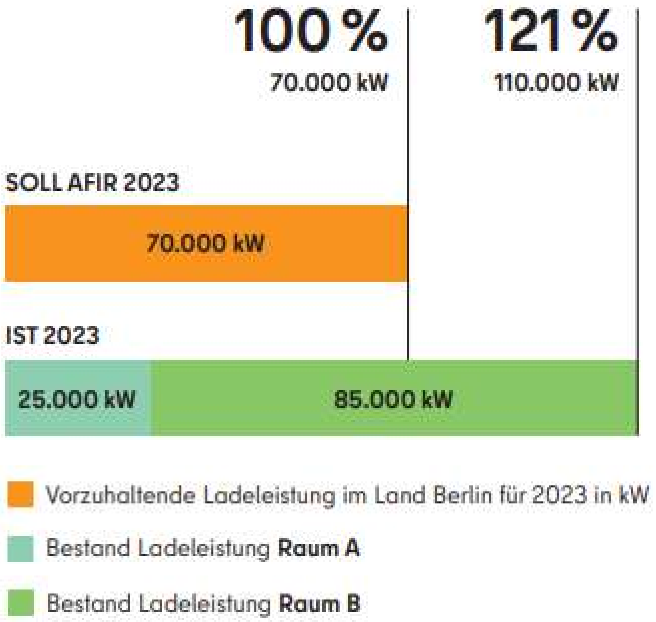
2024

Actual situation

63,000 electric vehicles

With a daily charging demand of

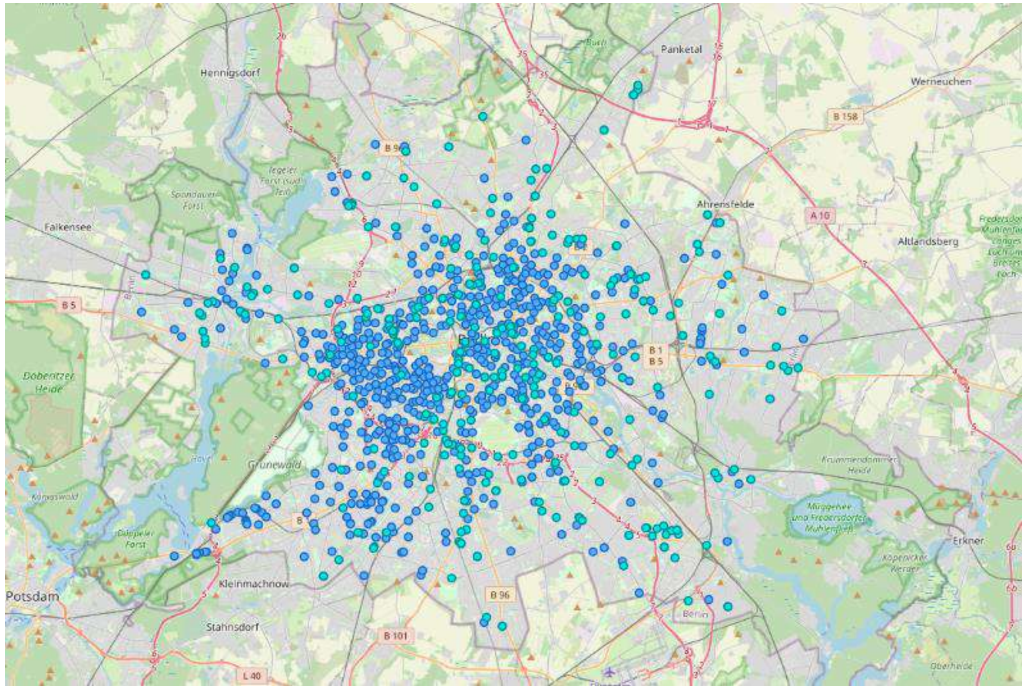
300,000 kWh / d



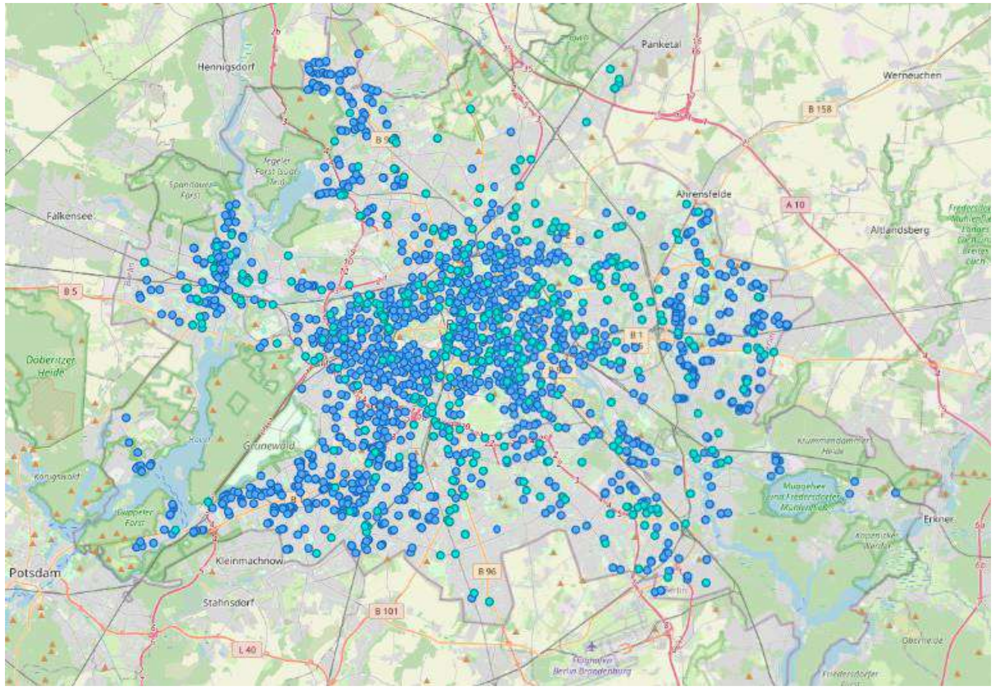
PUBLICLY ACCESSIBLE CHARGING INFRASTRUCTURE

There are more than **25,000 charging points** across all areas of the city.
Approximately **4,200 are publicly accessible.** Around **2,500 of these charging points are on public ground** (as of the end of Q4 2022: around 1,200).

Publicly accessible charging infrastructure – end 2022



Publicly accessible charging infrastructure – end 2023



Public space
Publicly accessible private space

Source: https://energieatlas.berlin.de/

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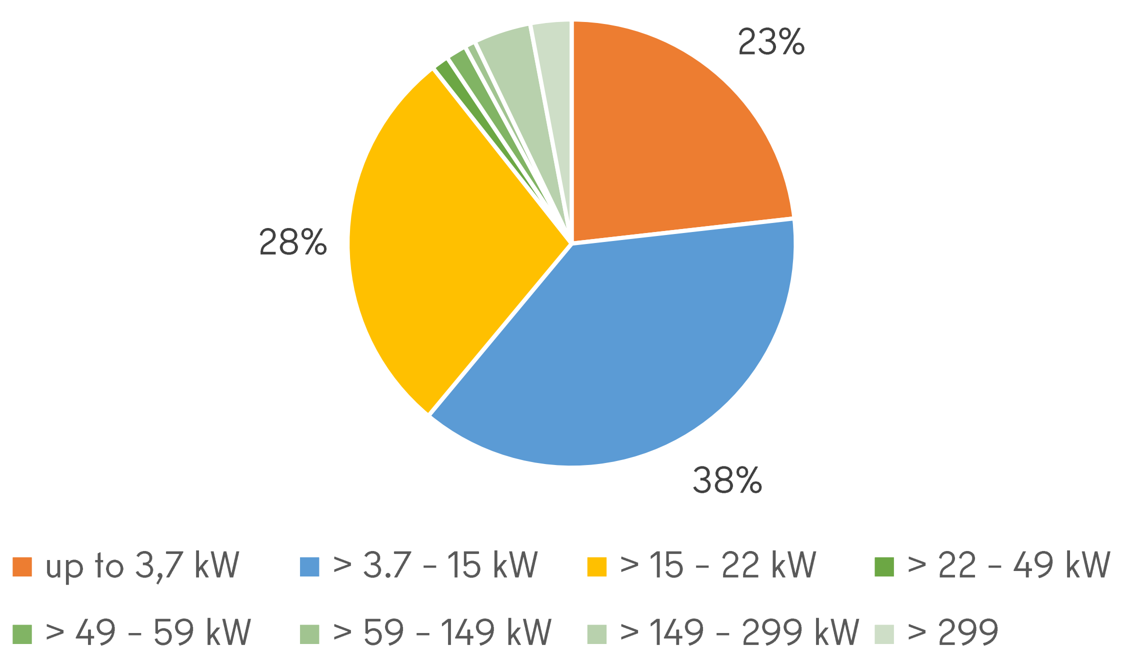
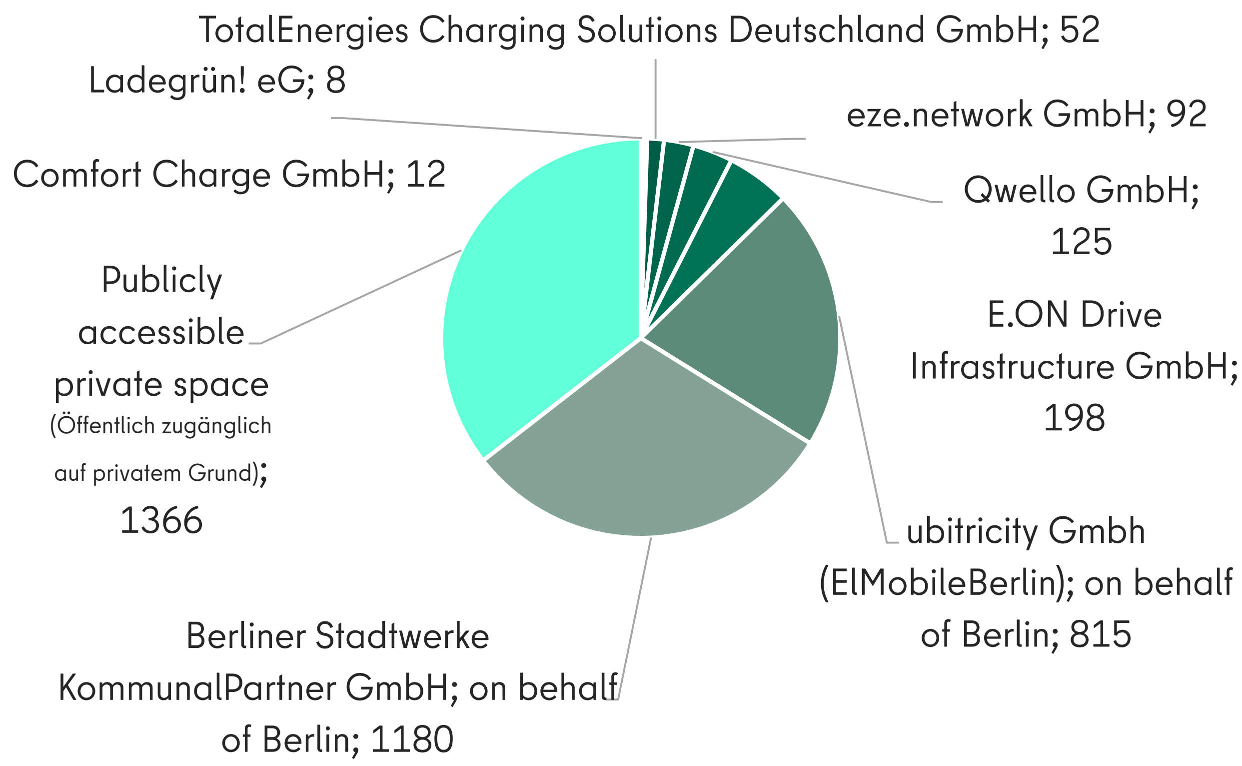
BERLIN

SHARES OF DIFFERENT CHARGING INFRASTRUCTURE CAPACITIES – CPOs ON PUBLIC GROUND

SHARES OF CHARGING INFRASTRUCTURE CAPACITIES FOR PUBLICLY ACCESSIBLE CHARGING INFRASTRUCTURE (END 2023)



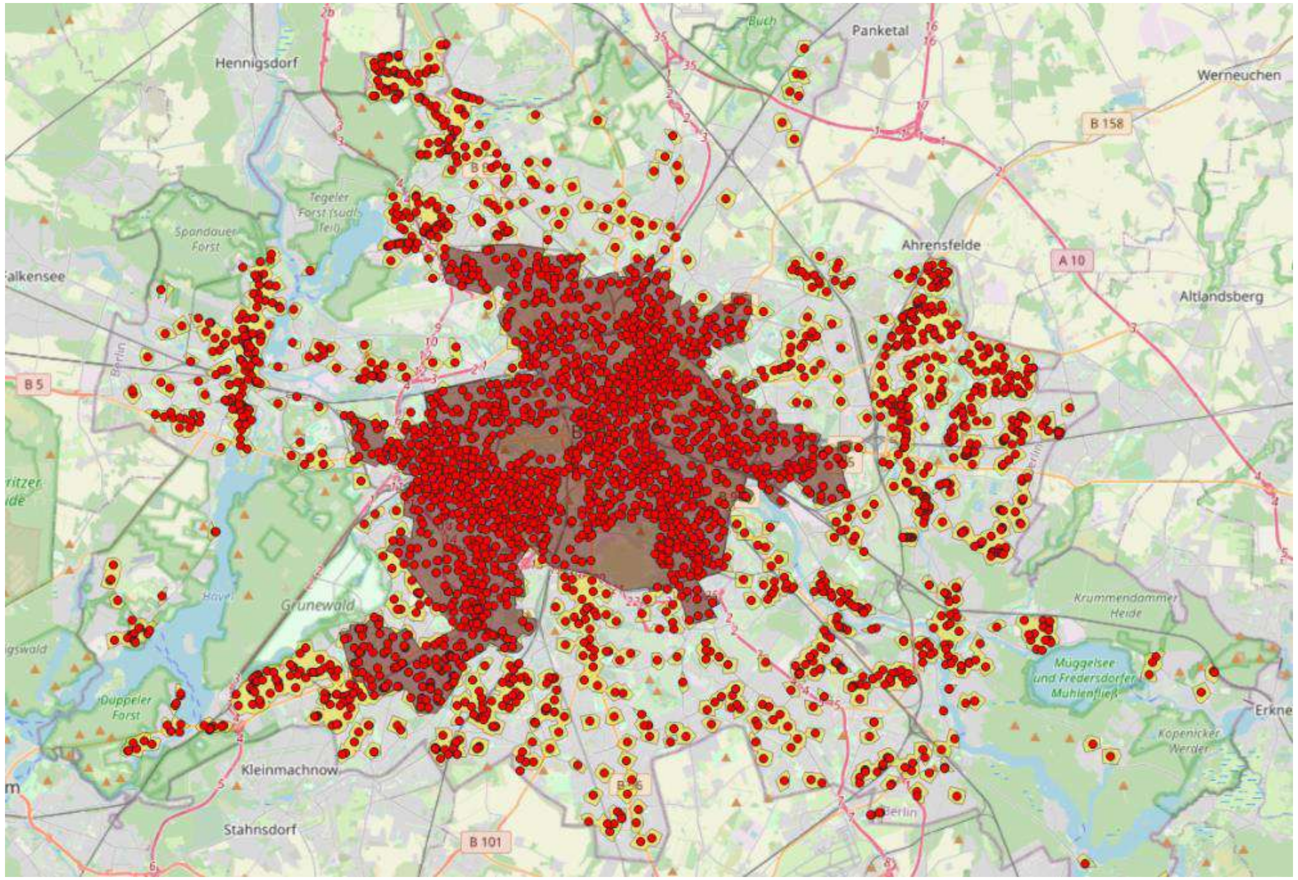
CHARGE POINT OPERATORS ON PUBLIC GROUND (BERLINER MODELL)



source: https://energieatlas.berlin.de/

GAP ANALYSIS AND APPROACH TO AVOID PLANNING CONFLICTS

Charge points on public ground (existing, in approval phase, in implementation)



Blocked search areas on public ground

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BERLIN

CHARGING INFRASTRUCTURE STRATEGY BERLIN 2030

(APRIL 2024)

AVAILABLE UNDER:
HTTPS://LADEINFRASTRUKTUR.BERLIN

MAIN GOALS

1. A forward-looking, user-oriented charging infrastructure roll out shall form a key incentive for an accelerated EV market penetration.
2. The Federal State of Berlin itself is – on state-owned areas – taking over a pioneering role in expanding the charging infrastructure.
3. Most charging takes place in private spaces at home and at work. The Federal State of Berlin therefore prioritizes and promotes the expansion of charging infrastructure in private spaces, such as residential complexes, underground car parks and retail outlets.
4. The Federal State of Berlin counts on an intensive cooperation and information transfer with all relevant stakeholders to expand, accelerate and simplify the charging infrastructure roll-out.
5. The Federal State of Berlin creates – in cooperation with private actors – a central information platform and guidance system in order to create transparency about assets and plans (areas, processes and approvals).

2030

400,000
Electric vehicles
BEV and PHEV

- Private and commercial transport
- Commuters
- Inhabitants
- Guests

AFIR

420,000 kW

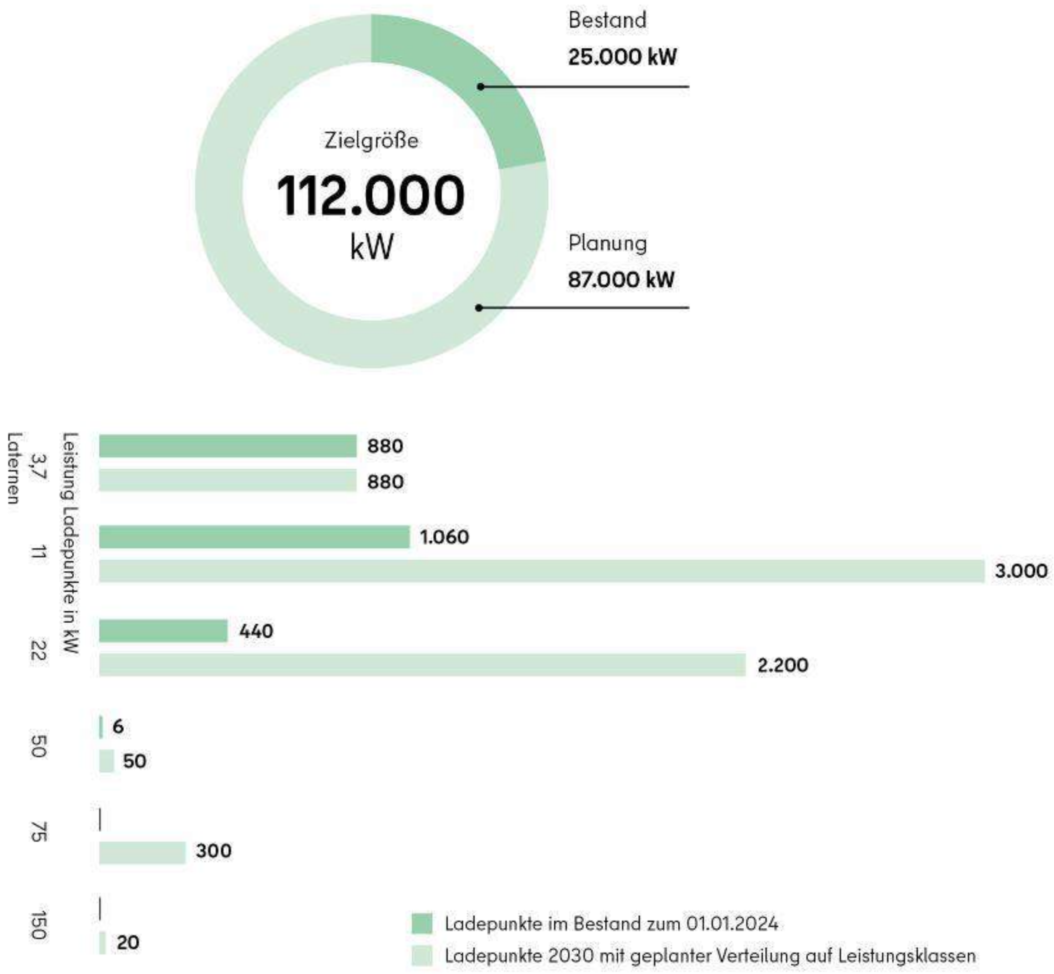
1.3 kW BEV / 0.8 kW PHEV

OVERALL CHARGING DEMAND

2 M kWh/d

5 kWh per day * 400,000 EV

EXAMPLE: PUBLIC SPACE



- Charging infrastructure on public ground will contribute to 20% of the total energy required per day in 2030
- Network extension activities are based on future demand intensities
- Creation of a basic network in all 440 planning areas, expansion of the existing network also in the outskirts
- Goal: Creating a mix of fast charging stations (DC); normal charging station (AC) and charging facilities with lower charging capacities (AC), e.g. on streetlights
- Creation of an offer for different user groups, e.g. cars, light commercial vehicles in commercial transport fleets, etc.

Senatsverwaltung für Mobilität, Verkehr, Klimaschutz und Umwelt
BERLIN

RESULTS – USER-CHI

CHALLENGES AND SOLUTIONS

1

PUBLIC SPACE IS HIGHLY CONTESTED.

Potential solution:

- Using the space potential on publicly accessible private ground can reduce the spatial impact on public streets.

2

THE INSTALLATION OF CHARGING INFRASTRUCTURE IS A VERY COST-INTENSIVE BUSINESS.

Potential Solution:

- A higher utilization makes private investments more attractive.
- A higher utilization reduces the total number of charging points necessary.

3

MANY CHARGING POINTS ARE NOT BEING USED. COSTS COMPARISONS ARE OFTEN NOT POSSIBLE. QUALITY OF AVAILABLE INFORMATION DIFFERS.

Potential Solution:

- Improved information provision / integration of payment
- Use of standard protocols and an (also spatial) integration of different charging networks increases accessibility and user experience.

USER CHI RESULTS – WITH FOCUS ON BERLIN

1

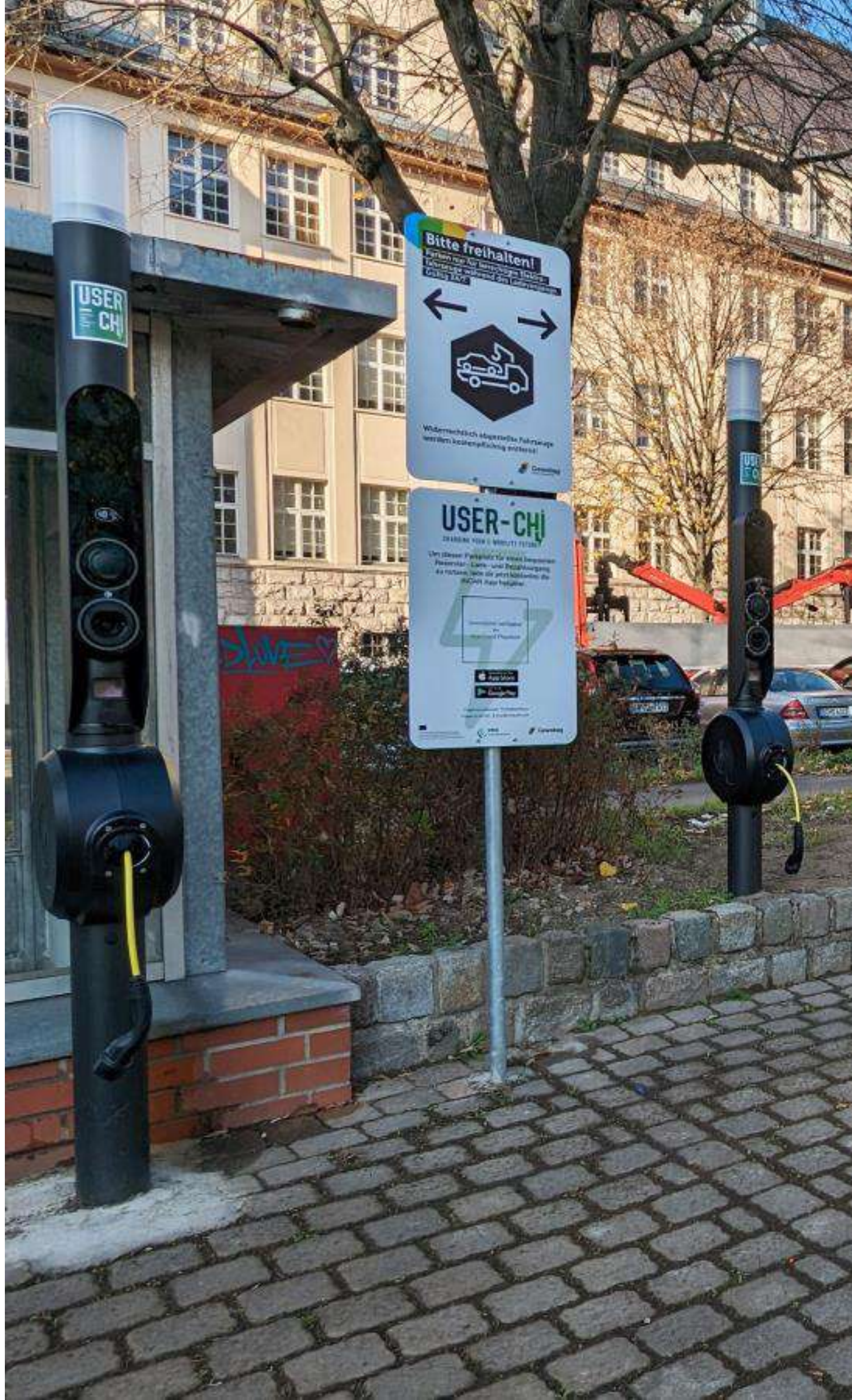
- **USER-CHI** developed new business models for (publicly accessible) charging on private ground
- **implemented new charging infrastructure** on publicly accessible ground of a large housing company
- results from USER-CHI are a transferable to other companies.
- **The company is now opening more private space for CPOs.**

2

3

- **USER-CHI‘s INCAR APP** integrated 1,300 charging stations in Barcelona, Berlin, Budapest, Rom and Turku
- uses the Open Charge Point Interface (OCPI) 2.2 protocol and improved the interoperability between different charging networks.
- Is available in eight languages and allows reservation and payment.

- **1,000 users have already registered.**
- **5,000 charging sessions carried out via the app.**



Senatsverwaltung
für Mobilität, Verkehr,
Klimaschutz und Umwelt

BERLIN

THANK YOU!

NORMAN DÖGE
Transport Policy and und Strategic Concepts;
Senate Department for Urban Mobility, Transport, Climate Action and the Environment
norman.doege@senmvku.berlin.de

CITY OF ROME – ROMA MOBILITAT

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

FINAL EVENT

PANEL "CITIES IN THE SPOTLIGHT: A GLIMPSE AT URBAN ELECTROMOBILITY IN EUROPE"

THE EVOLUTIONS OF MOBILITY IN ROME: THE APPROVED SUMP, ELECTRIFICATION OF MOBILITY AND USER-CHI IMPACT

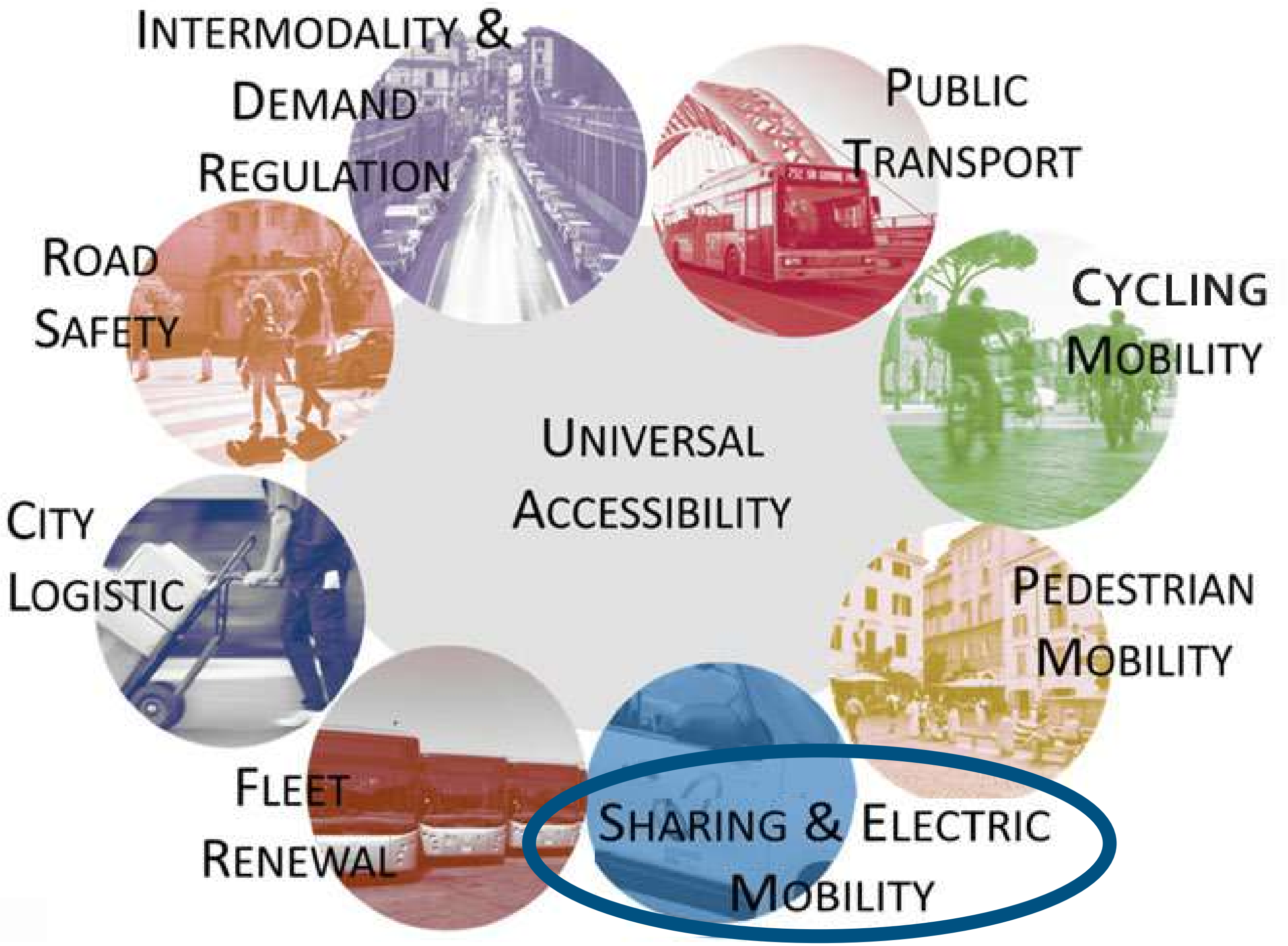
BRUXELLES – JUNE 18TH, 2024

mobilità ROMA

Ing. Fabio Nussio
Head International Co-operation & Sustainability
Mobility Agency of the City of Rome

Roma

The Approved SUMP (2022) & targets for electric mobility



Adapting the **development of public charging** infrastructures according to the structure of energy distribution network

Evaluating solutions for automatic **monitoring of parking spaces** reserved for electric recharging

Equipping **multi-modal hubs** with low-power recharging facilities and Promoting the creation of **smart service stations**

Specific solutions for **two-wheels vehicles** recharging and electric sharing mobility

The SUMP Scenario and the first Electric Mobility Plan (2020)

- **4.000 infrastructures** on public areas to support the objective of increasing to **35%** of the share of electric cars (BEVs) and plug-in hybrids (PHEVs) in the Metropolitan City of Rome

- Promote the use of **ZEVs for urban freight distribution** such as cargo bikes, pedal-assisted tricycles and quadri-cycles

The **plan defined** charging point needs in the public areas and supported the private investments in the sector defining its rules

It included a **technical and administrative regulation** to rule:

- How to submit applications
- The technical specifications of charging points
- Road signs of the parking lots

New Regulation 2023: main technical features

Definitions

- **Charging corridors**: 3-10 standard power devices. Each city borough will provide indication on routes where installing slow (mainly) recharging devices
- **Charging islands**: 5-30 high-power devices near Multimodal hubs, parking and points of interest

Steps

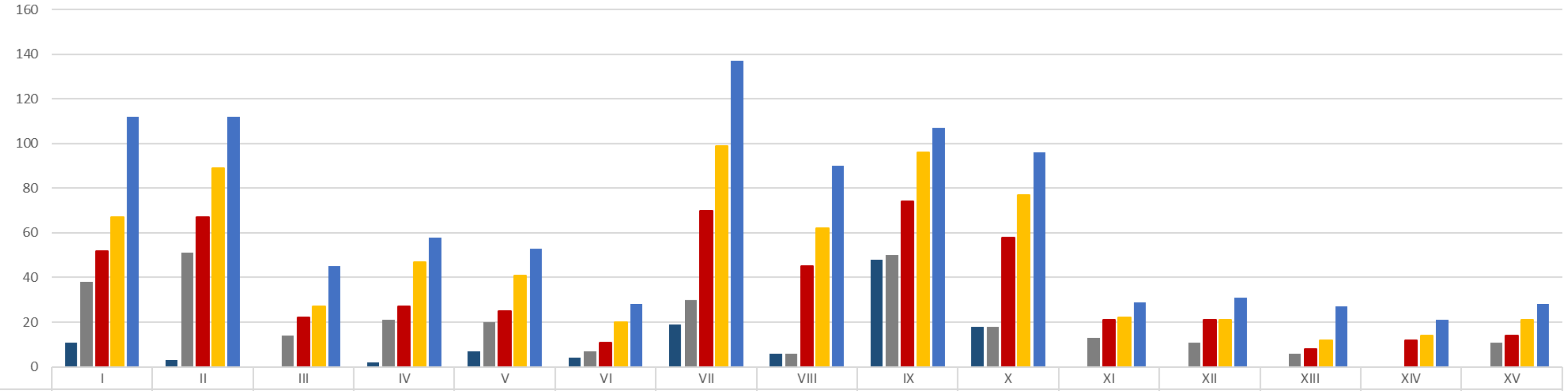
- Identification of charging needs carried out by Mobility Dpt (RSM) based on indications of city boroughs
- Agreement with electricity distributor Areti
- **Conferences of the interested Parties** (participation process with stakeholders) for acquisition of consent documents. Within 30 days of the closure of the SC, the Mobility and Transport Department issues the concession for the implementation of the interventions to be concluded within 90 days.
- The concession has a **duration of 10 years**

The development of charging columns

Installed 31/12/23: 1115
(2230 recharging points)

Working 31/12/23: 857
(1714 recharging points – 721 Slow, 136 Fast)

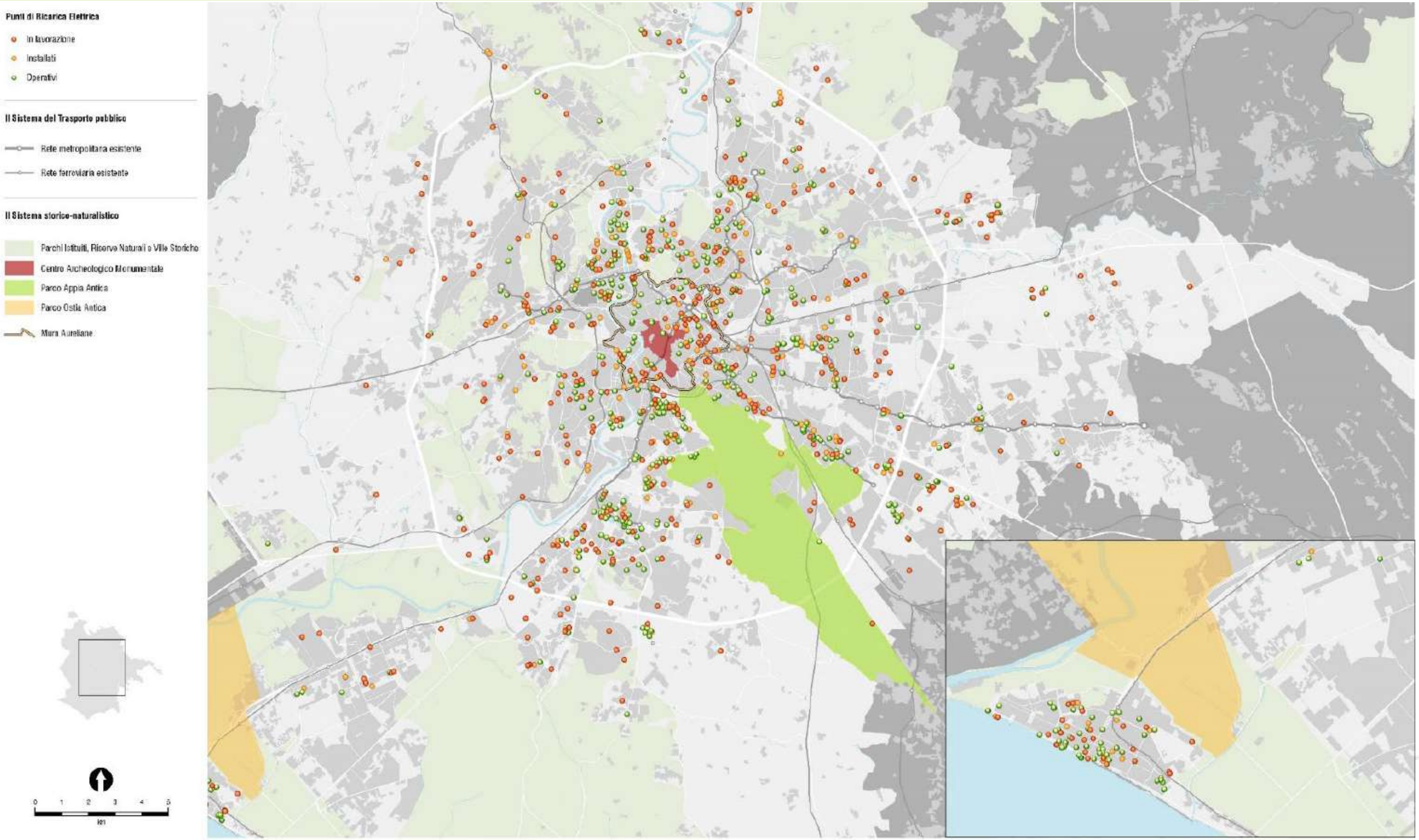
INSTALLAZION PER MUNICIPIO
confronto 2019 - 2020 - 2021 - 2022 - 2023



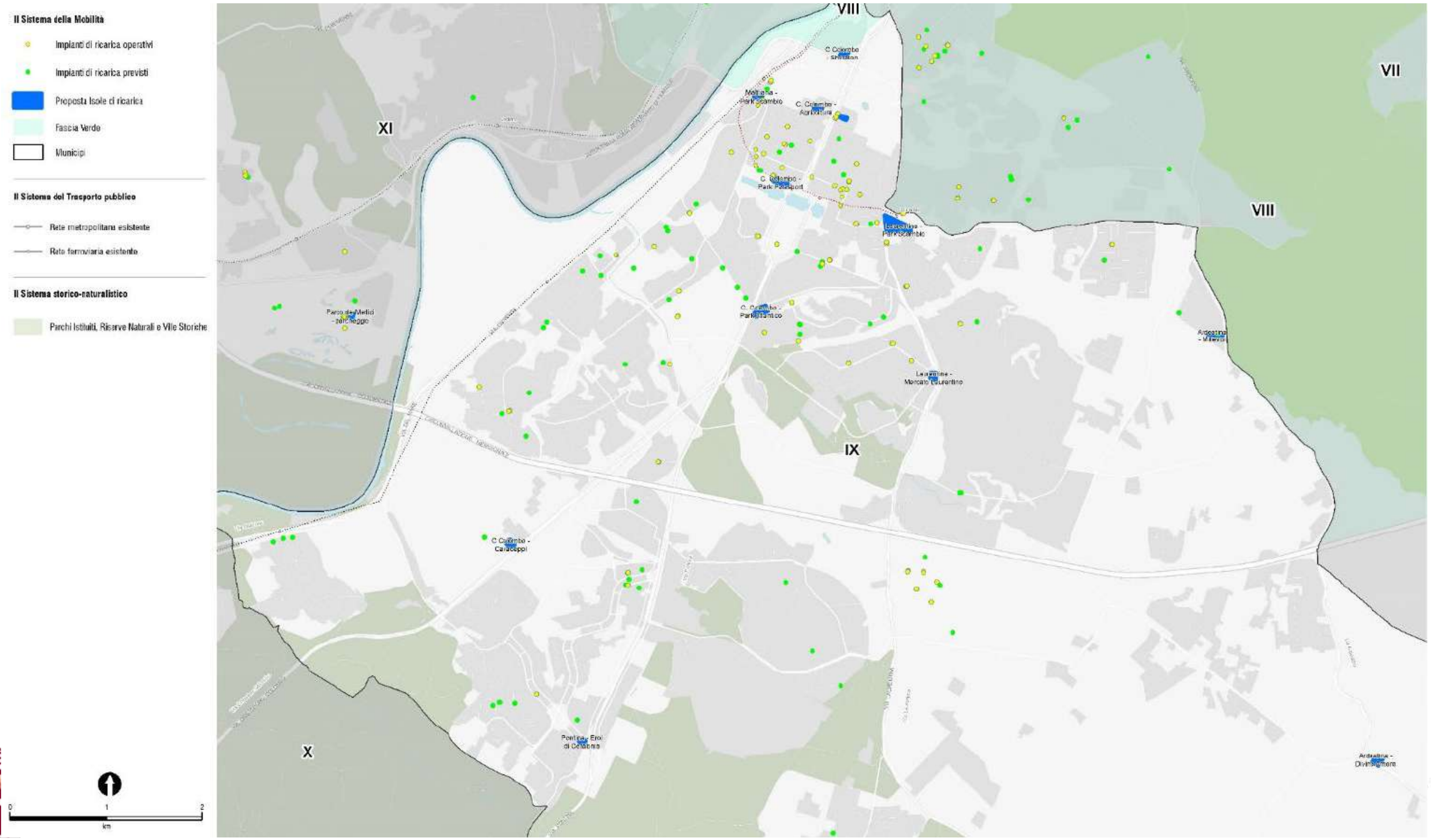
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
al 31 12 2019	11	3	0	2	7	4	19	6	48	18	0	0	0	0	0
al 31 12 2020	38	51	14	21	20	7	30	6	50	18	13	11	6	0	11
al 31 12 2021	52	67	22	27	25	11	70	45	74	58	21	21	8	12	14
al 31 12 2022	67	89	27	47	41	20	99	62	96	77	22	21	12	14	21
al 31 12 2023	112	112	45	58	53	28	137	90	107	96	29	31	27	21	28

■ al 31 12 2019 ■ al 31 12 2020 ■ al 31 12 2021 ■ al 31 12 2022 ■ al 31 12 2023

Electric charging point in Rome: a view



Proposal for installation of charging islands (IX borough)



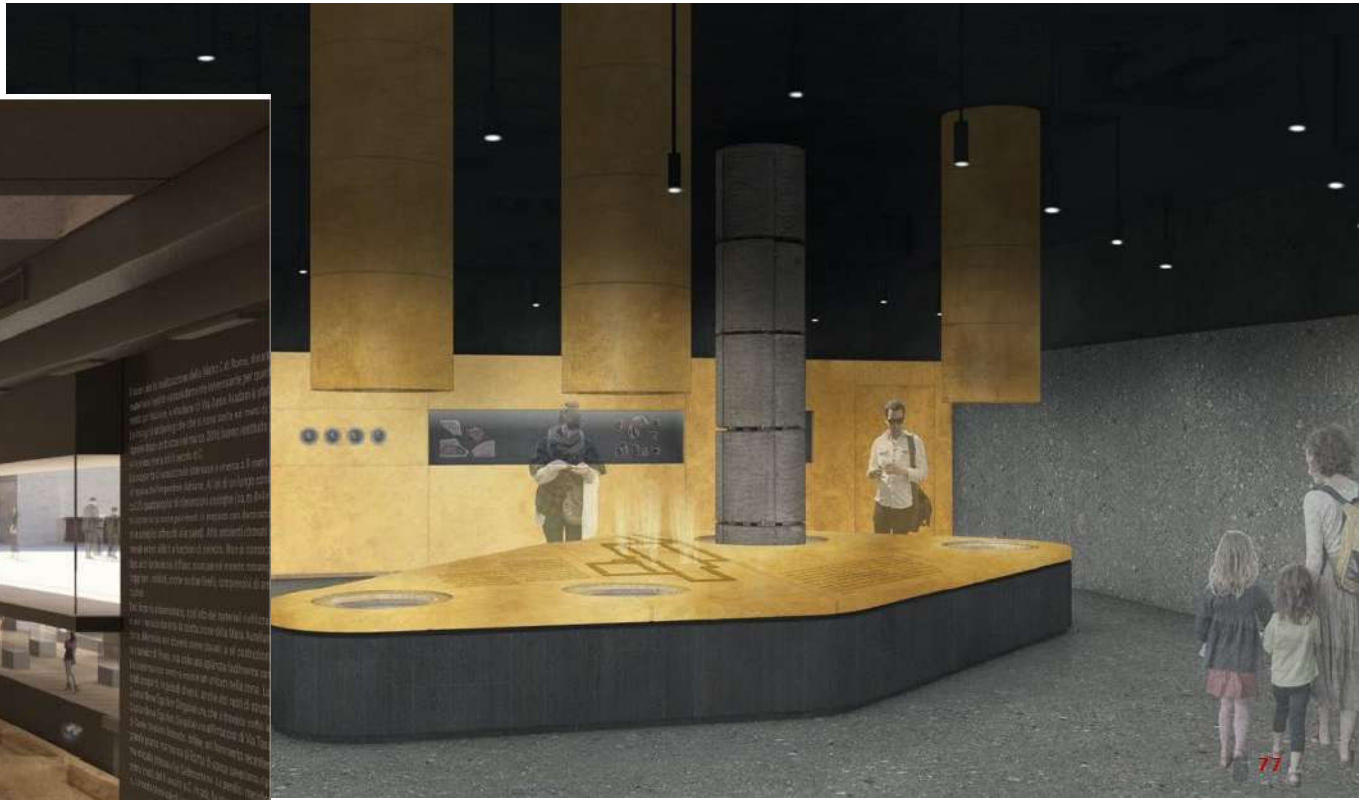
Electrification of Public Transport within 2026

About 3 billion euros financing obtained and works running for:

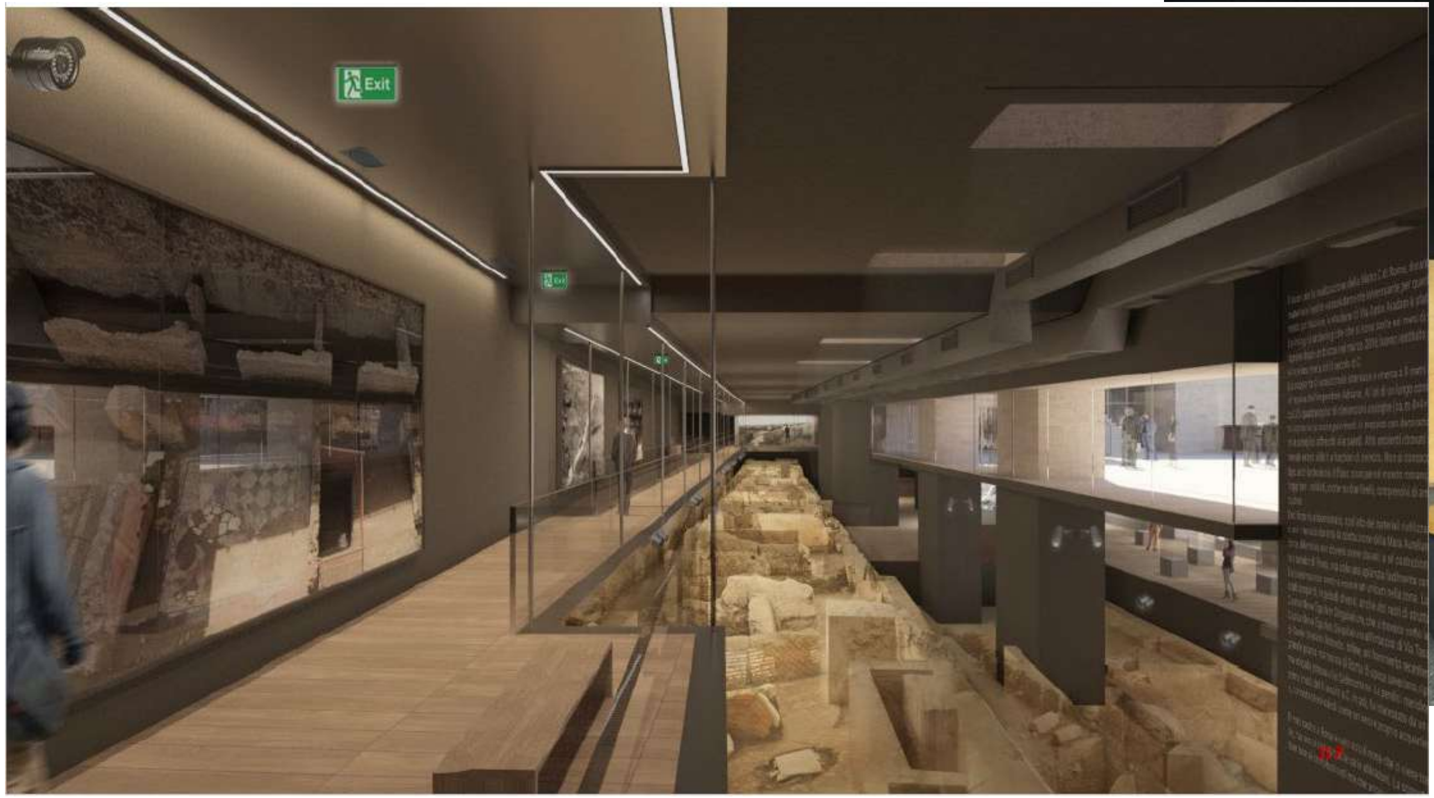
- **NEW TRAMWAY LINES**
  - Tramway TVA Termini-Vaticano-Aurelio and new Tram Depot *(financed by RRF)*
  - Tramway viale Palmiro Togliatti *(financed by RRF)*
  - Tramway via Tiburtina (piazzale del Verano - Stazione Tiburtina)
  - Tramway Termini-Giardinetti
  - **ROLLING STOCK:** Purchase of 121 new tram and 30 new metro convoys
- **METRO C COMPLETION:** opening of Amba Aradam and Colosseo Station in mid 2025

Electrification of Public Transport within 2026

The new archeo-metro station: Colosseo Fori Imperiali



The new archeo-metro station: Porta Metronia



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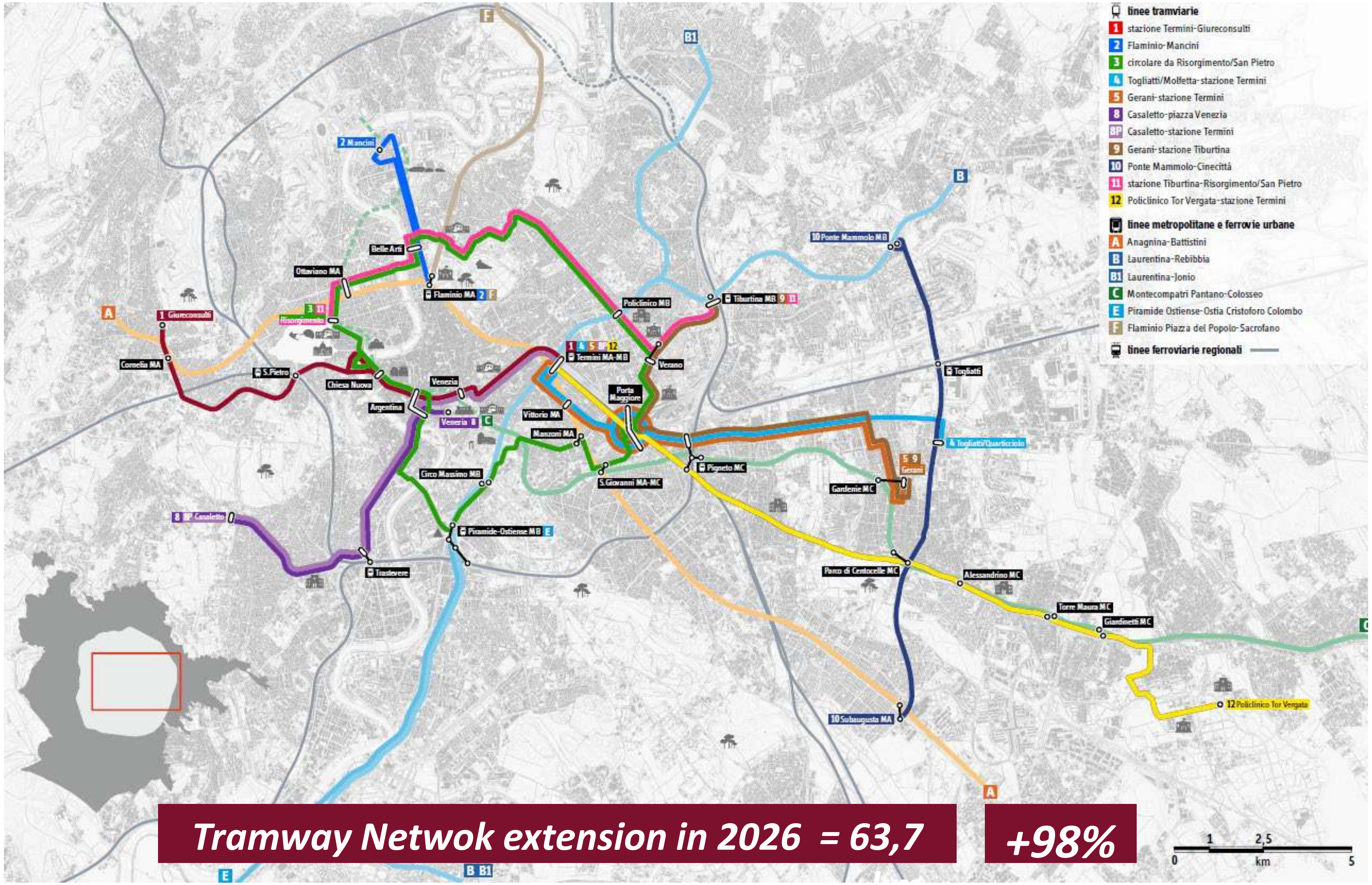
Electrification of Public Transport within 2026: the tramway network



Tramway Netwok extension in 2026 = 63,7

+98%

Electrification of Public Transport within 2026: the tramway network

TOGLIATTI Line (8 km)

TERMINI – VATICANO – AURELIO Line: 8,3 km)

TERMINI - TOR VERGATA Line (12,8 km)

121 new Tram convoys

mobilità ROMA

Electrification of Public Transport within 2026: new e-buses & depots

Purchase of electric-powered buses:

- **411 for ATAC,** to be put in service by 30/06/2026 (110 in 2024)
- **514 for new operators**, with a gradual entry in operation in 5 years

New bus depots adapted for the introduction of the new electric bus fleet

New charging stations at the end of the main lines

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Demand Management Policies: towards e-fleets

City zoning: 6 areas with increasing constraints to private mobility, supported by ITS measures.

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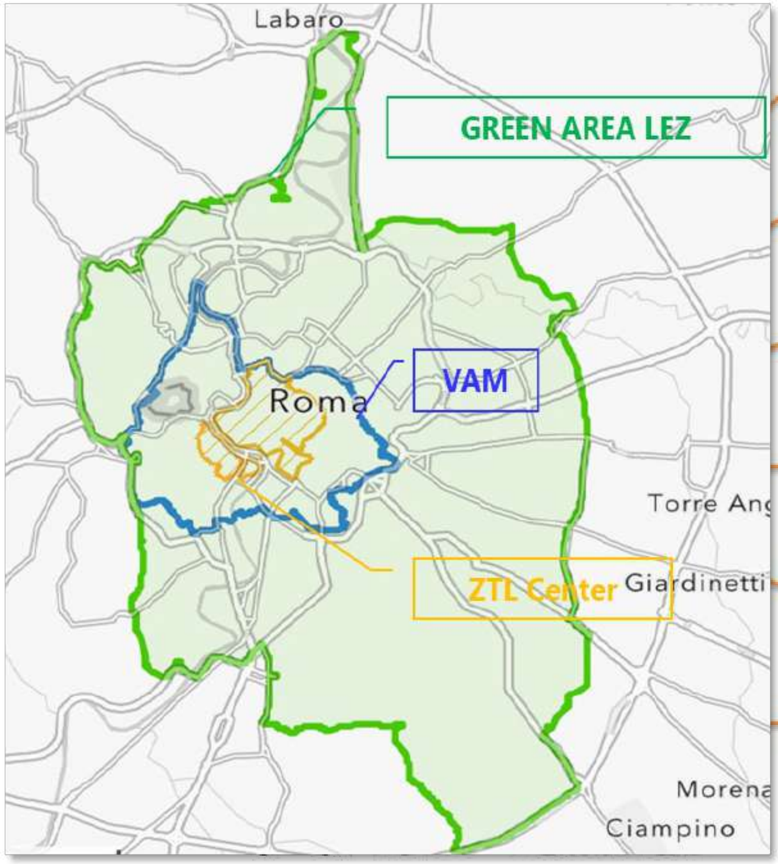
From **November 2023** new regulations (with gradual bans over the years) with **new access and circulation rules** to limit air pollution



Zone1 – hystorical city center
Target → massive reduction of cars

Zone2 – Rail ring
Target → public transport and sharing increase

Zone3 – internal ring road
Target → balancing private/public transport

Zone4 – ring road
Target → public transport / intermodality increase

Zone5 – beyond GRA
Target → public transport / intermodality increase

Zone6 – city along the sea
Target → intermodality increase / commuters

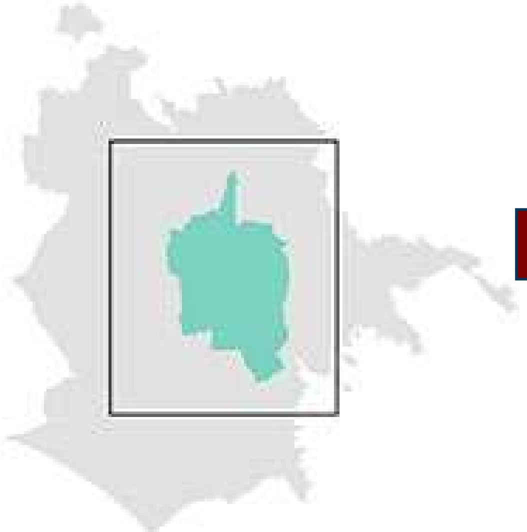
Demand Management Policies: towards e-fleets

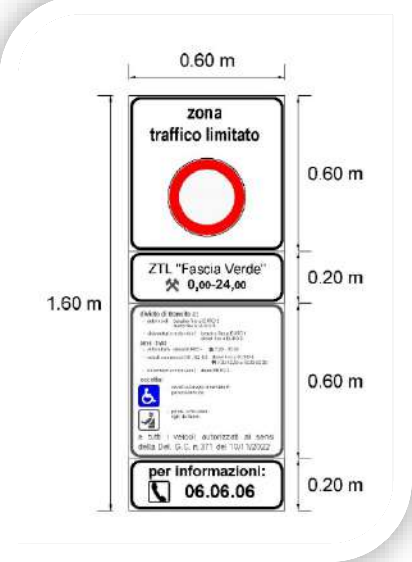
Zone 3: Green Area LEZ controlled by electronic access control systems

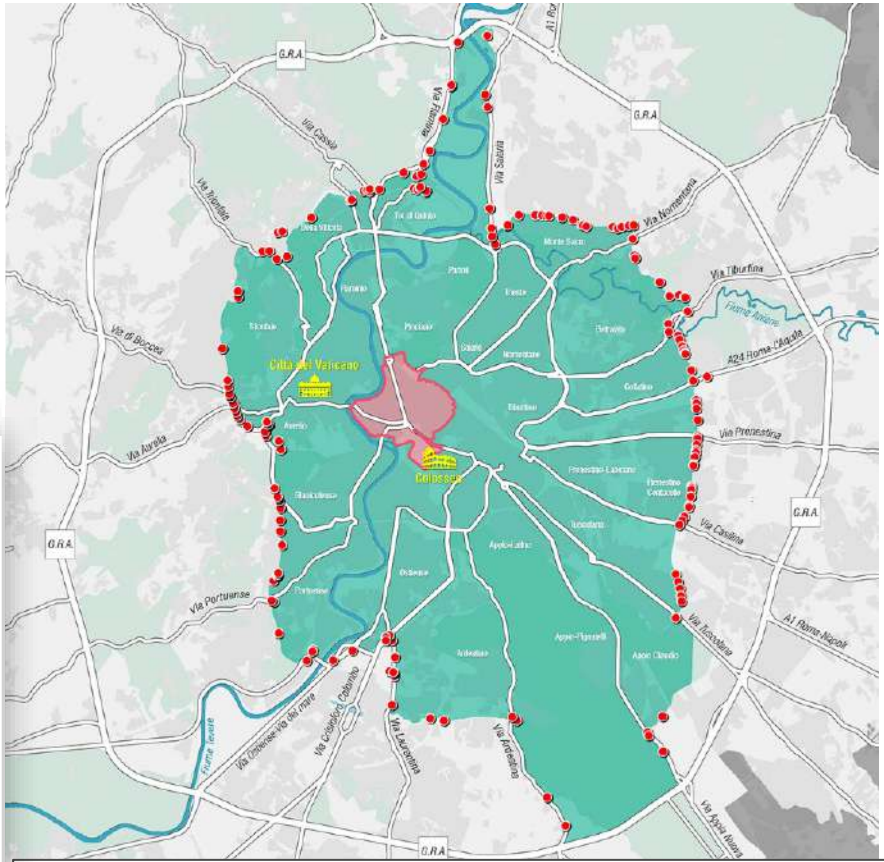
A Council Act approved the LEZ in 2022. E-gates project granted by EU & Vatican Jubilee funds. **Active from 11/24**

ANPR based controls on accessing vehicle carried out remotely by Urban Police.

Electronic Systems implemented, centralized and maintained by RSM.





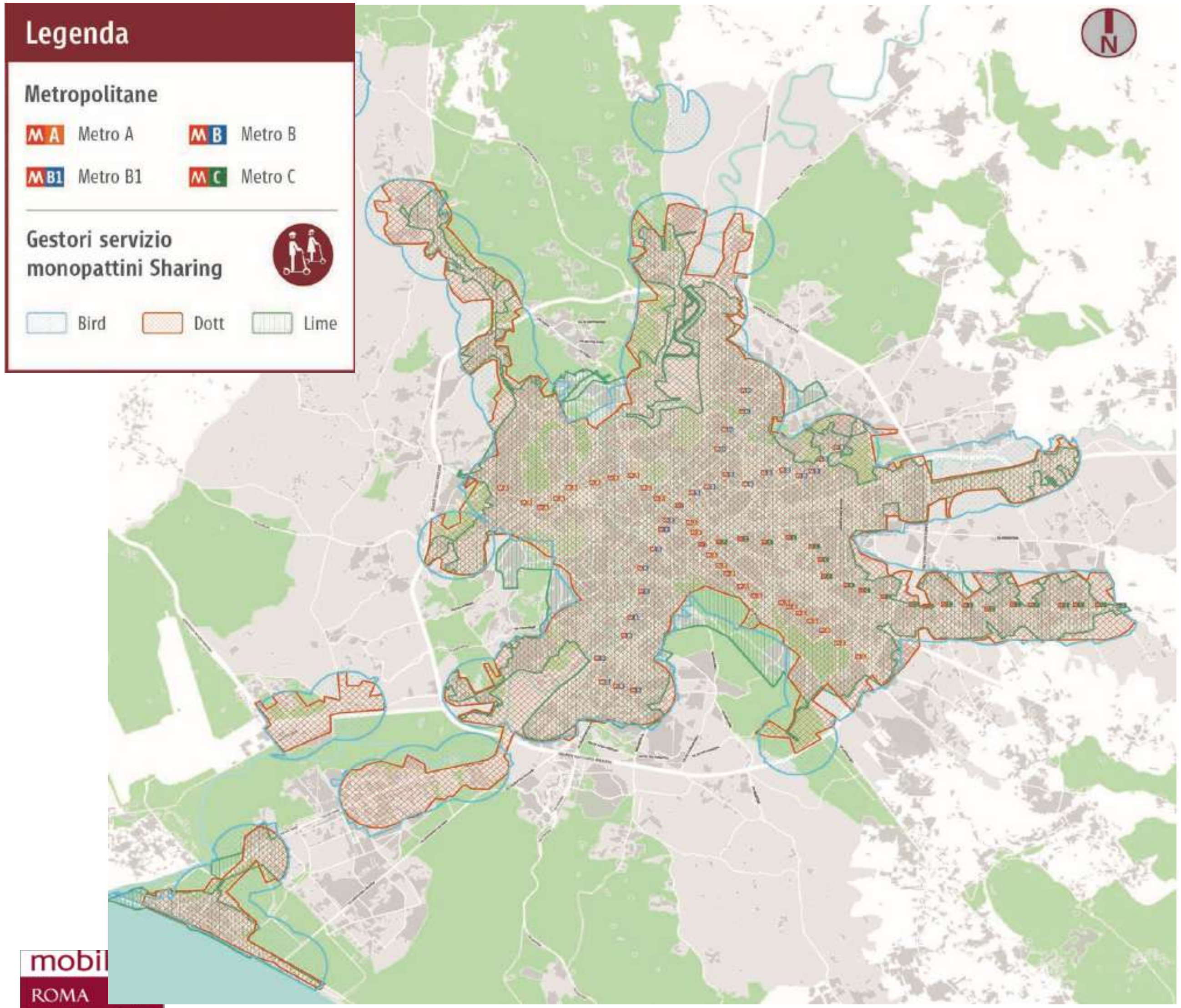


Surface: *156,16 kmq* – ***45 % of the area inside G.R.A.***

Working h24, from Monday to saturday

Accesses:***154***, **I phase *80 e-gates***

Promotion of sharing: e-micromobility



MICROMOBILITY SHARING

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- 3 e-scooter operators with new rules from 1 September 2023:
- 2 e-bike operators from 1 November 2023;

80 rides/month included in annual PT card (Metrebus)

- **New hubs for secure private e-bike parking**

Rome and USER-CHI project: European R&S project in e-mobility

USER-CHI project in Rome: Thanks to the development of their products, has represented a lever for the promotion of electric mobility, also for micro-mobility.
USER-CHI is supporting the development of the Electric Mobility Plan and the issues contained in the SUMP, oriented towards a more sustainable mobility and alternative to the use of more polluting vehicles

Rome cluster composition and partner contributions

The Rome cluster within USER-CHI includes **Roma Servizi per la Mobilità** (RSM) that represent the city and leads the deployment of the demonstration activities in Rome, supported by:

- **Enel X Way**, technically supporting the demonstration activities and providing technical skills and knowledge for the successful design and implementation of Citizens e-Mobility Stations
- **DSI**, providing strategic vision and execution capacity, specifically on the Citizens e-Mobility Station
- **ENEA**, especially supporting the integration of EVSE with smart grid and RES

Kick-off mid-November 2022.
November 2023 dedicated to integration with INCAR:
SMAC integration with V2G in June 2023

Intermodal Hub – Corso di Francia

Services to the user

Coffee & restaurant
Smart Working facilities
Co-Working space

Juice Media

Digital screen incorporated into 2 quick charging stations available for information, communication, and entertainment

CEUC

x4 HPC

High-power charging stations for EVs up to 300kW

Juice Pole

2 charging points for EVs up to 22kW

Dissemination on EV user experience

Videos with messages on false myths of electric mobility, multimedia and recreational activities also to involve children

Services to the Citizen

Payment of bills, car tax, requests for chamber of commerce registration, etc

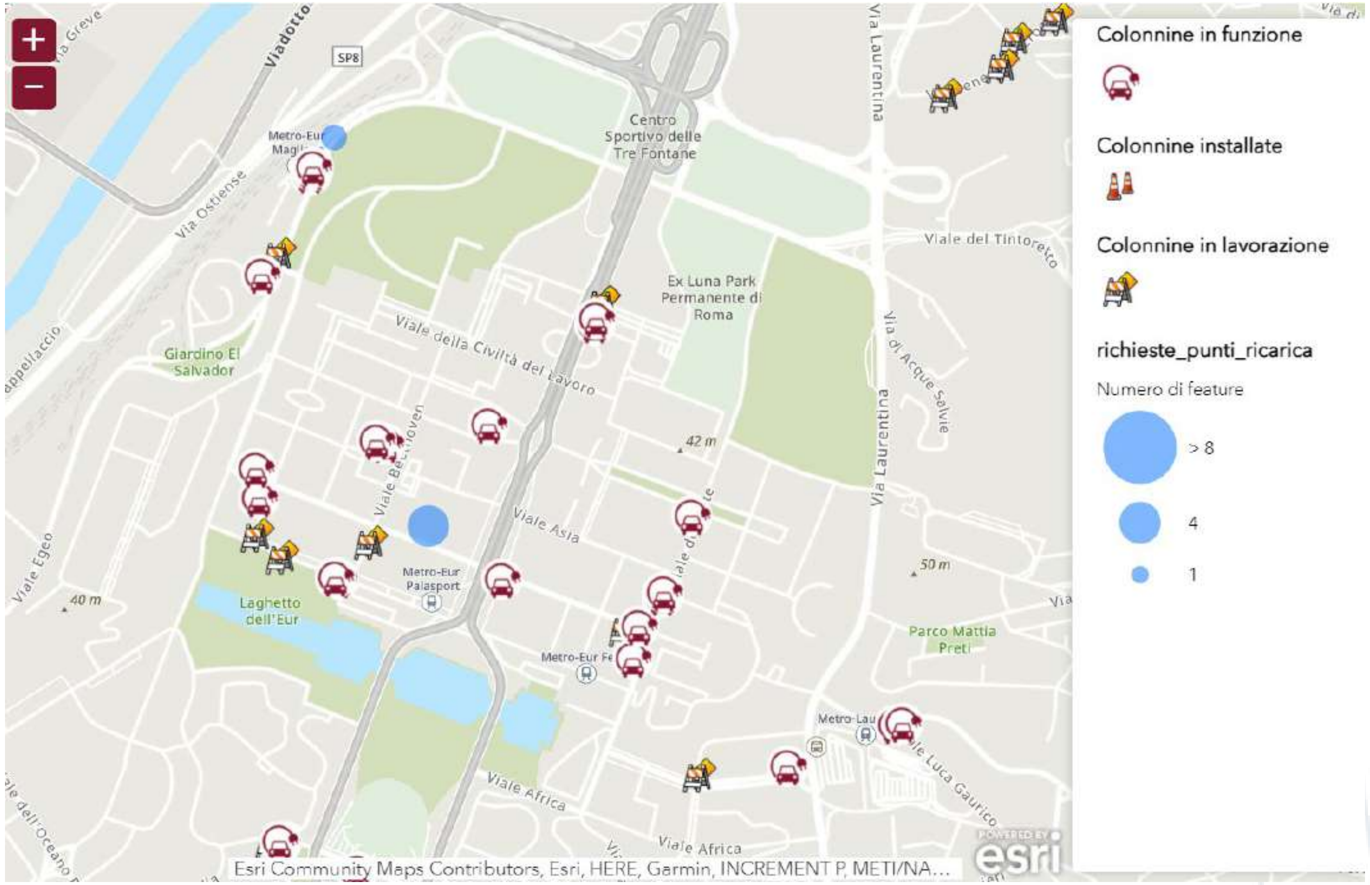
mobilità ROMA

Click product and information website of the Mobility Agency RSM

The RSM site
https://romamobilita.it/it/muoversiaroma/elettrico constantly updates the map of the plants in relation to the level of construction

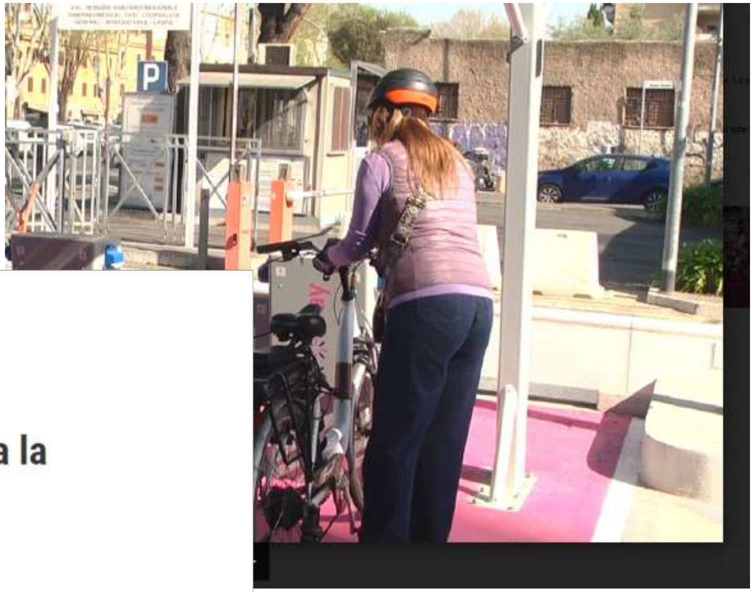
The georeferenced information is superimposed on the map of the reports of installation needs advanced by citizens, in order to facilitate the matching of supply and demand for charging systems.

CLICK was tested and evaluated in two separate testing phases by urban and transport planners within all pilot cities. After each testing phase, the feedback was collected and analyzed by the demonstration and development-partners VMZ and IKEM.



RSM is working on possible synergy with Click product for charging points planning, cooperating with VMZ

Insoc / micro mobility & Incar: since May test in via Ostiense 131 & on the INCAR app



mobilità ROMA **ROMAMOBILITA.IT**

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HOME / PROGETTI / PROGETTI INTERNAZIONALI / USER-CHI

USER-CHI, dal 1 giugno al 15 luglio è attiva la sperimentazione dell'app INCAR

Data di inizio dell'evento: 01-06-2024

Nell'ambito del progetto europeo USER-CHI è stata sviluppata la **piattaforma INCAR**, il cui obiettivo principale è risolvere i problemi che si possono presentare nel settore della mobilità elettrica **offrendo - in un'unica app** destinata a operatori di punti di ricarica (CPO), micro-CPO, fornitori di servizi di mobilità elettronica (EMSP) e conducenti di veicoli elettrici - **le funzioni** di:

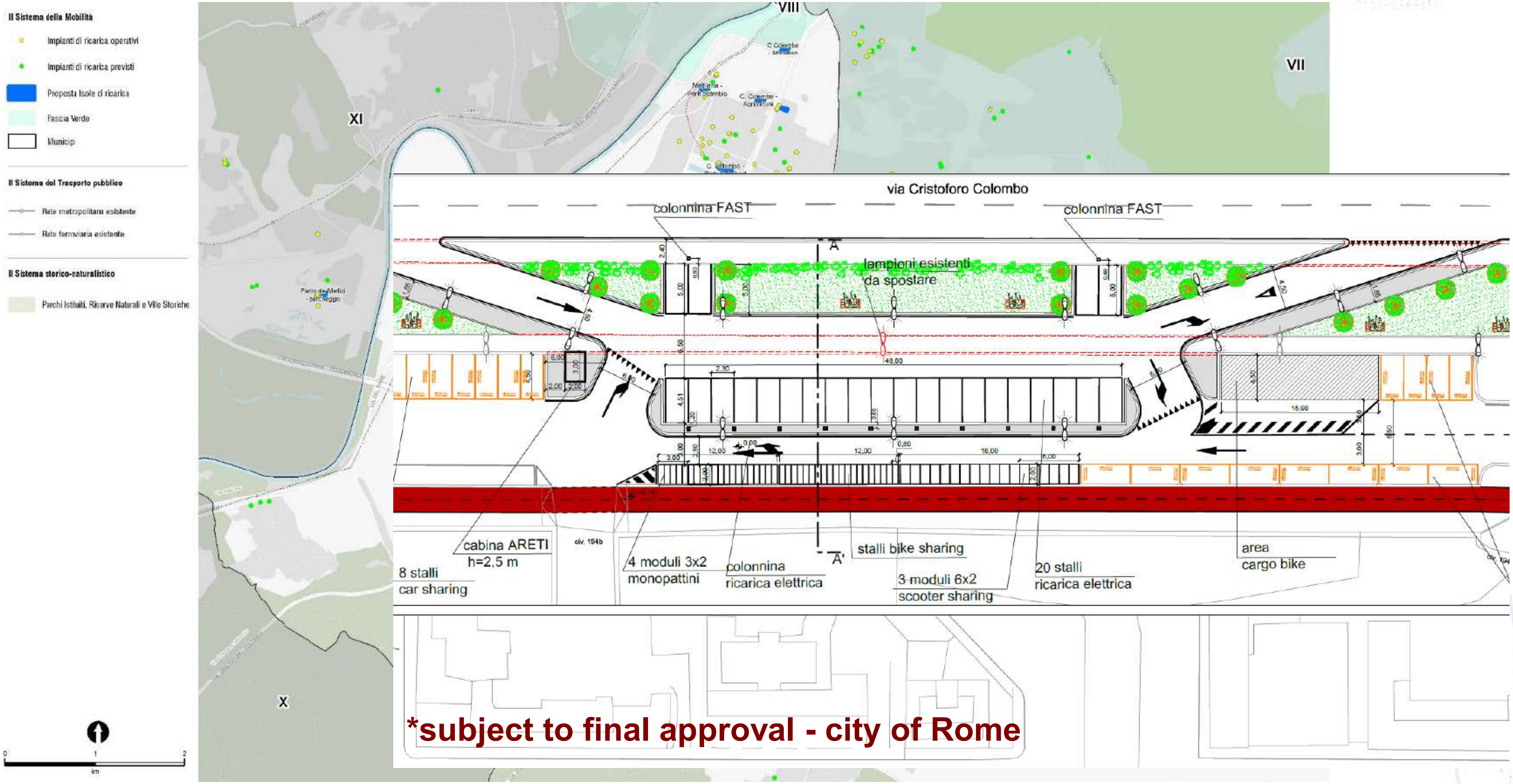
- **prenotazione** del parcheggio e della ricarica per i veicoli elettrici - evitando i tempi di attesa e aumentando quindi il tasso di utilizzo degli impianti di ricarica
- **informazioni in tempo reale** sugli impianti di ricarica accessibili al pubblico
- **ricerca del punto di ricarica** più vicino e relative indicazioni stradali.

La piattaforma è sperimentale e sarà **attiva dal 1 giugno al 15 luglio 2024**.

Per **promuovere la sperimentazione dell'app** e la **partecipazione all'indagine di definizione del profilo** degli utenti della rete di ricarica (che è tra gli obiettivi del progetto USER-CHI), viene offerto - **a chi effettua la prima ricarica** utilizzando la app INCAR e compila il questionario - uno **sconto fino a € 30,00 sul costo della ricarica**.

Compila il questionario e ottieni lo sconto scaricando l'app (Android - iOs)

Additional test: User-centric multisource recharging platform *



*subject to final approval - city of Rome

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Thank you

for your attention!

For any question:

mobilità ROMA
Mobility Agency of the City of Rome
fabio.nussio@romamobilita.it

Roma

CITY OF FLORENCE

CITY OF MURCIA

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

CITIES IN THE SPOTLIGHT: MURCIA CASE

Evolution and future

Date: **18/06/2024**
Author: **Manuel Valls Sevilla**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Evolution: 2020 - 2024

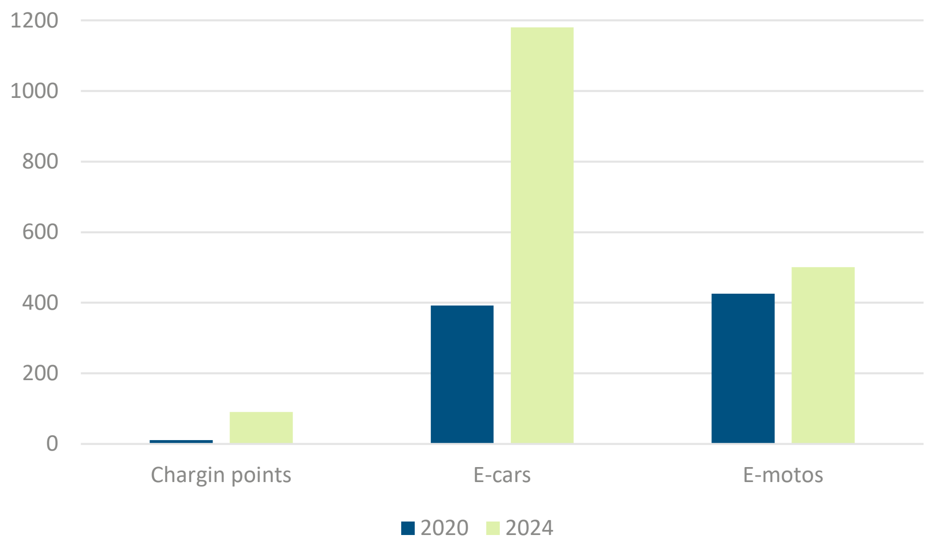
2020

6 public charging points managed by municipality (22 Kw)

5 public charging points (dual socket) managed by electric company (50 kW) - Public/private partnership

46 parking spaces for e-vehicle

392 e-cars and 426 e-motos



2024

25 public charging points managed by municipality (22 Kw)

10 public charging points (dual socket) managed by electric company (50 kW) - Public/private partnership

46 parking spaces for e-vehicle

Public service of e-scooters (1000 uds) - Public/private partnership

Public service of e-motos (200 uds) - Public/private partnership

1180 e-cars, 501 e-motos and hundreds of e-scooters

Ordinance for PMV - personal mobility vehicle

June 2024: public tender for managing, maintaining 25+10 charging points and installing 55 points more

December 2024: public tender for PMV (bikes, e-bikes, e-scooters)

FUTURE VISION

KPIs selected	Phase 1		Phase 2		Phase 3
	2022	2023	2024	2025	>2025
% of Strategy measures implemented.	50%	60%	70%	75%	>75%
Number of electric vehicles in the municipality of Murcia	1200	1800	2700	4000	>4000
Number of residential communities benefited by the subsidies for the installation of charging points.	25	100	200	300	>300
Nº of daily trips made using shared electric mobility systems in Murcia.	4000	4800	5760	6912	>6912
Nº of municipal initiative public electric vehicle charging points.	23	35	40	40	40
Nº of information and awareness actions promoted by the Murcia City Council.	15	10	7	5	5
Nº of fast charging points for electric vehicles of private promotion and public access.	15	25	40	60	>60

Key takeaways - INSOC

Our suggestions box:

- Quite useful and sustainable
- Slow so, ideal for workers
- Some network failures make difficult the charge

It was not necessary to install a solar panel.
We use the pre-existing one

THANK YOU!

MANUEL VALLS SEVILLA

@Sevillavalls

https://www.linkedin.com/in/manuel-valls-sevilla-16781251/

www.murcia.es

manuel.valls@ayto-murcia.es

USER-CHI

CHARGING YOUR E-MOBILITY FUTURE

REPLICATION BOOKLET

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No [875187]

Replication Booklet

INPRINT

PUBLISHER

Eurocities, Brussels, Belgium

MAIN AUTHORS

Marion Pignel, Kateřina Kührová (Eurocities)

CO-AUTHORS

Marco Surace, Stella Aaltonen, Elena Aversa, Alessandra Barbieri, F. Javier Montesinos García, Silvia Valero, Luca Grzeski, Lena Korostylova, André Kleinhaus, Kinga Lőcsei-Tóth

LAYOUT

20stm Studio

DISCLAIMER

The views expressed in this publication are the sole responsibility of the authors named and do not necessarily reflect the views of the European Commission.

Table of content

USER-CHI is an industry powered, city driven, and user-centric project that co-created and demonstrated **smart charging solutions** around **7 connecting nodes** of the Mediterranean and Scandinavian-Mediterranean Trans European Network-Transport (TEN-T) corridors between February 2020 and July 2024.

Check out our videos

CLICK
CHARGING LOCATION AND HOLISTIC PLANNING KIT
An online tool for the location planning of new charging infrastructure in cities and TEN-T corridors.

INCAR
INTEROPERABILITY, CHARGING AND PARKING PLATFORM
INCAR is an advanced platform providing seamless access to EV charging points with innovative features like interoperability, roaming, park & charge booking, and real-time information. It supports various stakeholders, including CPOs, micro-CPOs, EMSPs, and casual EV drivers, by offering customized services and automating billing. The INCAR app enhances user experience by displaying charging station availability, tariffs, and enabling booking, payment options and management of the charging session.

SMAC
SMART CHARGING TOOL
A tool providing smart grid integration and demand management services for slow, medium, fast and ultrafast charging.

INSOC
INTEGRATED SOLAR DC CHARGING FOR LIGHT ELECTRONIC VEHICLES (LEVS)
A solution offering charging and parking for Light Electric Vehicles using clean energy from integrated PV canopy.

INDUCAR
INDUCTIVE CHARGING FOR E-CARS
A wireless and highly automated charging solution for e-cars.

STATIONS OF THE FUTURE HANDBOOK
Guidelines and recommendations to design the perfect user-centric charging station of the future.

EMOBEST
E-MOBILITY REPLICATION AND BEST PRACTICE CLUSTER
A collaboration platform to facilitate the transfer of best practices among the demonstration and replication cities.

INFRA
INTEROPERABILITY FRAMEWORK
A package of rules, guidelines and recommendations to support highly interoperable processes among the electromobility stakeholders

Roadmap of replication milestone

10 FELLOW CITIES

joined USER-CHI replication programme

Their questions, feedback, and reports helped identify the replication potential of different solutions and fostered discussions on how to boost the widespread adoption of urban electromobility across Europe and the role of cities in this process.

«Taking part in the USER-CHI programme was a great opportunity to learn from the experiences of contemporaries working in different European cities on the shared objective of seeking to decarbonise transport and move towards city scale infrastructure to support EV uptake. This is, of course, one of the key components to the broader work required to tackle the climate emergency.»

Andy Hickford
Senior Project Manager
Leeds City Council

City fingerprints

Replication training

Replication webinars
ElectriCity webinars

Technical webinars

Peer-learning visits
(in Berlin, Barcelona, Rome, Turku & Budapest)

Peer-learning webinars

Implementation roadmaps

Our participation in USER-CHI provided us with actionable knowledge on how to transform mobility in our city in order to become more sustainable, and accelerate our transition towards cleaner economy! It was particularly interesting to have 360° information on the feasibility and impact of a variety of projects and investments (EV sharing, cycling, etc) in cities of similar size to ours. Also, networking with USER-CHI partners broadened our horizons for cooperation and further exchanges, and we are very grateful for that!

Alexia Spyridonidou & Vasileios Filippou
Climate Neutrality Advisors
Karditsa, Greece

List of the fellow cities

- Leeds **UK**
- Lisbon **Portugal**
- Göteborg **Sweden**
- Bucharest **Romania**
- Hannover **Germany**
- Karditsa **Greece**
- Venice **Italy**
- Graz **Austria**
- Sarajevo **Bosnia and Herzegovina**

FOCUS ON

BARCELONA

SOLUTIONS DEMONSTRATED :
CLICK, INDUCAR, INCAR, SMAC & INSOC
PARTNERS : Àrea Metropolitana de Barcelona

TIPS FOR REPLICATION

Plan ahead! **Grid connection and permitting procedures can take longer than expected and may delay the installation of your charging station.**

INCAR

- **3** ***charging points*** available on the **INCAR platform & App**
- **24** ***hours*** accessible charging points in public spaces
- For both ***private*** and ***professional*** EV drivers
- For now, the charging is ***free of charge*** on **USER-CHI** chargers
- The entire AMB charging network offers a public service that is accessible to ***any EV user.***

FREE CHARGING · FREE PARKING · PUBLIC SPACE · EV DRIVERS

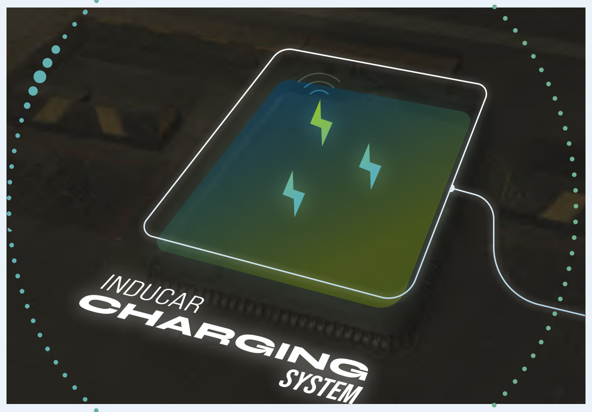
TIPS FOR REPLICATION

The charging service provider must be contractually engaged in implementing new Open Charge Point Protocol (OCPP) necessary for new and future charging features, such as energy balancing, monetary transactions, and platform integration.

INDUCAR

The **INDUCAR** solution was specifically designed to be tested on AMB premises :

- 2 retrofitted vehicles used
- Administration's employees involved as EV users
- 2 charging pads installed and reserved for wireless charging at the AMB HQ parking premises



TIPS FOR REPLICATION

Ensure that your fleet or vehicle is modern enough to support CCS communication for wireless retrofitting.

LESSONS LEARNED

CHALLENGES

- More flexibility needs to be provided in parking positions.
- There is a need to improve compatibility between the vehicles and charging stations.
- The special permitting process required for retrofitted vehicles before they can be driven needs to be considered.

LESSONS LEARNED

OPPORTUNITIES

- There is significant potential for installing inductive charging points in underground parking areas and for company fleets.
- The charging process is more convenient for users as it eliminates the need to handle cables.
- The equipment is less visually intrusive.
- The charging station is simple to install, requiring only a Schuko outlet to connect the pad.

TIPS FOR REPLICATION

Handbooks and user-friendly guides are essential for boosting the use of such decision support system tools.

INSOC

Fundesplai Centre Esplai
Youth hostel

FREE CHARGING | FREE PARKING | PUBLIC SPACE

- ***A low-power charging station*** for light electric vehicles (LEVs) was installed.
- Employees of the hostel were provided with ***4 electric bikes*** and tested them for their daily commute to work.
- The test users had access to ***free charging at the INSOC station*** on the hostel premises.

LESSONS LEARNED

- ***Need for sustainable use cases :*** Shared LEVs and their use are creating tensions and conflicts in many European cities. Sustainable use cases need to be developed to operate them effectively in urban environments.
- ***Assess the priorities :*** Most LEVs can charge using a normal Schuko socket, do not require extra power, and are easy to install indoors. Therefore, the need for public charging solutions for LEVs does not seem to be a high priority and the added value of public charging stations for LEVs lies in providing appropriate and secure parking solutions for these vehicles.

TIPS FOR REPLICATION

Charging stations for e-bikes in public spaces need extra security and anti-theft parking systems to ensure users feel safe leaving their bikes for several hours.

TIPS FOR REPLICATION

As e-bikes have components around the bike wheel, the parking system should avoid contact with the wheels.

CLICK

- **CLICK** is being used in the Geographic Information System (GIS) department of **AMB** and their collaborators.
- **AMB** relies on local municipalities to provide their own data and preferences for the deployment of the network.
- The results will be used internally to compare with the current locations decided.
- If the results differ significantly, **AMB** may include the **CLICK** criteria for future tenders in a new extension of the charging stations network.

FOCUS ON

BERLIN

SOLUTIONS DEMONSTRATED :
CLICK, INCAR

PARTNERS : Gewobag (housing company), Qwello (CPO), VMZ (technology provider)

INCAR

PAID CHARGING · PAID PARKING · PRIVATE SPACE · EV DRIVERS

USER-CHI PARTNERS IN BERLIN
demonstrated :

6 *publicly accessible AC chargers*
in 2 different **private car parks.**

Users *Private and professional* **drivers.**

Locations *Innovative business model and user-friendly location*
A housing company rents private parking spaces to **charge point operators (CPOs).**
CPOs equip these spaces with **charging infrastructure** and make them **available for public use.**

TIPS FOR REPLICATION

Targeted communication and incentives are crucial to engage users and promote the new and innovative charging solutions! Explore the VMZ and Gewobag communication campaign, which effectively combines social media posts, in-person activities, user guidance, and local press promotion to engage and inform the public.

LESSONS LEARNED

This business model promotes the efficient use of existing private infrastructure and supports the expansion of publicly accessible charging networks in urban areas. It addresses the growing demand for publicly accessible charging stations and optimizes the use of private property with advantages for all parties involved.

Property owners :

- increase revenue by optimizing the use of their parking properties, offering them at higher rental rates.

Charge Point Operators (CPOs) :

- faster installation and easier operation of their charging stations due to fewer permits required compared to public spaces.
- further income generated by charging for parking time in addition to revenue from electricity sales.
- revenue-sharing agreements with property owners are established to share income from charging sessions and parking fees based on pre-agreed terms.

EV drivers :

- greater choice of charging options due to access to reservable and secure parking and charging spaces.

THE RESPONSIBILITIES OF EACH PARTNER
are as follows

Property Owner
The property owner is responsible for the maintenance of the car park, which includes ensuring adequate and operational lighting, cleanliness of the car park, proper signage, maintenance of access barriers and removal of hazards.

Charging Point Operator (CPO)
The Charge Point Operator (CPO) is responsible for installation, operation and maintenance of the charging points. Additionally, the CPO ensures that the charging points remain operational and is obligated to resolve any technical issues that may arise.

E-Mobility Service Provider (EMSP)
The E-Mobility Service Provider (EMSP) makes the charging points accessible to the public through a mobile application, such as the INCAR app. The mobile app caters to a large user base of electric vehicle drivers, allowing them to locate and reserve the charging points, start and stop the charging sessions, and make cashless payment, which simplifies the entire parking and charging process.

Looking at the bigger picture

The seamless integration of charging infrastructure into private parking spaces represents a significant step forward in building a robust, inclusive, and user-friendly electric vehicle ecosystem. The model is replicable and scalable, allowing for expansion to different types of properties (e.g., commercial real estate) and geographic regions, thereby fostering more widespread adoption of electric vehicles.

Read ***Eurocities article on the deployment** of public off-street charging infrastructure in Berlin.*

FOCUS ON

BUDAPEST

SOLUTIONS DEMONSTRATED :

INCAR, SMAC & CLICK

PARTNERS : Municipality of Budapest, BKK (public transport agency), E.ON (CPO)

INCAR

FREE CHARGING · PUBLIC SPACE · EV DRIVERS · CAR SHARING

6 *AC chargers* have been installed across **4** *different locations in Budapest* to test integration with the **INCAR app.**

This deployment is part of the

MOBILITY POINT NETWORK CONCEPT

that Budapest has been developing since 2020:

3 *-level service structure*

- MicroMobility points (Mobi)
- Mobility points
- Mobility stations

The deployment of each service level depends on the **modes and technologies involved**, as well as **user demand.**

4 *e-mobility points and stations* equipped with USER-CHI chargers integrated with INCAR

Used by **car-sharing companies** and **private EV users.**

TIPS FOR REPLICATION

Designing sustainable and future-proof business models with all parties involved is essential before investing in the deployment of charging points.

Take a look at our **STATIONS OF THE FUTURE HANDBOOK** to learn more about sustainable business models for charging infrastructure.

CLICK

The Climate and Environmental Affairs Directorate of the Municipality of Budapest, along with the Strategy and Mobility Planning Directorates of BKK, tested the CLICK planning tool :

- The results and recommendations are being integrated into Budapest's e-mobility strategy, (currently under development).
- In the long run, **CLICK** will serve as a supporting planning tool for future charging infrastructure.

LESSONS LEARNED

- A decision-support system tool like CLICK is essential for cities, aiding in the planning of their future charging infrastructure. However, CLICK is not a stand-alone solution. In Budapest, it was used in combination with traffic modelling data to cross-check and validate results from current planning strategies.

Find out more here on the ***« mobility station concept »*** in Budapest, developed jointly by the Municipality and the public transport company BKK.

LESSONS LEARNED

- ***Build capacity to address the ever-changing landscape of electric mobility:***

Electric mobility is a fast-changing ecosystem, influenced by growing demand, advancements in charging technology, vehicle innovations, evolving standards, legislation, and energy availability. Cities often lack the technical capacity, human resources, and knowledge to keep up with these changes. Therefore, dedicated departments should be established in each city to develop and ensure the proper expertise.

- ***Think strategically and involve your stakeholders:***

Municipalities should develop clear and transparent deployment strategies for charging infrastructure. This includes defining stakeholder roles and responsibilities, as well as providing guidelines on business models and revenue schemes.

ITALY - **Rome**

PARTNERS : Roma Servizi per la Mobilità (public transport agency), ENELX Way (charging solutions provider)

FOCUS ON

ROME

SOLUTIONS DEMONSTRATED :

INCAR, INSOC, CLICK

INCAR

The partners in Rome are demonstrating the integration of the whole Roman network of ENELX into the INCAR app.

- Around **100 chargers** are now accessible via the **INCAR app**.
- **Slow, medium and fast** chargers are available.
- This integration aims to test the interoperability and automation of processes and payments between **ENEL X** as a CPO and **ETRA** as an eMSP.
- Roma Servizi per la Mobilità is offering a monetary incentive to users charging through the **INCAR app** and has launched an information campaign.

TIPS FOR REPLICATION

It is possible to combine the use of an existing service app with the demonstration of a new and innovative app. The ENEL X app is informing users that they can switch to the INCAR app and receive a discount for testing the services and completing a feedback questionnaire.

INSOC

- INSOC is being tested in a **publicly accessible private area** near Garbatella metro station in the Ostiense area.
- The charging station is accessible **24/7**.
- It can be used to charge **electric bikes and e-kick scooters.**
- The station is equipped with **6 wireless charging spots**, integrated theft-proof mechanical rack for personal locking, payment services and on-site produced **renewable energy** through the photovoltaic canopy present on the roof of the station.

LESSONS LEARNED

- ***Fit for commuters :*** INSOC product improves the management of electric light vehicles parking and fleet through a single hub as collection point in Ostiense area. In this area, there is a huge number of commuters and citizens that work and live.

CLICK

- Roma Servizi per la Mobilità (**RSM**), in cooperation with the Municipality of Rome, is drafting an Electric Mobility Plan and has developed a model for identifying areas in need of electric charging points.
- RSM technicians, who are directly involved in planning the charging points and drafting the Electric Mobility Plan, have tested the **CLICK** tool.
- The areas identified by the CLICK tool will be put out to tender for operators of charging points.
- According to the model, the locations of the charging points are determined by the density of residents and employees and their connection to the electricity distribution network.

LESSONS LEARNED

- In terms of urban planning, the tests of the CLICK product were instrumental in expanding the variables included in the model implemented by RSM for locating charging points in public areas.
- In terms of urban planning, the tests of the This use of CLICK is highly replicable as it is applicable to any urban area.

SMAC

ENEL X will test the SMAC tool using three V2G chargers on the company fleet and on company premises.

FINLAND - Turku

PARTNERS : City of Turku, Turku Energia (energy company), TVT ASUNNOT OY (housing company), VASO (housing company) and IGL-Technologies Oy (technology provider).

FOCUS ON

TURKU

SOLUTIONS DEMONSTRATED :

INCAR, SMAC, INSOC, CLICK

The consortium :

In Turku, a local consortium was formed to test and demonstrate USER-CHI solutions in different settings.

- **2** housing companies — TVT, VASO
- **1** energy company — TURKU ENERGIA
- The City of **Turku** — TURKU

The Finnish technology provider **IGL-Technologies Oy** which manufactures the charging devices, developed a back-end system compatible with the INCAR application as part of the project and also operates the charging devices on the properties.

TVT

INSOC use case

FREE CHARGING · PRIVATE SPACE · LEV DRIVERS

The housing company TVT seized the opportunity of their new residential building to test different and innovative ways of charging LEVs as a means to promote their use :

- An INSOC station with six charging points was installed.
- Freely available to all local residents and other commuters.
- Allows for the charging of light electric vehicles, such as electric bicycles and scooters. charging cabinet was installed for safe charging of electric bike batteries inside the building: The battery, removed from the bike, is charged in a compartment that can be opened with an app, ensuring that any malfunction does not pose a fire hazard to the surroundings.
- Separate area for electric senior scooters in the bike storage: This charging area for senior scooters was designed in collaboration with the City of Turku's accessibility board. These indoor functions are available only to the residents of the building.

TIPS FOR REPLICATION

Are you interested in ensuring accessibility of charging infrastructure to all users? Check out our resources ***here.***

TURKU ENERGIA

INCAR use case

26 load-managed charging points, each with a maximum charging power of 22 kW:

- **6** ***charging points*** installed in the **parking area** of **Turku Energia's new headquarters in Kupittaa** (for both private vehicles and the company fleet).
- **20** ***charging points*** **in front of the office building in Turku Harbor** (available to all EV drivers, targeting local workers and boat cruise passengers)

PAID CHARGING · PUBLIC SPACE · EV DRIVERS

SMAC use case

Turku Energia's Kupittaa office and the office building at Turku Harbor are equipped with electric vehicle charging devices, solar panels, and battery solutions, enabling the testing of the SMAC tool. TVT has been testing intelligent and dynamic demand management since January 2024, allowing the CPO to optimize energy-related costs and enhance the use of renewable energy sources. Additionally, Turku Energia's Kupittaa office venue is equipped with a V2G (Vehicle to Grid) charger, allowing for the piloting of this new charging technology and further development of the SMAC tool.

TIPS FOR REPLICATION

Future-proof your chargers by equipping them with features that allow for smart charging and V2G capabilities.

VASO

INCAR use case

INCAR-compatible chargers installed at VASO Pääskyvuorenrinne's new housing development :

6 *22kW chargers intended for residents*

- **1** charger for **public use.**

- chargers are also connected to **PV panels** and **battery storage inverters.**

PAID CHARGING · PUBLIC SPACE · PRIVATE SPACE · EV DRIVERS · CAR SHARING

SMAC use case

In collaboration with Turku Energia, VASO has developed intelligent electricity control for the VASO Pääskyvuorenrinne pilot site. The property is managed with a system that integrates the entire property's energy consumption and production. This system connects to the solar panels, electric vehicle charging, property electricity consumption, battery storage, and hourly-priced electricity. The goal is to maximize benefits for the property owner without compromising the use of controlled loads. For example, consumption management prioritizes chargers that have been in use the longest, and consumption during expensive hours is managed with electricity stored in the batteries.

LESSONS LEARNED

The integration of all charging features (location, booking, session management, integration of RES and demand management) into a single application/platform is highly advantageous and ensures more efficient management of charging demand.

TIPS FOR REPLICATION

Participation in EU-funded research projects allows cities to expand their perspectives and better understand the rapidly changing technologies and innovations in the field of electric mobility.

TURKU

INSOC use case

FREE CHARGING · PUBLIC SPACE · LEV DRIVERS

In June 2023, the City of Turku installed a new portable bike garage in Kupittaa train station area :

- Secure storage, electric charging for e-bikes, and maintenance for bicycles and other small vehicles.

- The bike garage can be disassembled into three parts and transported to a new location if needed.

- Capacity around 40 bicycles, including space for cargo bikes and bicycle maintenance.

- The garage features the INSOC charging device integrated with the INCAR app. Thanks to the solar panels and battery system installed on the roof, the bike garage is energy-positive. The services provided by the garage are free and available to everyone.

The safety of the garage is ensured by a surveillance camera and lighting. Accessibility has been considered in the design, with easy access via a ramp and sliding doors that open with a motion sensor.

Two exterior walls of the bike garage are decorated with an artwork by artist Heidi Vuorio titled «Watt is Love.» The piece was selected through a public and jury vote from ideas and proposals submitted for the competition.

The bike garage window also features a display providing useful information, including schedules for nearby buses and trains, a map of the nearest bus stops, information on the mural, details about the services offered, and information about the USER-CHI project.

TIPS FOR REPLICATION

Are you interested in ensuring accessibility of charging infrastructure to all users? Check out our resources **here.**

LESSONS LEARNED

This type of portable garage can be a solution to the lack of safe parking solutions and maintenance services in cities where the modal split is rapidly shifting towards cycling. It integrates easily into the urban environment and is well-received by residents, especially thanks to the inclusion of artwork.

CLICK and Turku charging masterplan

The Urban Mobility solutions department of the City of Turku used the CLICK tool to determine the optimal locations for the charging network. The CLICK tool's proposal for the charging network in Turku for the year 2030 includes about 2,000 charging points. The data from the CLICK tool is supplemented by the results of an electric charging survey. This data is supplemented by the results of an electric charging survey, which support the recommendations by CLICK. From these results, a plan was created for the phased opening of charging points.

Everything you want to know about Turku electric charging masterplan...

The city of Turku has designed an electric charging masterplan within the framework of USER-CHI project. The plan covers all publicly available charging points on both municipal and privately-owned land. The development of the public charging network will be tied to the increase in the number of electric vehicles, and the actual number of charging points will be monitored annually. For the charging network, the city will use the «charging street» model, where one charging station has multiple charging points (ranging from 4 to 20) depending on the purpose and power requirements of the station. The general plan also defines guidelines for payment, cost structures, accessibility, signage, and parking enforcement for charging points. The city's goal is to ensure that the charging network becomes a functional and cohesive system that is convenient for residents and economically viable for charging operators.

TIPS FOR REPLICATION

Include extensive options in tenders for charging points to allow for future scalability. This ensures that the size and technology of the charging network can be easily expanded as budget and needs permit.

LESSONS LEARNED

- A decision-support system tool like CLICK can help a city design its masterplan. Beyond determining the size of the charging network, insights on placement and grid power requirements are highly valuable and can guide public authorities in tailoring their charging network to specific urban constraints.

- Learning from others: The City of Turku was inspired by the city of Stockholm's charging network, which has proven effective. A study visit to Berlin also highlighted the risks of a scattered network.

- Turku is particularly focused on developing the city center's charging network, as private entities do not have the same development opportunities in the center as they do outside. Therefore, Turku aims to create a sufficient charging network in the city center to effectively accelerate the electrification of private car use. In other areas, the charging network relies more on private charging at home and on commercial premises.

FOCUS ON

FLORENCE

SOLUTIONS DEMONSTRATED :

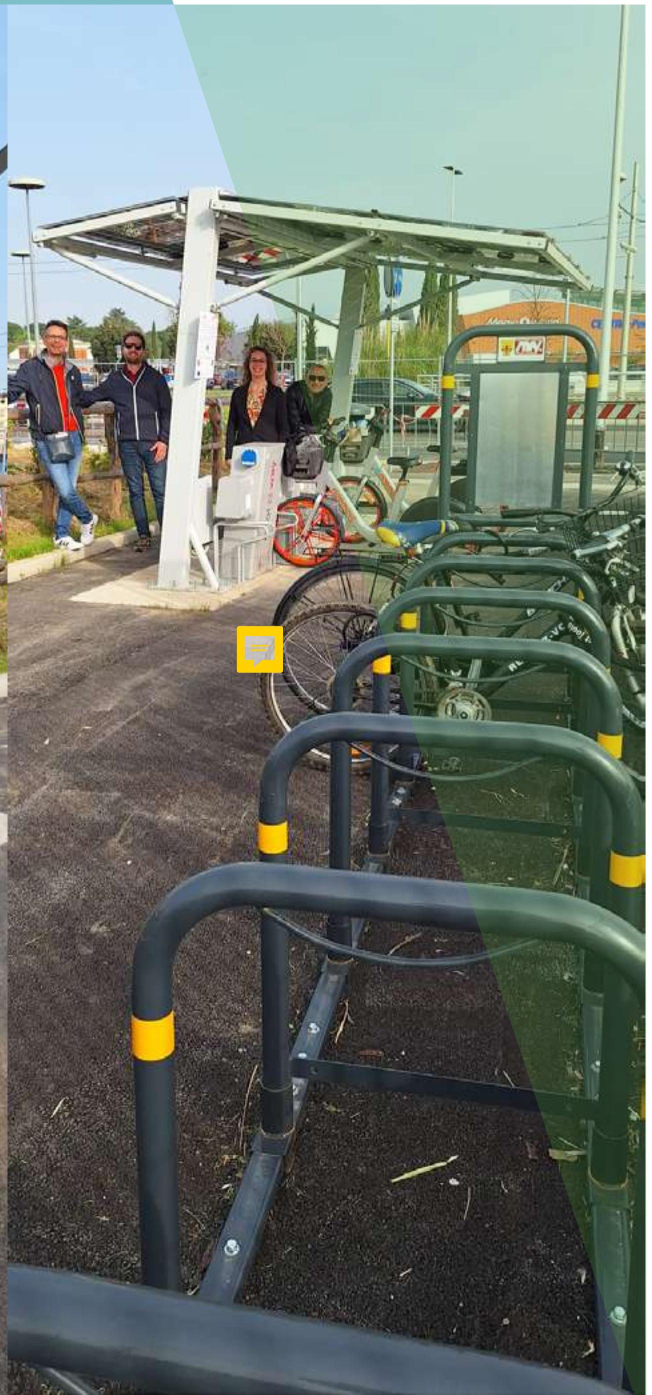
INSOC & CLICK

INSOC

- The **INSOC** charging station has been installed at the Ponte a Greve Park&Ride facility.
- The station features 6 wireless charging spots and uses on-site produced renewable energy from the photovoltaic canopy on the station's roof.

LESSONS LEARNED

- The **INSOC** station is an excellent example of integrating LEV charging infrastructure within a multimodal transport system.
- This new **Park&Ride** facility is one of the largest parking lots in the city, with 324 spots, serving the tramway and including a cycle path. It was created using European funds and enhances access to the tramway while improving traffic flow in the Ponte a Greve area.
- 230 meters of cycle path have been added along the perimeter of the car park to connect it to the rest of the cycling path network.



FOCUS ON

MURCIA

SOLUTIONS DEMONSTRATED :

INSOC & CLICK

INSOC

The City of **Murcia** installed an **INSOC** charging station under an existing photovoltaic (PV) panel roof at the local police station. This charging station is equipped with six wireless sockets for charging e-kick scooters and can be used by both municipal employees and private e-bike riders.

LESSONS LEARNED

- Charging stations for e-bikes prevent the parking of light electric vehicles (LEVs) inside the police station. With the increasing number of LEVs, secure parking and charging will become increasingly necessary in urban environments and workplaces.
- Charging stations for e-bikes are well-suited for charging larger municipal fleets.

USER-CHI

CHARGING YOUR E-MOBILITY FUTURE

ACCESS
ALL DELIVERABLES
HERE

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the grant agreement No [875187]

Where is the money? Investment needs, tariff schemes and sustainable business models for charging infrastructure

Date: **18/06/2024**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

CONTEXT

SPECIFICITIES OF EV CHARGING

Between 15 minutes and 8 hours

On highways, at home, at work, in the street…

Upgrade to electricity grid

Subscriptions, different pricing schemes…

How much do we need to invest?

€172 billion by 2030*

€85 billion for public charging

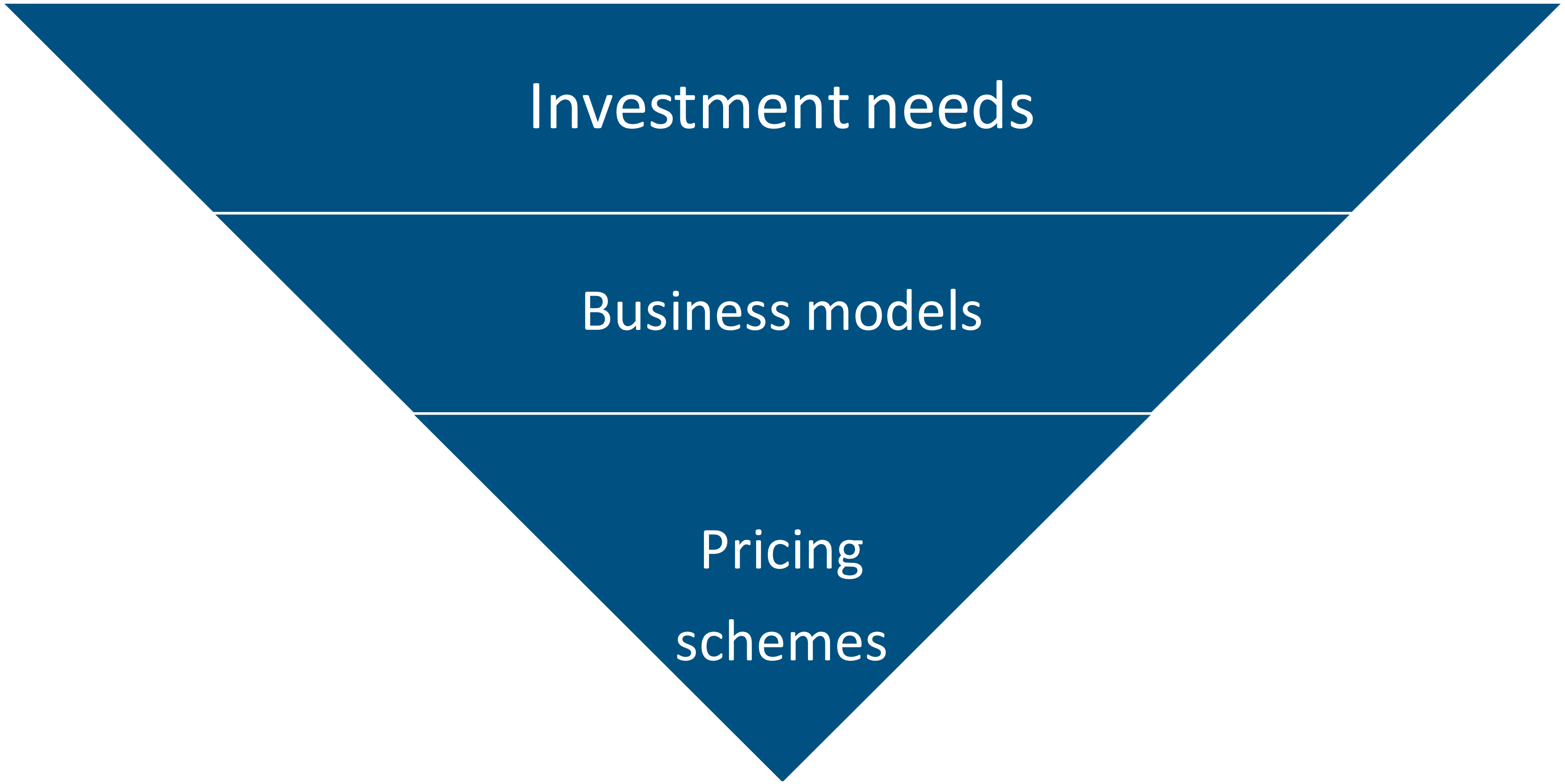
€4 billion/year in grid upgrade

*source European Electric Vehicle masterplan

How?

- Homeowners will need to pay for the hardware and installation of their private charging points, possibly receiving government subsidies to offset costs.
- Public charging points are built either by private charging operators or by local public utilities.
- Costs for grid upgrades will ultimately translate into electricity distribution fees for end consumers.

The investment needed can also be supported by loans such as the ones from the European Investment Bank.


Investment needs
Business models
Pricing schemes

Matching the users needs and sustainable business models – insights from USER-CHI project

Stations of the Future Handbook

JUNE 18TH, 2024

BRUSSELS, USER-CHI FINAL MEETING

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

JUAN F. GIMÉNEZ – A. LÓPEZ

IBV

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

The Context

Electromobility and the USER-CHI project

Introduction

USER-CHI is a research an innovation project, aimed at unlocking the massive potential of electromobility in Europe, from a user-centric perspective. Following a user driven innovation approach, the project performed a deep qualitative and quantitative research of charging needs, demands and requirements of citizens and users in six different European countries: Norway, Finland, Hungary, Germany, Italy and Spain. As a result of this research work, subjective perception of charging options, decision influences and acceptance barriers have been analysed to define the innovative features and value-added services needed and expected in the next generation of future charging stations.

STATIONS OF THE FUTURE

This document, Stations of the Future, presents the four different stations envisaged by the project team to fulfil the needs and expectations of Electric Vehicle users (including Light Electric Vehicles - LEVs), according to the results obtained in our user research.

Highlights

THE UPCOMING SCENARIO IN MOBILITY IS

ELECTROMOBILITY

Plug-in hybrid electric vehicles became the most popular type of passenger electric vehicles in the European Union in November 2020. This technological transition is supporting today the development of electromobility, but to foster a widespread use of electromobility, we need to provide appropriate charging infrastructure.

HOW MANY CHARGERS DO WE NEED? AND WHAT TYPE?

Although amount of chargers is quite different between Norway and Germany-Spain, Norwegians consider that the charging infrastructure is still an unsolved issue. This suggests that even in Norway the charging infrastructure has not overcome the required critical threshold, or perhaps there is something else...

NUMBER OF EV CHARGE INFRASTRUCTURE PER POPULATION

	GERMANY	NORWAY	SPAIN
Tesla Supercharger	1/1.000.000	1/70.000	1/700.000
Tesla Dest Charger	1/100.000	1/37.000	1/100.000
Charging Point	1/10.000	1/2.000	1/9.000
Connector	1/4.500	1/900	1/3.400

ELECTROMOBILITY IS ONLY A QUANTITATIVE PROBLEM, OR QUALITATIVE ASPECTS ALSO MATTER?

TRENDS IN EVs

→ Better availability of charging facilities
→ Energy saving and greener environment
→ Standardization of core components
→ Ubiquitous and environmentally friendly
→ Diversified charging modes
→ Digital and intelligent charging
→ Tighter control for safety and privacy protection
→ Charging infrastructure is a node for multi-network convergence

OUR AIM

In order to achieve the project aims, USER-CHI is focused in defining the charging infrastructures for EVs and LEVs that create value for customers, the industry and the society.

How do we boost electromobility?

It's a matter of quantity, but the qualitative matters

ACORDING TO OUR RESEARCH, CAR ELECTROMOBILITY HAS REQUIREMENTS:

MUST-BE REQUIREMENTS

- Availability of a dense charging point network in cities and in highways, including promoting the installation of charging points at drivers' home and in public parking lots. For professional drivers the city charging network is critical, while for private drivers the most critical point is charging when they arrive home, in private chargers or public chargers.
- A procedure for booking a charging point that ensures its availability when the driver arrives.

INCREMENTAL GAIN REQUIREMENTS

- Charging point status: occupied-unoccupied-in maintenance, blocked, charging, or reserved.
- Standardization of technical components and signalization.
- Paying with credit cards; contactless payment.
- Employing app utilities without subscription.
- Increase the amount of fast charging points; fast charge in highways.
- Automatic user detection in the charging point.
- Interoperability among charging points, at European level.
- A unique application for routing, booking and paying; pre-booking.

DESIRABLE REQUIREMENTS

- Additional services to perform activities when charging the battery. We could differentiate between:
  - Services at urban charging points, like shopping malls or mobility hubs.
  - Services at the charging points on route, in long range trips.
- Monitoring utilities like remaining charging time, percentage of charge in real time, power limitation to obtain a lower price, different criteria for fixing fees, or service interruption alarm, are interesting features for managing the waiting time when charging.
- Sustainability: users perceive electromobility as sustainable, and this value must be present in all the charging process.

What did we find out?

There are basic drivers, valuable requirements and desirable features

AND WHAT ABOUT LEVs IN ELECTROMOBILITY?

INCREMENTAL GAIN REQUIREMENTS (FOR LEVs)

- Specific free charging points for LEVs in urban areas.
- Lighter e-Bikes (they are currently heavier than conventional bikes).
- Safer e-Scooters.

AND WHAT ABOUT THE GENDER ISSUES?

What differences do they make in electromobility?

Based on our research, women tend to park in private parking. On the other hand, women would like to have more charging points at home. Both results could be related to security reasons as the risk of sexual harassment is higher for women in public spaces. From the gender perspective, there are two different dominant patterns and needs associated. This should be adressed when planning charging stations in the future.

Does everybody need the same?

LEVs have specific requirements. And women have a different experience …

		Technologies	Services / User demands	Location
Intermodal Station	Electric cars – eBikes – eScooters – Public transport	• Chargers for LEVs • Shared electric scooters (eScooters), electric-assist bicycles (eBikes) and electric mopeds. • Slow chargers. Low power chargers (AC, Inductive charging) • Fast chargers (DC) • Pay for charging (not parking), interchangeable payment method (credit cards; contactless payment; subscription, cash, ...) • Rental and shared vehicle area	• Standard and fast chargers • Inductive charging for EVs + Maintenance + Parking lot • Chargers for LEVs • Intermodal ticketing point • Cafeteria • Toilets • Lockers & Courier service • Coworking & resting area	• Nature integrated • Anti-theft / safe zona • Railway station, city accesses, university campuses • Big space is required
Urban Station	Electric cars – eBikes – eScooters - Electric vans	• Slow chargers (AC) • Fast chargers (DC) • Parking & Charging booking • Restricted access • Interchangeable payment method (credit cards; contactless payment; subscription, cash, ...)	• Parking & Charging service for LEVs and EVs • Lockers & Courier service • Logistics • Short stays • Loading/Unloading area	• City Center • Neighborhood • Shopping area
Highway Station	Electric cars – Electric vans	• Fast chargers (DC) • Charging booking	• Interchangeable payment method (credit cards; contactless payment; subscription, cash, ...) • Cafeteria • Toilets • Coworking & resting area • Vehicle maintenance • Playground / Physical activity	• Highway
LEV Station	eBikes – eSccoters – eMopeds	• Photovoltaic panels connected to grid • Modularity • Battery storage cabinets / Battery swapping • AC chargers • Charging booking	• Secure parking • Vertical parking • Interchangeable payment method (credit cards; contactless payment; subscription, cash, ...)	• Chargers in urban furniture, street lights and benches • Bus canopies, underground • University campus

According to the users' demands, FOUR different stations:

- The Long and the Short range
- Peri-urban areas and city centre
- Public Transport and active mobility

THE VALUE

Intermodal station of the future

Citizens e-mobility stations + Logistics Hubs + E-taxi stops + City centre park&charge

KEY PARTNERS

Electromobility Service Providers
CPOs
Technology Solution Providers
Grid infrastructure Managers
Energy supplier companies
TSPs
Local Authorities/Mobility Agencies
National and European Authorities
OEMs
Financial and payment system companies
Taxi corporations
Taxi vehicle manufacturers

KEY ACTIVITIES

Analysis of relevant pools of attraction
Power grid characteristics
Analysis and design of public space
Analysis of local ordinances and policy willingness
Analysis of current transport network and barriers
Analysis of market trends
Deals with most important energy suppliers
Roaming deals with different CPOs

THE BUSINESS

KEY RESOURCES

Municipal electrical assets
Logistics operations data
Strategic locations
National and local charging infrastructure plan

VALUE PROPOSITION (SERVICES)

To stop and charge in strategic intermodal locations
Standard, fast, and ultra fast chargers
Inductive charging
Battery swap
Vehicles maintenance
Parking lots
Pay for charging (not parking)
Rental and shared mobility services
Chargers for LEVs
Intermodal ticketing
Cafeteria
Toilets
Lockers, courier and logistics services
Sharing of logistics areas
Coworking & resting areas
Grid balancing solutions
Energy storage solutions

CUSTOMER RELATIONSHIP

Different payment solutions
Charging subscriptions
Parking&charging booking
Harmonized charging standards
Providers roaming solutions
Park&charge discounts
Automatic free point detection
Taxi parking&charging points
Logistics parking&charging points
PT parking and charging areas
Provision of private and fleet charging solutions
Grid load balancing discounts

CHANNELS

Specific channels for industrial and logistics
Strategic transport location visibility
Apps
Web sites
Local and/or national public administration visibility
Utility companies' channels

CUSTOMER SEGMENTS

Private drivers
Professional EV drivers (also taxis)
PT companies
Sharing mobility providers
Electromobility providers
Logistics operators

THE MARKET

COST STRUCTURE

Electricity grid upgrade (especially for DC fast charging points if needed in the intermodal point)
Charing point hardware
Charging point installation
Cost of energy
Land setting and adaptation
Location analysis
Administrative expenditures
Maintenance

REVEUE STREAMS

Logistics vehicles recharging
Private vehicles recharging
Business vehicles charging
Fees for parking
Maintenance services
Ancillary general services
Ancillary logistics services
Grid balancing
Advertisement
EV drivers' data (preferences, tendencies, behaviour, itineraries, charging time)

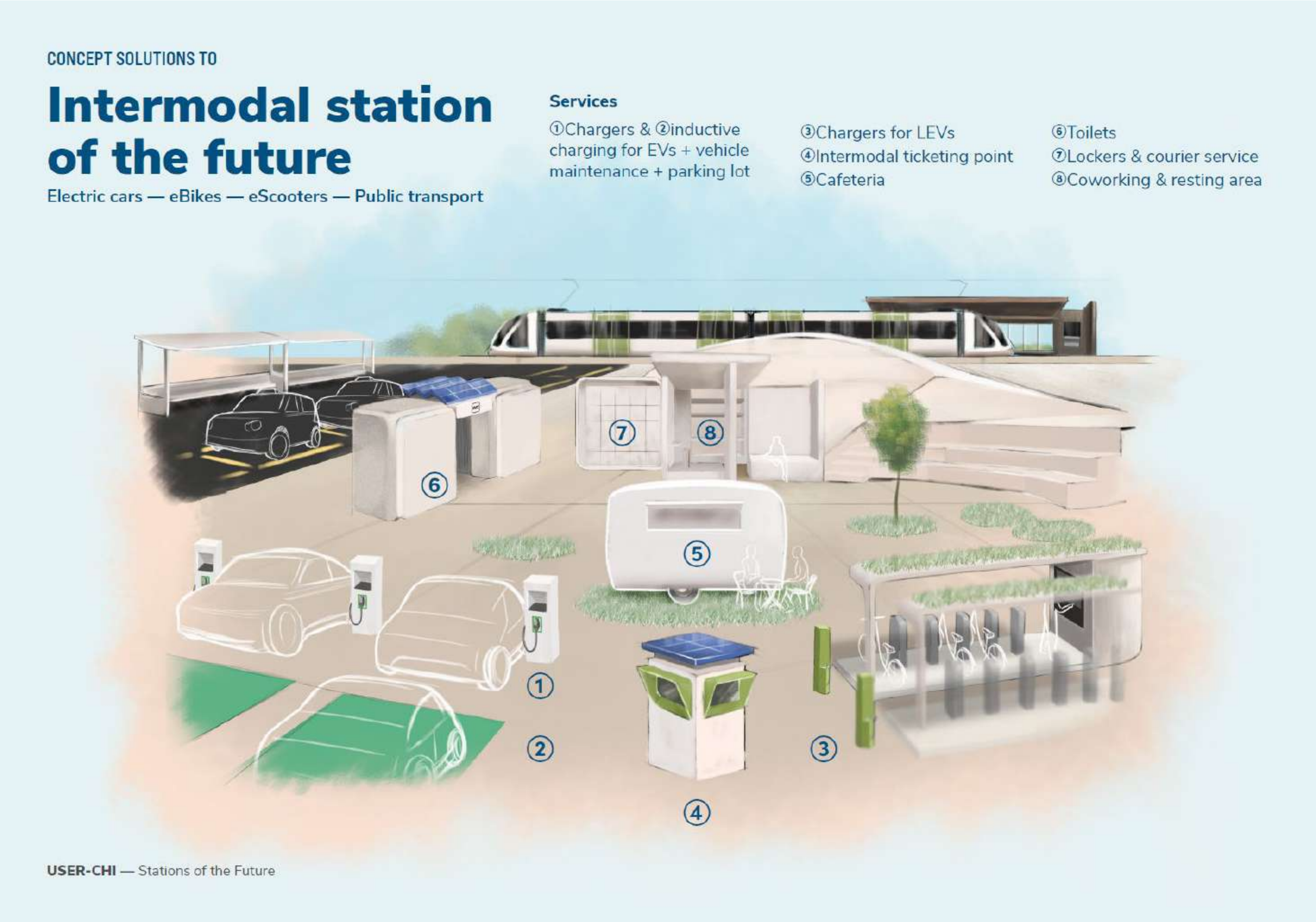
THE FLOW

Date: 31/01/2022
Author(s): Gabriele Pistilli, Fabio Cartolano

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875187

Before introducing our concept designs …

… a little explanation about how we tackled the business models definition



The Intermodal Station of the Future

A station to support the multimodal mobility

SPECIFICATIONS FOR

Intermodal station of the future

Electric cars — eBikes — eScooters — Public transport

SERVICES

①Standard and fast chargers
②Inductive charging for EVs + vehicle maintenance + parking lot
③Chargers for LEVs
④Intermodal ticketing point
⑤Cafeteria
⑥Toilets
⑦Lockers & courier service
⑧Coworking & resting area

TECHNOLOGY

- Chargers for LEVs
- Shared electric scooters (e-scooters), electric-assist bicycles (e-bikes) and electric mopeds
- Slow chargers. Low power chargers (AC, inductive charging)
- Fast chargers (DC)
- Pay for charging (not parking), payment method interchangeable (credit cards; contactless payment; subscriptions, cash...)
- Rental and shared vehicle area

LOCATION

- Nature-integrated
- Anti-theft/safe zone
- Railway station, city accesses, university campuses
- Big space is required

USER-CHI — Stations of the Future

13 14

Intermodal Station main features

- Services
- Technology
- Location

BUSINESS MODEL

Intermodal station of the future

Electric cars — eBikes — eScooters — Public transport

THE BUSINESS

PARTNERS

Electromobility Service Providers
CPOs
Grid Infrastructure Managers
Energy supplier companies

ACTIVITIES & RESOURCES

Power grid characteristics
Deals with most important energy suppliers
Roaming deals with different CPOs
Strategic locations

THE VALUE

To stop and charge in strategic intermodal locations
Standard, fast, and ultra fast chargers
Vehicles maintenance
Rental and shared mobility services
Intermodal ticketing
Lockers, courier and logistics services
Sharing of logistics areas
Coworking & resting areas
Grid balancing solutions
Energy storage solutions

THE MARKET

RELATIONSHIP & CHANNELS

Harmonized charging standards
Providers roaming solutions
Apps

SEGMENTS

Private drivers
PT companies
Electromobility providers
Logistics operators

THE FLOW

OUT

Electricity grid upgrade
Charging point installation
Land setting and adaptation
Maintenance

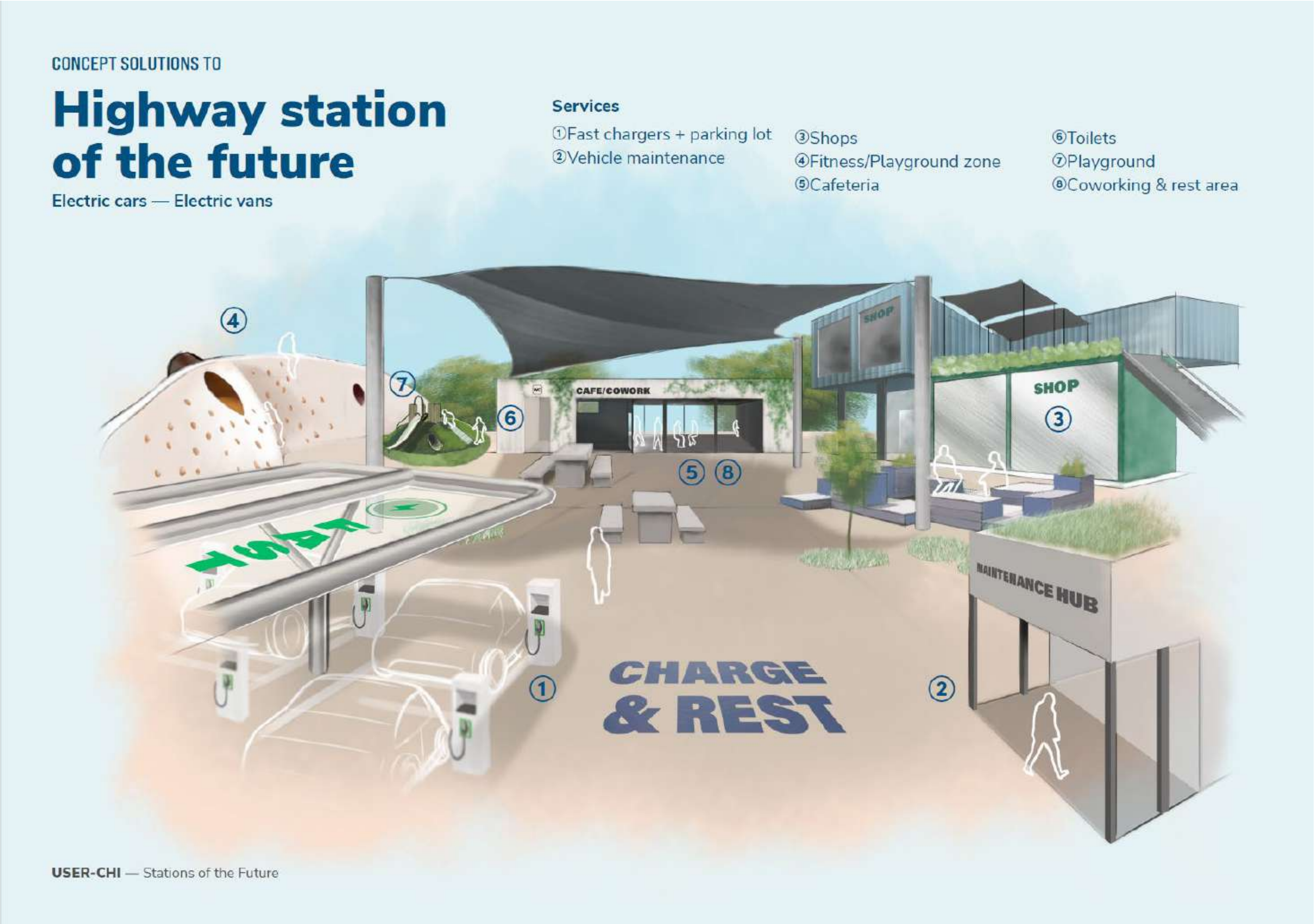
IN

Private vehicles recharging
Business vehicles charging
Maintenance services
Ancillary general services
Ancillary logistics services
EV drivers' data

USER-CHI — Stations of the Future

Intermodal Station business model

- Citizens e-mobility
- Logistics Hubs
- e-Taxi stops
- CC park&charge



The Highway Station of the Future

A station to support the long range electromobility

SPECIFICATIONS FOR

Highway station of the future

Electric cars — Electric vans

SERVICES

①Fast chargers
②Vehicle maintenance + parking lot
③Shops
④Physical activity zone
⑤Cafeteria
⑥Toilets
⑦Playground
⑧Coworking & resting area

TECHNOLOGY

- Fast chargers (DC)
- Booking of chargers

LOCATION

- Nature-integrated
- Highway
- Big space is required

Highway Station main features

- Services
- Technology
- Location

BUSINESS MODEL

Highway station of the future

Electric cars — Electric vans

THE MARKET

RELATIONSHIP & CHANNELS

Booking of chargers
Providers roaming solutions
Parking & charging points for trucks
Highway administrations and operators visibility

SEGMENTS

Private drivers
Professional EV drivers
Logistics operators

THE VALUE

To stop and charge in strategic highway locations
Fast and ultra fast chargers
Multiple ancillary services for different e-transport modalities
Grid balancing solutions
Energy storage solutions
Emergency and ad-hoc support for EVs
Provision of mobile charging stations

THE BUSINESS

PARTNERS

Highway operators and concessionaries
CPOs
Grid Infrastructure Managers

ACTIVITIES & RESOURCES

Analysis of relevant pools of attraction
Power grid characteristics
Roaming deals with different CPOs
National electrical assets

THE FLOW

OUT

Electricity grid upgrade
Charging point hardware (specific for heavy vehicles)
Maintenance
Staff, security

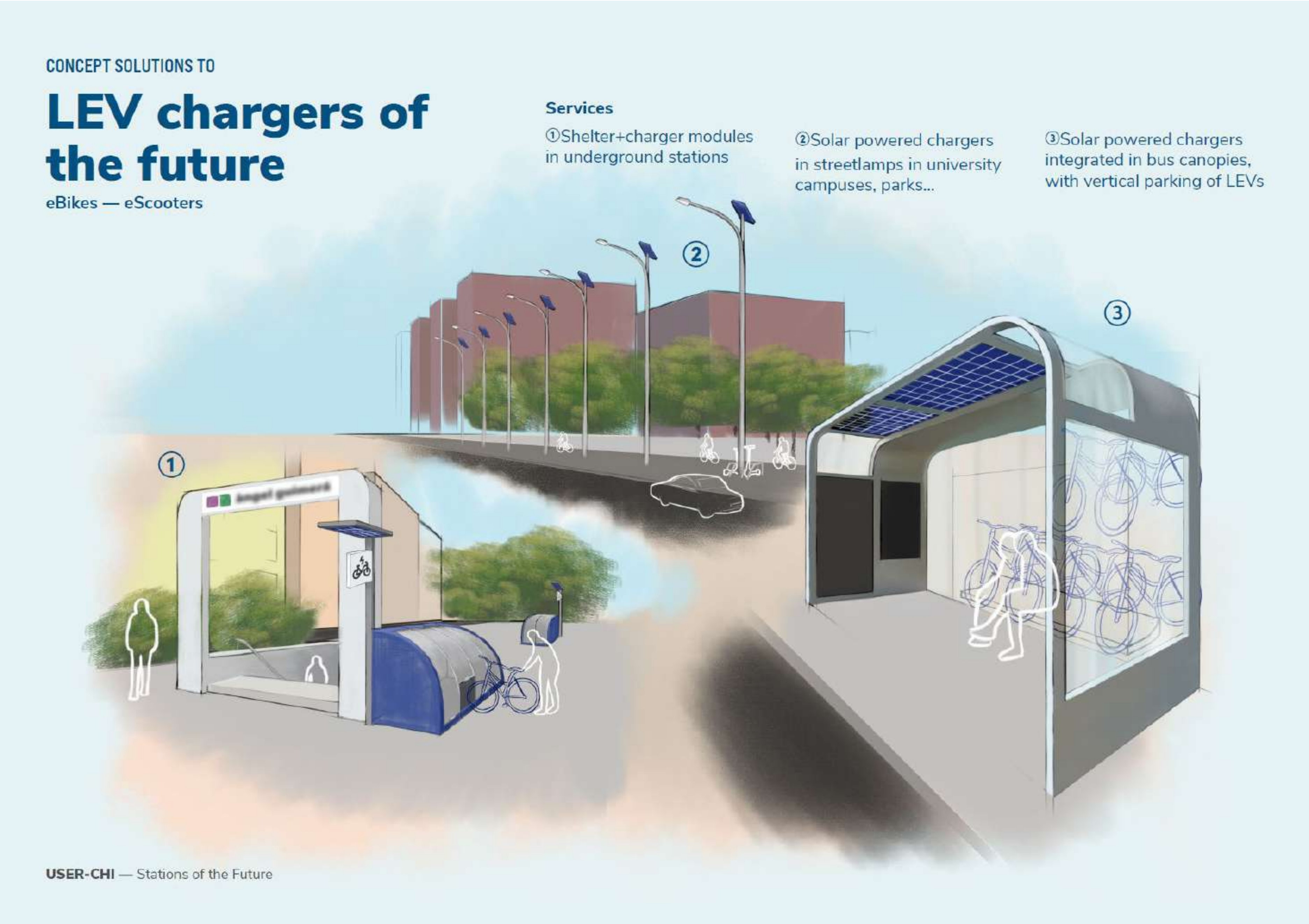
IN

Logistics vehicles recharging
Private vehicles recharging
Business vehicles charging
Ancillary general services
EV drivers' data

USER-CHI — Stations of the Future

Intermodal Station business model

- Citizens e-mobility
- Special Events
- e-Trucks
- Mobile charging



The LEV chargers of the Future

A station to support the active, multimodal and sustainable mobility

SPECIFICATIONS FOR

LEV chargers of the future

eBikes — eScooters

SERVICES

①Secure parking
②Vertical parking
③Chargers for LEVs
④Interchangeable payment method (credit cards; contactless payment; subscription; cash...)

TECHNOLOGY

- Photovoltaic panels connected to grid
- Modularity
- Battery storage cabinets / Battery swaping
- AC chargers
- Charging booking

LOCATION

- Chargers in urban furniture, streetlamps and benches
- Integrated in bus canopies or by underground stations
- Near university campuses

USER-CHI — Stations of the Future

25 26

LEV chargers main features

- Services
- Technology
- Location

BUSINESS MODEL

LEV chargers of the future

eBikes — eScooters

THE BUSINESS

PARTNERS

Electromobility Service Providers
CPOs
Sharing mobility operators
Location owners

ACTIVITIES & RESOURCES

Engagement with users and citizens
Analysis of relevant pools of attraction
Analysis and design of public space
Municipal electrical assets

THE VALUE

To stop and charge LEVs at strategic locations in the city
Charging infrastructure and services tailored to cities specific features and to different vehicle models
Secure parking
eBikes sharing services
Cargo-bikes for couriers and logistics services
loading/unloading areas Battery storage cabinets/Battery swapping
Solar powered chargers

THE MARKET

RELATIONSHIP & CHANNELS

Different payment solutions
Harmonized charging standards
Providers roaming solutions
Strategic urban location visibility
Apps

SEGMENTS

Private LEV drivers
Cargo-bike logistics operators

THE FLOW

OUT

Electricity grid upgrade
Charging point installation
Maintenance

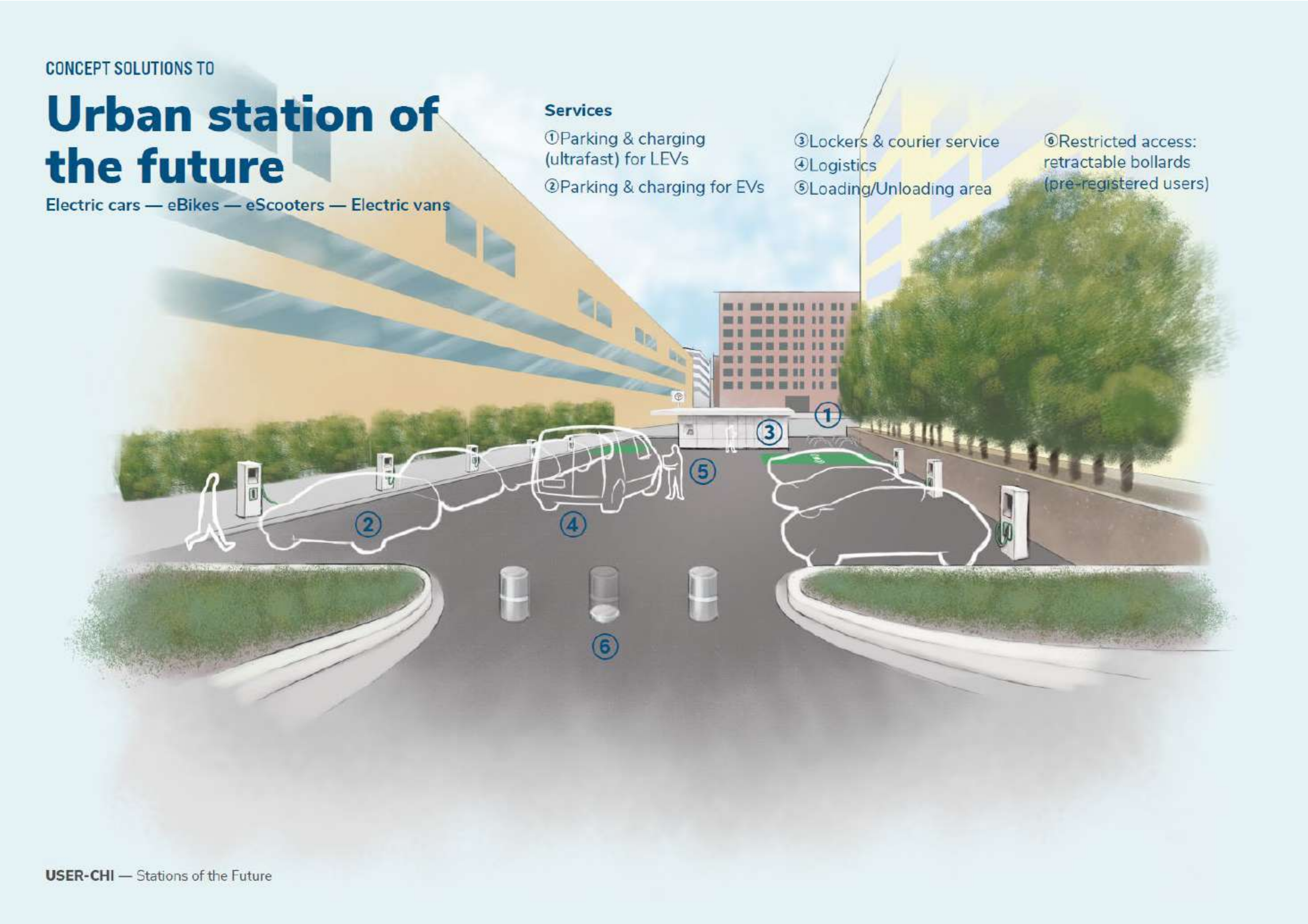
IN

Private LEVs recharging
Business LEVs charging
Fees for parking
LEV drivers' data

USER-CHI — Stations of the Future

LEV chargers business model

- Citizens e-mobility
- CC park&charge



The Urban Station of the Future

A station to support the new mobility in the cities

SPECIFICATIONS FOR

Urban station of the future

Electric cars — eBikes — eScooters — Electric vans

SERVICES

①Parking & charging (ultrafast) for LEVs
②Parking & charging (AC & DC) for EVs
③Lockers and courier service
④Logistics
⑤Loading/Unloading area
⑥Short stays

TECHNOLOGY

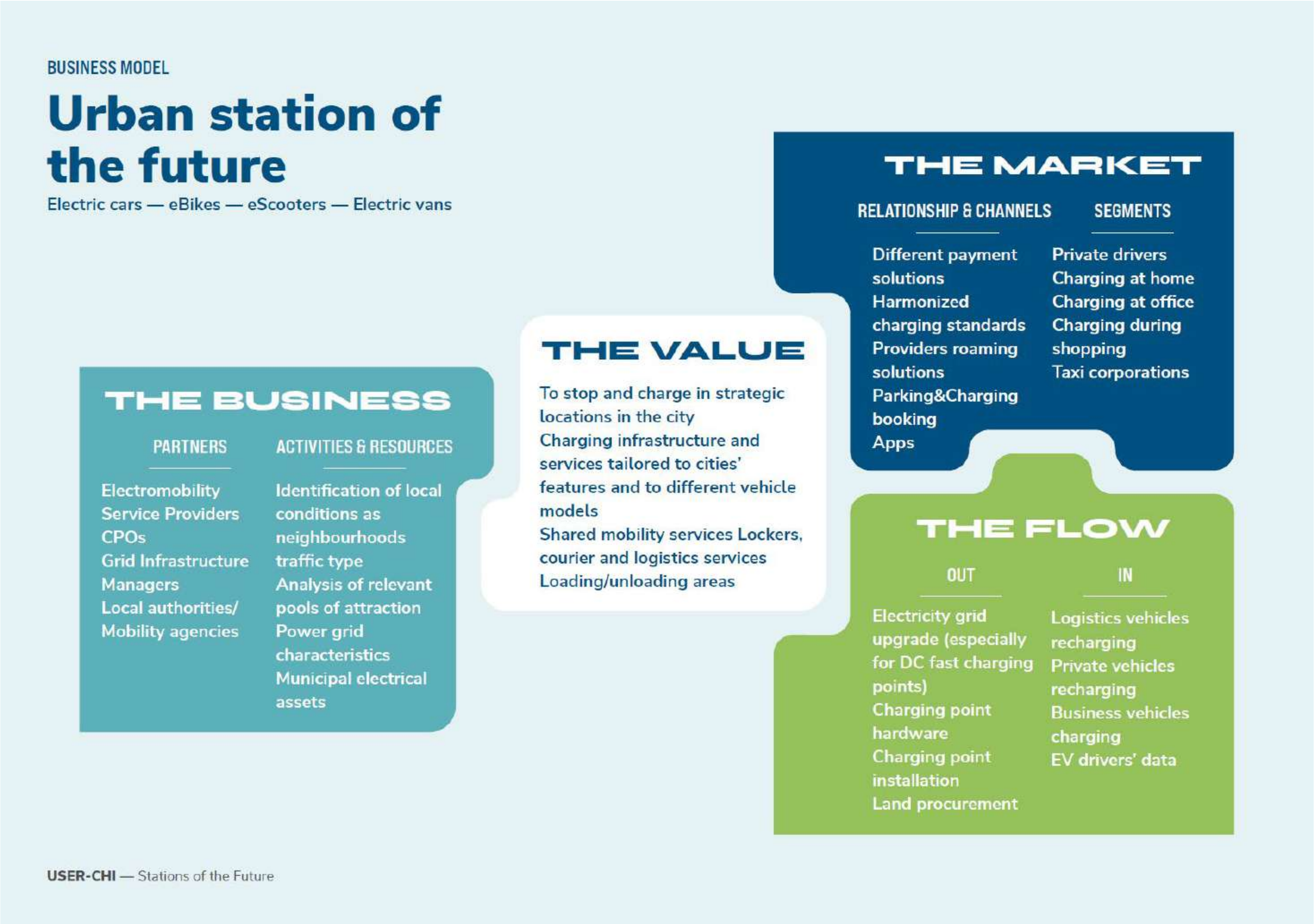
- Slow chargers (AC)
- Fast chargers (DC)
- Parking & charging booking
- Restricted access
- Pay for charging (not parking), payment method interchangeable (credit cards; contactless payment; subscriptions, cash...)

LOCATION

- City centre
- Neighbourhood
- Shopping area

Urban Station main features

- Services
- Technology
- Location



Urban Station business model

- Logistics Hubs
- e-Taxi stops
- CC park&charge

Some conclusions

- A Handbook to promote electromobility, based on user needs and expectations regarding the charging process of EVs.

- Our concepts aim to be a reference to support electromobility actors to implement the facilities their cities need to boost a more sustainable and active mobility.

- The Handbook relates every concept to different business models that have been defined and assessed with relevant European cities.

- A *CEN Workshop Agreement* (CWA) have been produced, with the aim of disseminating these results among the mobility industry (CWA18090_2024)

THANK YOU!

ANY QUESTIONS OR COMMENTS?

CONNECT WITH US:

Twitter: @Userchi_H2020

LinkedIn: https://bit.ly/2W7M3mW

Website: www.userchi.eu

Email: info@userchi.eu

Download the Handbook here

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Charging pricing schemes – insights from eCharge4Drivers project

Pedro Gomes

POLIS Network

USER-CHI Final Conference | 18 June 2024

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 875131 (Innovation Action)

eCharge4Drivers in a Nutshell

Call identifier: H2020-LC-GV-2018-2019-2020

Topic: GV-10-2017 "Demonstration (pilots) for integration of electrified L-category vehicles in the urban transport system"

EC funding: 14,424,526.39 €

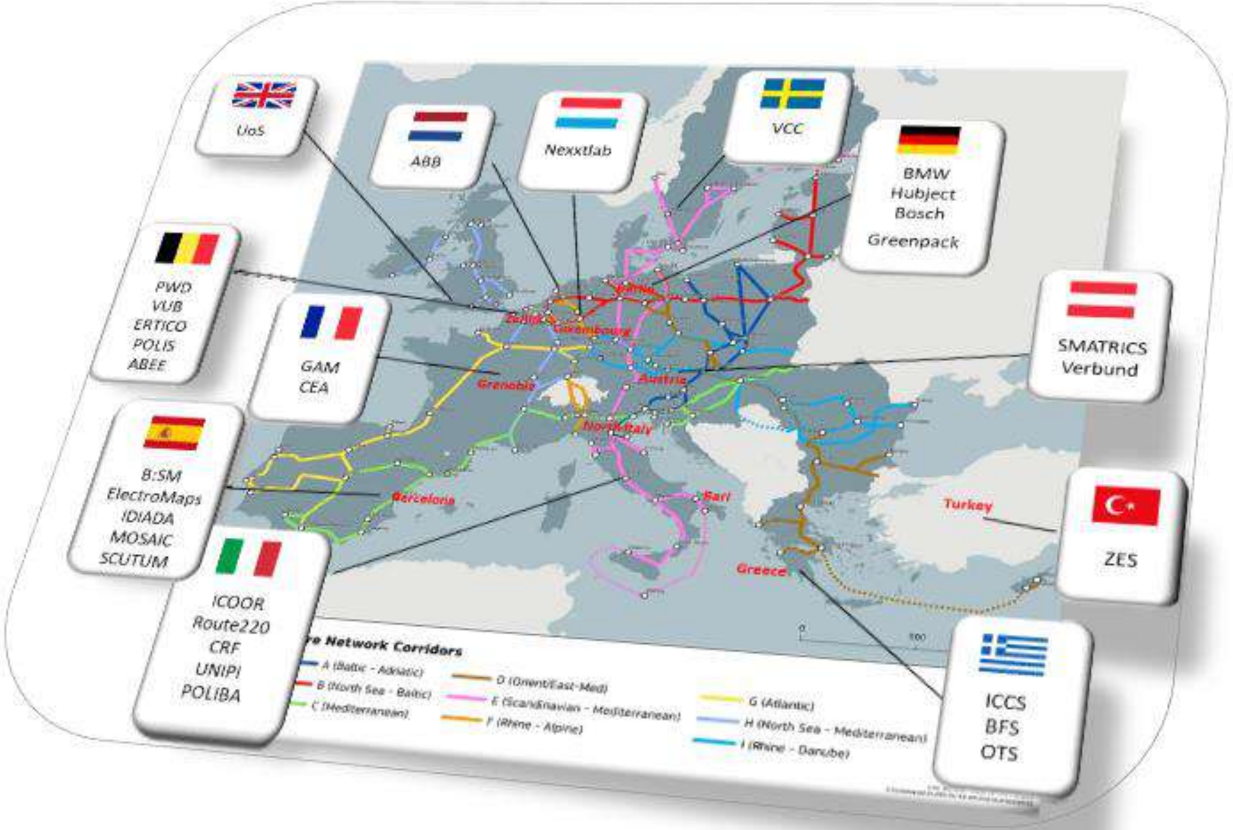
Duration: June 2020 – November 2024

12 countries - 30 Partners – 10 demonstration areas

SCOPE:

eCharge4Drivers aims to **improve the Electric-Vehicle charging experience in urban areas** and on interurban corridors towards promoting e-mobility concept and making it more convenient for users to go green by **developing and designing user-centric and interoperable charging solutions**.

Different e-mobility maturity level



https://echarge4drivers.eu/

Strategic objectives

O-1: Understand the user needs so that the project charging solutions and services substantially **improve the user charging experience**

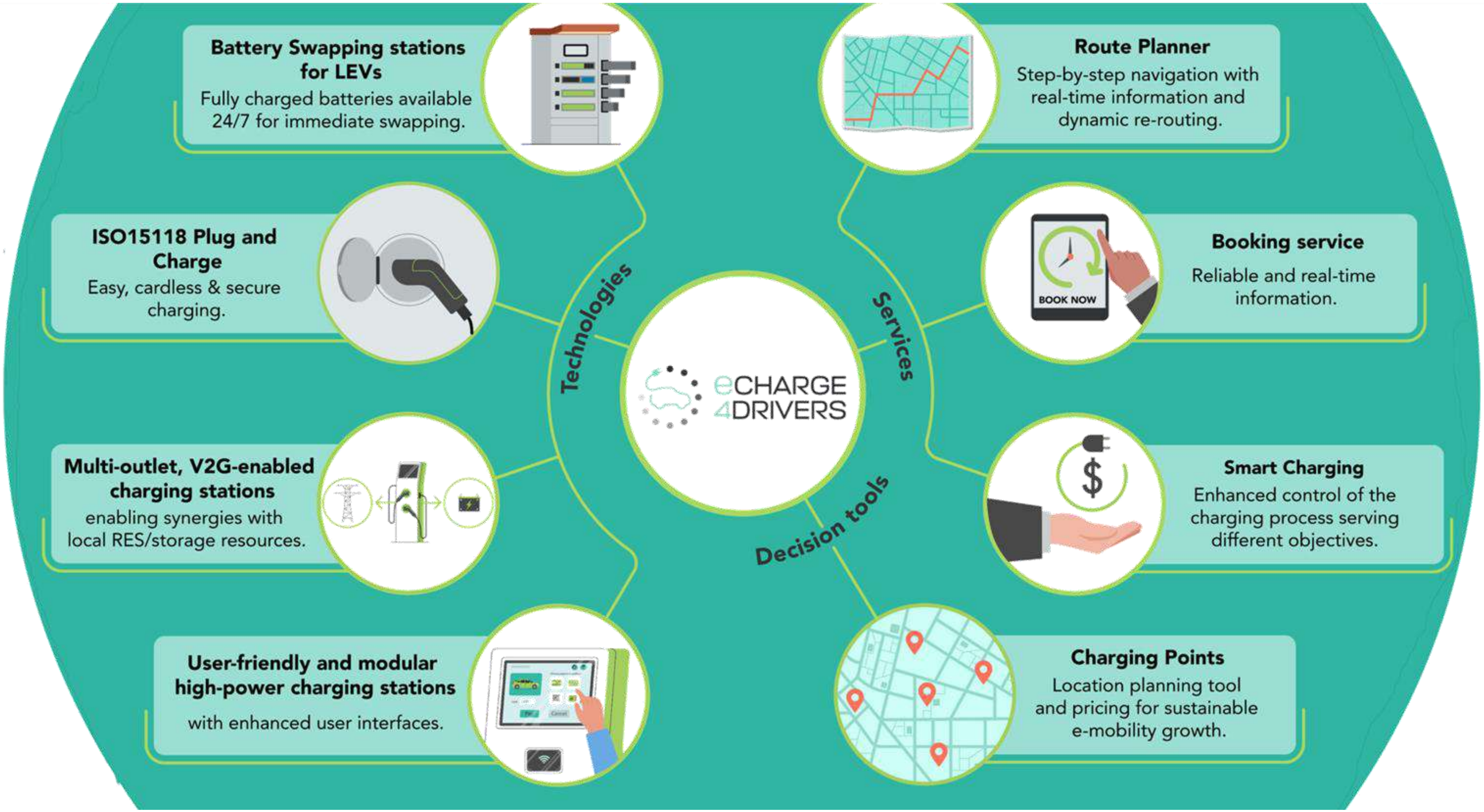
O-2: Develop and demonstrate **user-friendly and cost-efficient charging stations** for passenger vehicles and LEVs

O-3: Design and **demonstrate advanced user-centric charging services (smart charging/booking/routing)** serving diverse objectives and unlocking several business opportunities

O-4: Enable and demonstrate **interoperability of end-to-end communication** and provision of **enhanced information to the EV users**, before, during and after a charging session

O-5: Propose mechanisms to **accelerate the deployment** of charging infrastructure and other charging services in a sustainable and user-centric way (CP location planning tools, new tariff/.incentives schemes)

eC4D solutions



Demonstration Areas

Infrastructure

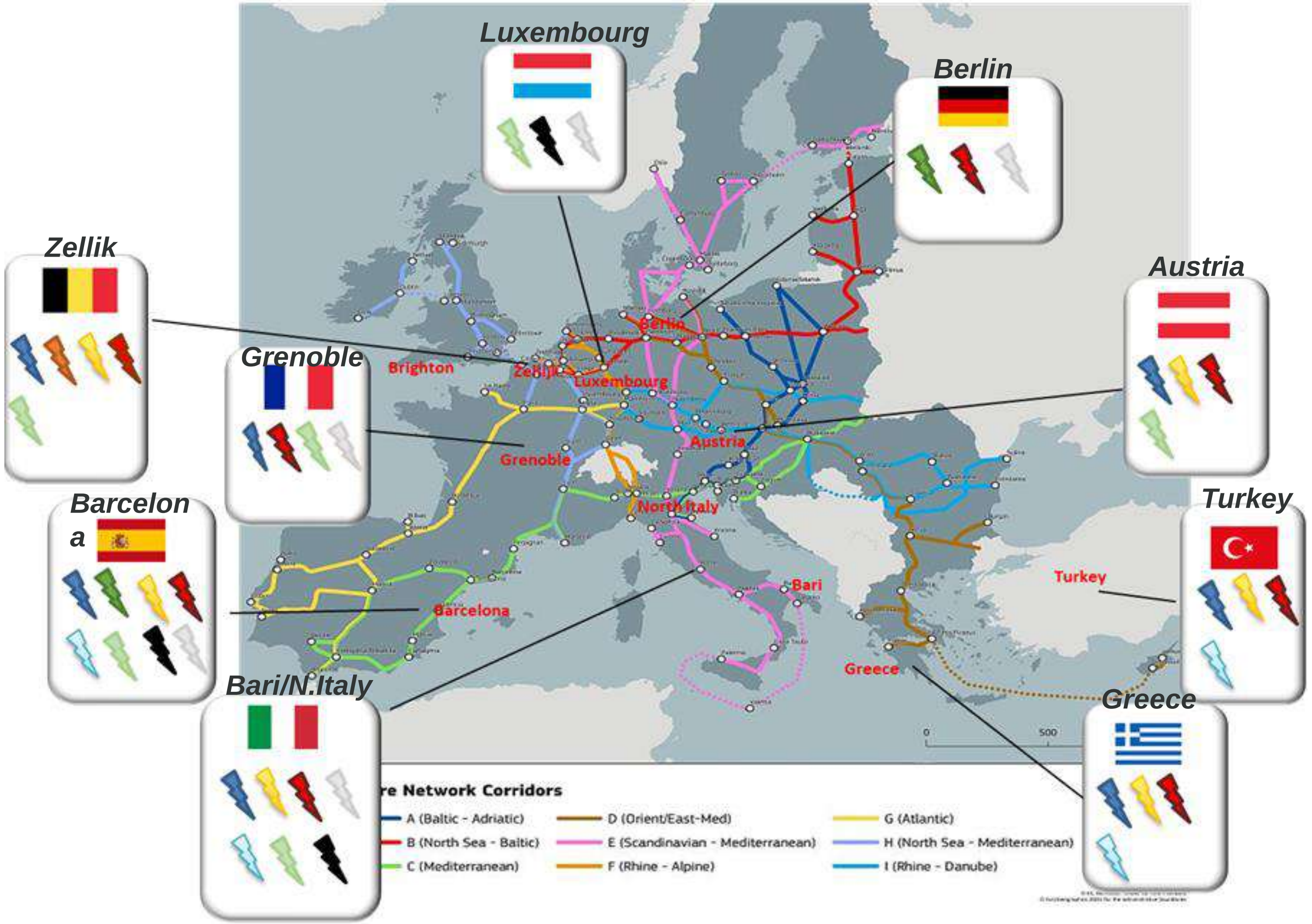
- ***Use Case I-1:*** *User-friendly, low and high-power charging stations for passenger & L3e vehicles with enhanced user interfaces*
- ***Use Case I-2:*** *Multi-user master station with multiple DC power charging points for passenger and L1e EVs*
- ***Use Case I-3****: Battery swapping concept for L1e vehicles*

e-Mobility Services

- ***Use case II-1:*** *Advanced charging authentication - ISO15118PnC*
- ***Use case II-2:*** *Enhanced booking service*
- ***Use Case II-3:*** *Advanced routing service*
- ***Use Case II-4:*** *Smart charging suite unlocking new business opportunities*

Decision Support Tools

- ***Use Case III-1:*** *EV Charging location planning tool*
- ***Use Case III-2****: Incentives schemes and tariff structures towards emobility sustainability*



Metropolitan areas:
Zellik, Grenoble, Barcelona, Bari, Berlin, Luxembourg

TEN-T corridors
Austria, Greece, Turkey, N. Italy

Tariffs and Incentives Analysis

The objective of the work done under eC4D was to provide EV stakeholders (authorities, eMSP, CPO, users and OEM) with a generic frame of incentives and tariff structures as well as recommendations on their use. This was done via:

Analysing all possible manners to **incentivise the purchase and the usage of an EV**. Each country and region have different approaches to incentivise EV's depending on national regulations, degree of maturity of the market, cultural values, etc.

Analysis of the tariff structures used by the projects partners (MSP's and CPO's) and the motivation of the parameters used to define them. A **generic formula** has been defined so that any eMSP or CPO is able **to define a tariff structure** according to their users behaviour, constraints and revenue expectations.

Incentive Schemes Outcomes

- Making **incentives available at the time of purchase or** shifting the incentives to vehicle purchasing tax exemptions or reductions of similar value, appear to be effective solutions.
- Existing financial incentives should not be removed in the short-term. Research shows that the **tax exemption benefits is more effective than the purchase subsidies in the use phase of EVs**. The governments still need to undertake the cost of EVs through incentive policies.
- The **deployment of charging infrastructure** is a prerequisite for **mass market adoption**. The governments should expand the scale of charging points to ramp up density and it is a key measure to popularize EVs. Incentives on EV charging infrastructure have critical effect in this regard.
- **Non-financial incentive** measures can promote the adoption of EVs **by raising consumers' awareness of EVs.**
- Incentives that have complex indexing of the incentive magnitude (incentives which are evaluating lots of points) can be hard to understand for both customers and sellers. **All the incentives should be understandable and customer friendly.**
- It may be important to encourage users that **the incentives applied remain active for at least a few years instead of temporary processes.**

How to increase Tariff Efficiency

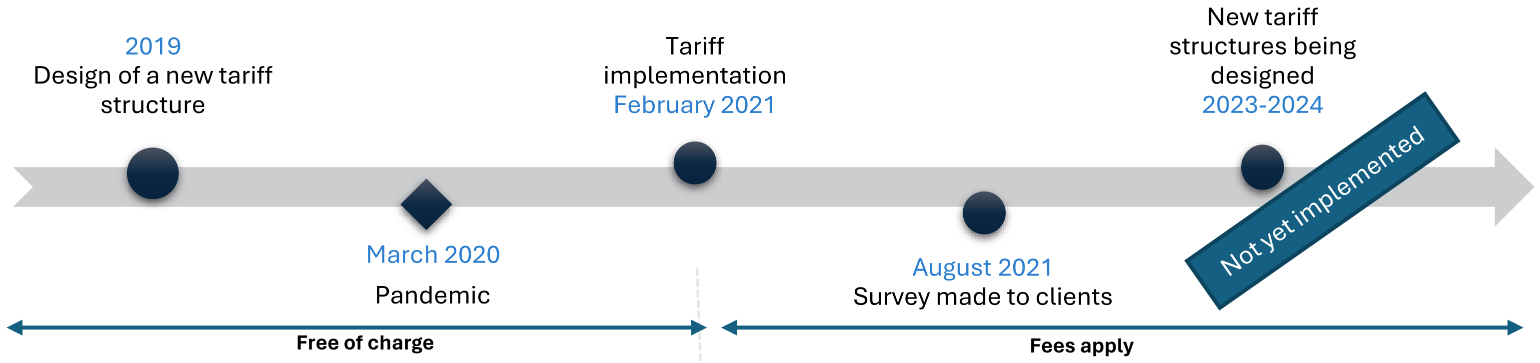
- **Low use of the charging points** → Temporary promotions, reduction of the initial fee
- **High rate of parked vehicles without charging (after a charging session)** → Increase energy cost after certain time, increase parking cost after a certain time, increase charging costs after a reasonable time
- **High rate of no show of booked charging sessions** → Implement a penalty fee (booking cost only charged if user does not show)
- **Very high use of charging points (low availability)** → Set a reduced cost at nighttime to incentivise moving the time of charge, reduce or eliminate parking costs at lower-use times
- **High use of PHEV of the charging points** → Ban subscriptions to PHEV, increase booking costs to PHEV, increase the minimum charge to a threshold in which small PHEV batteries pay above the energy charged
- **Short use (short amount of time, little energy charged) of the charging stations** → Set or increase the minimum charging to incentivize a better use of charging points.
- **Long use of slow chargers at car parks (longer than required)** → Apply a fee for the parking space after a reasonable amount of time

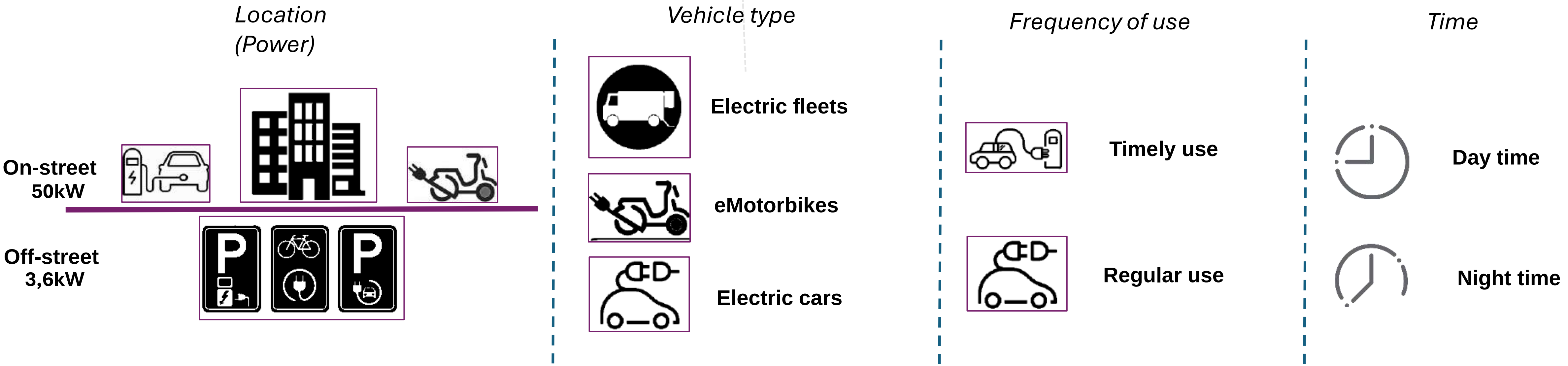
eC4D cities in the spotlight: Barcelona and Grenoble

Different tariff approaches

…tariffs depend on…	Barcelona	Grenoble
Subscription	✓	✓
Type of charger		
Location of the CP	✓	✓
Type of vehicle	✓	
Time of the day	✓	✓
Cost (€/kWh or €/min)	✓	✓
Minimum charge	✓	
Time threshold		✓
Discounts	✓	

Tariff structure at BSM (Endolla)





Tariff structures where designed identifying all possible profiles of users and proposing tariffs customed to these profiles.

Tariff structure at BSM (Endolla)

Subscription (€/year)

Minimum charge(€/charge)

Energy fee(€/kWh)

Total charging cost

The tariff structure is currenty calculated by adding three parameters, subscription, minimum charge and the energy fee. When charging in off-street car parks, a parking fee is added

Are you a particular that use the service regularly?

- With an annual subscription for cars,vans and motorbikes
- Can be shared with 2 other family members
- More affordable recharging prices

Annual subscription: 50 €
Now 50 % off: 25 €
This promotion is valid until the 30th of June 2024

CAR / VAN

BSM PARKING	STREET
Recharge type: Normal	Recharge type: Fast
0.27 €/kWh Diurnal	**0.40 €/kWh Diurnal**
0.22 €/kWh Nightly	**0.35 €/kWh Nightly**

MOTO

BSM PARKING	STREET
Recharge type: Normal	Recharge type: Normal
0.27 €/kWh Diurnal	**0.30 €/kWh Diurnal**
0.22 €/kWh Nightly	**0.25 €/kWh Nightly**

Are you an occasional user, particular or professional?

- With an annual subscription for cars,vans and motorbi
- Exclusive options for professionals
- More affordable recharging prices

Annual subscription: 100 €
Now 50 % off: 50 €
This promotion is valid until the 30th of June 2024

CAR / VAN

BSM PARKING	STREET
Recharge type: Normal	Recharge type: Fast
0.27 €/kWh Diurnal	**0.35 €/kWh Diurnal**
0.22 €/kWh Nightly	**0.30 €/kWh Nightly**

MOTO

BSM PARKING	STREET
Recharge type: Normal	Recharge type: Normal
0.27 €/kWh Diurnal	**0.28 €/kWh Diurnal**
0.22 €/kWh Nightly	**0.23 €/kWh Nightly**

Are you a professional that search for the best payment option?

- Without subscription
- For cars, vans and motorbikes

CAR / VAN

BSM PARKING	STREET
Recharge type: Normal	Recharge type: Fast
0.35 €/kWh Diurnal	**0.49 €/kWh Diurnal**
0.30 €/kWh Nightly	**0.44 €/kWh Nightly**

MOTO

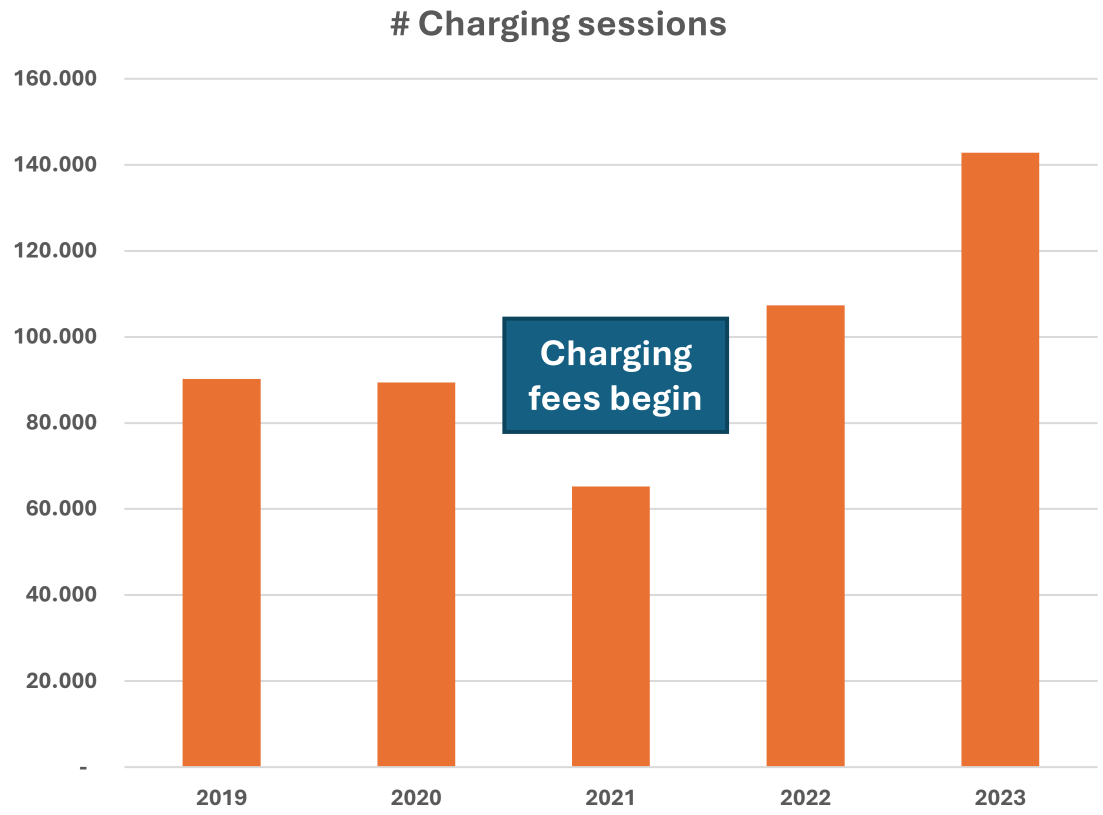
BSM PARKING	STREET
Recharge type: Normal	Recharge type: Normal
0.35 €/kWh Diurnal	**0.40 €/kWh Diurnal**
0.30 €/kWh Nightly	**0.35 €/kWh Nightly**

The fees charged where designed following two main objectives:

- **Be competitive against other eMSP offerings** in the city of Barcelona and the surrounding areas
- **Offer reasonable prices** that are in accordance **with energy costs.**

Fees do not intend, at this moment, to provide a return on the investment or the operational expenses.

Results of the implementation of tariffs in Barcelona

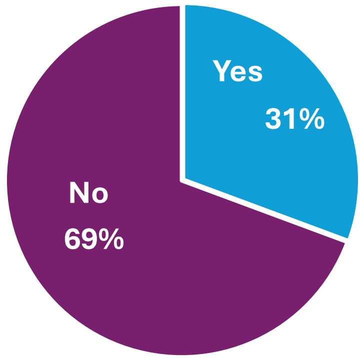


2022/2023 increase due to:

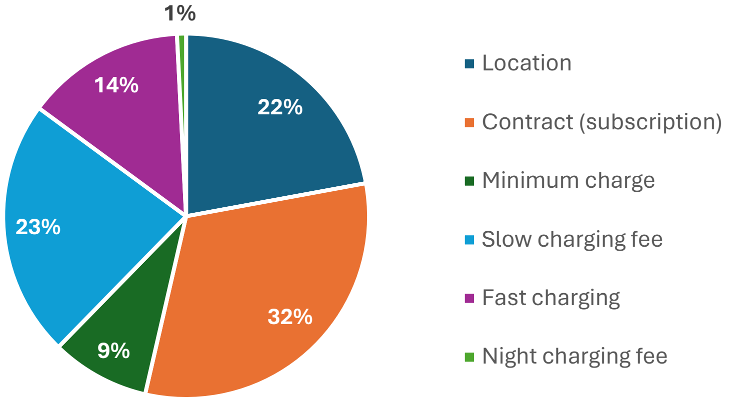
1 – More chargers

2 – People used to tariff

Use of annual subscriptions



Most valued attributes to select a tariff



The median number of minutes of use of the on-street fast chargers dropped from 135’ to 25’ with the implementation of tariffs

Lessons learned

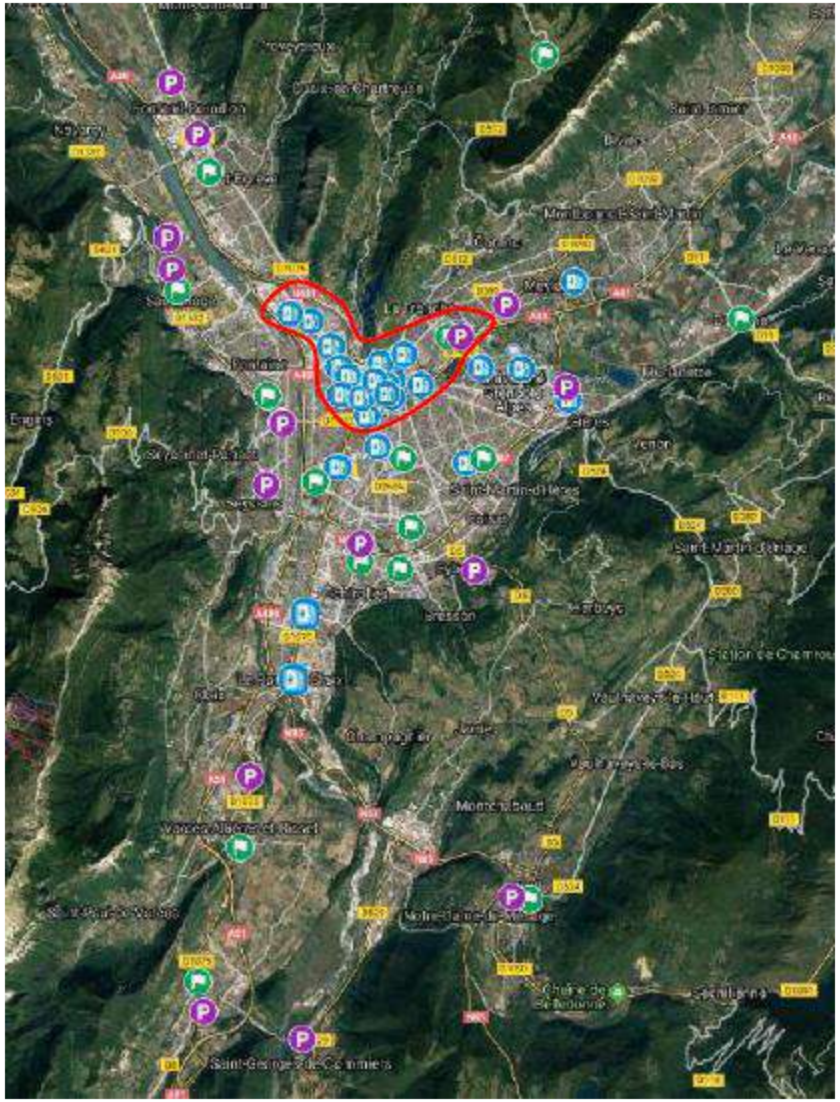
- Hybrid vehicles don’t reach the minimum charge, there are complains about this.
- Network is working much better compared to the period in which no tariffs were applied.
- Requested enhancements include a tariff simulator to improve selection of most suitable fee.
- Not all subcriptions are being used, so rethinking the subcriptions structure is needed (the subscription for professionals using e-motorbikes is hardly being used). In general, there is a low use of the subscriptions
- The difference is night and day-time fees make sense for underground car parks, but not for on-street charing stations (very few users do a fast-charge at night)
- The large amount of tariff schemes makes it difficult for users to understand and select their best option. For this reason, a simplification of the tariffs is being prepared.
- Future tariff structure will include gamification processes to incentivise a more loyal use.
- New tariffs should encourage the slow night-time charges, in order to reduce peak power demands.

Implementation of new tariff schemes in Grenoble Alpes Métropole

- Objectives:
  - ➢ Balancing takings and OPEX as quickly as possible
  - ➢ Prioritize complement charging
  - ➢ Encourage existing vehicle rotation

- Pricing is based on:
  - ➢ kWh consumption
  - ➢ Space occupation time, which depends on the pressure on this space (consistency with parking policies), with 2 differentiated zones

- Timeframe:
  - ➢ Time-based tariff integrated in May 2020
  - ➢ New tariff schemes applied since 1st April 2022
  - ➢ Subscription from 10€/year to 6€/month



Zoning mapping for duration pricing: the area circled in red is with duration pricing from the first minute of charging; outside this zone, the first two hours are free for subscribers

Implementation of new tariff schemes in Grenoble Alpes Métropole

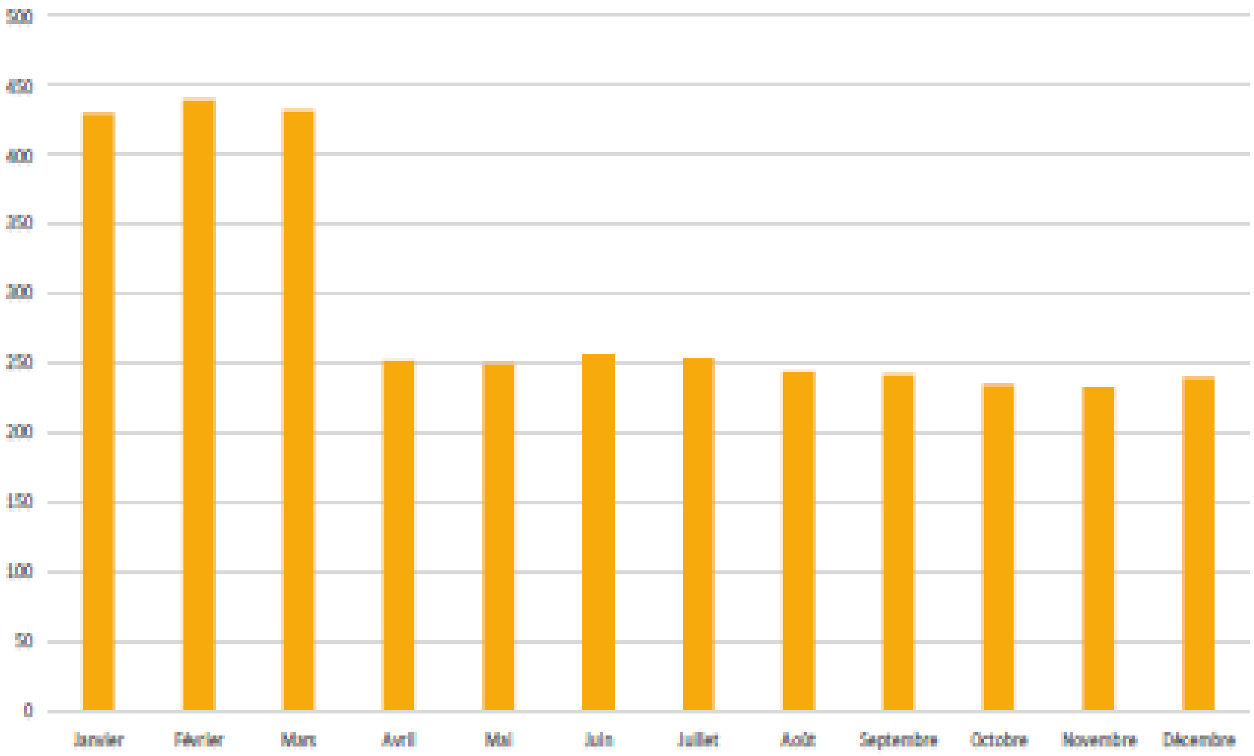
New tariff schemes:

- Park and ride facilities (7kW): 0,25 €/kWh (before: 0,20 €/kWh)
- On-street (22 kW), for subscribers:
  - ➢ Subscription 6€/month; 0,25€/kWh + 1€/30 min (free at night) (before: 0,20 €/kWh)
- On-street, for non-subscribers:
  - ➢ 0,45€/kWh + 1€/30 min (before: 0,30 €/kWh)
- Lampposts: 0,25 €/kWh (same as P+R)
- Hypothesis to balance takings and OPEX - doubling of the number of users:
  - ➢ If the number of users is multiplied by 1,5, the deficit is estimated at 32 k€;
  - ➢ If the number of users is multipled by 3, the benefit is estimated at 85 k€.

Sticker put at the charging stations

Implementation of new tariff schemes in Grenoble Alpes Métropole

1st impact: decrease of the number of subscribers and increase of roaming



Evolution of subscribers’ number in 2022

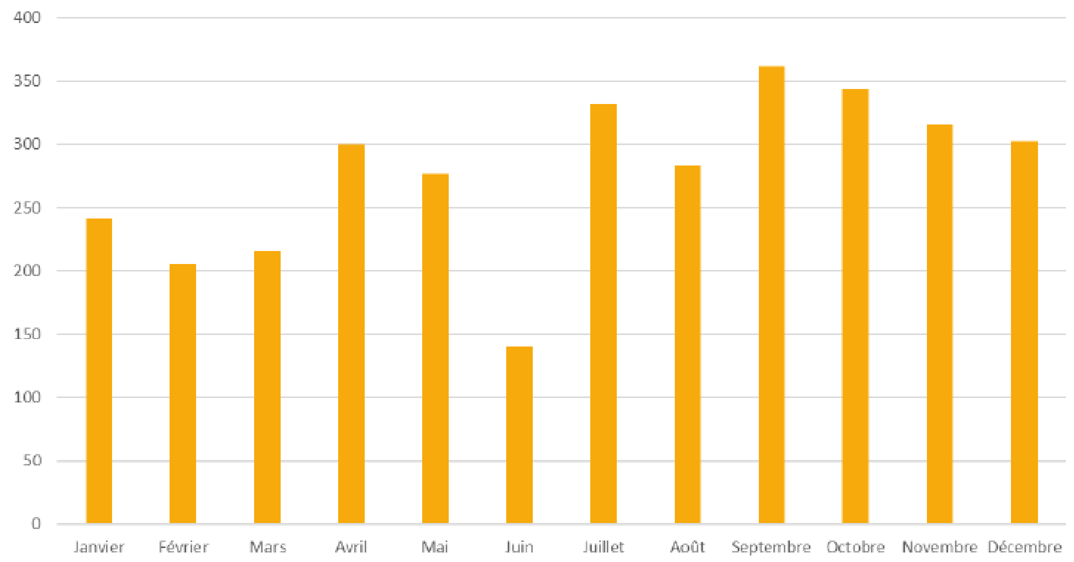
2nd impact: keeping the vehicles rotation

- One of the objectives of the tariff scheme was to avoid reducing vehicles rotation at charging stations (as the tariff scheme prevailing in 2021 already included tariff on duration)
- The average duration of a charging session remained the same:
  - 3 hours and 44 minutes in 2022
  - 3 hours and 43 minutes in 2021

Implementation of new tariff schemes in Grenoble Alpes Métropole

3rd impact: Increase of the revenues

In 2022, for the first time, revenues exceeded OPEX, which was confirmed in 2023



Average monthly revenue per charging station in 2022

Lessons learned

- Successful:
  - Budget balance (with OPEX)
  - Vehicles rotation
  - Permitted to keep only «active» subscribers (~200)
- Unsuccessful:
  - Complaints at the beginning about the pricing increase
  - Still parking bay squatters (by combustion-engine vehicles or electric vehicules not plugged in)
  - No price differentiating between charging power output

Thank you!

Pedro Gomes, pgomes@polisnetwork.eu

If you want to know more:


eCHARGE
4DRIVERS

D2.2

Accessibility requirements,
tariff schemes and incentives

www.echarge4drivers.eu

eCHARGE
4DRIVERS

@Charge4E

https://www.linkedin.com/company/echarge4drivers-project

info@echarge4drivers.eu

www.echarge4drivers.eu

Welcome to deep-DIVE SESSION #2

EV charging uncovered: for an efficient multistakeholder planning of infrastructure location

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

AGENDA

- Introduction – the importance of efficient planning of infrastructure location and stakeholders to involve – Peter Staelens, Eurocities

Stakeholders round

- The DSO perspective: efficient planning and integration of charging infrastructure in the electricity grid - Selene Liverani, Senior Technology and Projects Advisor E.DSO – European Distribution System Operators – 5'
- The case for off-street charging infrastructure, Luca Greski, Gewobag (housing company), Berlin – 5'
- The mobility provider perspective: ride-hailing contribution - Sophie Bonnecarrere, Uber – 5'
- Presentation and demonstration of the CLICK tool – Ishak Gougam, VMZ 15'

Discussion and Q&A

USER-CHI FINAL EVENT

The DSO perspective: efficient planning and integration of charging infrastructure in the electricity grid

Selene Liverani, Senior Technology and Projects Advisor, E.DSO

E.DSO: who we are

E.DSO is committed to the achievement of the ambitious European energy, climate, and growth targets by enabling **customer empowerment**, supporting **decarbonisation** through **electrification**, and driving the development and digitalisation of **smart distribution grids**.

European Distribution System Operators gathers **leading European electricity DSO**

35 Distribution System Operators, including 2 Associations

>350 million Customers

7 million kilometres of distribution lines

E.DSO: what we do

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

Policy & Regulation

- **Advocacy and dialogue** between industry and policymakers.
- Monitoring **EU regulation** and legislative amendments, defending the DSO vision.

E-mobility Working Group

Technology & Knowledge Sharing

- **Debate on technological topics** that impact distribution grids.
- **Share knowledge and promote cooperation** among E.DSO members and key external players.

Task Force 2 E-mobility

Innovation & Research

- Share experiences from **EU/national projects.**
- Directly **participate in EU-funded projects** and R&I initiatives focused on strategic topics.

Horizon EU FLOW project

E-mobility impact on distribution grids

E.DSO
SHAPING SMARTER GRIDS FOR YOUR FUTURE

As part of the EU's decarbonisation ambition, the **Alternative Fuels Infrastructure Regulation (AFIR)** aims to bolster the infrastructure necessary for the uptake of alternative fuel vehicles, including integration of charging infrastructure with power grids to boost the uptake of electric vehicles (EVs).

Move to a sustainable, resilient and forward-looking transport sector.

Support integration of Renewable Energy Sources (RES) and security of supply.

Increase system complexity due to mass electrification and intermittent generation.

Planning

- **Short-term**: ensure grid stability to face rapid EV uptake.
- **Long-term**: optimise grid reinforcement with flexibility solutions to meet peak demand.

Connection

- Manage the surge in connection requests, especially in areas with **limited grid capacity**.
- Relieve **bottlenecks in permitting** and **connection** processes.

Operation and Control

- Address emerging **congestion issues**.
- Implement **advanced load management** and smart grid technology for dynamic balancing.

Solutions for optimal vehicle-grid integration

The electrification of the transport sector and optimal integration of charging infrastructure with the power network calls for the implementation of new measures across all dimensions of distribution grid management.

Planning

- Enhance **grid observability** through digitalisation.
- Introduce **strategic, coordinated planning** for grid expansion and optimal location of charging stations.
- Introduce **anticipatory investments** to prevent congestion issues.

Connection

- Assess mechanisms for the reallocation of unused network capacity and **flexible connection agreements**.
- **Streamline permitting processes** in cooperation with governments and introduce **guidelines for** (prioritization of) **connection requests**.
- Promote customer awareness to ensure **reporting of new charging stations**.

Operation and Control

- Enable **EV flexibility procurement** for DSOs and stimulate smart charging and V2G mechanisms.
- Put in place adequate **control strategies** to ensure grid stability and emergency response.

Thank you for your attention!

selene.liverani@edsoforsmartgrids.eu

www.edsoforsmartgrids.eu

https://www.linkedin.com/company/edso-for-smart-grids

Deep-dive session #2
EV off-street charging expansion

18. June 2024
Luca Grzeski

Gewobag
Die ganze Vielfalt Berlins.

“In Europe, 70% of EV charging occurs at home or at work…”

+

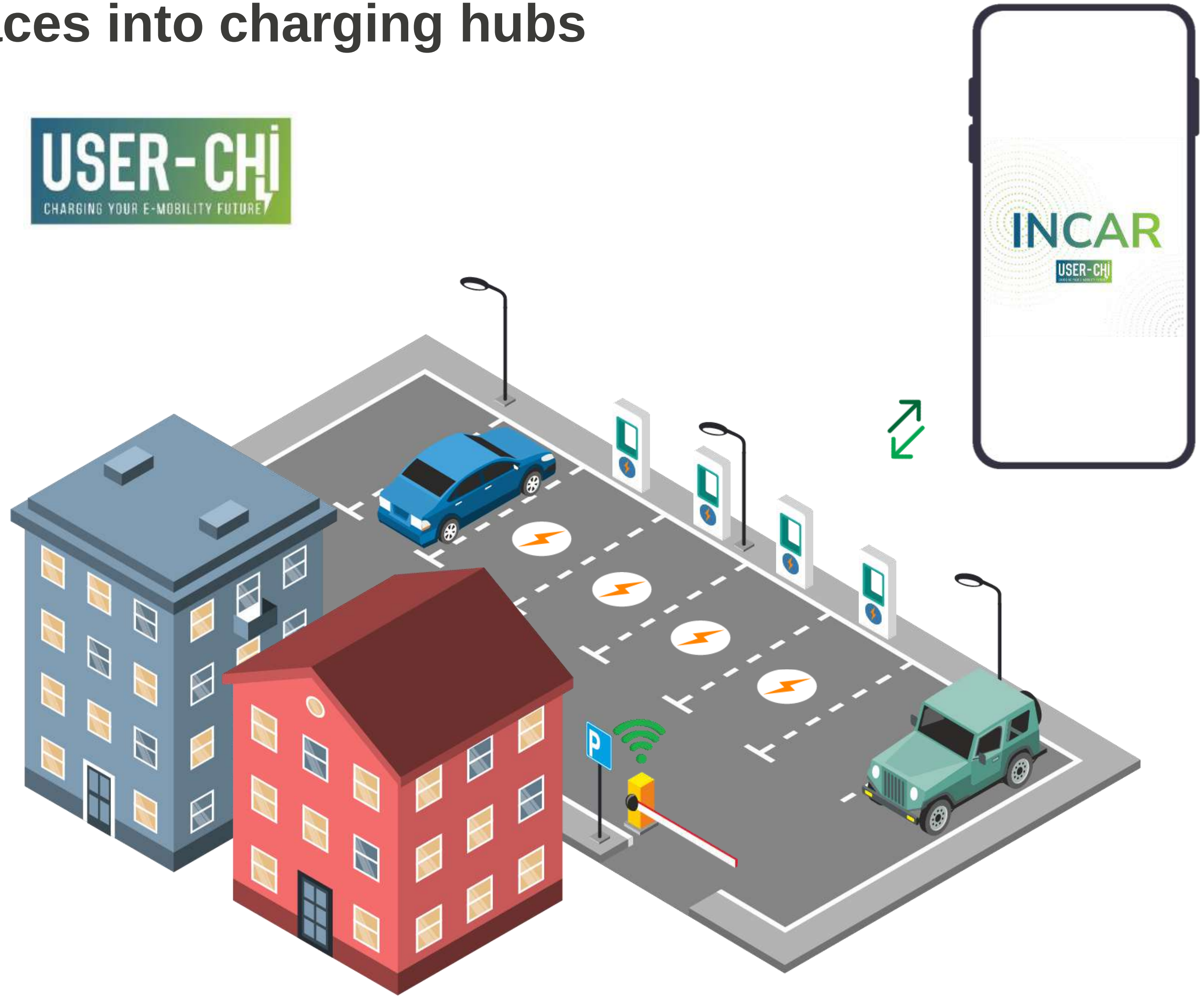
Private tenant charging (AC)

Semi-public charging (AC)

Source: https://alternative-fuels-observatory.ec.europa.eu/consumer-portal/electric-vehicle-recharging-prices

Turning off-street parking spaces into charging hubs

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE



Publicly accessible off-street parking and charging

Property owners
+ optimize parking properties
+ higher rental rate

CPOs / EMSPs
+ install and operationalize charging stations more quickly
+ generate further income by charging for parking time
+ expand the range of charging options

Electric vehicle drivers
+ access to reservable and secure parking and charging spaces
+ greater choice of charging options

Thank you!

Luca Grzeski
Department of Mobility

Phone +49 172 8843041
E-Mail l.grzeski@gewobag.de

Gewobag
Wohnungsbau-Aktiengesellschaft Berlin
Alt-Moabit 101 A
10559 Berlin

service@gewobag.de
www.gewobag.de

MORE INFO

Gewobag
Die ganze Vielfalt Berlins.

Ride-hailing & EV charging demand

Sophie Bonnecarrere
USER-CHI Event
18 June 2024

Uber

Create opportunity through movement in Europe…

343+
cities

25
countries

32
mobility services

280k+
driver partners

17k
taxi partners

We're electrifying every ride

2030

100% rides in zero emission vehicles, on micromobility and transit:

...in the US, Canada and Europe

2040

...globally

Net zero emissions across all corporate accounting scopes (1, 2 and 3)

Charging as a barrier to EV for drivers on Uber

72%	EVs are expensive
54%	Lost earnings due to charging
47%	I can’t find suitable charging
46%	I don’t have a private parking space to install a home charger

Provide Earners with the **best charging solution** for their situation and a **seamless charging experience**

Overnight charging

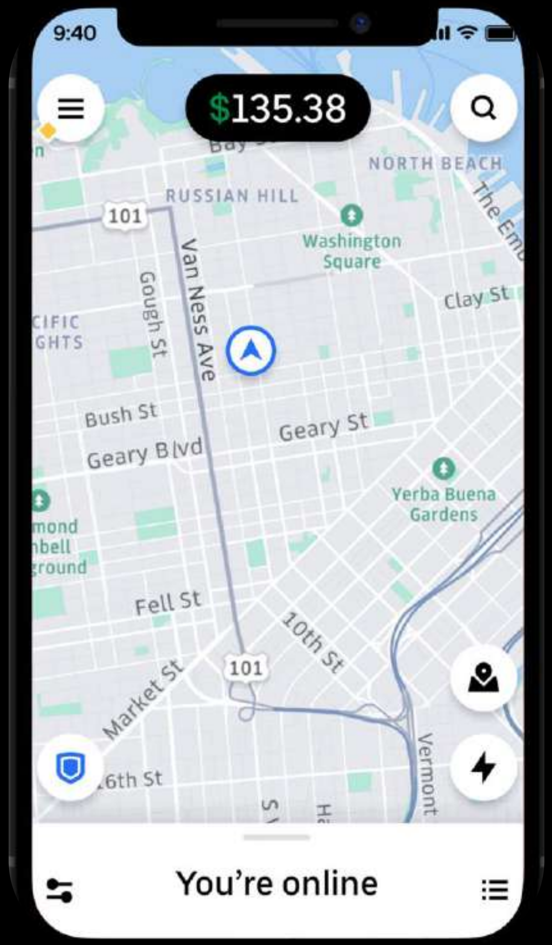
On-the-go charging

Home charging

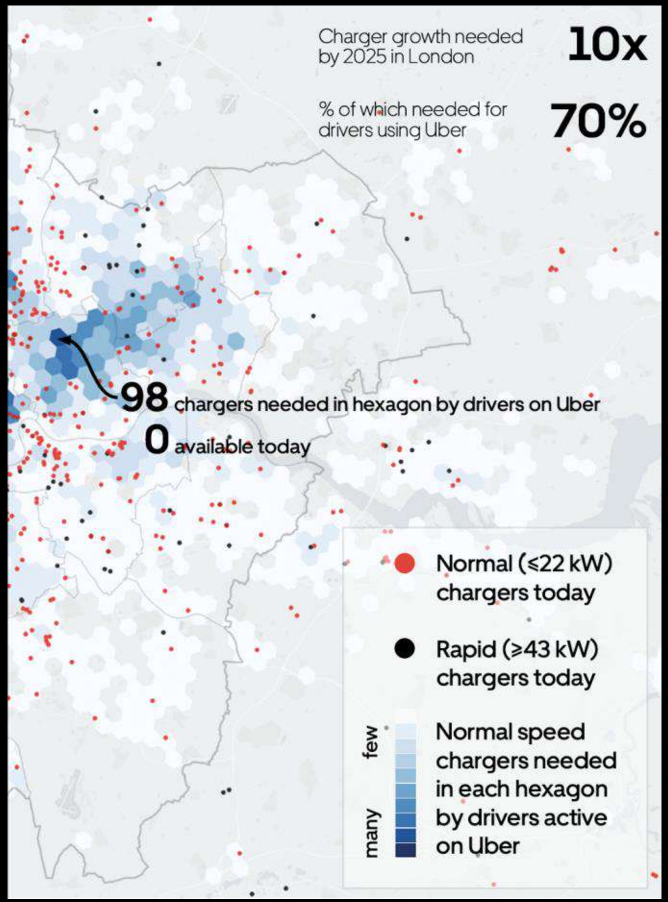
Street charging

Depot charging

(Ultra) Rapid charging



In app experience



Demand Mapping

Learnings

- **‘Right to charge’**: ease financial & administrative burden of at- and near-home charging
- **Faster deployment of EV charging** especially at urban nodes like airports and train stations
- **Address charging deserts** by providing chargers in low-income neighborhoods
- **Enhance public-private partnerships:** Bring all players involved in the ‘charging chain’ together

CLICK

USER-CHI FINAL EVENT– June 18TH, 2024

VMZ Berlin / Ishak Gougam

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Introduction

Problem:

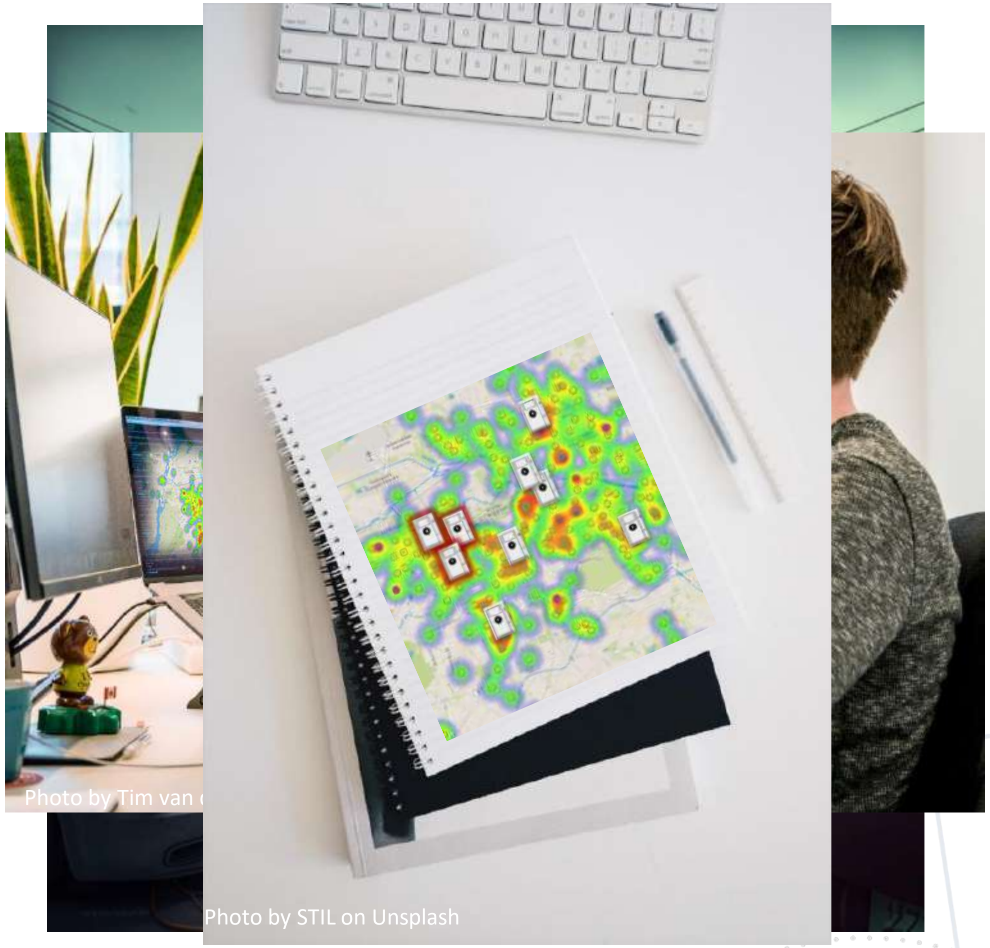
Cities need assistance in evaluating the best locations for charging points.

Idea:

Decision support tool with GIS statistical calculation

Solution:

- Easy-to-use online platform with personal accounts and custom projects and calculation function
- CLICK – Charging infrastructure Location concept development kit



Introduction

Create a new project

City, Country

Set your personal goal

„Become a market leader in infrastructure“
„Provide a basic coverage“

Feed in geospatial data

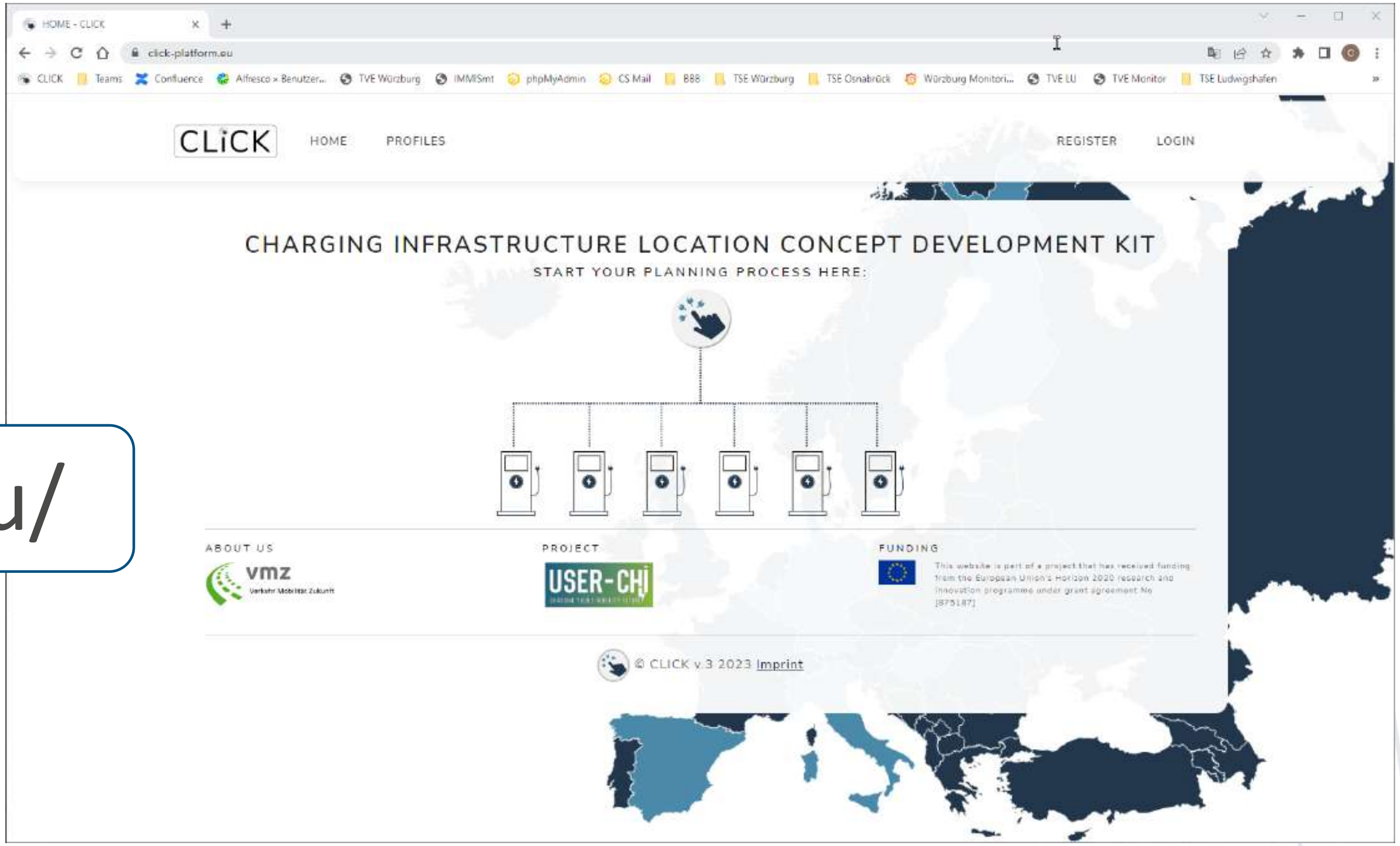
Planning Area, Road Network, POIs, Parking Areas, Electrical Grid

Get recommdendation

Number of charging points and technology by cell

DEMONSTRATION

https://click-platform.eu/



Testing & Results

1

- **Scope:** Detailed manual for the use of CLICK
- **Style:** Clear instructions in bullet point form complemented with screenshots of the software (e.g. Microsoft Support)
- **Format:** PDF

2

- **Scope:** Detailed explanation of the CLICK tool with an integrated Q & A session
- **Style:** Clear oral instructions by leading through the software step by step and answering questions
- **Format:** Microsoft Teams Webinar

City:

Barcelona Metropolitan Area – Berlin – Budapest –Rome – Turku – Florence - Murcia

User Comments

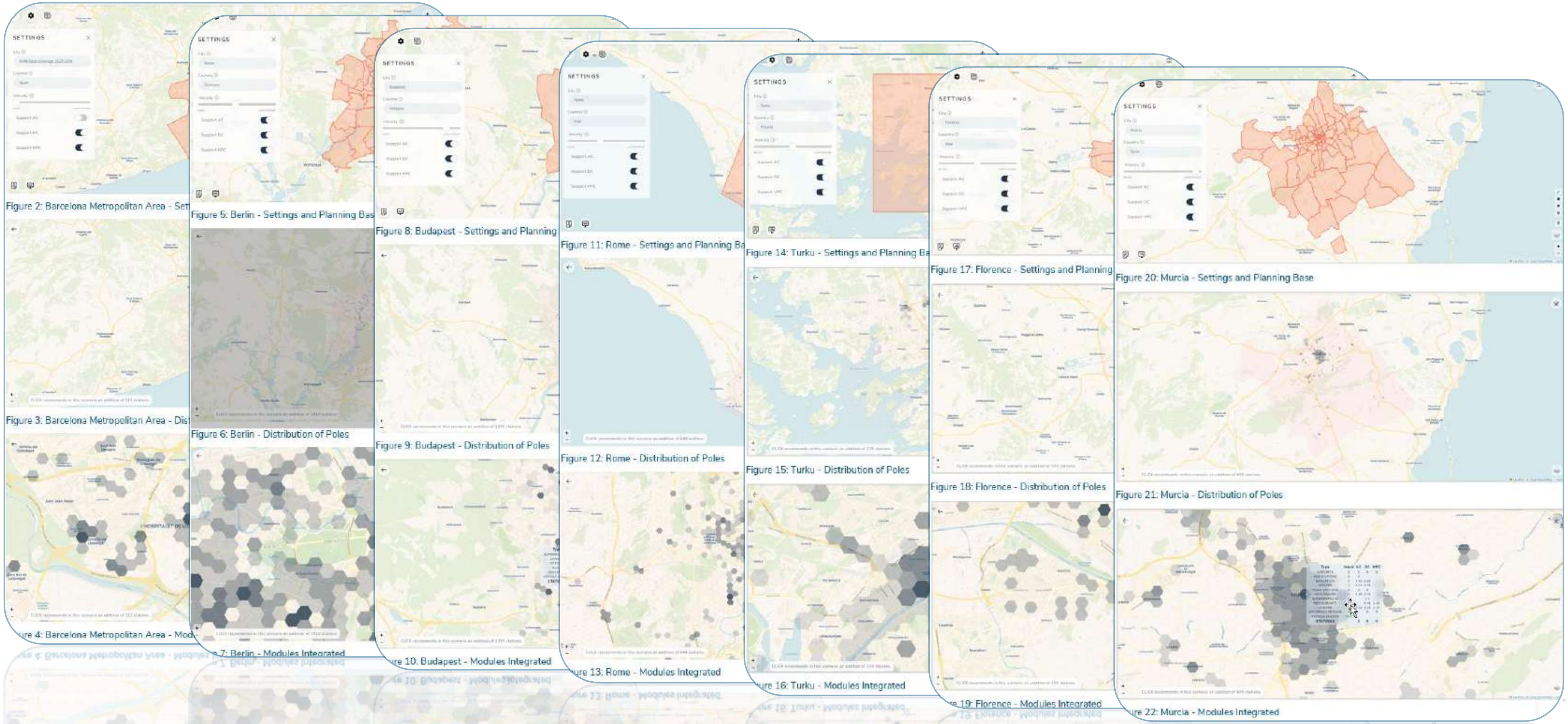
User Feedback

Test Results

May 2023 — **Testing Phase** — August 2023 — **Analysis**

Delivery Date: October 2023

Testing & Results



Outlook

- After the end of the USER-CHI project, VMZ keeps CLICK online
- VMZ will apply for master planning and will use CLICK as a consulting product
- Further development of CLICK in the EU project Unchain

Connect With Us

Twitter: @Userchi_H2020

LinkedIn: https://bit.ly/2W7M3mW

Website: www.userchi.eu

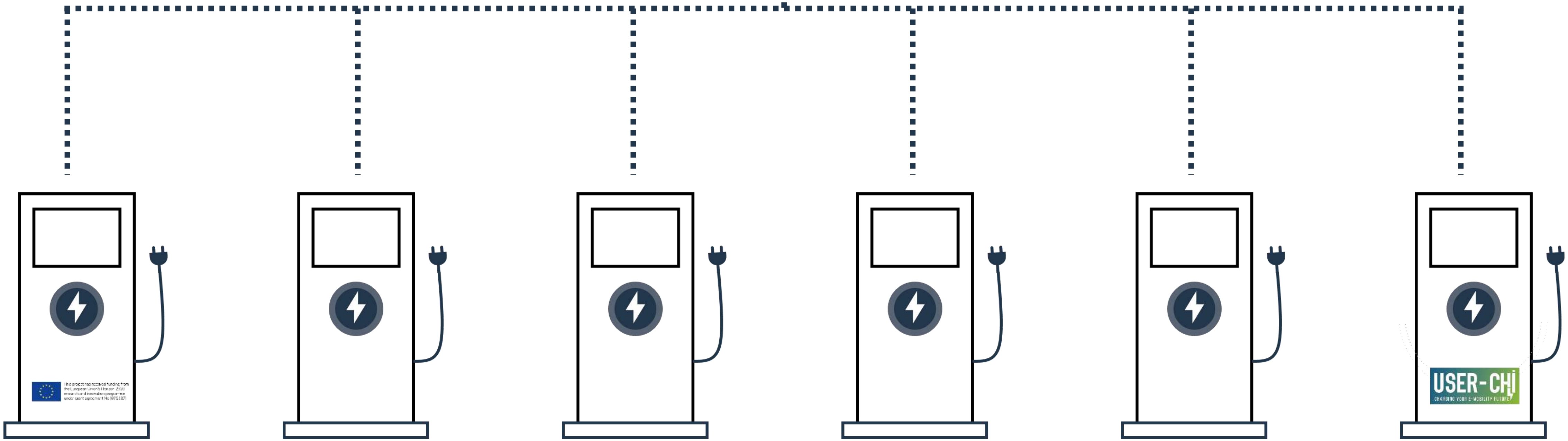
Email: info@userchi.eu

Ishak Gougam

ishak.gougam@vmzberlin.com

Phone: +49 30 81453-182

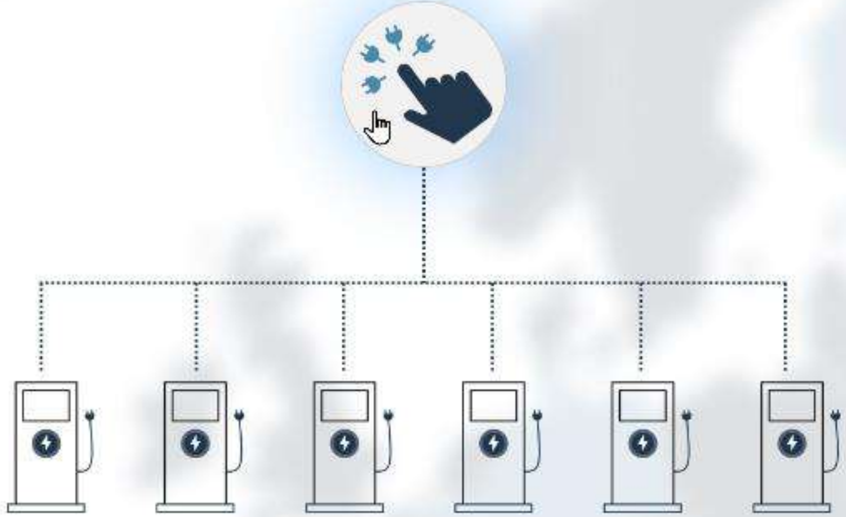
VMZ Berlin Betreibergesellschaft mbH
Ullsteinstr. 120, Turm C
12109 Berlin



CHARGING INFRASTRUCTURE LOCATION CONCEPT DEVELOPMENT KIT

Welcome to CLICK, the online platform for suggesting charging locations for e-mobility. With CLICK, city planners and government officials can easily identify gaps in charging infrastructure and make data-driven decisions to improve the availability and accessibility of charging stations.

START YOUR PLANNING PROCESS HERE:



ABOUT US

vmz Verkehr Mobilität Zukunft

PROJECT

USER-CHI CHARGING YOUR E-MOBILITY FUTURE

FUNDING

This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

https://click-platform.eu/Profiles

CLiCK HOME PROFILES REGISTER LOGIN

REGISTER

CREATE A NEW ACCOUNT.

Email
user@click-platform.eu

Password
••••••••••

Confirm password
••••••••••

REGISTER

ABOUT US

vmz Verkehr Mobilität Zukunft

PROJECT

USER-CHI CHARGING YOUR E-MOBILITY FUTURE

FUNDING

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REGISTER CONFIRMATION

Please check your email to confirm your account.

ABOUT US

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Verkehr Mobilität Zukunft

PROJECT

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

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CLiCK HOME PROFILES REGISTER LOGIN

REGISTER CONFIRMATION

You have successfully confirmed your account..

ABOUT US

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CLiCK HOME PROFILES REGISTER LOGIN

LOG IN

TO YOUR PERSONAL ACCOUNT.

Email
user@click-platform.eu

Password
••••••••••

Remember me?

LOG IN

Forgot your password?

Register as a new user

Resend email confirmation

ABOUT US

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PROJECT

USER-CHI CHARGING YOUR E-MOBILITY FUTURE

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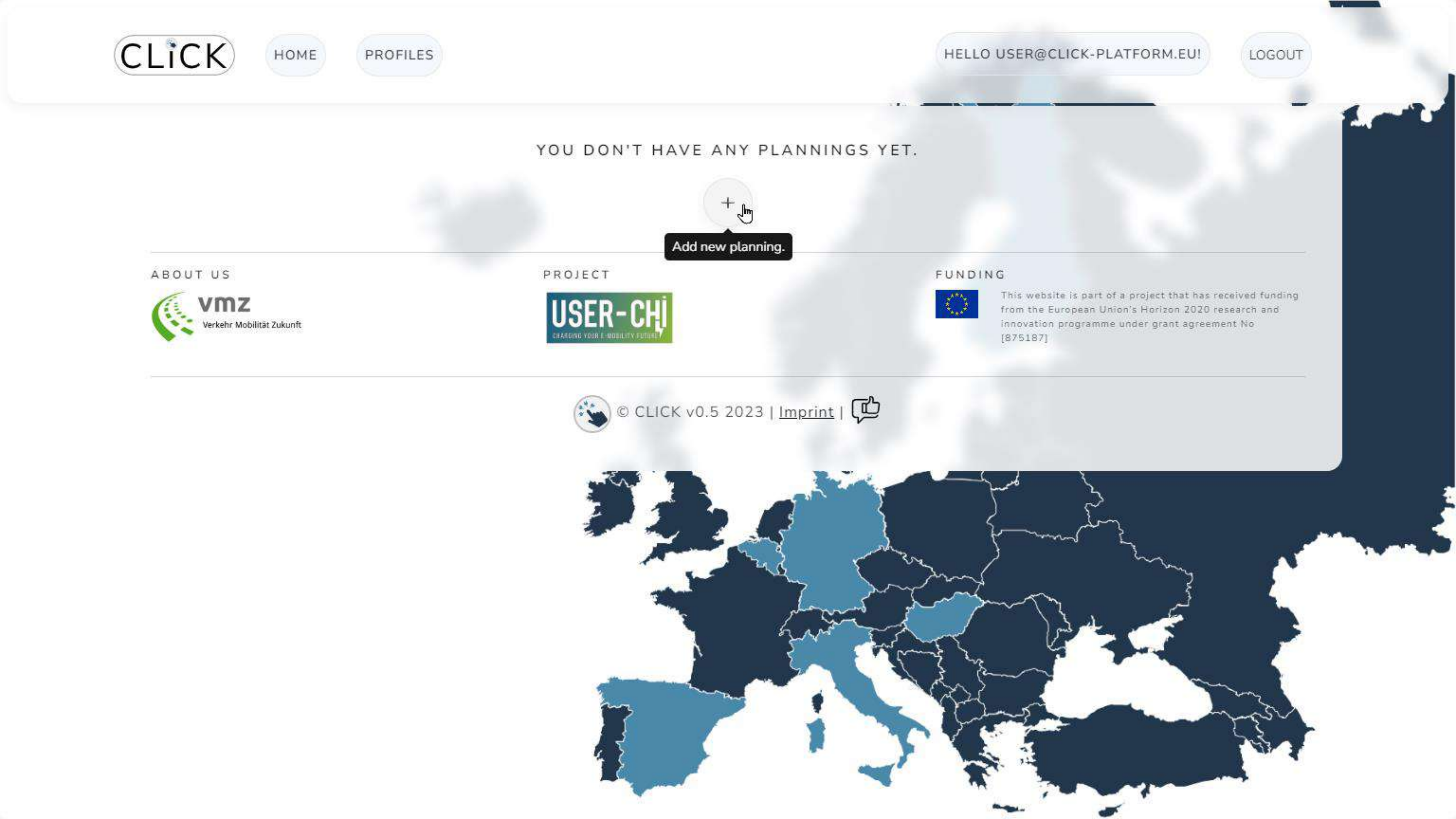
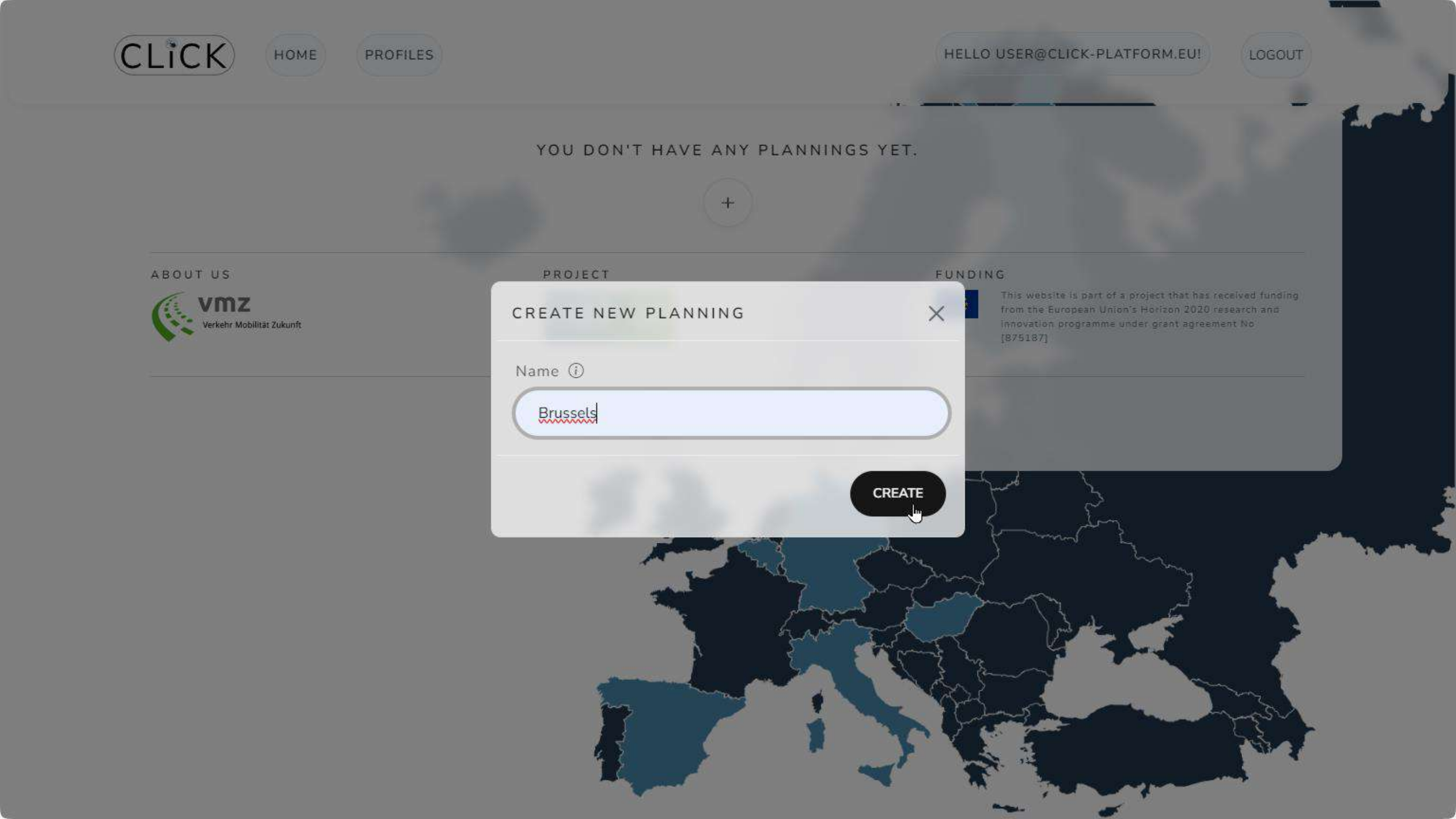
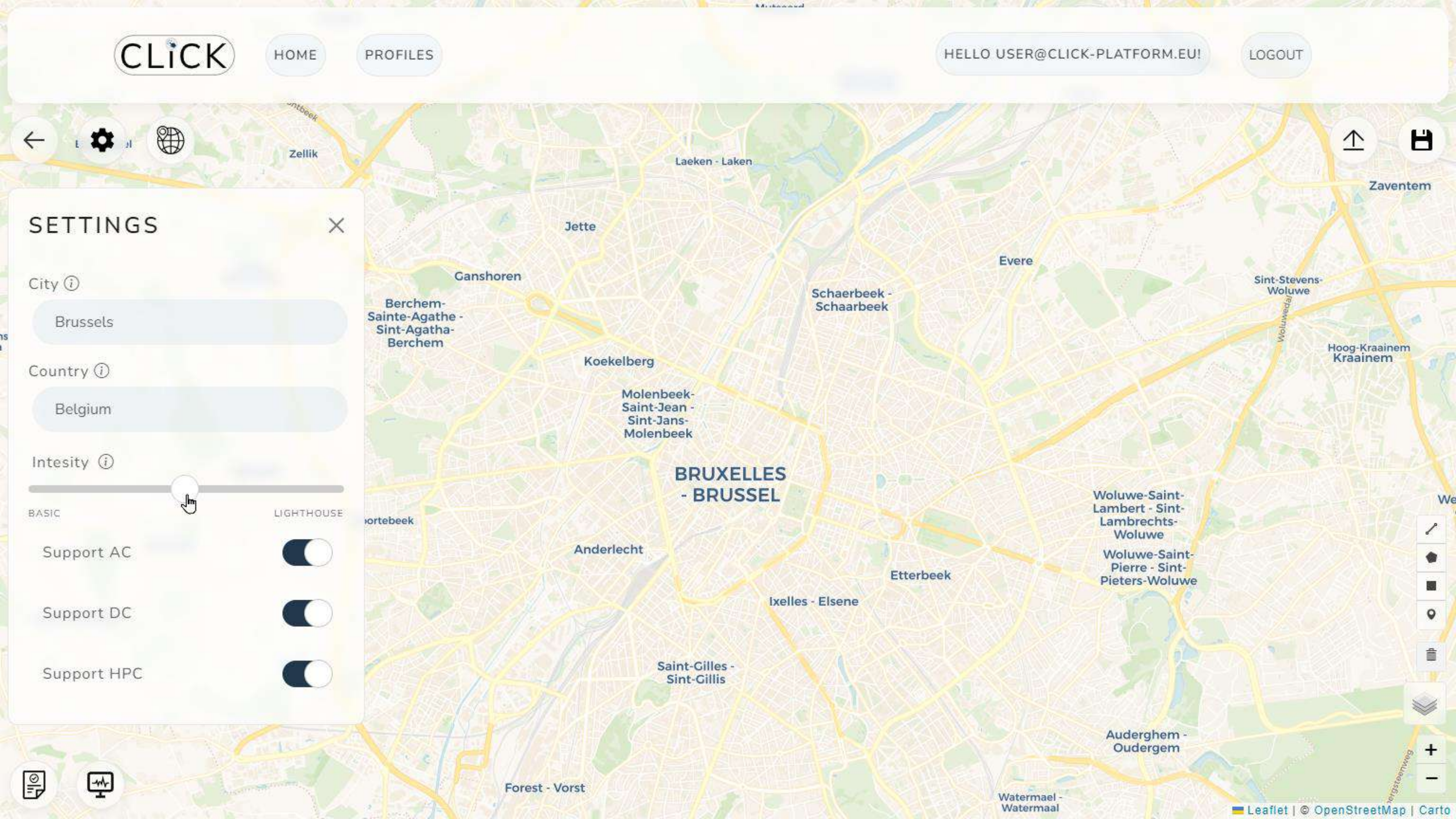
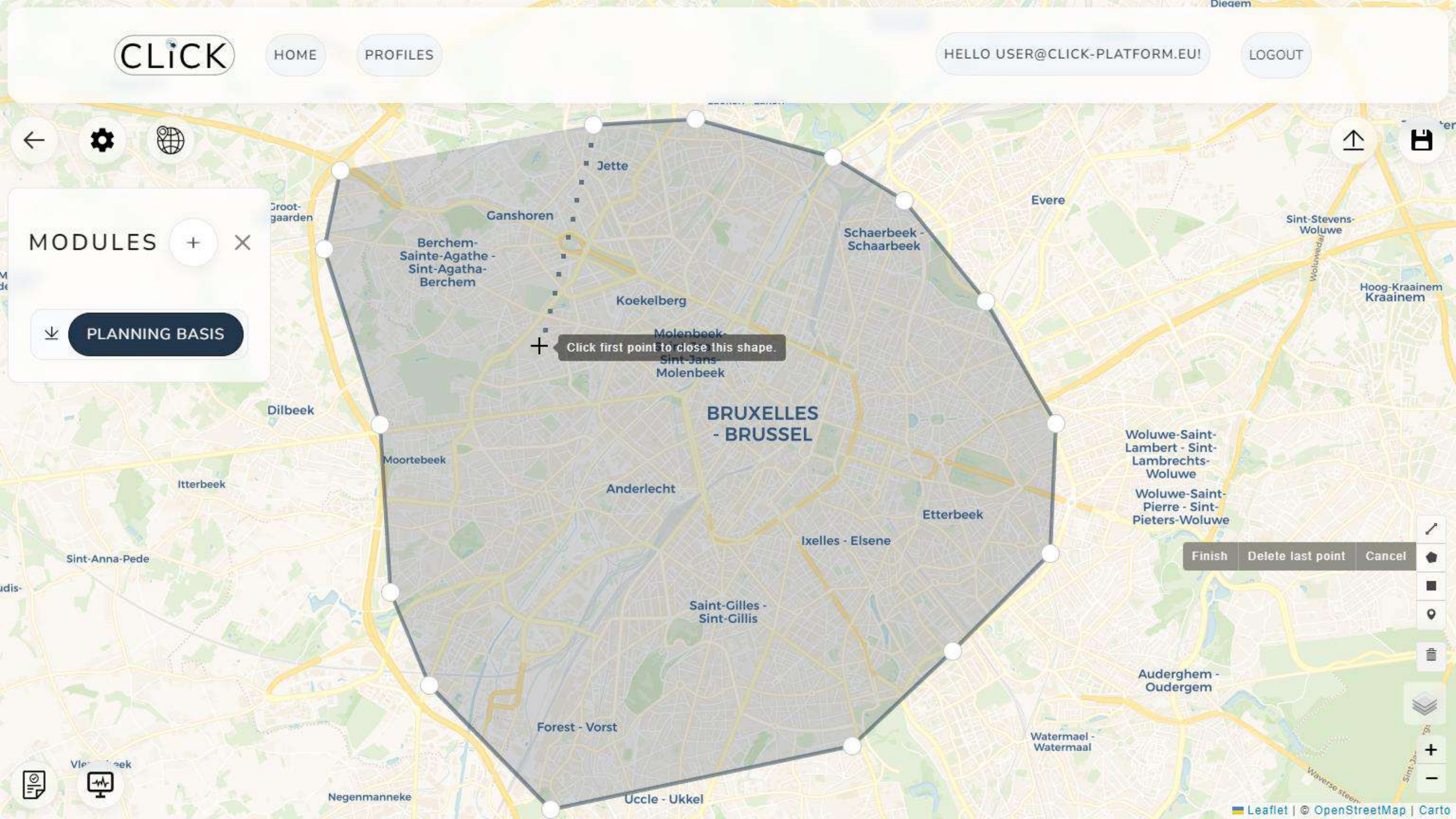
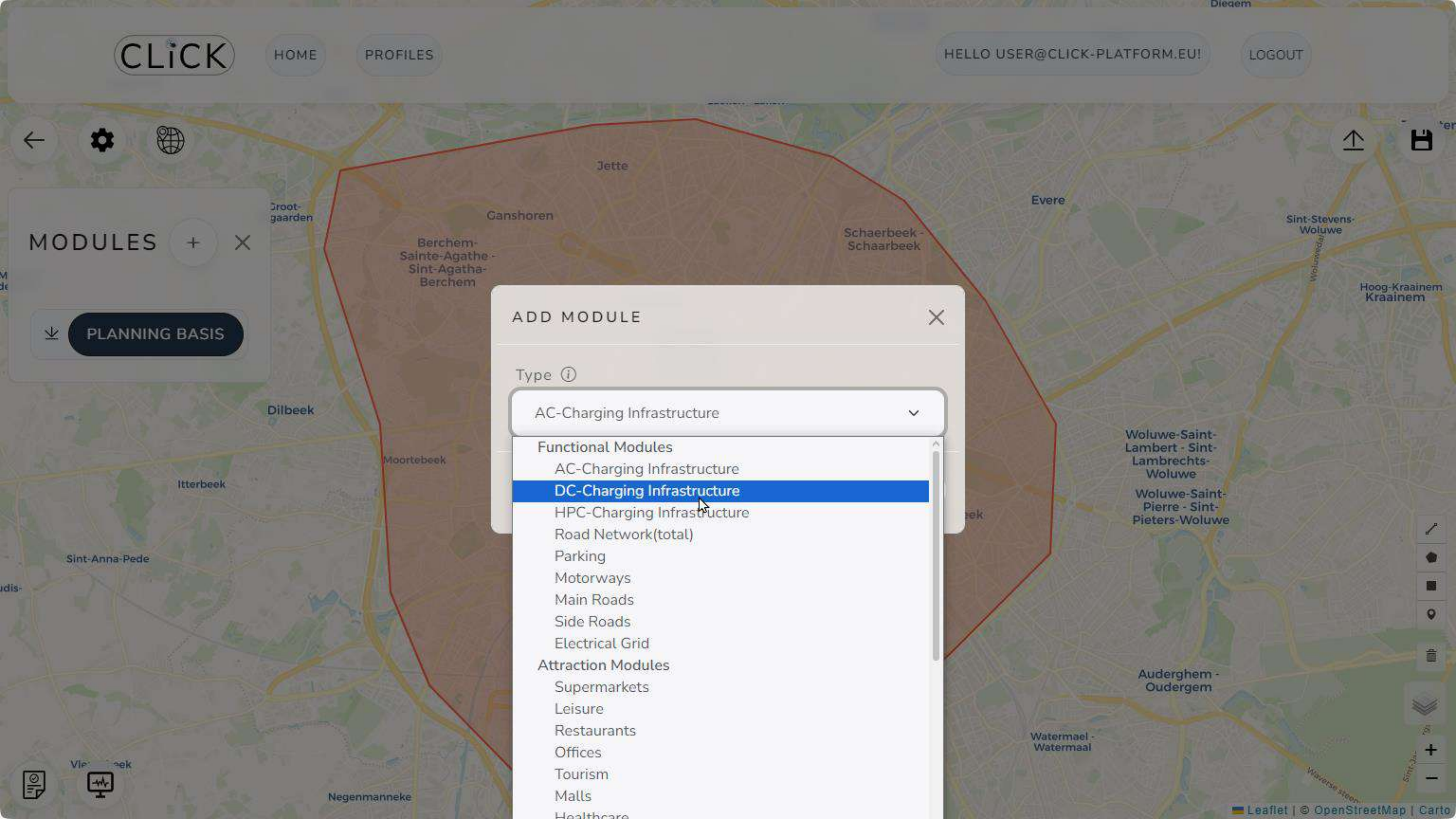
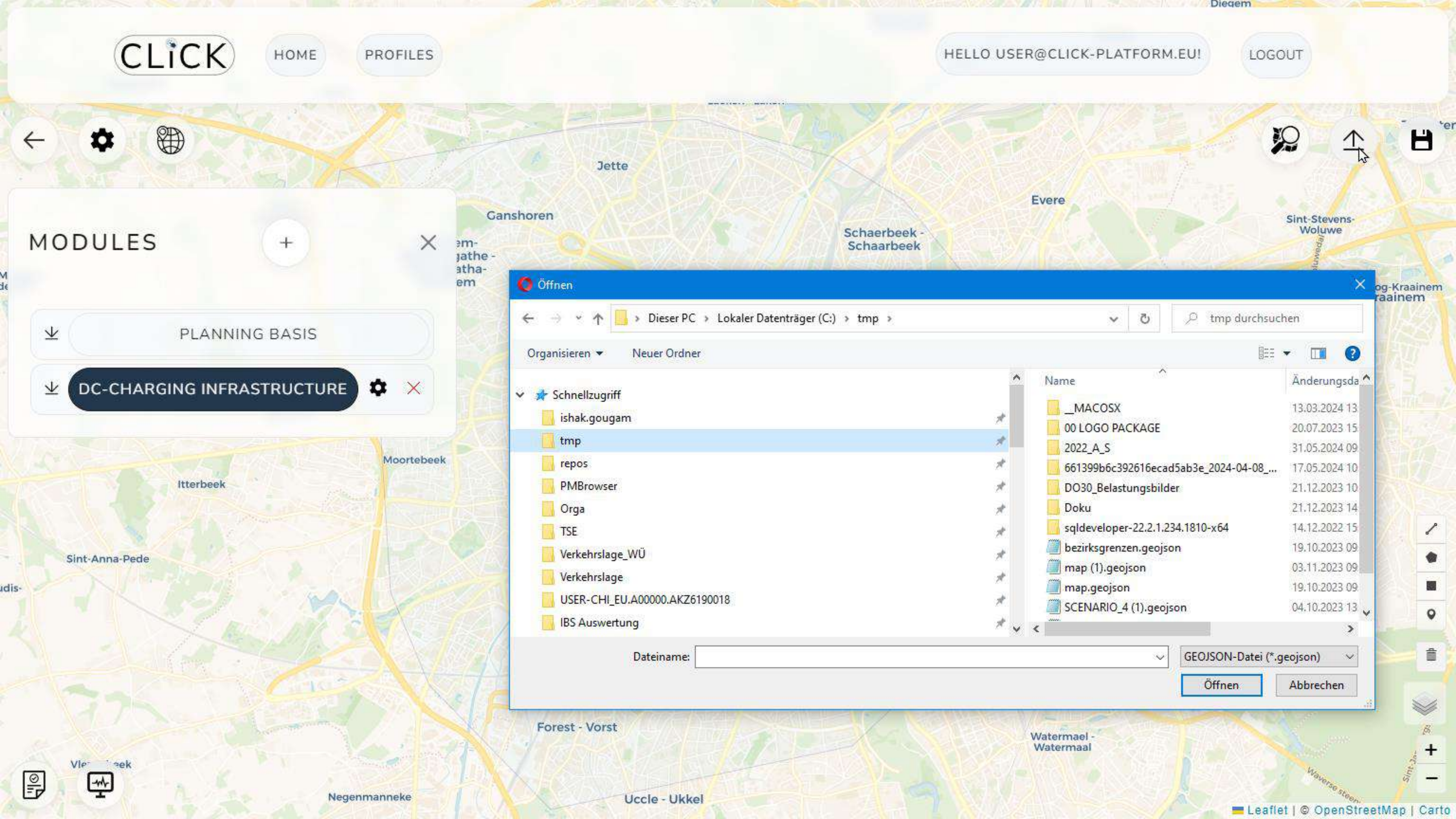

CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
YOU DON'T HAVE ANY PLANNINGS YET.
+
Add new planning.
ABOUT US
vmz
Verkehr Mobilität Zukunft
PROJECT
USER-CHI
CHARGING YOUR E-MOBILITY FUTURE
FUNDING
This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]
© CLICK v0.5 2023 | Imprint |


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
YOU DON'T HAVE ANY PLANNINGS YET.
+
ABOUT US
vmz
Verkehr Mobilität Zukunft
PROJECT
FUNDING
This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]
CREATE NEW PLANNING
Name
Brussels
CREATE

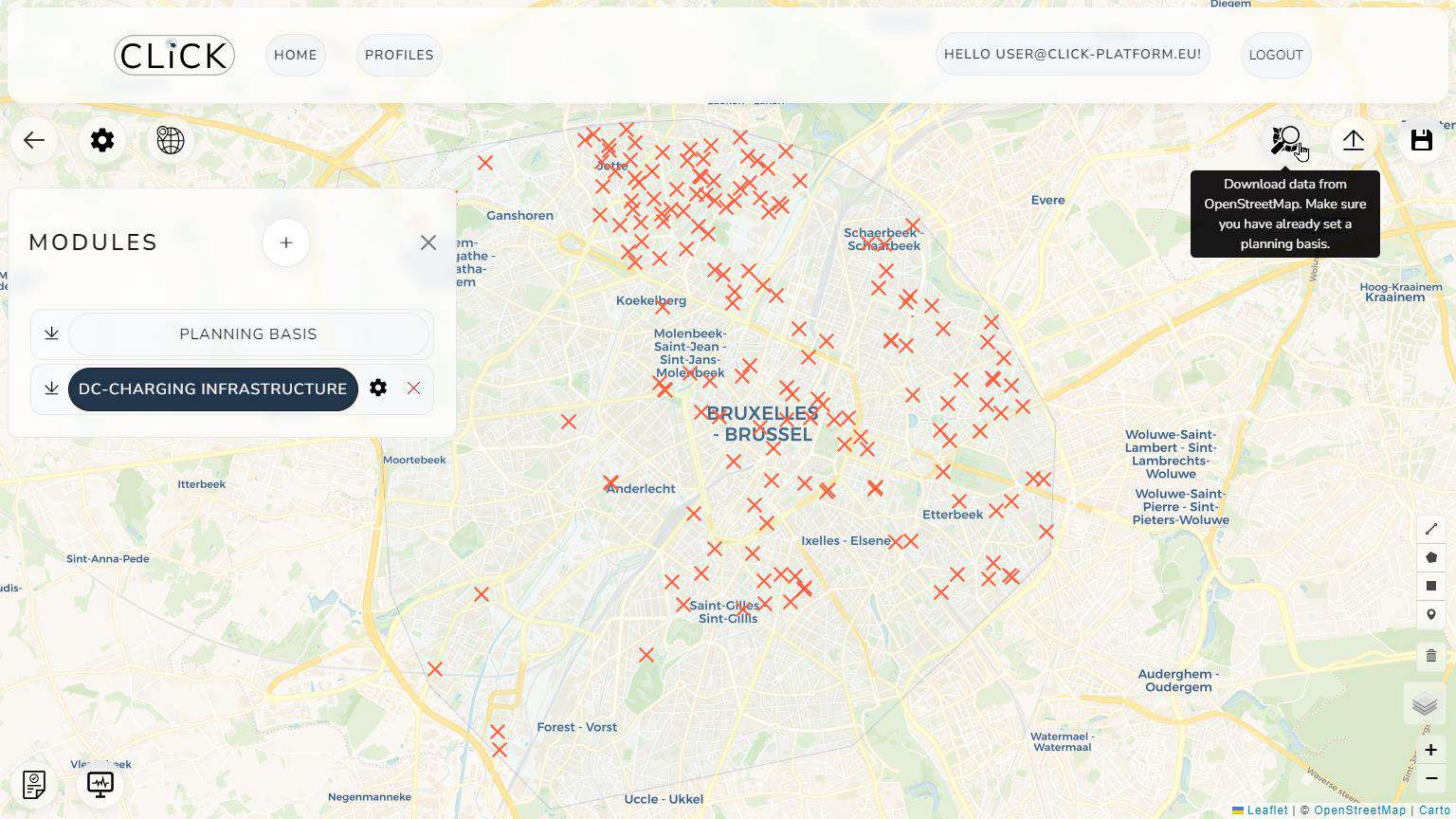

CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
SETTINGS
City
Brussels
Country
Belgium
Intesity
BASIC
LIGHTHOUSE
Support AC
Support DC
Support HPC
Zellik
Laeken - Laken
Zaventem
Jette
Evere
Ganshoren
Schaerbeek - Schaarbeek
Sint-Stevens-Woluwe
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Koekelberg
Hoog-Kraainem
Kraainem
Molenbeek-Saint-Jean - Sint-Jans-Molenbeek
BRUXELLES - BRUSSEL
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Anderlecht
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Etterbeek
Ixelles - Elsene
Saint-Gilles - Sint-Gillis
Auderghem - Oudergem
Forest - Vorst
Watermael - Watermaal
Leaflet | © OpenStreetMap | Carto

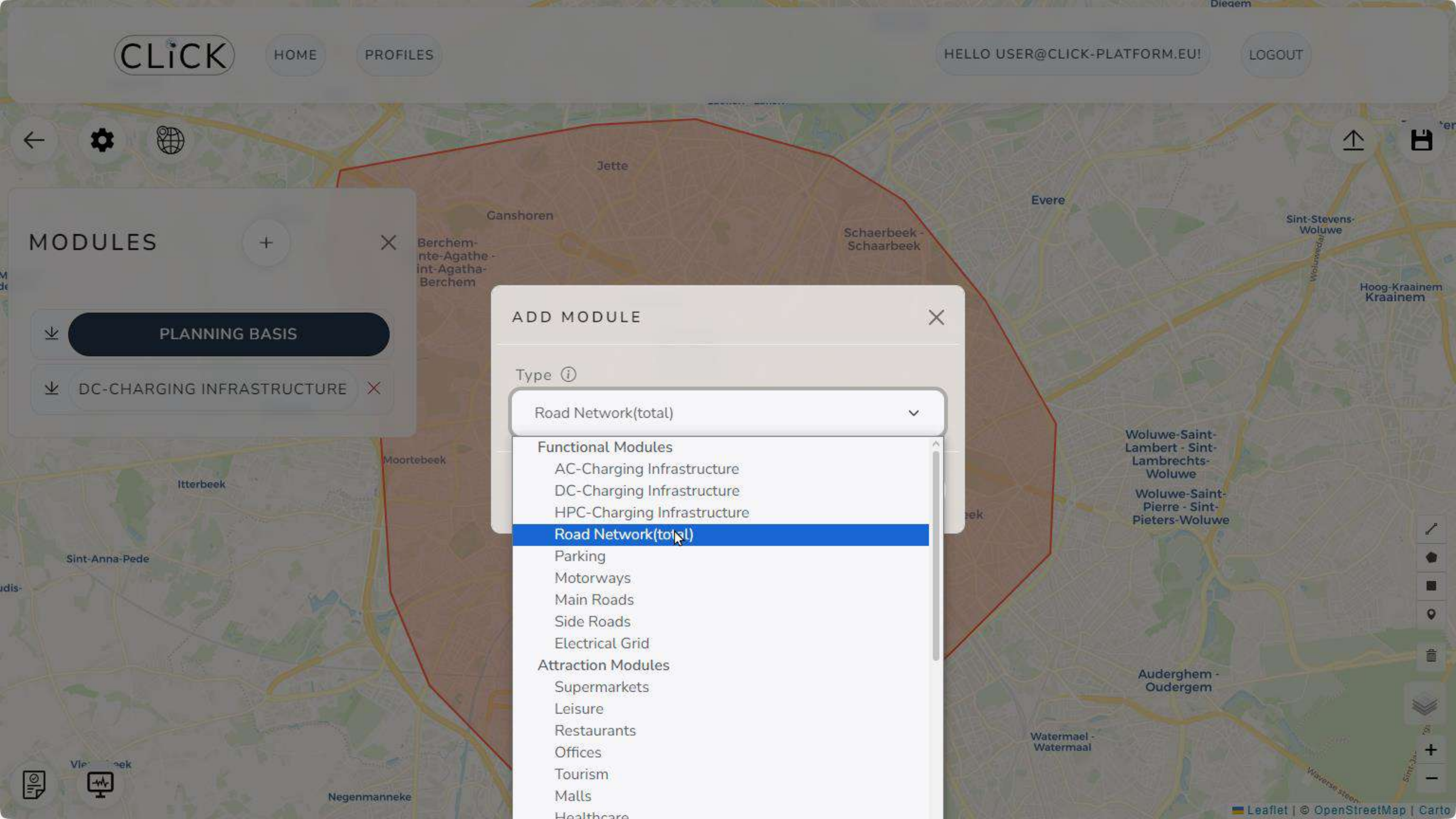

CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
Click first point to close this shape.
Finish
Delete last point
Cancel
Jette
Ganshoren
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Koekelberg
Molenbeek-
Sint-Jans-
Molenbeek
BRUXELLES - BRUSSEL
Schaerbeek - Schaarbeek
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Dilbeek
Moortebeek
Itterbeek
Anderlecht
Etterbeek
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Ixelles - Elsene
Sint-Anna-Pede
Saint-Gilles - Sint-Gillis
Auderghem - Oudergem
Forest - Vorst
Watermael - Watermaal
Negenmanneke
Uccle - Ukkel
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
ADD MODULE
Type
AC-Charging Infrastructure
Functional Modules
AC-Charging Infrastructure
DC-Charging Infrastructure
HPC-Charging Infrastructure
Road Network(total)
Parking
Motorways
Main Roads
Side Roads
Electrical Grid
Attraction Modules
Supermarkets
Leisure
Restaurants
Offices
Tourism
Malls
Jette
Ganshoren
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Schaerbeek - Schaarbeek
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem Kraainem
Dilbeek
Moortebeek
Itterbeek
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Anna-Pede
Auderghem - Oudergem
Watermael - Watermaal
Negenmanneke
Leaflet | © OpenStreetMap | Carto



CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
Öffnen
Dieser PC › Lokaler Datenträger (C:) › tmp ›
tmp durchsuchen
Organisieren
Neuer Ordner
Schnellzugriff
ishak.gougam
tmp
repos
PMBrowser
Orga
TSE
Verkehrslage_WÜ
Verkehrslage
USER-CHI_EU.A00000.AKZ6190018
IBS Auswertung
Name
Änderungsda
__MACOSX 13.03.2024 13
00 LOGO PACKAGE 20.07.2023 15
2022_A_S 31.05.2024 09
661399b6c392616ecad5ab3e_2024-04-08_... 17.05.2024 10
DO30_Belastungsbilder 21.12.2023 10
Doku 21.12.2023 14
sqldeveloper-22.2.1.234.1810-x64 14.12.2022 15
bezirksgrenzen.geojson 19.10.2023 09
map (1).geojson 03.11.2023 09
map.geojson 19.10.2023 09
SCENARIO_4 (1).geojson 04.10.2023 13
Dateiname:
GEOJSON-Datei (*.geojson)
Öffnen
Abbrechen
Jette
Ganshoren
Evere
Schaerbeek - Schaarbeek
Sint-Stevens-Woluwe
Moortebeek
Itterbeek
Sint-Anna-Pede
Forest - Vorst
Watermael - Watermaal
Uccle - Ukkel
Negenmanneke
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
Download data from OpenStreetMap. Make sure you have already set a planning basis.
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
BRUXELLES - BRUSSEL
Jette
Ganshoren
Koekelberg
Molenbeek-Saint-Jean - Sint-Jans-Molenbeek
Schaerbeek - Schaarbeek
Evere
Hoog-Kraainem
Kraainem
Anderlecht
Moortebeek
Itterbeek
Etterbeek
Ixelles - Elsene
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Anna-Pede
Saint-Gilles - Sint-Gillis
Forest - Vorst
Auderghem - Oudergem
Watermael - Watermaal
Negenmanneke
Uccle - Ukkel
Diegem
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
ADD MODULE
Type
Road Network(total)
Functional Modules
AC-Charging Infrastructure
DC-Charging Infrastructure
HPC-Charging Infrastructure
Road Network(total)
Parking
Motorways
Main Roads
Side Roads
Electrical Grid
Attraction Modules
Supermarkets
Leisure
Restaurants
Offices
Tourism
Malls
Jette
Ganshoren
Evere
Schaerbeek - Schaarbeek
Sint-Stevens-Woluwe
Hoog-Kraainem Kraainem
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Auderghem - Oudergem
Watermael - Watermaal
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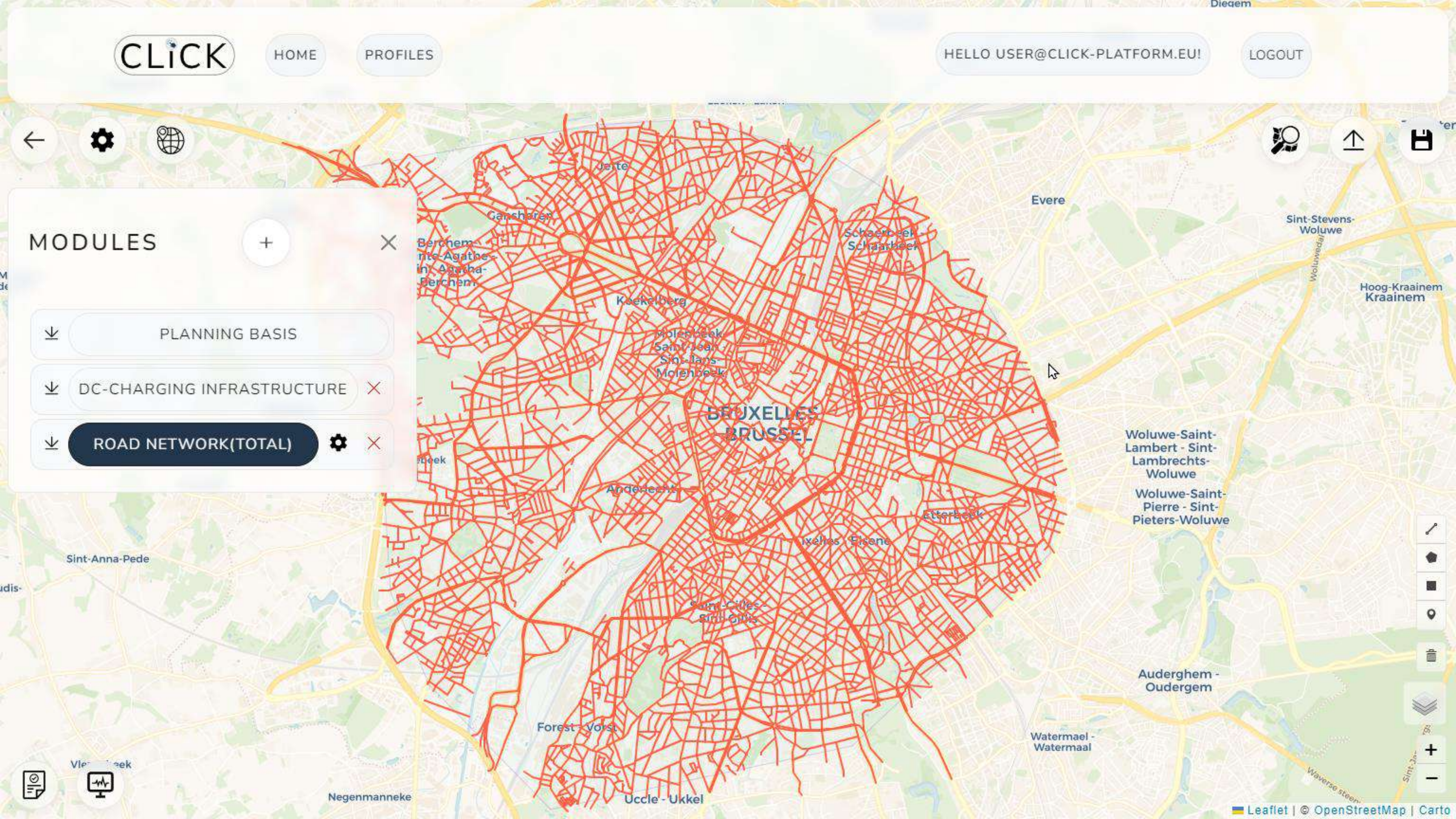
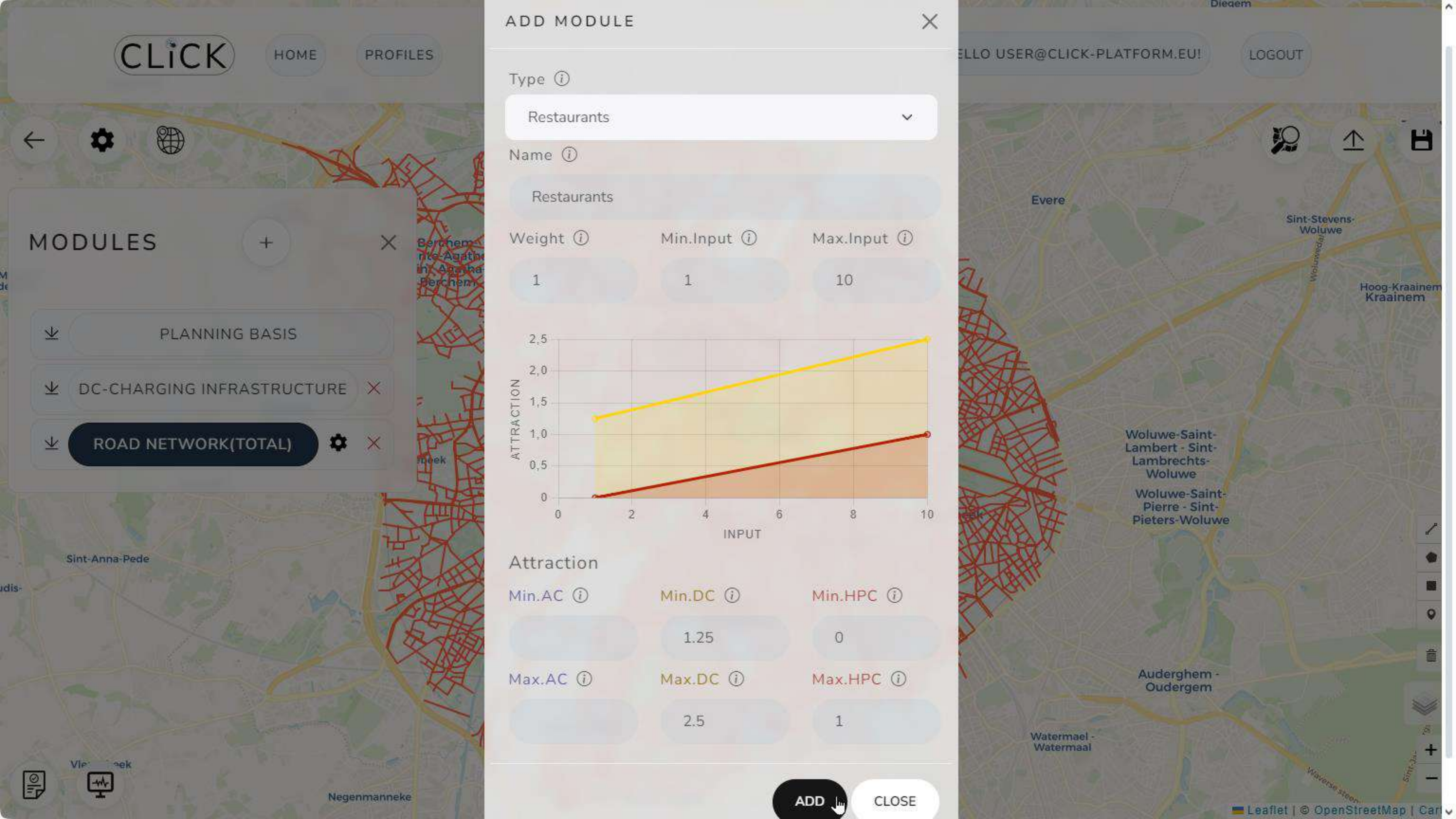
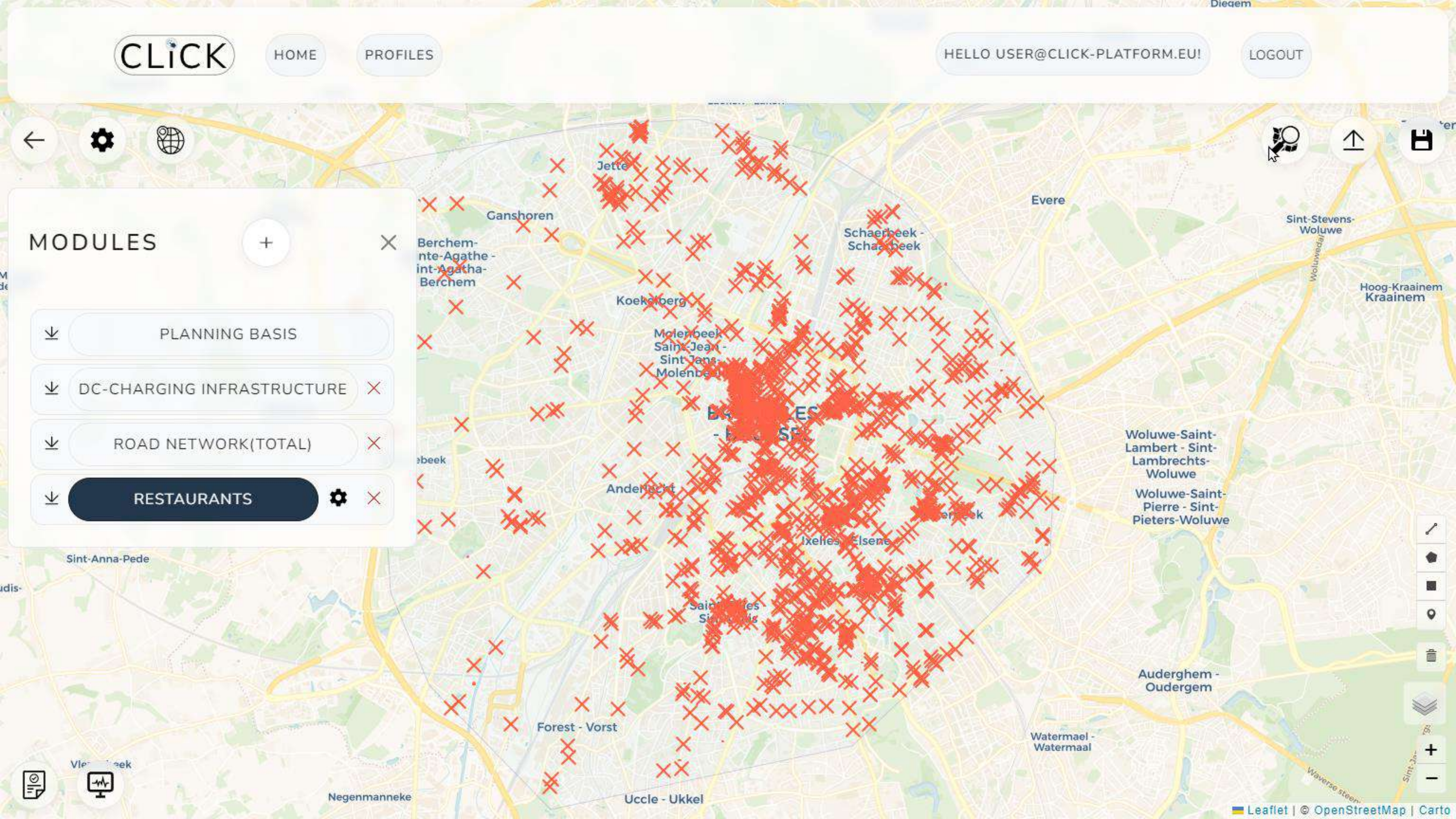
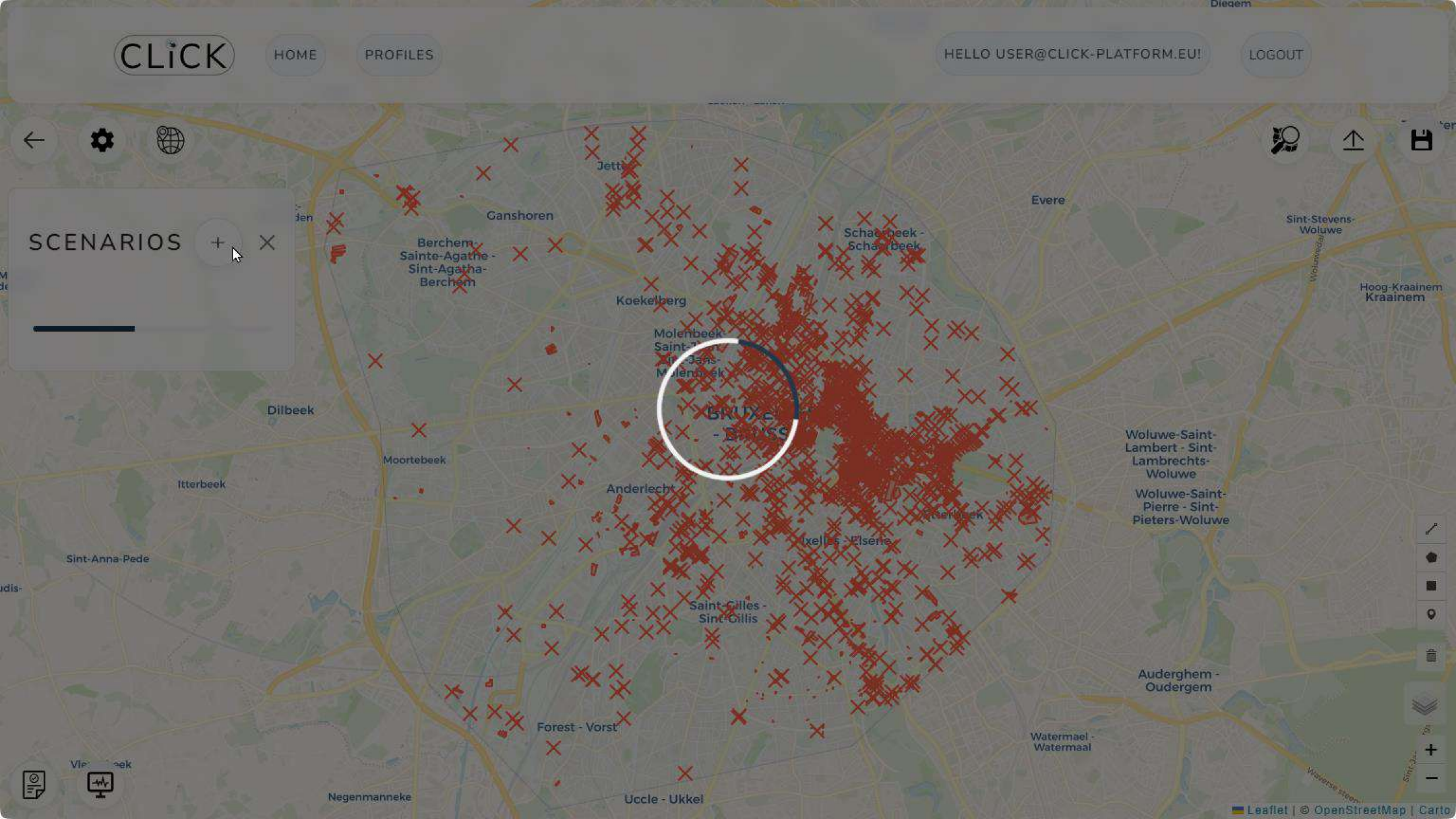
Itterbeek
Sint-Anna-Pede
Negenmanneke
Leaflet | © OpenStreetMap | Carto

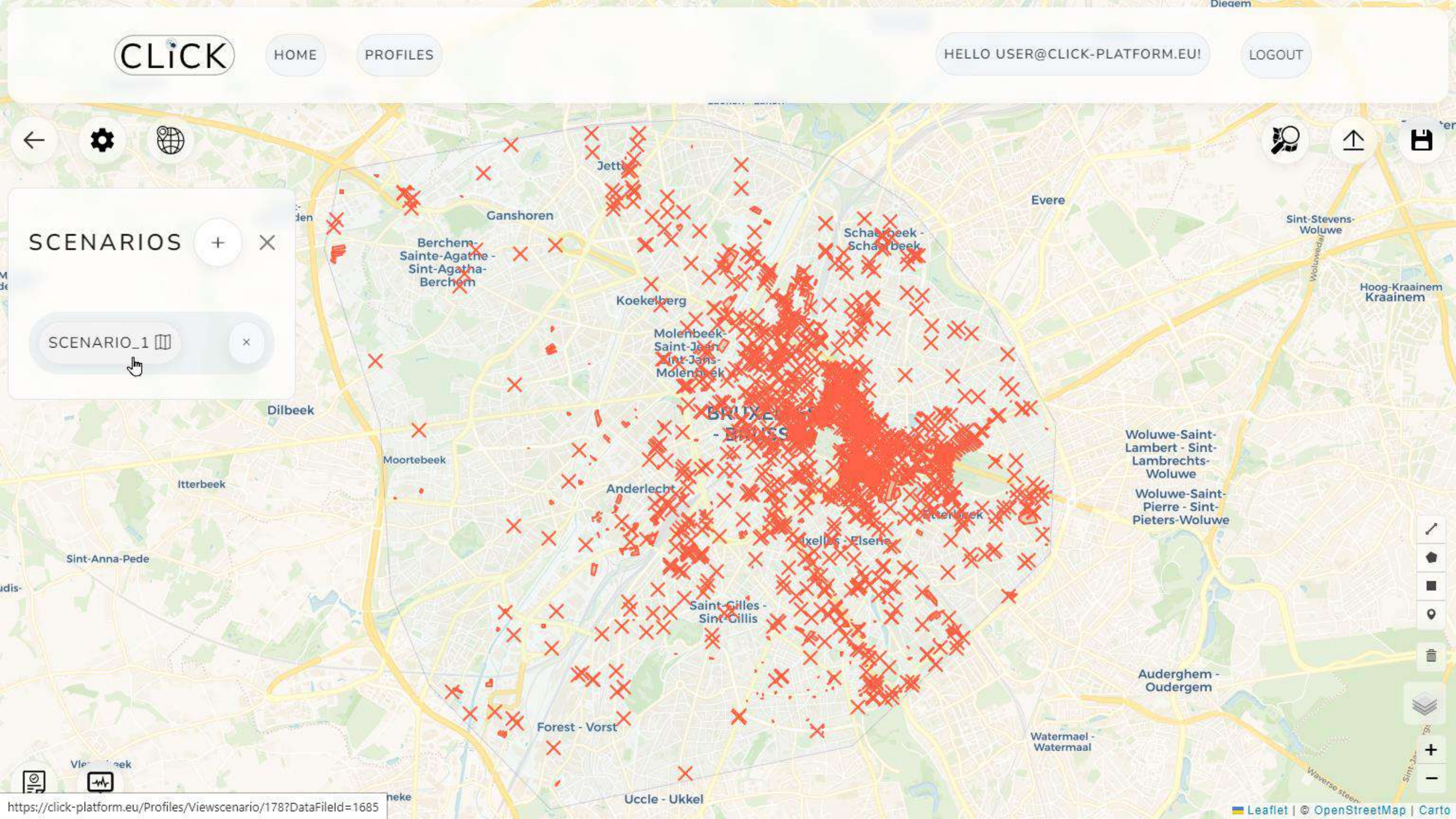

CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
ROAD NETWORK(TOTAL)
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Jette
Koekelberg
BRUXELLES - BRUSSEL
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Anna-Pede
Auderghem - Oudergem
Watermael - Watermaal
Forest - Vorst
Uccle - Ukkel
Negenmanneke
Leaflet | © OpenStreetMap | Carto

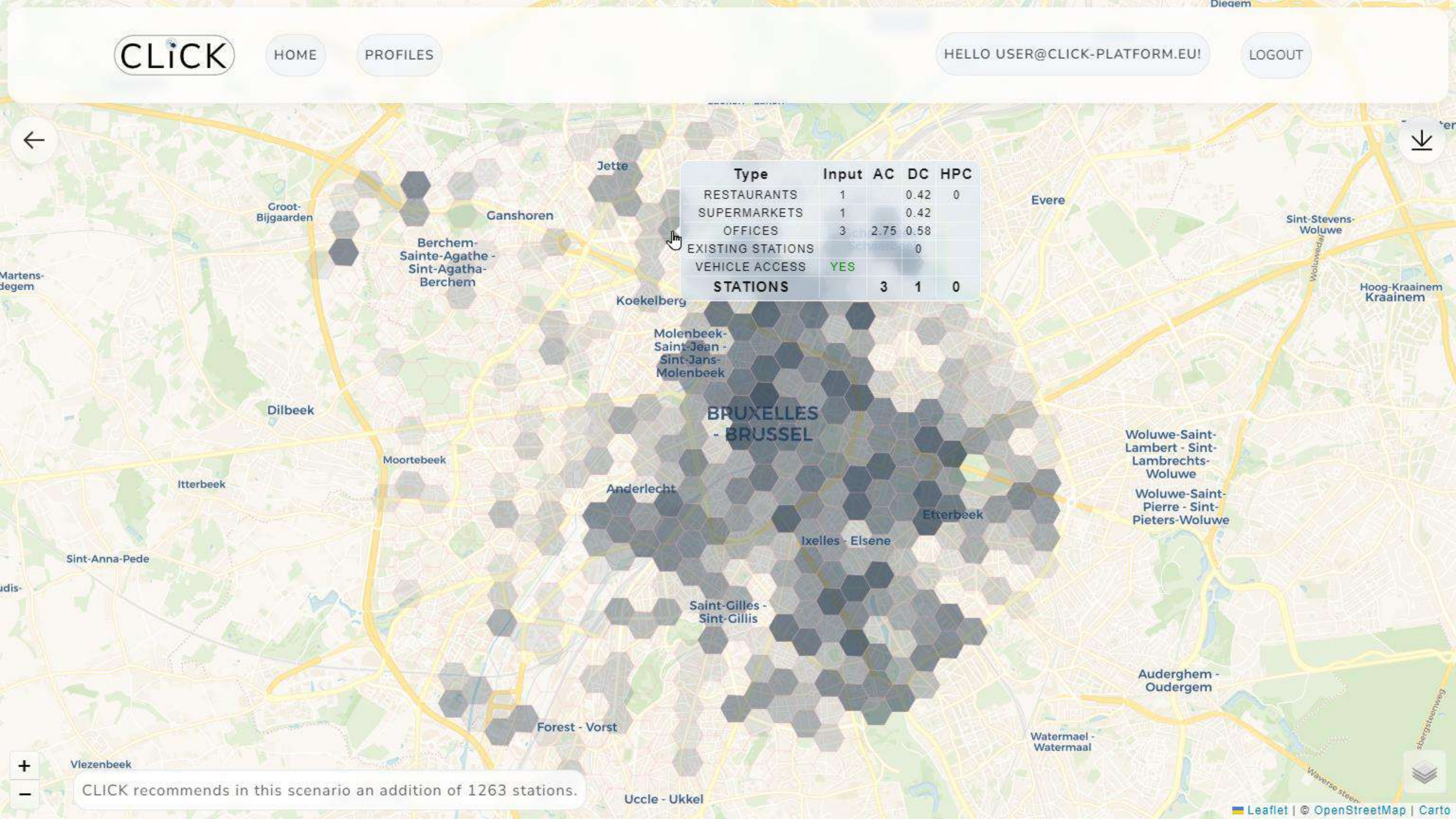

ADD MODULE
CLiCK
HOME
PROFILES
ELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
ROAD NETWORK(TOTAL)
Type
Restaurants
Name
Restaurants
Weight
Min.Input
Max.Input
1
1
10
ATTRACTION
INPUT
Attraction
Min.AC
Min.DC
Min.HPC
1.25
0
Max.AC
Max.DC
Max.HPC
2.5
1
ADD
CLOSE



CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
MODULES
PLANNING BASIS
DC-CHARGING INFRASTRUCTURE
ROAD NETWORK(TOTAL)
RESTAURANTS
Jette
Ganshoren
Evere
Koekelberg
Anderlecht
Forest - Vorst
Uccle - Ukkel
Sint-Anna-Pede
Negenmanneke
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Auderghem - Oudergem
Watermael - Watermaal
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
SCENARIOS
Jette
Ganshoren
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Koekelberg
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Dilbeek
Moortebeek
Itterbeek
Anderlecht
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Anna-Pede
Saint-Gilles - Sint-Gillis
Auderghem - Oudergem
Forest - Vorst
Watermael - Watermaal
Negenmanneke
Uccle - Ukkel
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
SCENARIOS
SCENARIO_1
Jette
Ganshoren
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Koekelberg
Molenbeek-Saint-Jean - Sint-Jans-Molenbeek
Schaerbeek - Schaarbeek
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Dilbeek
Moortebeek
Itterbeek
Anderlecht
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Etterbeek
Ixelles - Elsene
Sint-Anna-Pede
Saint-Gilles - Sint-Gillis
Auderghem - Oudergem
Forest - Vorst
Watermael - Watermaal
Uccle - Ukkel
Diegem
https://click-platform.eu/Profiles/Viewscenario/178?DataFileId=1685
Leaflet | © OpenStreetMap | Carto


CLiCK
HOME
PROFILES
HELLO USER@CLICK-PLATFORM.EU!
LOGOUT
Type Input AC DC HPC
RESTAURANTS 1 0.42 0
SUPERMARKETS 1 0.42
OFFICES 3 2.75 0.58
EXISTING STATIONS 0
VEHICLE ACCESS YES
STATIONS 3 1 0
Jette
Ganshoren
Groot-Bijgaarden
Berchem-Sainte-Agathe - Sint-Agatha-Berchem
Koekelberg
Molenbeek-Saint-Jean - Sint-Jans-Molenbeek
BRUXELLES - BRUSSEL
Evere
Sint-Stevens-Woluwe
Hoog-Kraainem
Kraainem
Dilbeek
Moortebeek
Itterbeek
Anderlecht
Etterbeek
Ixelles - Elsene
Woluwe-Saint-Lambert - Sint-Lambrechts-Woluwe
Woluwe-Saint-Pierre - Sint-Pieters-Woluwe
Sint-Anna-Pede
Saint-Gilles - Sint-Gillis
Auderghem - Oudergem
Forest - Vorst
Watermael - Watermaal
Vlezenbeek
Uccle - Ukkel
Diegem
CLICK recommends in this scenario an addition of 1263 stations.
Leaflet | © OpenStreetMap | Carto

CLiCK HOME PROFILES HELLO USER@CLICK-PLATFORM.EU! LOGOUT

BRUSSELS, BELGIUM

BERLIN, GERMANY

+

ABOUT US

vmz
Verkehr Mobilität Zukunft

PROJECT

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

FUNDING

This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

https://click-platform.eu/Profiles/Planning/179

THANK YOU

TIME FOR A COFFEE BREAK, LET'S MEET BACK AT 16:00

Setting the scene: the benefit and importance of smart and innovative charging solutions

Jaap Burger, RAP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Setting standards for smart charging solutions – a European perspective

Luka De Bruyckere, ECOS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Standards for smart charging

Luka De Bruyckere | Senior Programme Manager | 18.06.2024

What is a **standard?**

Voluntary but common way to

- implement specifications
- ensure interoperability

What is a standard? **Examples**

- **EV charging plug**
- Standardised **communication protocols** for enabling e.g.
  - V2G
  - Optimised load management
  - Grid services – emergency response

How can standards support policy making?

- Provide a **common way of implementing legislative requirements**
- EU Commission requests **standardisation organisations** to develop standards
- Needed to test whether product can be **sold on the EU market**
- Can be based on **international standards** (ISO/IEC)

EXAMPLE: AFIR

EU law on public charging infrastructure sets **mandatory specifications for charging stations**

- Commission requested smart charging standards
- Standards provide **interoperability**
- Key **smart charging** standards are not finished

Smart charging standards

ISO 15118-20 = V2G standard

IEC 63110 (OCPP?) = Management of charging infrastructure (CSMS)

IEC 63119 = Roaming standard

EN 50491-12-2 = Customer Energy Management standard (S2)

EV ⇔ charging station

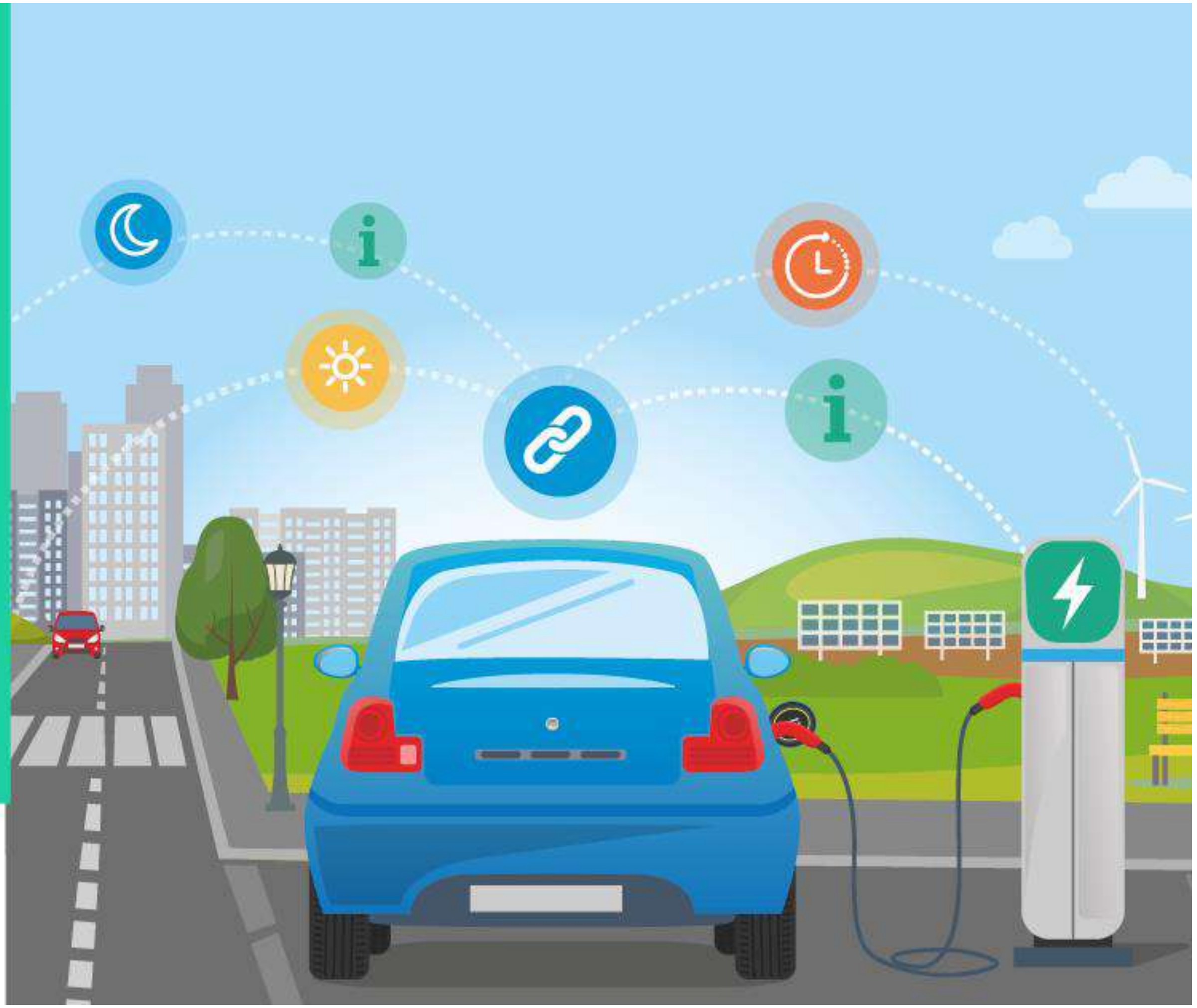
charging station ⇔ charging station management system (CSMS)

CSMS ⇔ third-party roaming systems

CSMS ⇔ home energy management system (HEMS)

Standards for EV smart charging: A guide for local authorities

Planning for future-proof charging infrastructure in cities



ecos

RAP

Our recommendations for future-proof infrastructure

Make infrastructure ready to evolve with standards

- Anticipate the evolution of standards
- **Upgradable** infrastructure

= **Future-proof** infrastructure avoids replacement before end of expected lifetime

How can local authorities make sure the charging infrastructure is future-proof?

The following should be taken into account:

Make sure that charging station operators (CSOs) - the companies contracted to install and operate charging infrastructure - play an active role in ensuring the infrastructure is built to last. This means CSOs must think ahead about how to implement anticipated hardware and software upgrades when the infrastructure is built. **Cities should require operators to:**

- ensure infrastructure meets the latest available smart charging standards;
- integrate upgraded or new standards into the charging station's software as soon as they are available, either replacing the old standard, or functioning in parallel. This is best accomplished by means of contractual agreements on an implementation timeline with CSOs;
- provide all technical documentation of the implementation of these protocols so that third parties can upgrade the infrastructure in case the manufacturer or operator ceases to exist;
- for newly built infrastructure
  - Implement the ISO 15118-20 standard as soon as possible and by early 2024 at the latest. This standard supporting V2G technology is well advanced and will soon be available for widespread use. Therefore, operators of newly built infrastructure should be required to implement the standard as soon as it is commercially available.
  - Anticipate the arrival of the IEC 63110 and IEC 63119 standards. These important standards are further from completion but should be foreseen nonetheless. While it is unclear at what level these future standards will be compatible with the current ones, efforts should be made to prepare for the coexistence with the new IEC standards, and eventual migration towards them. For instance, operators should install charging stations with sufficient computing and memory capacity.

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What should local authorities ask from charging station operators when issuing a tender?
Ensure infrastructure meets the latest available smart charging standards
Integrate upgraded or new standards into the charging station's software
Install charging stations with sufficient computing and memory capacity
Provide all technical documentation regarding the protocols applied
In new infrastructure, implement V2G technology, and anticipate future standards IEC 63110 and IEC 63119
ecos
RAP

Conclusion and way forward

- Standards needed to make all charging stations **capable of smart charging**
- EC has a key role in bringing them to the EU level
  - **Smooth** process: EC to mandate ISO 15118-2 and 15118-20
  - **Delay** of IEC 63110, IEC 63119. Harms the roll-out of **future-proof** smart charging stations
- International standards need to be finalised asap to support legislation, while ensuring large scale EV grid integration
- In the meantime, local authorities can ensure that charging stations implement the right standards by **procuring upgradable charging stations**: Guide for cities in evolving standardisation landscape

ecos

R&I contributing to standardisation

Date: **18/06/2024**
Author: **Javier López (UNE)**
Project Manager for Transport Means
jlopezr@une.org

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Standards

Voluntary

Established by **consensus**

Standard

Set of **specifications/technical information**

Adopted by stadardisation body

Standards

Provide a basis for mutual understanding among individuals, businesses, public authorities and other kinds of organizations

Facilitate communication, commerce, measurement and manufacturing

Benefit: reduce costs, enhance performance and improve safety

Ensure the compatibility of different components/products/services

Early stages of the project

- Standards are state of the art for industrial and societal practices

Starting point

Ensure methodological robustness and improve the quality

- Recognized test methods, health and safety requirements

- Ensure compatibility of the project results with what is already on the market

Ensure broad applicability of the project results

During and after the project

Increase the impact of the project

- Provide access to discuss and promote project results with stakeholders and potential customers

Long term dissemination of project results

- Disseminate the project results to a relevant range of European or world-wide stakeholders

Ensure market acceptance of the project results

- Ensure that the project results are known and used by the market well beyond the duration of your project

R&I projects contribute to standardization

Bidirectional communication between R&I projects and the standardization system will provide the framework for contributing to future standardization from the project results

R&I projects generate knowledge that can contribute to existing standards or develop new ones

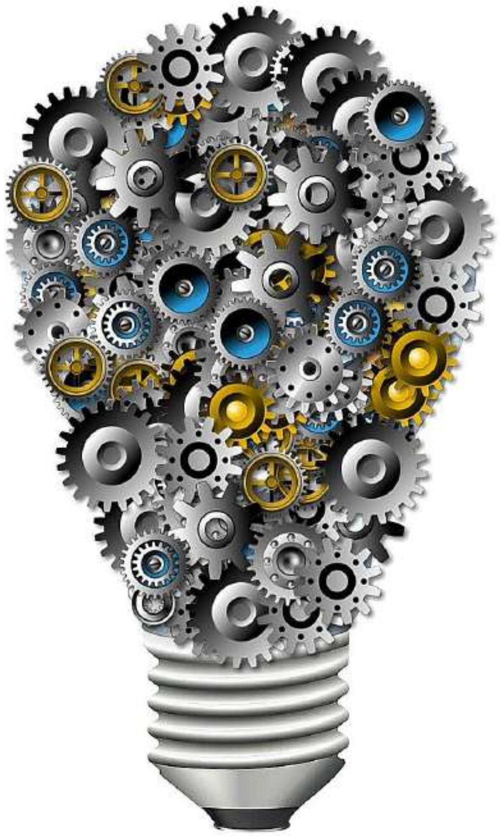
USER-CHI Example

USER-CHI is an industry-powered, city-driven and user-centric project which will boost a large-scale e-mobility market take up in Europe, by means of developing integrated smart solutions, novel business models and new regulatory framework conditions.

USER-CHI Example

- CEN-CENELEC WS “Innovative solutions for user centric charging infrastructure for electric vehicles”
  - CWA 1 “User centric charging infrastructure for electric vehicles – Guidelines for operators to implement advanced smart charging and management strategies“
    - Provides guidance in terms of smart charging, interoperability and payment and accounting processes among the different actors of the electromobility
    - Homogenous strategies and methodologies that facilitate the implementation of advanced functionalities in the electromobility
  - CWA 2 “User centric charging infrastructure for electric vehicles – Charging stations of the future – Stations models considering users’ expectations“
    - Provides guidelines for the stations of the future to fulfil the needs and expectations of Electric Vehicle (EV) users

Conclusions



- Tool to boost the project impact
- Ensures compatibility and interoperability
- Provides the distribution and transfer of knowledge
- Facilitates market acceptance of innovations

THANK
YOU
GRACIAS
ARIGATO
SHUKURIA
DANKSCHEEN
SHUKRIA
TINGKI
YAQHANYELAY
TASHAKKUR ATU
SUKSAMA
EKHMET
GRAZIE
MEHRBANI
PALDIES
MERCI
GOZAIMASHITA
EFCHARISTO
JUSPAXAR
KOMAPSUMNIDA
MAAKE

In practice – lessons learned from USER-CHI & INCIT-EV projects

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

SMAC

Smart charging tool

Alberto Zambrano, Telecom Eng., ETRA I+D
azambrano.etraid@grupoetra.com

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

18/06/2024

What is SMAC?

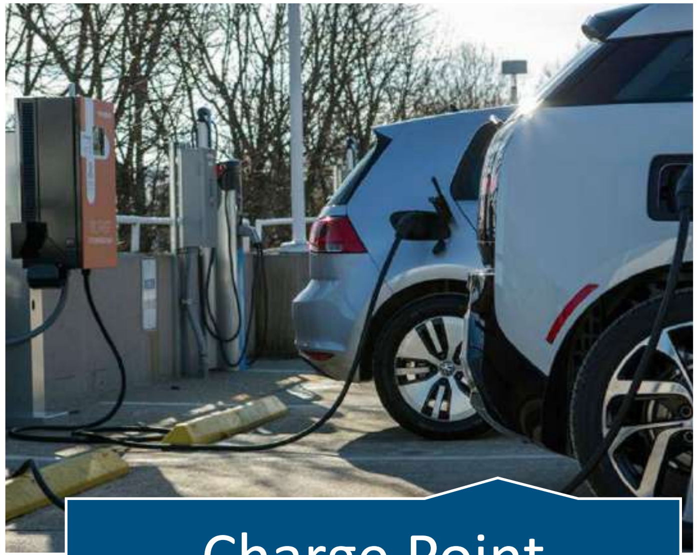
A platform that enables adoption of smart charging strategies by CPOs

Reduce operational costs while keeping quality of service

Increase competitiveness and transfer benefits to its customers (EV drivers)

Facilitate adoption of smart charging strategies

Target actors

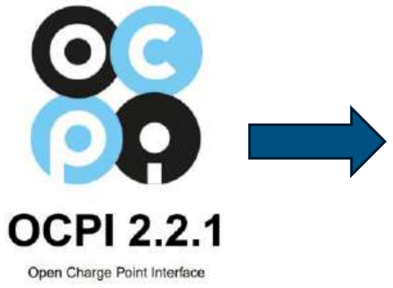


Charge Point Operators

EV drivers

Distribution System Operators

Architecture: how to facilitate adoption? Identified synergies



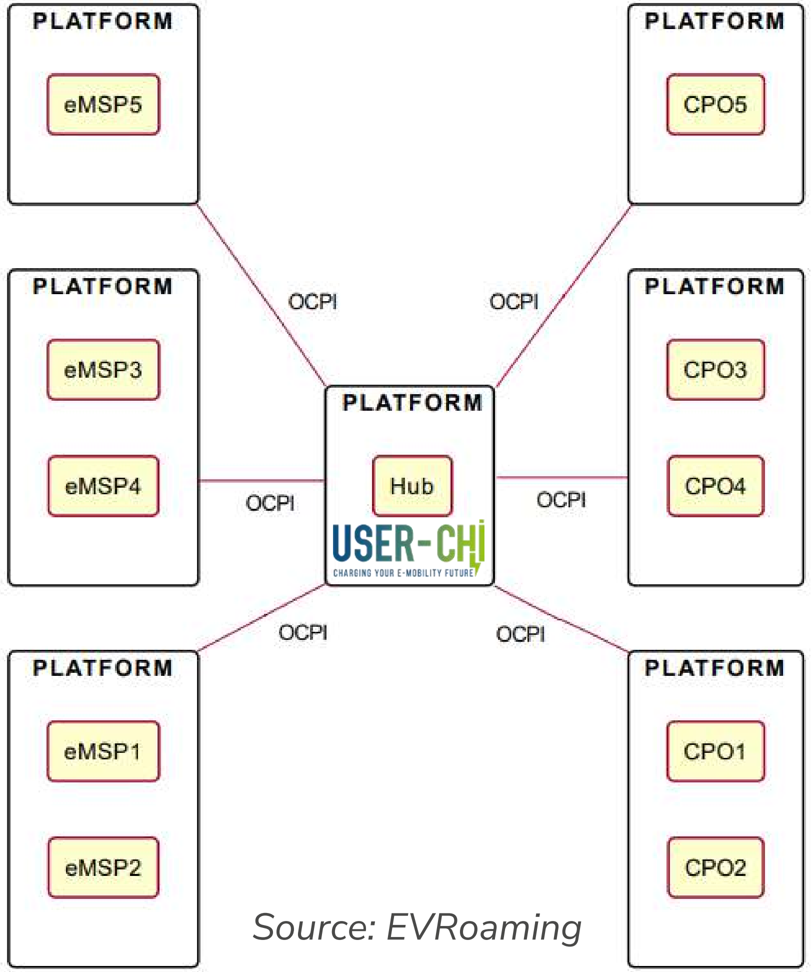
New actor!

Smart Charging Service Provider

HUB topology

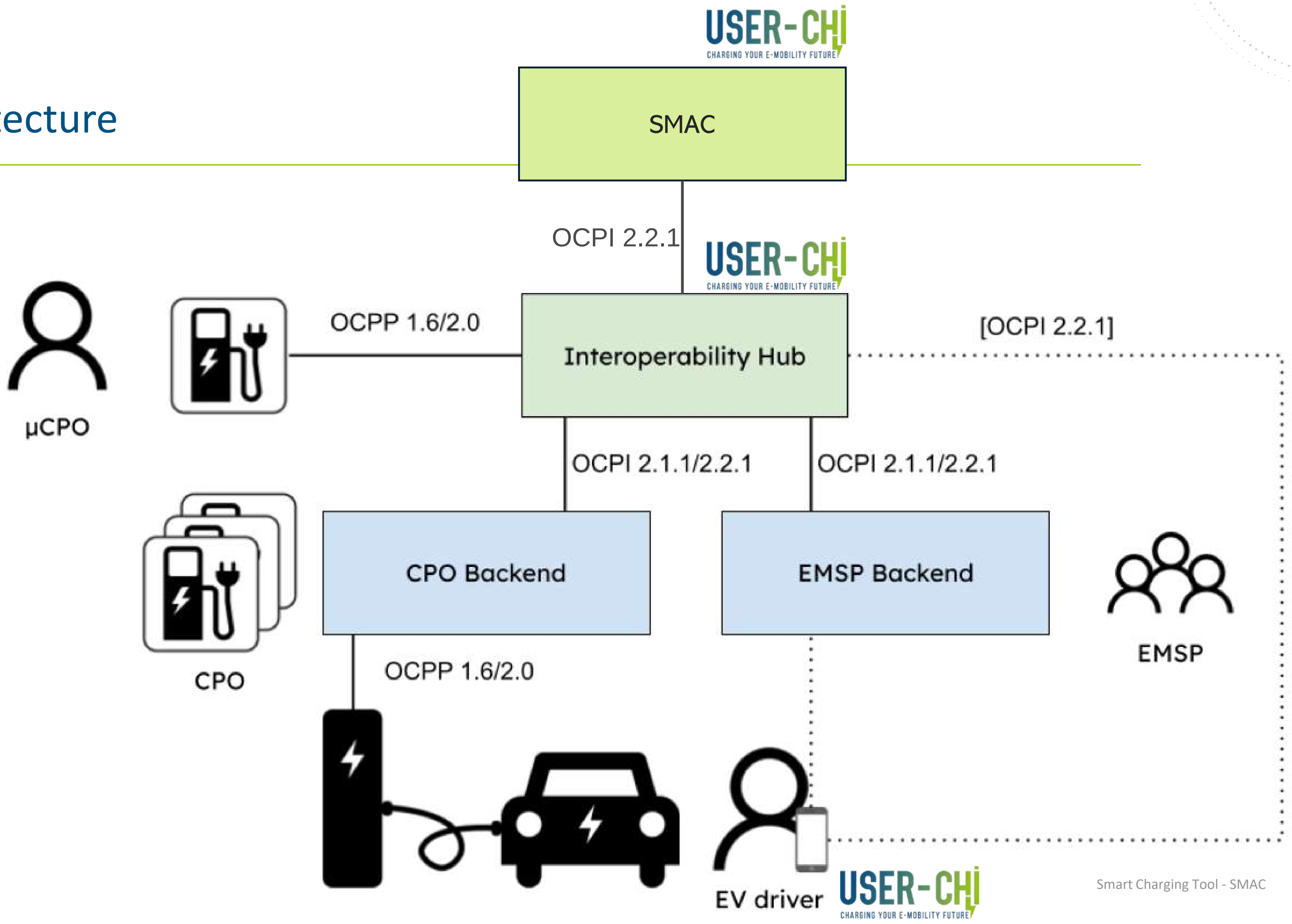
- Single contract and integration between INCAR and CPO/EMSP partner required

- Seamless access to elements from other partners
- EMSPs customers have access to any charger from any CPO
- CPOs gain visibility

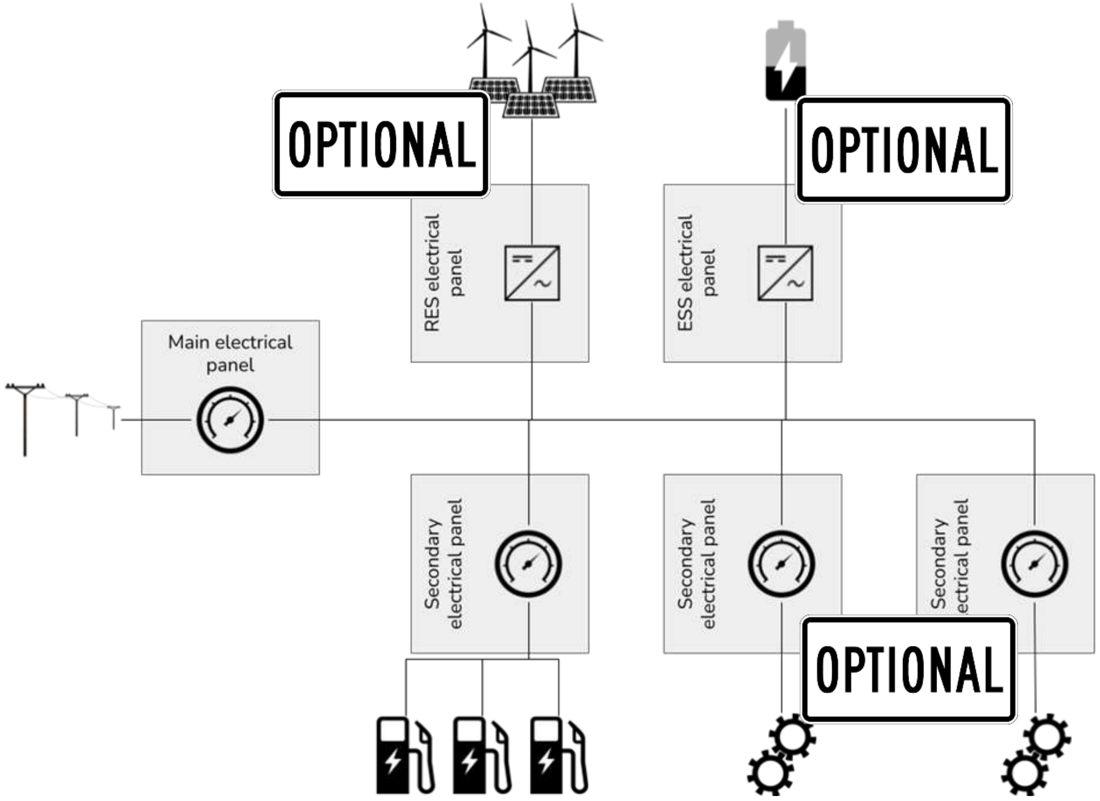


Source: EVRoaming

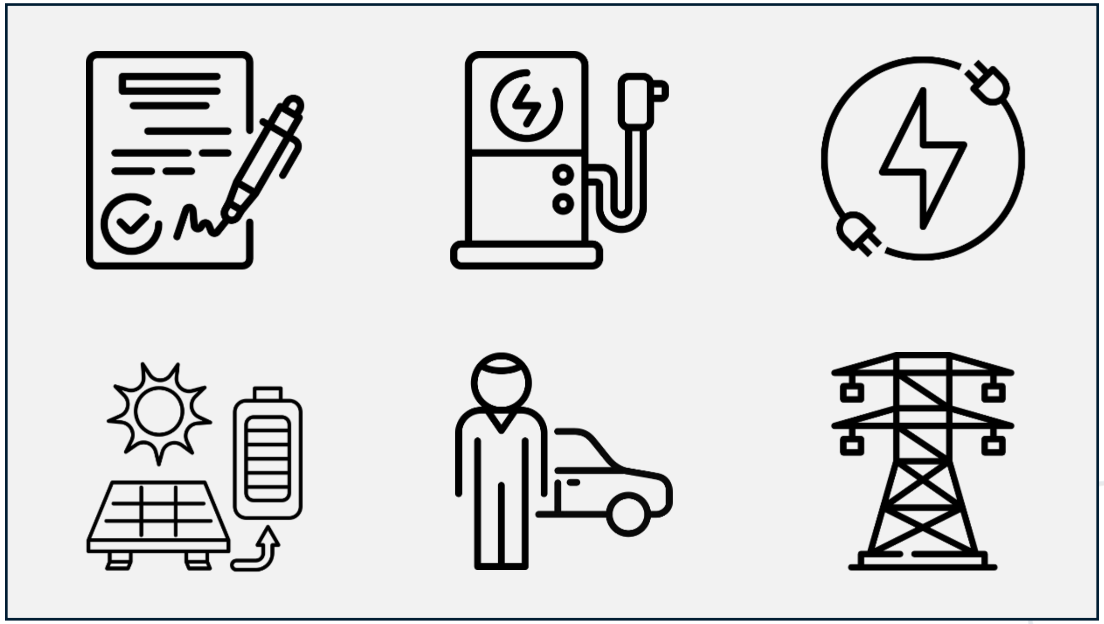
Architecture



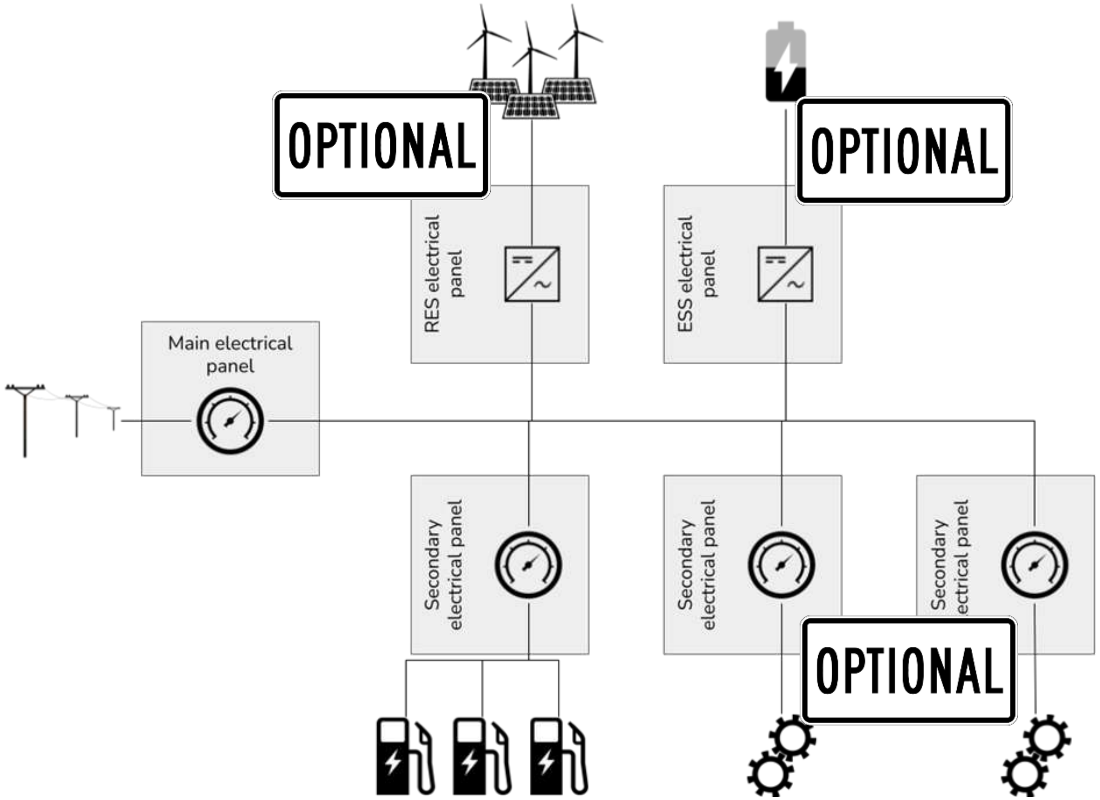
SMAC core: optimization



<u>Minimize cost</u> of the charge sessions



SMAC core: optimization (ii)

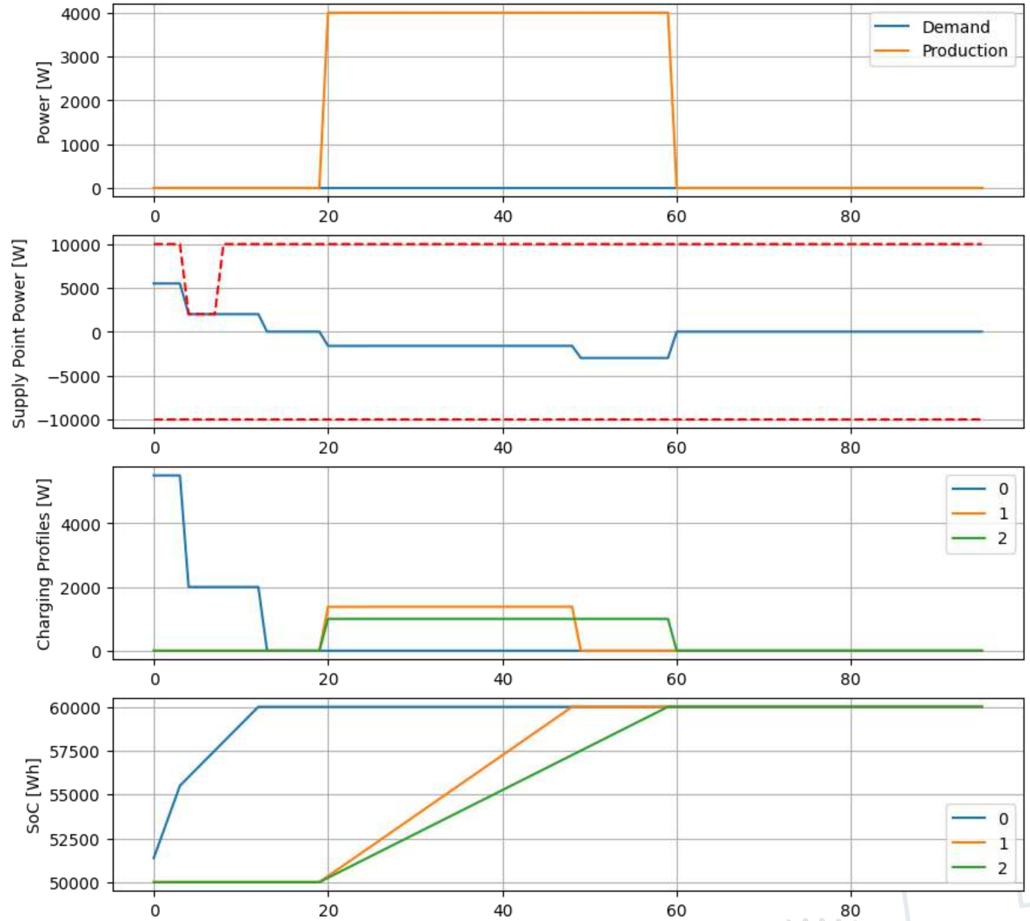


Enabled use cases

Dynamic load balancing / Peak power reduction
Energy cost-driven smart charging
RES-driven smart charging / Self-consumption optim.
Active participation in smart grid management

SMAC core: optimization

Evs	3
Demand forecast	-
Production forecast	4kW @ slots [20 - 70]
Supply point max. power	10kW
Supply point min. power	-10kW
Energy price	Constant (0,1€/kWh)
Capacity	EV0: 60kWh EV1: 60kWh EV2: 60kWh
SoC	EV0: 50kWh EV1: 50kWh EV2: 50kWh
Nominal power of EVSEs	EVSE0: 7,7kW EVSE1: 7,7kW EVSE2: 7,7kW
Nominal discharge power of EVSEs	EVSE0: 0kW EVSE1: 0kW EVSE2: 0kW
Target slots	EV0: 12 EV1: 48 EV2: 96
Target SoCs	EV0: 60kWh EV1: 60kWh EV2: 60kWh
Flex. orders	8kW restriction @ slots [4 - 8]



Conclussions

- MICRO

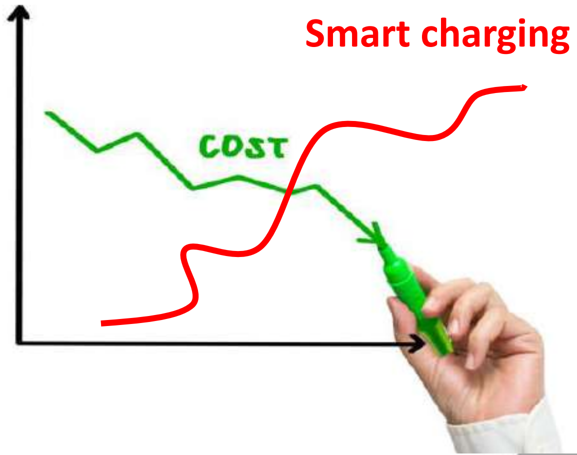
  - Optimize costs faced by CPOs/infrastructure managers (even domestic)
    - Energy-wise (kWh)
    - Capacity-wise (kW)
  - Load shifting (ToU tariffs, local RES generation)
  - Based on open protocols

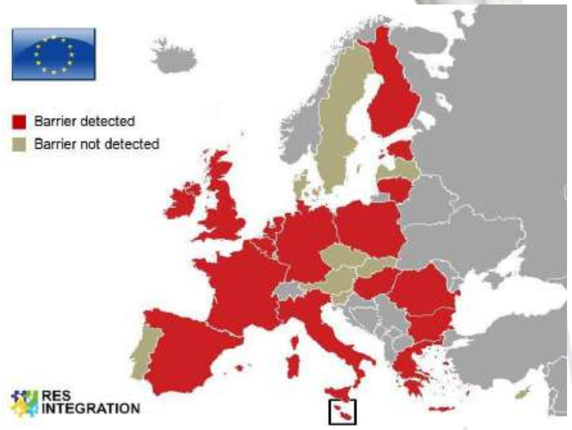
Increase competitiveness, transfer cost savings to end users

- MACRO

  - Increase capacity* of electricity distribution networks
  - *Capacity = charging sessions with proper QoS without network reinforcement investment

Facilitate and promote adoption of smart charging strategies





THANK YOU!

Connect with us:

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www.linkedin.com/in/user-chi-project

www.userchi.eu

info@userchi.eu

INDUCAR

USERCHI FINAL EVENT

Date: **18/06/2024**
Author: **Sergio Perez**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

Product overview

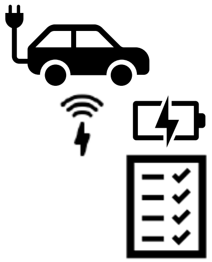
P8: INDUCAR
INDUctive Charging for e-**CAR**s

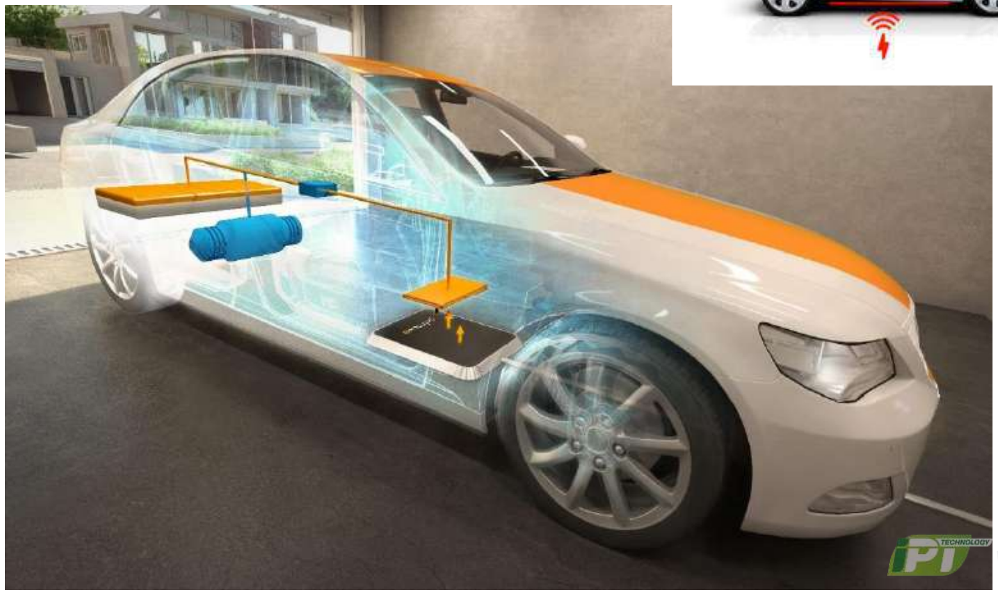
Inductive Charging for e-Cars: inductive charging system for electric cars, designed to better fit the users' charging preferences and maximize their convenience, i.e. avoid the frequent handling of heavy cables.

Wireless charging will be implemented for user-friendly charging for private use, professional use and car sharing services.

DEMO SITE 2. Inductive charge AMB Infrastructure

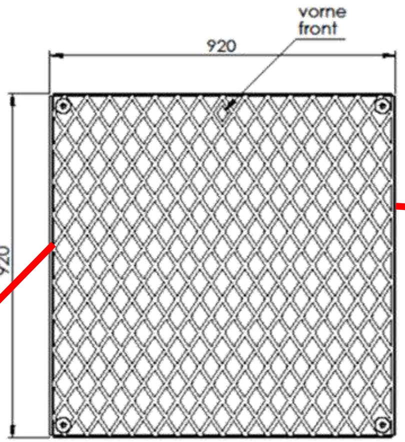
INDUCAR

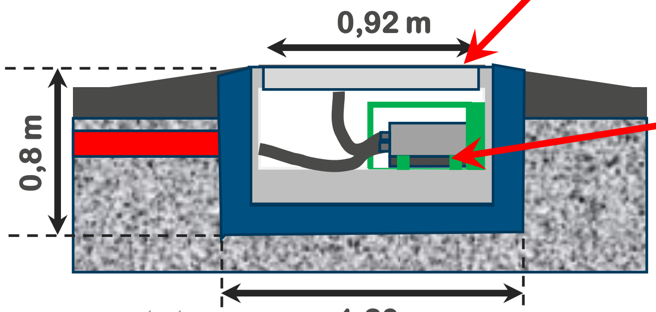


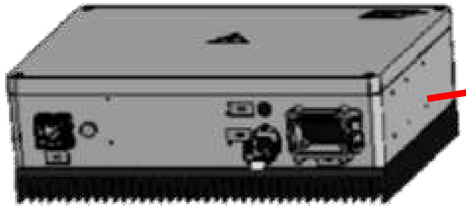


State of the Art at the start of the project

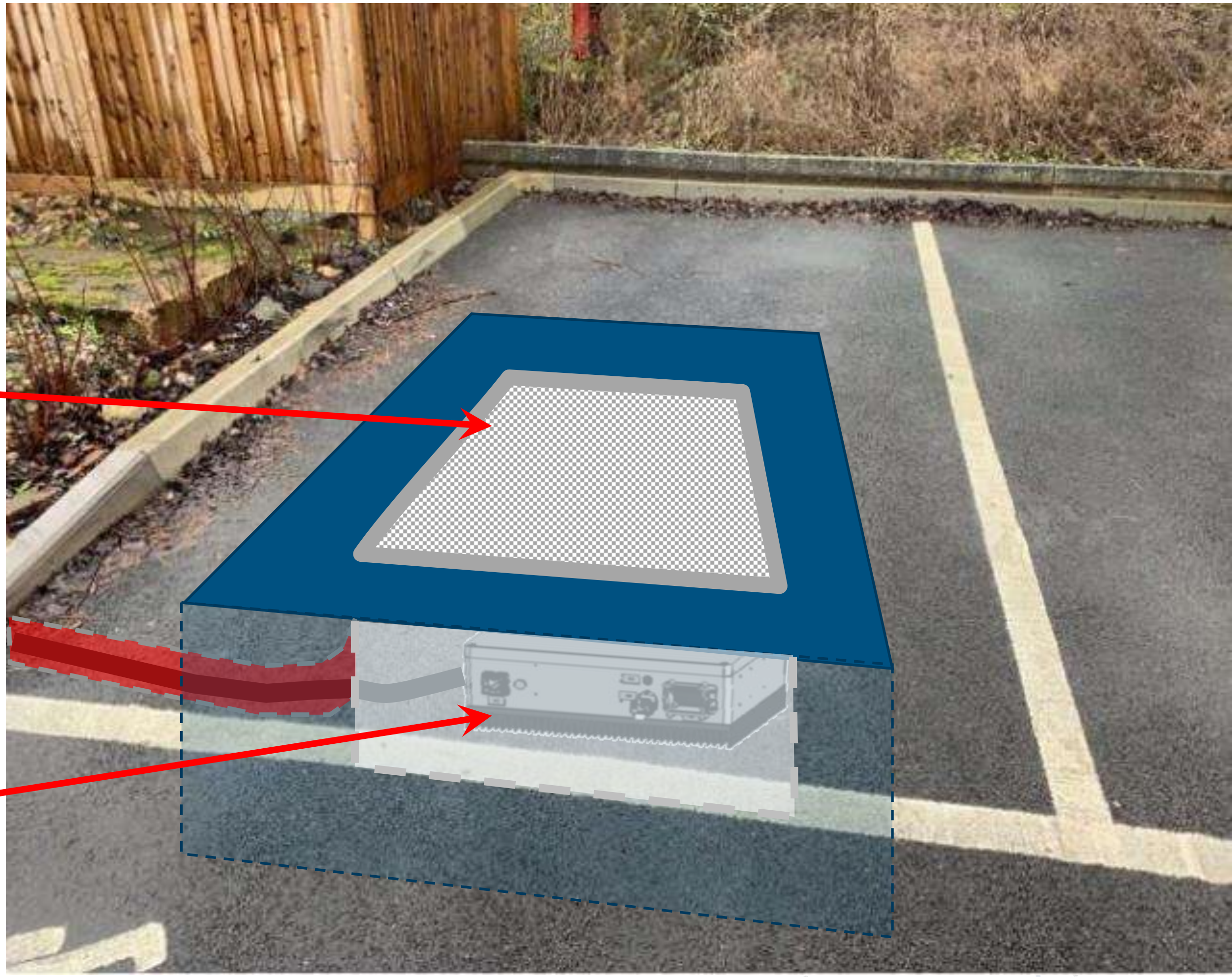
Ground Assembly





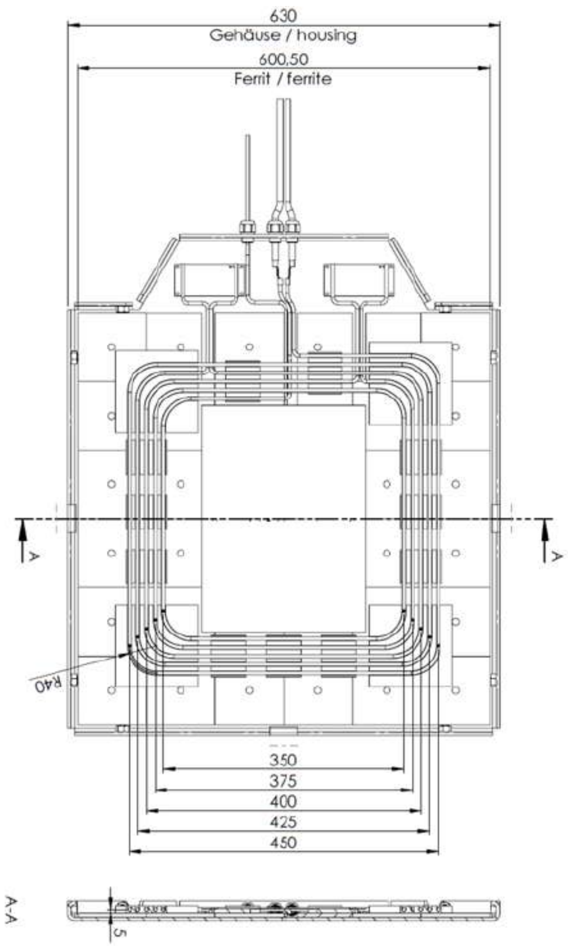


Track supply electronics
404 x 313 x 150 mm

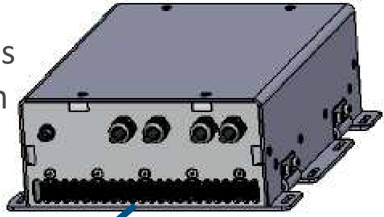


State of the Art at the start of the project

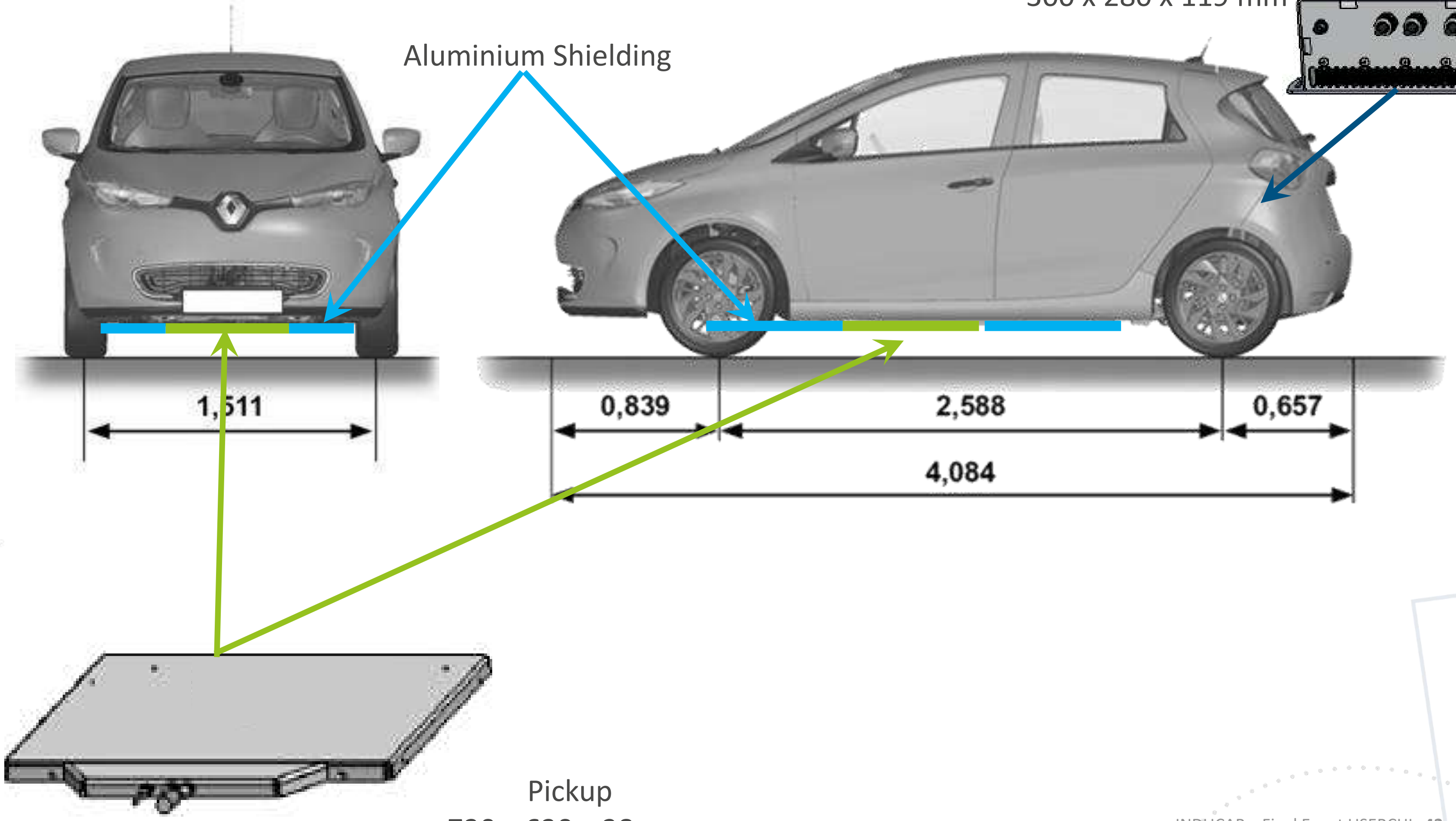
Vehicle Assembly



Regulator electronics
300 x 280 x 119 mm



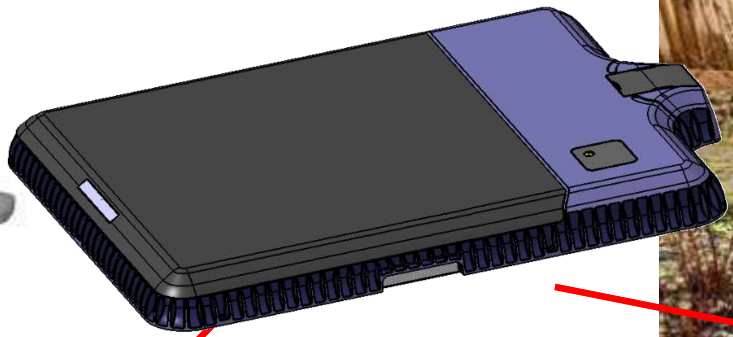
Aluminium Shielding



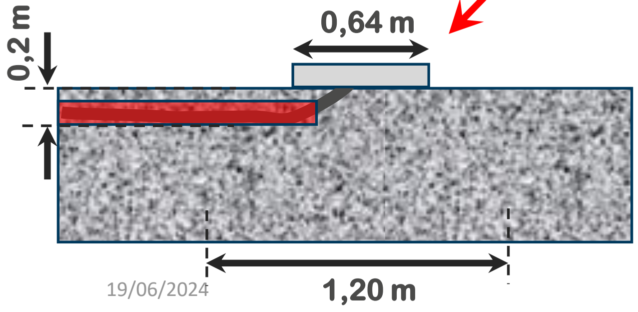
Pickup
730 x 630 x 28 mm

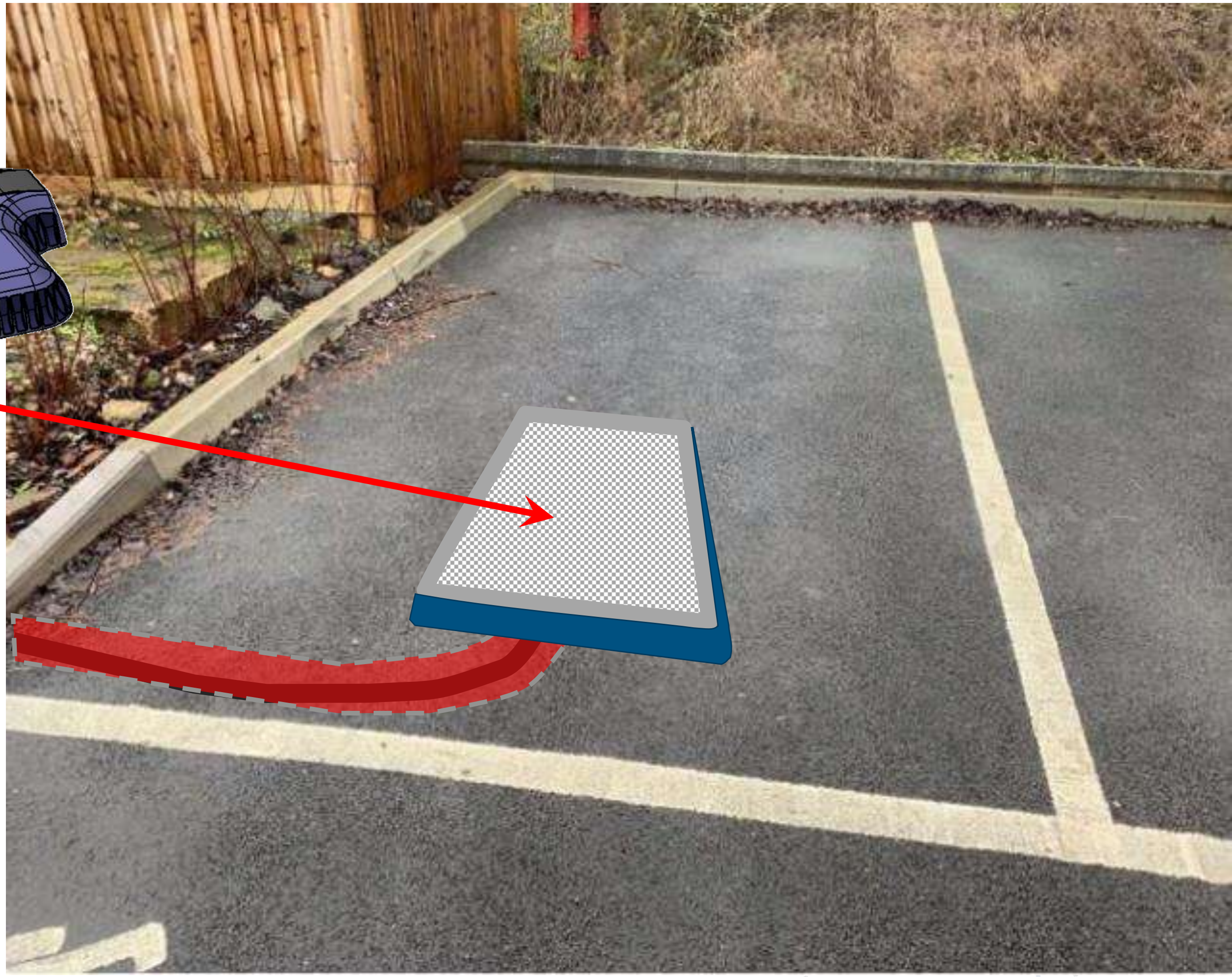
Innovative Wireless Charging – Z-Mover Concept

Ground Assembly



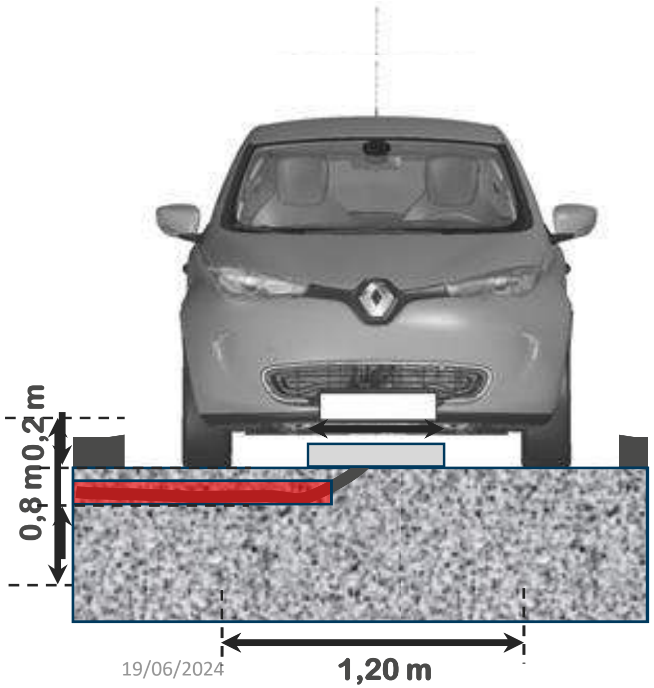
Coils + Track Supply Electronics
914 x 642 x 72 mm





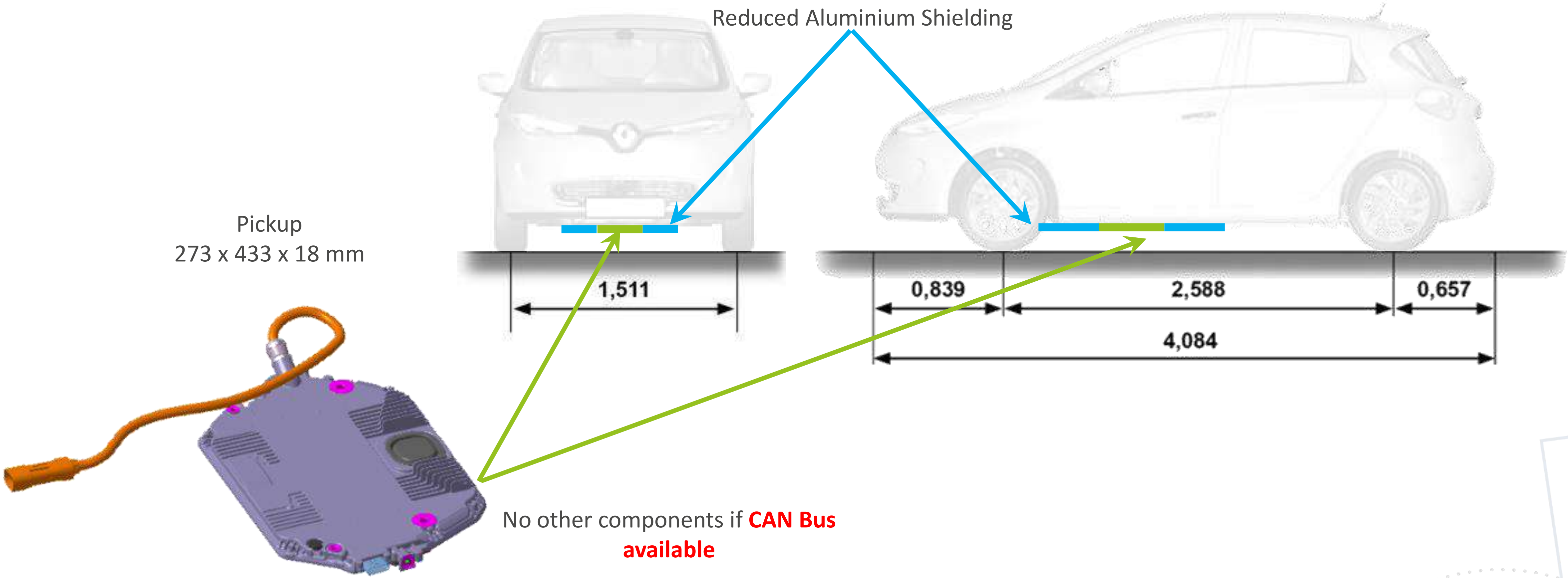
Innovative Wireless Charging – Z-Mover Concept

Ground Assembly



Innovative Wireless Charging – Z-Mover Concept

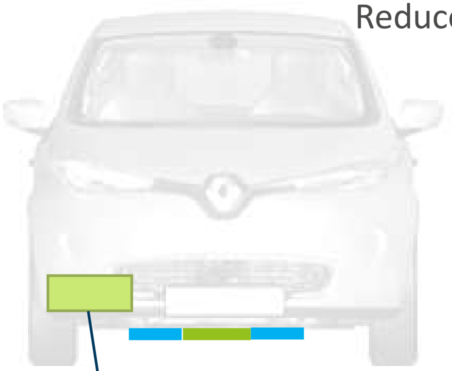
Vehicle Assembly



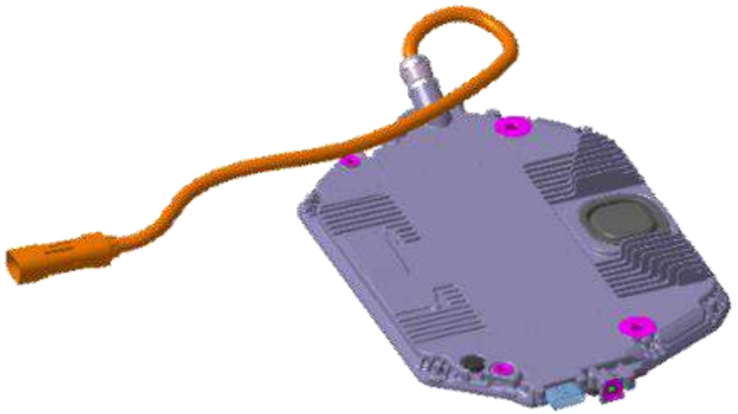
Innovative Wireless Charging – Z-Mover Concept

Vehicle Assembly

Reduced Aluminium Shielding



Pickup
273 x 433 x 18 mm



Extra component

No other components if **CAN Bus available**

Communication through CCS Connector
Software Bridge needed

Product overview

Vehicle unit (ORU) and charging infrastructure (PAD)

Electrical Data	Value Unit
Input Voltage, nominal	230 V
Input frequency	50/60 Hz
Input Current, max	16A
Input Power, max	3,6 kW

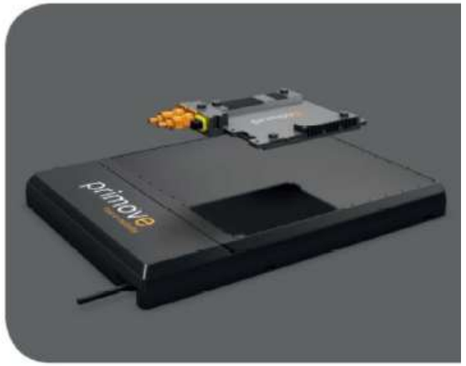
Mechanical Data	Value Unit
Ingress Protection	IP67 / IP69k
Weight	40 kg
Surface load, max*	1000/200 kg/cm²
Dimension (LxWxH)	914 x 642 x 72mm

Electrical Data	Value Unit
Max. Transient Overvoltage	500 V for 1ms
Output Power, max	3,3 kW
Output Current, max	12 A
Operating voltage, min	250 V
Operating voltage, max	465 V
Current consumption, Sleep Mode	200 µA

Mechanical Data	Value Unit
Ingress Protection	IP67 / IP69k
Weight	3,7 kg
Dimension (LxWxH)	273 x 433 x 18mm

FEATURES

Automatic



- No cables or plugs
- Automatic positioning system
- Ready for autonomous parking

Efficient

- High efficiency
- One system fits all vehicle heights
- Compact and light design

Safe

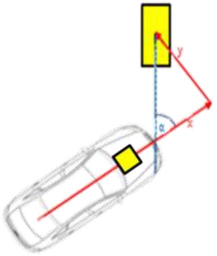
- Minimized electro magnetic emissions
- Integrated state-of-the-art metal detection
- No room for living objects

Z-Mover design

FEATURES

Positioning is an elementary function of wireless charging

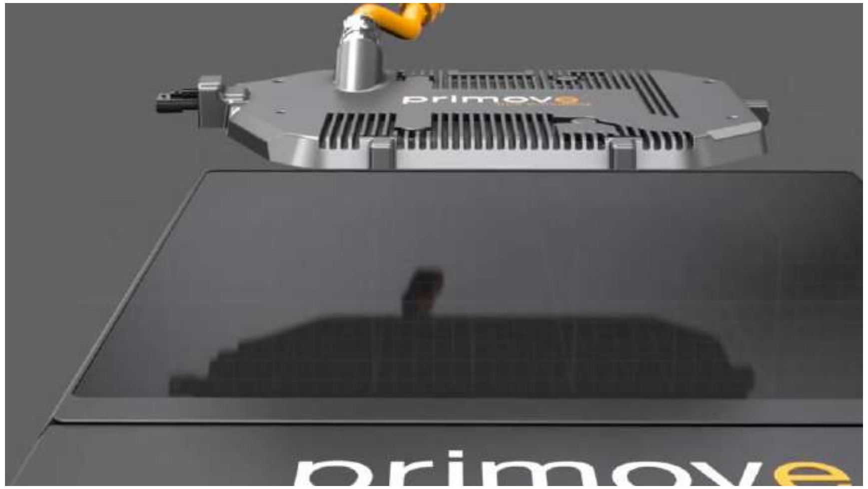
- End customer experience in form of assisted parking function
- Preparation for autonomous parking
- Robust operation in different environmental conditions
- Use cases (in order of occurrence)
- Range 6,5m
- Sufficient accuracy to meet use cases
- No components external to vehicle and infrastructure component
- Minimal interference with other vehicle systems (e.g. keyless entry)
- Stay below 6.25uT (ICNIRP98) in accessible areas

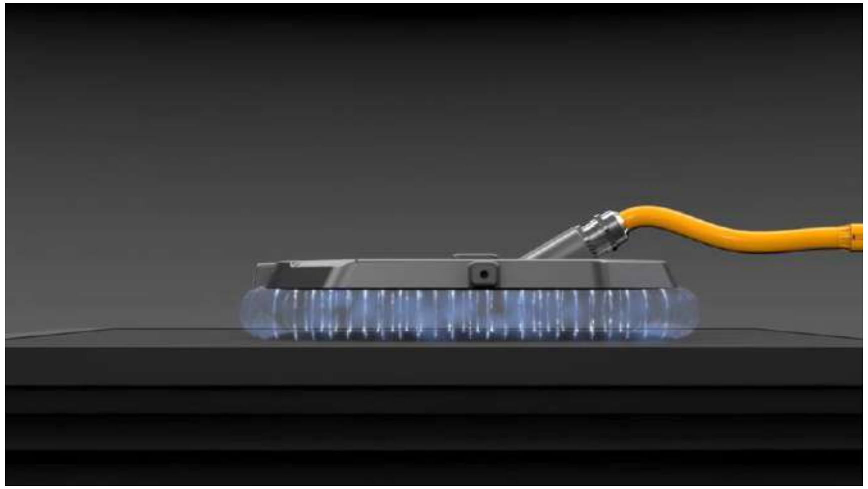


FEATURES

FOD Vehicle with specific teach-in process

- FOD-System suppresses metallic signature of car and vehicle coil
- Only additional metal will trigger the FOD shut-down
- No re-calibration / no delay or blind times
- Targets present before charge starts will be detected
- Continuous supervision for FOD during charging



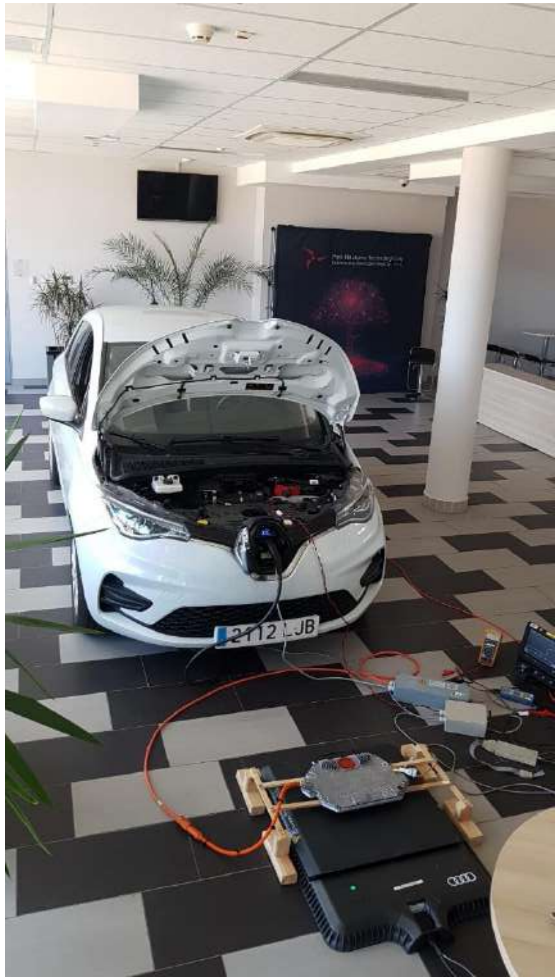


Pinch protection

Avoids potential hazards harming animal life (particularly pets / domestic animals)

INDUCAR Development

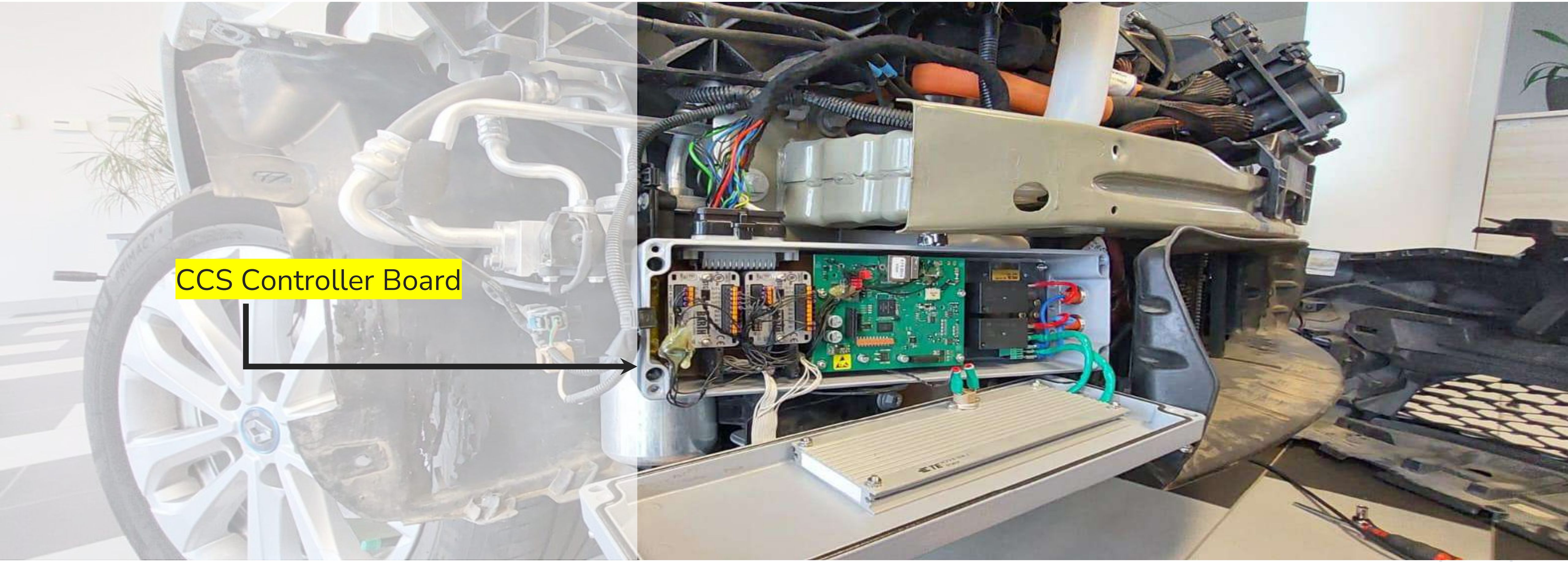
First results and feedback from demosite



PICKUP (ORU)

PICKUP (ORU)

Extra CCS Controller and timing protocols



Extra CCS Controller and timing protocols

Additional interface

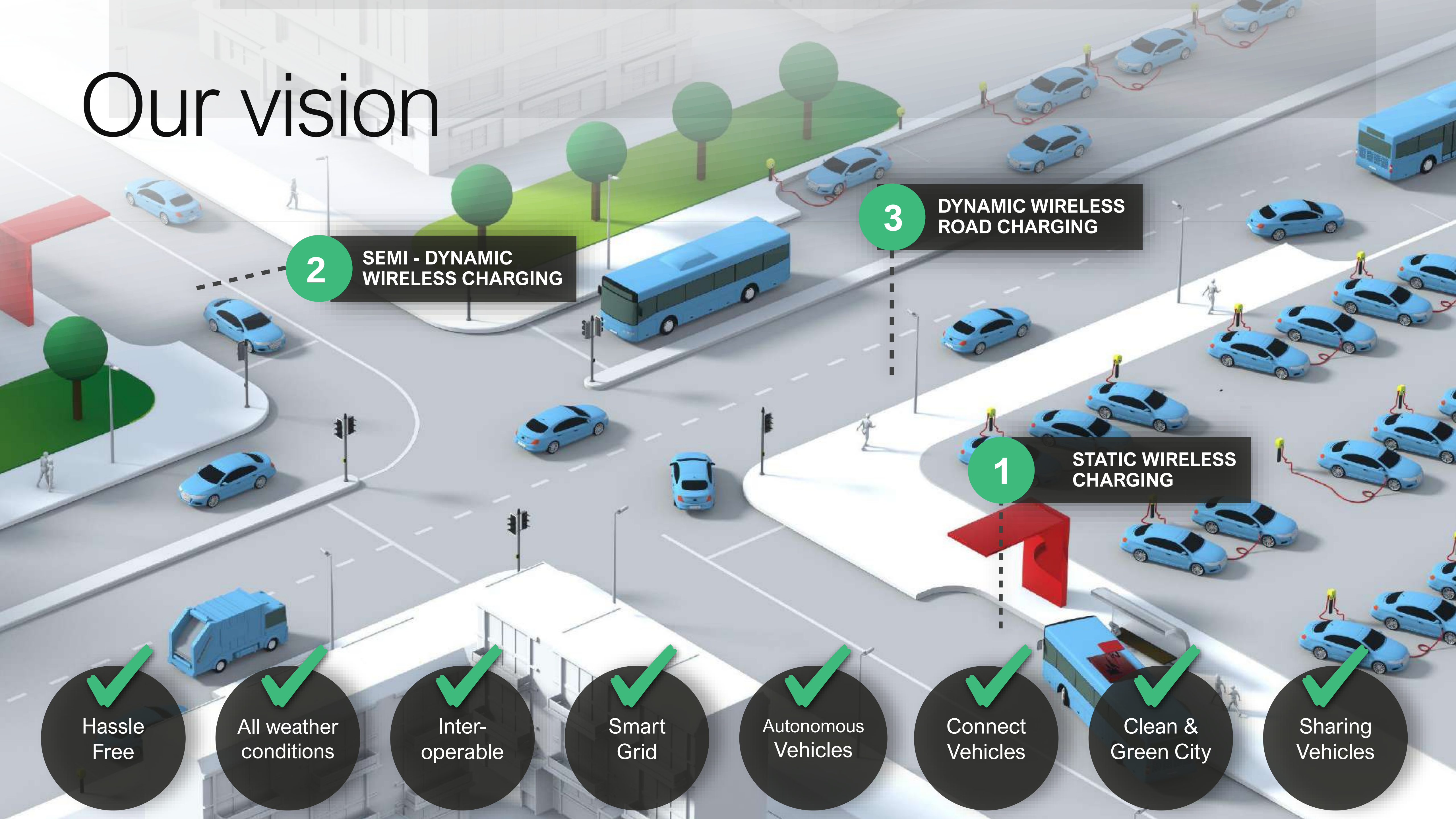

7882 LBD
3466 LBF
LEAF


RESERVAT
7882 LBD
AMB
USER-CHI
151
ZOE
2985 LGD


2985 LGD
2112 LJB


2985 LGD
2112 LJB

Our vision


2
SEMI - DYNAMIC WIRELESS CHARGING
3
DYNAMIC WIRELESS ROAD CHARGING
1
STATIC WIRELESS CHARGING
Hassle Free
All weather conditions
Inter-operable
Smart Grid
Autonomous Vehicles
Connect Vehicles
Clean & Green City
Sharing Vehicles

E-Mobility Charging solutions

Charging Heavy-Duty (Ships & Ferries)

> 100.000 kilometres
of wireless charged energy

2 + 2 new Ferries Norway
uses wireless charging energy

4 x 100 kW wireless charging stations

Charging Light-Duty (Fleets, Taxis and Cars)

12 personal car projects
of wireless charged energy

25 Cars in Europe
uses wireless charging energy

16 wireless charging stations 3 kW > 20 kW

Charging Heavy-Duty (Trucks and Buses)

> 25 million kilometres
of wireless charged energy

70 Buses in Europe
uses wireless charging energy

30 wireless charging stations (60 kW > 200 kW)

Dynamic Charging (Trucks, Buses and Cars)

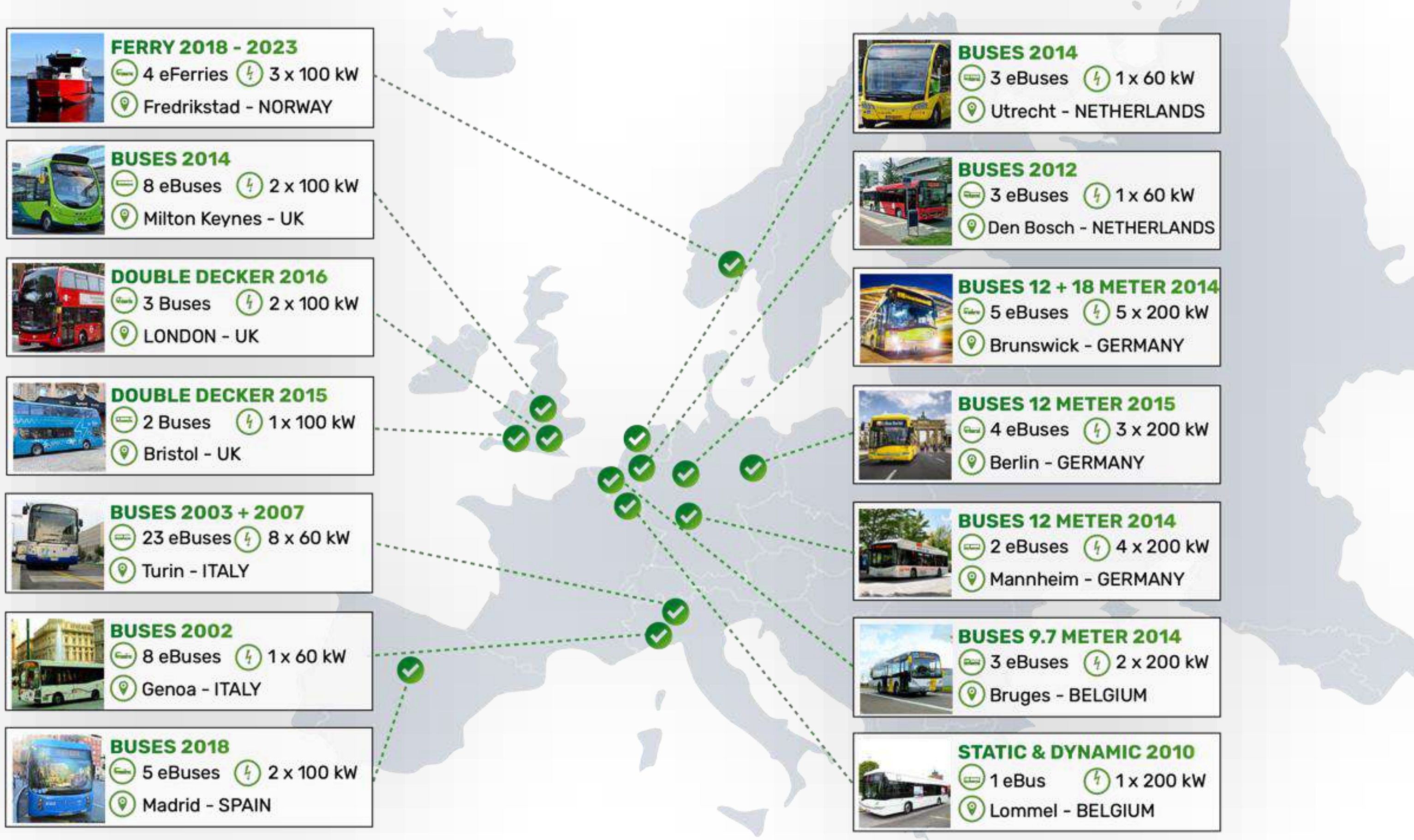
6 Dynamic road projects
of wireless dynamic charging

4 Buses and 1 Truck
uses wireless charging energy

- **Speed of 80 km/h**
- **Charging 180 kW**
- **>90% efficiency**

Heavy-Duty WPT Buses & Ships

- 18 years on the road, all WPT buses in Europe by ENRX **>25 Million wireless kilometres**
- More than 5 years on the water, all WPT E-Ferries by ENRX **>150.000 wireless kilometres**

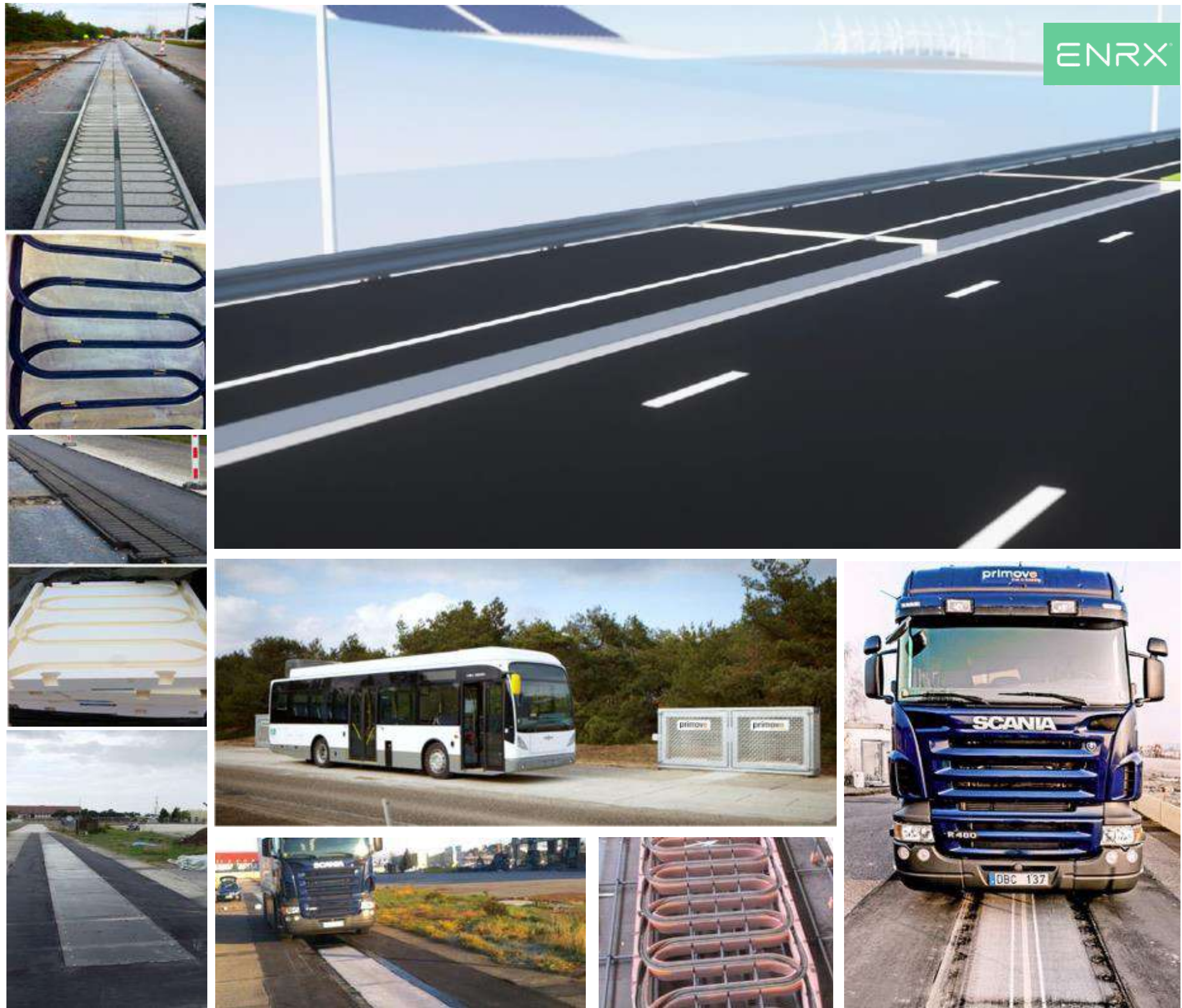


Dynamic Wireless Electric Roadways

ENRX proven track record in real-world applications:

- **2011:** First pilot with a bus in Augsburg, Germany
- **2014:** Two Pilots with a bus in Lommel, Belgium, Concrete and Asphalt pavement
- **2016:** Two pilots with Scania Truck in Mannheim, Germany
- **2022:** Next GEN Project InductInfra in Aachen, Germany
- **2024: Next GEN: ASPIRE NSF Engineering Research Center - Demonstrator Center in Utah, USA**
- **2026: Project CFX - Implements 1,2 km 'Next GEN' electric roadway in State Route 516, Florida**

180 kW power | **80 km/h** speed | **>90 %** efficiency



ENRX Next Generation Electric Roadway

Benefits at a glance:

- High-power 200 kW
- Unique protection of the battery from peaks
- Highest protection against EMC radiation
- Optimized for the civil engineering
- Maintenance-free and long lifetime

Unique interoperability: › Power Output Levels for Different Types of Vehicles and Batteries › Custom Distance (Air Gap): ground and vehicle › Dynamic & Static charging Combined › Interoperable with all different coil typologies (Continuous Homogeneous Field)

ENRX

INCIT-EV

LARGE DEMONSTRATION OF USER CENTRIC URBAN AND LONG-RANGE CHARGING SOLUTIONS TO BOOST AN ENGAGING DEPLOYMENT OF ELECTRIC VEHICLES IN EUROPE

External Meetings
INCIT-EV Project Highlights

General presentation of the project

June, 2024

Miguel Zarzuela
mzarzuela@fcirce.es

circe

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 875683.

Follow us on: https://www.incit-ev.eu/

INCIT-EV Overall Project Introduction

INCIT-EV is a European project **led by CIRCE** in which **electric vehicle charging technologies** will be developed and validated in **five European countries**, thus improving the user's perception of electric mobility.

REFERENCE CITIES IN EUROPE

INCIT-EV PROJECT

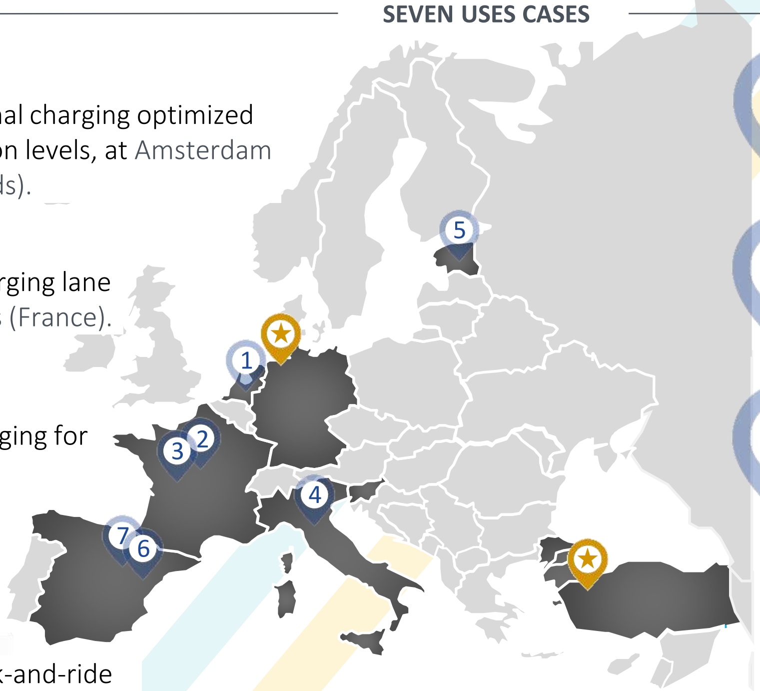
SEVEN USES CASES

UC1 Smart and bi-directional charging optimized at different aggregation levels, at Amsterdam & Utrecht (Netherlands).

UC2 Dynamic wireless charging lane in urban area, at Paris (France).

UC3 Dynamic wireless charging for long distance – e-road prototype, at Satory (Versailles, France).

UC4 Charging hub in a park-and-ride facility, at Turin periphery (Italy).



UC5 Superfast charging with VPP, at Tallinn periphery (Estonia).

UC6 Low power DC bidirectional charging infrastructure for EV, including two-wheelers, at Saragossa (Spain).

UC7 Opportunity wireless charging for taxi queue lanes in airports/central stations, at Saragossa (Spain).

TWO FOLLOWER LOCATIONS

- Bursa (Turkey)
- Norderney (Germany)

INCIT-EV in figures

18,6M€ budget
15M€ funded by the European Commission
32 partners are directy involved in the project
52 months long. January 2020 - June 2024
More than 7 innovative solutions


VEDECOM

INCIT-EV Consortium

CIIRCE coordinates the INCIT-EV project, to improve the experience of electric vehicle (EV) driving with a consortium of 32 partners from eight countries

INCIT-EV

Project Objectives

INCIT-EV aims to demonstrate, at five demonstration environments, an innovative set of **charging infrastructures**, **technologies and its associated business models**, ready to improve **the EV users experience** with the ultimate goal of **fostering the EV market share** in the EU.

EV users preferences and expectations

3,475 EV drivers engaged

Grid Congestion
Smart Energy / Charging
Interoperable payment

Decision Support System for mobility planners

V2G ready
30 kW modules

Wireless Charging
90 kW Static and Dynamic

Up to 130 km/h

Wireless Interoperability
In all demos

Promote investment in charging infr **Attractive Business Models**

Low cost scalable V2G AC and DC chargers
3,7 to 200 kW

8.87 M€ investment on the Use Cases
Regulation and standards
Based on Project devep

2 – Needs of users and adaptation of electric vehicles

Pains and gains of the users (4800 surveys)

EV USERS

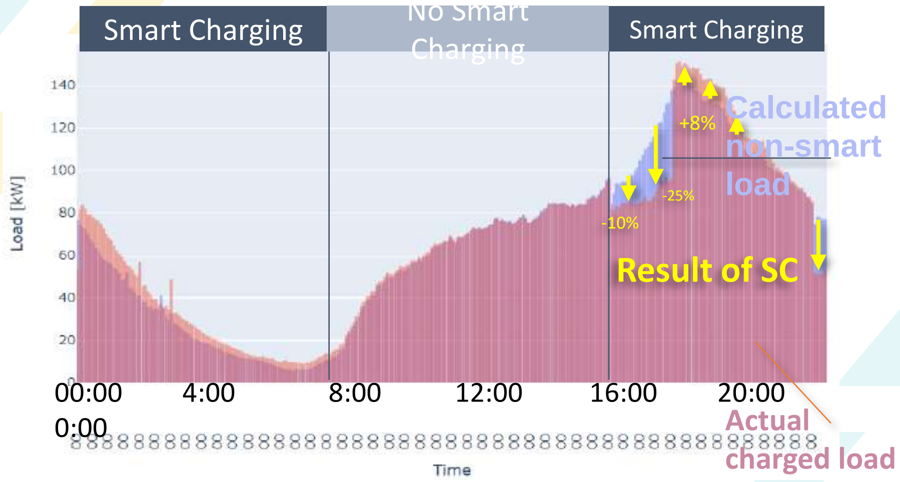
- Seamless and **reliable** charging
- Fast and interoperable charging for travels
- Charge at home/work (slow)
- Integration of EV battery in smart grids
  - EV batteries for solar charging
  - EV batteries as energy back-up

GRID OPERATORS

- EVs as storage for RESs / Grid (demand side)
- V2G / Smart charging for ancillary services
  - Frequency, voltage and reactive regulation
  - Smart charging – Flexible Demand!!
  - Load balancing

Smart Charging and V2G demonstrators

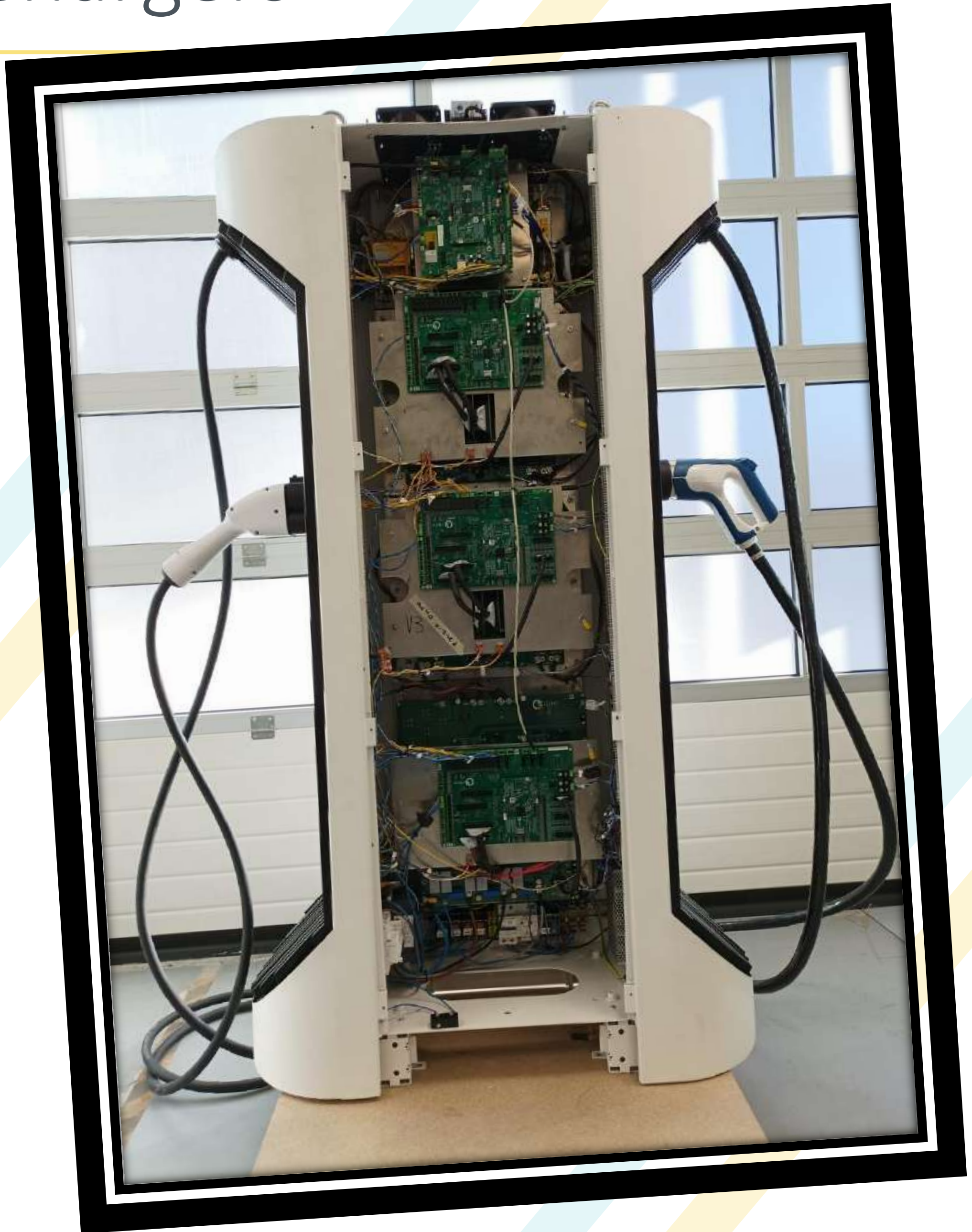
- Smart Charging algorithms in operation in 250 charge stations of Total in Netherlands joined Congestion Markets (GOPACs)
  - 100 kW Steering capability in real bids
- Communication works with ISO 15118-20 for V2G for AC and DC
- 25 kW V2G charger with grid support services – CCS + CHAdeMO
  - 96-97% charger efficiency and 89% full V2G including chemical losses



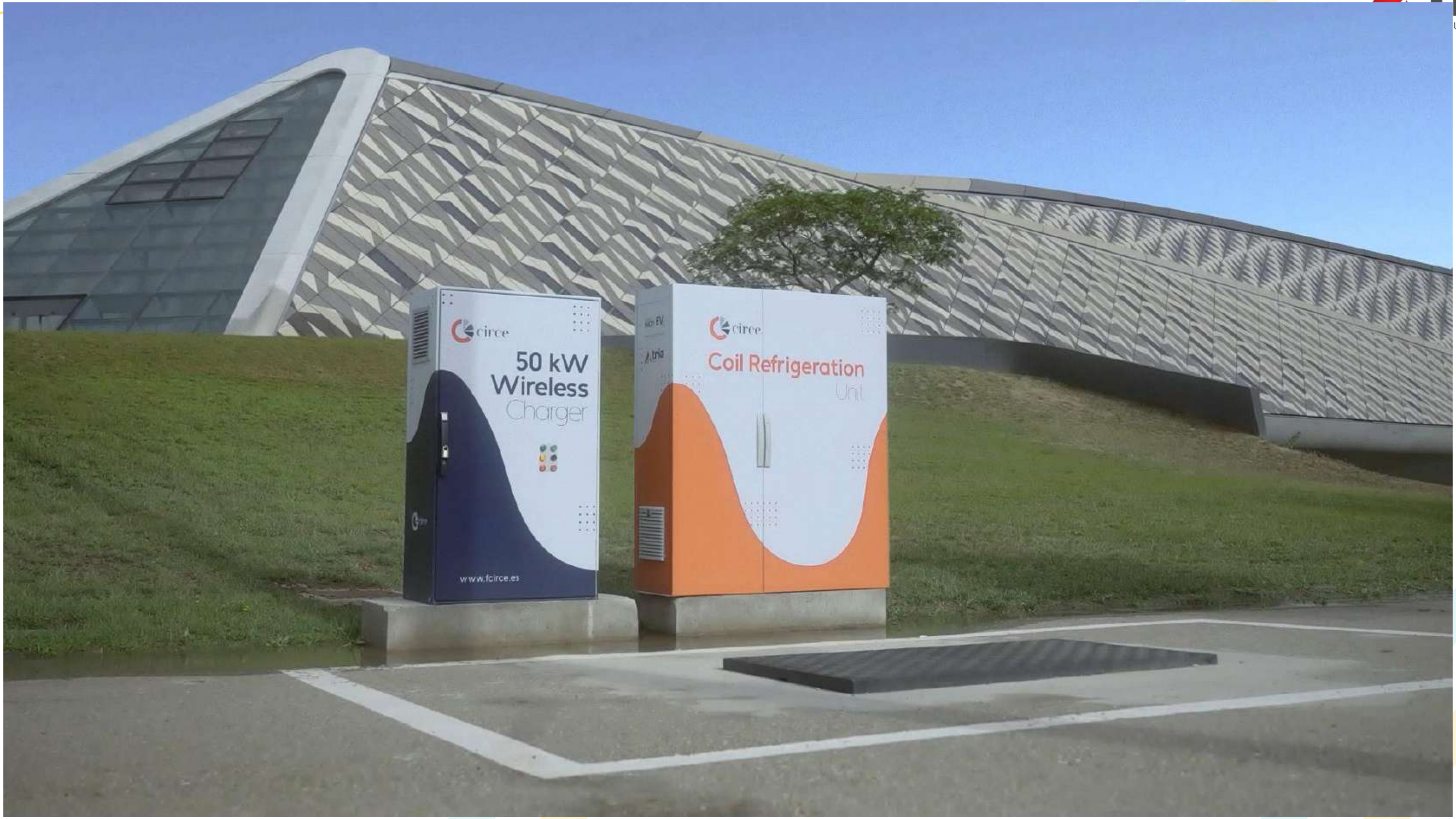
25 – 200 kW V2G SiC Chargers

25 kW V2G charging station:

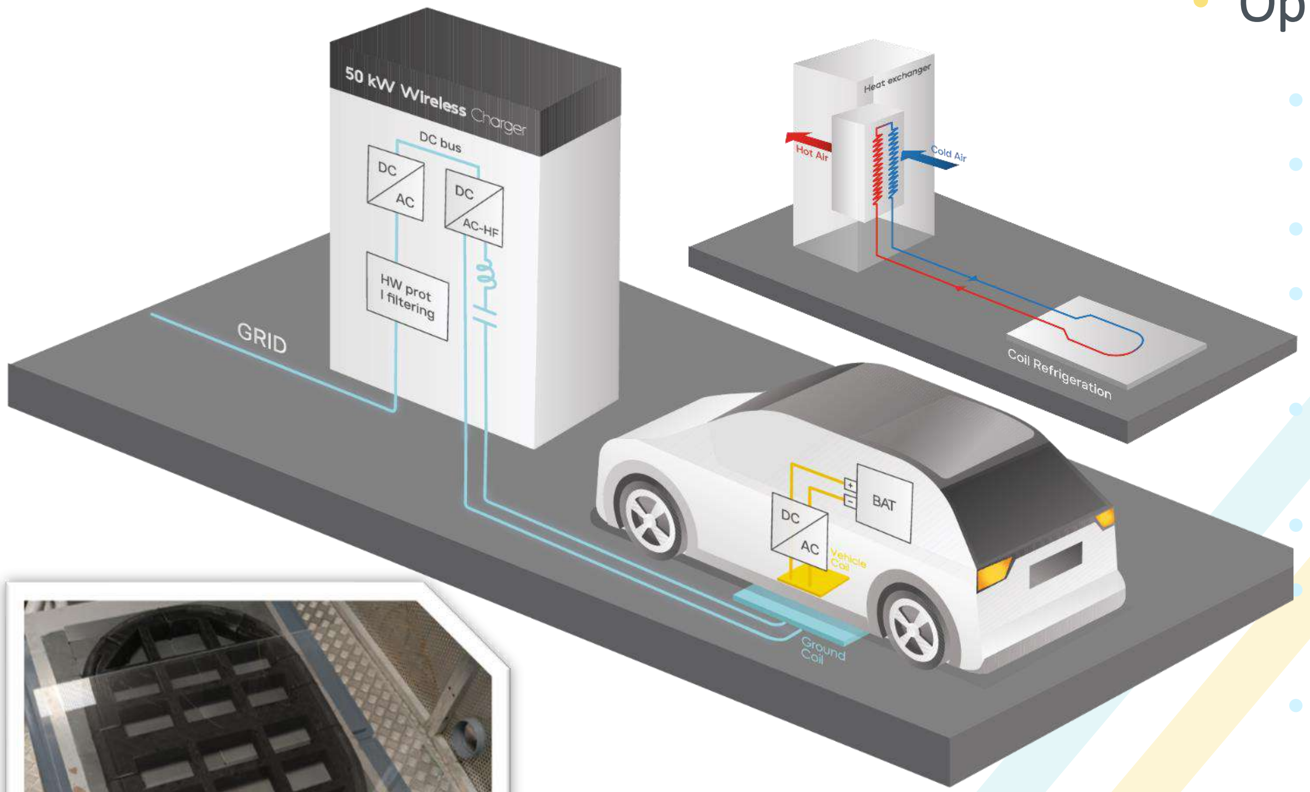
- 25-kW bidirectional charger enclosure (low cost design)
- V2G and V2V CHAdeMO & CCS tests (ISO 15118-20 vehicles not available)
- Improved thermal efficiency AC/DC and DC/DC
- >97% Charging Efficiency with high frequency switching (83-125 kHz)



Static 50 kW Wireless Charging in Zaragoza



Static 50 kW Wireless Charging in Zaragoza



- Opportunity wireless charging system:
  - A highly replicable model
  - Designed for **static wireless 50 kW**
  - Pavement integration
  - Refrigeration needs for continuous operation
  - **Up to 85-90% charge efficiency** vs conductive charging (testing pending)
  - Misalignment accepted **up to 25%**
  - Vehicle detection, communication and energy billing
  - Seamless user charging experience

  - <u>UC designed for Taxi Queue</u>
  - 50 km charged every 10 min

  - Lower power can be used for <u>premium charging experience</u> at home

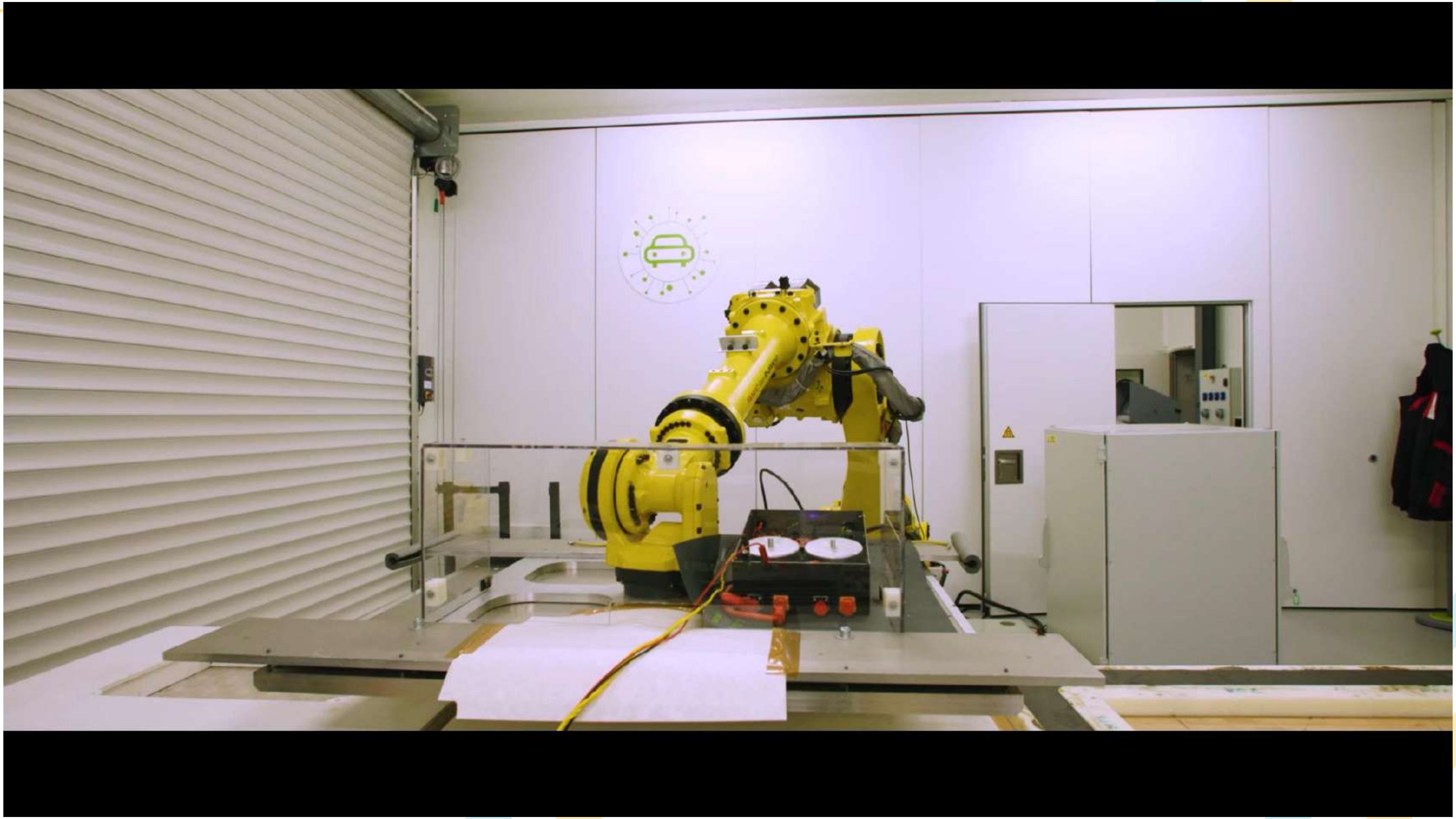
WP7 Use cases deployment and demostration in areas.
UC7: opportunity charger

WP8 Use cases deployment and demostration in areas.

Dynamic Wireless Charging

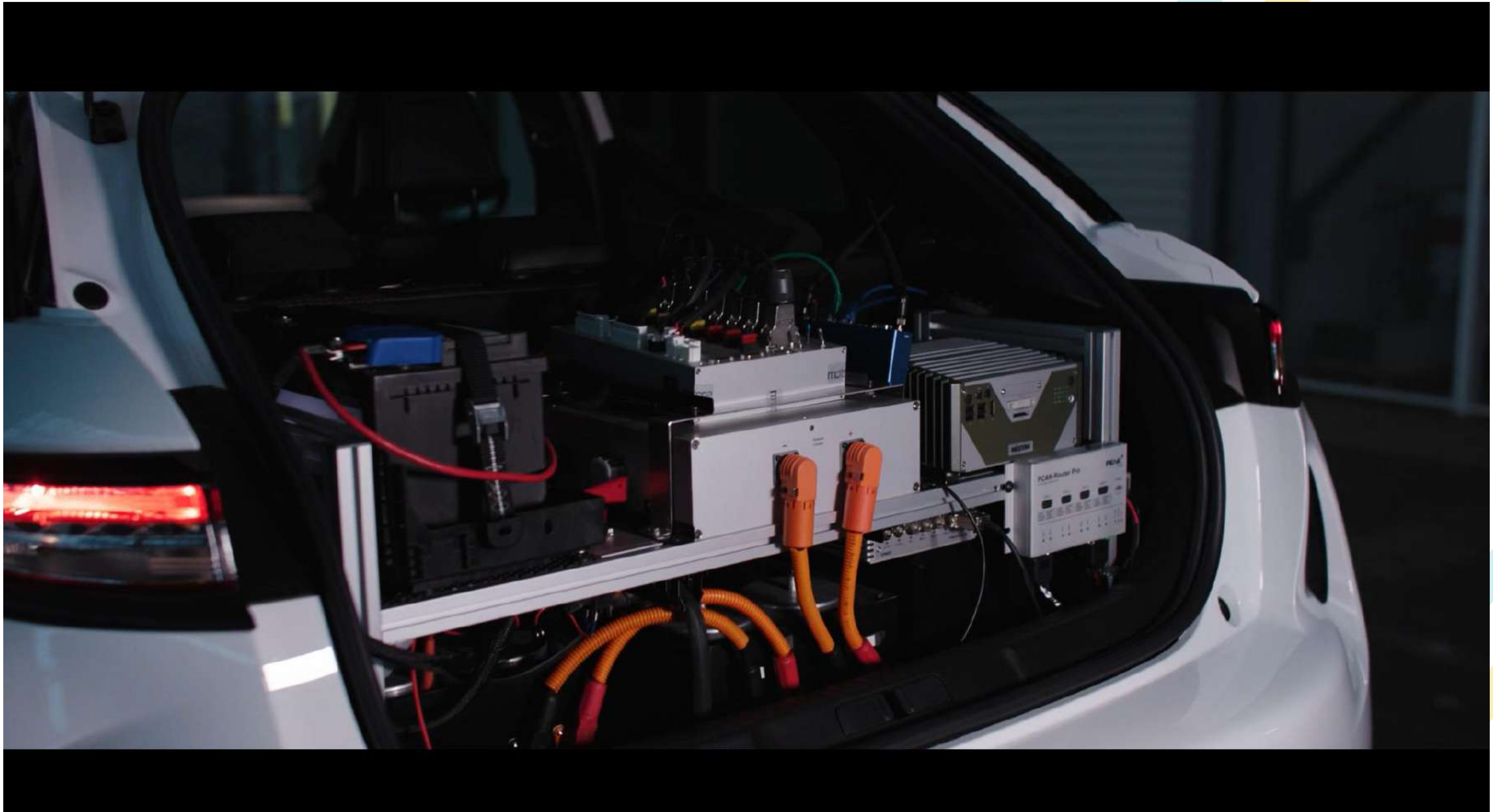
WP8 Use cases deployment and demostration in areas.

Dynamic Wireless Charging



WP7 Use cases deployment and demostration in areas.

Vehicle Power Electronics



WP8 Use cases deployment and demostration in areas.

Dynamic Wireless Charging

6 – Contribution to future standards

INDUCTIVE

- **INCIT-EV is paving the standards**
  - Interoperability of all cars and tracks
  - Up to 3 coils per vehicle (90 kW)
  - High frequency operation (85 kHz) for inductive high-power transfer
  - Large misalignment operation
  - Reference project for high power inductive charge in cities and highways
  - Required further standarisation demand side
    - Onboard secondary coil definition
    - Interoperability for all systems

CONDUCTIVE

- **INCIT-EV Recommendations**
  - Easy Smart Charging for End Users and CPO
    - Demand side flexibility
    - Reduce Grid Congestion
    - Reduced EV Charging Costs
    - Increase Renewable Share
  - V2G AC Tests – ISO 15118-20 (vehicle side issue)
  - Impressive potential of V2G to increase grid battery storage
    - Storage Schemes Pending
  - Ancillary services provided by EV charging
    - Frequency, voltage and reactive regulation
    - Smart charging – Power optimization
    - Load balancing
    - Economic pending

Synergy Club: Collaboration with sister projects

- 19 projects were identified with INCIT-EV synergies
  - In 2021 we create the Synergy Club: between “the sister projects” of the same H2020 call: INCIT-EV, USER-CHI, eC4D, and E-smart.
  - regular exchange on results (2 times a year)
  - Work on common recommendations / demonstrations / technical collaboration

Final Event - Paris

- Final Event planned for **June 26th** in Paris
  - Online and in person attendance
  - Subscribe to INCIT-EV Newsletter to be informed

https://www.incit-ev.eu/

Thanks for your attention!

https://www.incit-ev.eu/

Miguel Zarzuela / mzarzuela@fcirce.es

Smart Charging
WP4 SMAC

SMAC Study Germany

Final Event, June 18th, 2024

Author: **Lars Balzer, Qwello GmbH**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

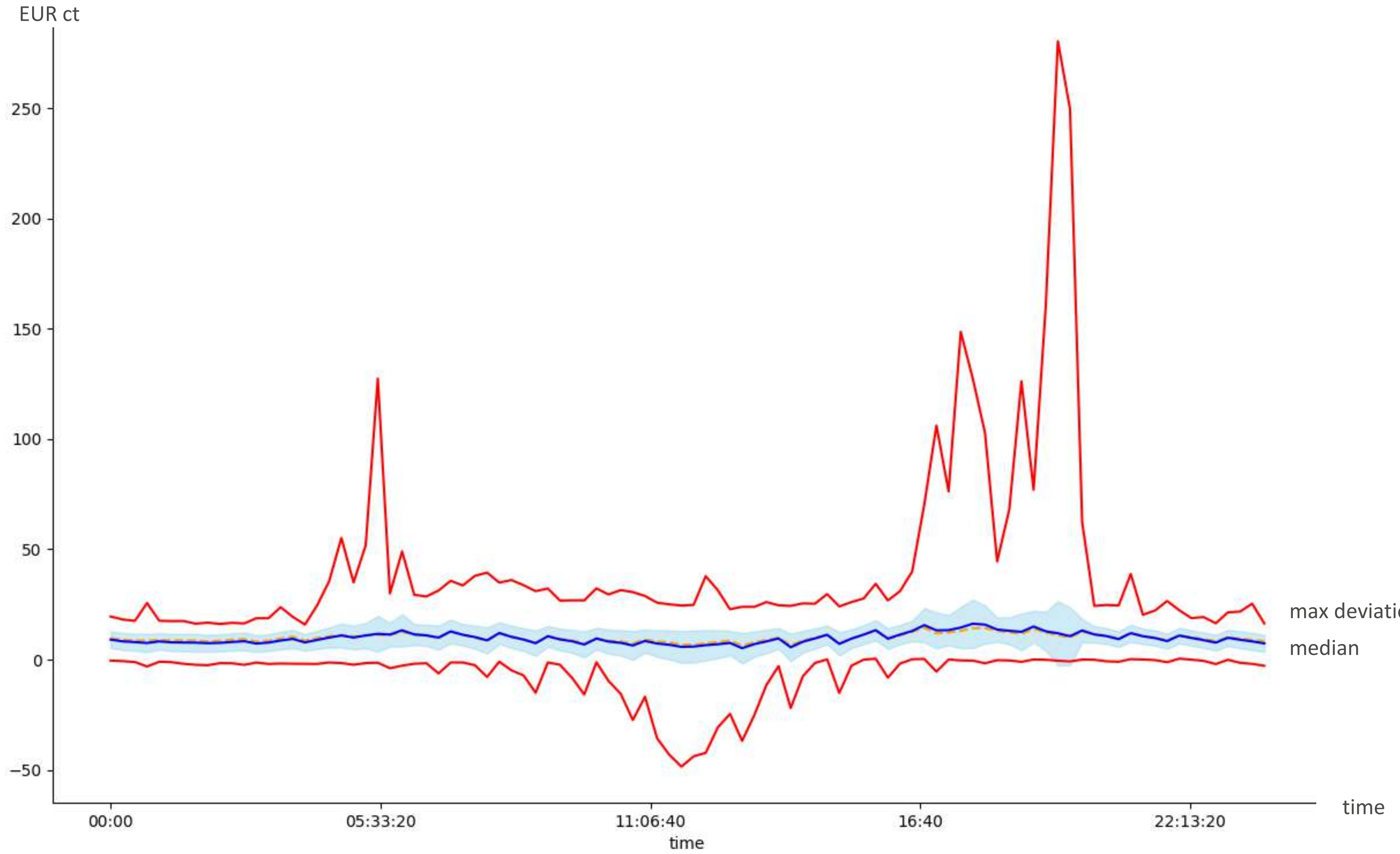
Smart Charing to support “Energy Transition” in Germany

- **80% renewables until 2030 (52% in 2023)**
- **Increase of volatility in energy production vs consumption**
  - **Number of hours with negative energy prices increasing**
  - **40 new gas plants to cover peaks**
- **Estimated costs 721 billion EUR…just Germany**

→ Flexibilization needed

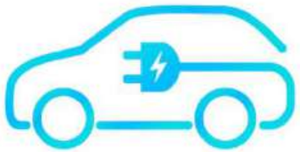
The volatile energy market offers opportunities for smart charging

15min intraday EPEX prices 2023 in ct



Source: https://www.energy-charts.info/charts

Germany is different



Largest EV Fleet in Europe with >2,4 mio vehicles

Insufficient charging infrastructure

§

- Highly regulated
- Very complex
- German Calibration Law (Eichrecht)

"Energiewende" with shutting down of nuclear power and coal

Lacking smart meter rollout
…thanks to German complexity

>800 DSOs with different grid connection regulations

Simulation with real data in 3 SMAC scenarios

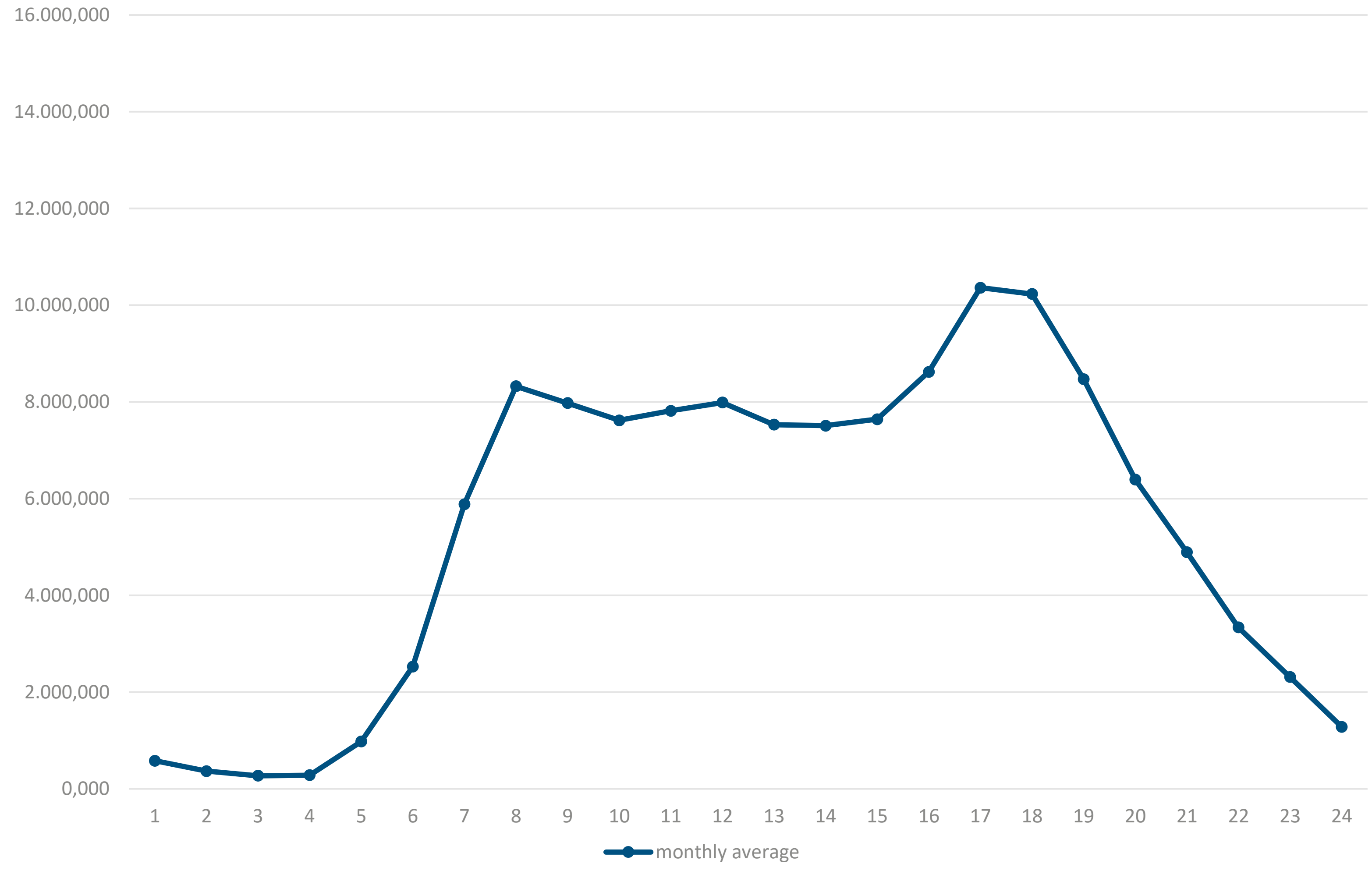
Real user behavior 2023

- **80,117 charging sessions**
- **283 charge points (CPs)**
- **118 locations**
- **>20 cities and municipalities**

1. Intraday stock price vs monthly average
2. Intraday stock price optimized
3. Intraday plus 1 hour optimized

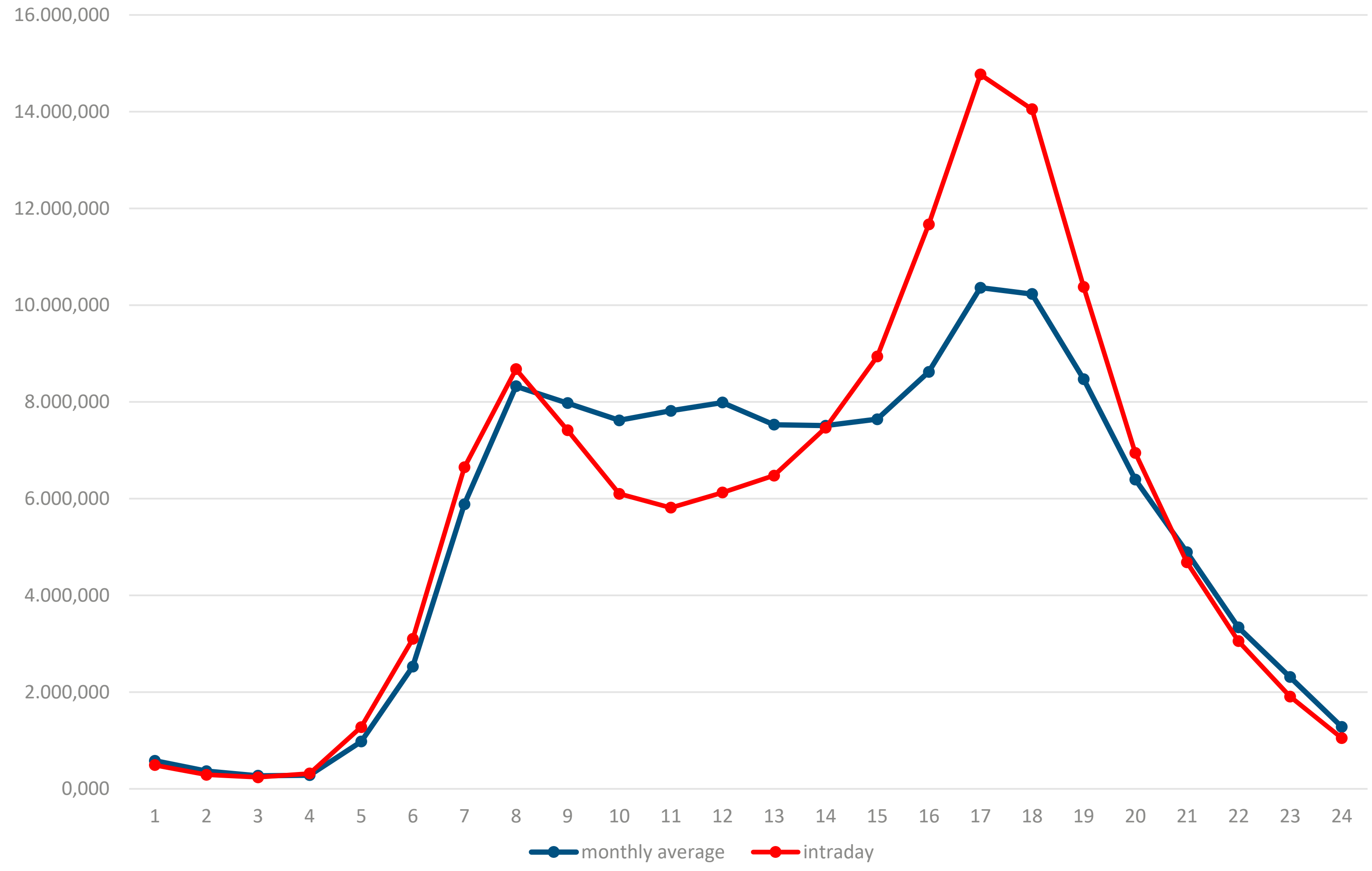
The monthly average shows the classic duck curve

Scenario comparison on average hourly basis in EUR, Qwello data



The intraday approach is more expensive for a CPO

Scenario comparison on average hourly basis in EUR, Qwello data

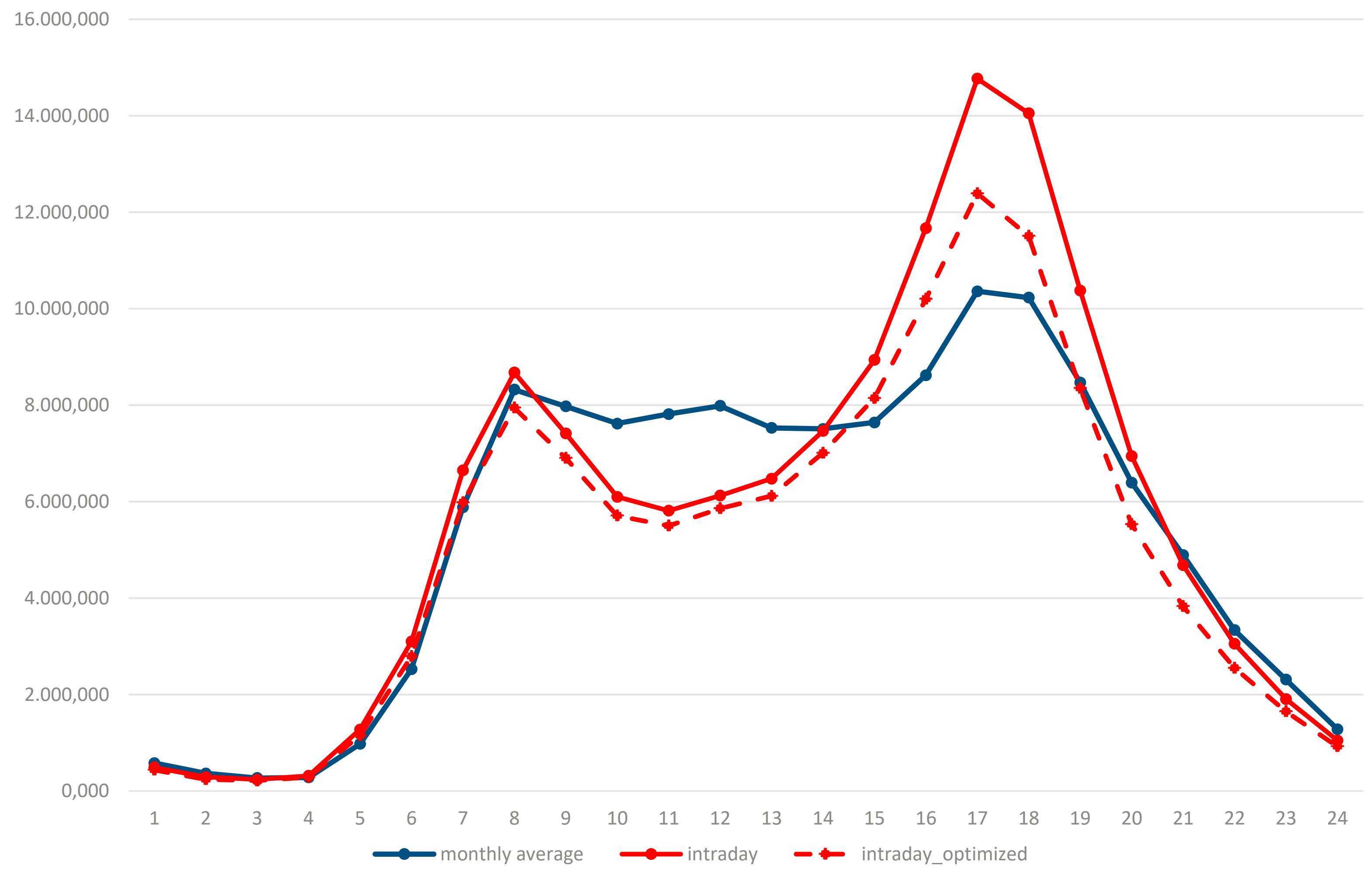


Savings for the CPO on power generation price compared to the monthly average:

- Scenario 1, intraday: -6,7%

An optimization within the regular sessions grants 6,2% lower cost

Scenario comparison on average hourly basis in EUR, Qwello data

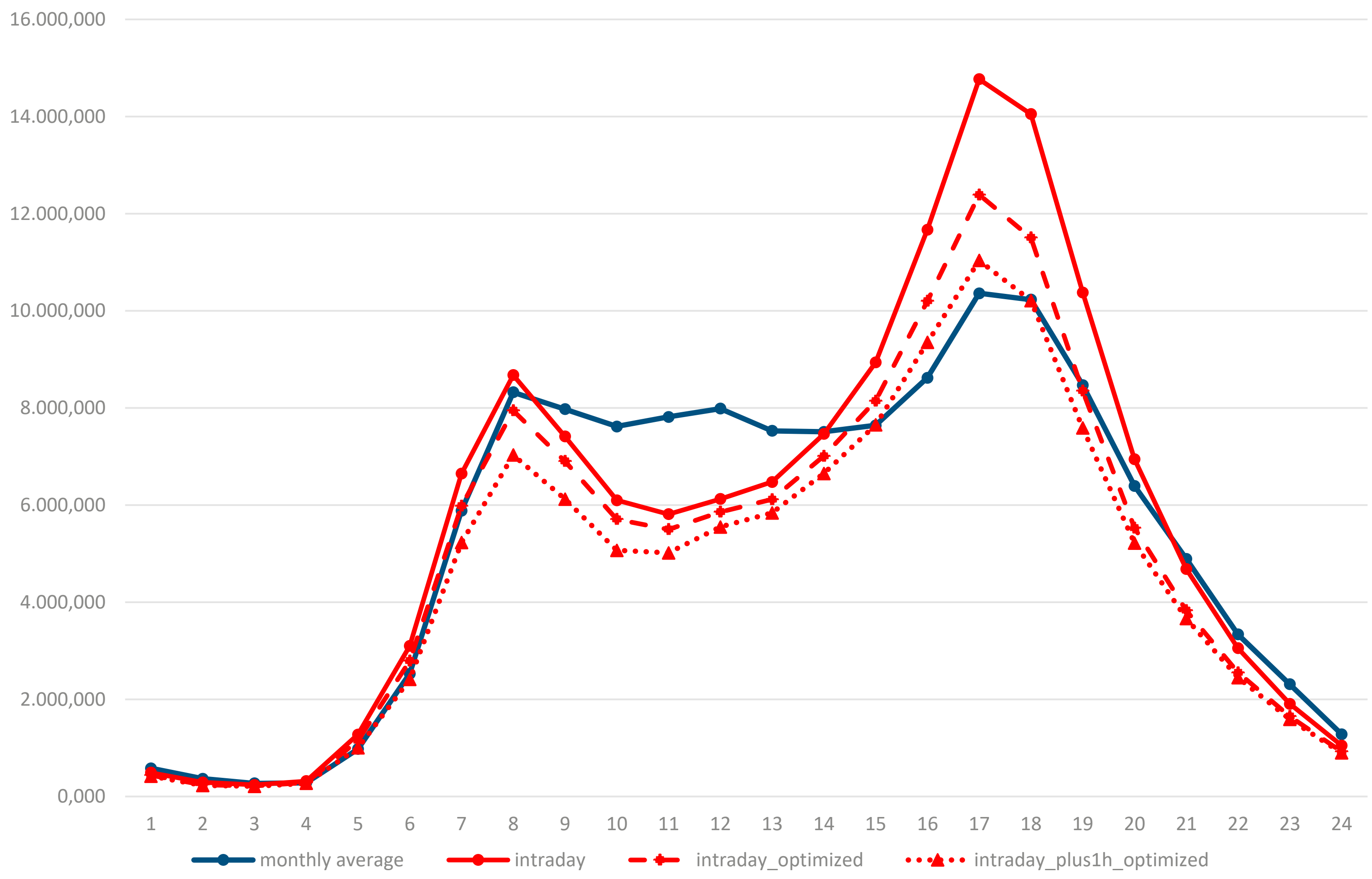


Savings for the CPO on power generation price compared to the monthly average:

- Scenario 1, intraday: -6,7%
- Scenario 2, intraday optimized: +6,2%

1h more flexibilization already allows 14,3% savings

Scenario comparison on average hourly basis in EUR, Qwello data



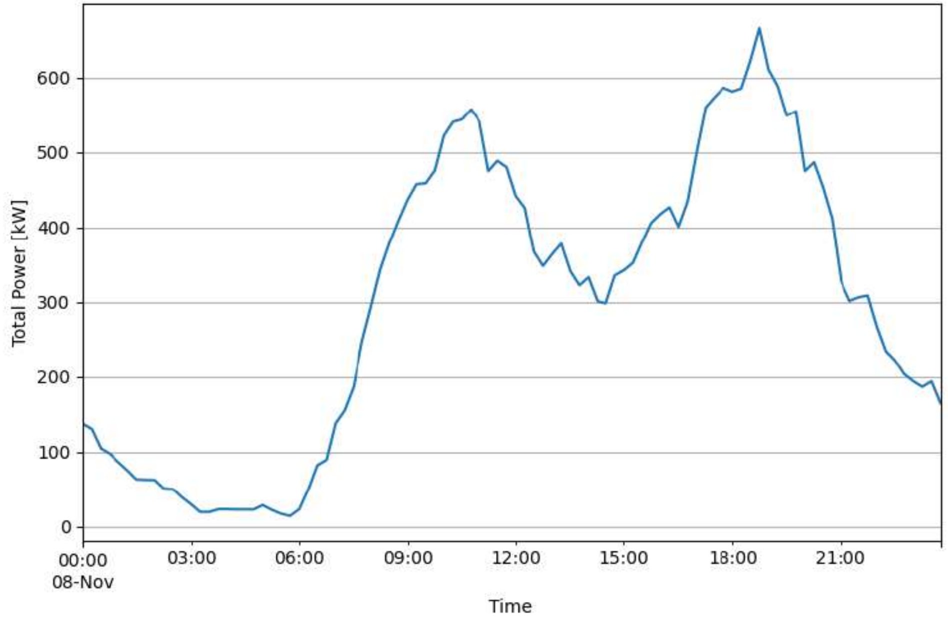
Savings for the CPO on power generation price compared to the monthly average:

- Scenario 1, intraday: -6,7%
- Scenario 2, intraday optimized: +6,2%
- Scenario 3; intraday plus 1h optimized: +14,3%

Power generation price makes approx. 43% of the total energy cost to CPO

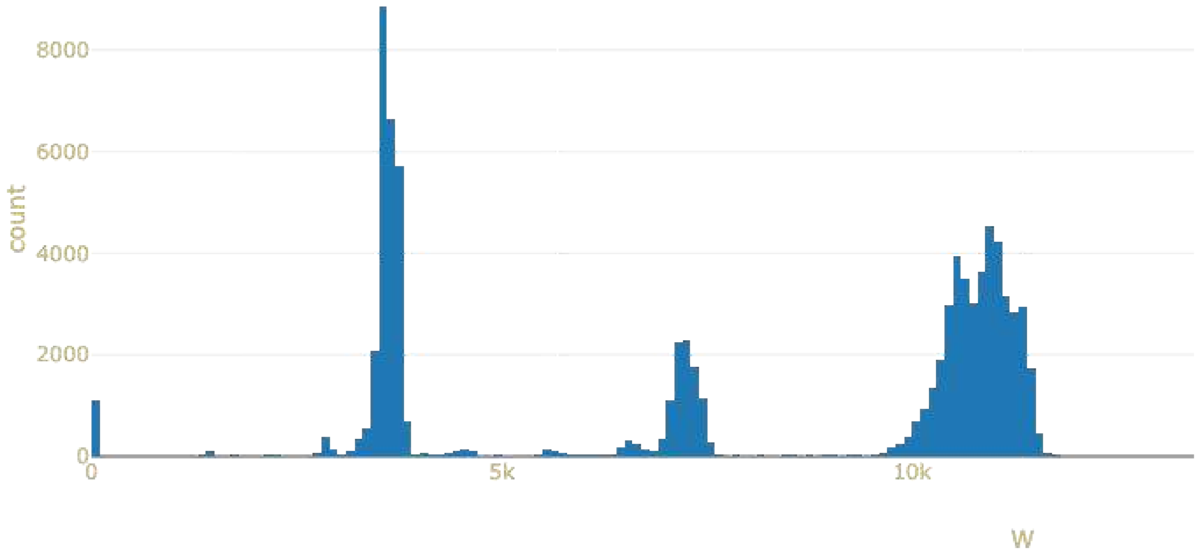
Ways to increase SMAC impact and balance the grid

1. Influence charging behavior



Load curve over a typical day

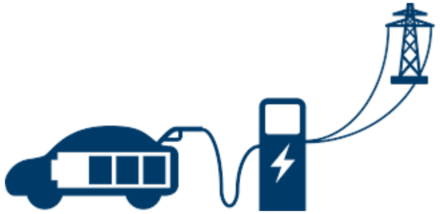
2. Shift to BEV and 22kW onboard converters



Max power from vehicles

3. Overcome legal barriers and align regulations

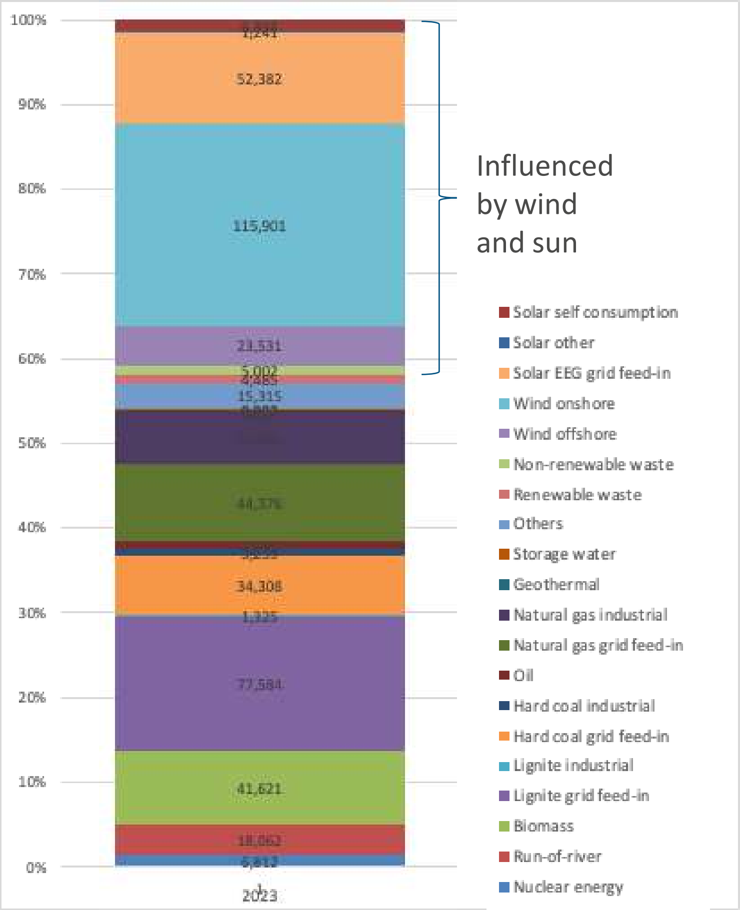
4. Vehicle to Grid (V2G)



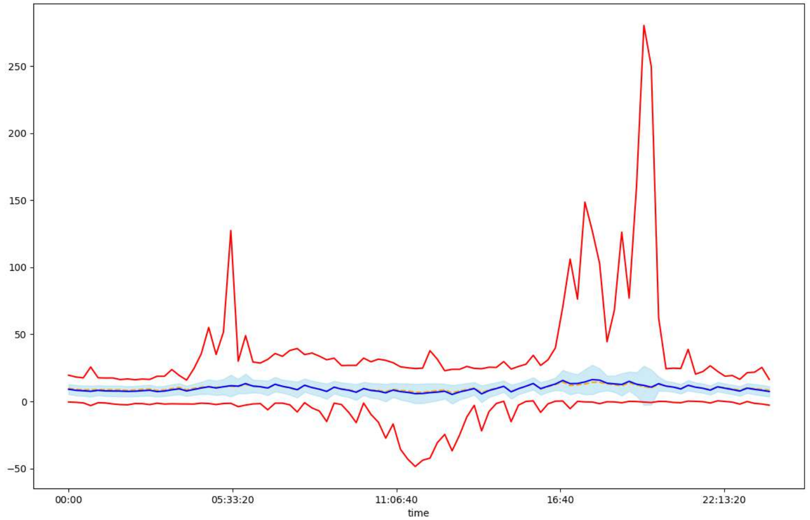
Thank you !

The volatile energy market offers opportunities for smart charging

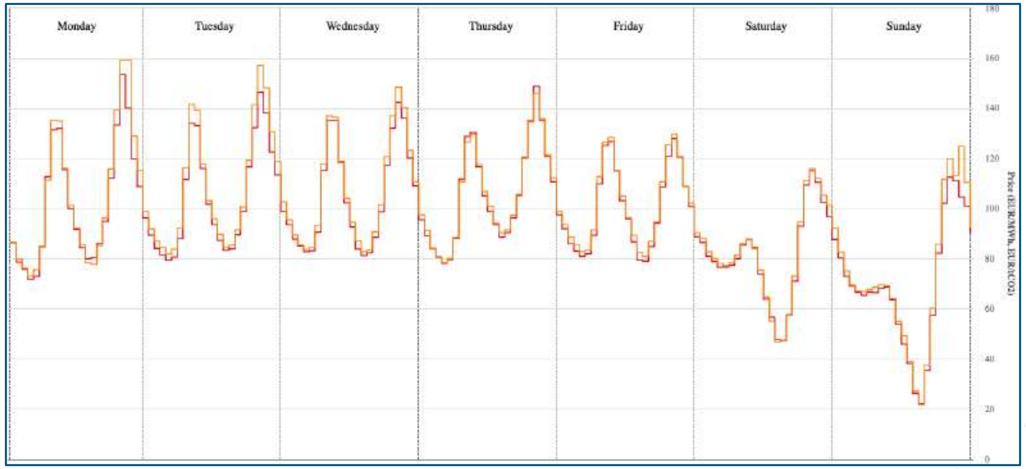
Energy mix in Germany 2023



15min intraday EPEX prices 2023 in ct

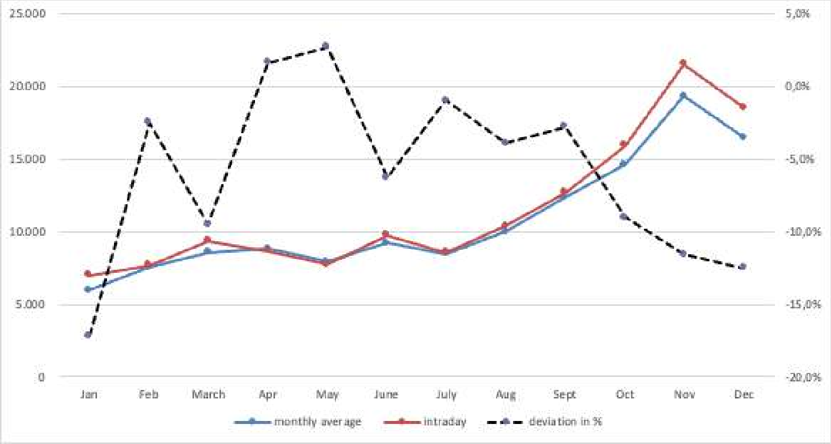


Average weekly day ahead and intraday energy prices 2023

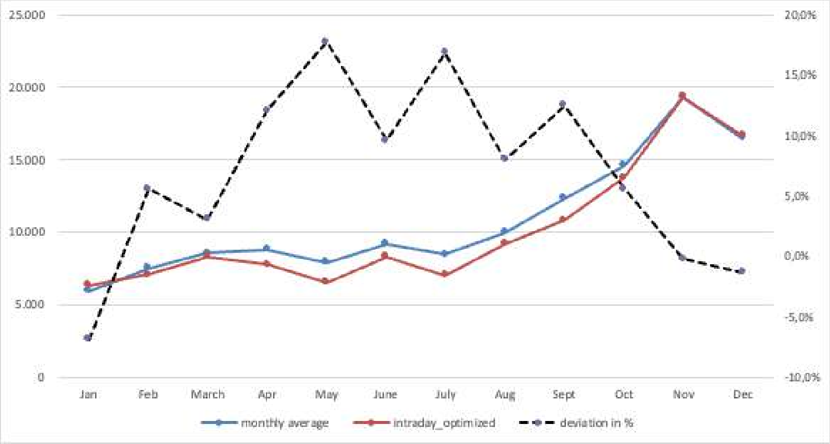


Scenario 3 is granting highest savings for the CPO - User

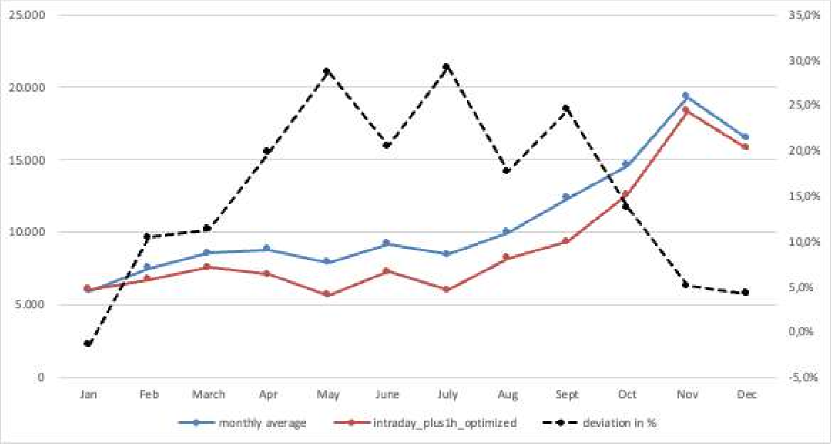
Scenario 1: Intraday stock price vs monthly average



Scenario 2: Intraday stock price optimized



Scenario 3: Intraday plus 1 hour optimized



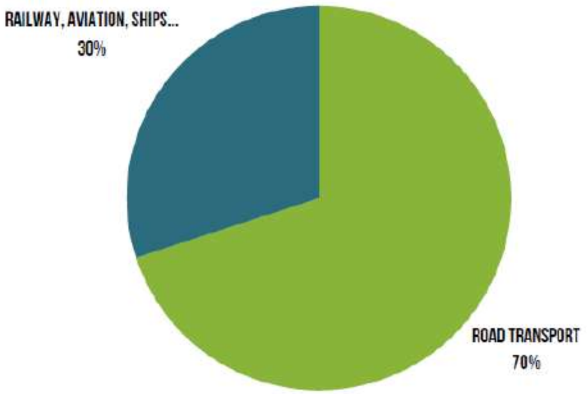
POLICY RECOMMENDATIONS

Thomas Lymes, Eurocities Policy Advisor

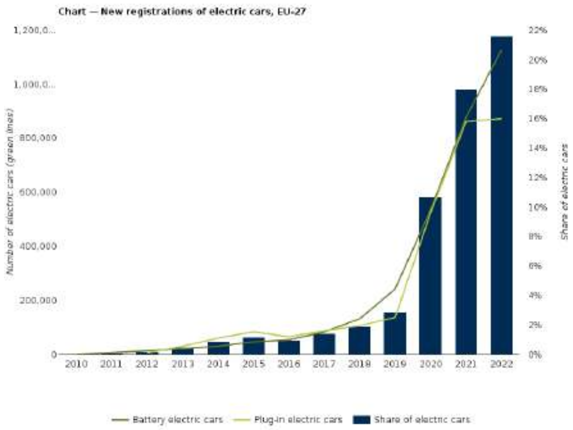
Date: **18/06/2024**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [875187]

CONTEXT



Source: EEA



Source: EEA

In 2022, 70% of EU transport emissions came from road transport, contributing to air and noise pollution in European cities.

The share of electric vehicles (EVs) is growing rapidly in Europe, with electric car registrations in 2022 accounting for 21.6% of total new car registrations.

➡ This growth must be matched by the deployment of a **reliable, affordable, and coherent charging infrastructure** throughout a dense European network in both urban and non-urban areas.

The role of EU-funded projects

EU-funded projects such as USER-CHI are essential to finance, test and demonstrate innovative charging solutions and deployment schemes as well as gathering knowledge on ***what*** is needed in terms of enablers and regulations for a coherent deployment of charging infrastructure in the EU.

Contributions from local authorities

Feedback and lessons learned from demo sites

Community of practice and Best practices platforms

Webinars and workshops

AFIR – a major revision impacting the deployment of charging infrastructure in Europe

Art 3 – Targets for LDV recharging infra

National fleet-based targets

1.3 kW power output per BEV and 0.8 kW power output per PHEV

Target to be met on 31 December of every year, starting from year after legislation comes into force

"Sunset clause": target no longer applies once share of BEV in national LDV fleet reaches 15%

TEN-T distance-based targets

Target date	Scope	Minimum capacity requirement every 60 km (in each direction of travel)
31 December 2025	TEN-T core[3]	400 kW
31 December 2027	TEN-T core	600 kW
	50% of comprehensive TEN-T	300 kW
31 December 2030	TEN-T comprehensive[4]	300 kW
31 December 2035	TEN-T comprehensive	600 kW

Derogations (to be requested by Member States)

50% reduced power output on roads with less than 8,500 LDV/day

Increased distance of up to 100 km on roads with less than 3,000 LDV/day

+

Easy payment

Ad hoc payment at all ***new*** publicly accessible recharging points

P≥50kW: payment card readers / contactless (NFC)

for P<50kW: + internet-based payments, eg via safe and specifically generated QR code

Retrofitting of existing points P>50kW along TEN-T by 1 January 2027

Fair, transparent and easily comparable prices

CPOs to charge reasonable, easily and clearly comparable and transparent prices; no discrimination between ad hoc price and contract-based price, nor between different MSPs

at P≥50kW: ad hoc price shown; at P<50kW: ad hoc price made easily available

At P≥50 kW only price per kWh and occupancy fee are allowed

CPOs & MSPs to make prices and components/fees known prior to start recharging session

RECOMMENDATIONS FOR EU POLICY MAKERS

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

Mainstream and coherent regulation to send strong regulatory signals

- **Coherent integrated regulations in key areas impacting the EV market**: e.g Weights and Dimensions Directive, Greening Corporate Fleets Initiative, EU pollutant emission standards/Euro 7, CO2 standards for new cars and vans
- **Upholding current regulations**, particularly the agreed CO2 standards for cars and vans, is crucial **for the incoming European Commission**.
- These measures will offer **clear and strong regulatory signals to support long-term investments in the EV market, ensuring confidence and equitable access for all EU citizens.**

Renewable energy prioritization

- In 2022, 38.7% of electricity was generated from fossil fuels in the EU and 39.4% from renewable energy sources.
- The EU must set **ambitious targets for renewable and decarbonized energy sources to diversify the energy mix** and ensure a **fully decarbonized electromobility ecosystem.**
- This aligns with the revised **Renewable Energy Directive**, which raises the EU's binding renewable energy target for 2030 to a minimum of 42.5%, with the aim to reach **45%.**

Going beyond

- Future regulations should promote shared mobility solutions to reduce the negative externalities of individual transport modes. They should **support the development of infrastructure specifically for shared vehicles and integrate multimodal aspects into the regulatory framework.**

Reduce red tape

- Limit bureaucratic hurdles for operators by harmonizing permitting and administrative procedures across the EU.
- For example, providing **EU-wide guidelines** **–> Sustainable Transport Forum**

RECOMMENDATIONS FOR NATIONAL AUTHORITIES

Consultation and stakeholder engagement

- Establish **national consultation frameworks** that involve regional and local authorities, wider transport and energy sector stakeholders, and the public to inform the development and update of the National Policy Frameworks required by AFIR.
- Cooperation with **neighbouring Member States** is essential to ensure a cross-border interoperable and reliable charging network.

Balanced infrastructure deployment

- Implement the **national 'fleet-based' charging targets in a decentralised way**, so that deployment of charging follows EV uptake at regional or even provincial level; This approach supports a balanced expansion that meets actual local demand.
- As part of the national implementation of the AFIR provisions, Member States should ensure, that all needed infrastructures are deployed in a **territorially balanced way** either through public service obligations or positive incentives
- **Public financial support** should be **focused** where market failure occurs, such as where infrastructure is needed but underutilized and does not attract private investment.

Be ambitious

- Deploy **fast-charging hubs every 60 km along main roads by 2025** – ahead of the 2030 deadline under AFIR
- Extend the targets to **other major national roads**. This is essential to eliminate charging and range anxiety across countries and the EU in general.

Electricity production and stability

- Ensure stability: maintain the **stability of electricity production** at the national level to support the increasing demand from electric vehicles.
- Smart recharging and bidirectional charging: anticipate the benefits of smart recharging and bidirectional charging for the flexibility of the electricity system.
- Enable smart charging: ensure that **national legislation on electricity does not interfere with the implementation of smart charging on public charging networks**.

RECOMMENDATIONS FOR LOCAL AUTHORITIES

Local authority as a steering entity

- Act as a steering authority to **oversee and ensure the deployment of sufficient, future-proof, and accessible charging infrastructure**.
- Integration in **SUMP**: Fully integrate the deployment of charging infrastructure into the Sustainable Urban Mobility Plan (SUMP) as a tool to achieve sustainable mobility targets. **Align with existing strategies and priorities from your SUMP and Climate action plans**, such as saving public space, improving air quality, or reducing car usage.
- Avoid oversizing: **Calibrate charging infrastructure and deployment targets according to modal shift and traffic reduction goals**, recognizing and mitigating the risk of rapid infrastructure deployment not matched by demand.

Planning ahead

- Use **Decision Support System (DSS) tools** such as the CLICK tool to support and inform the planning and location decisions.
- Choose a strategic approach and consider **semi-private and publicly accessible private land** in your planning to save public space.

Procurements

- Select a procurement model after assessing your financial, technical, and human resources. This procurement model should also help you align with existing strategies and priorities.
- **Phased procurement**: procure charging points in several phases and monitor their use, reliability and challenges to manage deployment effectively.

Future-proofing

- Consider evolving standards: deploy charging infrastructure without delay but consider the evolving nature of standards. Contractual agreements should ensure that **charging infrastructure operates according to the latest available standards** and that **hardware and software are upgradable**.

Stakeholder engagement framework

- **Engage public and private local stakeholders in an organised and systematic way**: list and map, define role and responsibilities, set regular meetings and communication flow.
- Engage service providers **early**: based on the experience of developing the Turku e-charging master plan, engagement with service providers is advisable as early as possible when setting your deployment strategy.

GET OUR POLICY BRIEF

USER-CHI
CHARGING YOUR E-MOBILITY FUTURE

POLICY BRIEF

RECOMMENDATIONS FOR A MASSIVE DEPLOYMENT OF USER-FRIENDLY CHARGING INFRASTRUCTURE IN EUROPE

In 2022, 70% of EU transport emissions came from road transport, contributing to air and noise pollution in European cities. To reach **climate neutrality** by 2050 and **tackle air pollution-related deaths**, a transition to cleaner fuels and vehicles is necessary.

The share of electric vehicles (EVs) is growing rapidly in Europe, with electric car registrations in 2022 accounting for 21.6% of total new car registrations. This growth must be **matched by the deployment of a reliable, affordable, and coherent charging infrastructure** throughout a **dense European network** in both urban and non-urban areas.

Despite significant advancements in the deployment of charging infrastructure, EV drivers still face challenges in finding a denser and more reliable charging network. Issues include the **availability of charging points**, the **standardization of technical components and signalization**, and the **provision of ad-hoc and contactless payment alternatives**, as identified during USER-CHI user research phase. The higher electricity demand can lead to **grid congestion** during peak charging times.

The revision of the **Alternative Fuels Infrastructure Regulation (AFIR)** that entered into force in April 2024 is a huge step in the right direction. But **decisive efforts are still required to foster a European electromobility services market, including cross-border roaming and interoperability.**

This policy brief outlines key recommendations for EU policymakers, national authorities, and local authorities to ensure the massive deployment of user-friendly charging infrastructure across Europe.

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Sustainable Transport Forum

Sub-group on public authorities

USER-CHI final event 18 June 2024

Aleksandra Klenke, DG MOVE

B4 – Sustainable & Intelligent Transport Unit

STF Structure - Plenary and Sub-groups

Vision for 2024

SUSTAINABLE TRANSPORT FORUM

NEW structure

Sustainable Transport Forum (STF)

- Implementation sub-group
- Governance & Standards sub-group
- Data sub-group
- Public authorities sub-group
- Heavy-duty vehicles sub-group
- Hydrogen sub-group
- EU PKI management sub-group

Active sub-groups | **CfA 2023** | **CfA 2024**

Sub-group on Public Authorities

State of play

- There are 7 standing Task Forces:
  - **Task Force 1**: Development of Recommendations for permitting and grid connection procedures for recharging points (Guidelines finalized and published in December 2023)
  - **Task Force 2**: Development of templates, tools, decision trees and standard contracts for public authorities

  (The deliverables were adopted, and it was agreed to update the template agreement for the installation of recharging infrastructure, as well as the Guide to contracting of recharging infrastructure, to bring these in line with AFIR)

  - **Task Force 3**: Development of Recommendations for recharging infrastructure roll-out for specialized and captive fleets (Draft recommendations ready; need to be prepared for the publication)
  - **Task Force 4**: Update SUMP Electrification topic guide (draft SUMP Guide is dependent on the finalisation of other reports)
  - **Task Force 5**: Development of Recommendations for Accessibility of recharging stations (Guidelines with recommendations to be finalised by mid 2024)
  - **Task Force 6**: Developments for fire safe deployment of recharging points in covered parking garages (Guidelines with recommendations to be finalised by mid 2024)
  - **Task Force 7**: Update: Recommendations for public authorities for procuring, awarding concessions, licences and/or granting support for electric recharging infrastructure for passenger cars and vans and the Summary Handbook (Handbook should be finalized after summer)

TF1 State of Play

Best practices guide for permitting and grid connection procedures

EAFO | POLIS

European Commission | European Alternative Fuels Observatory

POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

European Commission

Main drivers and key messages

- Without properly addressing the permitting and grid connection bottlenecks, implementation of AFIR targets can be severely undermined.
- The lack of a comprehensive EV recharging infrastructure could hinder the widespread adoption of EVs and the decarbonization of the transport sector.
- The report emphasizes the importance of cooperation between PAs and market players (CPOs, DSOs/TSOs…) to streamline these processes.
- It provides practical solutions and good practice examples to assist in the smooth deployment of recharging infrastructure in the EU.

Main bottlenecks and proposed solutions

1. **Streamlining Procedures:** clearly defined timelines, standardized procedures, and technical support for PAs to expedite permitting and grid connections.
2. **Transparency on Costs:** greater clarity on the costs involved in both permitting and grid connection procedures to reduce unpredictability.
3. **Enhanced Cooperation:** closer cooperation between PAs and DSOs/TSOs to accelerate grid connections for recharging points.
4. **Joint Planning:** need for coordinated planning between authorities, CPOs, and DSOs/TSOs to align recharging infrastructure with urban and mobility planning.

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Some recommendations

Permitting Procedures

- Implement defined timelines for permitting, with a cap of 3–6 months, as suggested by the city of Stockholm and the European Parliament.
- Provide technical support to local authorities for streamlined grid-permitting processes.
- Adopt a 'one-stop-shop' approach and digital permit-granting processes to simplify and expedite the procedure.

Grid Connection Procedures

- Coordinate long-term grid planning and stimulate investments aligning with urban mobility plans.
- Establish transparent, digital procedures for grid connection applications, with defined timelines for connection requests.

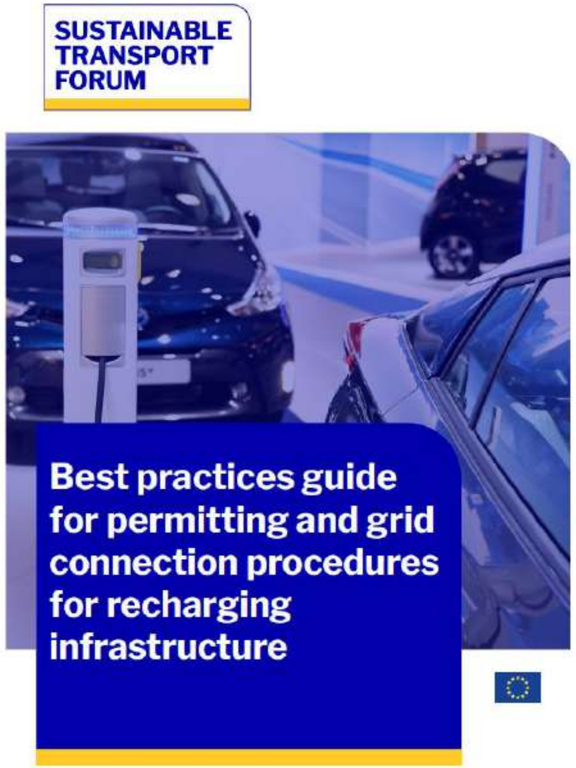
Good practices

- *“Permitting Olympics”* in **California** (gold, silver and bronze permitting medals for counties).
- EV Infrastructure Taskforce in **London** (mixed planning- and business-oriented approach).
- Integrated approach to planning and installation in **Stockholm**.
- **UK Power Networks** detailed maps of grid capacity for recharging points (50 kW, 100 kW, 150 kW).
- **Paris** city-led planning-oriented business model for the development of their public AC regular recharging network.

Publication in the EAFO Portal

This Report was published in the EU publications in December 2023 and is also published on EAFO:

EU Report Unveils Recommendations for Smoother EV Recharging Infrastructure Deployment



TF3 State of Play

Recommendations for recharging infrastructure roll-out for specialized and captive fleets

EAFO | AVERE | FIER

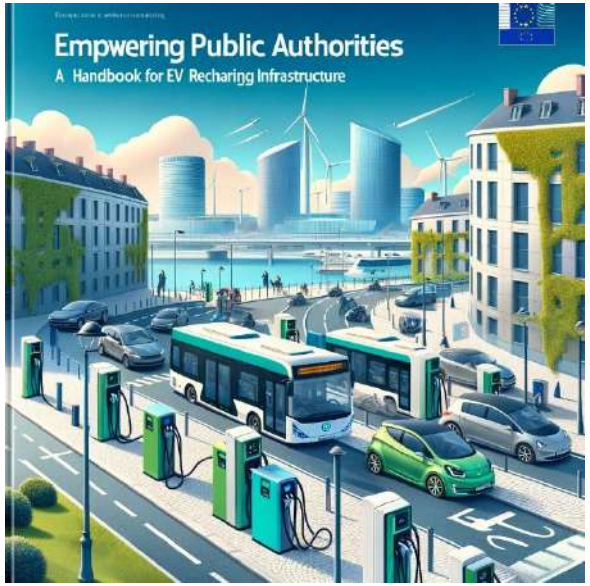
Scope of the work

Overview of covered captive fleets

Objective: Formulating policy recommandations for public authorities to support the deployment of a recharging infrastructure for captive fleets

Deliverable:

1) Handbook of overview of selected use cases including challenges, best practices and recommendations
2) Repository of collected documents with filters and search option



Captive fleets covered:

- Delivery, utility, and urban duty logistics use-case
- Coaches use-case
- Ride-hailing use-case
- Taxis use-case
- Municipal fleets use-case
- Ground transport in ports, airports use-case
- Shared fleets, vehicle sharing use-case
- Vehicle rental use-case

Main cross-sectoral recommendations

1. Create synergies between the different use cases in order to make the most of deployed recharging infrastructures
2. Facilitate the installation of pre-cabling and recharging points at depots and in underground locations
3. Aggregate recharging demand to facilitate grid planning and reinforcement
4. Support the deployment of fast recharging stations outside urban areas to support long distance trips for coaches, car rentals, etc
5. Plan recharging points locations in collaboration with captive fleets representatives and analytics

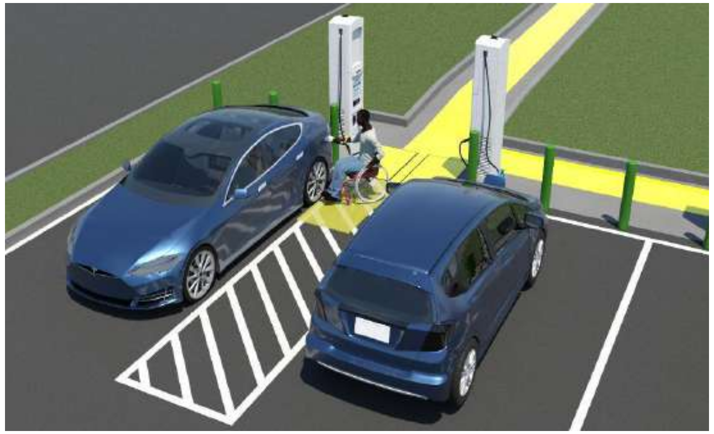
STF – PA Task Force 5

Acessibility of recharging infrastructure

STF – PA Task Force 5: scope

Scope of the guidelines:

1. Hardware: pole/charging station: design, new technologies like wireless charging…
2. Associated parking spaces and surrounding environment
3. Information/data for the user (before & during recharging/protocols & interoperability)
4. Distribution/location of accessible recharging poles/stations & parking spaces (ratio of accessible recharging infra)



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STF – PA Task Force 5: structure

1. **Introduction** (objectives, policy context, methodology…)
2. **Analysis of the survey respondents** (type of entity, country, etc.)
3. **State-of-the-art and key challenges** related accessibility of recharging points
4. **Overview of legislations/guidelines** in place across Europe and beyond
5. **Good Practices and lessons learnt** to facilitate the accessibility of recharging infrastructure in the EU and beyond
6. **Recommendations** to national, regional, and city policymakers
7. **Recommendations** to private stakeholders (industry and business)

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Survey to assess main issues

Problems, bottlenecks, and limitations	SCORE
Lack of common standards for accessible EV recharging	**53**
Absence of a clear regulatory framework at European, national, regional and local level	**33**
Lack of available public space	**25**
Lack of knowledge about technical developments/requirements, upcoming technologies and possible redundancy of current systems	17
Lack of know-how from public authorities and CPOs on the specific needs of people with disabilities or the elderly	13
Technical feasibility of retrofitting	11
Retrofitting costs becoming too cumbersome and not cost-efficient	9
Uncertainty about the legal ‘interface’ between national disability rights legislation and any future European regulatory framework	9
Concern over whether the public would prioritise the funding of accessible recharging over other competing budgetary issues;	8
Lack of knowledge about installation and maintenance costs and longevity of equipment	2

STF – PA Task Force 6

Recommendations for public authorities on Fire safety of recharging infrastructure in roofed parking garages

5’ | AVERE

Task Force 6 Fire safety - objectives

Situation

- A majority of EV recharging happens at private locations and increasingly in covered underground or abover ground car parks
- EV fires can occur and present unique risks and challenges pushing some local authorities to enact restrictive legislations

Objective of Task Force

- Establish guidelines for **public authorities** to support the roll-out of EVs in covered car parks while maintaining fire safety

Aim of guidelines

- **Busting myths** about EV fires / provide evidence-based data with regards EV fires
- Providing an **overview of exisiting legislations/ guidelines**
- Identifying **best practices and challenges**
- Establishing **recommendations** to maintain fire safety in covered car parks

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STF – PA Task Force 7

UPDATE of the Handbook and of the STF Recommendations for public authorities for procuring, awarding concessions, licences and/or granting support for electric recharging infrastructure for passenger cars and vans

Task force 7 – State of Play

- Short term objective: **UPDATE of the Handbook** of the STF Recommendations for public authorities for procuring, awarding concessions, licences and/or granting support for electric recharging infrastructure for passenger cars and vans **to accompany the entry-into-force date of AFIR**, to provide public authorities actionable guidance they can use as they prepare tenders for the deployment of public EV charging infrastructure.

Deliverable 1: Actionable, concrete recommendations to help public authorities prepare & launch tenders for LDV recharging (Summer 2024)

- Longer term objective and **Deliverable 2**: Larger UPDATE of the STF Recommendations, including new technologies, practices, smart charging, HDV, and more (Autumn 2024)

- **D1** includes: Organizing Tender Procedure: pre-selection and selection criteria, tender duration, and clear technical requirements, coordination with (DSOs), and Specific Tender Requirements

- D1 and D2 would contain the update according to the AFIR requirements.

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Thank you

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INSTITUTIONAL OPENING

Salima Abu-Jeriban, CINEA

CINEA

European Climate, Environment and Infrastructure Executive Agency

USER-CHI Final Event

18/06/2024

Salima Abu Jeriban

Project Adviser

Department C Green Research and Innovation

Unit C3 Horizon Europe Transport

European Climate, Infrastructure and Environment Executive Agency

CINEA - Making implementation happen

- CINEA - the Climate, Infrastructure and Environment Executive Agency
- Implementing EU funding for **transport, energy and mobility** to supports **the European Green Deal** and achieve **climate neutrality by 2050**

CINEA in a nutshell

> 58 billion for the period 2021-2027

> 500 staff

> 4500 projects by 2027

- **Policy feedback** as an essential part of funding activities
- **Expertise** at the service of **beneficiaries** in managing the complete lifecycle of projects
- Exploitation of **synergies** and dynamic ways to work **across programmes**

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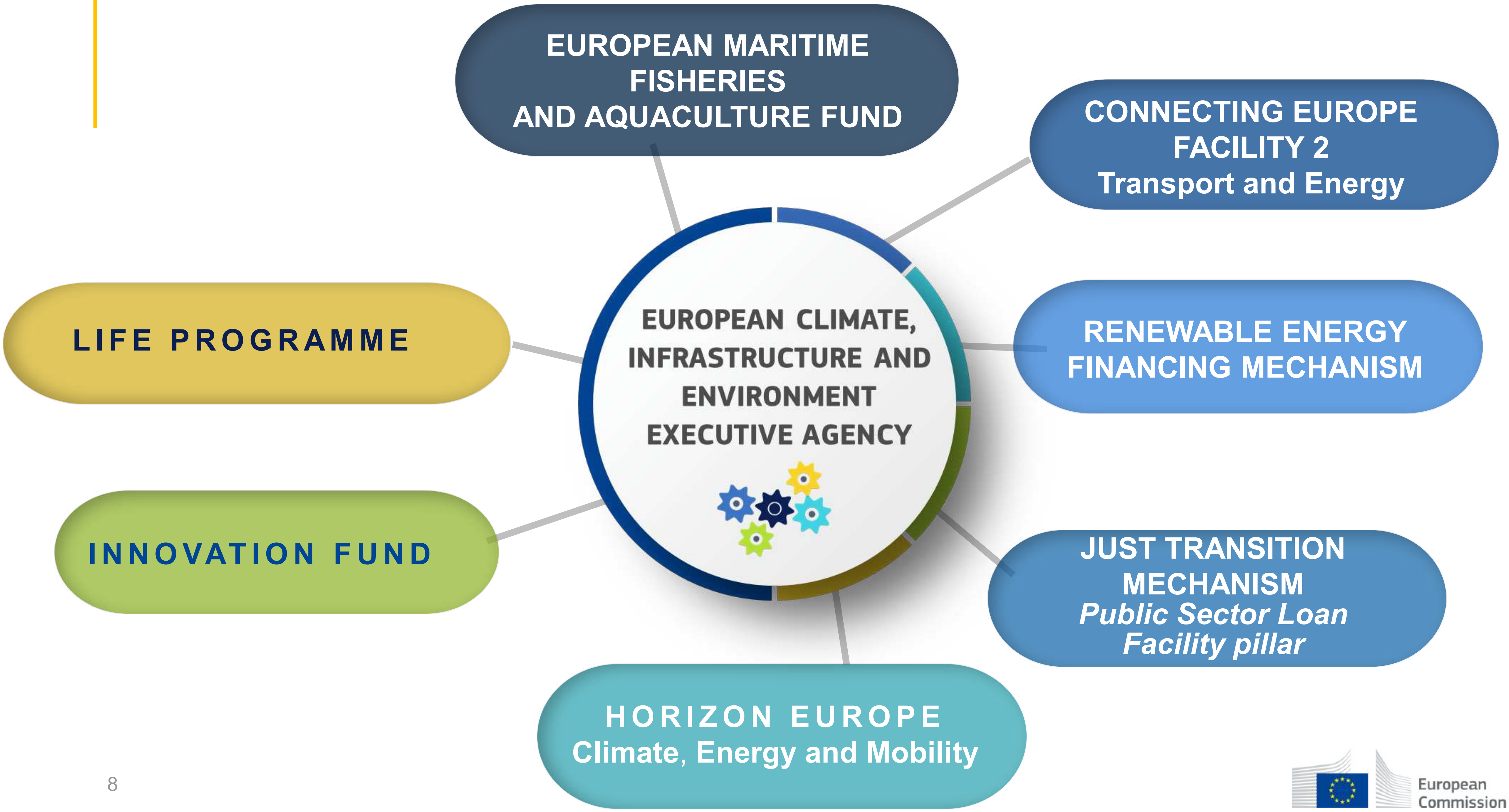
EUROPEAN MARITIME FISHERIES AND AQUACULTURE FUND
CONNECTING EUROPE FACILITY 2
Transport and Energy
LIFE PROGRAMME
EUROPEAN CLIMATE, INFRASTRUCTURE AND ENVIRONMENT EXECUTIVE AGENCY
RENEWABLE ENERGY FINANCING MECHANISM
INNOVATION FUND
JUST TRANSITION MECHANISM
Public Sector Loan Facility pillar
HORIZON EUROPE
Climate, Energy and Mobility

Cluster 5 Work Programme - Overview

Destination 1 – Climate science

- Climate science

Destination 2 – Cross-cutting solutions

- Batteries
- Cities
- Breakthrough technologies
- Citizen and stakeholder engagement

Destination 3 – Energy supply

- Renewable energy
- Energy system, grids and storage
- CCUS
- Cross-cutting activities

Destination 4 – Energy demand

- Buildings
- Industry

Destination 5 - Clean and competitive solutions for all transport modes

- Zero-emission road transport
- Aviation
- Waterborne transport
- Transport-related health and environmental issues

Destination 6 - Transport and Smart Mobility services

- Connected, Cooperative and Automated Mobility
- Multimodal and sustainable transport systems for passengers and goods
- Safety and resilience

More info

Cluster 5 work programme 2023-2024 :

- wp-8-climate-energy-and-mobility_horizon-2023-2024_en.pdf (europa.eu)

Funding & Tender Portal

- Funding & tenders (europa.eu)

Call Topic – H2020-LC-GV-03-2019

- **User centric charging infrastructure**
- INCIT-EV Large demonstratIoN of user CentrIc urban and long-range charging solutions to boosT an engaging deployment of Electric Vehicles in Europe
- eCharge4Drivers Electric Vehicle Charging Infrastructure for improved User Experience
- USER-CHI innovative solutions for USER centric CHarging Infrastructure

Call HORIZON-CL5-2024-D5-01

- The call for proposals HORIZON-CL5-2024-D5-01 closed on 18/04/2024.
- 196 proposals were submitted to the call.
- Topic linked to « Charging Infrastructure for road transport »
    - Smart, low-cost pervasive stationary slow charging and bi-directional solutions synergic with the grid for EV mass deployment (2ZERO Partnership) : 13 proposals
    - Integrated flexible multipoint megawatt charging systems for electric truck mass deployment (2ZERO Partnership) (2024) : 5 proposals

Horizon Europe Evaluation Experts

Interested?

Contact CINEA or register on website

Funding and tender portal:

Thank you

CINEA on TWITTER: @cinea_eu

CINEA on LINKEDIN: https://www.linkedin.com/company/cinea-european-climate-infrastructure-environment-executive-agency/about/

CINEA website: https://cinea.ec.europa.eu/index_en

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