

# POLIS

CITIES AND REGIONS FOR TRANSPORT INNOVATION

ANNUAL  
CONFERENCE  
**2022**

30 November  
1 December, 2022  
Brussels, Belgium



#POLIS2022

# *eCharge4Drivers:*

*Improving the EV charging experience  
within cities and for longer trips*



**Dr. Evangelos Karfopoulos**

**Senior Researcher**

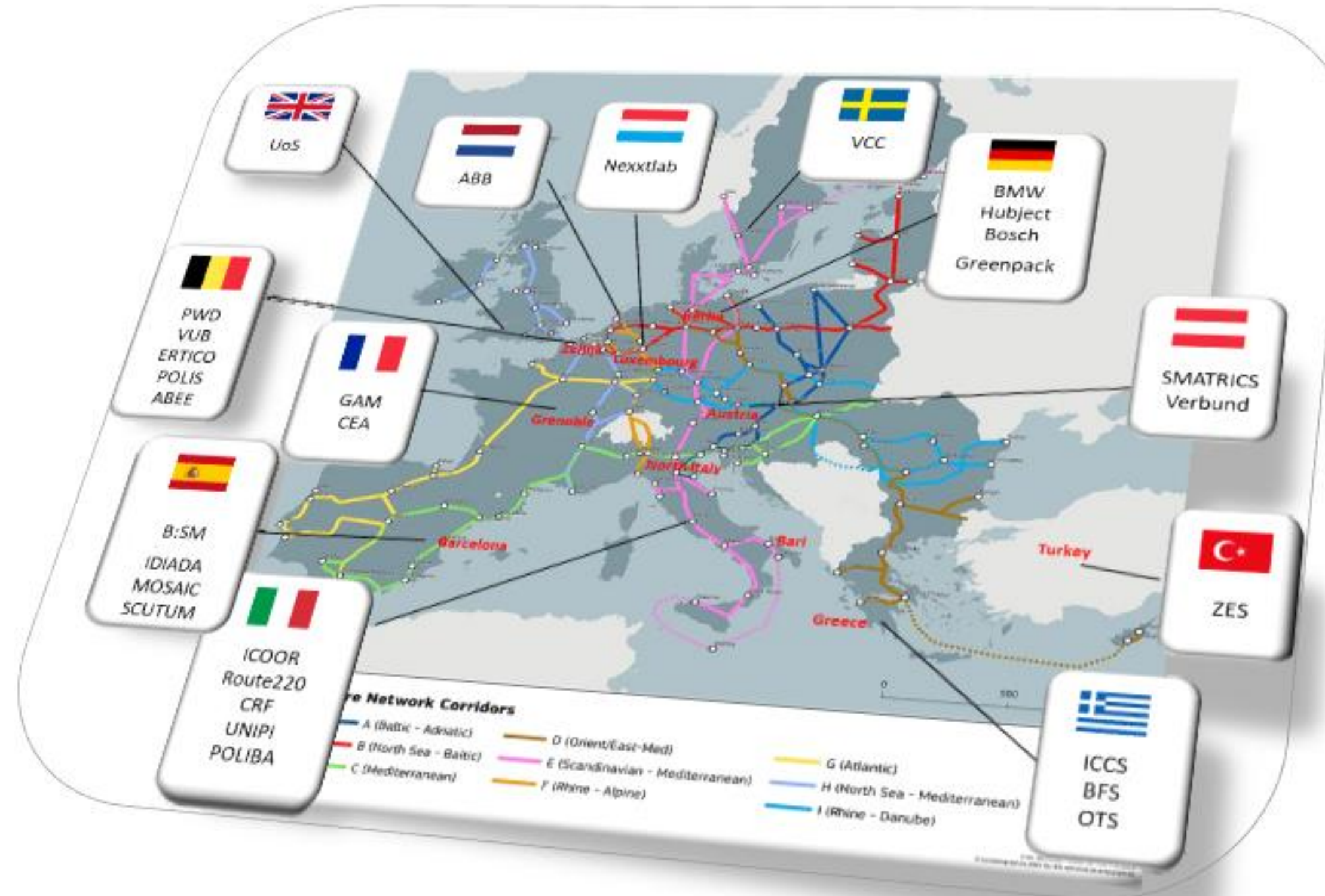
***i-sense Research group***

**ICCS/NTUA**

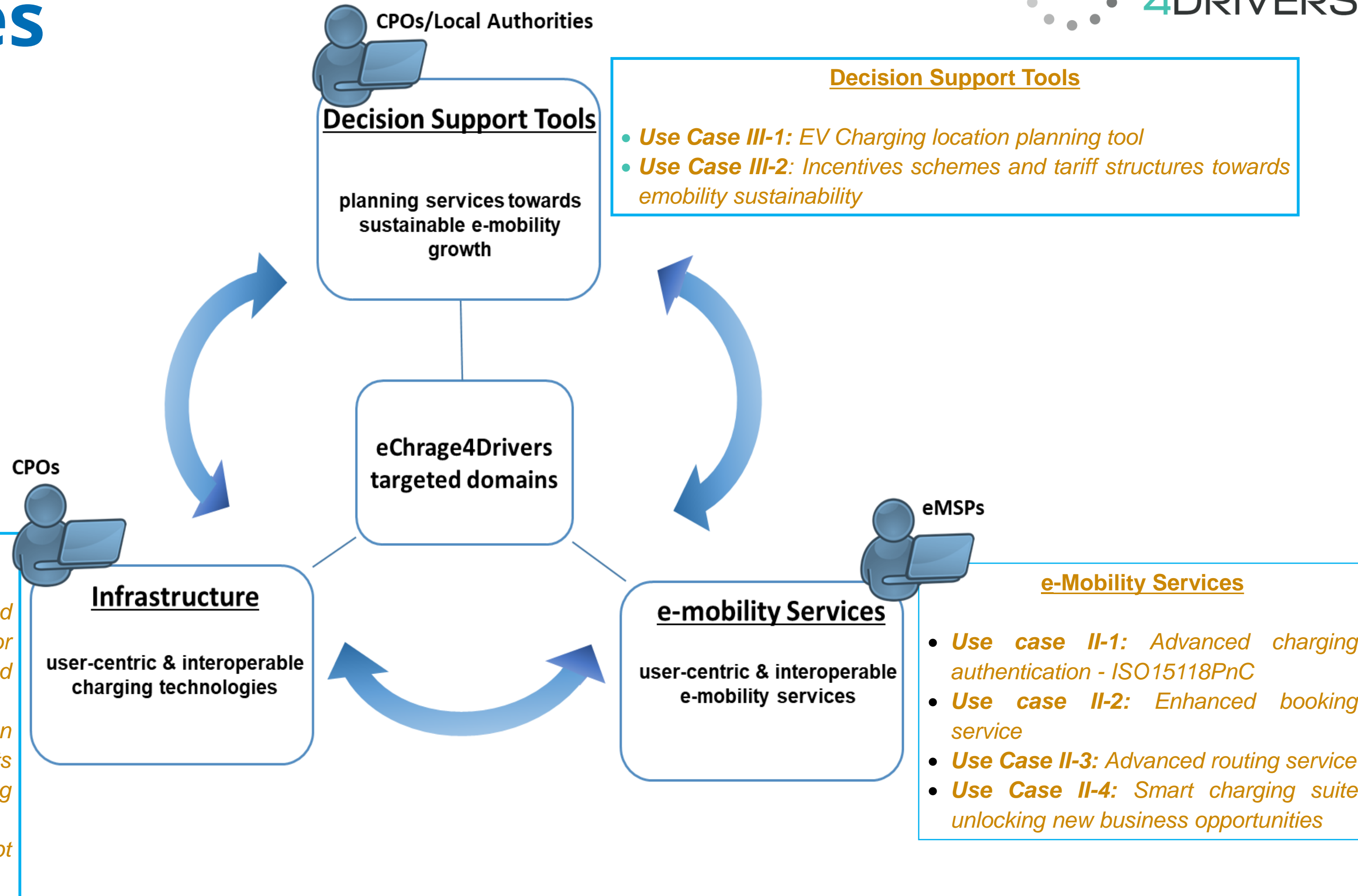
# In a nutshell....

eCharge4Drivers is an EU project coordinated by ICCS aiming to **design & develop user-centric and interoperable charging solutions** towards **improving the Electric-Vehicle charging experience** in urban areas and on interurban corridors as well as **promoting e-mobility concept**

12 countries - 30 Partners –  
10 demonstration areas



# Use cases



# 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 sharing concept for L1e vehicles

## e-Mobility Services

**Use case II-1:** Advanced charging authentication - ISO15118PnC

**Use case II-2:** Enhanced booking service

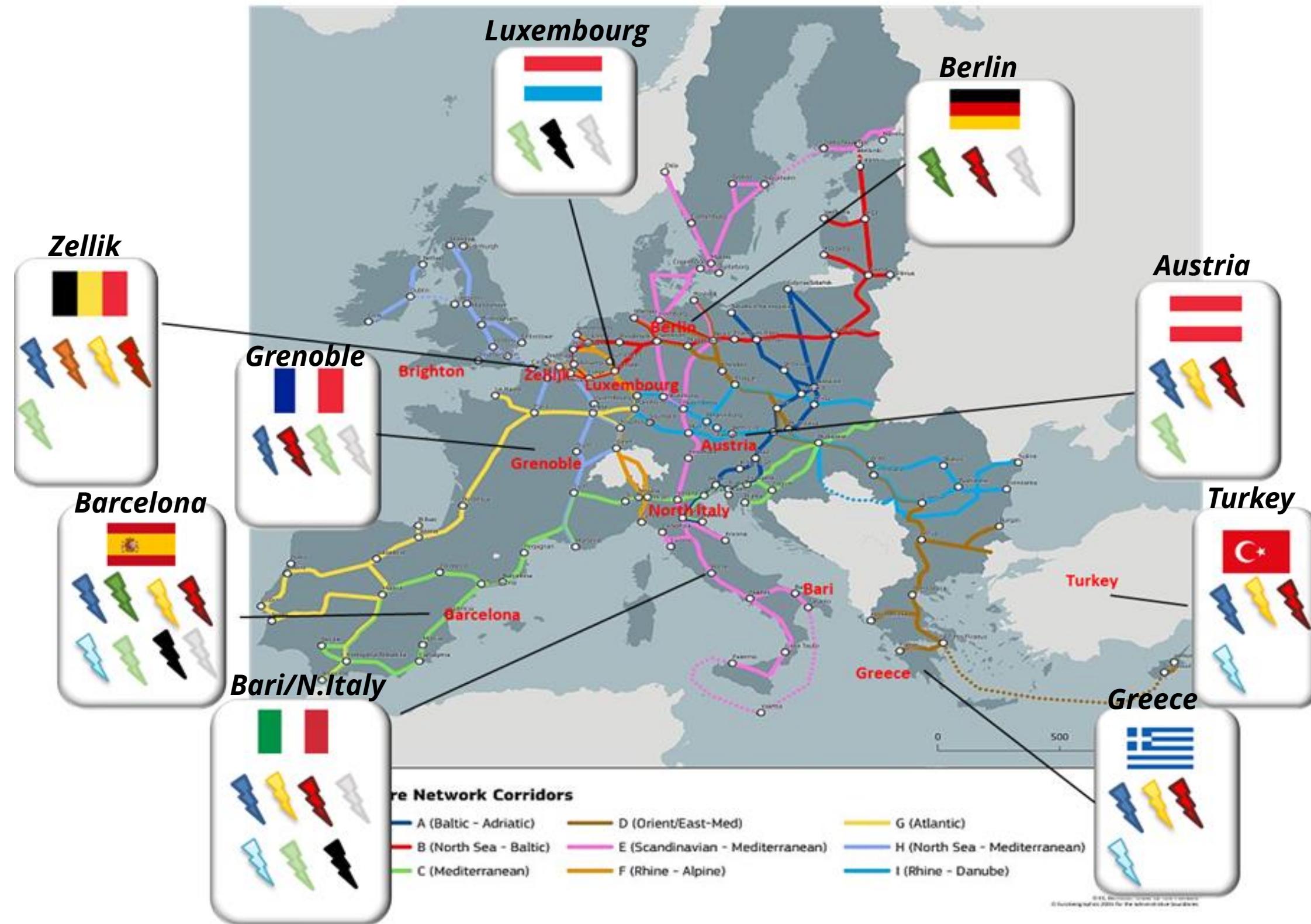
**Use Case II-3:** Advanced routing service

**Use Case II-4:** Smart charging suite unlocking new business opportunities

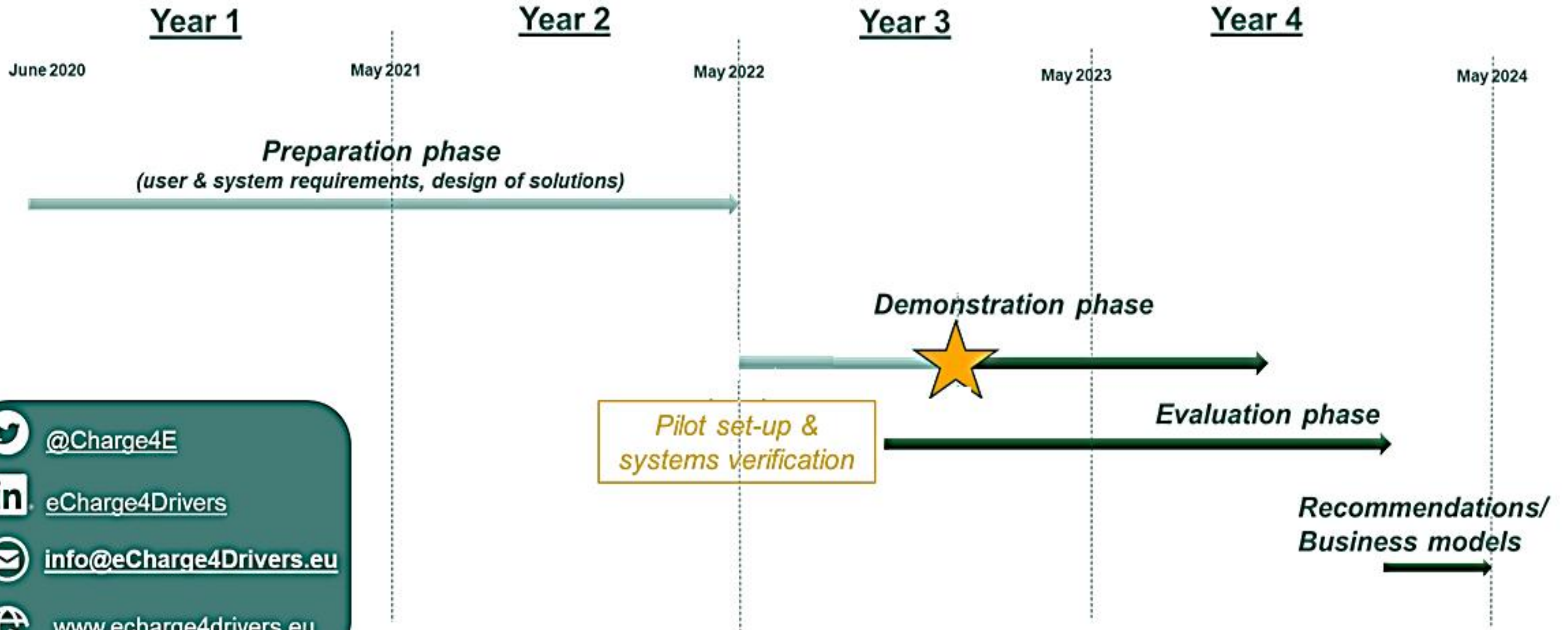
## Decision Support Tools

**Use Case III-1:** EV Charging location planning tool

**Use Case III-2:** Incentives schemes and tariff structures towards emobility sustainability



# Work plan – Current Status



 [@Charge4E](https://twitter.com/Charge4E)  
 [eCharge4Drivers](https://www.linkedin.com/company/eCharge4Drivers)  
 [info@eCharge4Drivers.eu](mailto:info@eCharge4Drivers.eu)  
 [www.echarge4drivers.eu](http://www.echarge4drivers.eu)

# Thank you for your attention!

For questions:

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# *eCharge4Drivers:*

*Easy charging for easy driving into the future*

***Dr. Angel López Rodríguez***

***Director of ElectroMobility Strategies***

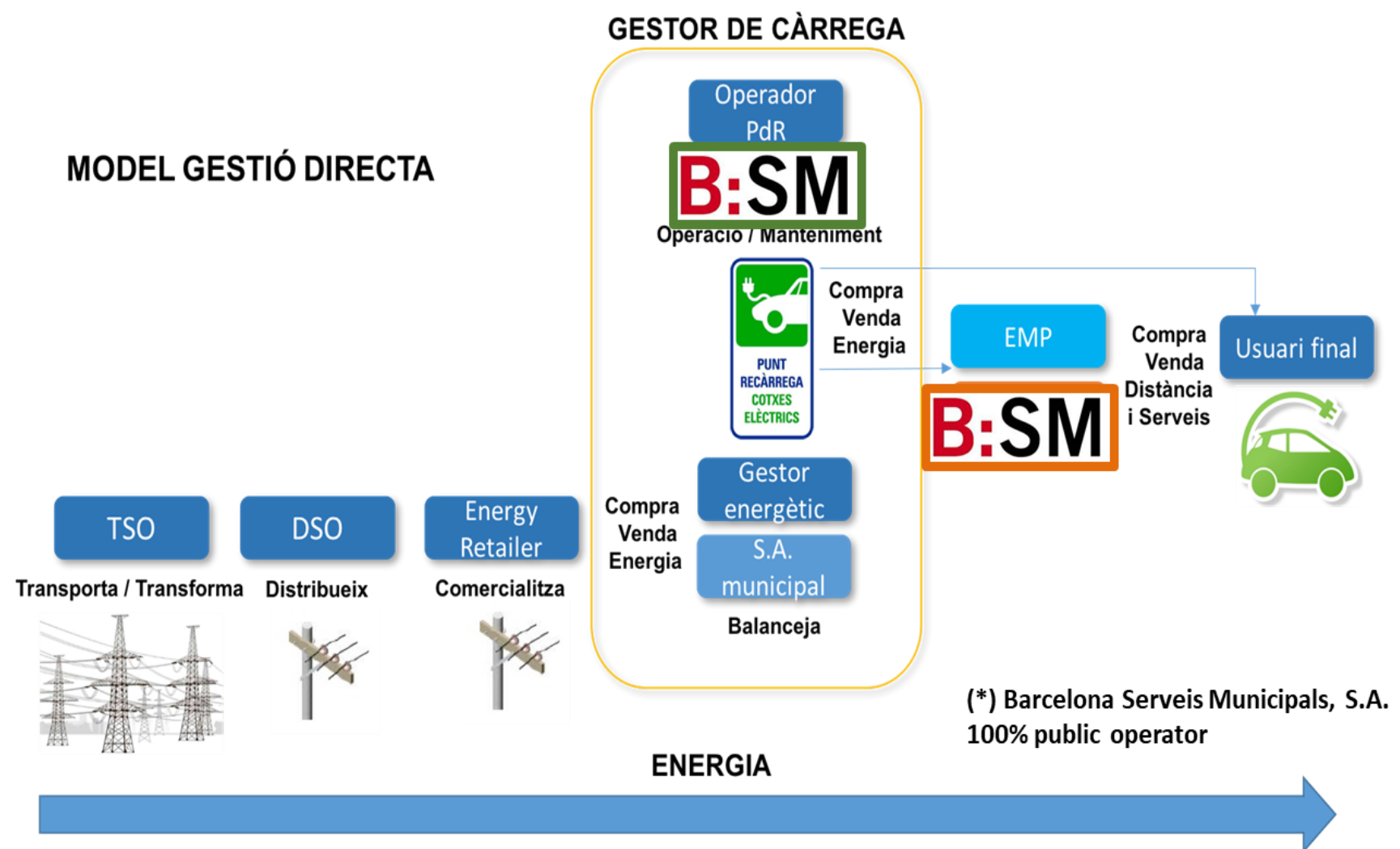
***BARCELONA CITY COUNCIL***

**Ajuntament de  
Barcelona**





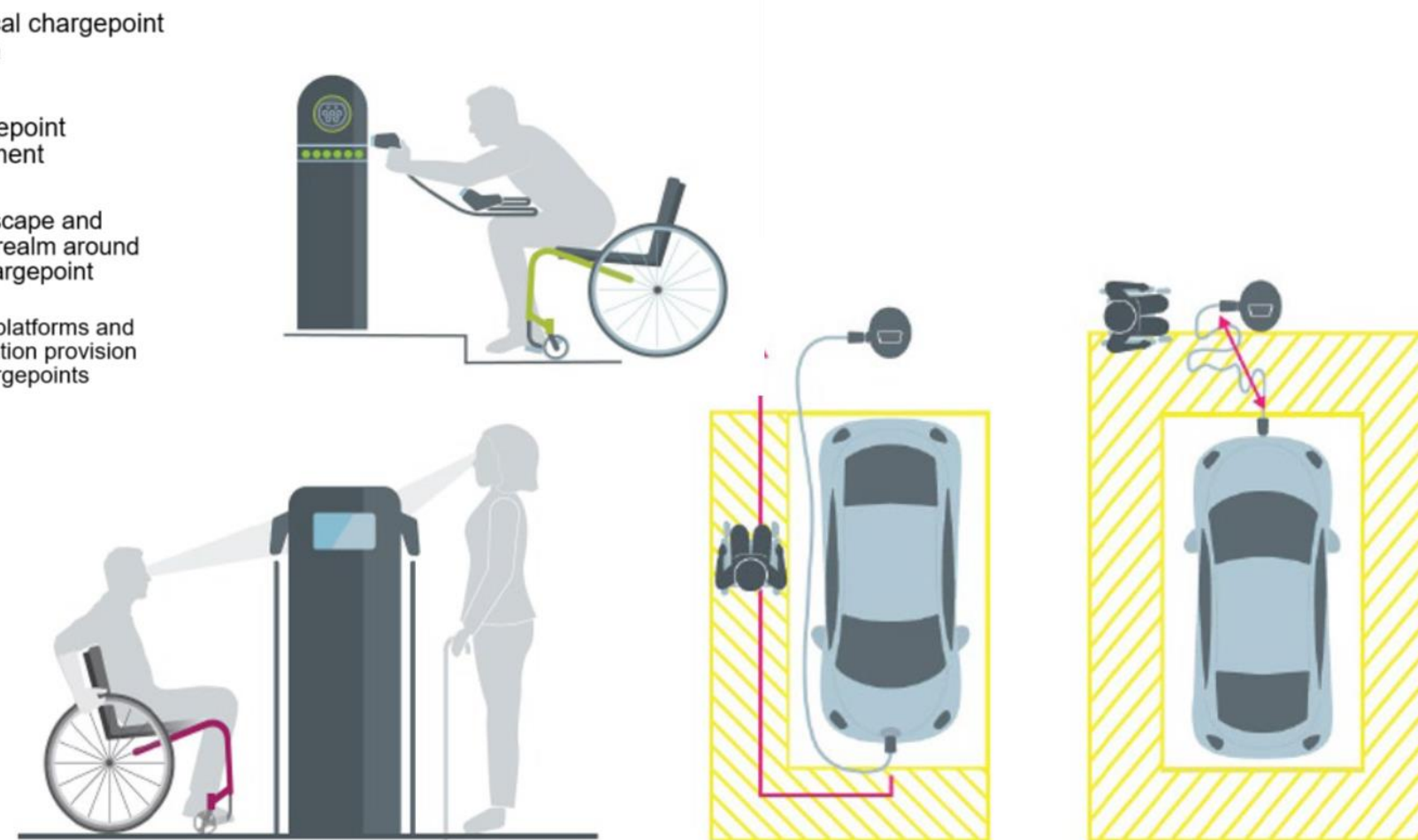
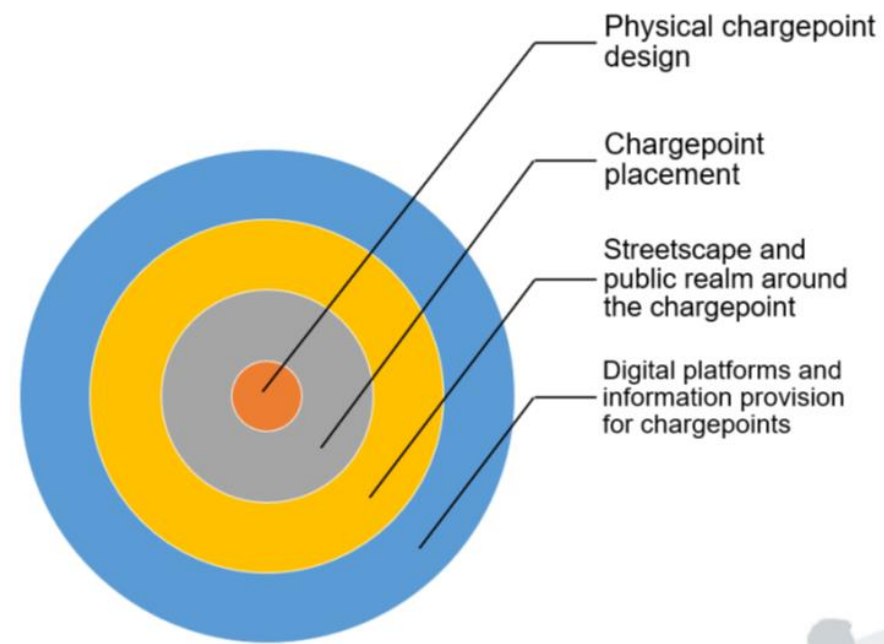
# ENDOLLA: Public EV\_charging services in Barcelona







# Use Case I-1: User-friendly, low and high-power charging stations





# Use Case I-3: Battery sharing concept for L1e vehicles

## Factory Electric vehicles and batteries

B2B & B2C

Same battery system for all of the brand's models

S02



SILENCE

New 2022

S01+



S01



Battery Pack Standard



Silence's current 36 Battery Stations +140 subscribers to BaaS



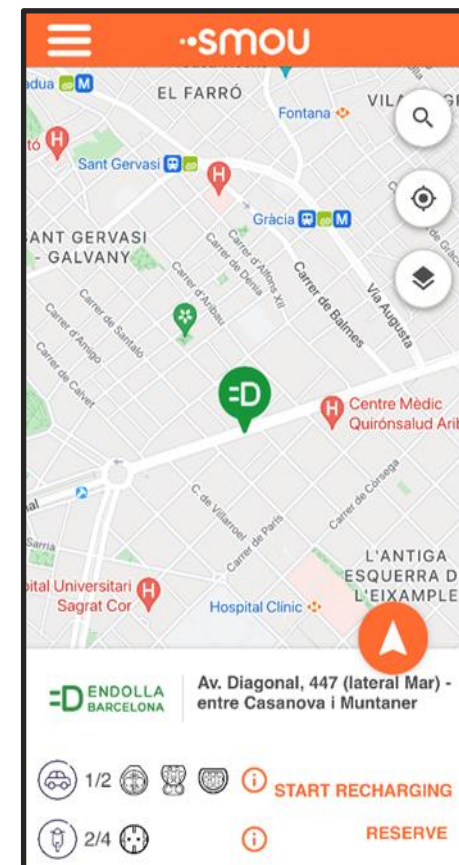


# Use Case II-1: Advanced charging authentication - ISO15118PnC

### RFID



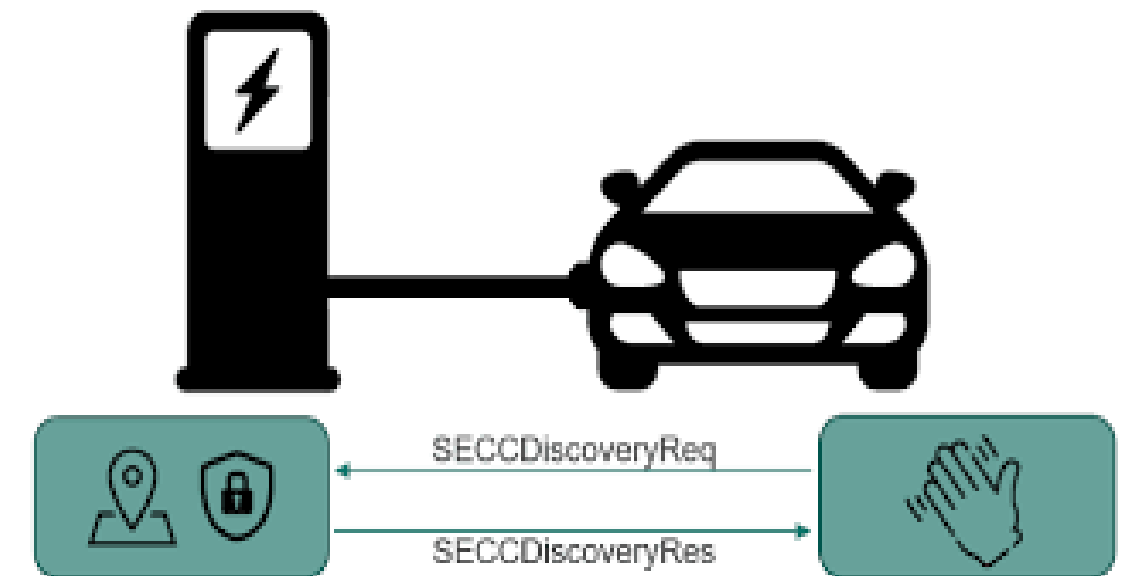
### APP



### EMV Card

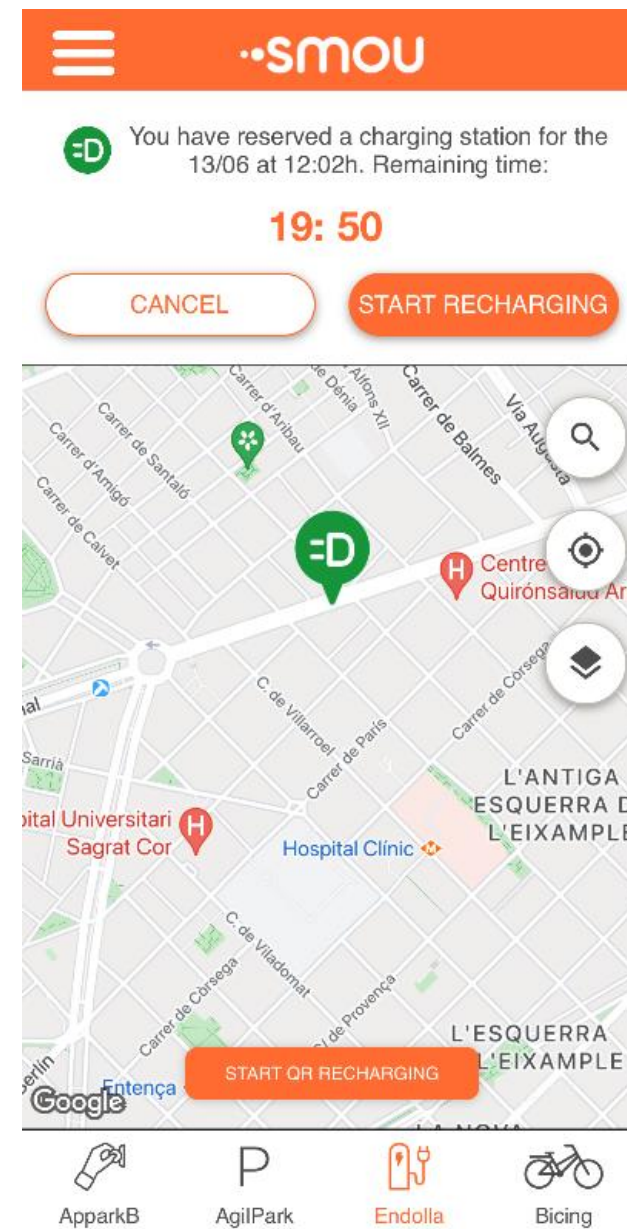
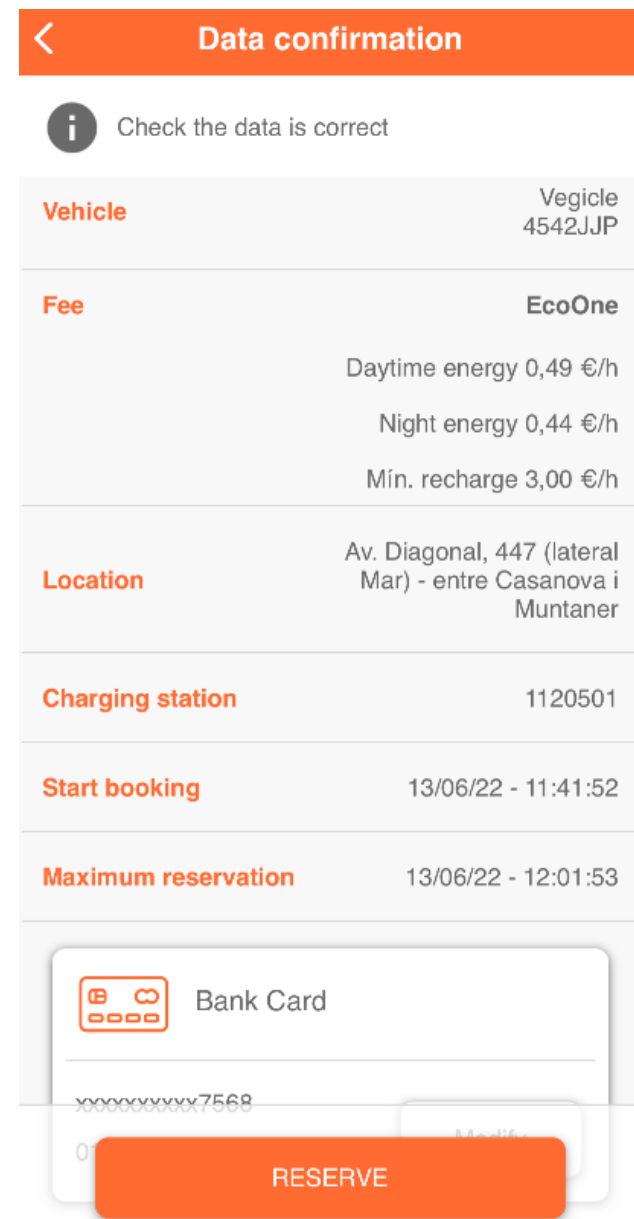
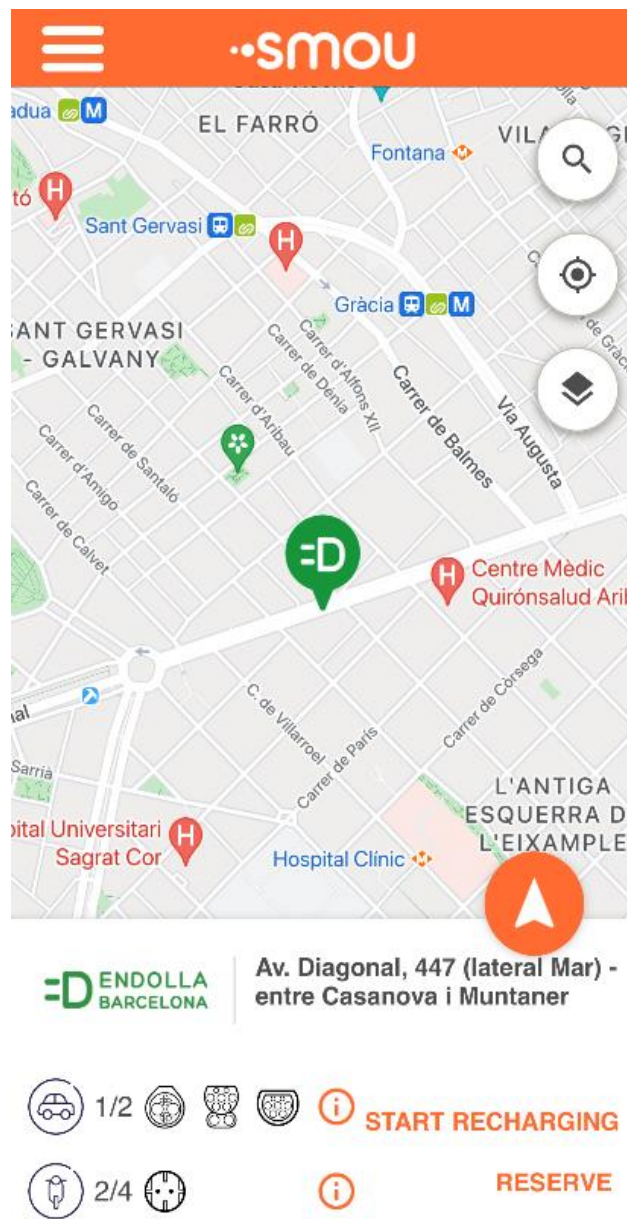


### Plug&Charge

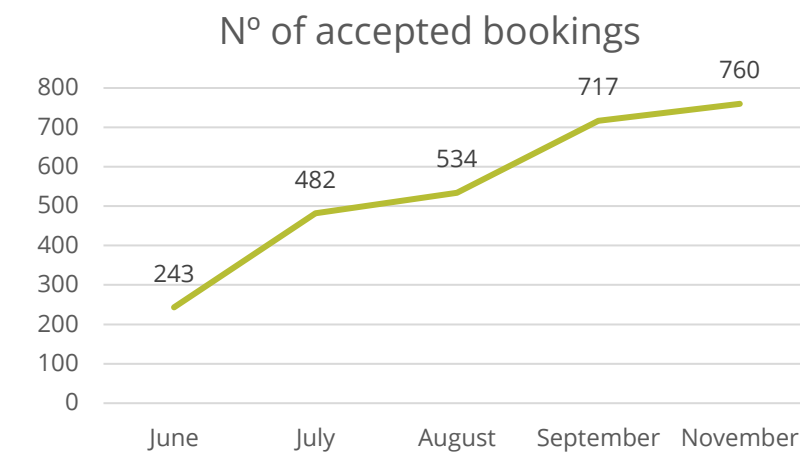




# Use Case II-2: Enhanced booking service



**Short term booking (20'):**  
Already implemented in SMOU App



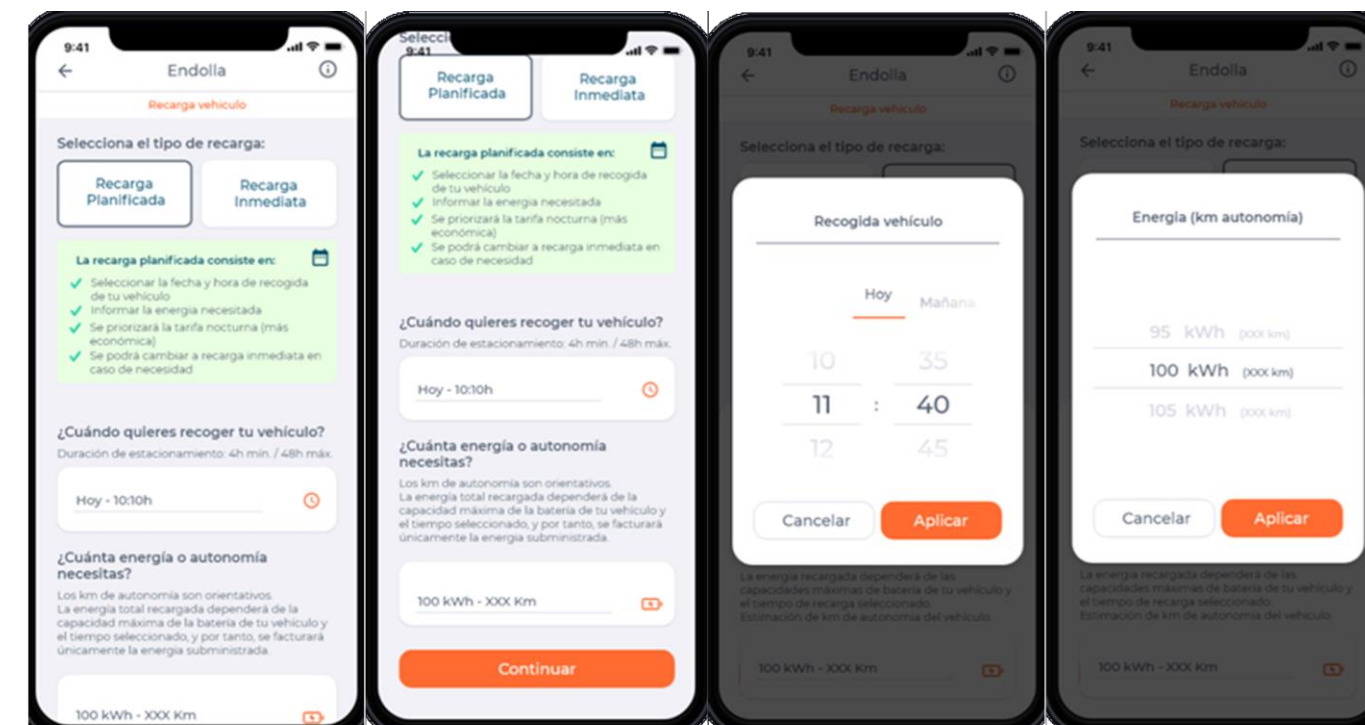
**Long term and recurrent booking:**  
The process will be designed and analyzed together with a group of users, the advantages, attractiveness and what technological, legal and practical barriers will be discovered



# Use Case II-4: Smart charging suite unlocking ~~new business opportunities~~ new users troubles



User difficulties to understand advantages of a planned load (cost-time-energy)



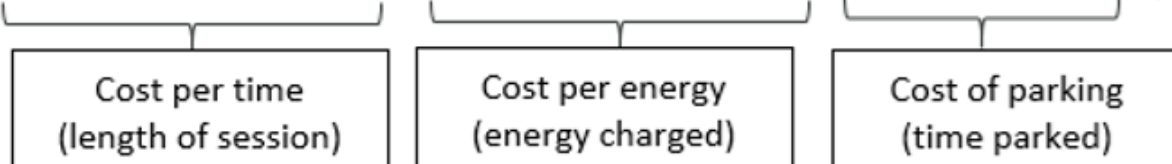


# Use Case III-2: Incentives schemes and tariff structures

...tariffs depend on...	In...							
	Barcelona	Grenoble	Berlin	Luxembourg	Belgium (Flanders)	Bari	Greece	Turkey
Subscription	✓	✓			✓	✓	✓	
Type of charger		✓	✓	✓	✓	✓	✓	✓
Average power								✓
Initial fee							✓	
Location of the CP	✓						✓	
Type of vehicle	✓							
Time of the day	✓	✓						
Cost (€/kWh or €/min)	✓	✓	✓	✓	✓	✓	✓	✓
Minimum charge	✓							
Energy threshold						✓		
Time threshold		✓						
Connection fee (when EV is fully charged)					✓			
Discounts	✓							✓

- **High rate of parked vehicles without charging (after charging)** → 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 booking cost only charged if user does not show
- **Very high use of charging points (low availability)** → Set a reduced cost at night time to incentivise moving the time of charge, reduce or eliminate parking costs at low-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

$$C_{i,j}^s = C_{i,j}^{cs} + T_{i,j}^f + m_{i,j} \cdot \max[(d_s - f_d), 0] + n_{i,j} \cdot \max[(e_s - f_e), 0] + p_{i,j} \cdot \max[(d_e - f_p), 0] + T_{i,j}^{excess}(t, e)$$



# Thank you for your attention!

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