

echarge4Drivers:

Improving the EV charging experience within cities and for longer trips



Brussels, Belgium

#POLIS2022



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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**







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





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



Zellik, Grenoble, Barcelona, Bari, Berlin, Luxembourg



<u>**TEN-T corridors</u>** Austria, Greece, Turkey, N. Italy</u>

Work plan – Current Status



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Thank you for your attention!

For questions:

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echarge4Drivers: Easy charging for easy driving into the future



Dr. Angel López Rodriguez Director of ElectroMobility Strategies **BARCELONA CITY COUNCIL**







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







Use Case II-1: Advanced charging authentication - ISO15118PnC

RFID

APP



EMV Card







Plug&Charge





Ajuntament de **Barcelona**

Use Case II-2: Enhanced booking service



C Data con	firmation				
Check the data is c	orrect				
Vehicle	Vegicl 4542JJ				
Fee	EcoOne				
	Daytime energy 0,49 €/h				
	Night energy 0,44 €/h				
	Mín. recharge 3,00 €/h				
Location	Av. Diagonal, 447 (lateral Mar) - entre Casanova i Muntaner				
Charging station	1120501				
Start booking	13/06/22 - 11:41:52				
Maximum reservation	13/06/22 - 12:01:53				
Bank Card	r in the second s				
xxxxxxxxx7568					
RES	ERVE				





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)





Ajuntament de Barcelona

Use Case III-2: Incentives schemes and tariff structures

	In								
tariffs depend on	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						V			
Time threshold		~							
Connection fee (when EV is fully charged)					~				
Discounts	✓							✓	

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



- energy charged



High rate of parked vehicles without charging (after charging) \rightarrow 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

• Short use (short amount of time, little energy charged) of the **charging stations** \rightarrow 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) \rightarrow Apply a fee for the parking space after a reasonable amount of time

Thank you for your attention! For questions:

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