



Ajuntament
de Barcelona

eMobility in Barcelona

Electric Mobility Infrastructures in Barcelona



SCALE
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Background and Context

Barcelona is a city of 1.6 Mhab on 100 km²,
within a metropolitan area of 3.2Mhab on 636 km²

Successive SUMP 2006-2012 & 2013-2018 & 2018-2024:
BCN needs EV to achieve goals

Regional EV-Plans PIRVEC

National EV-Plans MOVELE, MOVEA, MOVALT, MOVES





2009 – the story begins years ago





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FIRST STEPS: MOBECPOINT & eMotorBIKES





FIRST STEPS: MUNICIPAL PUBLIC PARKING LOTS



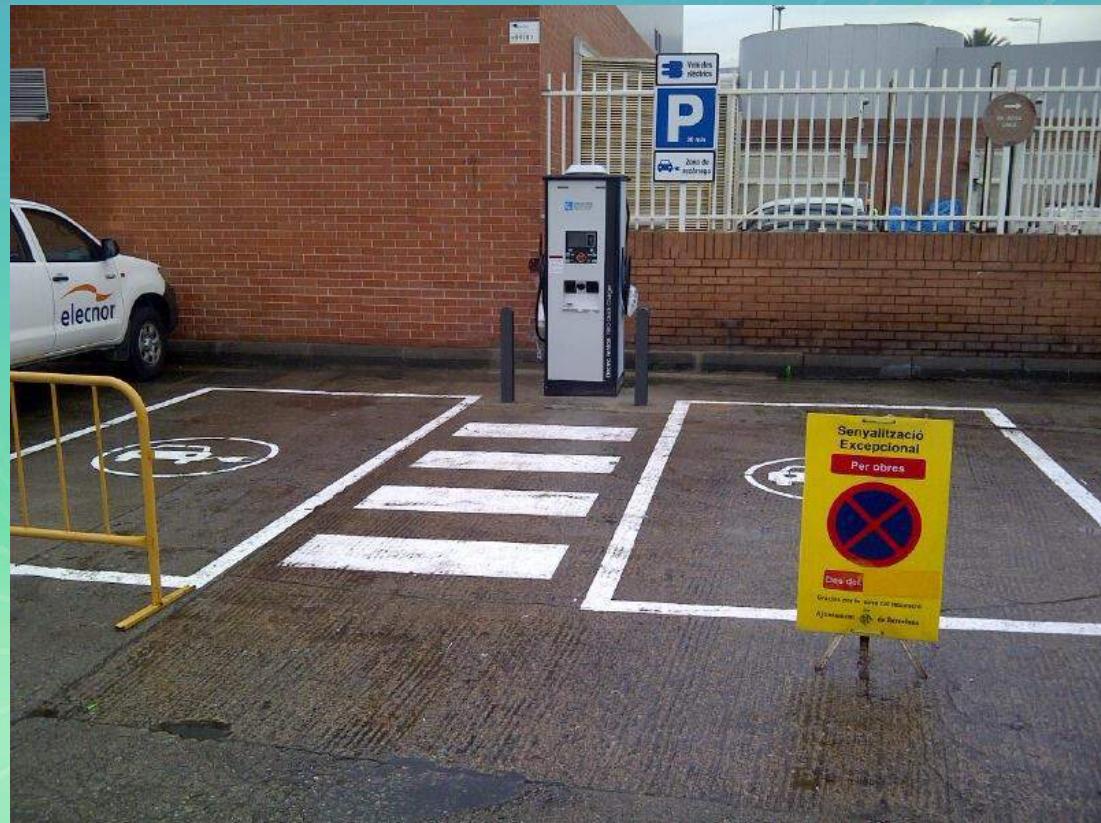


MAP OF THE CHARGING NETWORK (2012)





2013 - The first QUICK CHARGER Tristandard 50kW





2014





EV Charging Infrastructure – Where & How fast?

EV should charge as long as it needs to be parked. (Operational criteria)

Residential Charge ($\approx 10h$, full battery):

Charging at home, overnight, private sphere

Opportunity Charge ($\approx 2h$, add some km):

“Meanwhile” charging, associated to another main activity, at work, leisure, shopping, restaurant, hospital, Park&Ride... private/public activity

Emergency Charge ($\approx 30'$, in the case of empty):

Battery exceptionally exhausted, needed to get back home or just to enlarge autonomy once (one of the main fears of a novice EVdriver). Public Service. Similar to RoadSide Assistance.

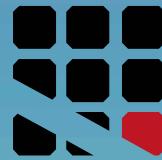
OnRoute Charge ($\approx 5'$, enlarge autonomy):

Long planned trip, charging in route to enlarge autonomy. Similar to gas station.



2018-2020 Set of plans around climate change and air quality

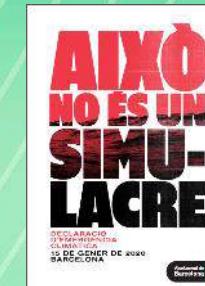
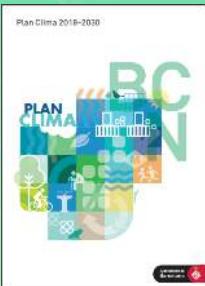




Set of 2018-2020 plans around climate change and air quality

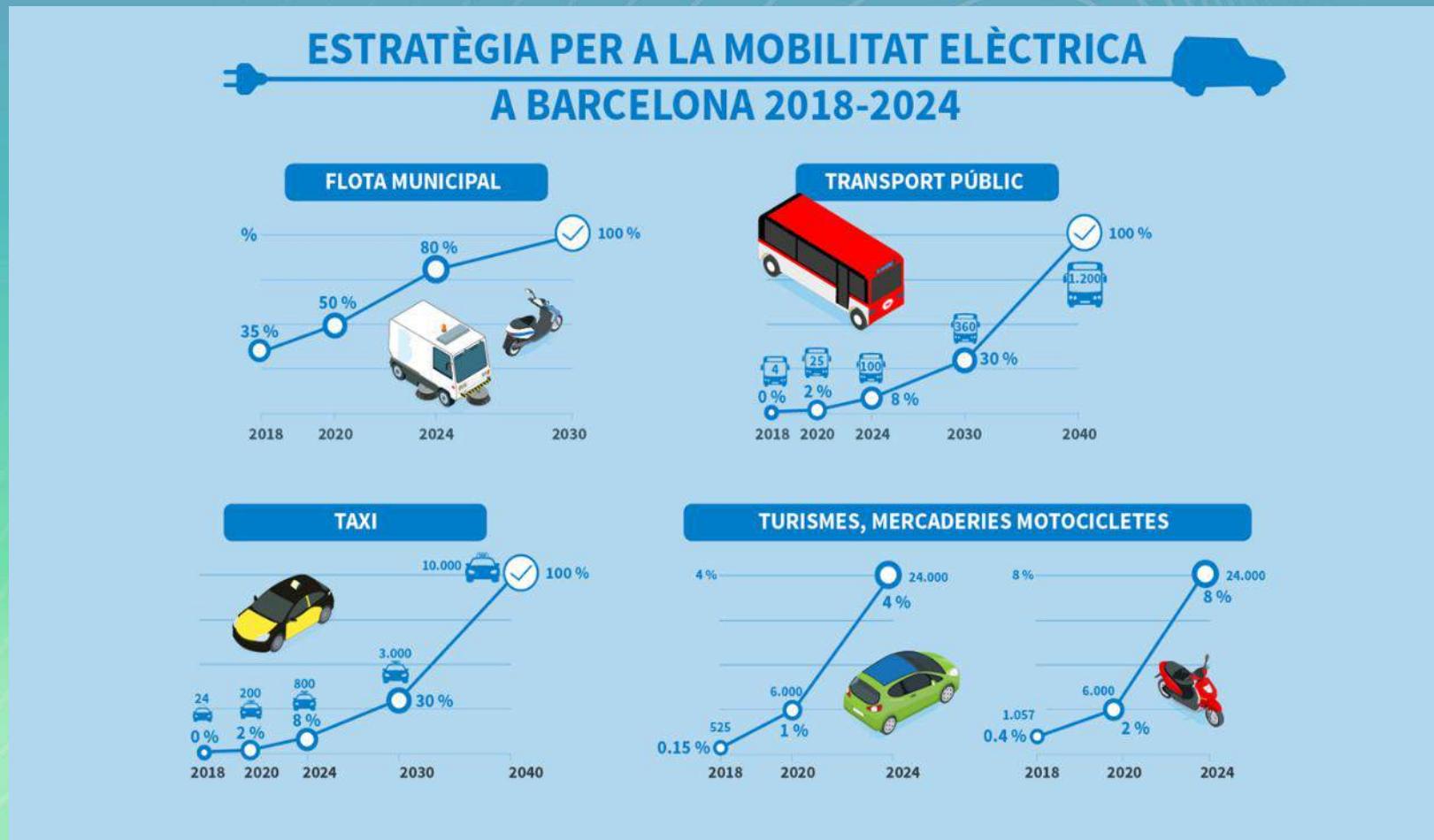
Barcelona City Council has strengthened its commitment by developing and implementing the following plans and strategies:

- ➔ Pla Clima Barcelona 2018 – 2030
- ➔ Pla de Mobilitat Urbana (PMU) 2024
- ➔ Declaració d'emergència climàtica de Barcelona 2030
- ➔ Zona de Baixes Emissions (ZBE) 2021
- ➔ **Estratègia de mobilitat elèctrica a Barcelona (EMEB) 2018 – 2024**



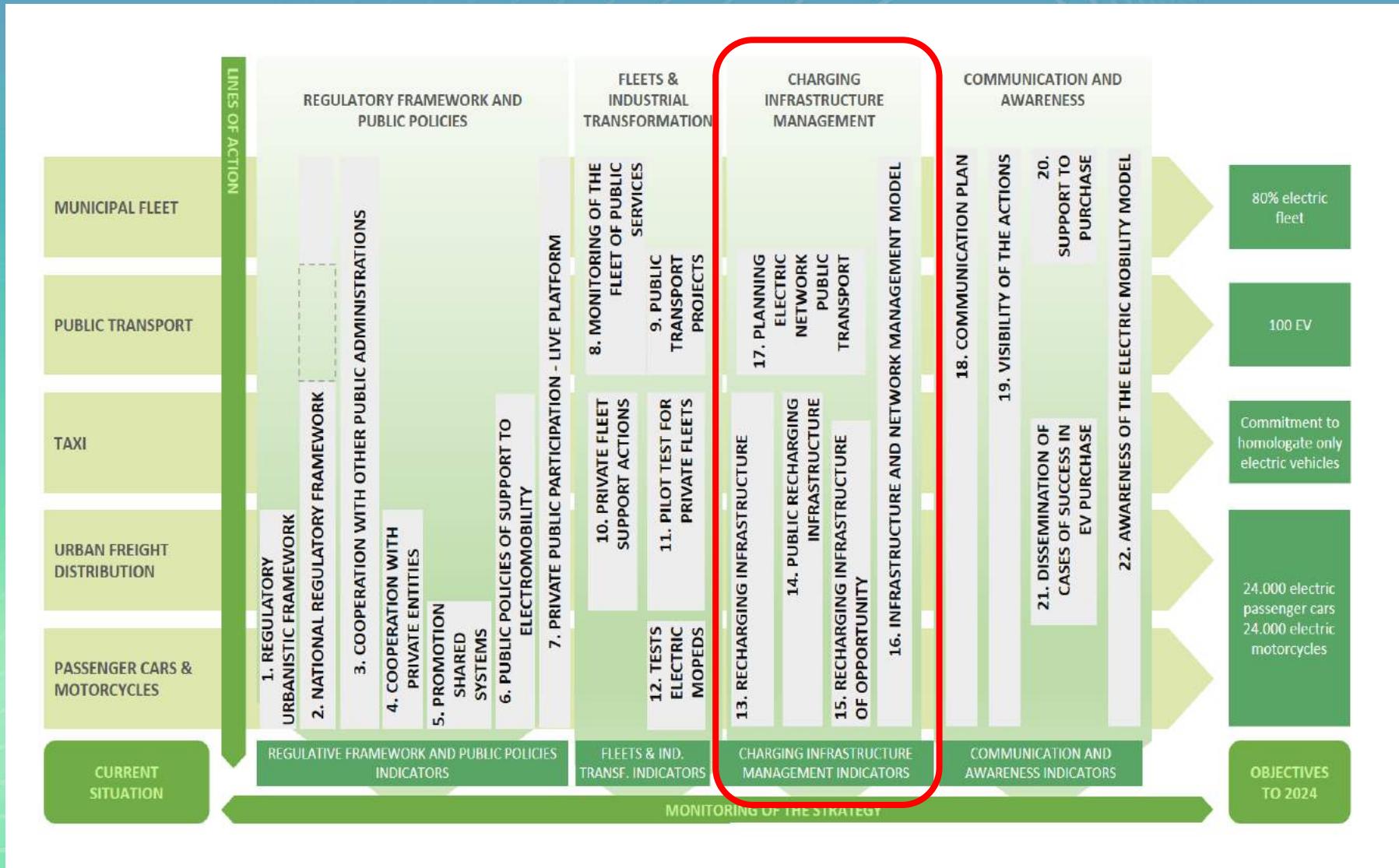


2018 - a strategy to boost e-mobility



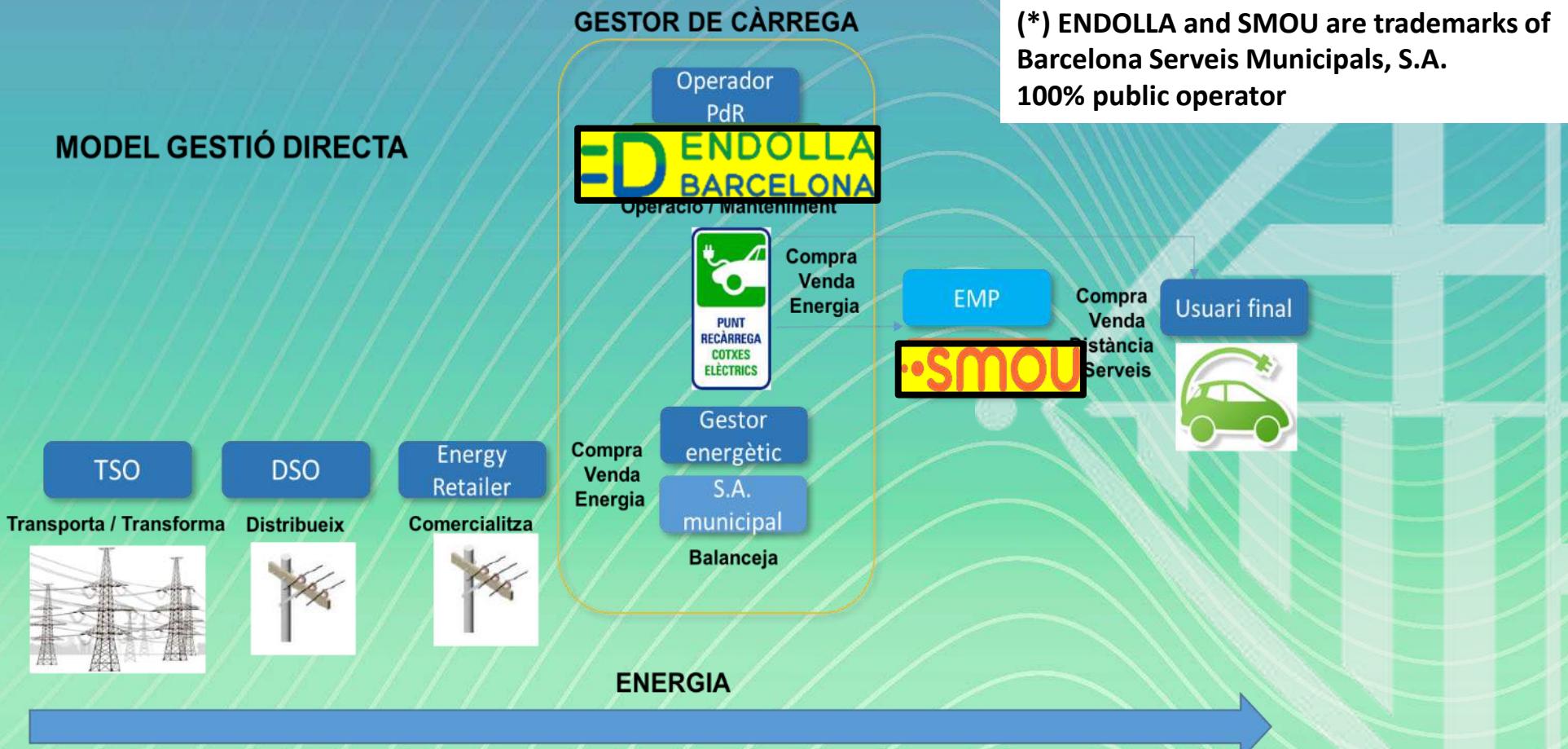


Strategy for the development of electromobility





2019 - Governance. CPO&eMsP management assignment to B:SM (*)

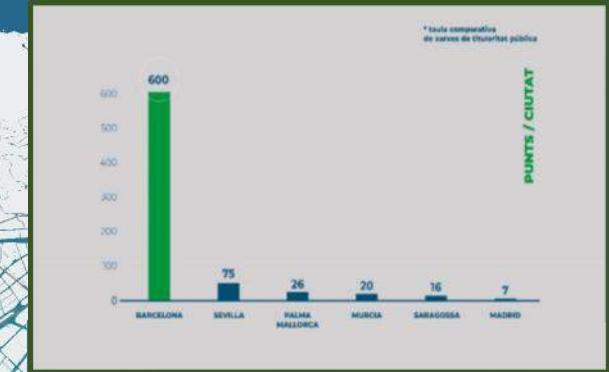


**860 EVCS
(8,6 EVCS/km²)**

**809 off street
+ 51 QC on street**

1,26kW/eCar

**+ 12.000 uses/month
+ 18.000 registered users**



**2013-2020 Inversió acumulada 5 M€
2021-2024 Inversió prevista 12M€**

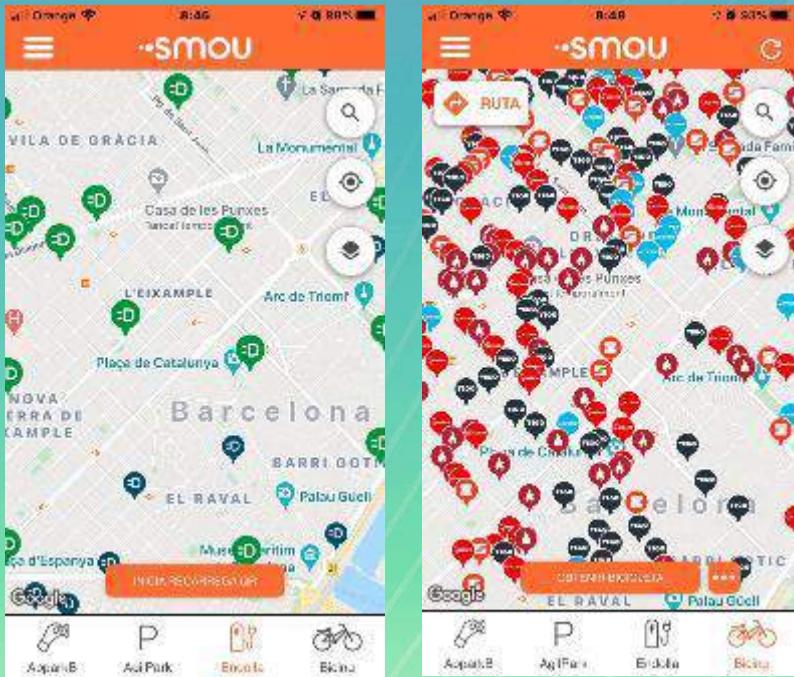


Aparcaments B:SM

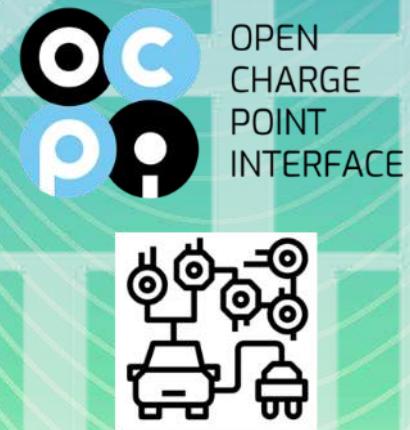
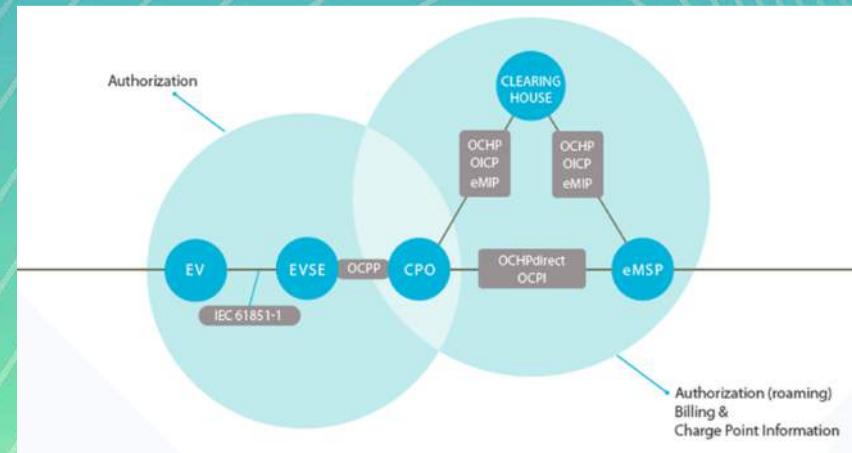
Al carrer



Aggregated interoperable SERVICES – SMOU

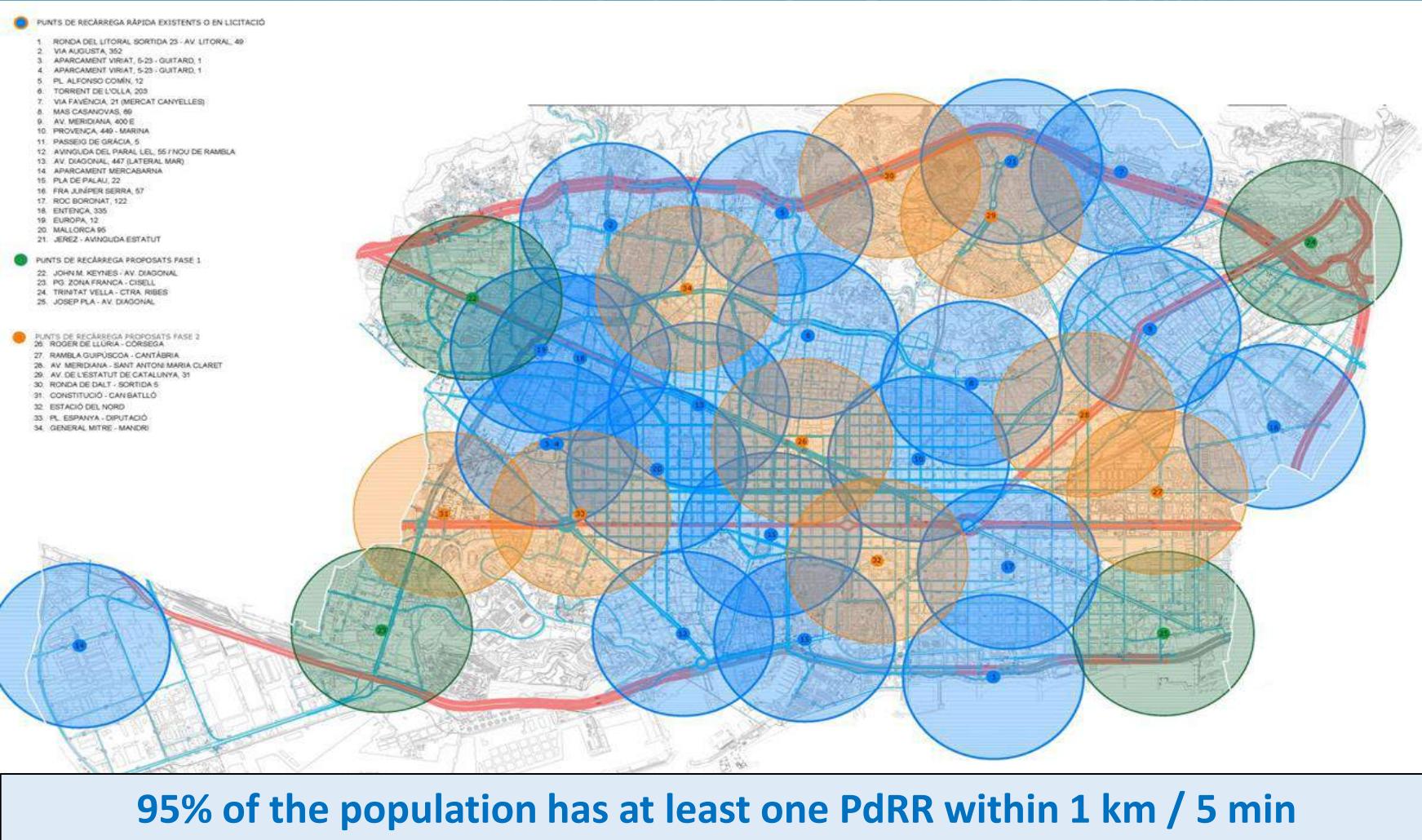


Solving the lack of interoperability with Open Source Standards





Strategy 2018/24: a public fast charging network with more than 60QC





2018 – modification of parking regulations



Art. 300

14. Los estacionamientos o aparcamientos contemplados en esta norma deberán incluir la instalación eléctrica específica para la recarga de vehículos eléctricos, ejecutada de acuerdo con lo establecido en la normativa vigente (ITC BT-52), con las siguientes dotaciones mínimas:

- a) en los estacionamientos o aparcamientos colectivos, de uso público o privado, se deberá ejecutar una conducción principal (mediante tubos, canales, bandejas, etc.) de manera que se facilite la realización de derivaciones (de máximo 20 metros) hasta cualquiera de sus plazas. Asimismo, se reservará el espacio necesario para la instalación de contadores y protecciones de las instalaciones de recarga para vehículos eléctricos.
- b) En los estacionamientos o aparcamientos de uso público (usos previstos en el ART 298.2, epígrafes: B, C, C.1, D, E, F, G, H, I) deberán ejecutarse las instalaciones necesarias para un punto de recarga normal por cada 10 plazas de aparcamiento para vehículos de 2 y 4 ruedas.

Estas instalaciones mínimas se aplicarán al conjunto del estacionamiento o aparcamiento considerado, especialmente en los casos de ampliación de plazas por incremento del volumen edificado o por cambio de uso de la edificación o por sustitución en espacios contiguos de aparcamiento.





BUT!!! Increasing Demand needs x2 infrastructure every 2 years aprox.



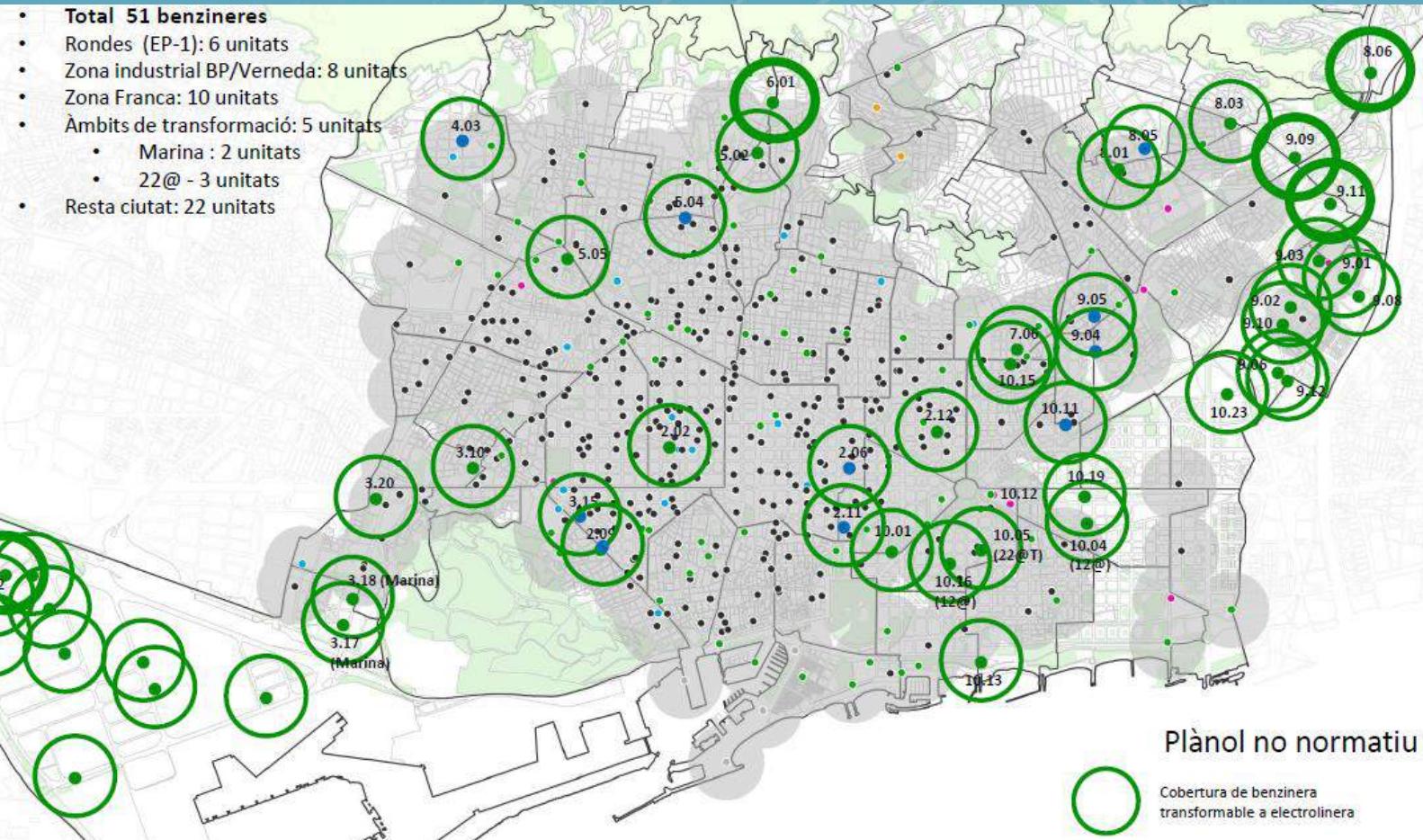


2021 - Special urban plan for the (no new) installation of fuel supply facilities
(and boosting recharge service stations)





Reorienting private investments from re(fuel) to re(charge) service stations





Incorporating USER-centric perspective – eCharge4Drivers



**Improving the EV charging experience within cities and for longer trips:
the eCharge4Drivers project**

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

Challenges



Improve comfortability of charging



Enable services interoperability and provide appropriate information to users



Promote smart charging solutions



Propose standardised charging options for LEVs



Support the wide deployment of charging infrastructure



Use case II-1: Advanced charging authentication - ISO15118PnC

Readiness of existing systems/Infrastructures towards use case demonstration

The charging point will be installed at the same car park where the smart charging demonstrator is being installed.

SMATRICS has offered its back-end and will be the CPO of the charging point

Pending upgrades towards use case demonstration + timeplan

Connection to the grid, which will be done in late 2022, prior to the arrival of the ABB CP.

Time plan: First semester 2023 (February - March 2023)

Requested contribution from other technology and service providers

ABB will provide the wallbox charging point

SMATRICS will act as a CPO of the charging point



Location of the car park



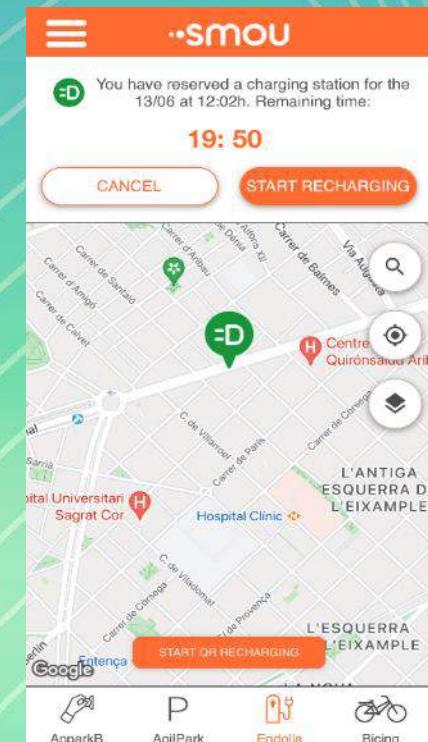
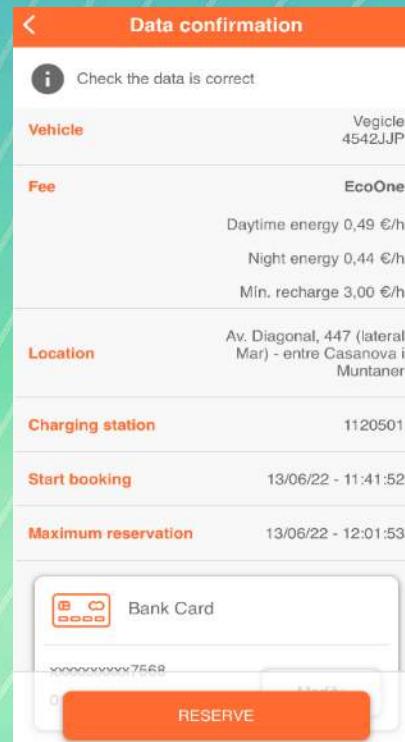
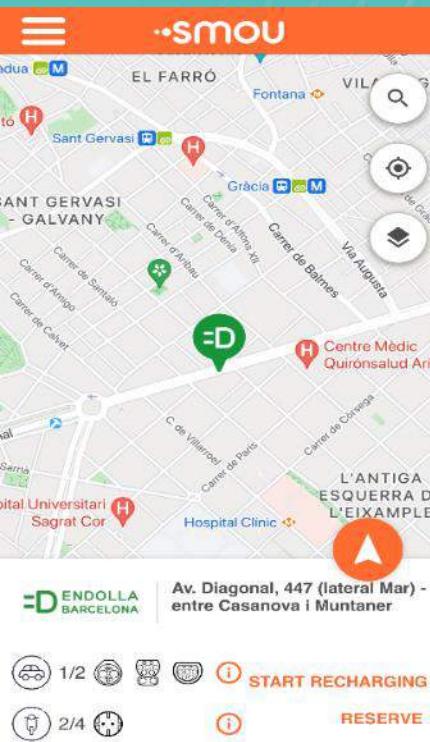
Use case II-2: Enhanced booking service

Readiness of existing systems/Infrastructures towards use case demonstration

- Short term booking → already existing and functioning via de Smou app (20' reservation)
- Enhanced information → most of the new items are already in service and are offered to users

Pending upgrades towards use case demonstration + timeplan

- Both services are already in operation





Silence's 5,6 kWh
Battery Pack

It aims to become the
standard Battery
Pack

Targetting the 125-
300 cc equivalent
LEVs category

Use case II-3: Battery Swapping





Battery Swapping in Fuel Station





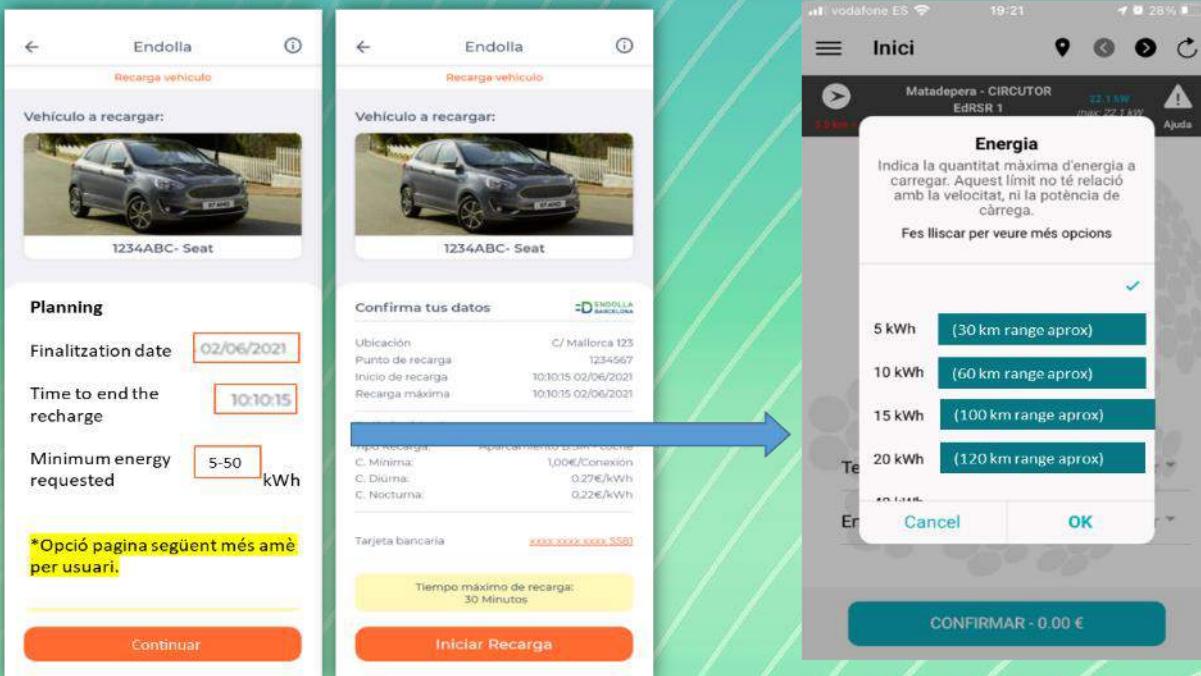
Use Case II-4: Smart Charging

Readiness of existing systems/Infrastructures towards use case demonstration

- **4 new charging points** have been renewed in the car park in order to increase the existing technology (OCPP 1.6). There are still two CP that have to be renewed. In total, 6 CP will be available for smart charging. To be installed during the last months of the year
- CEA has developed the charging algorithm and is now testing the connection with the charging points

Pending upgrades towards use case demonstration + timeplan

- Add a functionality at the Smou app in which the user will be requested the leaving time or amount of battery
- Due to several delays in updating the required technology, the system will not be ready for users until late 2022





ENDOLLA challenges in the context of InnovAction 2030 program

- Mobile and flexible charging point
- Low power economic charging point





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-D ENDOLLA BARCELONA +

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