

# MEISTER



**M**obility **E**nvironmentally-friendly, **I**ntegrated and economically **S**ustainable **T**hrough innovative **E**lectromobility **R**echarging infrastructure and new business models

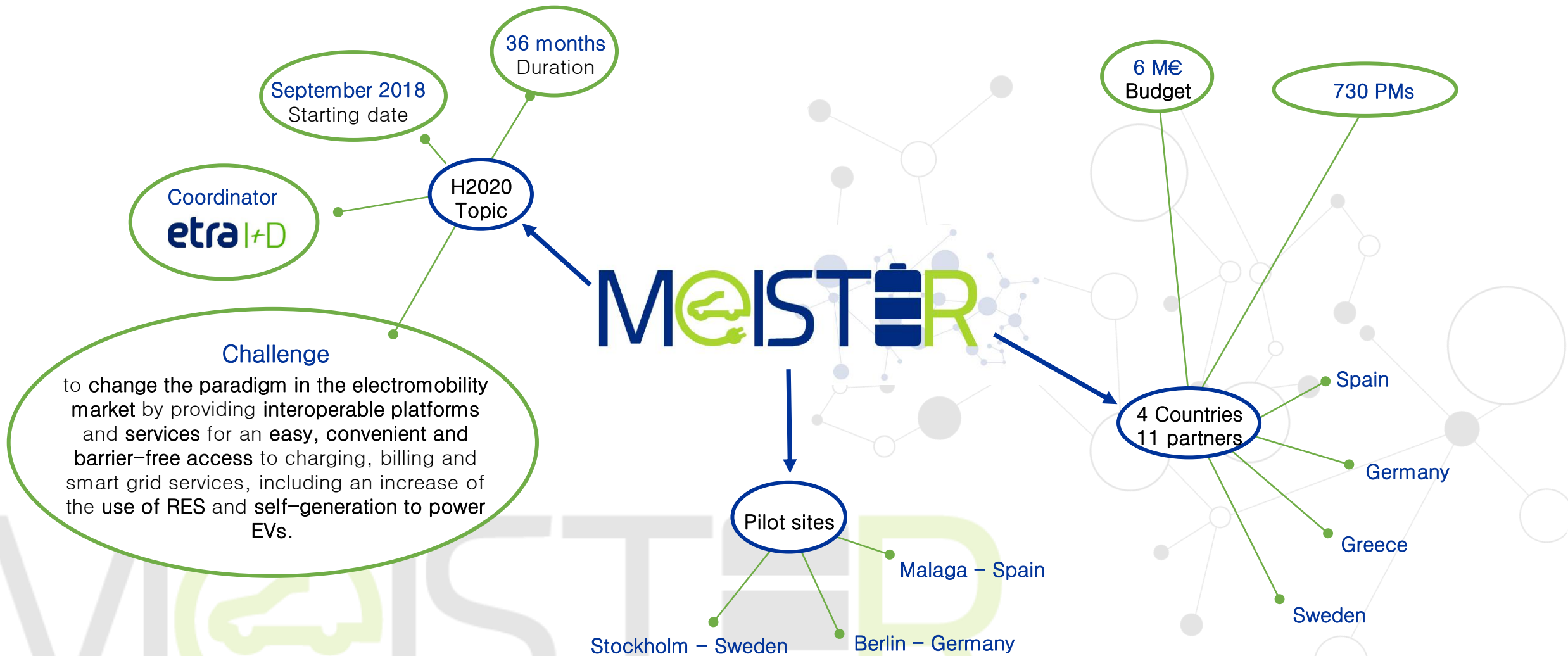
**CIVITAS ECG MEETING**  
@Urban Mobility Days 2022, Brno

**IKEM**

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# Project Overview



# Project Objectives



## Establishment of innovative sustainable business models for smart mobility

- Reduction of mobility and parking costs (BC1, BC2, and BC4)
- Increase in EV demand over time (BC2, BC3, BC4)
- Reduction of EVSE installation and operational cost (BC6 and BC10)
- Reduction of EV charging prices (BC6)

## Deployment of an e-mobility interoperability platform

- Reduction of operational barriers (BC2)
- Social acceptance (BC1, BC2, BC3)
- Customers registered in the MEISTER platform/app (BC1, BC2, BC4, BC5, and BC6)
- Number of integrated services in the MEISTER platform/app (BC5 and BC6)

## Integration of e-mobility in the cities' SUMP and city planning processes

- Reduction of CO<sub>2</sub> emissions (BC1, BC2, BC3, BC4, BC5, and BC6)
- Increase in relative offer of EVSE (BC5, BC6, and BC10)
- Decrease of private car ownership (BC1 and BC2)
- Reduction of parking demand (BC4, BC5, and BC6)

## Integration with smart grid services

- Amount of flexibility services tendered by DSOs (BC10)

# Business Cases



BC1  
E-carsharing as Housing  
Service

BC2  
E-carsharing in the Municipal  
Fleet in Málaga

BC3  
Delivery of Home Care  
Services with EVs in Stockholm

BC4  
City E-logistics Enabling Ultra-  
low Emissions Hubs in Málaga



BC5  
Smart Park and Charge in Berlin

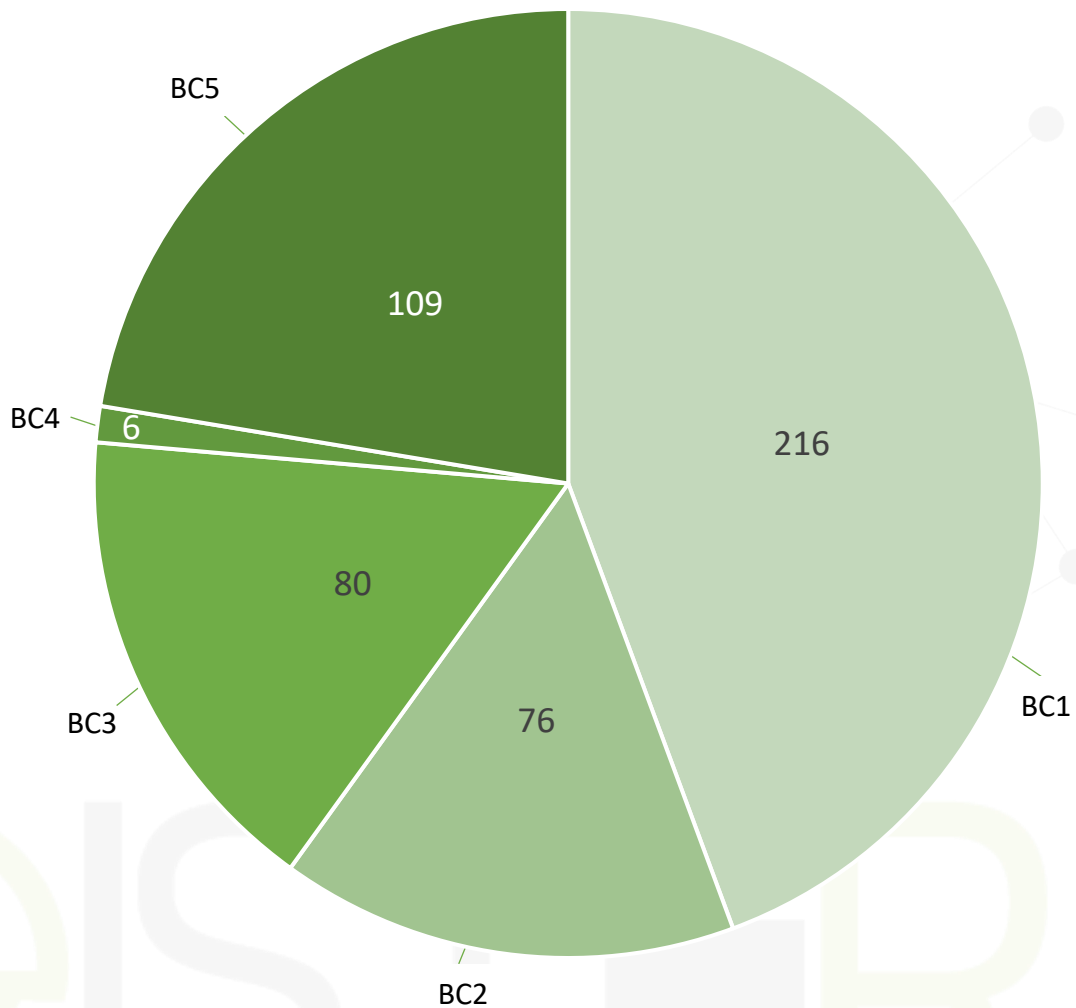
BC6  
Smart Park and Charge in Málaga

BC10  
Smart Charging in Stockholm

P3. MEISTER Integrated Real-Time Information & Booking Services

# Social Impact Dimension

## Customers Registered (for the MEISTER apps)



**487**  
additional  
customers/users  
due to MEISTER  
project (without  
BC6 and BC10)

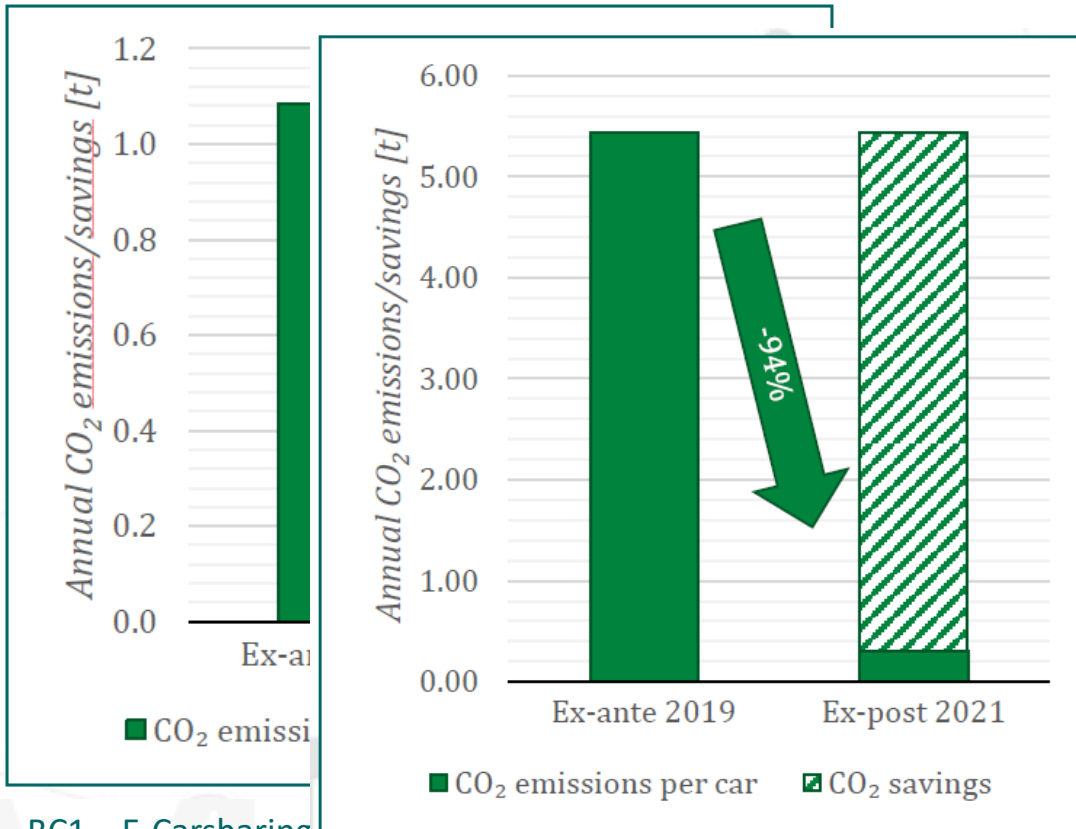


Source: Data from GEWOBAG, Málaga City Council, City of Stockholm and Platform Provider VMZ/ETRA

# Results



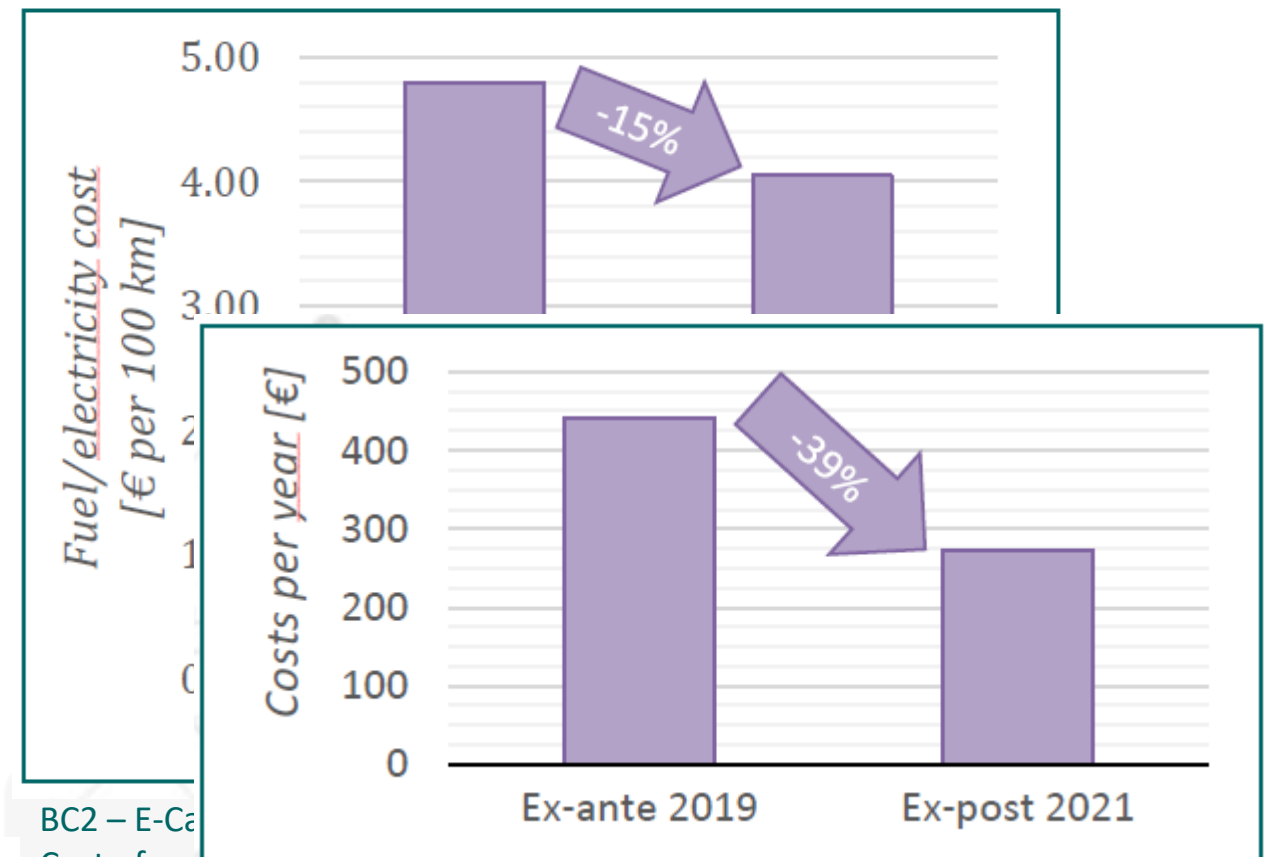
## CO2 Emissions



BC1 – E-Carsharing  
Total amount of CO<sub>2</sub> emissions per vehicle/EV of the e-carsharing fleet

BC3 Home Care Services for Elderly People (Stockholm):  
Total amount of CO<sub>2</sub> emissions per vehicle/EV of the home care service fleet per year

## Costs



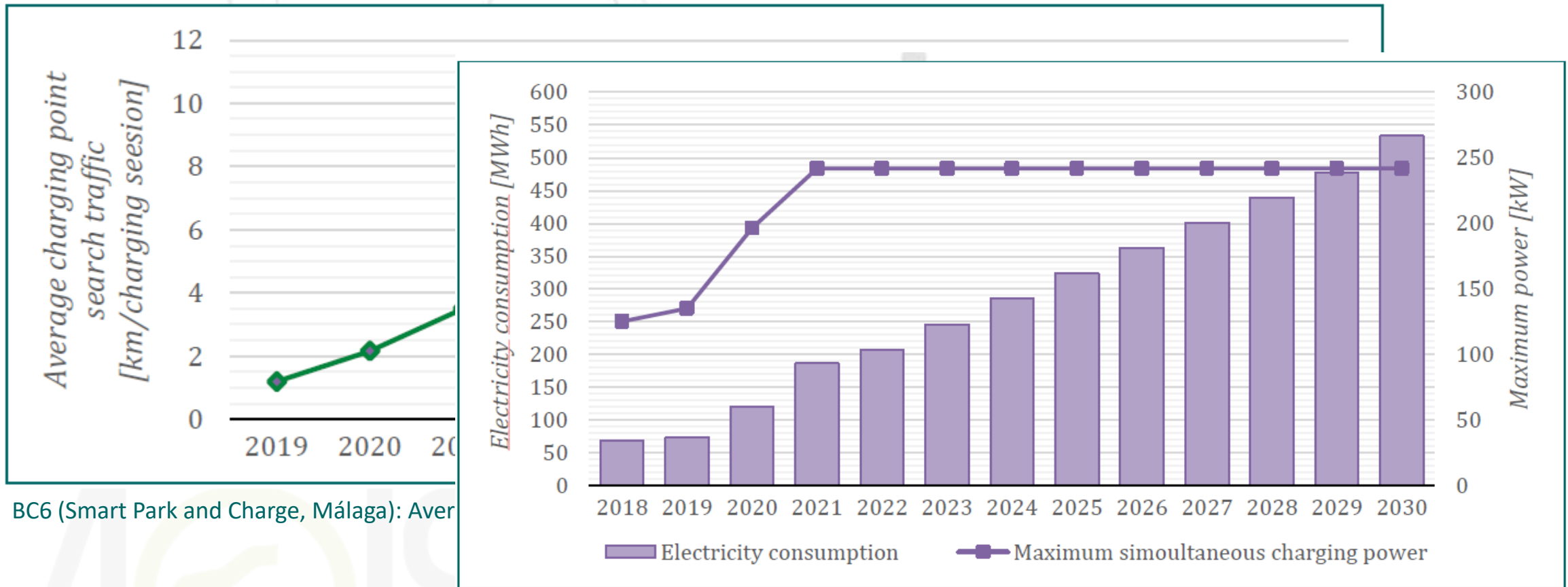
BC2 – E-Carsharing  
Cost of use of fuel and electricity

BC4 – City E-logistics Enabling Ultra-low Emissions Hubs (Málaga):  
Cost of loading and unloading parking spaces per year

# Results



## Business-as-usual scenarios



BC6 (Smart Park and Charge, Málaga): Average charging point search traffic

BC10 (Smart Charging, Stockholm): Change of maximum simultaneous charging power – b-a-u-scenario

# Conclusion and Recommendations



Objectives

## Establishment of innovative sustainable business models for smart mobility

- Decrease of mobility and parking costs in BC1, BC2 (E-Carsharing in housing companies/municipal fleet) and BC4 (city e-logistic) compared to the reference scenario
- With the exception of BC3 (home care services), demand for EVs has not been boosted by the BCs
- BM5 (P+C, Berlin) can considerably increase EVSE turnover if used extensively by EVSE users
- BC10 (P+C, Stockholm) can remarkably reduce EVSE OPEX if implemented throughout the city

## Deployment of an e-mobility interoperability platform

- Operational barriers have been relatively low, or could have been resolved quickly
- 5 out of the 6 services targeted have been successfully integrated in the MEISTER app
- Among BC1-BC5 approximately 500 customers could be acquired for the MEISTER solutions
- Acceptance vis-à-vis the MEISTER solutions and apps has been relatively high



Cost for mobility using private individual ICEVs will rise continuously and significantly



Further investigating the additional turnover of CPOs generated by Smart Park & Charge



Further developing the integration of MEISTER apps and EVSE or parking spaces



Defining ownership and operation responsibilities of Smart Park & Charge and Smart Charging



# Conclusion and Recommendations



Objectives

## Integration of e-mobility in the cities' SUMP and city planning processes

- Huge CO<sub>2</sub> saving potential not fully exploited during the BC demonstration
- If used more extensively by employees and tenants BC1 and BC2 (E-Carsharing in housing companies/municipal fleet) can reduce private car ownership
- BM5 and BC10 (P+C/Smart Charging) can considerably raise relative offer of EVSE if implemented throughout the city
- Reduction of parking demand by BC4 (city e-logistic) and BM5 if adopted thoroughly by commercial and private mobility patterns

## Integration with smart grid services

- Amount of flexibility services tendered by DSOs can be increased remarkably by Smart Charging if the BC is implemented throughout the city and refined by iterative re-optimization algorithms



Share mobility and reservation charging schemes require deeper behavior changes



Need to investigate turning points stimulating those changes



Due to the uptake of EVs in dense urban areas Smart Park & Charge and Smart Charging will become more relevant

# Summary



## Full results available as poster!

### Master the Urban Mobility Transition

Evaluating innovative sustainable mobility solutions throughout Europe

The Horizon 2020 project MEISTER, which took place from 2019 to 2022, involved the demonstration of seven novel business cases promoting sustainable mobility in the three pilot cities of Málaga, Berlin and Stockholm. IKEM conducted a comprehensive impact assessment to measure what these seven business cases imply for the economy, the environment,

society, and the energy and transport system, in compliance with the CIVITAS SATELLITE process and impact evaluation framework.<sup>10</sup> The methodology of the impact assessment consisted of an analysis of city-level and pilot-site specific indicators with business-to-citizen forecasting, control site analysis, and the evaluation of end-user and pilot-site leader surveys.

This poster presents the key findings of the impact assessment for each business case. A thorough presentation of the findings can be found on the MEISTER website. The more qualitative findings of the social impact of the business cases are also outlined here in more detail.



Scan to find out more about the Meister project



As print  
or  
digital (pdf) at  
<https://meisterproject.eu/poster-meister-results/>

#### 1 E-cashsharing as Housing Service

The demonstration of the business case "E-cashsharing as a Housing Service" (ECS) clearly showed that the concept can significantly reduce the tenants' annual mobility costs for mileage by up to 4200€ per year compared to a reference scenario in which their mobility needs are met primarily by private cars with a combustion engine. This relative benefit is likely to increase in the future, as various cost factors relevant to the reference scenario – such as the rental costs for parking spaces – will rise in the coming years.<sup>10</sup> IKEM/IKEM

Annual mobility costs for tenants

— E-cashsharing  
— Reference scenario

#### 2 Smart Park and Charge in Berlin

The business case "Smart Park & Charge" in Berlin showcased the potential of reservation charging schemes to decrease the time spent by EVs at public charging points after their battery is fully recharged. Even though the public charging landscape was dominated by a number of unreserved spaces during the demonstration period, the potential was verified by control site analysis and business-to-citizen forecasting. Given the continuous increase in the number of newly registered EVs, the findings of this business case are likely to become even more relevant in the future.<sup>10</sup> IKEM

Mean transition duration per charging process

■ AC charger (20 kW) ■ Triple charger (20 kW)

#### 3 Smart Park and Charge in Málaga

The business case "Smart Park & Charge" in Málaga demonstrated the potential to reduce the CO<sub>2</sub> emitted by road transport by minimizing charging point search traffic. The acceleration of EVs in Spain means that the total distance covered by such traffic will rise considerably over the coming years if the network of public charging points is not adequately expanded. However, to fully exploit this potential, Smart Park & Charge solutions must be accessed regularly by a significant number of public charging point users.<sup>10</sup> IKEM

Reducing CO<sub>2</sub> emissions by minimizing charging point search traffic

— CO<sub>2</sub> savings

#### 4 City E-logistics Enabling Ultra-low Emission Hubs

The business case "E-logistics Enabling Ultra-low Emission Hubs" has realized the potential to minimize CO<sub>2</sub> emissions of last-mile delivery services per 100 km driven by routing that stops made by light commercial vehicles with combustion engines are completed by cargo e-bikes and small electric tractors. However, this potential – which is likely to increase due to rising demand in commerce – can only be fully realized if these EVs access the full share of the biggest Swiss' road annual mileage.<sup>10</sup> IKEM/IKEM

Total amount of CO<sub>2</sub> emissions per 100 km driven by EVs (ICRV) for last-mile deliveries

■ CO<sub>2</sub> emissions ■ CO<sub>2</sub> savings

#### 5 E-cashsharing in the Municipal Fleet

The demonstration of "E-cashsharing in the Municipal Fleet" showed the potential of the business case to decrease the CO<sub>2</sub> emissions due to private vehicle usage by municipal employees if those employees use their mobility needs with an e-cashsharing car instead of a private vehicle with a combustion engine. However, to fully exploit this potential, the e-cashsharing service would have to be used much more intensively.<sup>10</sup> IKEM/IKEM

Total amount of CO<sub>2</sub> emissions of the private vehicle usage of the municipality's employees participating in the pilot

■ CO<sub>2</sub> emissions ■ CO<sub>2</sub> savings

#### 6 Smart Charging

The business case "Smart Charging" demonstrated the potential of power steering measures to reduce the maximum drawdown power of charging stations at public charging points at the grid connection level and thus contribute to decreasing the operational costs of charging stations. The potential to higher the power charging stations on shared infrastructure, and its promise to rise in the near future as more charging sessions are run in parallel due to the market ramp-up of EVs.

Relative change of maximum simultaneous charging power

#### 7 Delivery of Home Care Services with EVs

The demonstration of Delivery of Home Care Services with EVs showed that the business case can considerably increase the relative number of EVs within the municipal fleet, also through the identification of vehicle operating in those cities per day with a high daily mileage. The business case can thus boost the demand for EVs by the municipality in the long run and can be replicated elsewhere by other organizations.<sup>10</sup> IKEM

Relative amount of registered EVs in home care service fleet

■ Number of EVs ■ Number of combustion cars

# Summary



## .. or in the Deliverable (D7.2)



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## D7.2 Cross-site Evaluation and Impact Assessment Report

<https://meisterproject.eu/d7-2-cross-site-evaluation-and-impact-assessment-report/>

# Outlook



2019 – 2021

Cross Site Evaluation  
Impact Assessment  
Business Model Validation

**IKEM**

<https://www.userchi.eu/>



2020 - 2024

Impact Assessment

**IKEM**

+

exchange

Cross Site Evaluation  
Business Model Validation

fit Moving innovation

„Lessons-learned“ from evaluation process of MEISTER influence the work of User-Chi’s Impact Assessment



Mobility Environmentally-friendly, Integrated and economically Sustainable Through innovative Electromobility Recharging infrastructure and new business models



@MEISTER\_H2020

# THANK YOU! Any Question?



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For more information visit: <https://meisterproject.eu/>