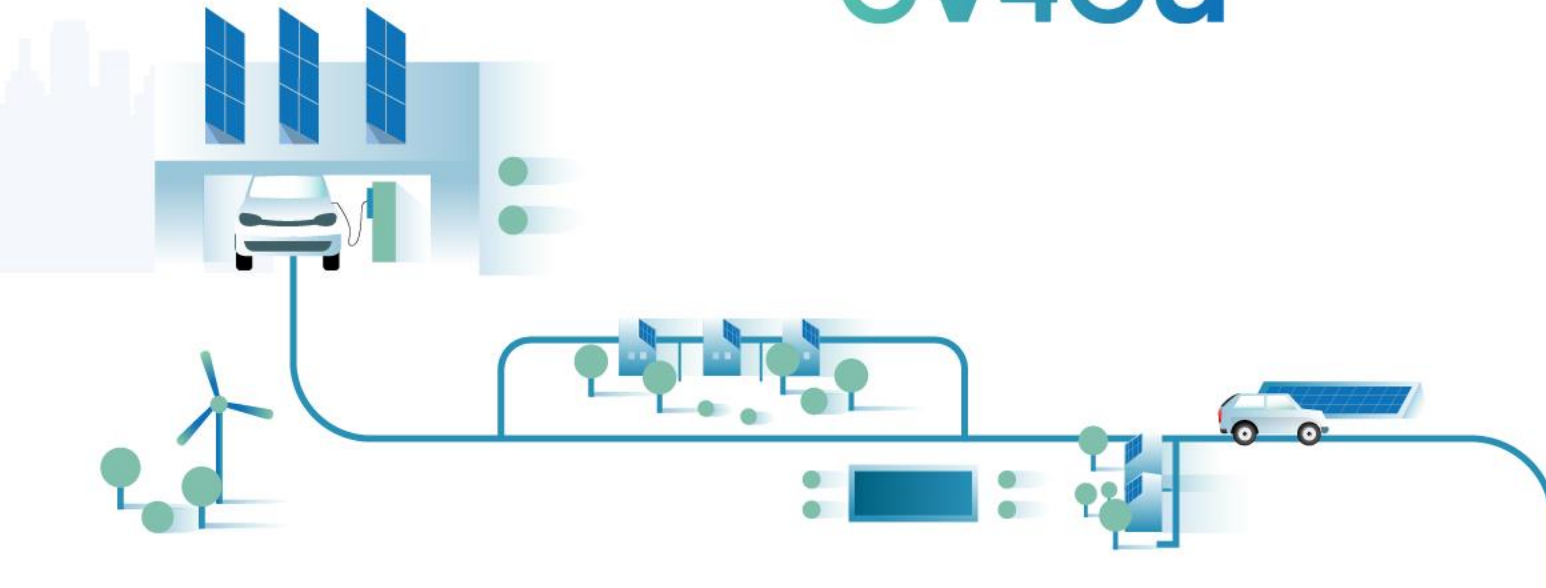


# Electric Vehicles Management for Carbon Neutrality in Europe: An overview and main innovations



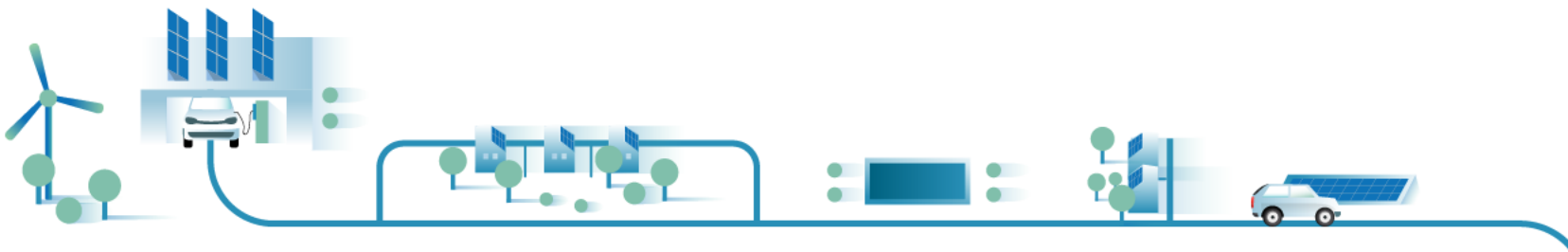
ISGT 2023 EU  
Special Session: Intelligent applications  
for energy communities and storage  
systems



Cindy P. Guzman  
cindy.lascano@tecnico.ulisboa.pt

24-10-2023

# EV4EU – Consortium



# EV4EU – Facts and Numbers

16

## PARTICIPANT PARTNERS

### RESEARCH ENTITIES:



### SYSTEM OPERATORS:



### AGGREGATORS:



### TECHNICAL PROVIDERS



Social Science experts

### V2X USERS/GOVERNMENTAL AND PUBLIC ENTITIES



### CAR MANUFACTURERS :

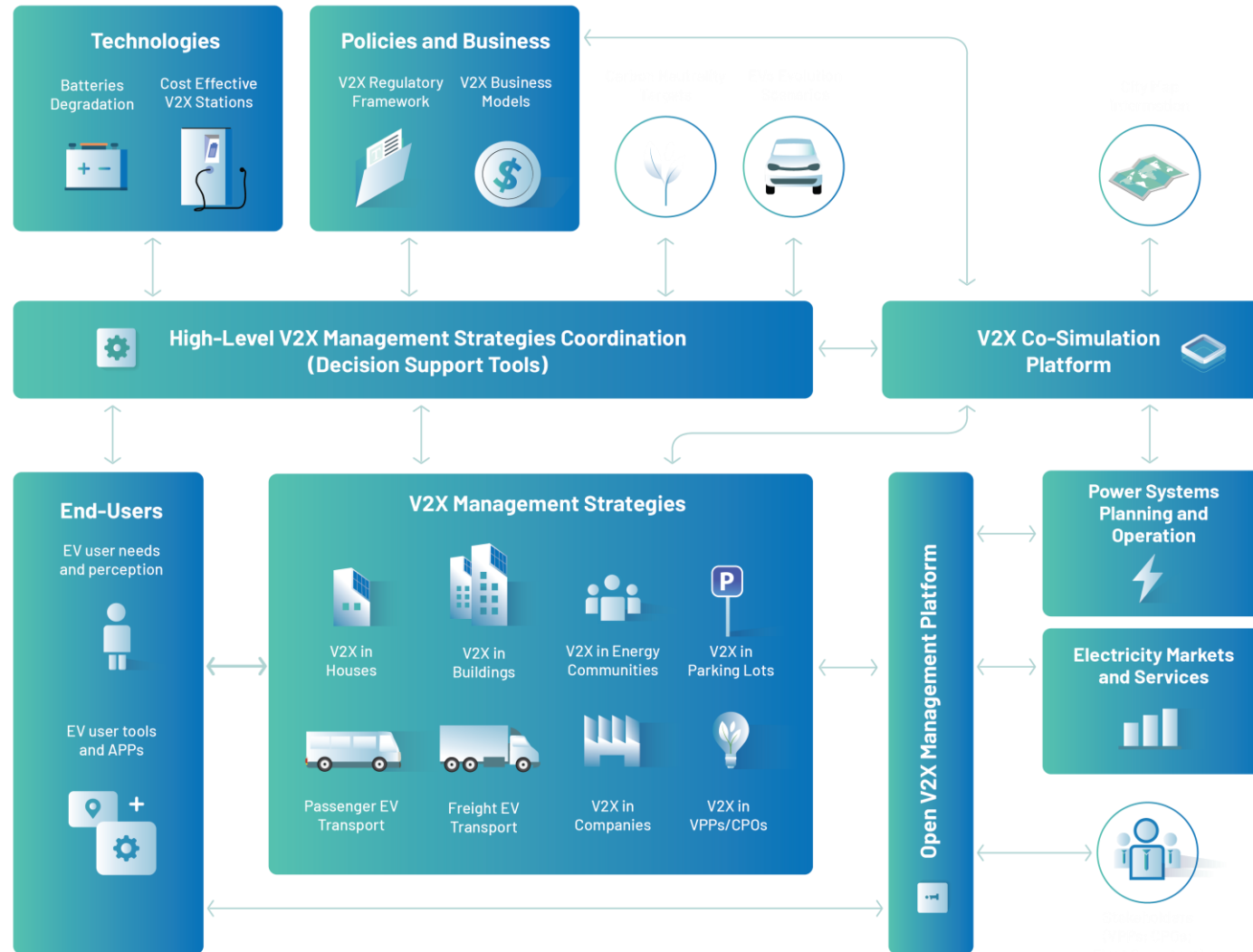


6

## ASSOCIATED PARTNERS



# EV4EU – Concept



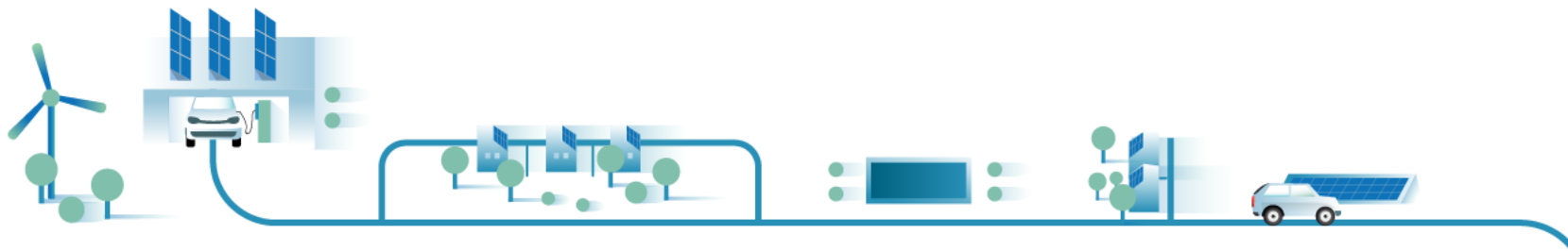
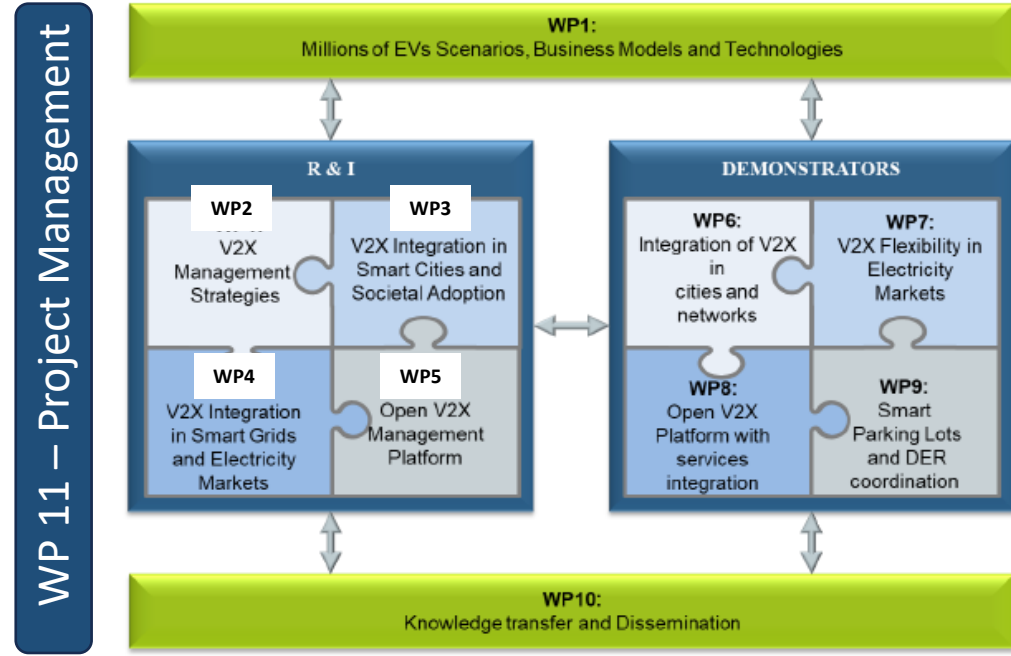
# EV4EU – Facts and Numbers

## 11

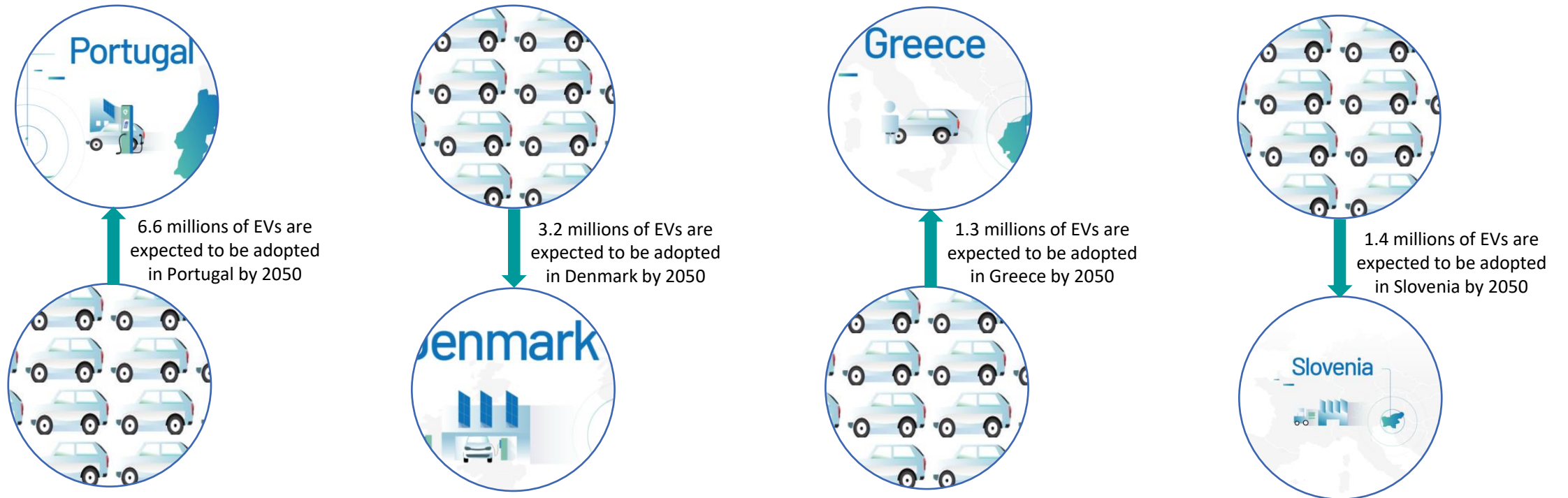
### WORK PACKAGES

#### Currently at Month 17:

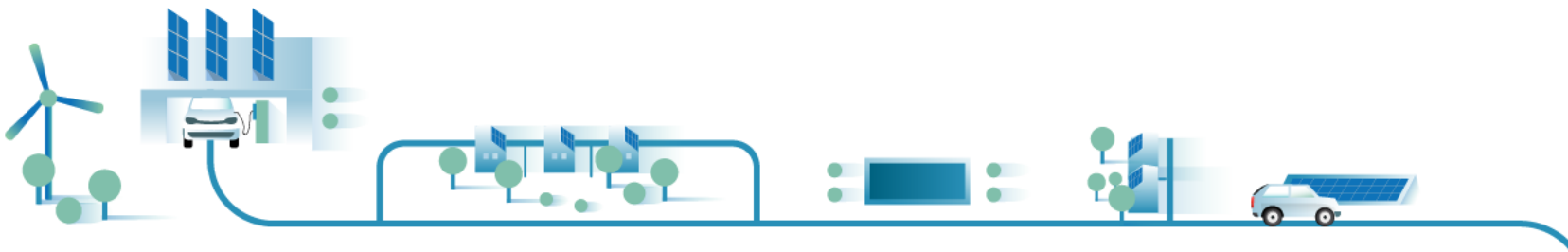
- All WPs are active;
- The four DEMO WPs (WP6, WP7, WP8, WP9) started at M13;
- 13 Tasks closed.



# EV4EU – EVs Evolution Scenarios

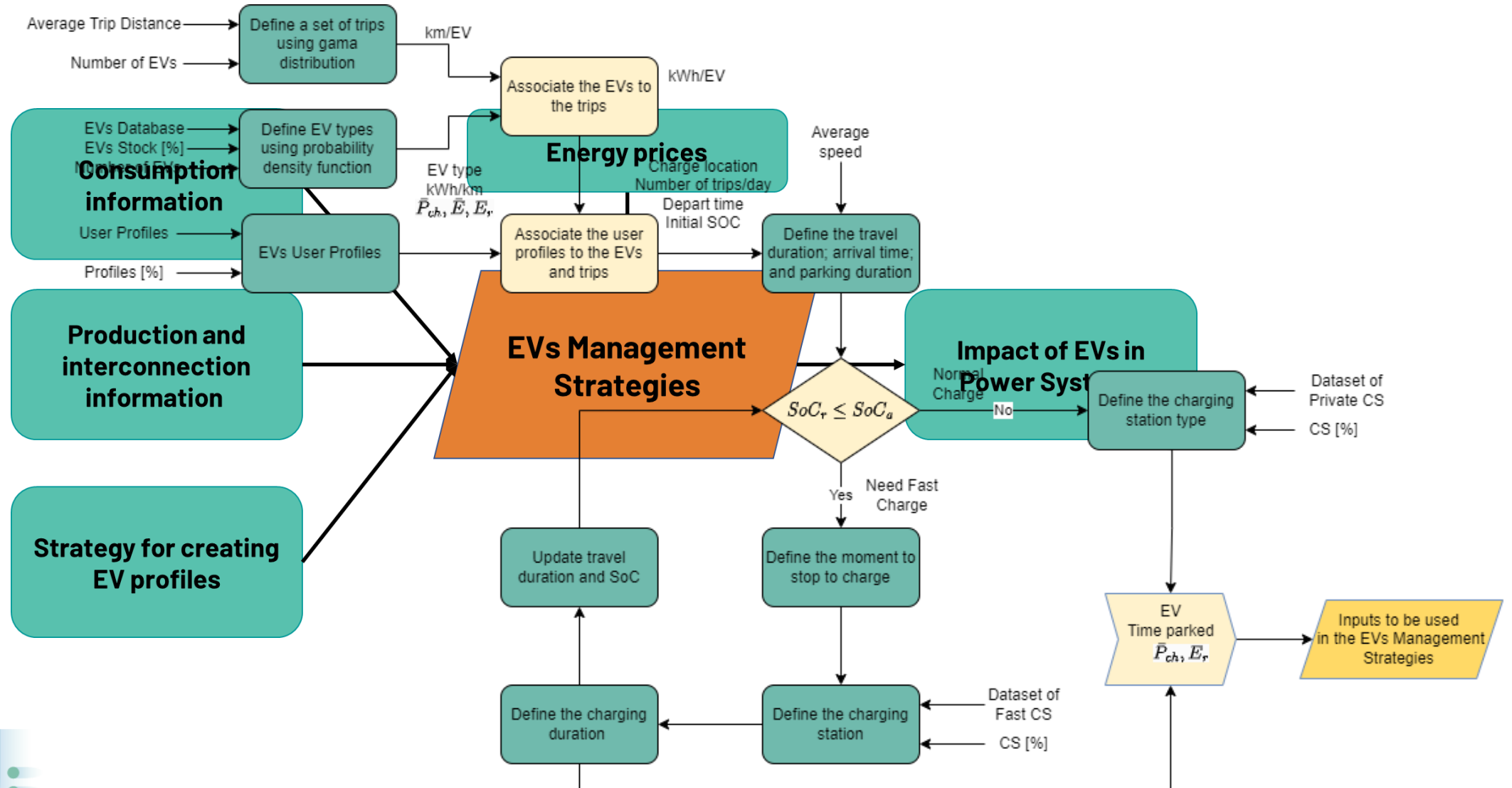


***What will be the impact of the massive penetration of EVs in the energy systems of each country???***





# EV4EU – EVs Impact in Energy Systems



# EV4EU – EVs Impact in Energy Systems

*OF1, OF2, OF3, OF4, OF5, OF6*

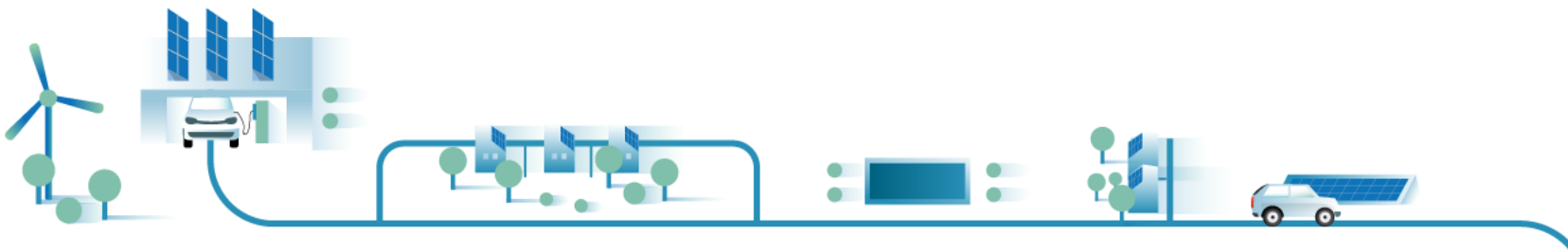
Subject to



EV operational constraints considering both charging and discharging



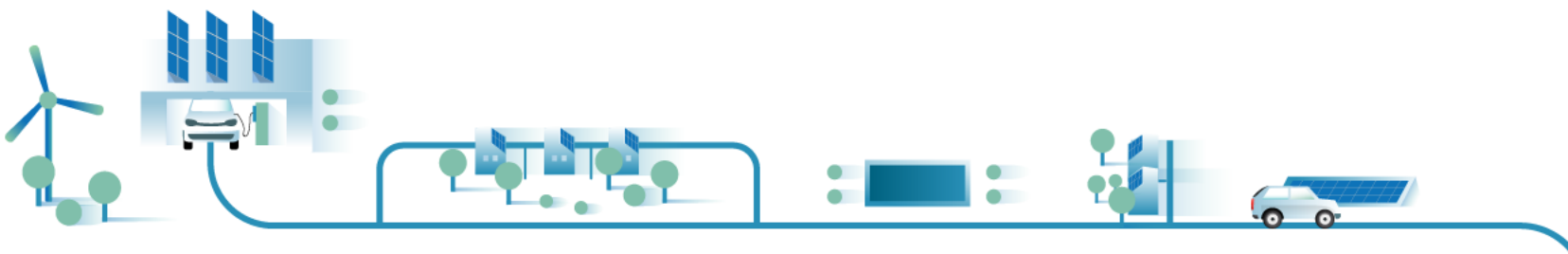
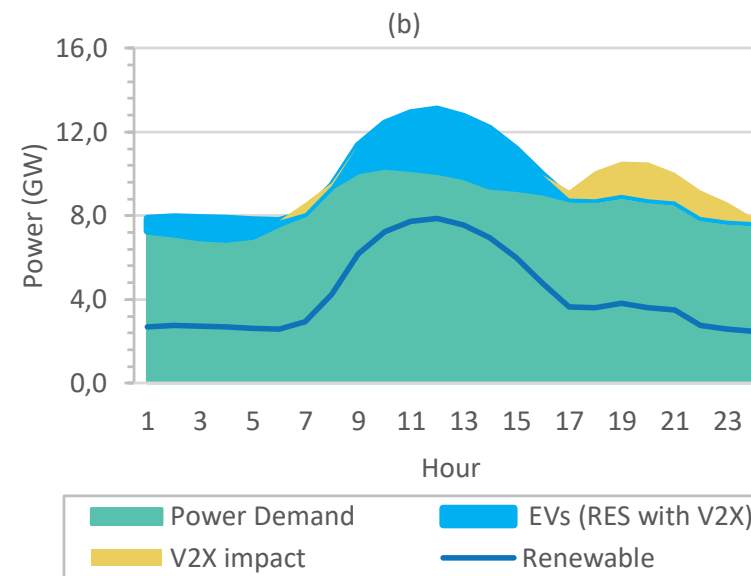
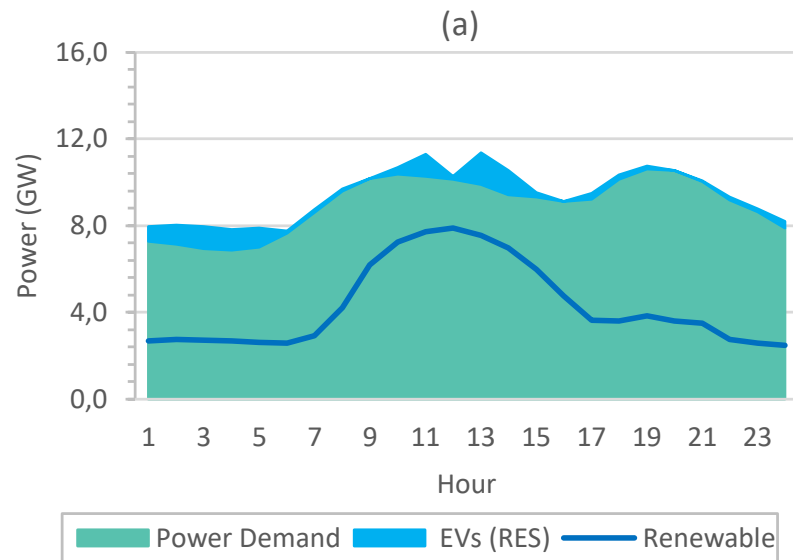
Power system operational constraints



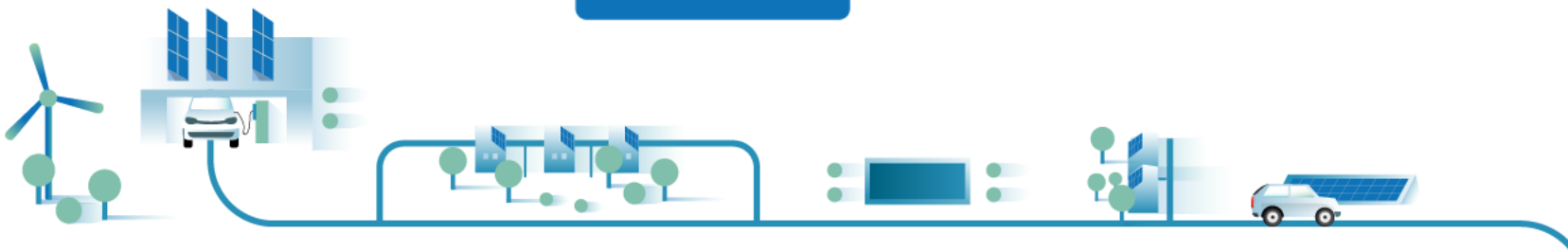
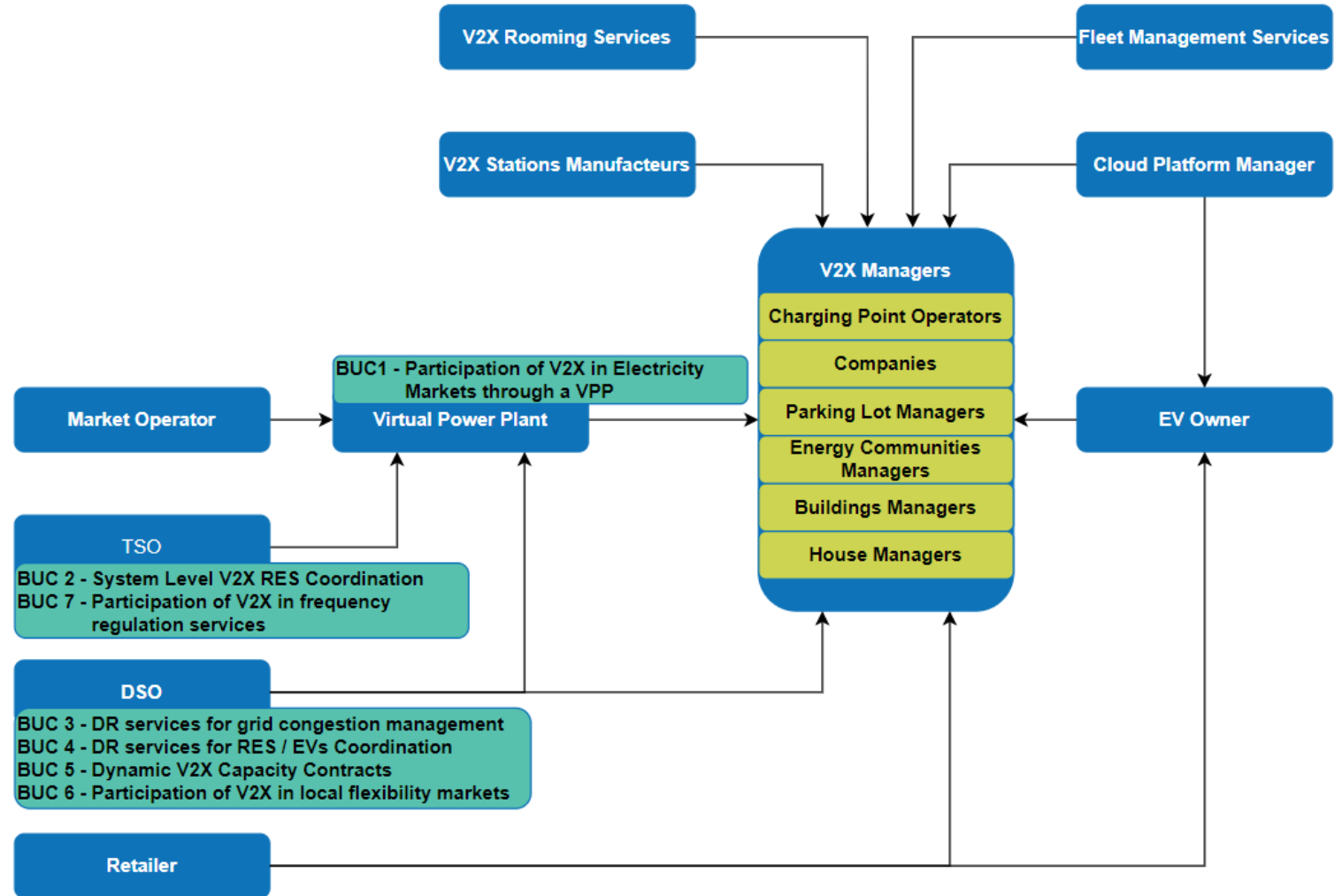


# EV4EU – EVs Impact in Energy Systems

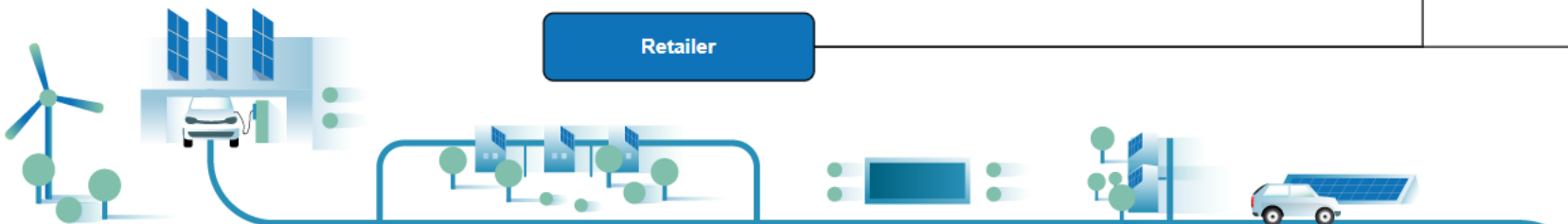
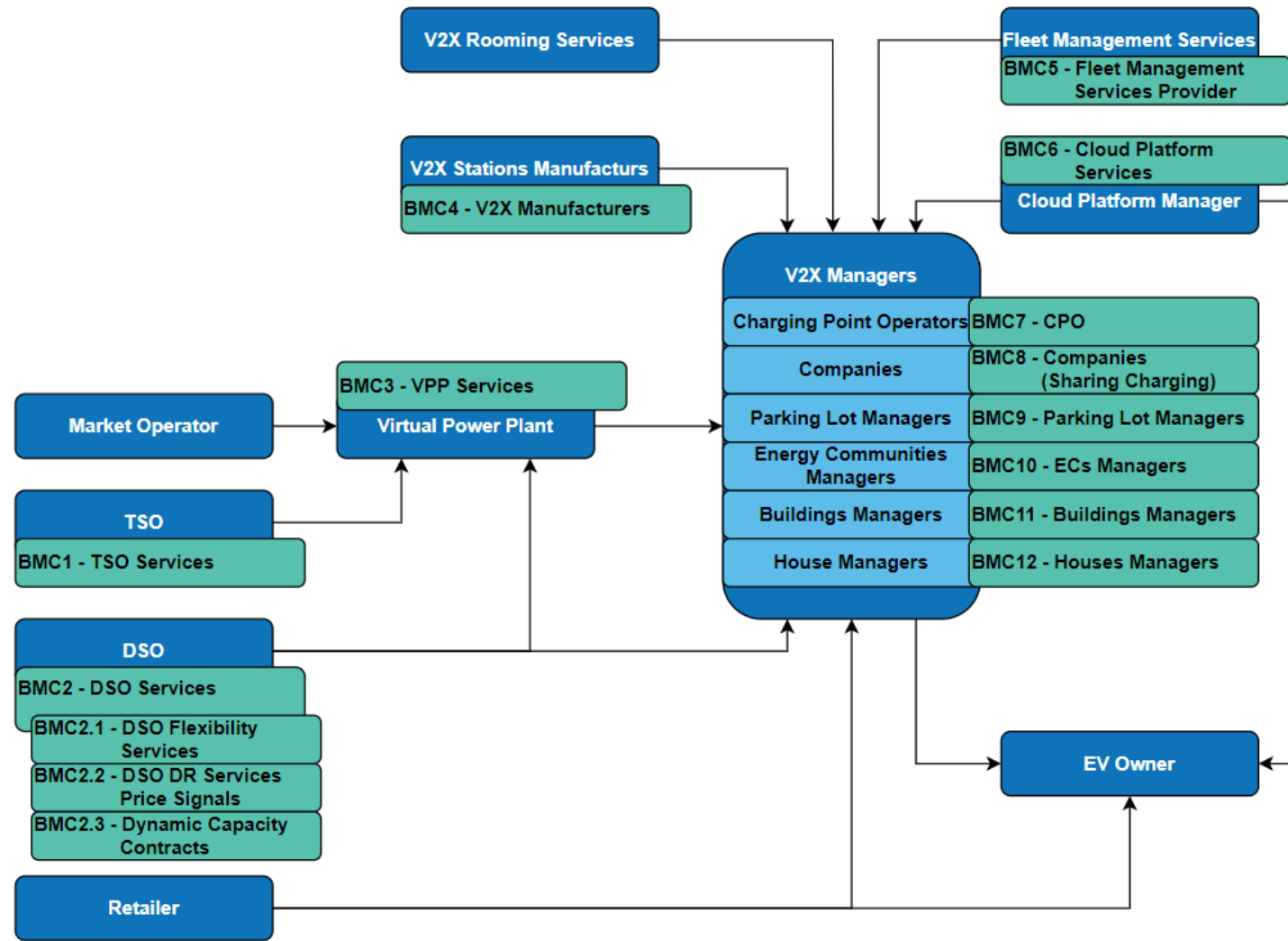
Impact of EV / RES coordination in Greek System in 2050



# EV4EU - Use Cases in the Proposal



# EV4EU - Use Cases in the Proposal



# EV4EU – Modeling EVs Clustering

Stage 1 - Preprocessing → Stage 2 - Clustering → Stage 3 - Validation

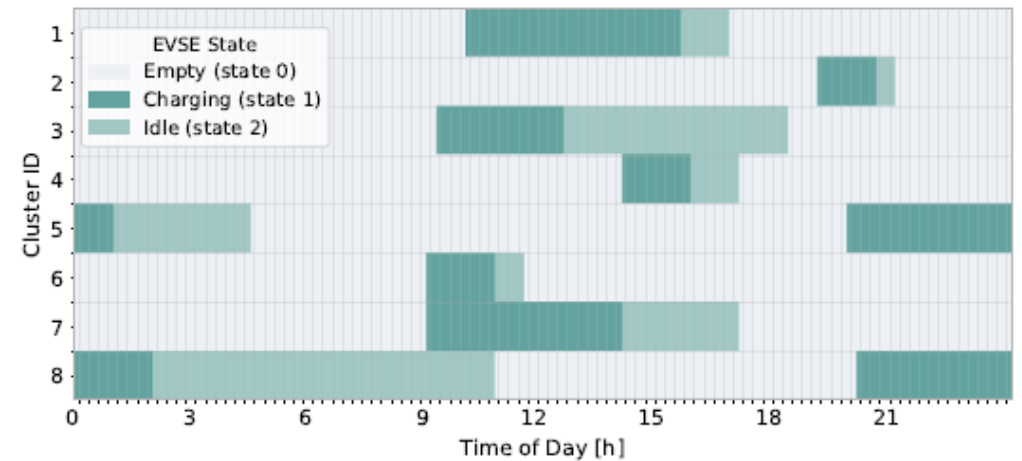
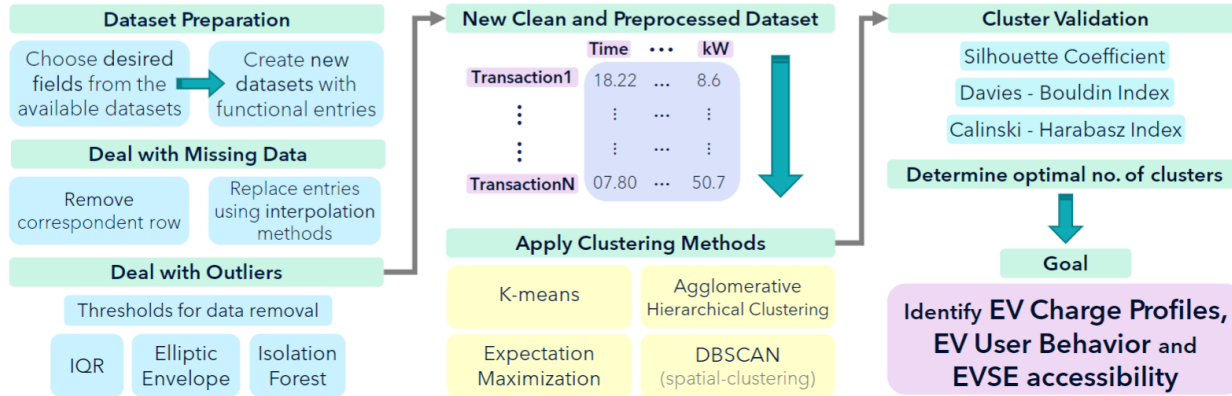
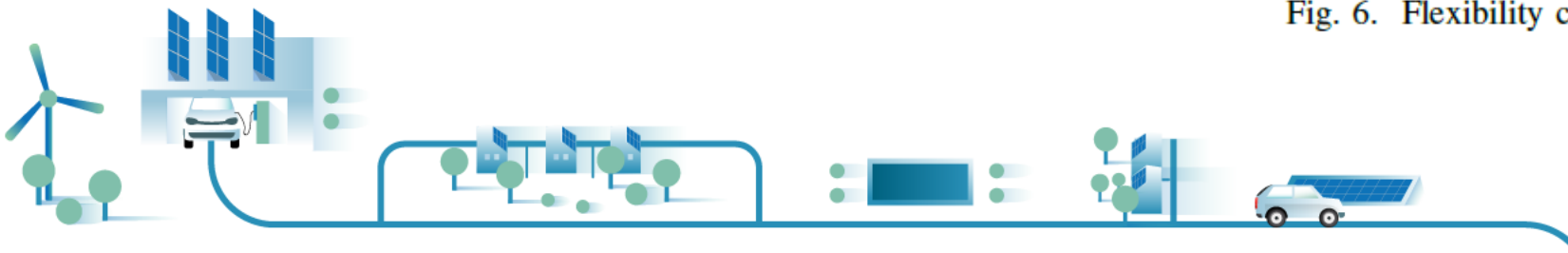
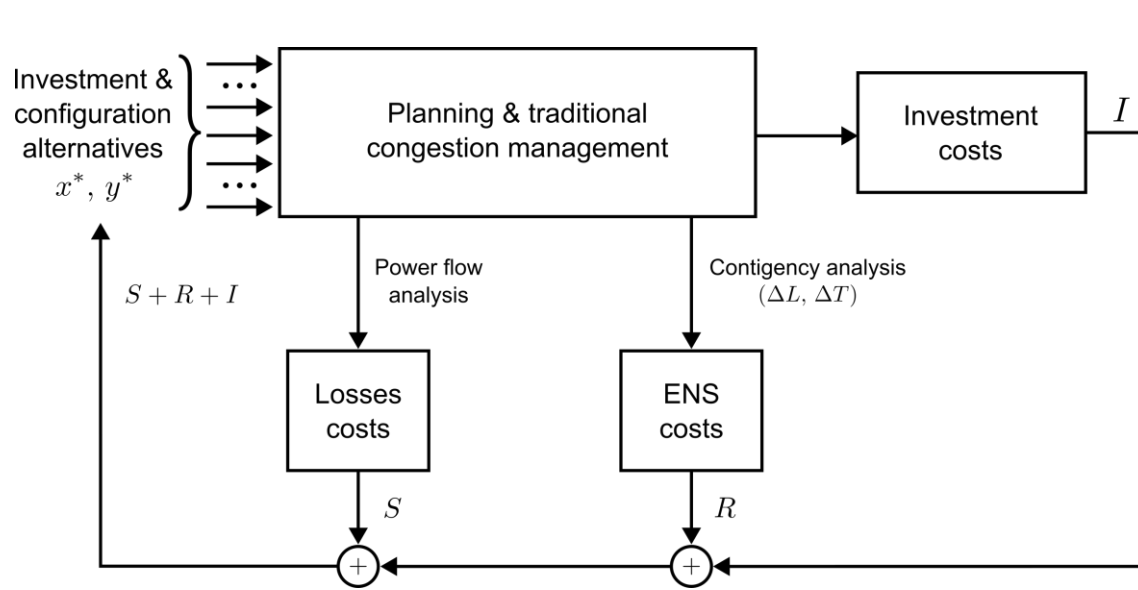


Fig. 6. Flexibility characterization of the EV Charging profiles for the ACN-Data dataset.

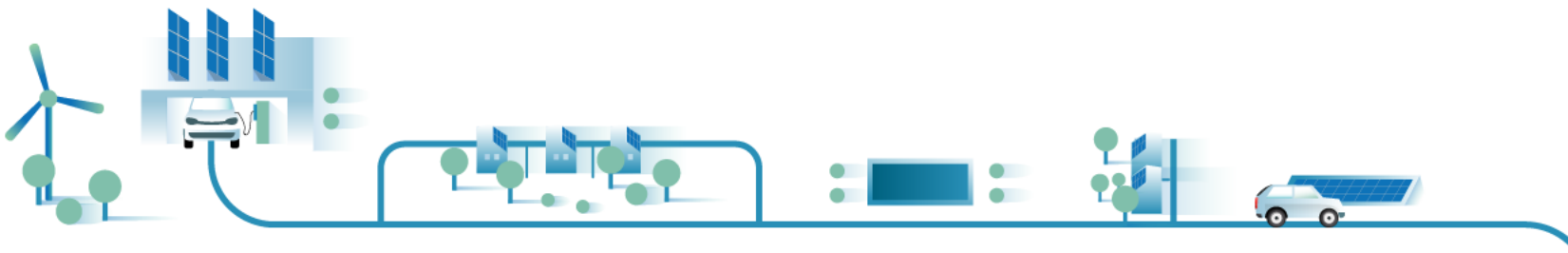
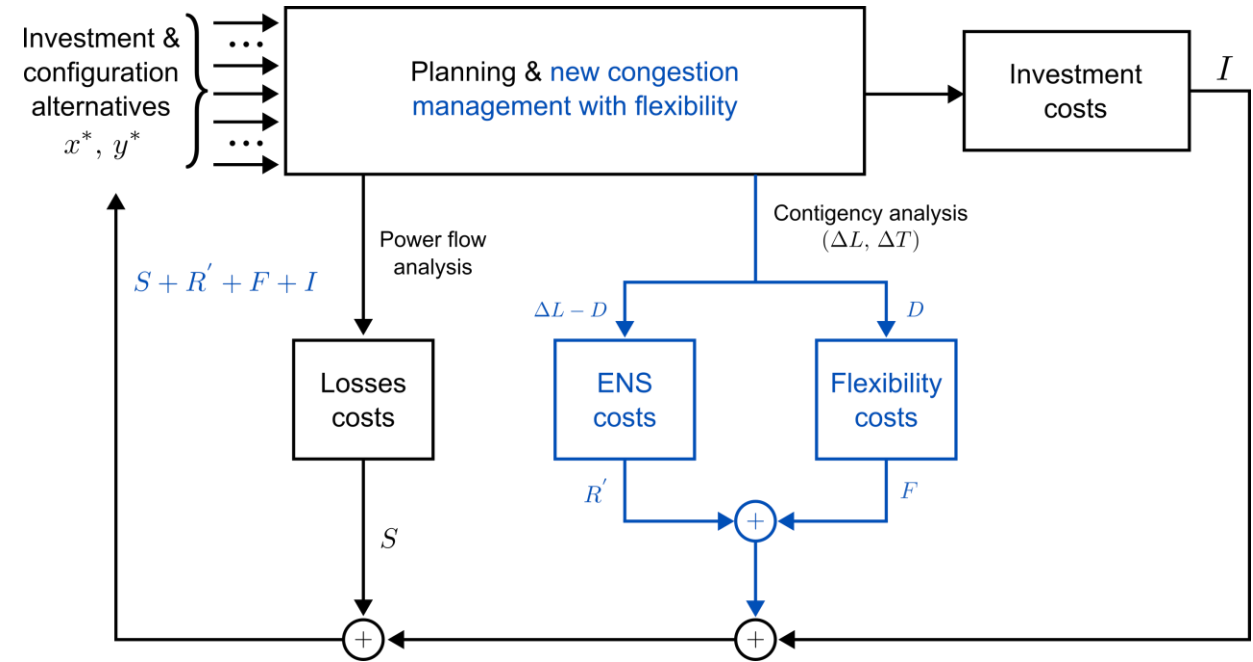


# EV4EU – Modeling EVs flexibility in distribution system planning

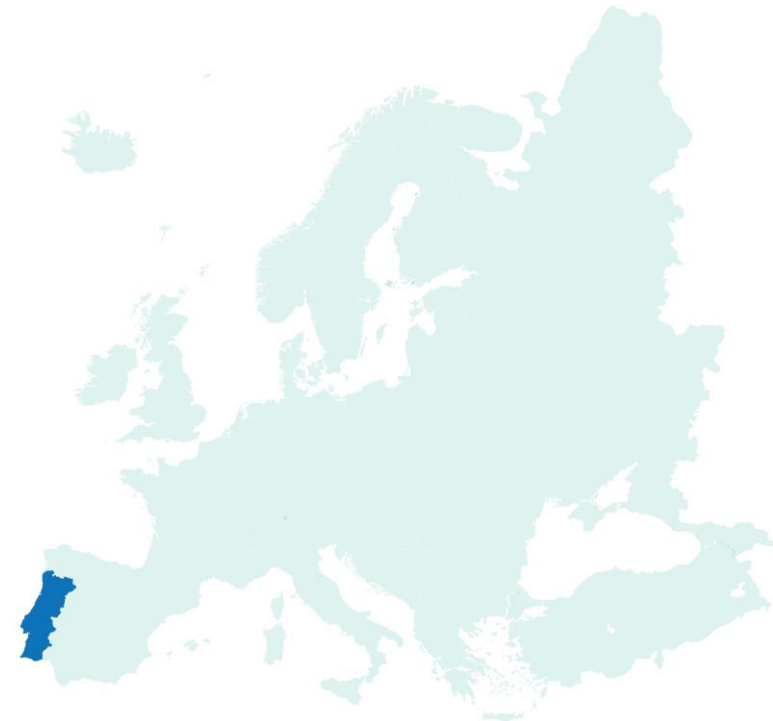
## OPTION 1 Low Flexibility Availability



## OPTION 2 High Flexibility Availability



# EV4EU- DEMO SITES: PORTUGAL



5 Use - Cases (UC) will be tested in the Portuguese Demonstrator



Houses



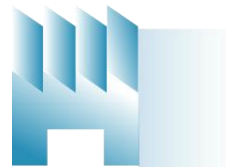
V2X management in Houses

Building  
Regional Civil Engineering  
Laboratory - LREC

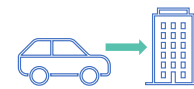


V2X in Buildings

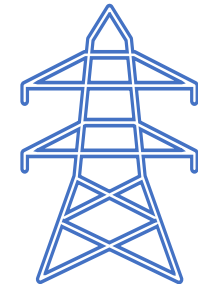
Campus (EDA HQ)



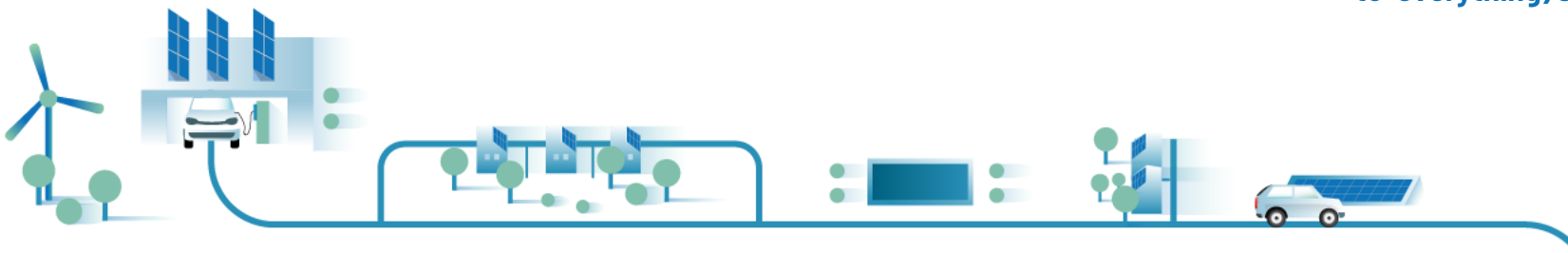
V2X management in Companies



Cost effective V2X (Vehicle-to-everything) station

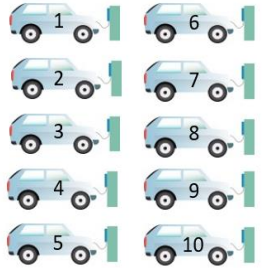


Activation of V2X services by Distribution System Operator (DSOs)



# EV4EU- DEMO SITES: DENMARK

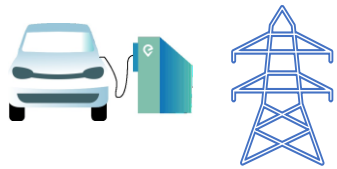
4 Use - Cases (UC) will be tested in the Danish Demonstrators:



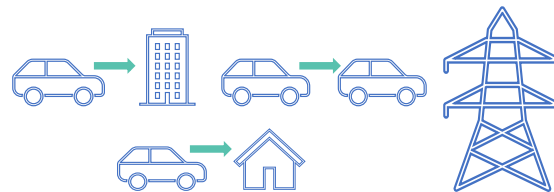
V2X management in parking lots



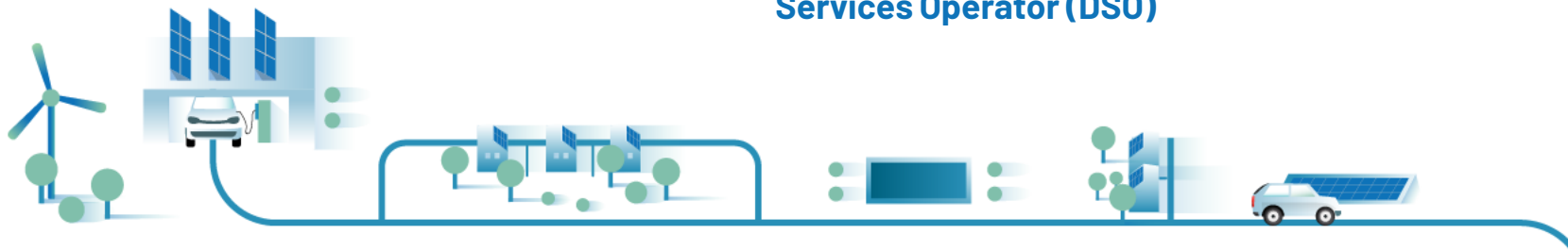
V2X management in buildings



New Demand Response and Flexible Capacity Contracts



Activation of V2X services by Distribution Services Operator (DSO)



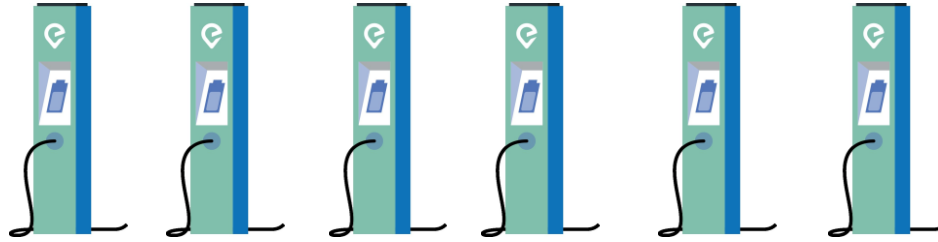


# EV4EU- DEMO SITES: SLOVENIA



Business office building in Krško

Each charger has 2 outlets capable of supplying up to 22 kW



## 4 Use - Cases (UC) will be tested in the Slovenia Demonstrator:

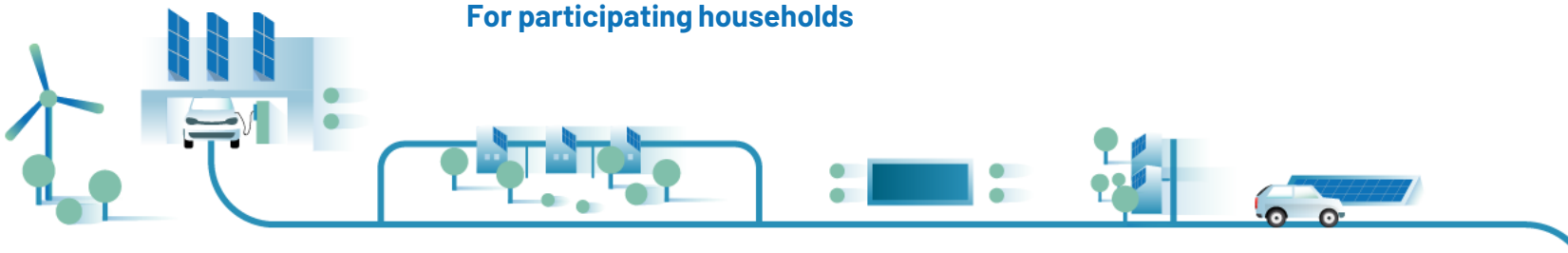
- V2X management by a Virtual Power Plant (VPP)
- Participation of V2X in electricity markets
- Participation of V2X in Grid Services
- Activation of V2X services by Distribution System Operator (DSOs)



**E** Elektro  
Celje

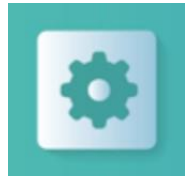


For participating households

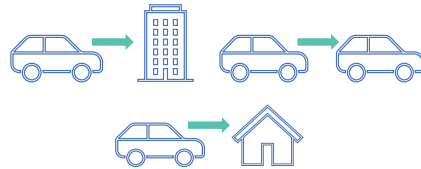


# EV4EU- DEMO SITES: GREECE

4 Use- Cases (UC) will be tested in the Greek Demonstrator



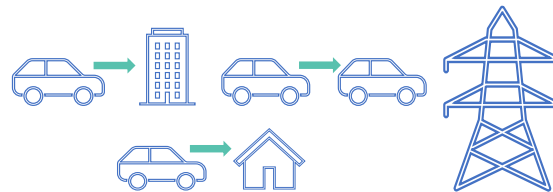
**Open V2X  
Management  
Platform**



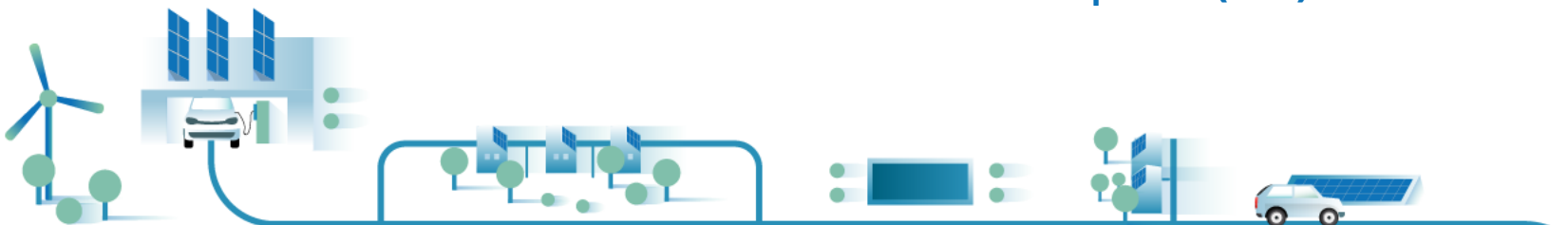
**V2X management by Charging  
Point Operator (CPO)**



**New Demand Response  
and Flexible Capacity  
Contracts**



**Activation of V2X services by Distribution  
Services Operator (DSO)**





@ev4eu\_eu



@ev4eu

# Thank You



ev4eu



Cindy P. Guzman

[cindy.lascano@tecnico.ulisboa.pt](mailto:cindy.lascano@tecnico.ulisboa.pt)

24-10-2023



Funded by  
the European Union

Funded by European Union's Horizon Europe research and innovation programme under grant agreement no. 101056765. Views and opinions expressed in this document are however those of the authors only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.