

The Eco2charge project Smart energy management for EV charging systems

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Shared innovation



Short, middle and long run issues related to electric vehicle deployment



Basic charging network 3-7 kW

Enables every day charging while EV are parked (home, work, downtown):
On average 45km/charge (10kWh).
3-7 kW charging points are sufficient to answer this need.

Fast charging network

To complete the basic charging network:

- When basic charging points are not existing: old city centres, collective housing
- When parking time is limited: car sharing, multiple trips
- To ensure long trips

Massive deployment of charging points

Buildings

Smart charging associated with storage for load levelling in order to avoid renovating the building electrical infrastructure.

Fast charging stations

Storage for load levelling in order to avoid renovating the site electrical infrastructure.

Power grid

Storage for load levelling in order to avoid or differ renovating the electrical infrastructure.

Support of distribution infrastructures

Storage and smart charging behind the meter

2017

2020

2025

2

Services to support this deployment

❖ Charger w/o civil work **City Charge**

<http://www.dailymotion.com/video/x553rji>



❖ Supervision Alizé

<https://www.youtube.com/watch?v=kLZ78acXRMA>

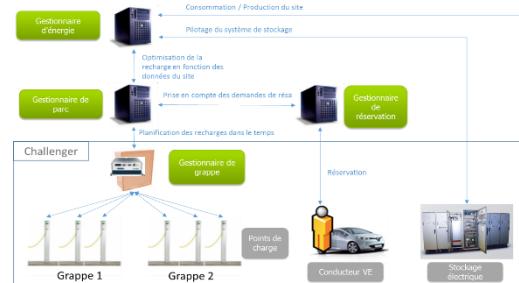


**Massive deployment of
charging points**

2017

❖ Smart charging with 2^{nde} life battery storage **eco2charge**

<https://www.youtube.com/watch?v=CIKZ03xkohA>



**Storage and
smart charging
behind the meter**

2020

❖ Buffer storage **2^{nde} life batteries**

<https://www.youtube.com/watch?v=t9KVD9ZGdgo>



**Support
of distribution
infrastructures**

2025

3

Supervision solution eco2charge



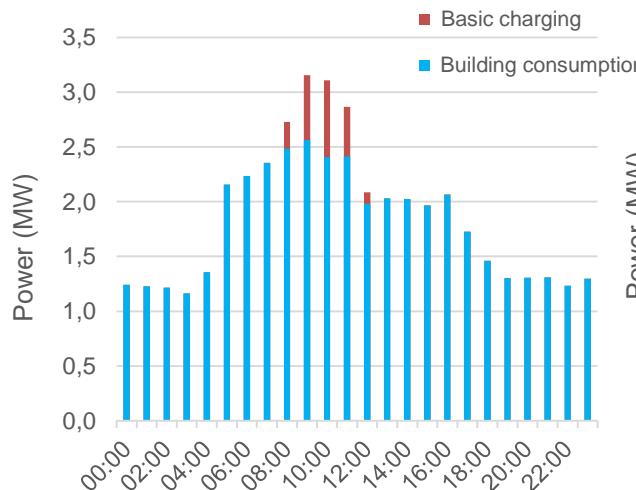
A global solution to develop charging infrastructures in buildings without impacting the electricity consumption (smart charging, storage) and taking into account the users' specific needs



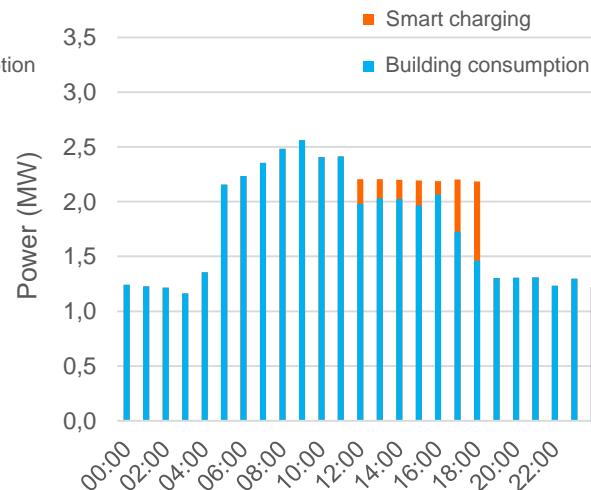
Project objectives

- ✓ Develop a complete solution to facilitate the massive deployment of charge points
- ✓ Deploy and validate the solution in two office buildings
- ✓ Load shifting and peak shaving to avoid adapting the existing electrical infrastructure
- ✓ Selfconsumption

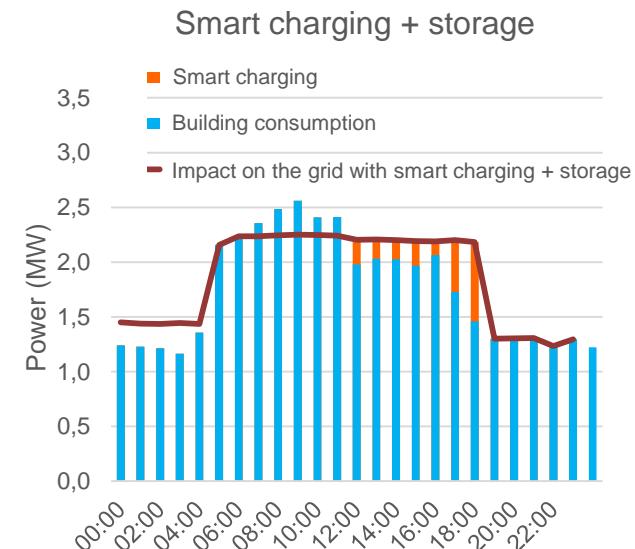
Basic charging



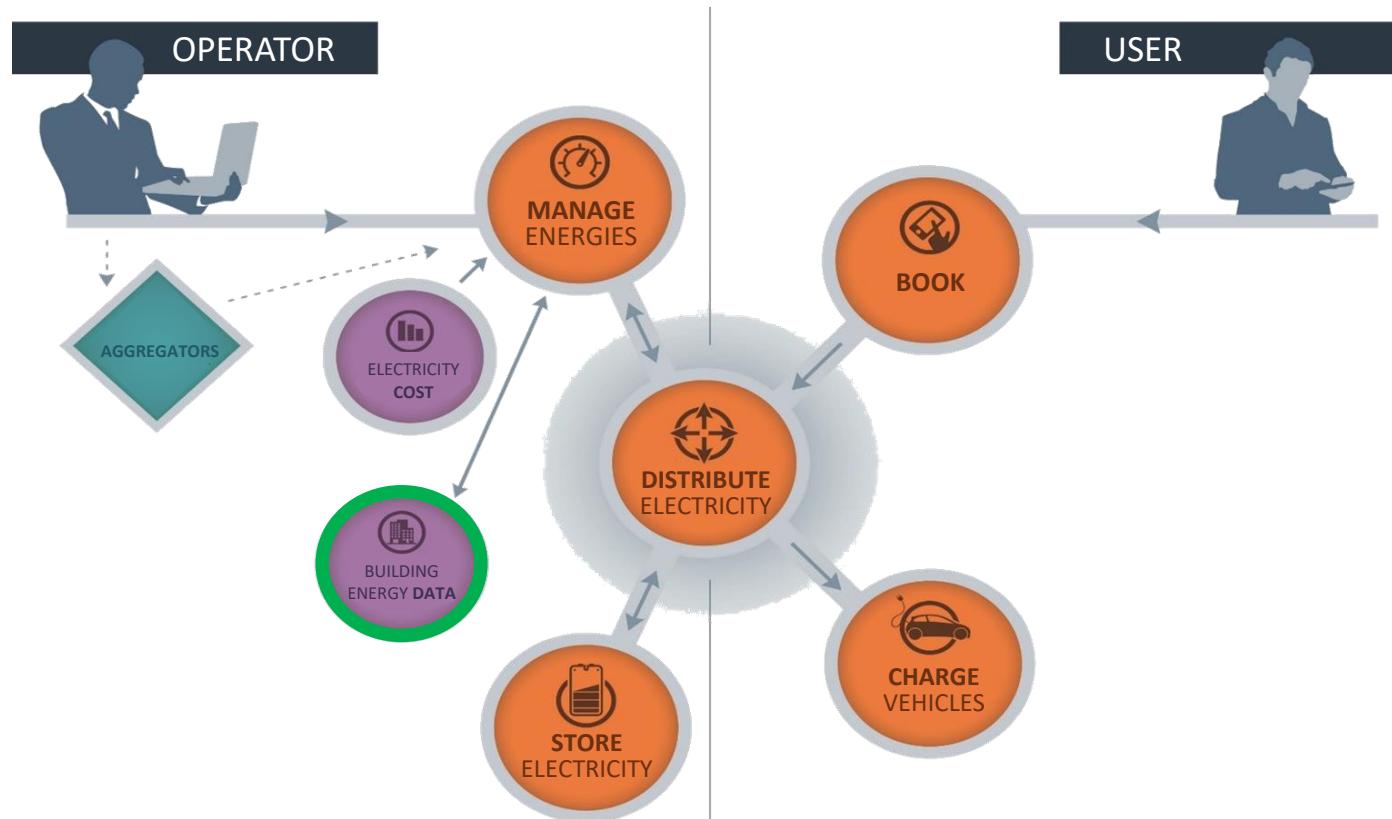
Smart charging



Smart charging + storage



Building energy data



Building energy data

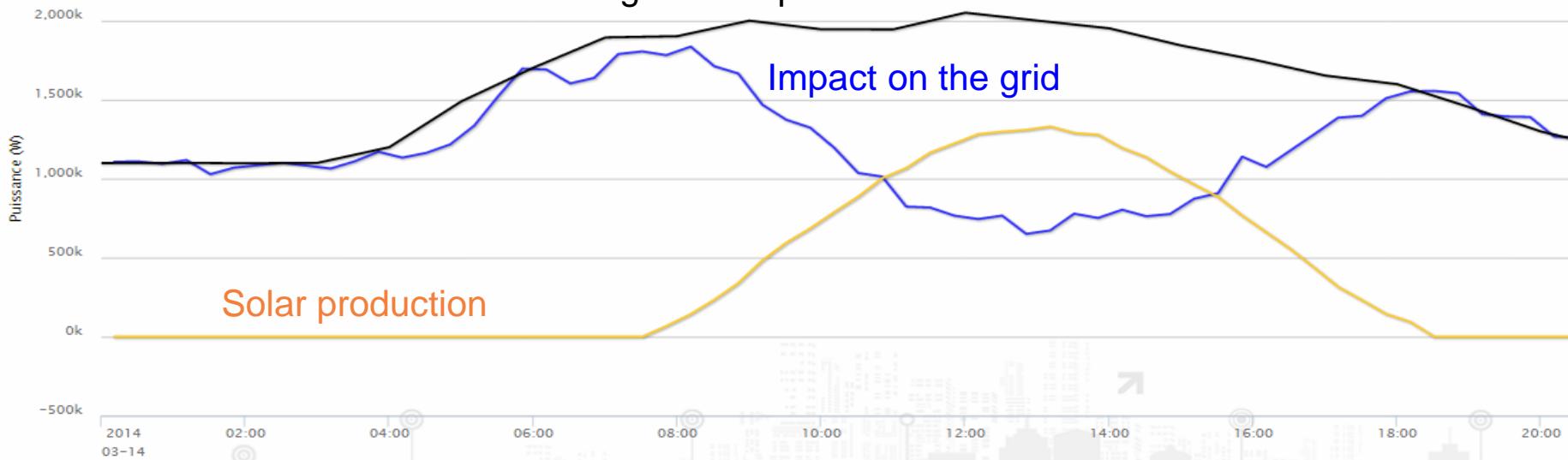


Challenger building
Bouygues Construction Head Office

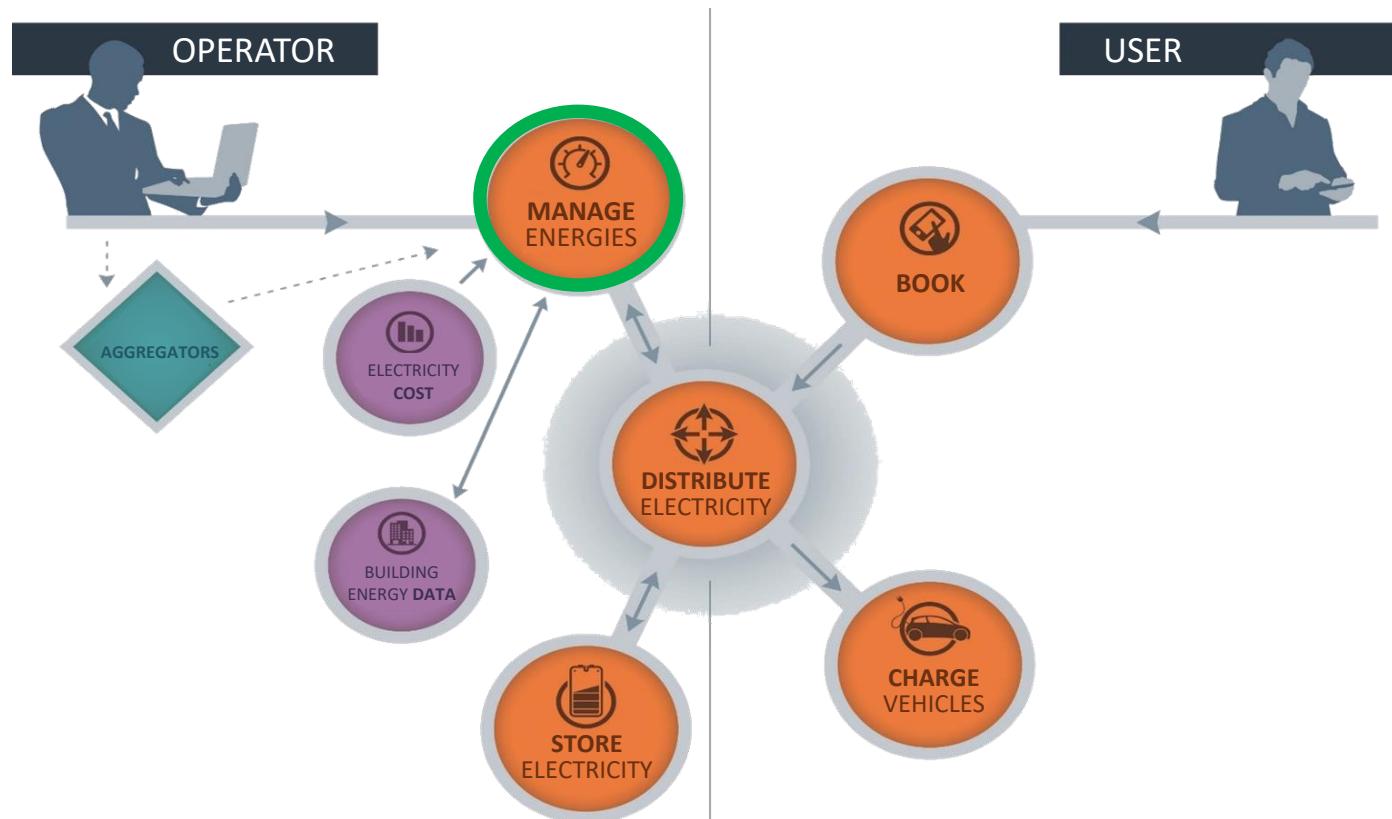


Australia building
Bouygues Energies & Services Head Office

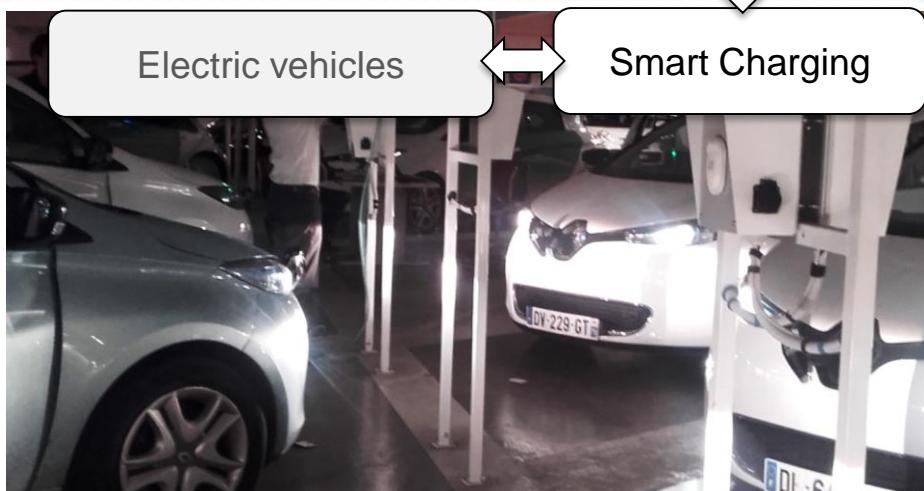
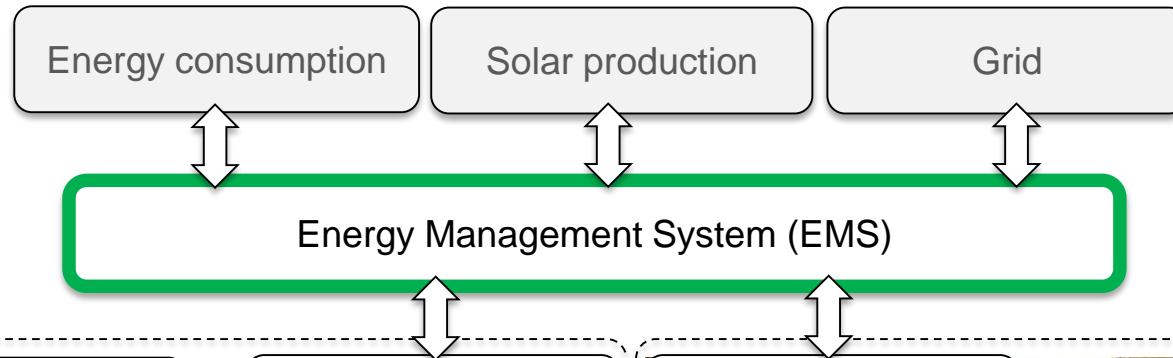
Building consumption



Manage energies



Manage energies



7 chargers G2, Ingeteam, Nexans – 7x7 kW



6 Kangoo batteries ZE – 66 kW / 66 kWh



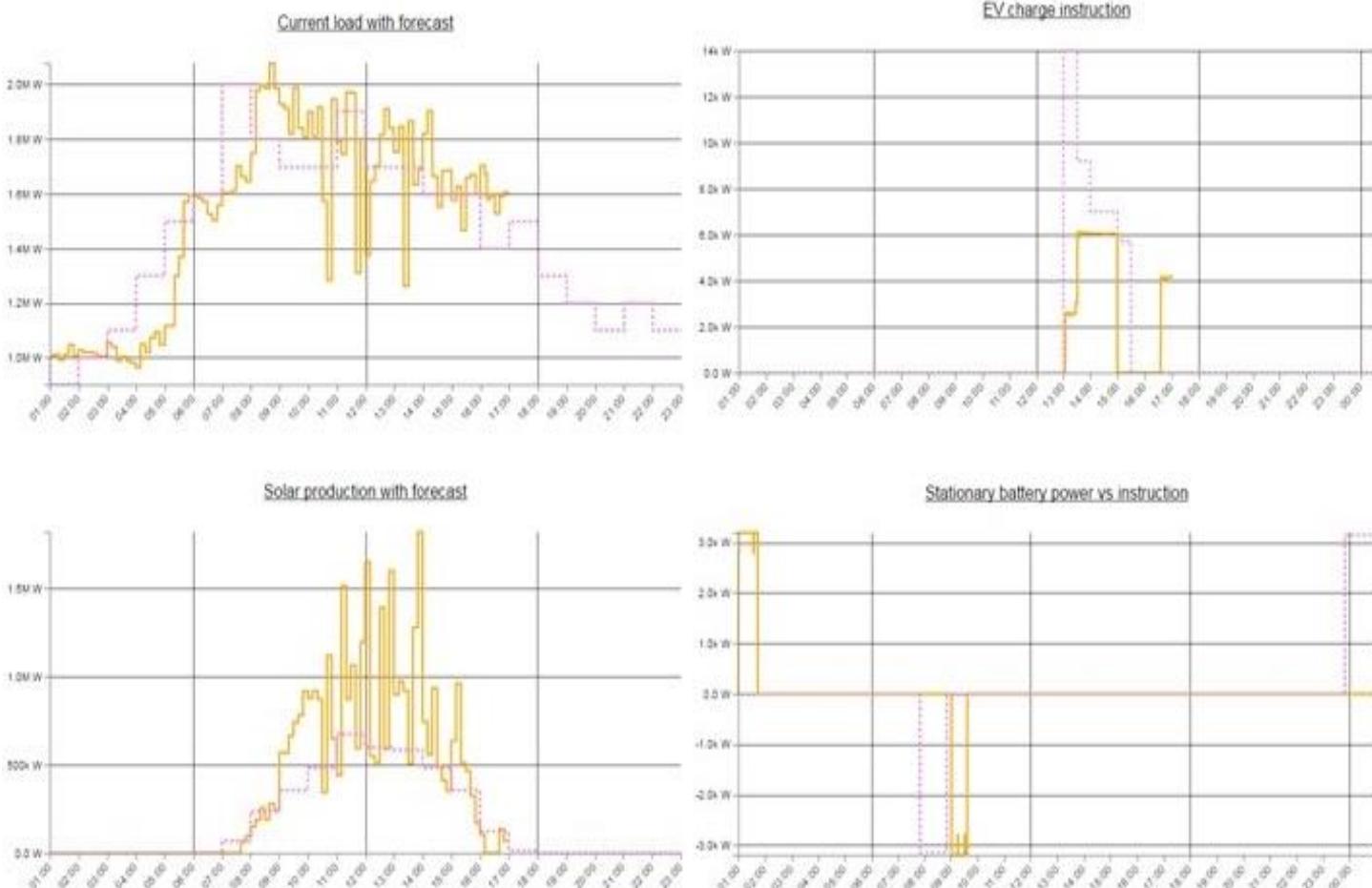
Manage energies



Energy Management System web interface



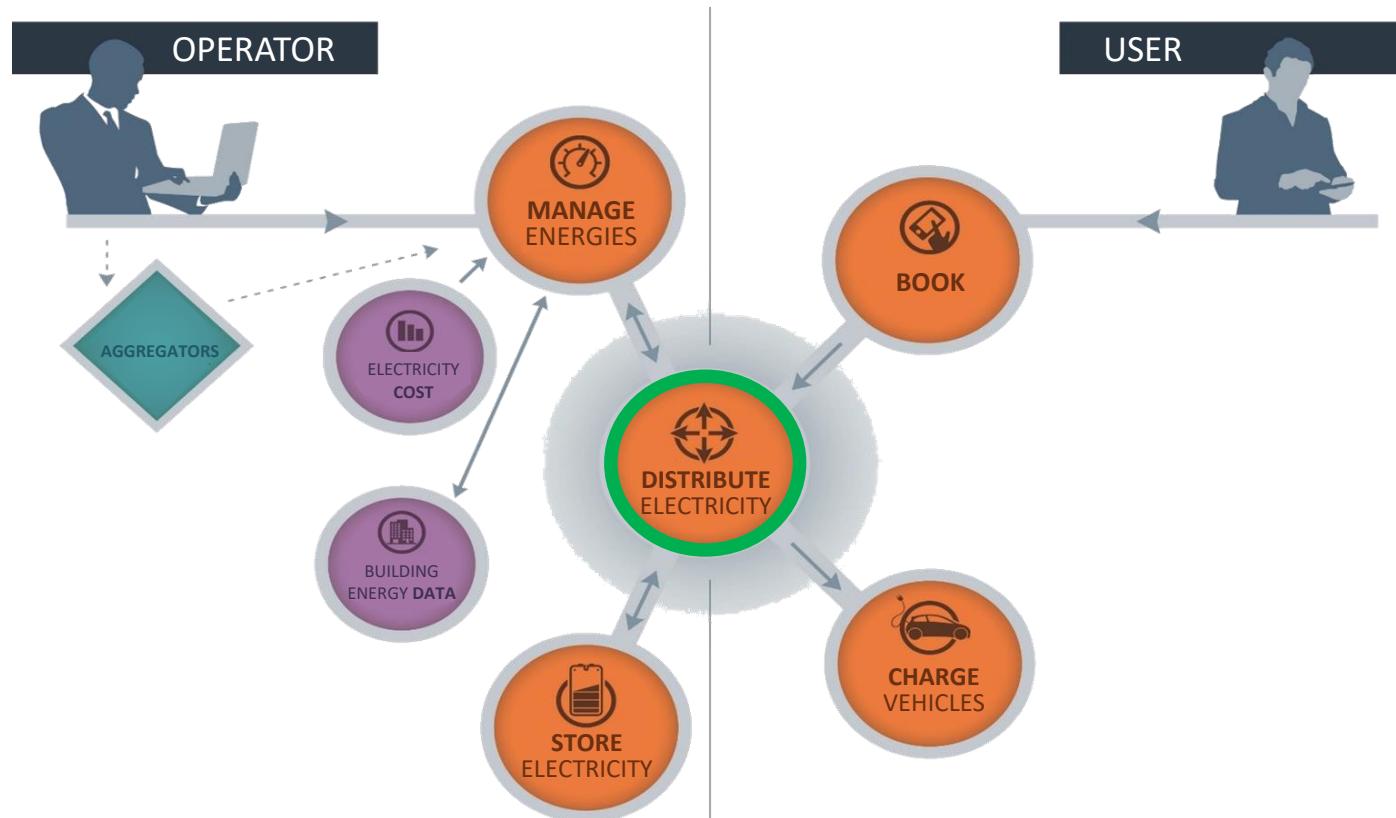
EMBIX



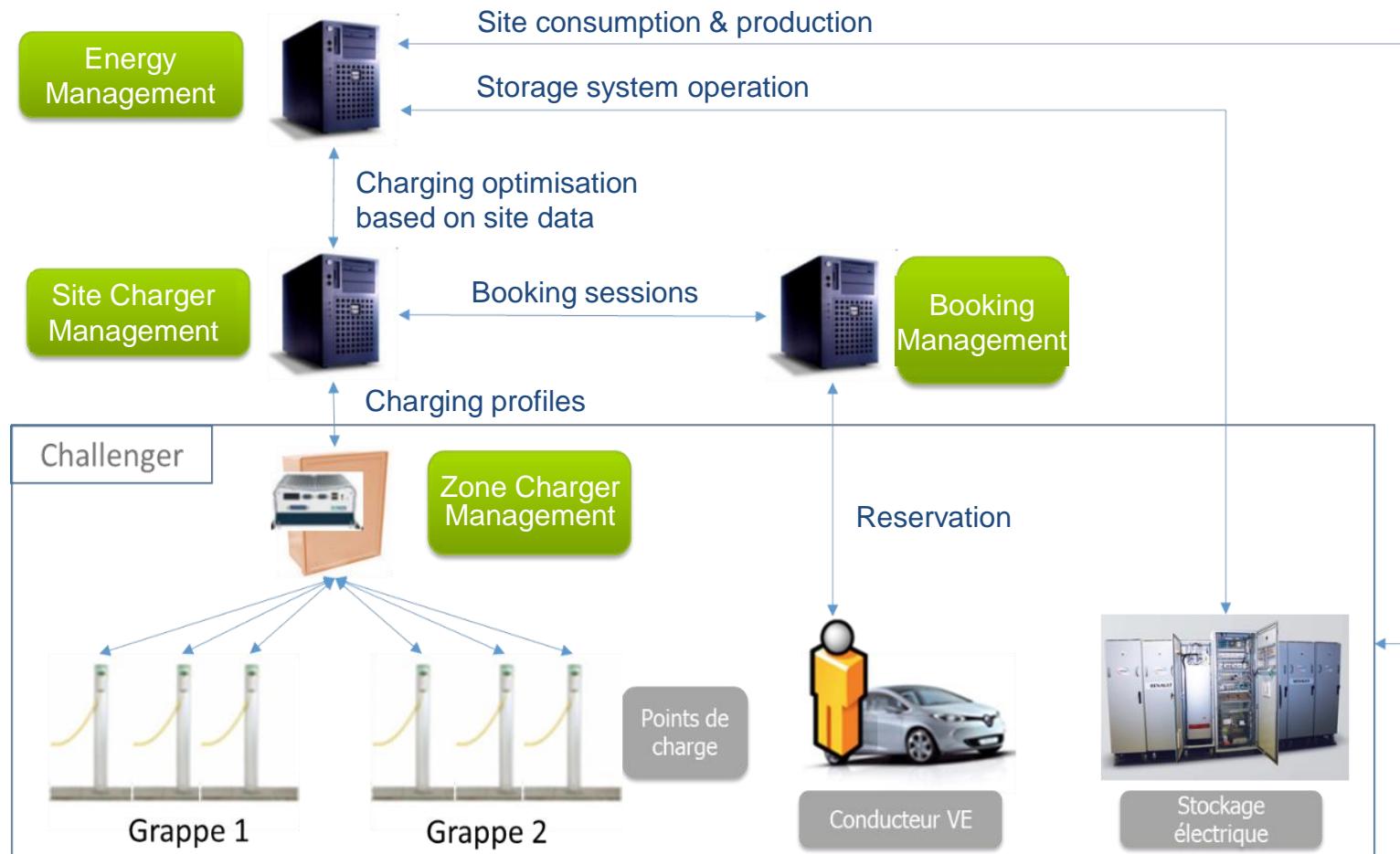
■ Day ahead forecast
— Real time data



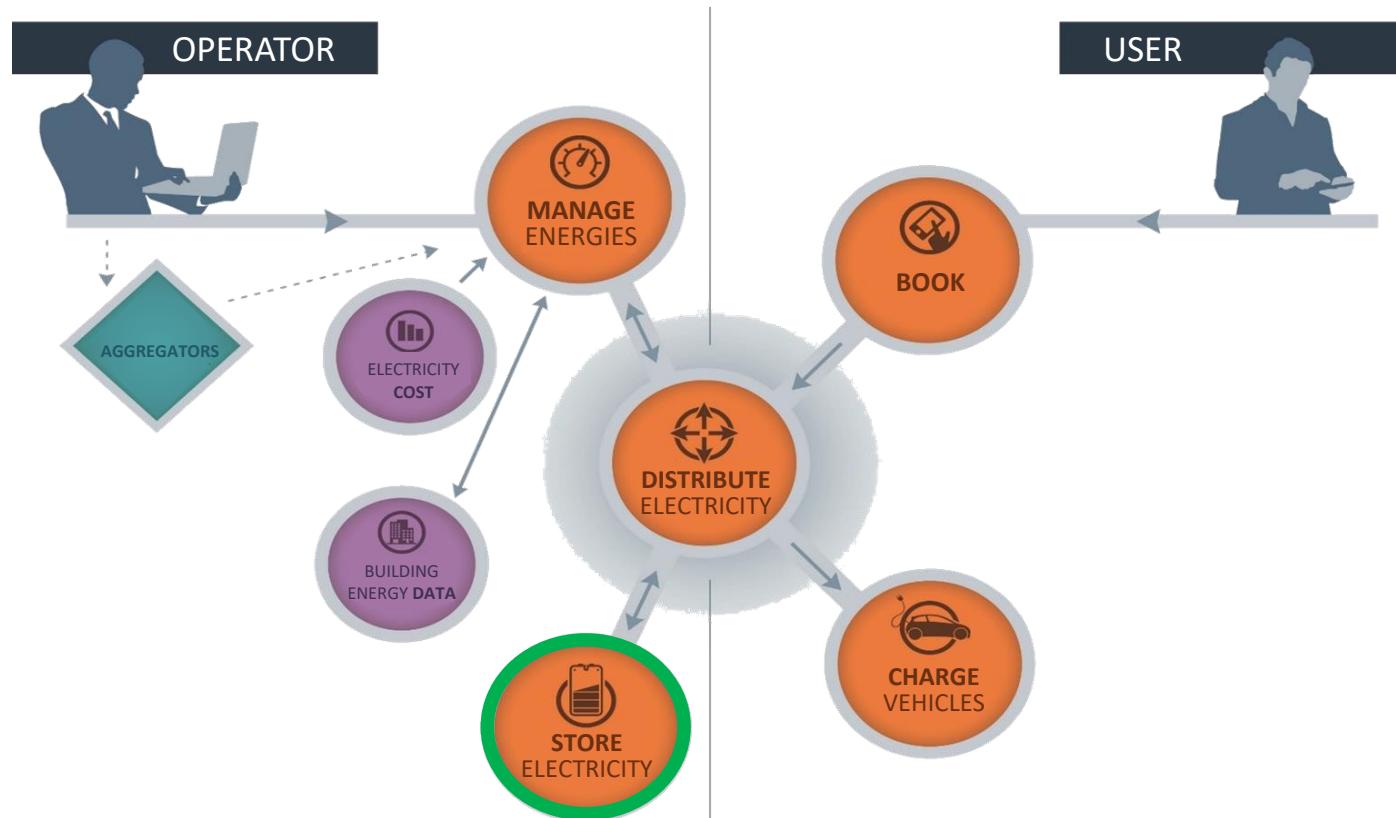
Distribute electricity



Distribute electricity



Store electricity



Store electricity



6 Kangoo batteries ZE
66 kW / 66 kWh

Storage system interface

Etats **Commandes**

Storage Ctrl AUTO

EXE: Soft SC ON

Alerte Maintenance OFF

M1 ON

MODULE 01 OK

Capacity Check Request (SC)

0.00 [0 | 720] H Total OFF

00 00 00

Batterie : 01

100 75 50 25 0

31%

7.6kWh Charge ON

-3.4kWh Décharge OFF

Cmd [-12 | 3kW]

2.00 [0.00]

SAFETY MODE OK

Cri SAFETY ON

Mode de Fcn

GE P_SC_Req_Ref [0 kW] 180,000

Manuel P_Req_IHM [-40 | 10] kW

Profil

TMH 0 kW 0

M2 ON

MODULE 02 OK

Capacity Check Request (SC)

0.00 [0 | 720] H Total OFF

00 00 00

Batterie : 02

100 75 50 25 0

29%

8.2kWh Charge ON

-2.8kWh Décharge OFF

Cmd [-12 | 3kW]

2.00 [0.00]

M3 ON

MODULE 03 OK

Capacity Check Request (SC)

0.00 [0 | 720] H Total OFF

00 00 00

Batterie : 03

100 75 50 25 0

33%

7.8kWh Charge ON

-3.2kWh Décharge OFF

Cmd [-12 | 3kW]

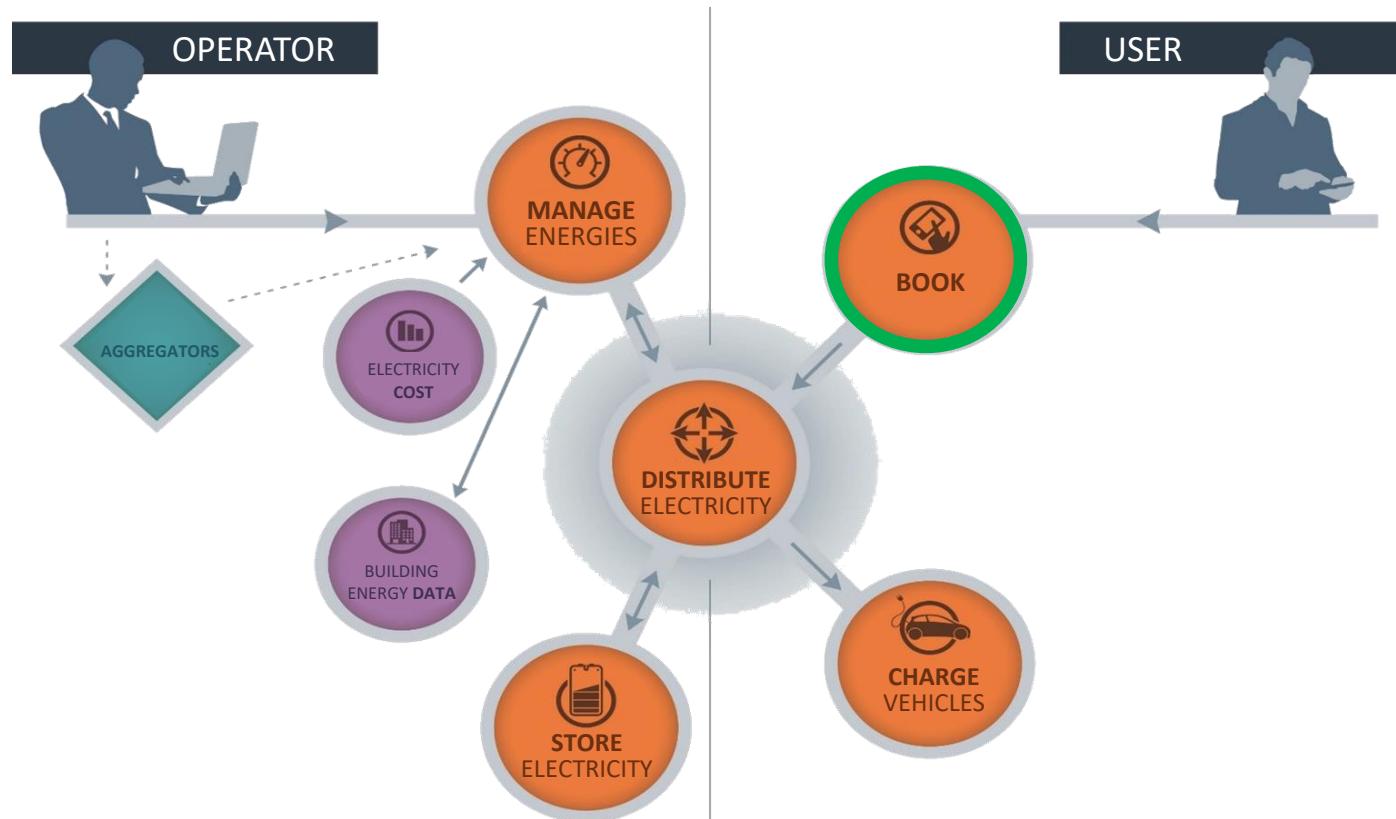
2.00 [0.00]

EXE Soft SSC ON

EXE Soft SSC ON

EXE Soft SSC ON





Book – User interface



User web interface

https://reza.eco2charge.fr/login

Username _____

Password _____

Remember me

Log In



RENAULT



Réservations Liste Nouvelle réservation Configuration

Nouvelle réservation

Véhicule

- ZOE BYES Blanc (DL644AJ)
- ZOE BYES Blanc Autopartage (CR329NT)
- ZOE BYES Bleu (DN570XP)

Site

- Démo
- Challenger
- Australia

Arrivée

9 mars 2017 11:00

Départ

9 mars 2017 18:30

Distance (km)

30

Réserver

Select vehicle

Select site

Select time slot

Indicate the autonomy

Réservation

Site	Besoins en énergie	Véhicule
Site : Australia Arrivée : March 7, 2017 12:50 Départ : March 7, 2017 18:30 Message : Zone-A-1, Zone-A-2	Énergie (Wh) : 4600 Distance (km) : 30	Utilisateur : f.petipas Véhicule : ZOE BYES Bleu (DN570XP)

Annuler la réservation

Book – EV details

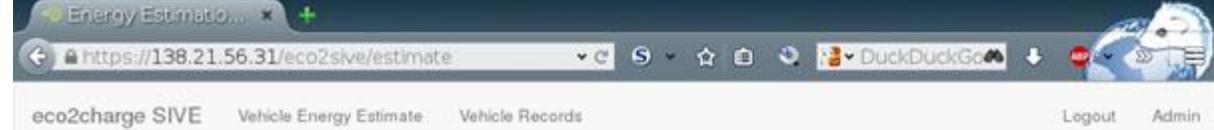
EV details web interface

eco2charge SIVE Vehicle Energy Estimate Vehicle Records Validation Logout Admin

Vehicle Records

Zoé blanche – May 20th at 1:57pm

- SoC 95%
- Battery Temperature 19.00000°C
- External Temperature 13.00000°C
- Distance totalized 1028.84000 km
- Available charging power 0.00210 kW
- Available energy 20.80000 kWh
- Electrical Consumption 0.20800 kWh
- Percentage battery conditioning estimation 3.00000%
- Habitacle conditioning estimation 900.00000 W
- EV consumption estimation 192.05000 Wh
- GPS Coordinates 48.783333, 2.066667
- Charging alert No alert



RENAULT

Energy Estimation

Vehicle

- Tests Michel (VF1AGVYA048955555)
- Zoé noire (VF1AGVYA050574767)
- Zoé TEST (VF1AGVYA048912345)
- Zoé VF1AGVYA050574982 (VF1AGVYA050574982)
- Zoé VF1AGVYA052049942 (VF1AGVYA052049942)

Arrival date

27/03/2015

at 12:31

Range

50

kilometers

Charge point type

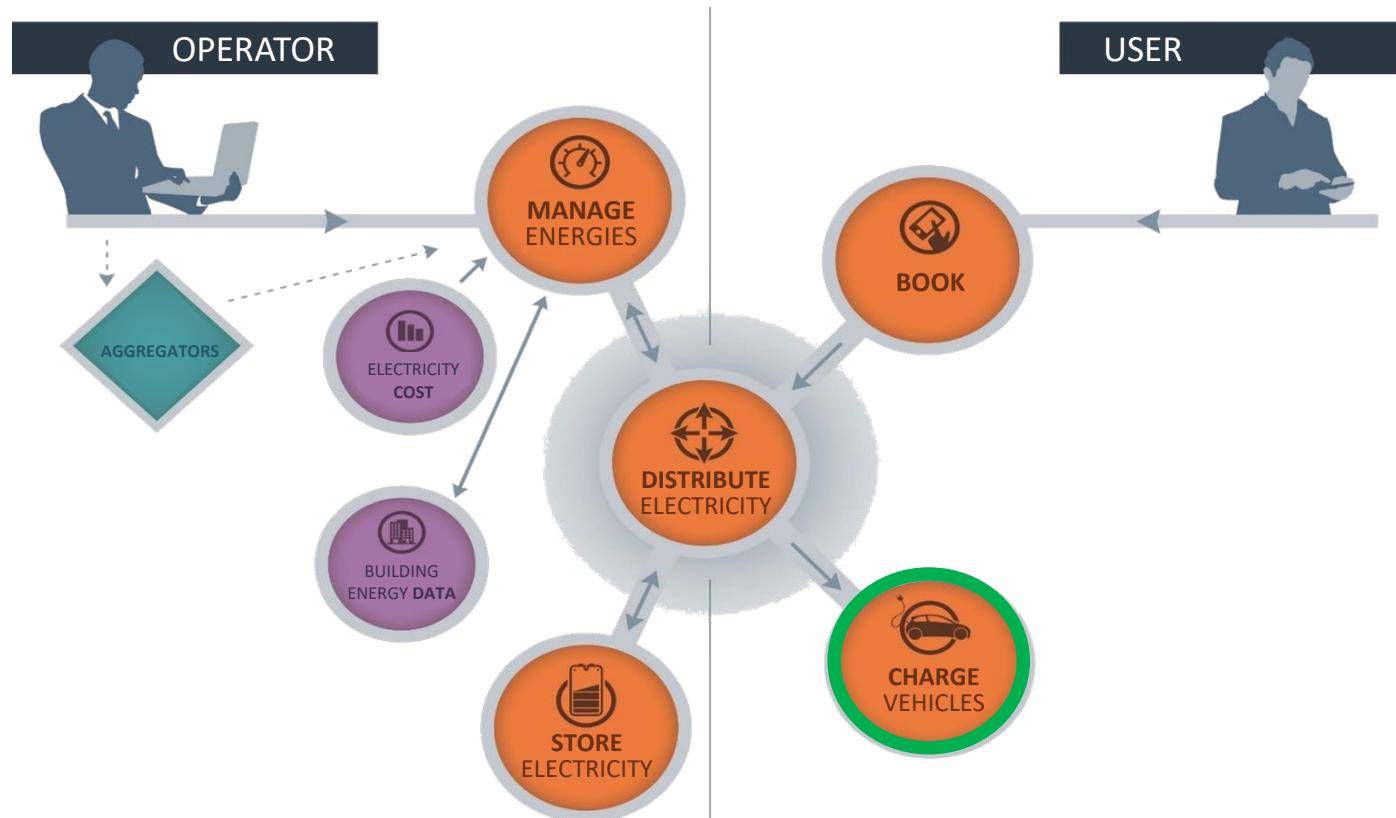
22kW

Air Conditioning

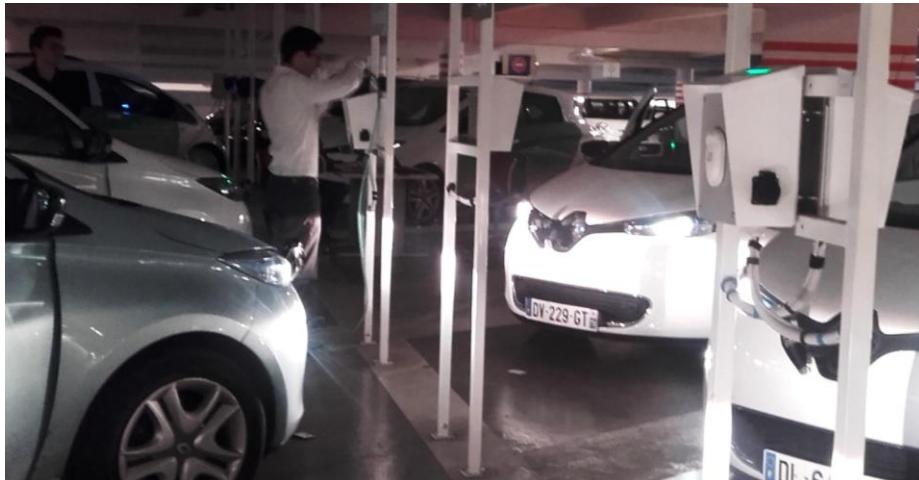
Estimate



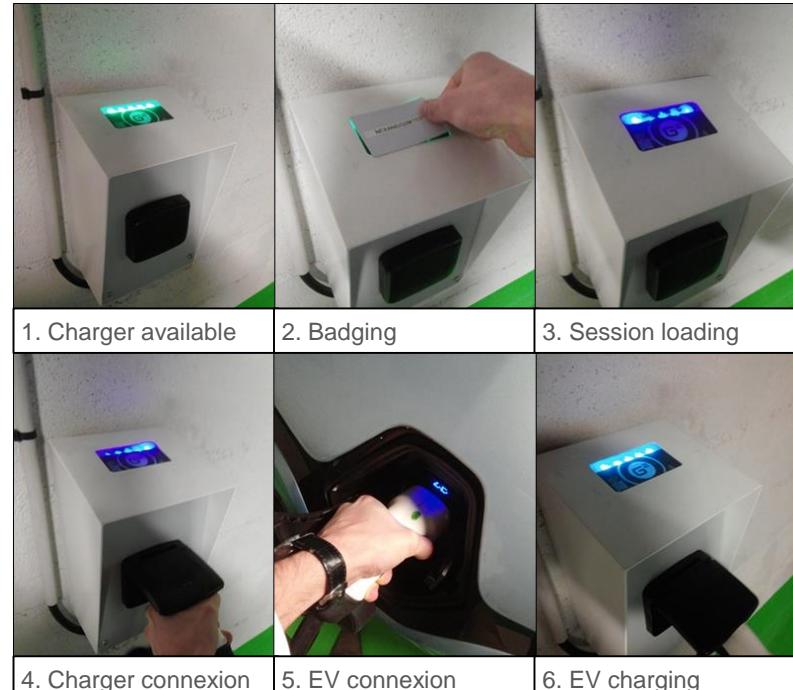
Charge vehicles



Charge vehicles – Chargers



7 chargers G2, Ingeteam, Nexans – 7 x 7 kW



Charge vehicles – Operator web interface



SIGP Administration (v2.5.0 - 2016-12-05)

Sessions

Charge Areas

Charge Clusters

Charge-Point Groups

Charge-Points

SIGG

Nexans

Dashboard

Charging Sessions

ID	CP	Arrival	Departure	Charge
3187	Zone-A-2	2017-03-16 13:40 → 14:33		10.65 → 0.77 kWh (0 % / 5 km)

Closed Sessions

ID	CP	Arrival	Departure	Charge
3210	Zone-1-d	2017-03-17 06:30 → 06:34	19:00 → 12:35	21.47 → 24.36 kWh (0 % / 140 km)
3200	Zone-A-1	2017-03-17 08:30 → 08:08	12:30 → 12:25	16.87 → 13.55 kWh (0 % / 110 km)
3215	Zone-1-a	2017-03-17 08:00 → 08:03	17:00 → 11:49	9.20 → 9.38 kWh (0 % / 60 km)
3160	Zone-A-1	2017-03-16 08:30 → 08:14	12:00 → 12:00	16.87 → 14.81 kWh (0 % / 110 km)

Clusters

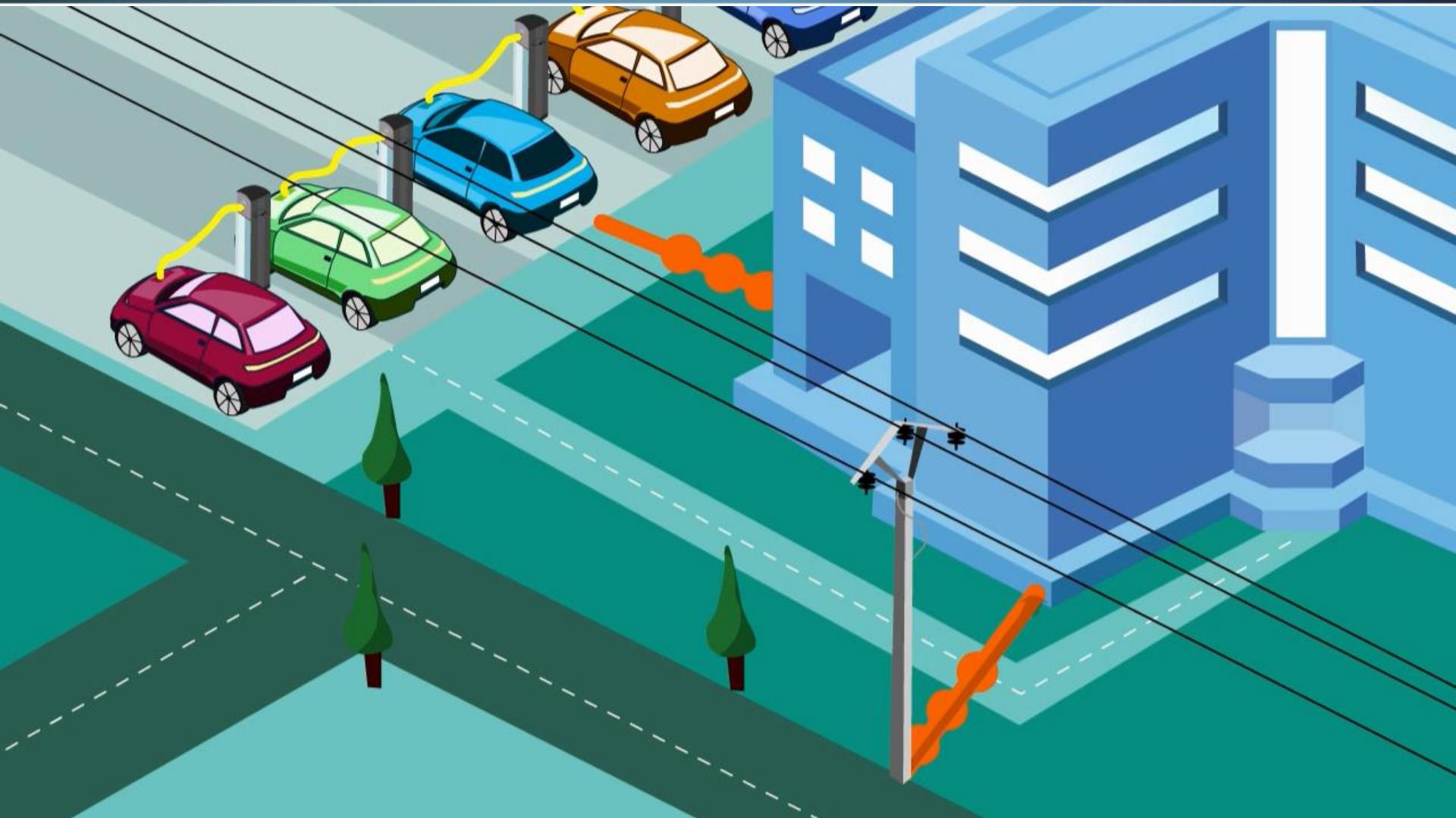
Name	CP Groups
ZoneA	ZoneA
Zone2	Zone2
Zone1	Zone1
DMO-2	DMO-2-7
DMO-1	DMO-1-22 DMO-1-7

CP Groups

Name	Charge Points
ZoneA	Zone-A-1 Zone-A-2
Zone2	Zone-2-a Zone-2-c Zone-2-b
Zone1	Zone-1-a Zone-1-b Zone-1-c Zone-1-d



Project video



A man and a woman are sitting at a desk in a dimly lit room, looking at a laptop screen together. They are both smiling. The woman has her arm around the man's shoulder. There is a mug on the desk to the left and another one to the right.

Thank you for listening

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