RENAULT

Z.E.

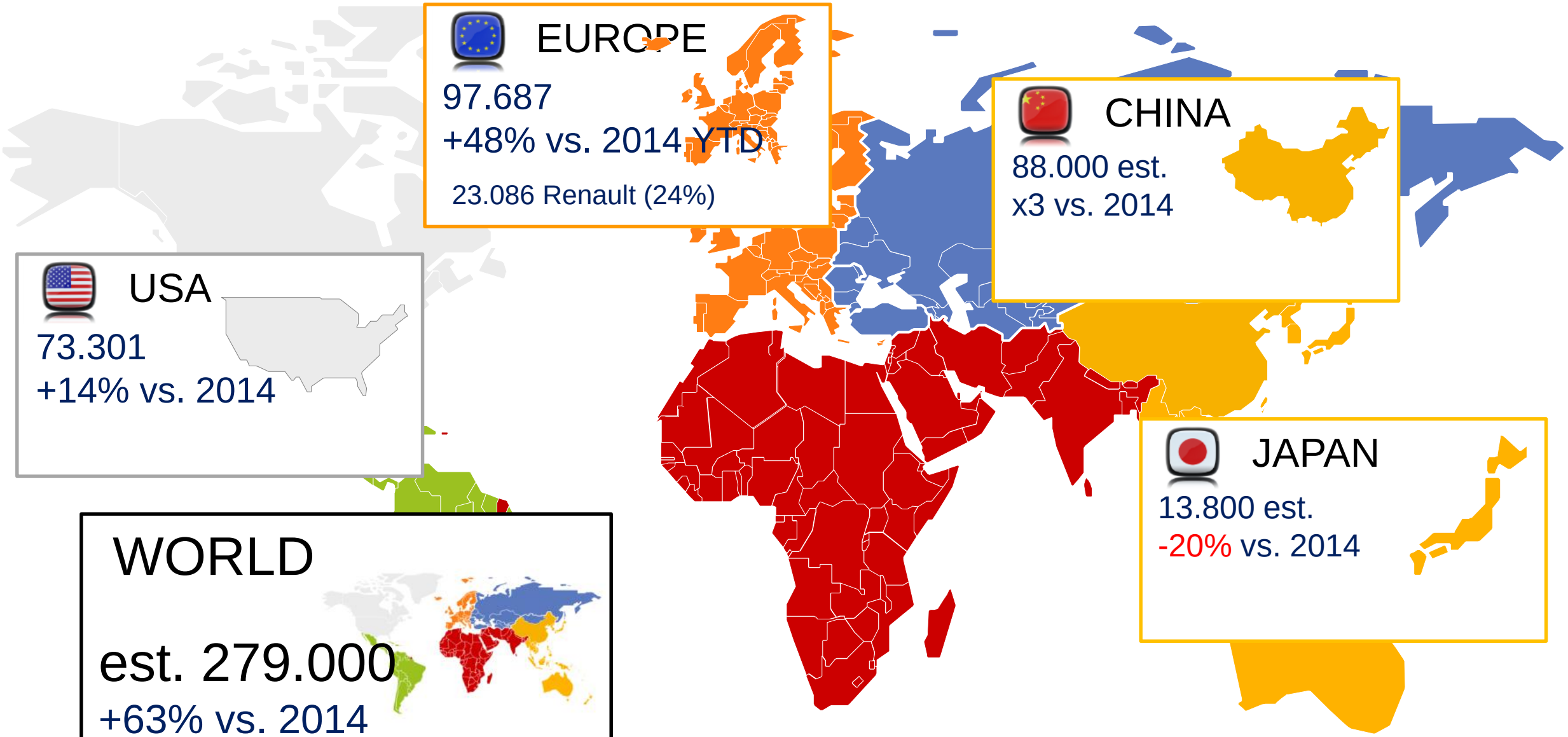
ZERO EMISSION

Office franco-allemand pour la transition énergétique
Deutsch-französisches Büro für die Energiewende

Electromobilité : rôle du véhicule électrique dans le système énergétique

Berlin, Mardi 28 février 2017
Ambassade de France

BEV MARKETS 2015



EUROPE

97.687
+48% vs. 2014 YTD

23.086 Renault (24%)

CHINA

88.000 est.
x3 vs. 2014

USA

73.301
+14% vs. 2014

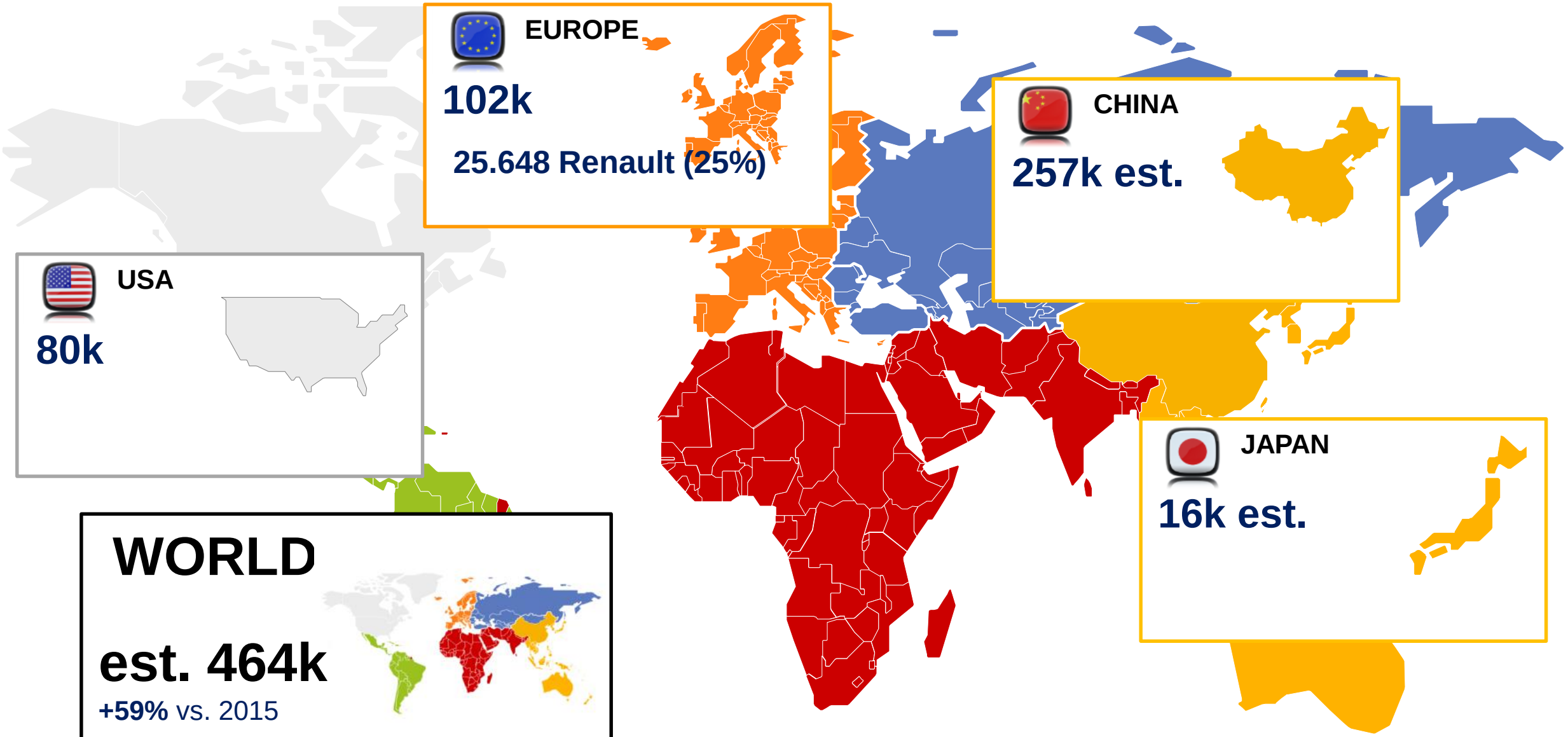
JAPAN

13.800 est.
-20% vs. 2014

WORLD

est. 279.000
+63% vs. 2014

BEV MARKETS 2016



EUROPE

102k

25.648 Renault (25%)

CHINA

257k est.

USA

80k

JAPAN

16k est.

WORLD

est. 464k

+59% vs. 2015

Renault EV range
a full range since 2012

+100.000 Renault EVs on the road

Facts and figures 2016: Make Evs an opportunity for power grids

100 000 EV

KANGOO Z.E.

ZOE

Constant grow of 2nd life
1000 per year up to 4000 per Year

Stationnary Storage System
For energy and power services

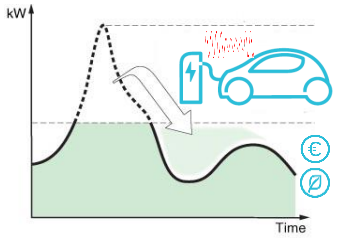
1,2 GW capacity = 1 nuclear unit
Renault Asset (Buy – Lease)

+21%
peak load in a 100% car electrification

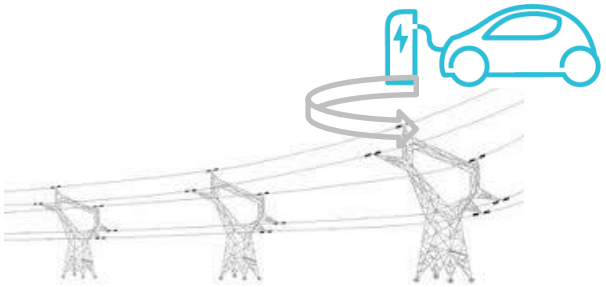
Smart Charging and Vehicle to grid to avoid Additional infrastructure cost

CHARGING THE EV

CHARGING THE CAR FOR MOBILITY : PLUG AND FORGET



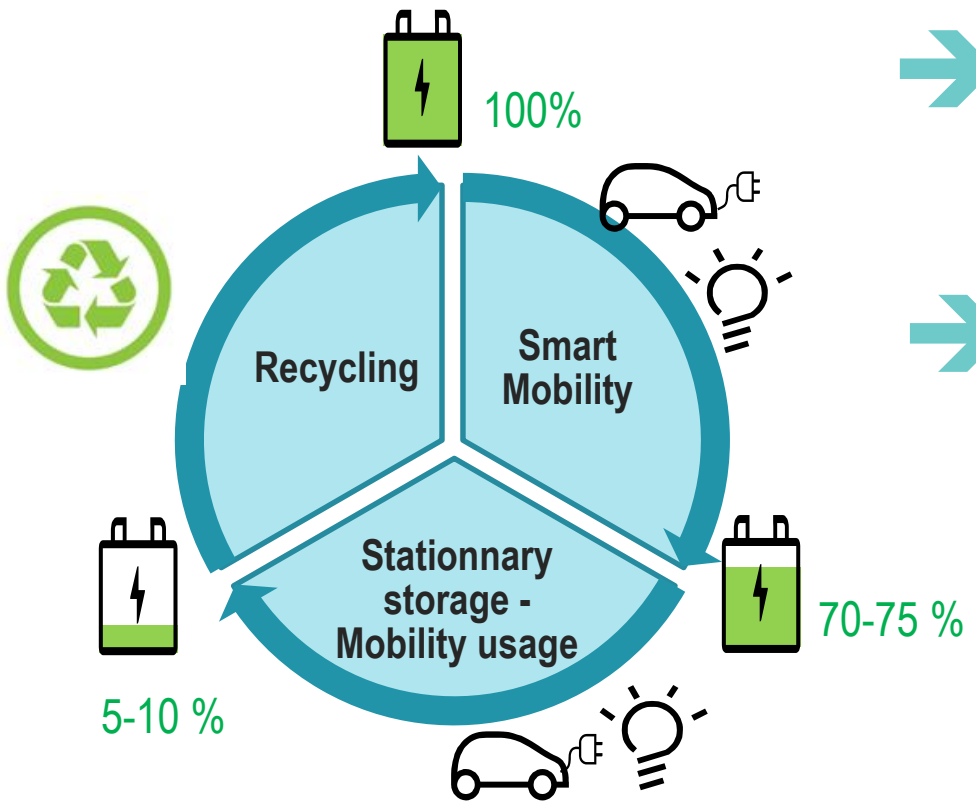
SMART CHARGING : OPTIMIZATION OF A CONTROLLED CHARGING WHILE **SATISFYING THE MOBILITY NEED** THROUGH BIDIRECTIONAL COMMUNICATION LINK



VEHICLE TO GRID : BIDIRECTIONAL SMART CHARGING

SMART CHARGING G2V, V2G

Renault Energy Services Activities



Virtuous loop of EV

Objective as OEM :

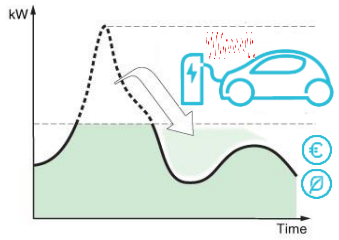
Lower the Total Cost of Ownership for the end user

Support Zero Emission while driving & while charging

Develop & commercialise innovative energy services during the battery life cycle

- First life : Smart Charging, V2G
- Second life : Energy Storage Systems (ESS)

Energy Services usecases



Peaker power plant ▪ Li-Ion batteries can replace thermal peakers (gas or diesel)		✓
Primary reserve ▪ Associated to renewable generation	✓	✓
Secondary and tertiary reserve ▪ Frequency control and balancing mechanisms		✓
Energy arbitrage ▪ Buying energy and store it when prices are low	✓	✓
Peak shaving ▪ Commercial and Industrial customers can reduce their electricity bill	✓	✓
Self consumption ▪ Residential, Commercial and Industrial customers with local PV production, Microgrids	✓	✓

RENAULT ECOSYSTEM OF PARTNERS

RENAULT OBJECTIVE: REDUCE TCO
ANTICIPATE CUSTOMER NEEDS

CPO TSO RETAILER

DSO AGGREGATOR

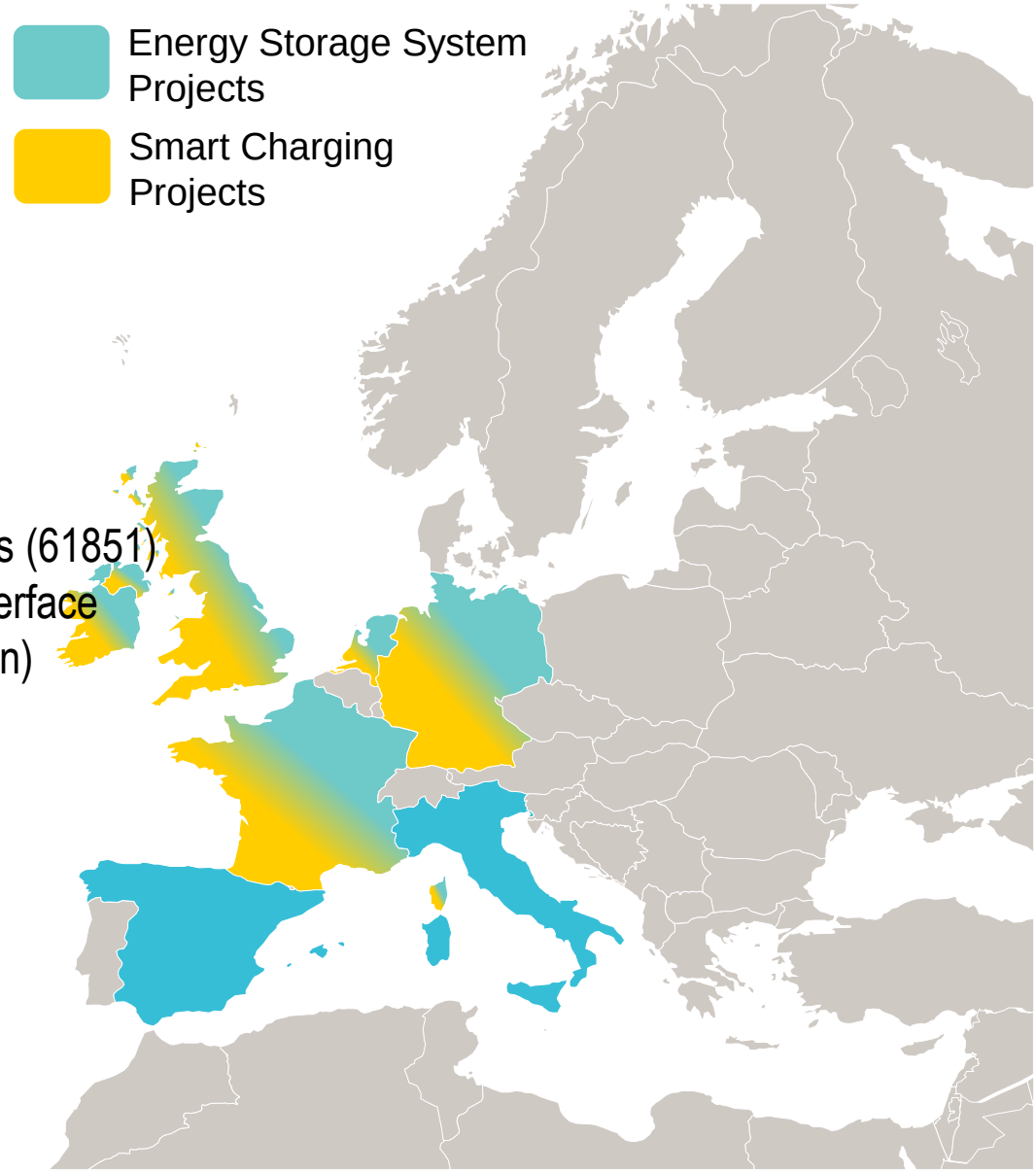
Panel of Services :

- *Primary reserve*
- *Tertiary reserve*
- *Capacity market*
- *Demand Response*
- *Smart Sourcing*
- *Self consumption*
- *Smart Home*

(€€)

Solution providers

RENAULT ENERGY SERVICES ACTIVITIES
From Pilot to commercial offers



PILOT PROJECTS
- Technical & business model

STANDARDIZATION BODIES
- IEC SyC Smart Energy
- IEC TC69 Conductive Charging for Electric road Vehicles (61851)
- ISO/TC22/SC31 JWG1 : 15118 V2G Communication interface
- Member of eMI3 (eMobility ICT Interoperability Innovation)
- Member of CharIN

EUROPEAN INSTANCES LOBBING
- Platform for Electro mobility
- Innovation Deals

2017 : START OF COMMERCIALIZATION

CONCRETE REALISATIONS EXAMPLES

Where: The Netherlands

Who: Renault, LamboxNet, e-laad, last mile solution, Jedlix

What: Smart Solar Charging for District car-sharing program + V2G

Why: 100% renewable charging + local grid infrastructure optimisation

Challenges: V2G Standardisation
Local energy Market setup

Where: Germany

Who: Renault, The Mobility House

What: Smart Sourcing for residential use

Why: Reduce the charging cost

Results: - 50% & CO2 reduction

Challenges: Smart Meter rollout in Germany

Where: Europe

Who: Renault, Bouygues, Nissan, RWTH, UTRC, Engineering Ingegneria Informatica S.p.A., B.A.U.M. Consult GmbH, ASM Terni S.p.A., Gateshead College et Allgäuer Überlandwerk

What: ELSA: Energy Local Storage Advanced system

Why: enable the integration of 2nd life EV battery into the energy system and their commercial use.

Challenges: Regulations

CONCLUSION

- ELECTRIC VEHICLES ARE NO MORE CONSIDERED AS A TREAT TO THE POWER SYSTEM BUT AS AN OPPORTUNUTY TO FACILITATE THE RENEWABLE INTEGRATION
- THE FLEXIBILITY PROVIDED BY THE BATTERY SHOULD REWARD THE EV DRIVER AND REDUCE ITS TCO
- NEED FOR STANDARDISATION V2G, SMART METER ROLLOUT, ADAPTED AND LOCAL ENERGY MARKET

THANK YOU FOR YOUR ATTENTION

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