



Thomas Orsini

Business Dev. Dir.

Renault



The Renault-Nissan Alliance Strategy on Electric Vehicle

Thomas ORSINI

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ZERO EMISSION STRATEGY

become leader, together with Nissan, in zero emission mobility by offering affordable electric vehicles



FLUENCE



TWIZY



KANGOO



ZOE



LEAF



Zero Emission



AGENDA

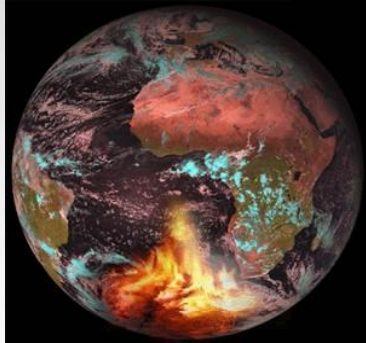
- Why EV today ?
- Renault EV Program
- Business Model and Prices
- Infrastructure
- Partnerships
- Pilot operations

WHY EV TODAY ?



CHALLENGES OF THE AUTOMOBILE INDUSTRY

Climate change



↑ Oil price



CO₂ taxes & regulation



Brand image



Economical crisis



ELECTRIC VEHICLES ARE A REAL ECOLOGICAL ANSWER

- No local pollution
- Less CO2 emission

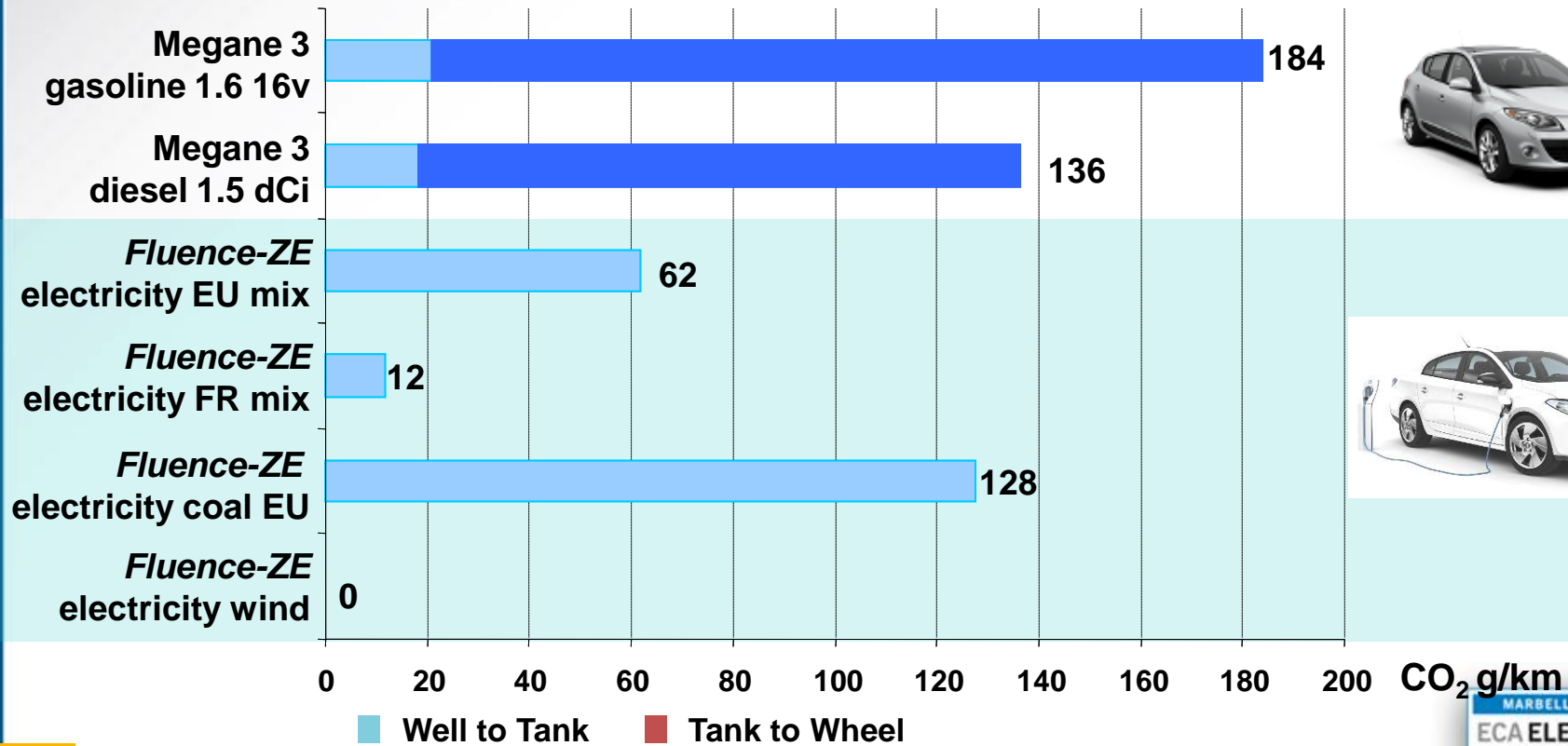
No Emission



No Noise

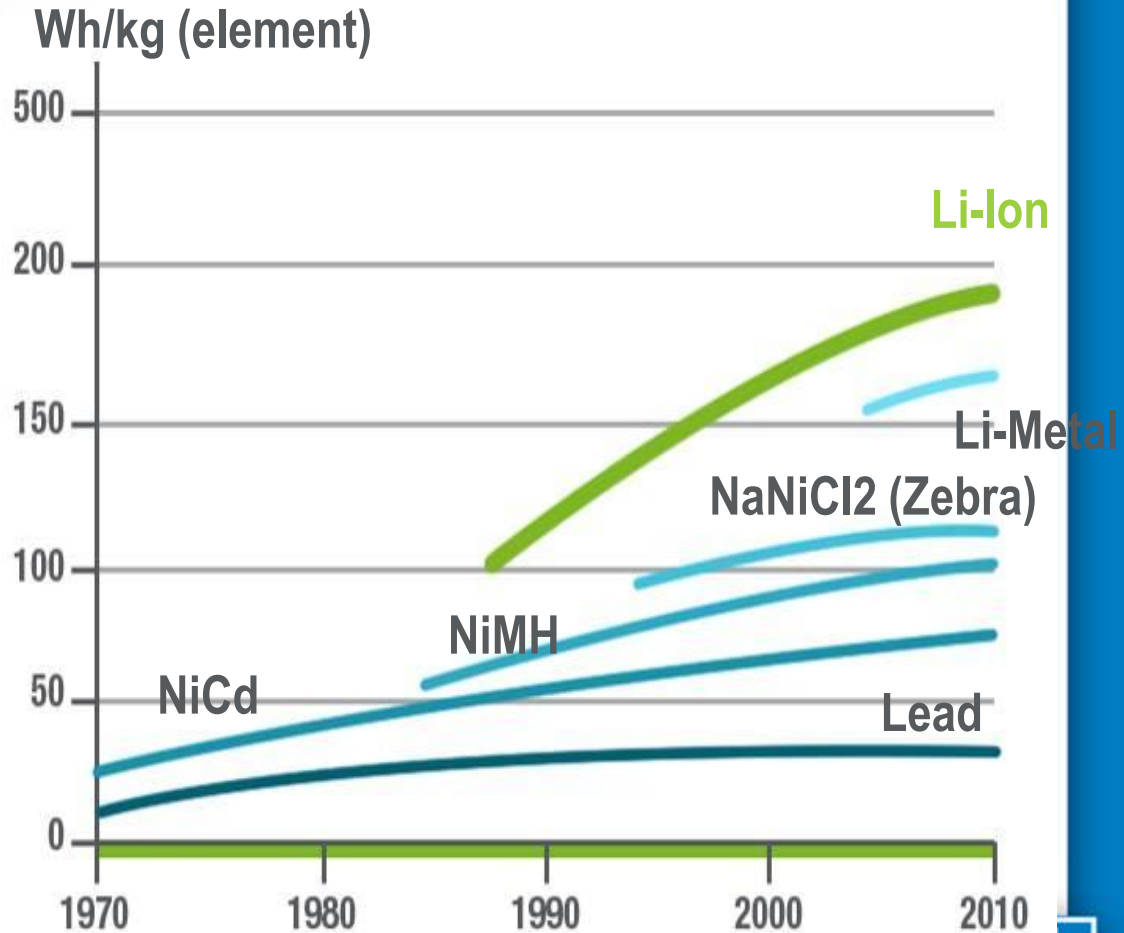
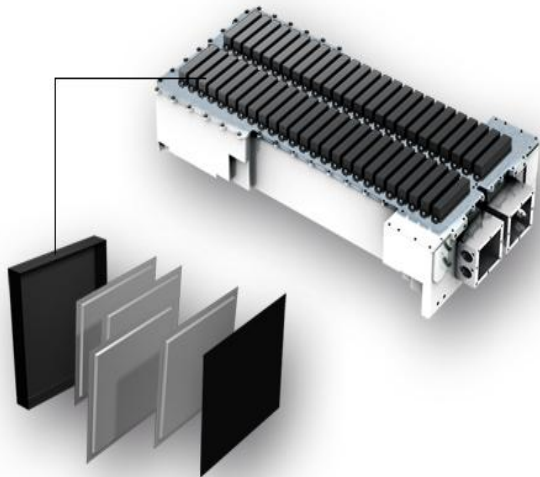


« Well to Wheel » CO₂ emissions for Renault C-segment cars on the standard NEDC



NEW LITHIUM ION BATTERIES OFFER DRIVING AUTONOMY

24 kWh for 250kg battery pack
No memory effect
More than 10 years lifetime

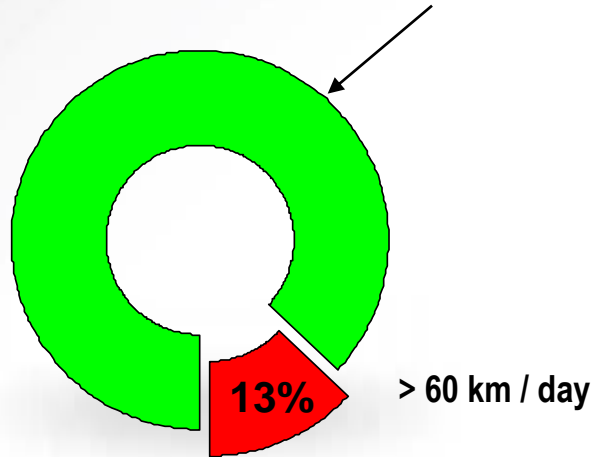


160 KM IS COMPATIBLE WITH DAILY USAGES

In Europe

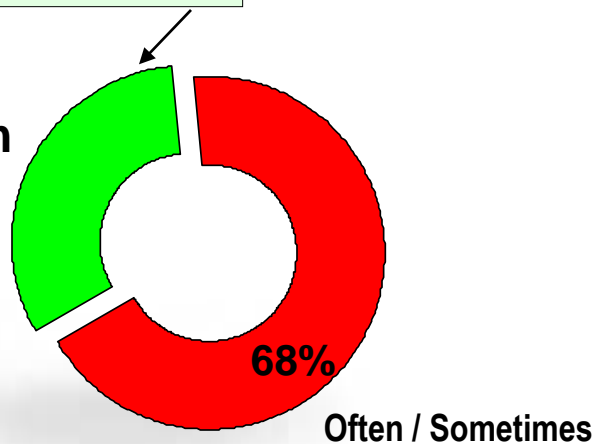
87% of daily trips

are less than
60 km / day



32% of B-segment cars

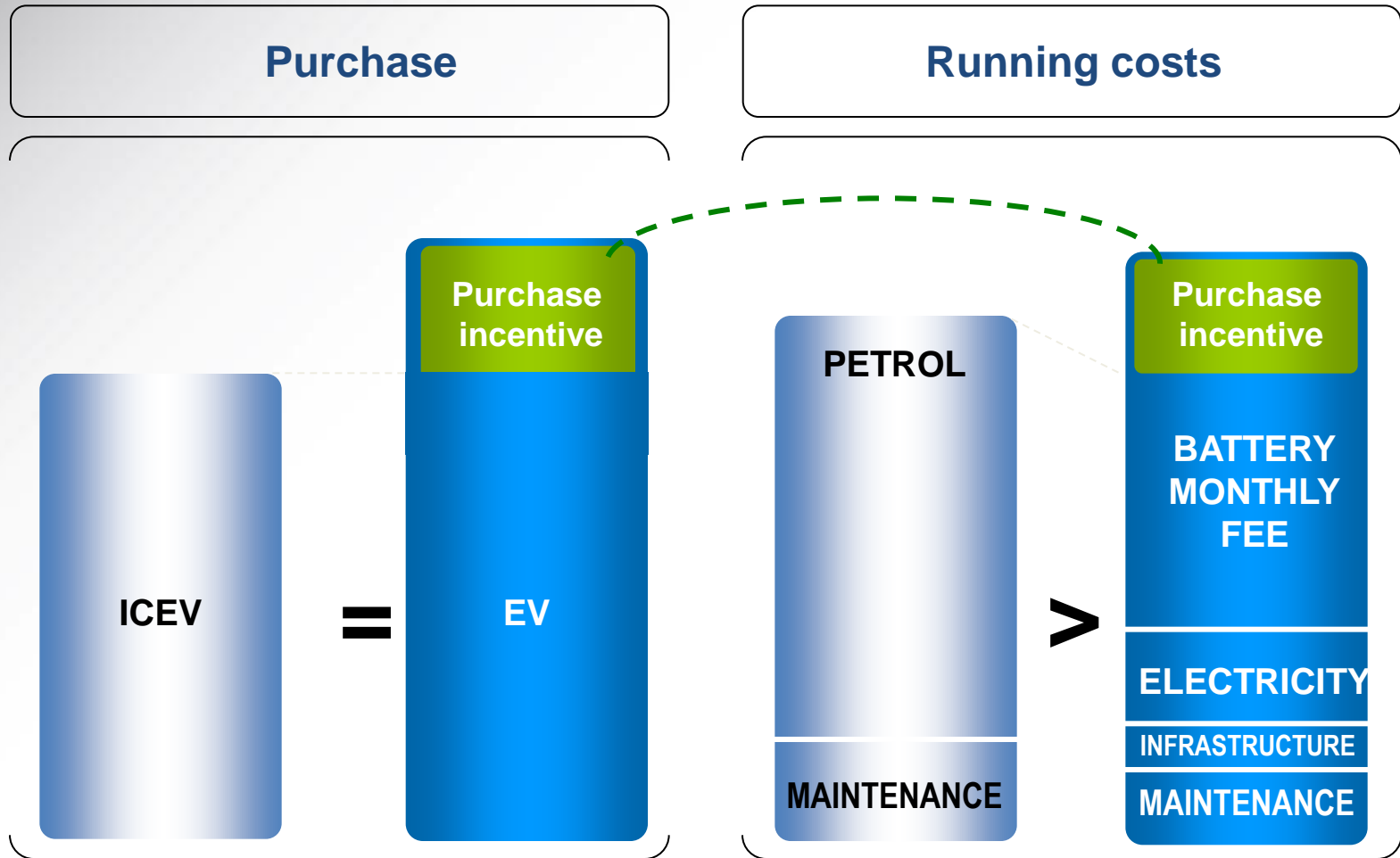
NEVER make
more than 150 km



EV BECOMES ECONOMICAL FOR CUSTOMERS

Purchase

Running costs



- ZOE will be more economical to run than an ICE car from ~50 km per day

THE RENAULT EV PROGRAM



4 MODELS FROM FALL 2011



Fluence ZE



Kangoo ZE



Twizy



ZOE

2011

2012

FLUENCE ZE : September 2011



Length : 4.748 m

Width : 1.813 m

Height: 1.458 mm

Weight empty : 1543 kg

Seats : 5

Engine power : 70 kW

Torque : 226 Nm

Max. Speed : 135 km/h

Autonomy (NEDC) : 185 km

Standard Charging : 6 - 8 hrs

Quickdrop-Technology :

Battery exchange in 3 minutes

Intelligent GPS Navigation system

KANGOO ZE : October 2011



*same as
ICE version*



Load Volume : 3 to 3,5 m³ / 4,6 m³

Load weight : 650 kg

Weight empty : 1410 kg

Engine power : 44 kW

Torque : 226 Nm

Maximum speed : 130 km/h

Autonomy (NEDC) : 170 km

Standard charging : 6 to 8 hrs

Fast charge (later) : 0.5 to 1 hr

TWIZY : End 2011



Length : 2.303 m

Width : 1.132 m

Height: 1.476 m

Seats : 2

Engine power: 15 kW

Torque : 57 Nm

Max. Speed : 75 km/h + Boostfunction

Autonomy (norm. urban cycle) : 100 km

Standard charging : 3.5 hr

ZOE : Mid 2012



Seats : 5

Engine power: 60 kW

Torque : 222 Nm

Max. Speed : 135 km/h

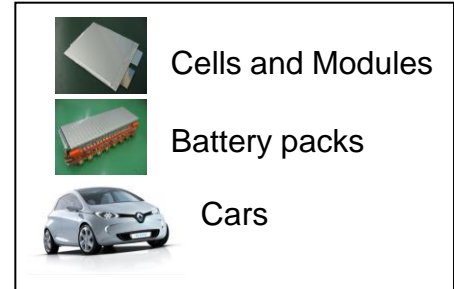
Autonomy (NEDC) > 160 km

Standard charging : 6 to 8 hrs

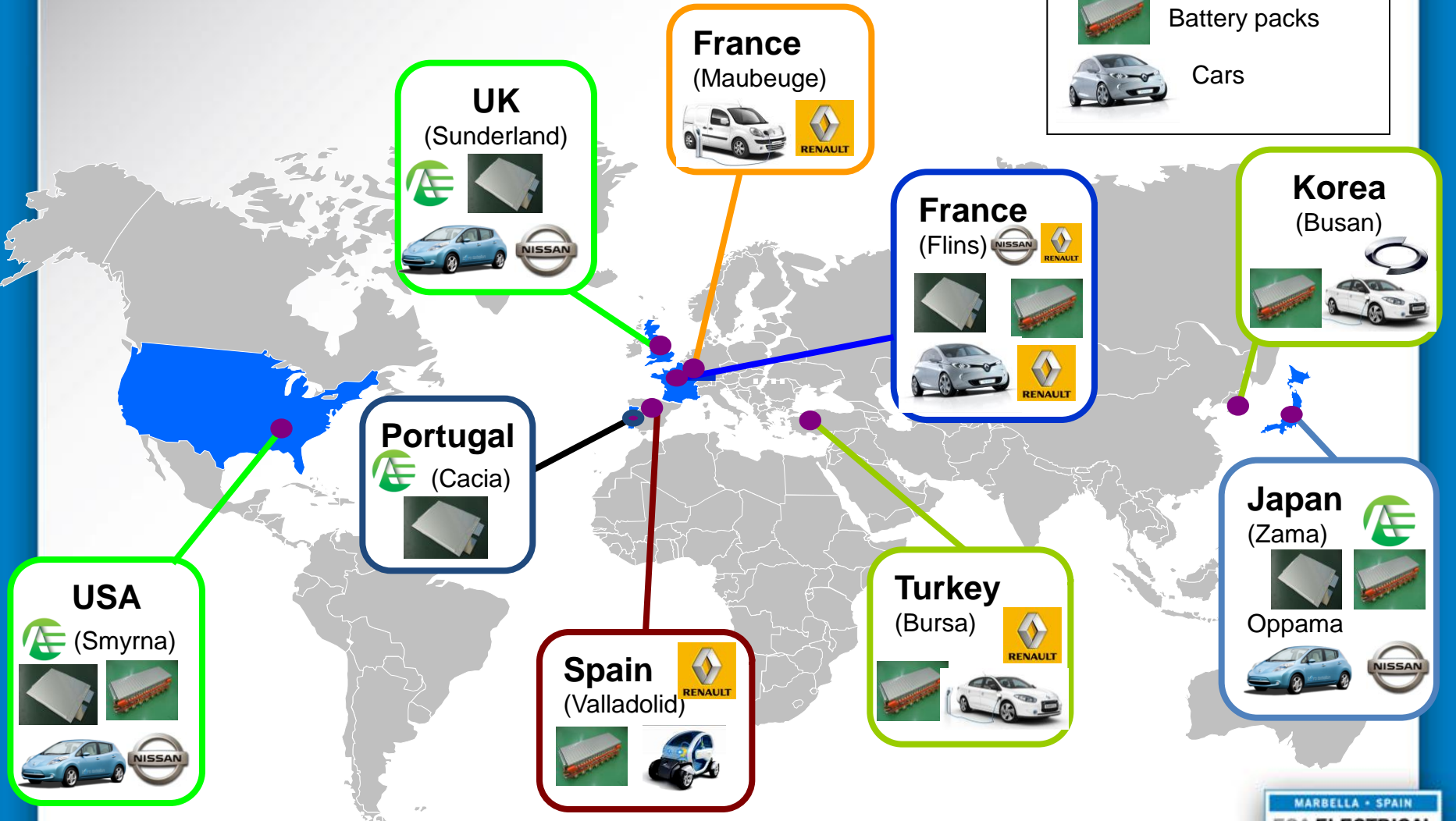
Fast charging : 0.5 to 1 hr

Quick drop : battery exchange in 3 mn

INDUSTRIAL STRATEGY



Cells and Modules
Battery packs
Cars



UK
(Sunderland)




Icons: Nissan logo, car, battery pack, cells and modules.

France
(Maubeuge)



Icons: Renault logo, van, car.

France
(Flins)



Icons: Nissan and Renault logos, car, battery pack, cells and modules.

Korea
(Busan)



Icons: Renault logo, car, battery pack, cells and modules.

USA
(Smyrna)



Icons: Nissan logo, car, battery pack, cells and modules.

Portugal
(Cacia)



Icons: Renault logo, battery pack, cells and modules.

Spain
(Valladolid)



Icons: Renault logo, battery pack, car.

Turkey
(Bursa)



Icons: Renault logo, battery pack, car.

Japan
(Zama)
Oppama



Icons: Nissan logo, car, battery pack, cells and modules.



BUSINESS MODEL AND PRICES



BUSINESS MODEL = BATTERY LEASE + ONE STOP SHOPPING



Charging solution at home (wallbox)

Contract

+ -

Insurance

Services

Electricity supply



BUY

BUY

Monthly lease

Energy bill

OR LEASE

Rent

« ONE STOP SHOPPING » IN THE RENAULT NETWORK



ATTRACTIVE PRICES, THANKS TO BATTERY LEASE BUSINESS MODEL



FLUENCE ZE
21 300 € inc VAT
(with incentives)



BATT FEE
79 €
inc VAT
(10,000 km)



KANGOO ZE
15 000 € excl. VAT
(with incentives)



BATT FEE
72 €
excl. VAT
(15,000 km)



TWIZY
6 990 €
(w/o incentives)



BATT FEE
45 €



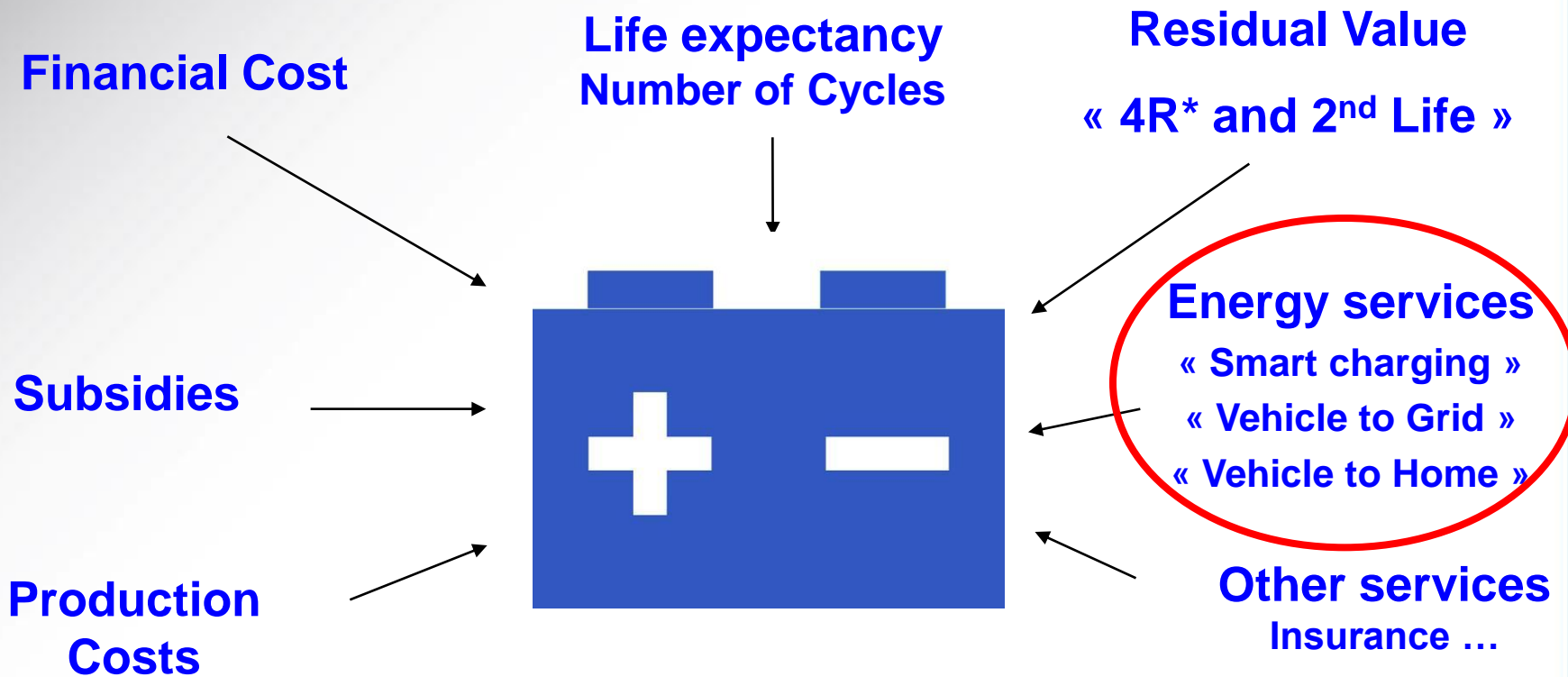
ZOE
XX XXX €



BATT FEE
XX €

Secret

ECONOMIC EQUATION OF BATTERY BUSINESS



79 € / month
*for Fluence ZE
Renault Battery Leasing*

*4R = Reuse, Refabricate, Resell, Recycle



CHARGING SOLUTIONS



Infrastructure is getting ready, but ...

- Delay in standards
- Clearing & Roaming systems difficult to build up
- Business model are difficult and need public support



Standardization in under way ...

Consortium
TEPCO

CHAdeMO
(Ch.Rapid.)



Plus &
charge

DAIMLER

De Facto

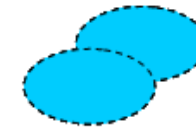
Z•E•Ready



E•V•Ready

DIN/DKE

E-mobility
platform

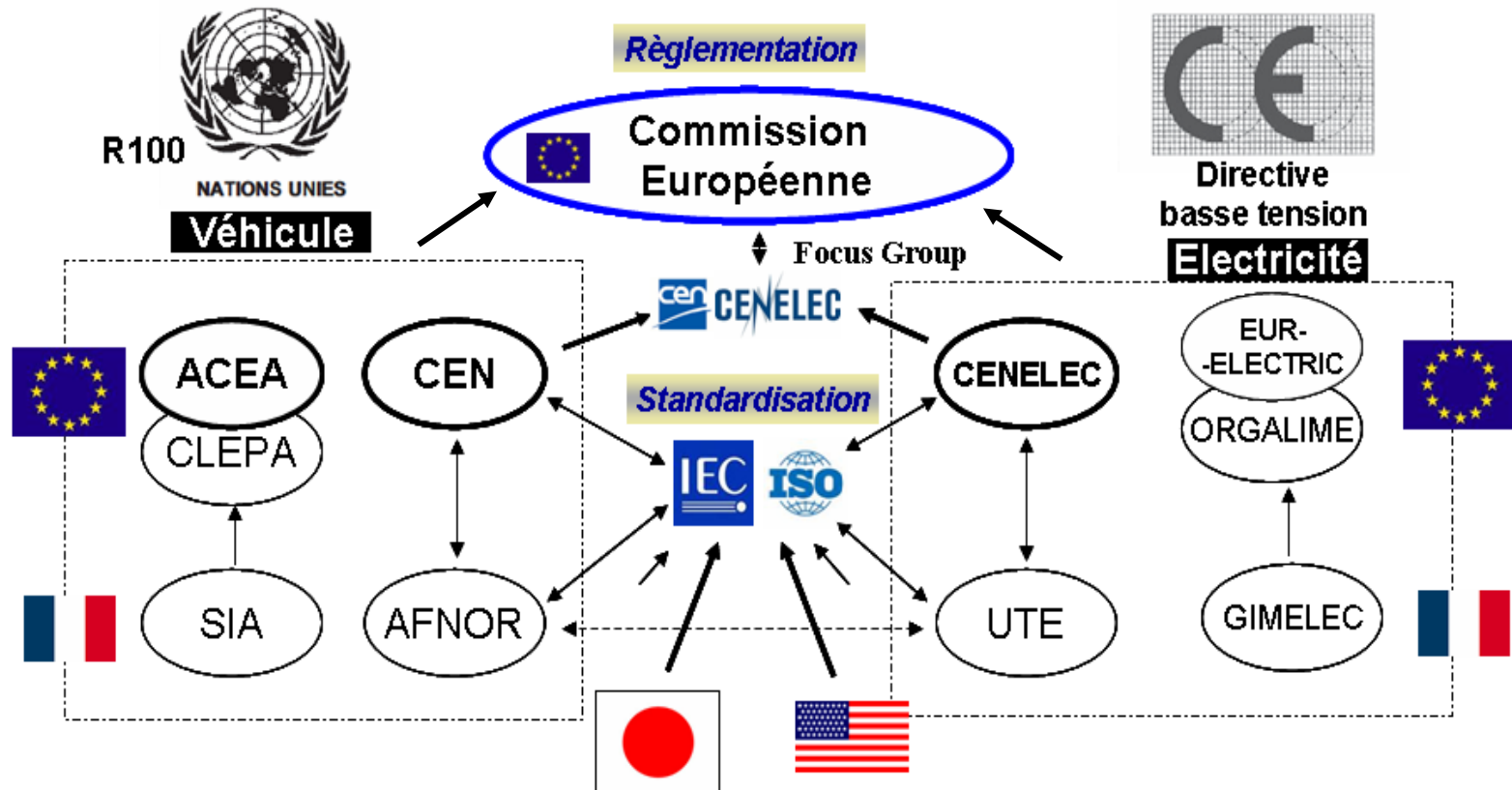


Guide Nationaux

Livre vert

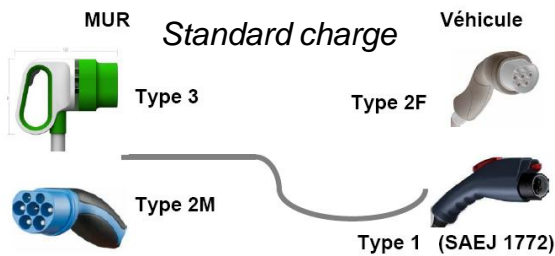


Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE



... but not quite ready !

- Too many solutions allowed by IEC/ISO standards 61851 & 62196

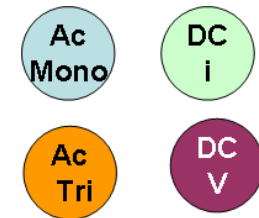


2 Plugs
On wall side

2 Others inlet
On vehicle side



4 Charging modes



4 Kinds of supply

- Insufficient precision on system description
- Focus group created by European commission but progress is too slow



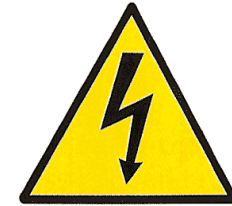
Control Risks related to EV charge

1° What must be absolutely avoid with EV infrastructure

Dangers, risks and standards of solar photovoltaic

More than one installation on three suffers from a defect of conformity with the security standards generating a risk of electrocution or fire.....

Consuel statement (French organization for electricity user safety)



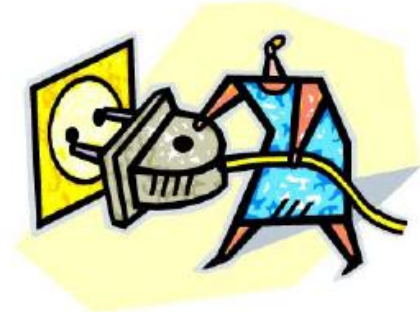
2° K°/°° for charge

On about 50 additional requirements (as regards new standards) currently inventoried in Z.E. / E.V. Ready,

35% are related to safety, 20% to avoid immobilizing risks.

3° What we must be prepared to face

- *Over 28 millions residences, 7 millions would present risks and 2.3 millions would be equipped with dangerous electrical installation*
- *Each year 4000 electrifications are reported, resulting in 100 deaths (about half are children)*
- *On 250.000 fires, 80.000 would be of electric origin*



Source : National council of consumption - France

WHERE	TYPE OF CHARGE	INFRASTRUCTURE	CABLE	TIME
HOUSE	DOMESTIC PLUG		 Mode 2	> 10 hours
	WALL BOX	 Wall Box		< 8 hours
PUBLIC PLACES (OFFICES, CAR PARKS, SHOPPING CENTERS)	STANDARD OR ACCELERATED	 ZE	Mode 3 – single to tri-phase	From 1 to 8 hours
	QUICK CHARGE		Attached to spot Mode 3 (AC) or mode 4 (DC) or mix	30 mn Specific Renault technology for AC on car side
QUICK DROP STATIONS	BATTERY SWAP			3 mn Israel and Denmark

Renault / Nissan: technical orientation and additional specifications are compulsory

Z.E. READY



Wall Box

AC Single Phase	<input checked="" type="radio"/>	OK
	<input type="radio"/>	TBC
AC 3 Phases	<input checked="" type="radio"/>	3KW
	<input checked="" type="radio"/>	6KW
	<input checked="" type="radio"/>	11KW
	<input type="radio"/>	22KW

Home charging



Closed technical collaboration to set up final interface specifications

E.V. READY

AC Single Phase	<input checked="" type="radio"/>	OK
	<input type="radio"/>	TBC
AC 3 Phases	<input type="radio"/>	3KW
	<input type="radio"/>	6KW
Mixed AC/DC	<input checked="" type="radio"/>	11KW
	<input checked="" type="radio"/>	22KW
	<input checked="" type="radio"/>	43KW
	<input checked="" type="radio"/>	DC 50 KW



Public and quick charge



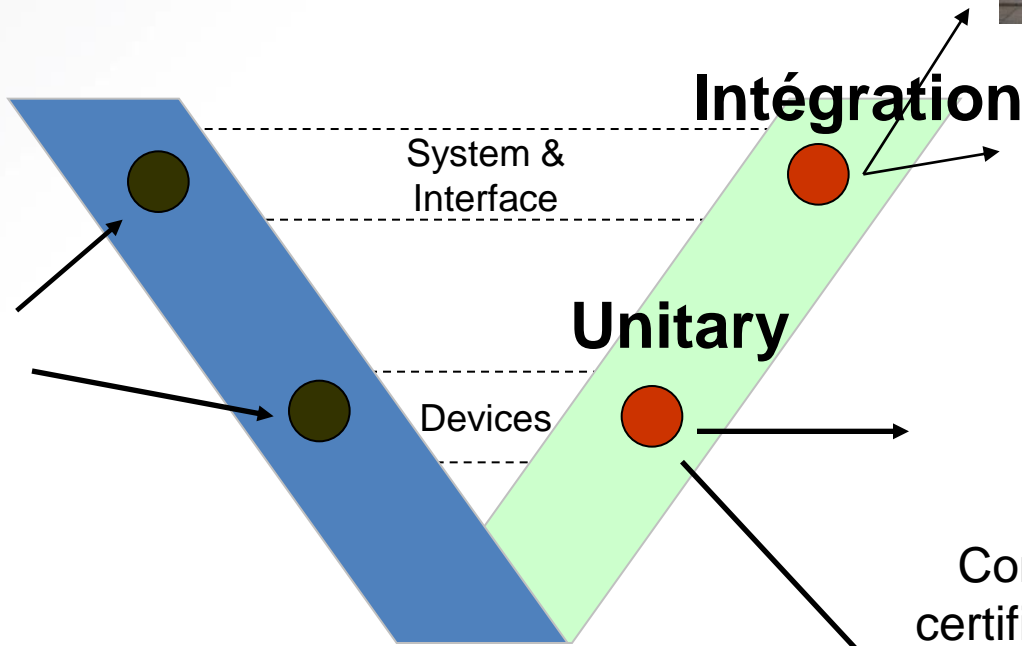
Main actors OEM & Utilities to find agreement by end of September
 France: Green Book
 Europe: 1st Focus group report



Validation Methodologie

Z.E. / E.V.
Ready Tech.
specification

Requirement attributes									Requirement check		To what does relate the requirement?			
Status	Estimate	Paragraph	Paragraph title	Z.E. READY	Charging mode	Topic	Requirement wording	Feasibility	Requirement type	Test conditions	Test means acceptance criteria	P1 & P2	P1	P2
OK/BA	REQ-012			X			The vehicle of EC 60931 is certified in compliance...	Approved	Functional			X	X	X
OK/BA	REQ-013			X			The vehicle of EC 60931 is certified in compliance with the requirements of the EC 60931...	Approved	Functional			X	X	X
OK/BA	REQ-014			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-015			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-016			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-017			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-018			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-019			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-020			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-021			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-022			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-023			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-024			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-025			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-026			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-027			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-028			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-029			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X
OK/BA	REQ-030			X			Access to CAN bus shall be possible in order to allow the diagnosis of the vehicle...	Approved	Functional			X	X	X



Nissan Bench



Renault Bench



Wall Box

Common R/N
certification agent

Device
supplier



Common R-N process
for unitary tests.
Dedicated benches for car integration



ZE Ready Certificate

Certification criteria :

1. ZE Ready Specifications Compliance

Self-certification is possible

2. ZE Ready Integration tests (Renault and Nissan)

3. Installation process : Demonstration that the process is under control must be provided to Renault

Example : Installation manual linked to the charging spot + contract with installation subcontractor (“Installation following the manual with check report as condition for payment”)

**The
Product
is
ZE Ready
Specification
Compliant**

**ZE Ready
Certificate
+
Logo label**

This ZE Ready certificate is mandatory for the part delivery to Renault and for the ZE Ready label on wallbox and charging spot



Deployment Status

- ZE Ready® and EV Ready® specification (V1) were released end of March.
- Schedule of compliance / integration test / installation process validation is being set for all partners
 - Current candidates: 250 different products by 26 suppliers, working with 20 partners in 13 countries

PARTNERSHIPS



PARTNERSHIPS – Around 100 worldwide !

- Utilities and operators: e.g.



- Infrastructure manufacturers: e.g.



- R&D centres: e.g.



- Infrastructure « owners » (shopping centres, car parks, hotels etc) : e. g.



- States, cities, regions : e.g.

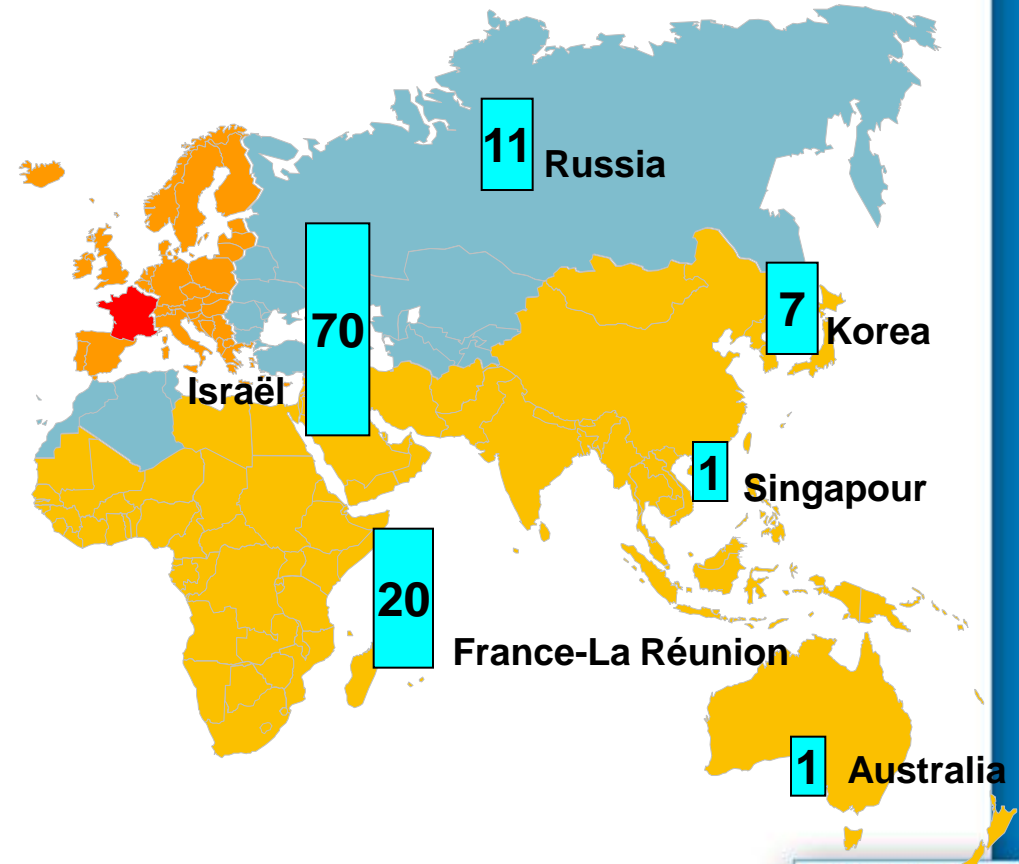
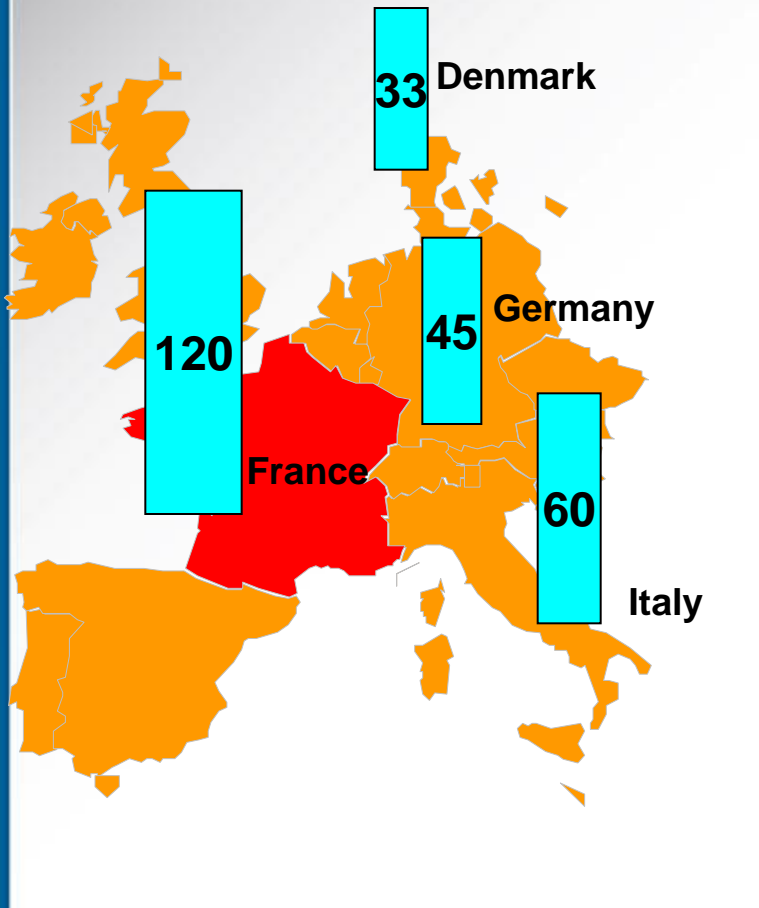


PILOT OPERATIONS



Electric Vehicles Democars
An International Operation

427 Vehicles
9 countries



From December 2010 until start of sales, over 400 cars will gradually be put into real customers' hands



PILOT PROJECTS IN EUROPE

Key Feedbacks :

- Technical / Internal Process : preparation for mass market launch
 - Training of emergency services
 - Preparation and training of dealerships and sales forces (incl.A/S), etc
 - Ingeniering/quality follow-up with several feedback systems
- Infrastructure preparation
 - Tests of different solutions for charging infras (content / price / choice), incl. smart grid.
 - Customer experience for infra. installation (incl. works)
- Customer feedback / usage
 - Ex : confirmation on the relative importance of charging infra in public area vs home charging



First manufacturing



First deliveries



Customer satisfaction



A/S training



Charging stations



Milano (Italy)



Hambourg (Germany)

FIRST CUSTOMERS' DELIVERIES



Mantes (France)

INFRASTRUCTURES IMPLEMENTATION STARTED



ELECTRIC VEHICLES ARE ON THE ROADS



Hamboug



Milano

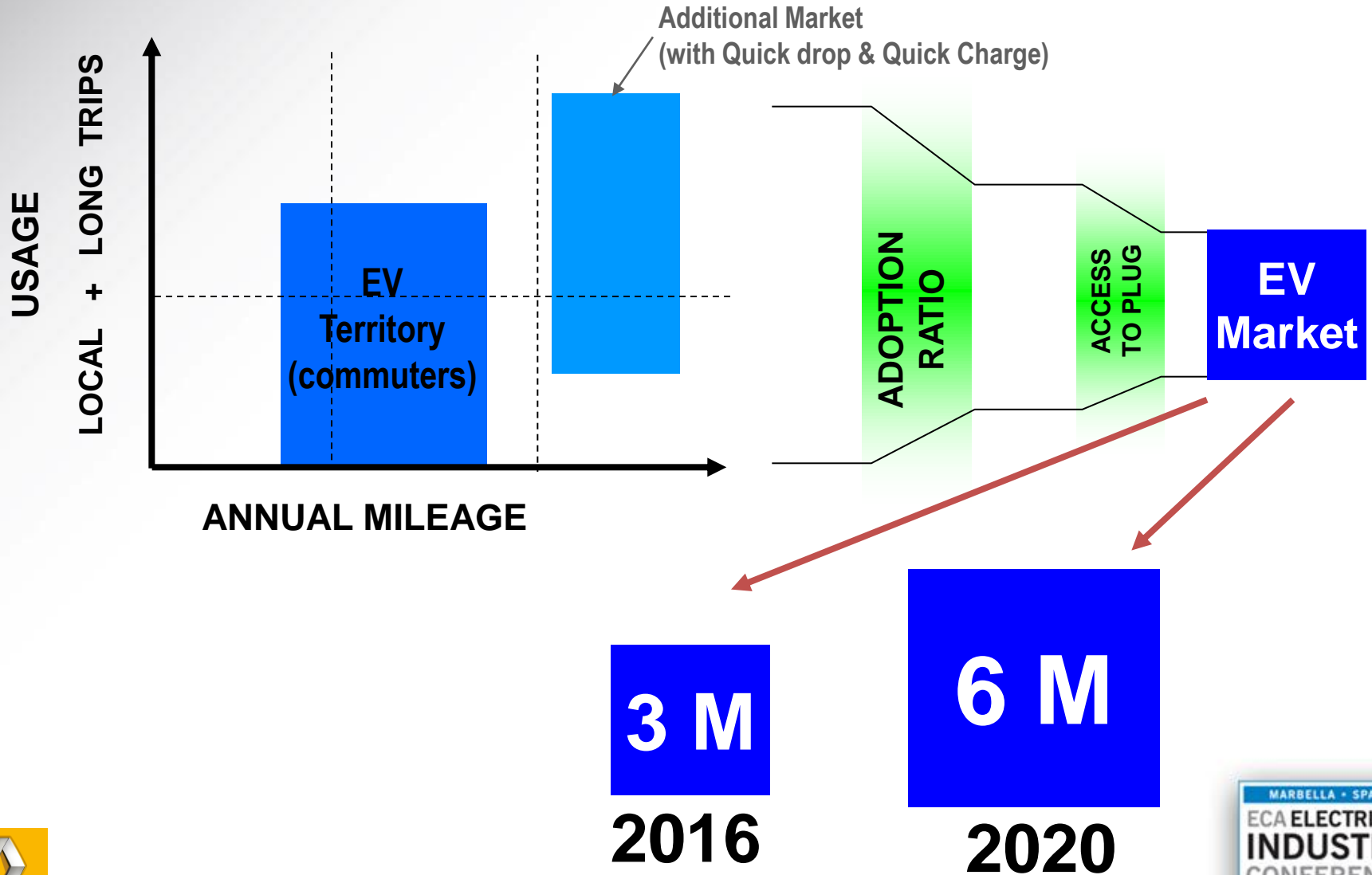


Flins



MARKET POTENTIAL

MARKET POTENTIAL



RENAULT
Z.E.

THANK YOU !

