

# AUTONOMY AT ANY COST?

17/10/2016



RENAULT  
**Z.E.VOLUTION**



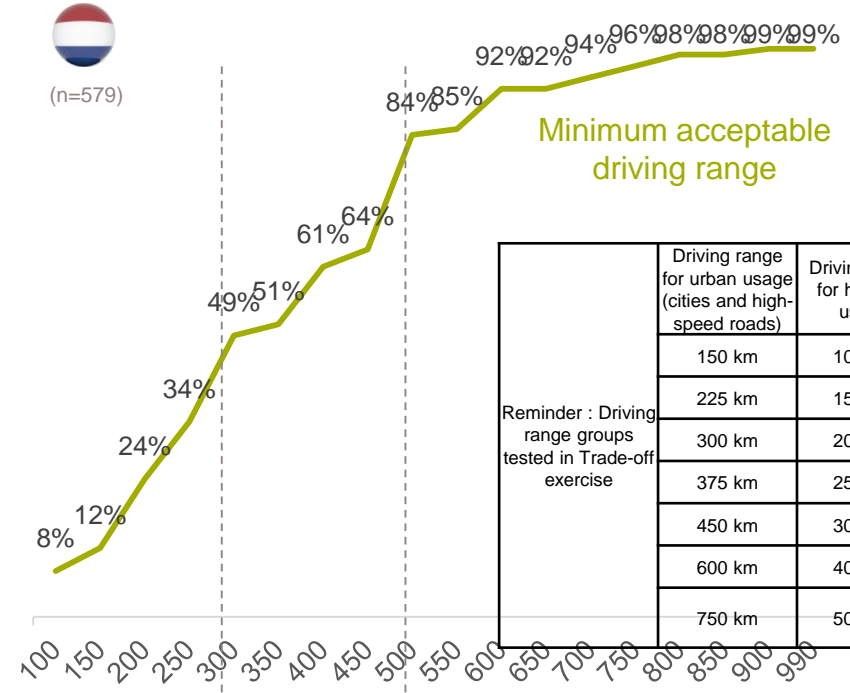
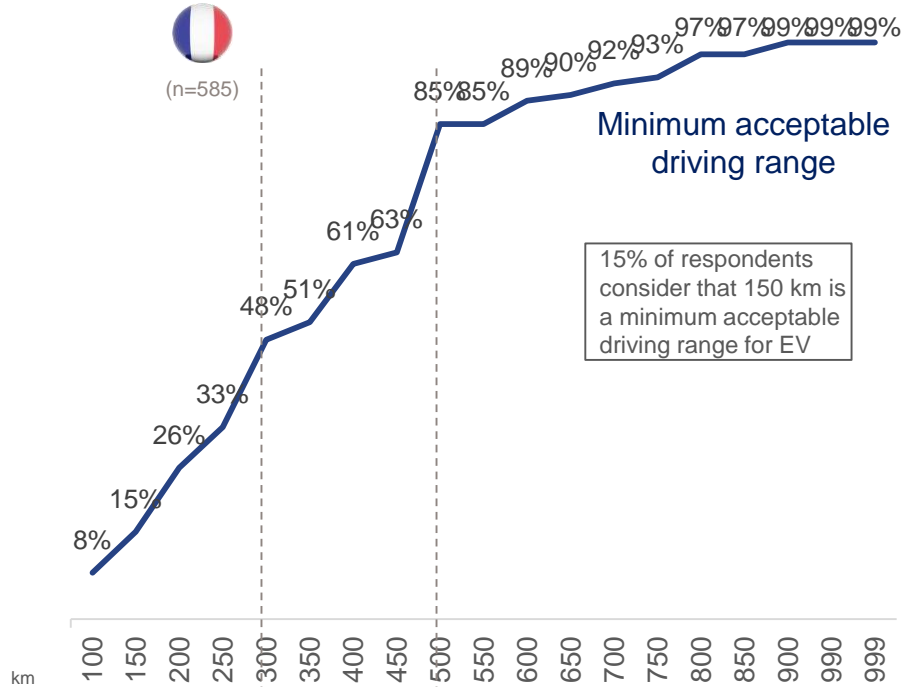
PROPERTY OF GROUPE RENAULT

**GROUPE RENAULT**

**A half of EV non-rejecters consider that 300 km of driving range is acceptable. 400km and 500 km are the next thresholds with a marginal impact beyond.**

This question was asked AFTER Trade-off exercise exposure

## Minimum acceptable driving range for EV



Reminder : Driving range groups tested in Trade-off exercise	Driving range for urban usage (cities and high-speed roads)	Driving range for highway usage
	150 km	100 km
	225 km	150 km
	300 km	200 km
	375 km	250 km
	450 km	300 km
	600 km	400 km
750 km	500 km	

C6. What would you consider to be the minimum acceptable driving range for your future Electric vehicle, i.e. the number of kilometers you would be able to drive before having to recharge the batteries? C7. If you were to buy an electric car in the coming days, would you buy it with the following driving ranges ?

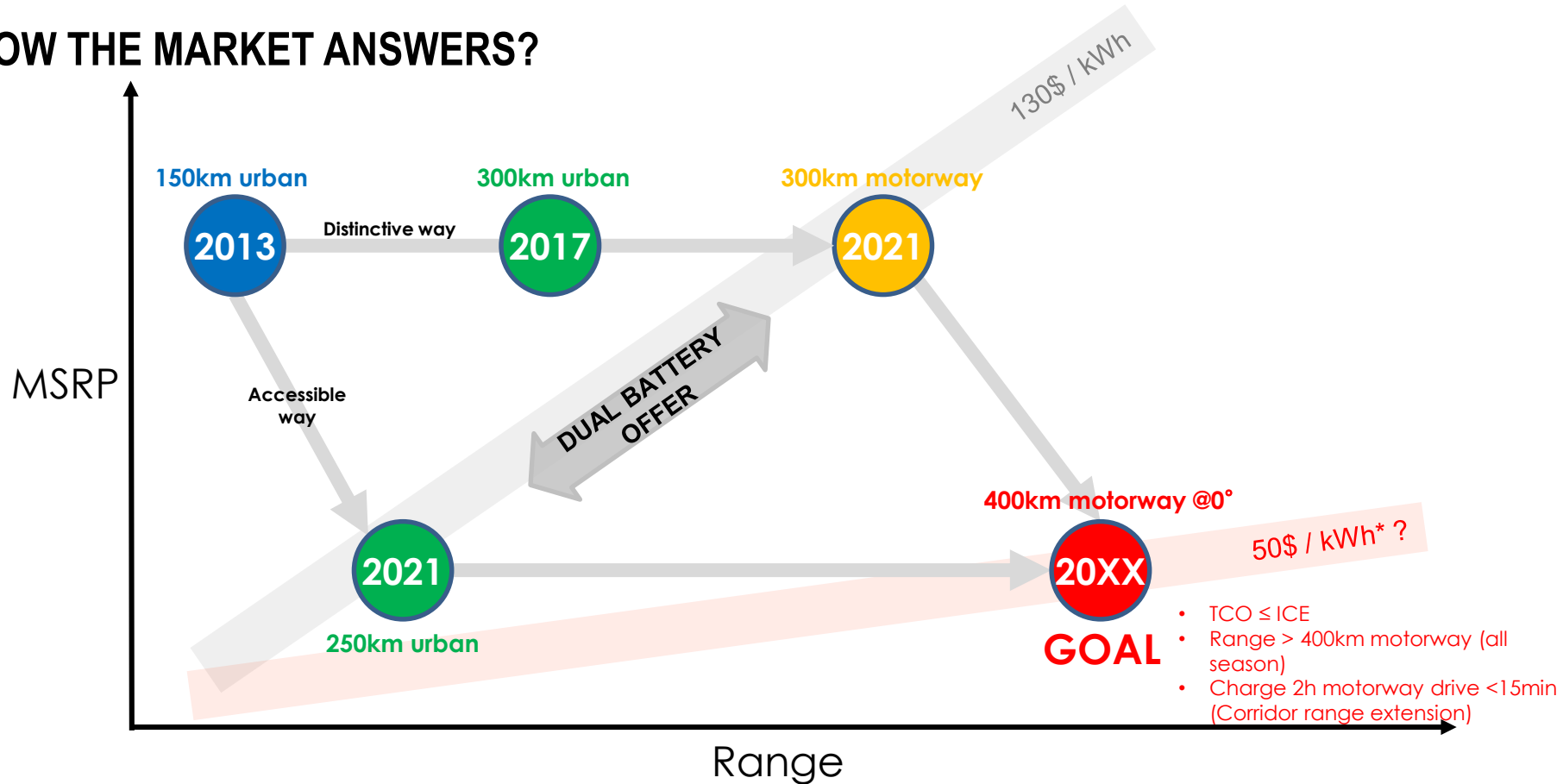
### RANGE EXPECTATIONS: 4 MAIN THRESHOLDS

1. 100-150km urban: minimum for **ACCEPTABILITY**
2. 200-300km urban: daily use **REASSURANCE**
3. 300km motorway: **USE EXTENSION** outside cities, access to “long distance” week-end trips\*
4. 400km motorway (all conditions): target to be credible as **1<sup>st</sup> CAR** by securing long distance trips potential\*

\* Once achieved, these ranges must be accompanied by **very fast charging capability** (Compatibility with QC corridor infrastructure deployment → DC 200-350kW announced at the competition by 2025 → Considering 25kWh/100km consumption on motorway, DC 200-350kW ≈ 200-350km refueling in 15min)

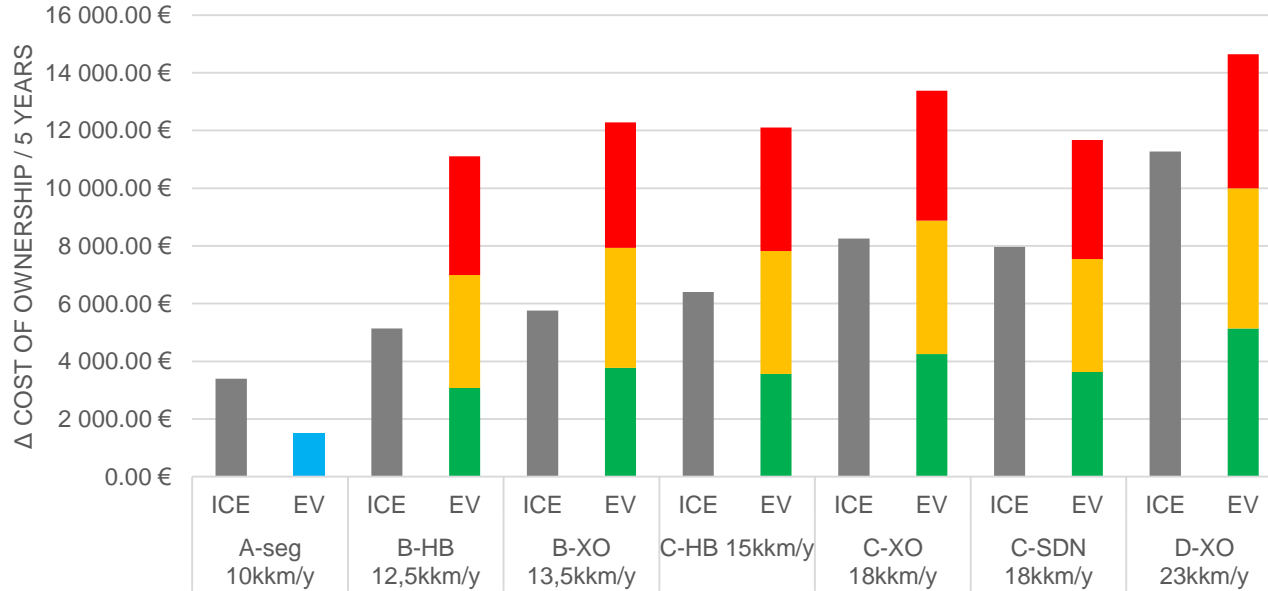
Source: ACME, EV survey FR/UK 2015

# HOW THE MARKET ANSWERS?





## EV COST OF OWNERSHIP VS ICE\*



- EV 400km HW @0°
- EV 300km HW @20°
- EV 250km URB @20°
- EV 200km NEDC
- ICE

### Hypotheses:

Δ cost EV shell vs ICE (w/o batt)	0
Nb of years	5
Fuel cost /L	1,58 €
Electricity cost / kWh	0,15 €
Wall-box price	500,00 €
Battery cost / kWh	120,00 €
Battery RV	45%
EV incentive	2 500,00 €

**! 45% Battery residual value taken into account**




By 2022, EV competitiveness vs ICE should be:

- ➔ Reachable for limited range EV ≤ 250km urban → More likely to fit with 2<sup>nd</sup> car uses
- ➔ Still not reachable for long range EV ≥ 300km motorway → EV value up necessary to balance the lack of competitiveness vs ICE (e-perfo, charging convenience, roominess, AD, etc.)
- ➔ RV of battery and Charging are key

\* 2022 projection over 5y ownership. Taking into account ΔMSRP, fuel cost, wall-box, incentive (EU) and battery residual value

## ZOOM ON CHARGING

# CHARGING PATTERNS : GIVE ADDED VALUE

	MAIN HARBOR charging	DESTINATION charging	RANGE EXTENSION charging
PLACE	Home or office 	Supermarket, cinema, etc. 	Fuel Station, Highway, etc. 
OCCURENCE	<b>75-90% - Once or twice a day</b> Same for fleet/pro, less time for some of them	<b>10-15% - 1 to 5 times a week</b> More for fleet/pro, mainly for small fleets.	<b>0-10% - Once a year to once a week</b> Same for fleet/ pro
DURATION	<b>Several hours</b> Several minutes to few hours for some fleets	<b>Several minutes to few hours</b>	<b>5 to 15 minutes</b>
PERFORMANCE	<b>200km in 8h / 1 night</b> (daily mileage use) Nice: <b>Full charge in 8h / 1 night</b>	<b>50km in 30min</b> (proximity shopping...) <b>200km in 2h</b> (cinema, theater, shopping mall...)	<b>2h motorway range in 15min maxi</b> (Perpetual REX on motorway for long distance trip: 2h drive → 15min stop → 2h drive →...)
DEVICE	<b>Cable mode 2-3, Wireless CS</b> V2X	<b>Cable mode 2-3</b> Nice: Wireless CS, Plug mode 4	<b>Plug mode 4</b> Nice: cable mode 2-3 & Wireless CS

**Normal charge**  
≈ AC 3-10kW

**Accelerated charge**  
≈ AC 22kW

**(Very) Fast charge**  
≈ DC 200-350kW

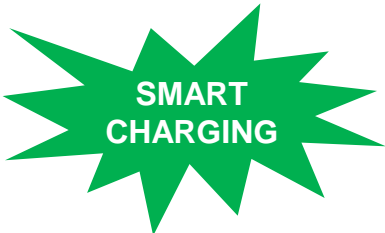
**KEY TARGET!**

- 3 types of usage: MAIN HARBOR, DESTINATION & RANGE EXTENSION
- Fleet specificities: less time on MAIN HARBOR, more need on DESTINATION

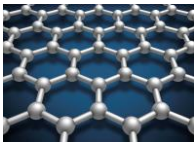
# ECOSYSTEM AND TCO



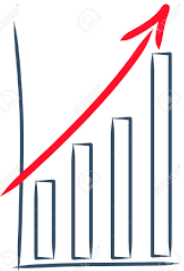
Mass market



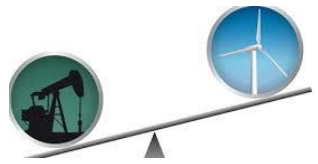
Technology improvement



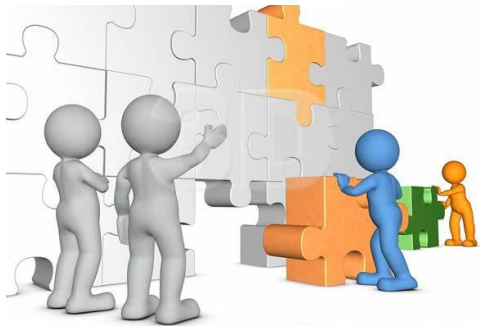
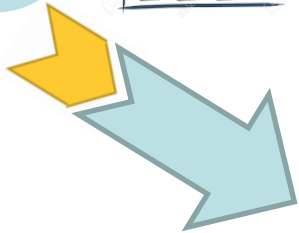
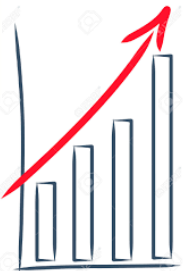
GW  
GWh



STANDARD  
DIVERSITY



Digitalization



## CONCLUSION

# REVOLUTION STARTED ALREADY!



- 400 km NEDC
- 300 km real
- 41 KWh Battery
- From 24 390€ (w/o incentives)



# THANK YOU!

