



RENAULT NISSAN MITSUBISHI

Impacts of alternative-fueled vehicles and electrification on urban transport

Decarbonizing Urban Passenger Transport
EXPERT WORKSHOP - 19-20 April 2018



Authorities are more and more empowered



Competitors Offering




Customer Preferences



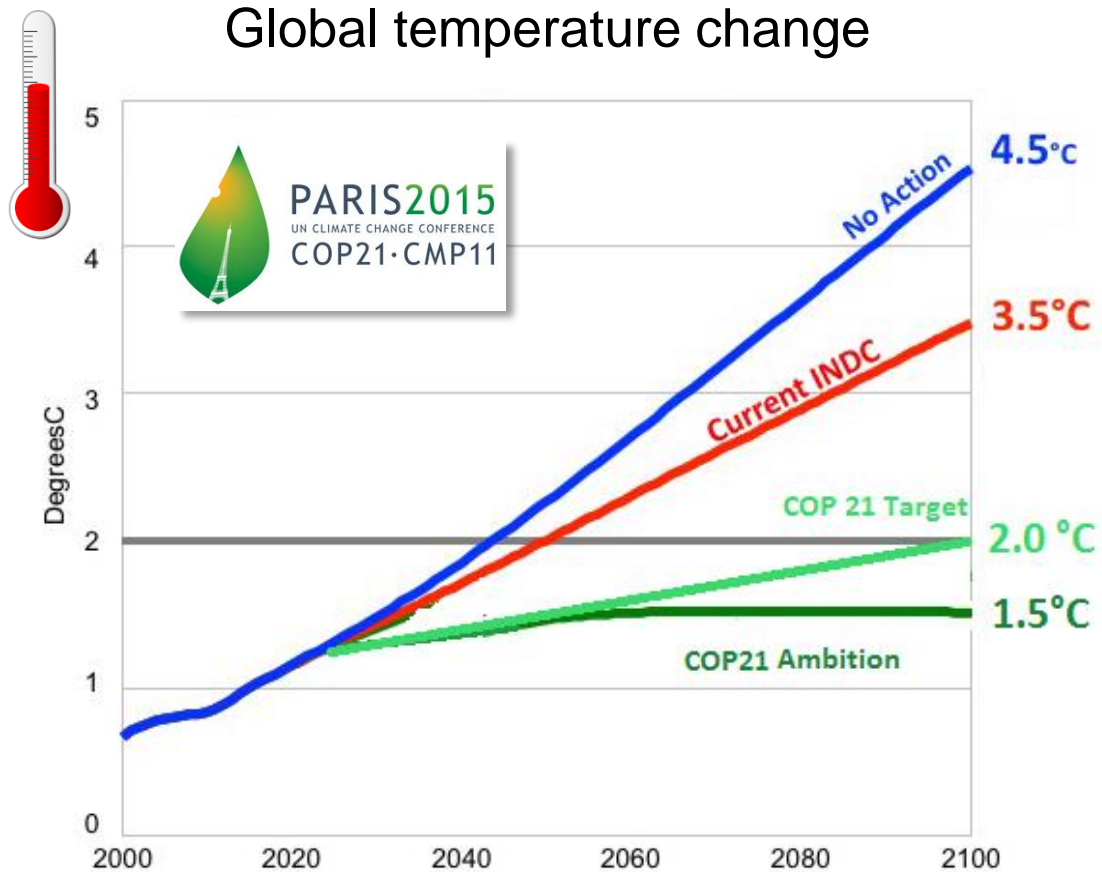
Region	Percent of world vehicle sales 2013	Emission	
		Current*	Adopted
China	25%	China 4*	China 5
US	19%	Tier 2	Tier 3
EU	17%	Euro 5b	Euro 6
Japan	6%	PNLT	
Brazil	4%	L-6	
India	4%	Bharat III	*

National regulation

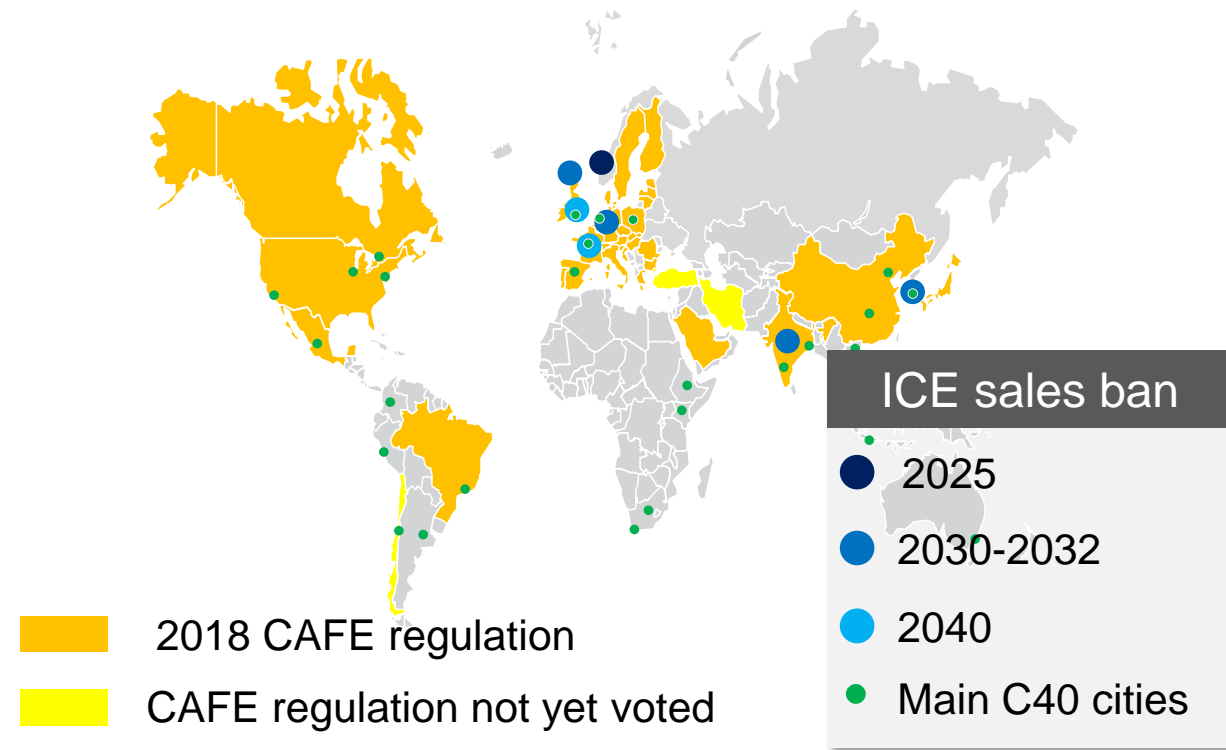


Local Authorities

CO2 emissions reduction at stakes

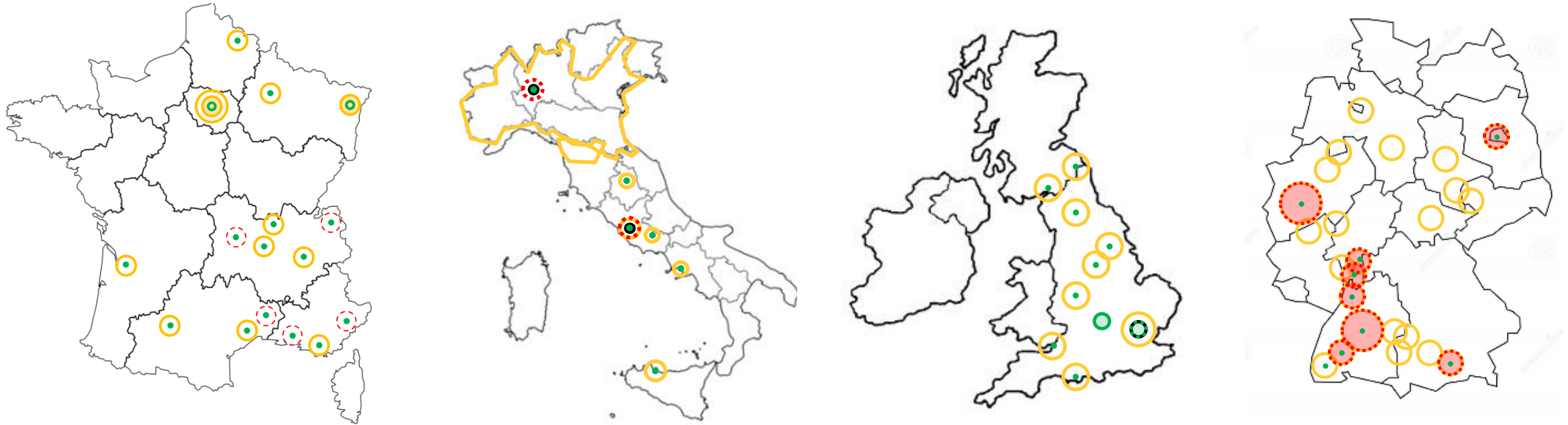


Worldwide view of CO2 oriented public policies



Air quality issue in urban areas

Post 2020 roadmap of urban vehicles access restrictions in Europe



○ Old ICE ban during pollution peak

● Diesel ban during pollution peak

○ Permanent Low Emission Zone

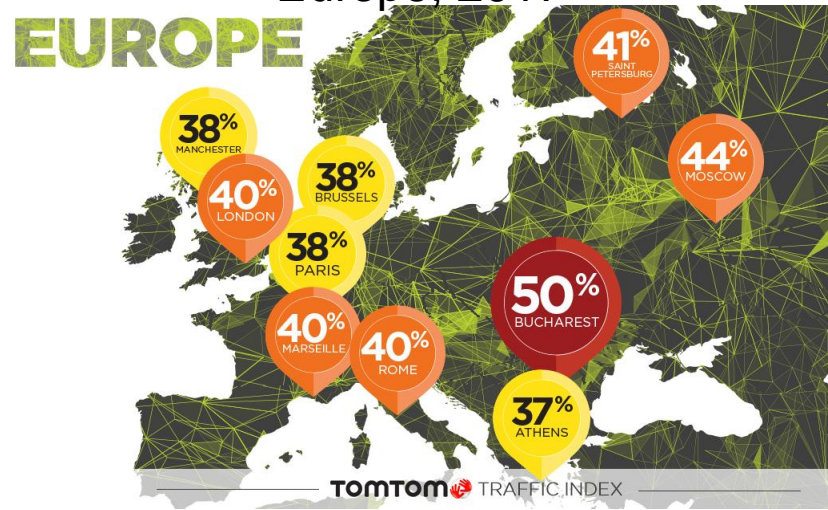
● Permanent Diesel ban

● Zero Emission Zone

○ Congestion charge

Congestion: an historical driver of local policies

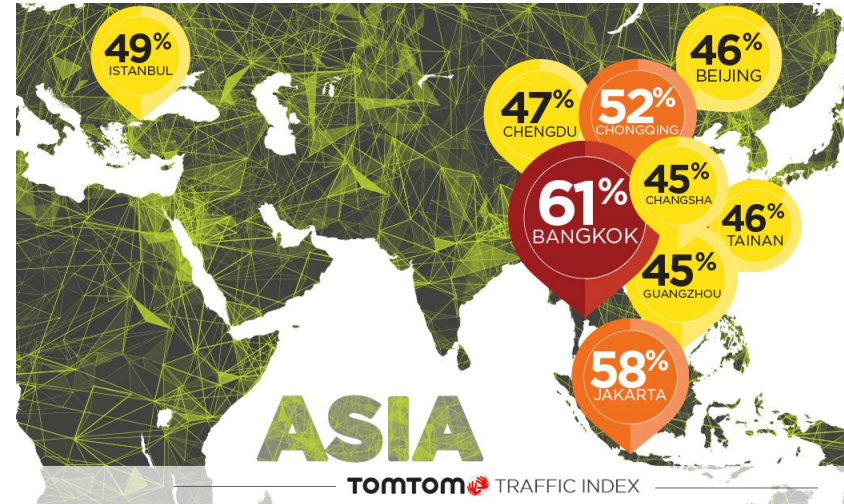
Europe, 2017



Paris, 1929

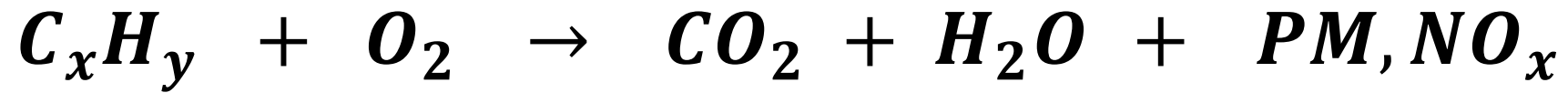


Beijing, 2013

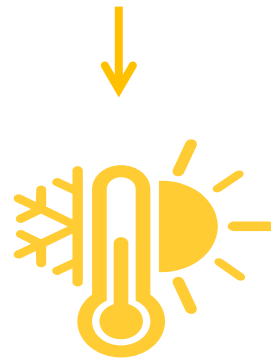


Asia, 2017

Environmental externalities linked to thermal engines



Resources



Climate

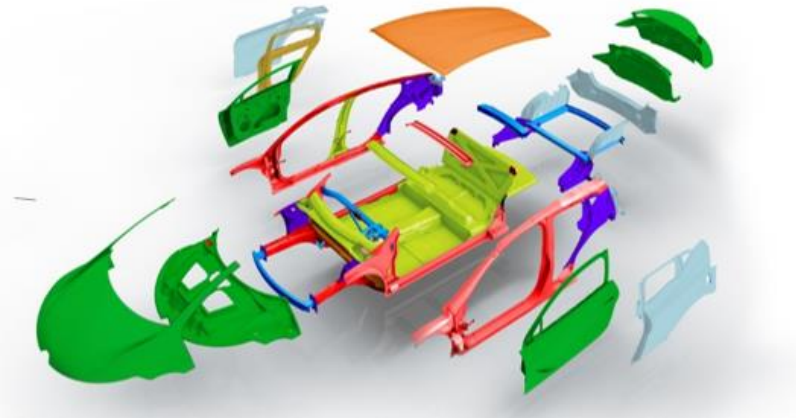


City & Health

Global impact
Mid / long term effect (> 1 generation)

Local impact
Short term effect

Thermal vehicles to be improved in the short-run



**Weight
& Inertia**



**Veh. Energy
Consumption**



**Powertrain
efficiency**

Technological breakthroughs for de-carbonization*

Electric mobility



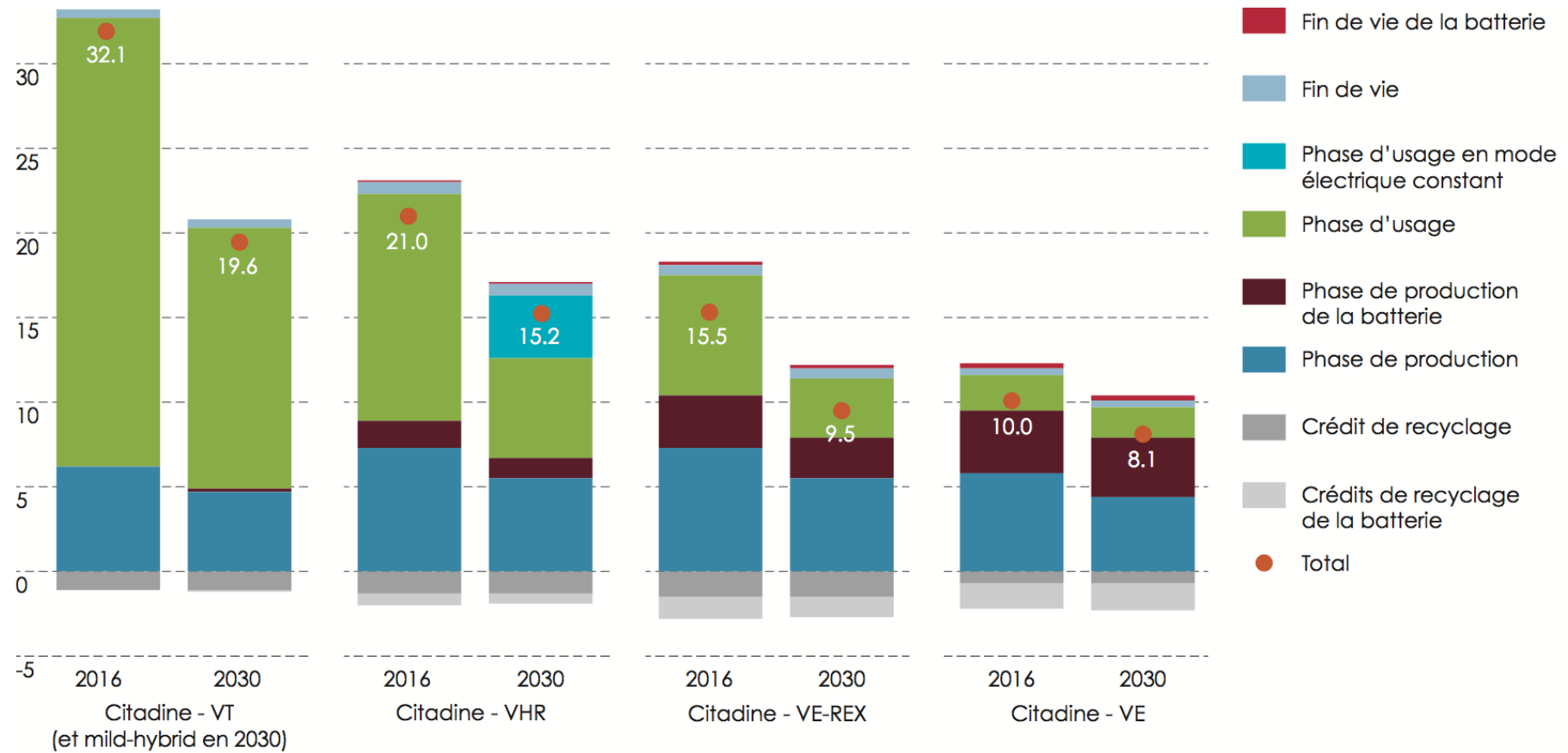
Biogas mobility



Possible EV contribution to de-carbonization



Global warming potential
 2016 → 2030
 comparative results on
 urban vehicles
 (t CO₂ – eq.)



Renault Electric Vehicles strategic plan

 **LINE-UP
EXTENSION**

 **SEGMENT
COVERAGE
IN EUROPE**

 **MARKET
EXPANSION**

2016

4 Models
1 Best seller




LEADER

1 Key market

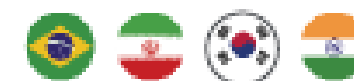
2022

8 Models
2 Pillar models



 
LEADER

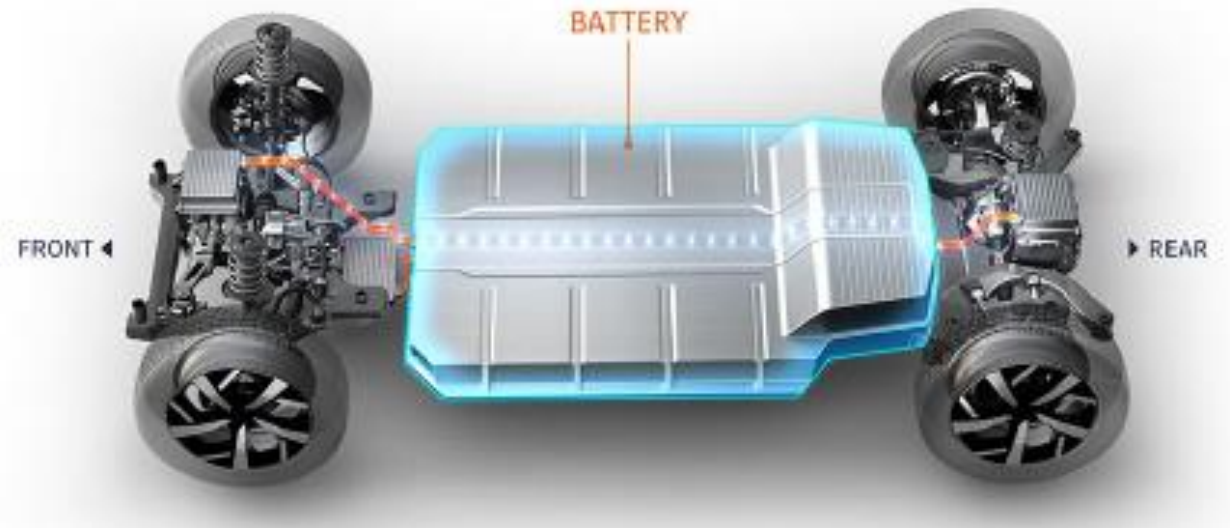
2 Key markets



Develop next
key markets

Battery at the heart of market development

NO MORE RANGE ANXIETY



- **Above 600 km NEDC**
- **≈ 400 km** real motorway range
- Recovery **>230 km NEDC** in **15 min**

Elec. Vehicles benefit leverage by the eco-system

SMART CHARGING



Pilot car charging to match electricity grid off peak prices

IMPACT

TCO reduction for customer

BATTERY SECOND LIFE



Connect clean energy to grid and buildings

IMPACT

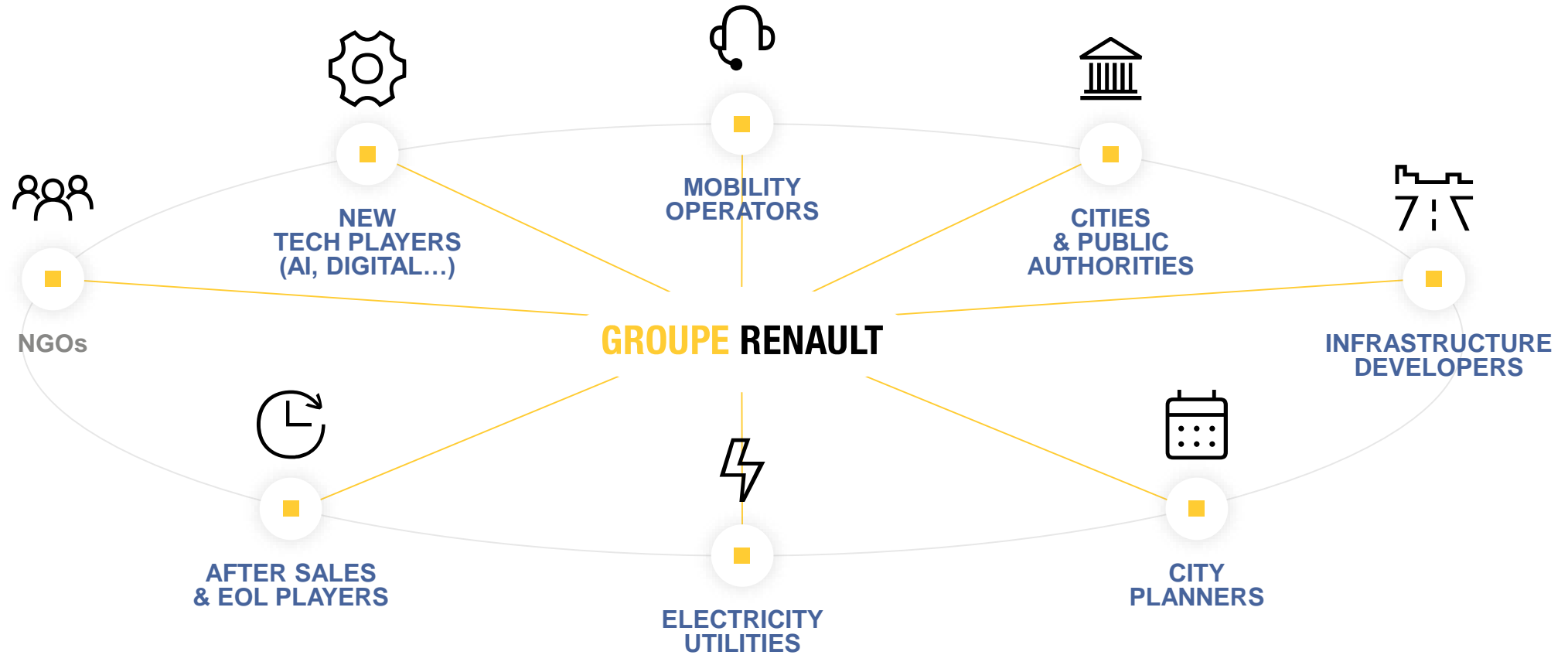
Secure battery leasing business model
Additional profit for OEM

Toward new offers to reduce private car footprint



Numerous stakeholders for eco-systemic solutions

MOBILITY ECO-SYSTEM MUTATION



Renault de-carbonization roadmap

Life-cycle tCO₂eq / veh sold / yr

