

# RESOURCES EFFICIENCY @ RENAULT

## WORLD MATERIAL FORUM

AUGUST 15<sup>TH</sup> 2020

RESOURCES AT STAKE FOR THE MOBILITY SECTOR

RESOURCE USAGES ARE CHALLENGED ECONOMICALLY AND POLITICALLY  
ANTICIPATE RESOURCES AVAILABILITY AND EFFICIENCY ARE KEY FOR COMPETITIVENESS & SUSTAINABILITY

ACCESS SCARCITY

PLANET RENEWABLE RESERVE  
OVERUSE IN LESS THAN 1/2 YEAR

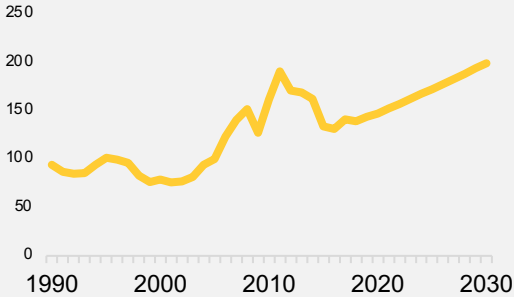
COPPER RESERVES 37 years  
1 EV = 4 x 1 ICE  
(80kg engine + battery + cables)



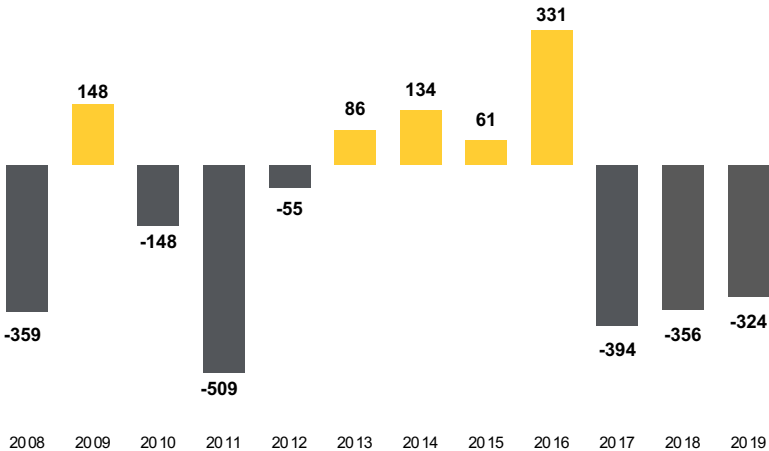
Source: Deutsche Bank, United States Geological Society

COST VOLATILITY

(CO+NI+LI) IN BAT COST  
WORLD COMMODITY INDEX PRICE  
(NON FUEL)

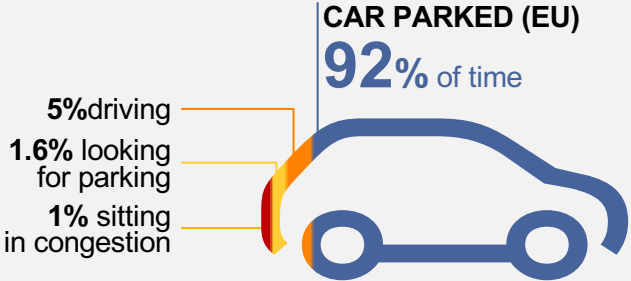


RAW MATERIALS COST IMPACT IN GROUP COP (M€)



USAGE EFFICIENCY

VERY LOW FOR CAR  
(When worldwide park expected to grow  
from 1,3 bn to 2,2 bn cars by 2050)



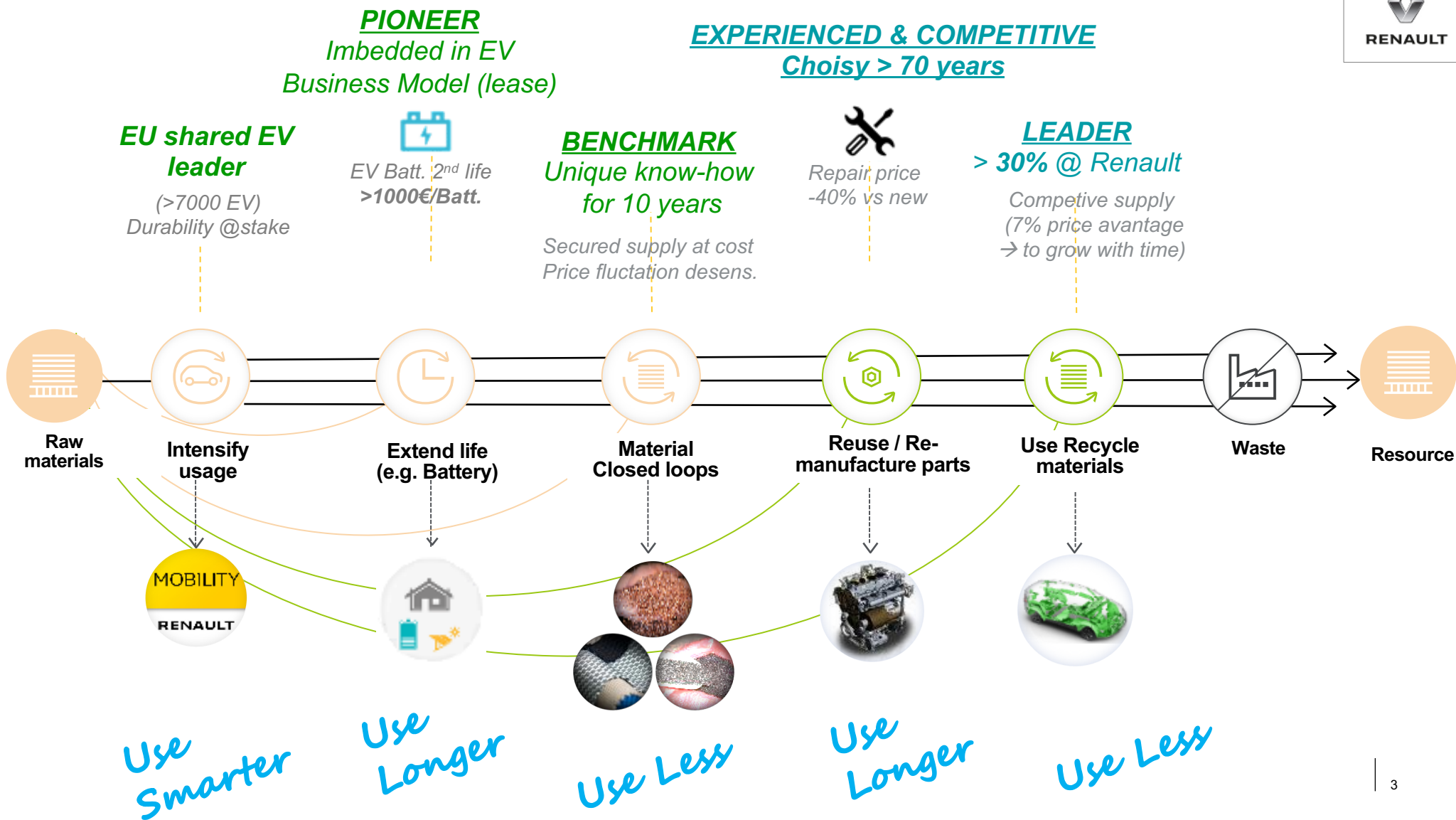
Average European car has 5 seats but carries 1.5 people/trip

50% PUBLIC SPACE DEDICATED TO CARS  
IN MOST CITIES (today)

Cars & Mobility  
Are perfect candidate for  
Circular Economy

RESOURCE EFFICIENCY & CIRCULAR ECONOMY

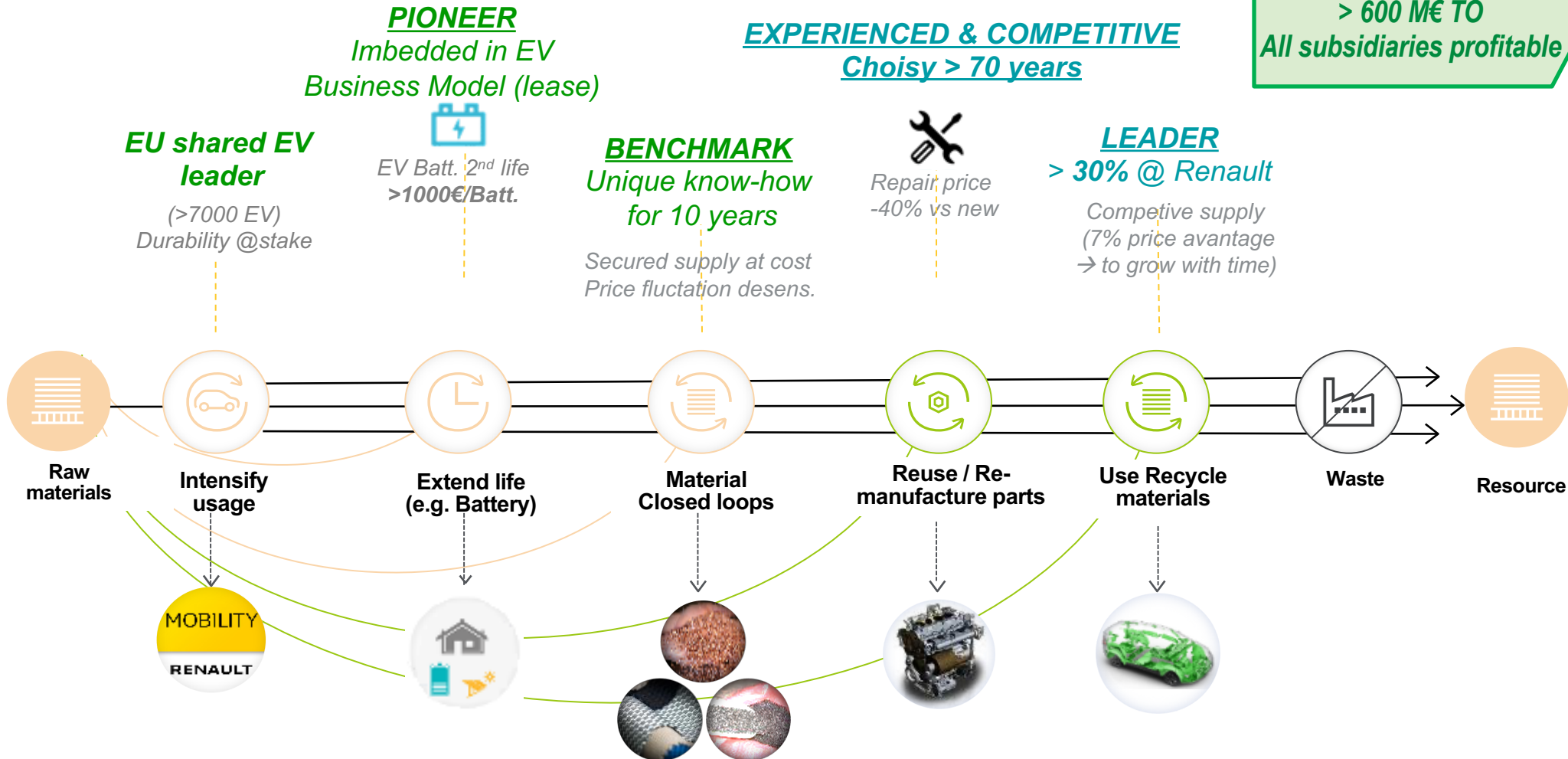
RENAULT HISTORICAL LEADERSHIP IN CIRCULAR ECONOMY



# RESOURCE EFFICIENCY & CIRCULAR ECONOMY

## RENAULT HISTORICAL LEADERSHIP IN CIRCULAR ECONOMY

### → A UNIQUE BUSINESS AND INDUSTRIAL APPROACH



\*FY 2019 figures

**GAIA** Renault Env. : 100%

Parts & material Valorization

Bat repair + 2<sup>nd</sup> life

**BCM**

R' Env. : 33% / Suez : 67%

Metallic Scraps management

World auto leader

**indra** AUTOMOBILE RECYCLING

R' Env. : 50% / Suez : 50%

French leader End of life Dismantling 300 000veh/year

**PARTS REMANUFACTURING**

Renault SA: 100%

## RENAULT'S CIRCULAR BUSINESSES & PROJECTS TOWARDS RESOURCE EFFICIENCY & VALUE CAPTURE

### RESOURCE EFFICIENCY AND ADDED VALUE



#### RECYCLED MATERIAL USE IN NEW CARS



**+50% recycled plastics**  
used in **2022** vs 2013

**LiB-to-LiB recycling of**  
battery minerals (Co, Ni...)

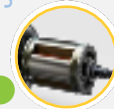


#### RECYCLE MATERIALS IN CLOSED LOOPS



**Wiring (Copper)**

**E-Motor (Copper)**



**Industrial waste**  
metal loop

**Catalytic**  
conv. (PGM)



**Bumpers (PP)**

**Recycled seat fabric**  
from waste safety belts



#### REUSE PARTS



**Resell of 2<sup>nd</sup> life parts**



**Parts Remanufacturing**



#### EXTEND PRODUCT LIFE



**Battery repair**



**Battery 2<sup>nd</sup> life**



#### INTENSIFY PRODUCT USE



**New mobility services**



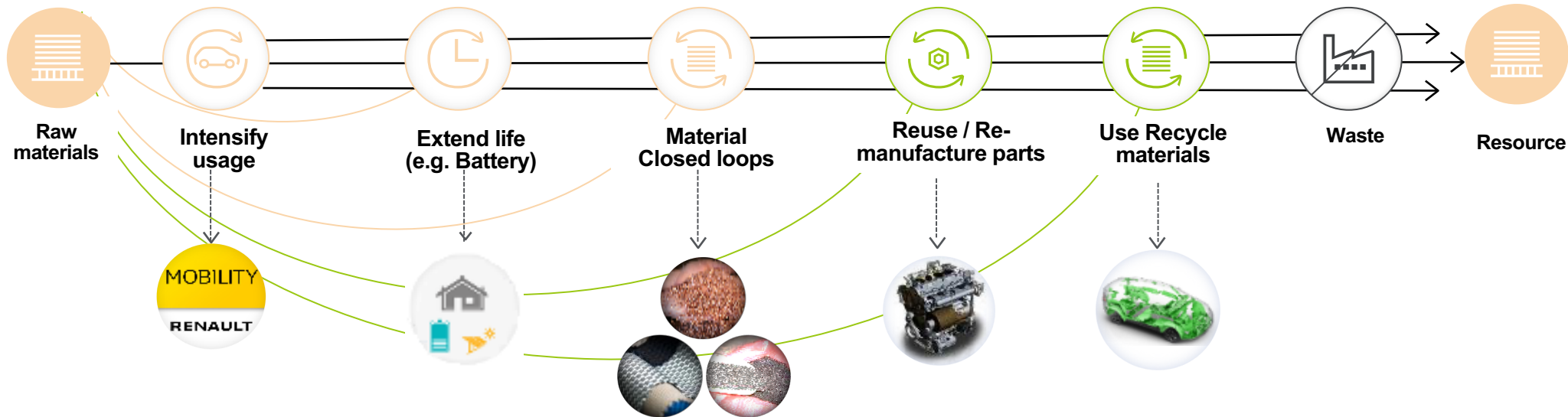
**Shared & regenerative**  
vehicle



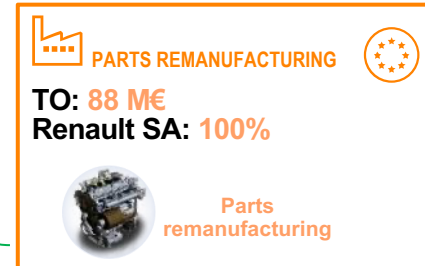
**3D printing**  
**Circular Energy**  
**Zero waste sites**

## 3 MANAGEMENT KPI'S :

- REDUCE BY 25% GROUP CARBON FOOTPRINT PER VEHICLE SOLD INCL. TOTAL LIFE CYCLE (2022 VS 2010)
- INCREASE BY 100 M€ (154 ➔ 254 M€) THE VALUE MAINTAINED IN AUTO BUSINESS BY CE ACTIVITIES (2022 VS 2016)
- INCREASE BY 50% THE AMOUNT OF RECYCLED PLASTICS USED GLOBALLY

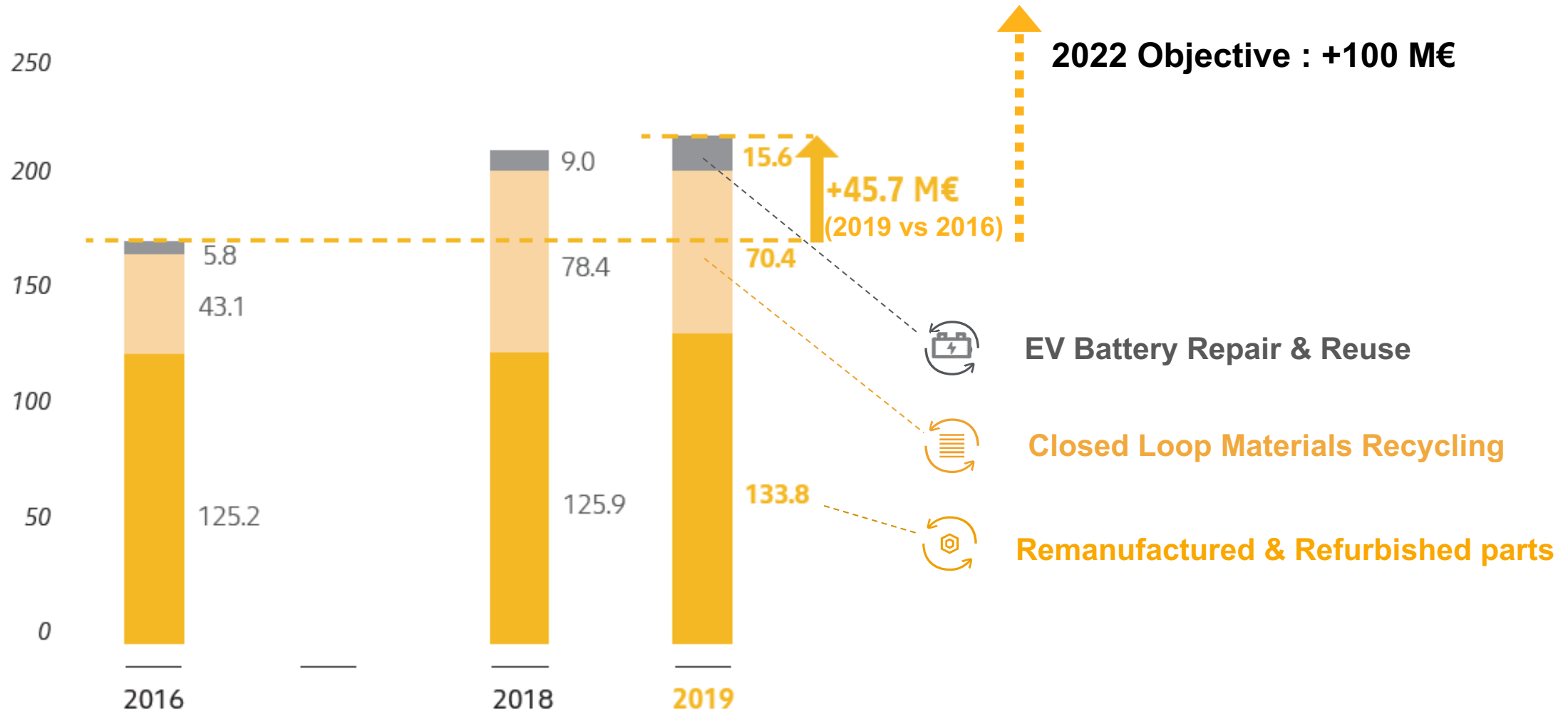


\*FY 2019 figures



# CIRCULARITY KPI : A SYNTHESIS INDICATOR FOR DIVERSIFIED CIRCULAR ACTIVITIES

*Value (M€) preserved in the automotive sector through **Groupe Renault's** circular economy activities*





# CLIMATE ISSUE

COP 21 Global objectives  
= -90% WtW CO2 emission  
(2005-2050 per veh. sold)



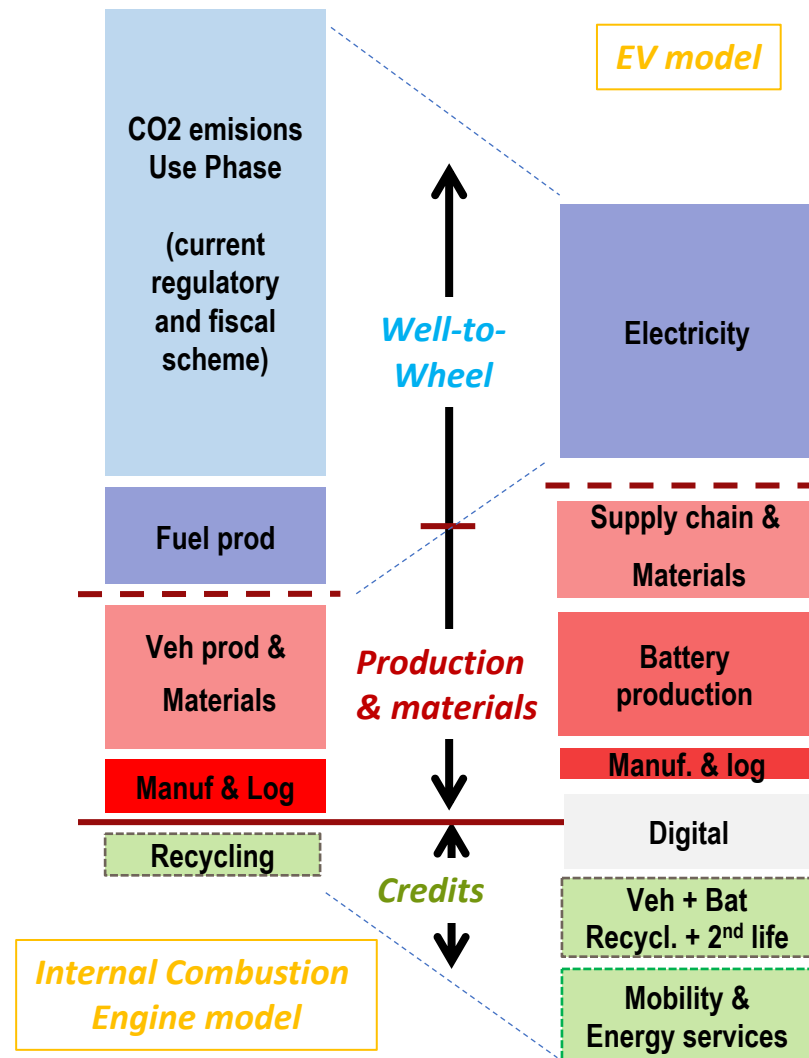
*Transition required towards  
Heavy electrification*



**GREEN DEAL**  
Carbon Neutral mobility by  
2050 (Life cycle scope)

**Clear Expectations**

## CO2 emissions (Carbon Footprint) over life cycle



**Mobility footprint and political instrumentation  
for transition move from use phase to  
production & End of life phase**

## CO2 & Euro

**Remain the main KPI to manage  
Vehicle or parts program  
development (LCA scope)**

**@ stake & Fostered by CO2  
regulation & fiscal scheme**

**Use Less & design smarter**

Recycled plastic competitiveness  
Veh weight for CO2 g/km regulation  
Battery Co & Ni content & cycling  
Localisation & Energy mix

**@ stakes & Embeded in new  
service usiness model**

**Use Smarter & Longer**

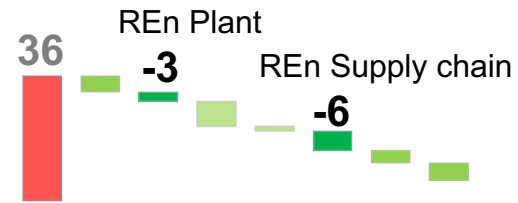
Battery Residual value (2nf life)  
Shared car Durability & smart maintenance  
Circular eco sytemic approach



# OPTIMIZING CO2 FOOTPRINT OVER EV BATTERY LIFE CYCLE

**Battery production :** *Chemistry + material content + material procurement conditions)*

CO<sub>2</sub> footprint (g/km)



**Extended First life (10-18 years)**

*Smart charging & V2G services*

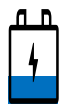


100%

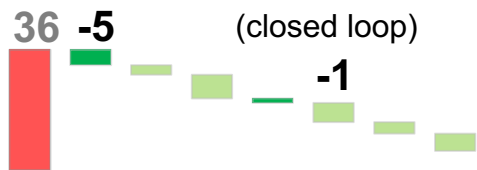
CO<sub>2</sub> footprint reduction (g/km)



**Battery Recycling & material loop**



CO<sub>2</sub> footprint reduction (g/km)



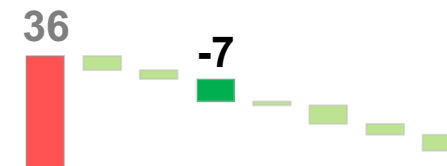
**Second life (≈ 5 to 10 years)**

*Stationary storage & mobile applications*



70-75%

CO<sub>2</sub> footprint reduction (g/km)



### **Latest ongoing initiatives involving Groupe Renault :**

#### **1. Global Battery Alliance – Battery Passport initiative (WEF)**

- Ensure traceability of the origin or raw materials and transparency on the conditions of their extraction
- Provide a reliable and comparable reporting of GHG footprint throughout the battery value chain
- Provide relevant and model-specific information to battery stakeholders : OEMs, clients, workshops, recyclers...

#### **2. Circular Car Initiative (WEF)**

- foster circular manufacturing and business models within the automotive and mobility industry

#### **3. Circulytics (Ellen MacArthur Foundation)**

- Circularity measurement tool for companies (version 2.0 to be launched in October 2020)

#### **4. Renault Flins car assembly plant reconversion into a circular economy ecosystem**

- « First of its kind » project announced in May 2020, to be implemented by 2024



**THANK YOU**