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Renault Eways

ELECTROPOP

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#1

E-TECH HIT

Batteries: a clear roadmap

One chemistry, one million units
Alliance-wide for 80$/kWh target

Renault battery lineup

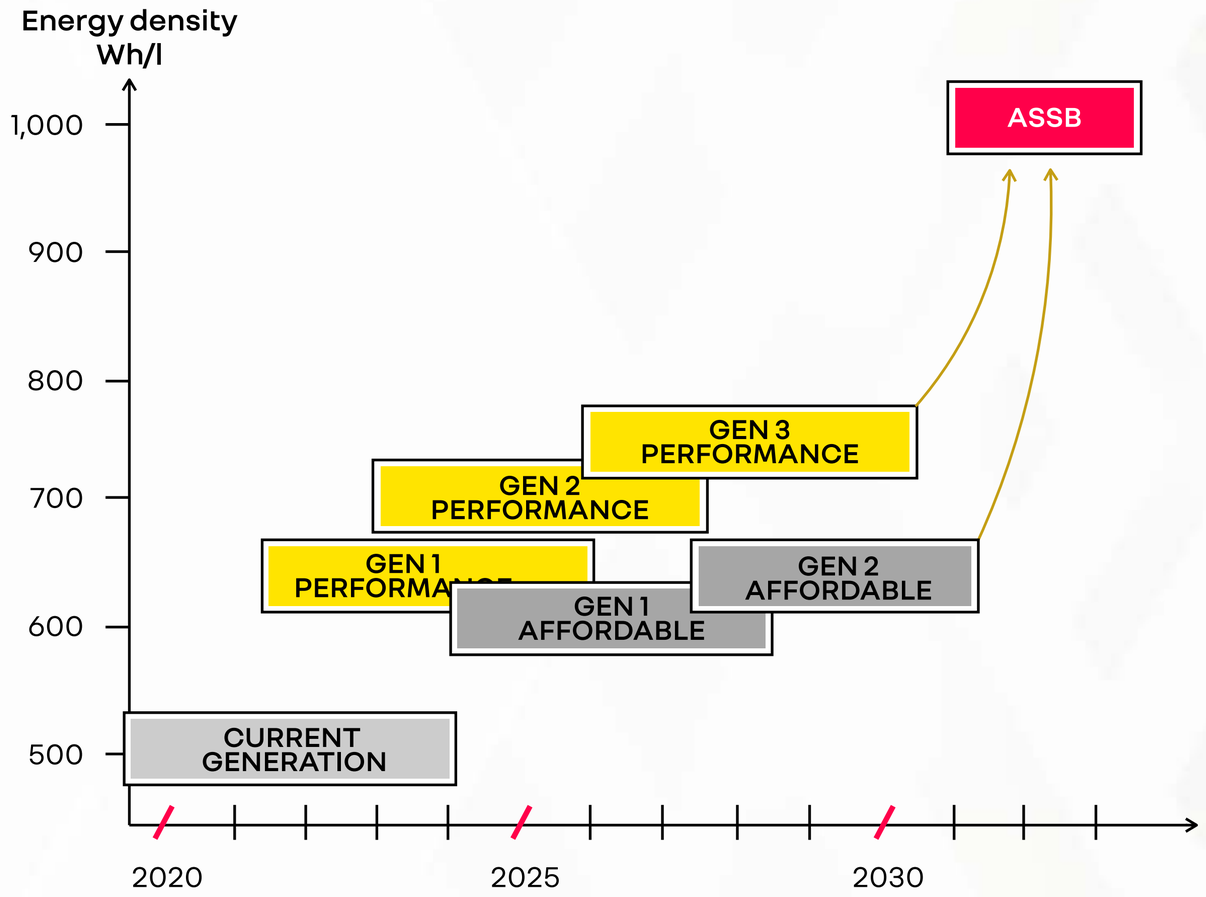
MEGANE

ZOE

MASTER

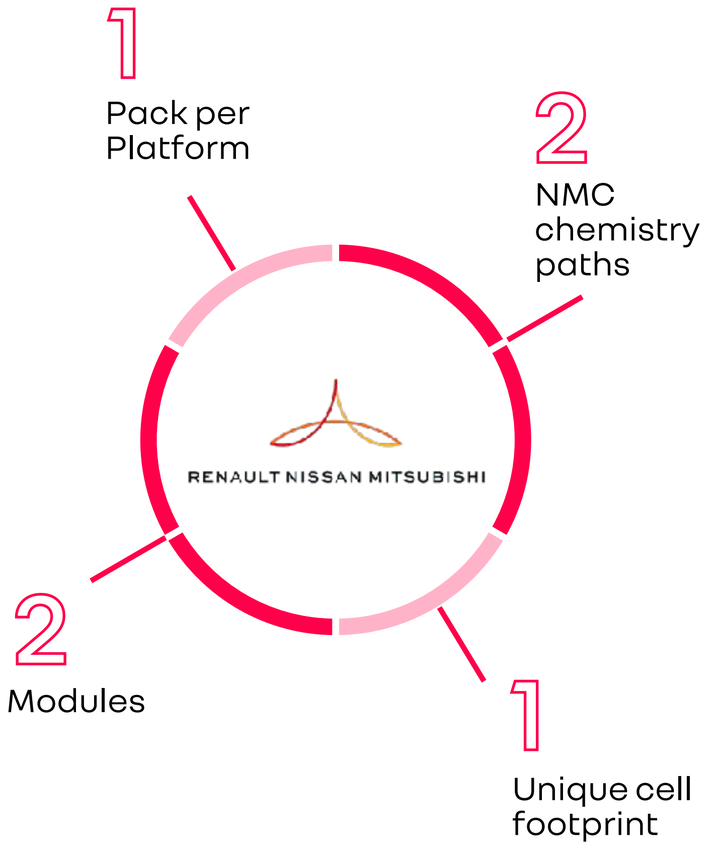
TWINGO
ELECTRIC

2 NMC based chemistry paths



Note: **NMC** = Nickel Manganese Cobalt / **ASSB** = All Solid State Battery

Battery standardization: better efficiency



All segments (from A to LCV)

From 350 to 580km (WLTP)

EV & H_2

100%

OF LAUNCHES[1] AFTER 2023

BATTERY STANDARDIZATION COVERING

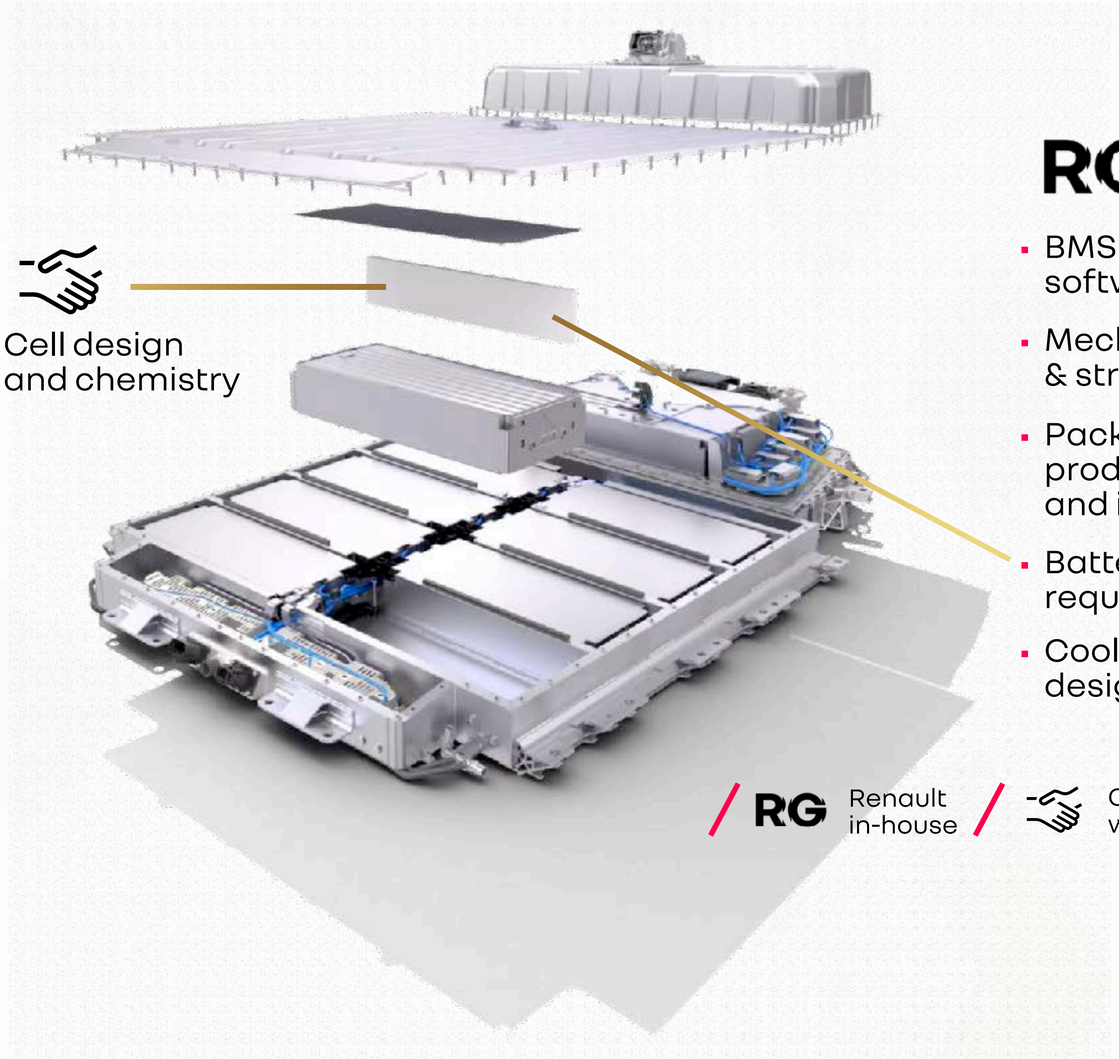
1 MILLION VEHICLES P.A.

BY 2030

Next breakthrough: Cobalt free and cost efficient ASSB

Note: **1** Excluding 1 LCV launch

In-house unique battery technology, from cell to pack



- Cell design and chemistry

RG

- BMS hardware & software development
- Mechanical design & structure
- Pack/module production and integration
- Battery pack and cell requirements definition
- Cooling system design

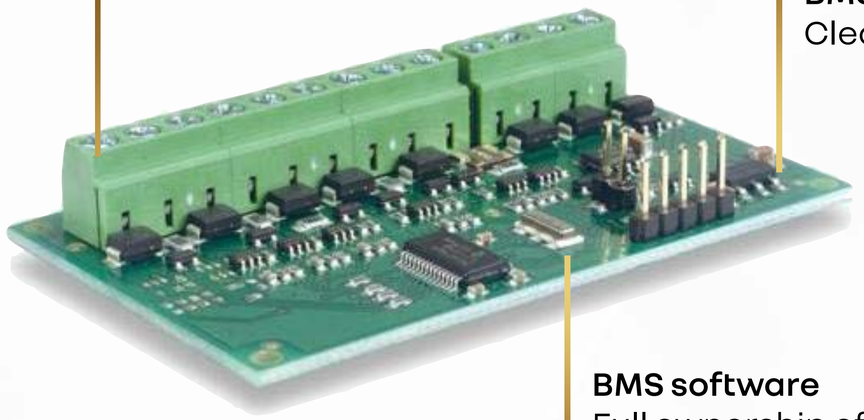
RG Renault in-house / Cooperation with suppliers

Better
EFFICIENCY
+
Better
PERFORMANCE
+
Reduced
COSTS

In-house software for best-in-class battery performance

Advanced aging algorithm
Proprietary algorithm ensuring battery performance along the entire car life

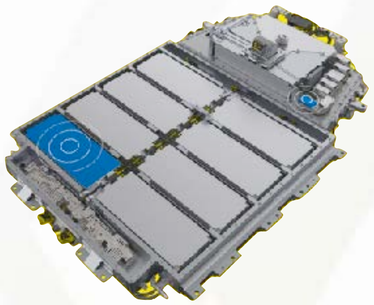
BMS hardware
Clear built-to-print strategy



BMS software
Full ownership of BMS software

NEXT STEP

INTEGRATED COOLING & WIRELESS **BMS**



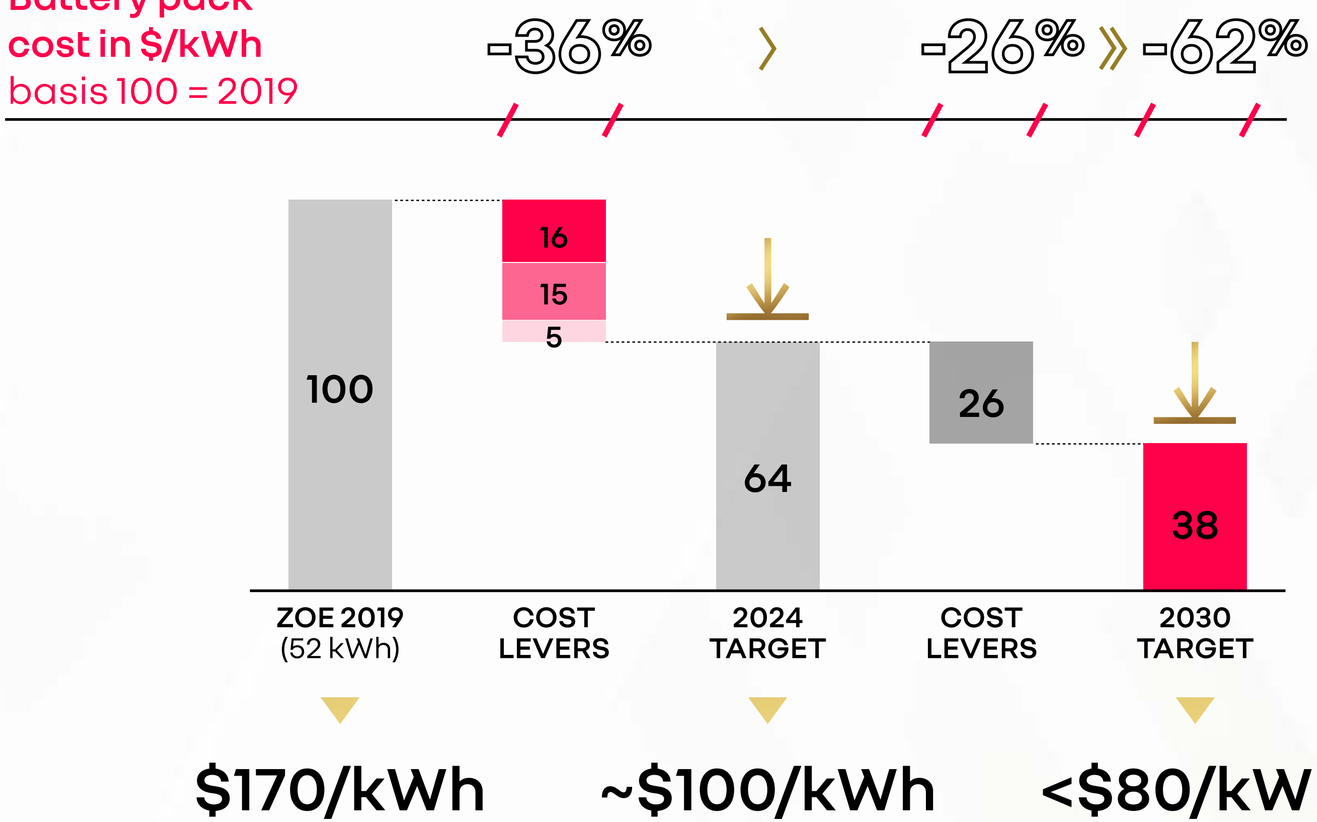
/ **Battery warranty** already longer than other vehicle components /

100k data points/vehicle collected every day

Note: **BMS** = Battery Management System

Battery standardization : up to -60% cost reduction

Battery pack cost in $/kWh
basis 100 = 2019



KEY LEVERS

- Upgraded **cell energy density**
- Standardized **cell & module design**
- Simplified **pack and vehicle integration:**
  - Optimized structure
  - Better cell-to-pack ratio
  - BMS slave integration

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#2

E-TECH HIT

Powertrain

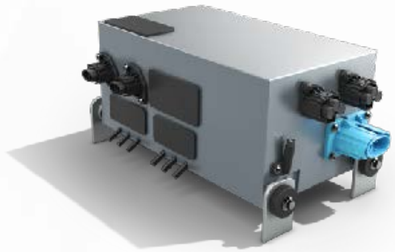
In-house
all-in-one e-powertrain:
-30% costs, +45% efficiency

In-house innovation from power electronics to e-motor

IN-HOUSE E-MOTOR TECHNOLOGY (EESM)

10+ YEARS OF FIELD EXPERIENCE

- **Performance:** better efficiency
- **Costs:** no permanent magnet
- **Environment:** no rare materials



IN-HOUSE POWER ELECTRONICS

STANDARD & MODULAR POWER ELECTRONICS
CUTTING-EDGE SEMICONDUCTOR MATERIALS

- Partnering

ALL-IN-1 **SYSTEM**

Integration of **e-motor, reducer** and **power electronics box** into a single system

Note: **EESM** = Externally Excited Synchronous Machine

Benchmark performance and cost improvements

E-MOTOR

+

POWER **electronics**

+

ALL IN 1 **system**

-45%

PACKAGING VOLUME

equivalent to the size of a Clio fuel tank

-30%

E-POWERTRAIN COST REDUCTION

saving being equivalent to the cost of the e-motor

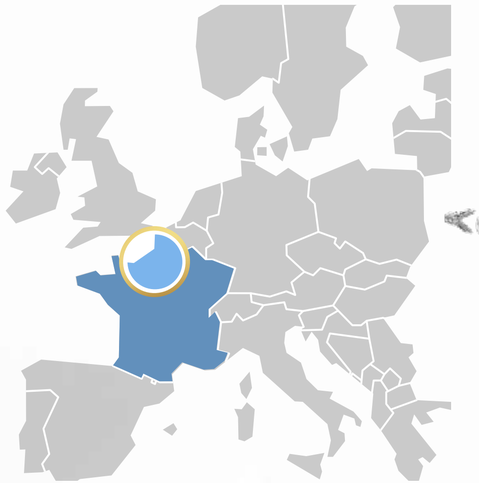
-45%

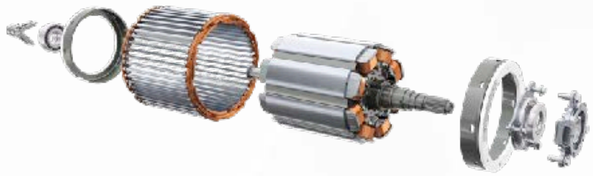
ENERGY LOSSES (WLTP)

allowing to extend the EV range by ~20km

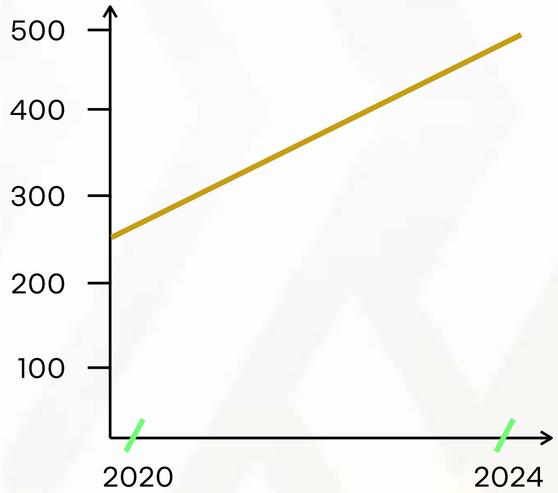
On way for the e-motor gigafactory, made in France

All e-motors produced
on one manufacturing site (Cléon)





Production output to reach **500k e-motors[1] per year** by 2024



Note: **1** BEV

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#3

E-TECH HIT

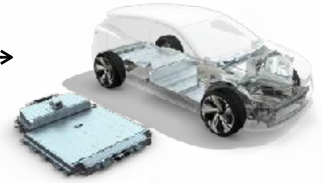
Platforms

EV-native platforms delivering high efficiency, competitive costs and optimum range

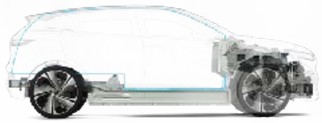
EV Native: efficiency & driving pleasure

CMF-**EV**

EV **NATIVE**



Smart cocoon



Great roominess

Superior vehicle dynamics

Reduced weight

Reduced friction

UP TO **580 km RANGE** (WLTP)

CMF-BEV: Affordability for everyone

CMF-B**EV**

HIGHLY COMPETITIVE **COST STRUCTURE**

-33%

at vehicle level compared to ZOE[1]

~ 50%

components in common with CMF-B[2]

HIGH **MODULARITY**

On body type & design

Note: **1** Current generation / **2** used by current generation of Clio, Captur, Nissan Juke

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#4

E-TECH HIT

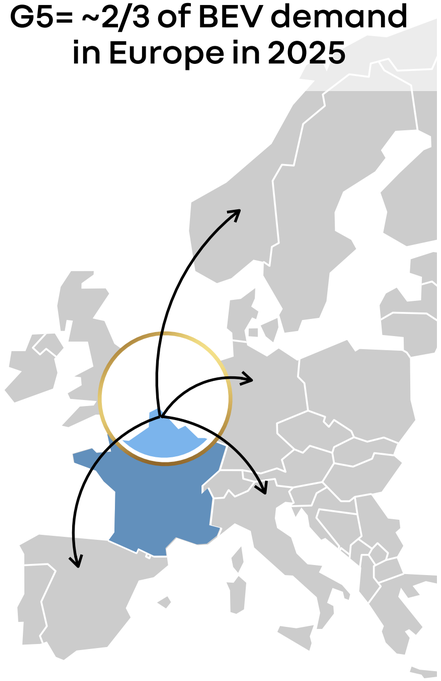
Renault ElectriCity

Leveraging a comprehensive ecosystem

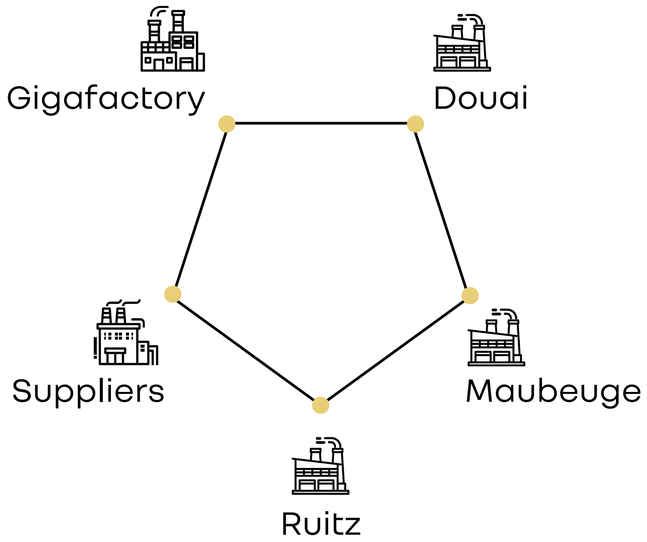
Leveraging a comprehensive ecosystem

In the heart
of EV demand...

G5= ~2/3 of BEV demand in Europe in 2025



...3 plants and
an ecosystem of suppliers



...Leveraging Renault's
industrial excellence

Full support from
public authorities

Union agreements

TO PRODUCE COMPETITIVE & PROFITABLE B & C SEGMENT BEVs

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#5

E-TECH HIT

Battery Lifecycle

Making the case of battery business: adding lifecycle value and dividing recycling costs by three

400€/year value for Renault and user generated through V2G[1]

V2G[1]

Estimated value:

400€ PER YEAR & PER BATTERY[2]

Shared between Renault, customer and ecosystem

END-TO-END V2G OFFER **ROLL-OUT IN EUROPE IN 2024**

GRID CONNECTION ABILITY

MONETIZATION KNOW-HOW[3]

END-CUSTOMER SOLUTION

Note: **1** V1G + V2G; **2** Estimation of revenues from grids for services brought by batteries liable to inject power 8h per day; **3** Applicable to V1G too.

500€ incremental value on each EV battery through 2nd life businesses

CAPACITY

Batteries retain considerable **capacity after their 1st life**

2/3 OF CAPACITY AVAILABLE

BUSINESS POTENTIAL

- **stationary** storage
- **mobile energy** storage

UNIQUE RENAULT POSITION

- **EV Fleet** ~400k units
- Expert in **appaisaing batteries value**
- Industrial **battery repackaging** with Re-Factory

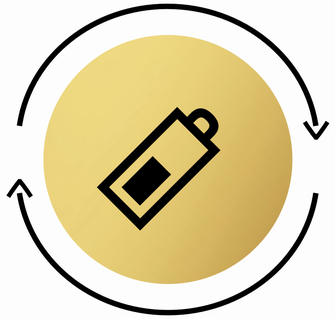
500€

INCREMENTAL VALUE

ON EACH EV BATTERY

Note: **1** Thanks to real-time data collection on a large battery fleet

Cost divided by 3



2021

~ 1,000€

PER BATTERY

2030

COST OF
BATTERY RECYCLING
divided by /3

- **Recycling of 95% of batteries' metallic contents**
- **Battery-grade quality for recovered materials[1]**

SOLVAY

VEOLIA

Note: **1** To serve in new cars' battery production

Lifecycle approach to improve battery value over lifecycle

Improved **battery cost and revenues** over lifecycle

1st life

400€/YEAR value for Renault and user generated through V2G[1]

2nd life

500€ INCREMENTAL VALUE on each EV battery through 2nd life businesses

Recycling

Cost of battery recycling **DIVIDED BY 3** by 2030

Note: **1** Mostly through V2G and partially through V1G services

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#6

E-TECH HIT

Line-up

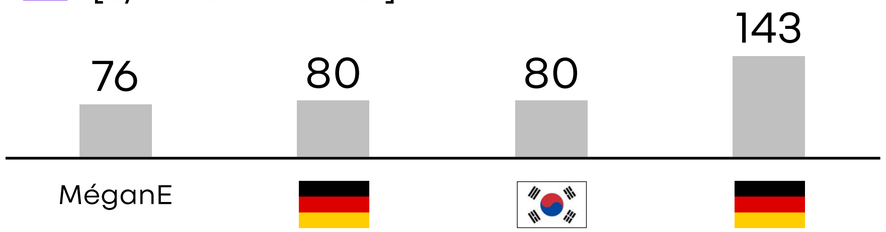
Popular, profitable cars

Popular, profitable cars

MEGANE

1 **CMF-EV** PLATFORM

2 **GREAT PRICE TO RANGE RATIO** [€/KM OF RANGE[1]]

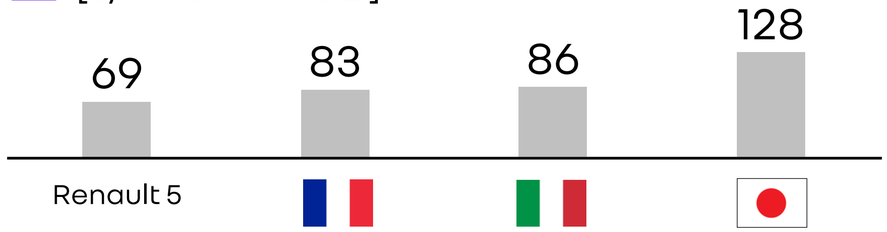


3 **THESE NEW BEV RENAULT MODELS CONTRIBUTION MARGIN (IN %) ARE IN LINE WITH ICE EQUIVALENT VEHICLES**

R5

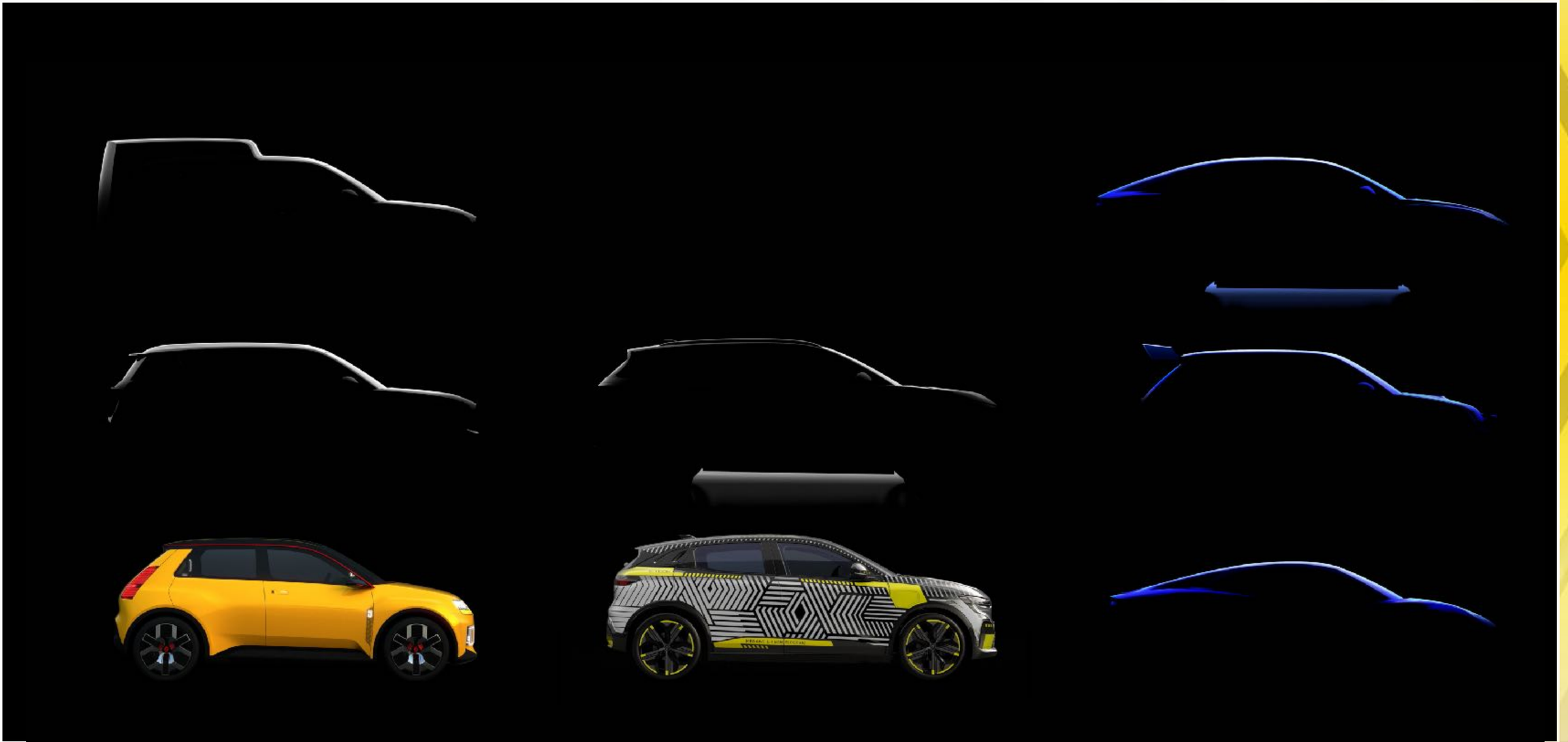
1 **CMF-BEV** PLATFORM

2 **GREAT PRICE TO RANGE RATIO** [€/KM OF RANGE[1]]



Note: **1** Selling Price inc Bonus [EUR] / WLTP Range [km]

Future line-up to be profitable with no compromise on design & affordability



On trajectory to 90% of BEV in 2030
(Renault brand, Passenger Cars, Europe)