

Circular Economy: From Strategy to Implementation

Andreas Walingen – Head of Volkswagen Group Circular Economy

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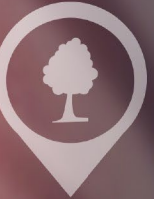
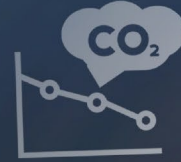
VOLKSWAGEN
GROUP

Circular Economy:
From Strategy to Implementation

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Head of Volkswagen Group Circular Economy

CIRCULAR
ECONOMY



Volkswagen Group **Circular Economy** initiatives to **close the loop** in the automotive industry



Vehicle recycling

Take back, dismantling & used parts business



Battery recycling

Investments in battery recycling start ups



VOLKSWAGEN GROUP
Volkswagen

CE Hub Zwickau

Group CE-Competence Center



PowerCo & partner

Battery recycling technology



Circular Economy Strategy @ Audi

MaterialLoop

R-Strategies enable *new business models*

NEW CARS

13-14 Mio. vehicles¹



- Circular Design
- Use of recycled materials



Redesign
Zero Impact Factory

CAR IN USE (USED CARS)

300 Mio. vehicles²



- Repair
- Refurbishment of vehicles



Repair
Refurbish



- Used parts
- Remanufactured parts



ReUse
Reman

END OF LIFE

4-6 Mio. vehicles³



- Securing raw materials e.g. plastics, aluminum, steel for new vehicles

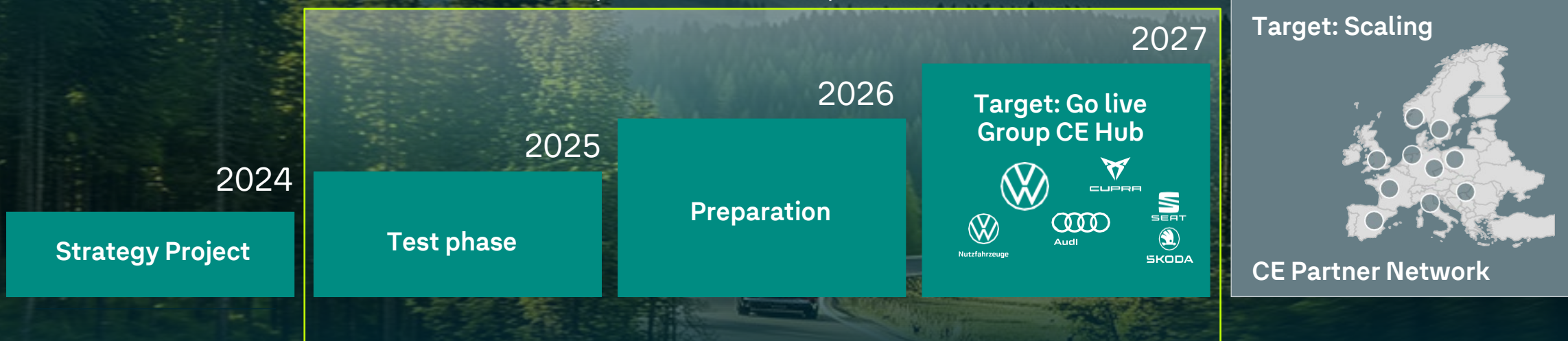


Recycle

Accelerating Circular Economy: From Pilot to Group CE Hub in 2027

Phase 1: Focus CE Group Hub ZWI and Preparation CE Partner Network

Phase 2 2030+



CE-Hub started in Zwickau, supported by Land Sachsen



Media Conference Jan. 21, 2026 in Zwickau, with Dirk Panter,
Minister of Economic Affairs, Labour, Energy and Climate Protection

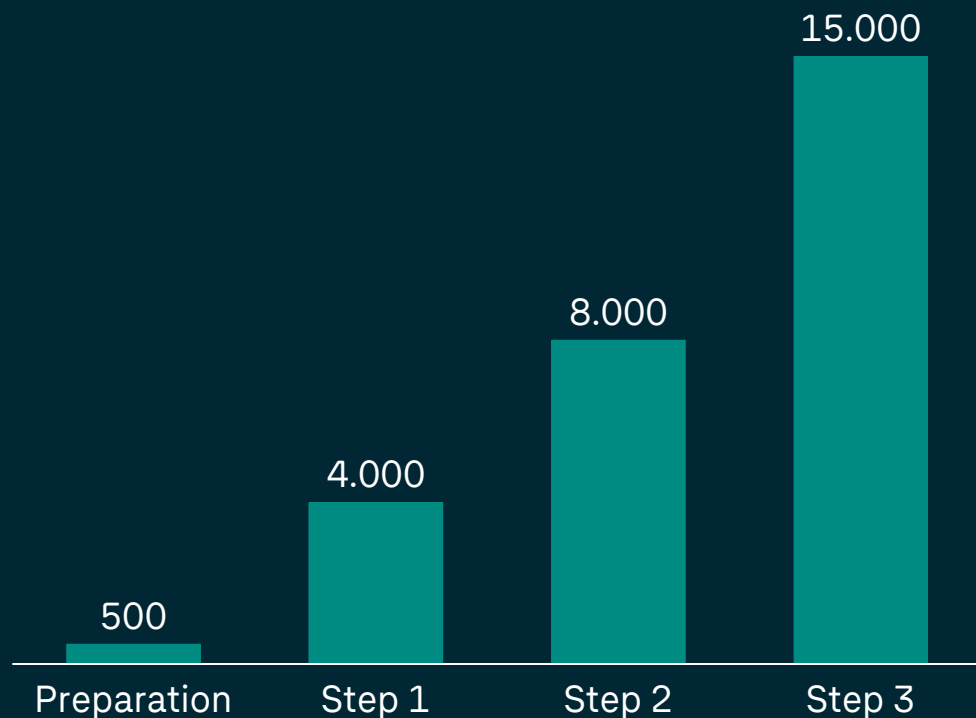
CIRCULAR
ECONOMY

21. Januar 2026

Startschuss für Kreislaufwirtschaft: Fahrzeugwerk Zwickau startet Geschäftsfelder

- Fahrzeugwerk Zwickau wird Kompetenzzentrum für Kreislaufwirtschaft der Volkswagen AG
- Ab 2030 sollen jährlich bis zu 15.000 Fahrzeugen zerlegt und wiederaufbereitet werden

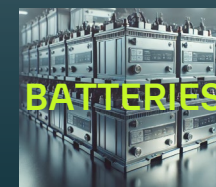
Ramp up in a step-by-step approach: Potential of up to 15,000 cars p.a.



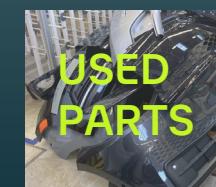
Potential



300 t autom.
quality recycled
polymers



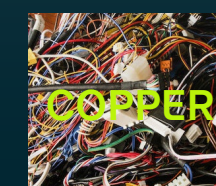
3,000-5,000
dismantled batteries



450,000
parts to be
dismantled/yr

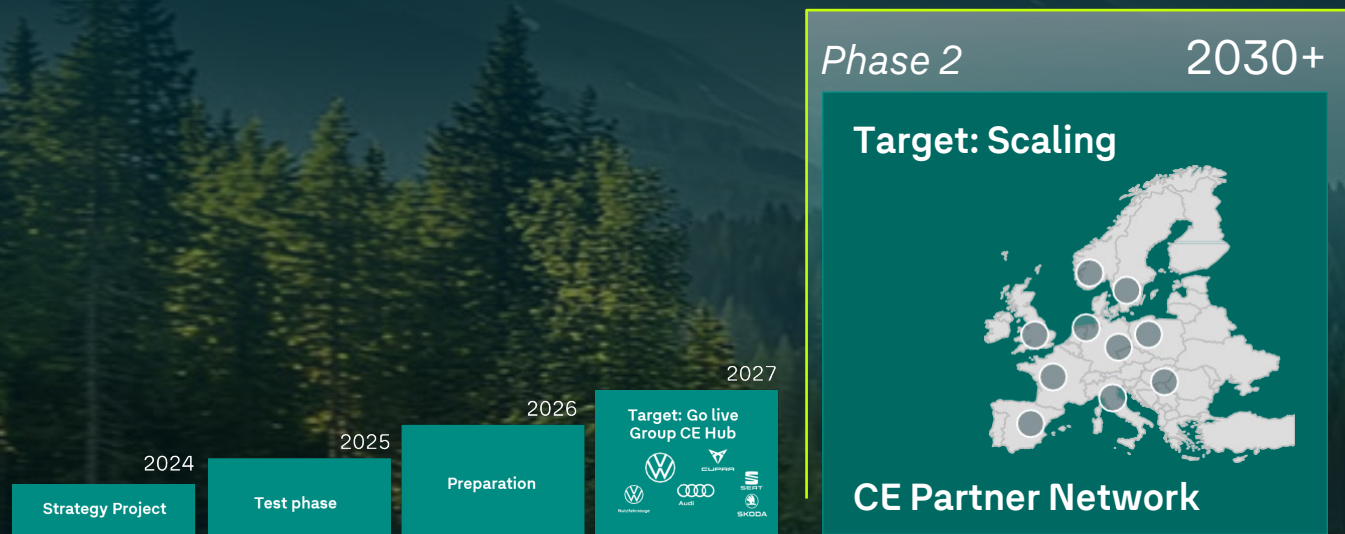


15,000 t of materials to be shredded
thereof 10,000 t of steel scrap

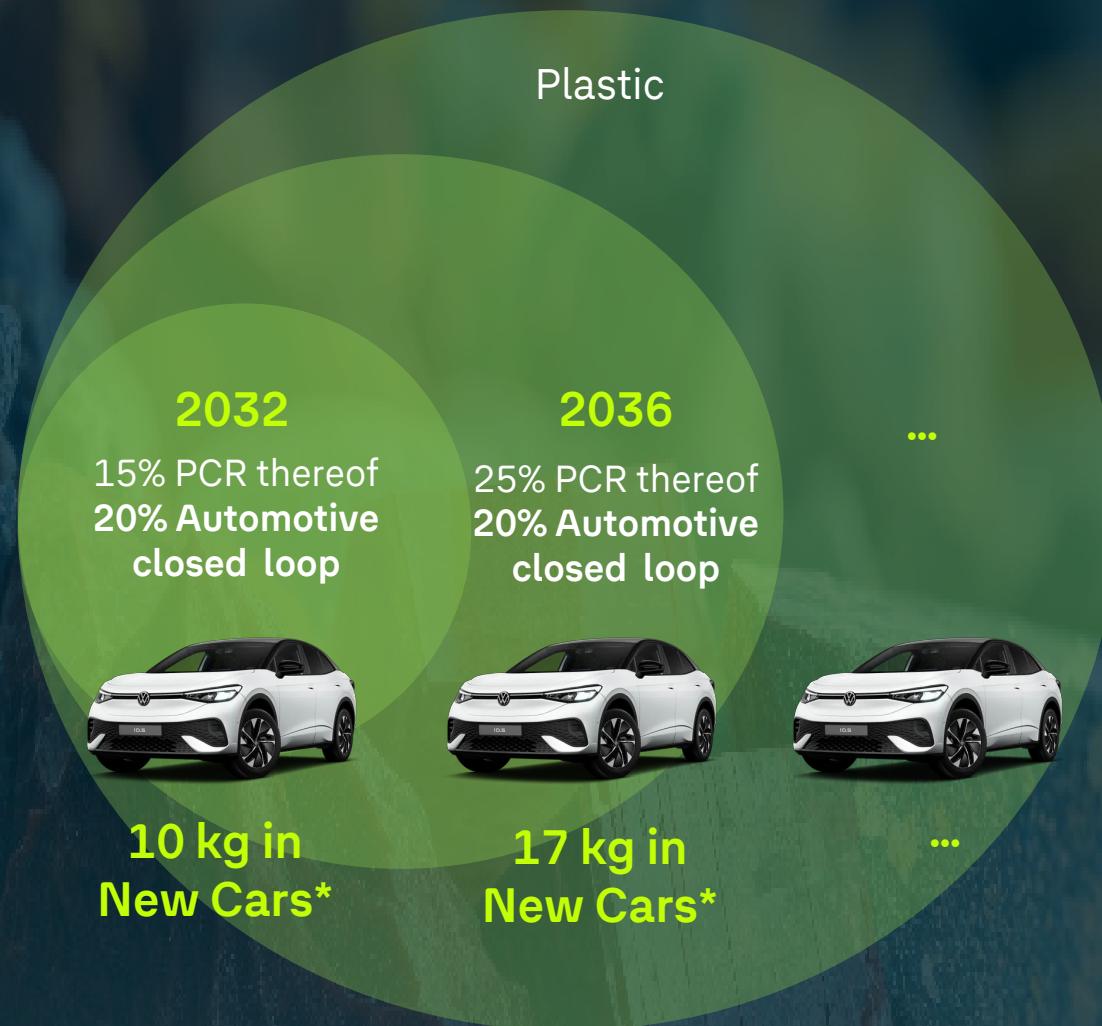


130 t
Copper in
wire harness

Scaling through CE partner network as of 2030+



Regulation for End-of-Life Vehicles is **mandatory for homologation** from 2032



Further Recyclate Quotes for other Raw Materials expected, e.g. steel, aluminium

any year and percentage based on ELV Draft

* Based on vehicle with 330 kg plastics; only for new type approvals

Today the automotive **closed loop** is not efficient

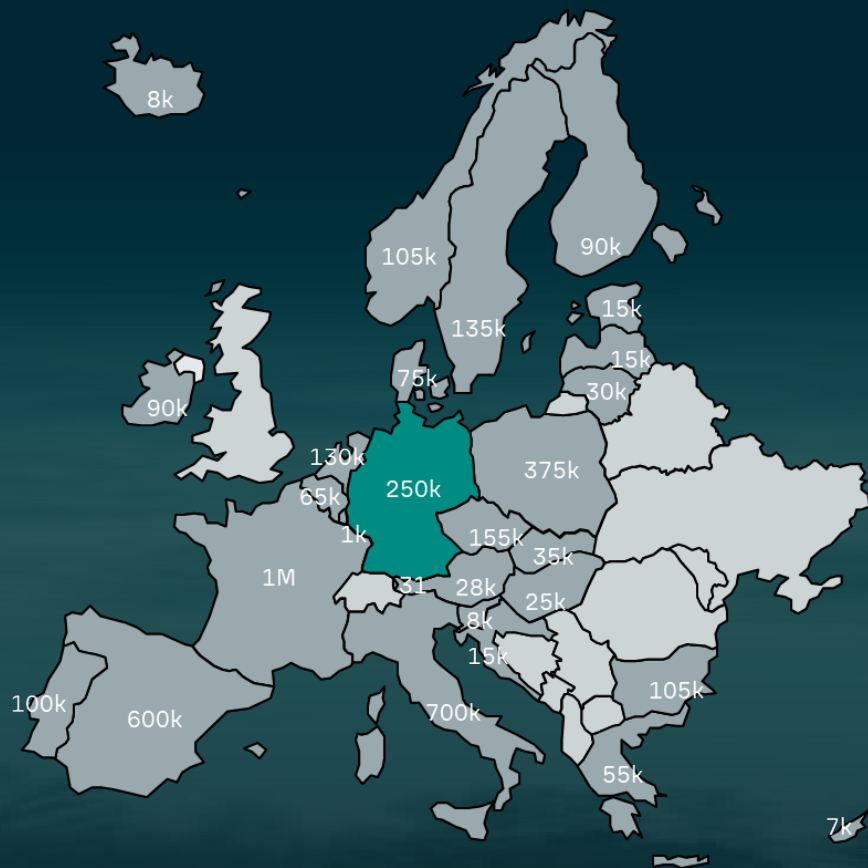
§ Law effective
from 2032:
15% PCR thereof
20% Automotive
closed loop



any year and percentage based on ELV Draft

* Based on vehicle with 330 kg plastics; only for new type approvals

Scaling CE requires adequate volume of End-of-Life Vehicles



| Ranking | Share ELVs / car fleet (2023) | Country |
|-----------|-------------------------------|----------------|
| 1 | 3.83% | Ireland |
| 2 | 3.70% | Norway |
| 3 | 3.31% | Iceland |
| 4 | 3.30% | Finland |
| 5 | 2.96% | Bulgaria |
| 6 | 2.70% | Sweden |
| 7 | 2.64% | Denmark |
| 8 | 2.62% | France |
| ... | | |
| 27 | 0.51% | Germany |
| 28 | 0.36% | Hungary |
| 29 | 0.26% | Luxembourg |
| 30 | 0.10% | Liechtenstein |



Total 4.3 Mio End-of-Life Vehicles in EU

Sources: [Eurostat](#) / [Umweltbundesamt](#) / [ACEA - European Automobile Manufacturers' Association](#)

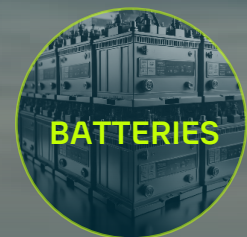
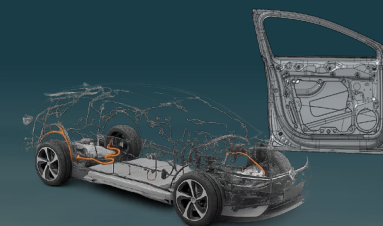


Strengthening the access to End-of-Life Vehicles in Germany through enforcement of certificate of destruction

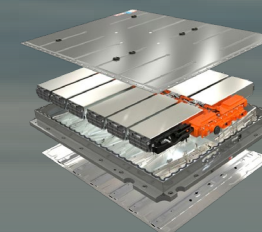
Closing **material** loops with collaboration across the value chain



Expand existing recycling loops including decarbonization effects



Establish Re-X Strategies and build holistic supply chain in Europe



Achieve cost parity of recycled vs virgin material through CE Design and recycling efficiency



Design for Circularity improves recycling efficiency

FROM END-OF-LIFES VEHICLES ...

Dismantling



Sorted materials



Used parts



Shredding



Material for increased recyclate content

Lessons Learned for improved recyclability

... INTO NEW CARS



RECYCLING EFFICIENCY

DESIGN FOR CIRCULARITY

To implement **Circular Economy successfully**, we focus on...

1

Scaling Circular Economy for Volkswagen Group

2

...with **profitable circular business models** and
raw material resilience

3

...based on **competencies** and new innovations

VOLKSWAGEN GROUP

Range / consumptions / emissions

| Model | Fuel consumption combined (WLTP) | Electrical consumption combined (WLTP) | CO ₂ emissions combined (WLTP) | Electric range combined (WLTP) |
|-------------------------------------|--|---|---|--------------------------------|
| VW | | | | |
| Golf R | 8.1 – 8.5 l/100km | n/a | 184 -193 g/km | n/a |
| Golf 8 GTI | 7.3 – 7.1 l/100km | n/a | 167 -162 g/km | n/a |
| ID.3 Neo | n/a | 14.3-15.7 kWh/100km | n/a | up to 629km |
| ID.3 Pro S | n/a | 14,9 kWh/100km | n/a | 402 – 575km |
| ID.4 Pro | n/a | 17.5-16.1 kWh/100km | n/a | 395 – 545km |
| ID.5 Pro | n/a | 15.5 – 18.0 kWh/100km | n/a | 492 – 567km |
| ID.7 Pro | n/a | 16.1 – 14.0 kWh/100km | n/a | up to 618km |
| ID.7 GTX | n/a | 18.8 – 16.6 kWh/100km | n/a | up to 584km |
| ID. Buzz Pro | n/a | 20.5-21.7 kWh/100km | n/a | 420 – 461km |
| ID. Buzz GTX | n/a | 21.6 – 20.5 kWh/100km | n/a | 402 – 423km |
| ID. Buzz LWB Pro | n/a | 21.2 – 19.5 kWh/100km | n/a | up to 487km |
| Caravelle | 7.9 – 7.2 l/100km | n/a | 207 – 188 g/km | |
| Passat R eHybrid | 5.6 - 6.0 l/100km | 17,5-16,6 kWh/100km plus 0,5-0,4 l/100km | 9 g/km | up to 118km |
| ID. UNYX 09, ID. AURA T6, New Atlas | These vehicles are not offered for sale in Europe. | | | |
| Tayron R Line Hybrid | 1.7 – 1.9 l/100km | 14.0 – 15.0 kWh/100km | 38 – 42 g/km | up to 116km |

Range / consumptions / emissions

| Model | Fuel consumption combined (WLTP) | Electrical consumption combined (WLTP) | CO ₂ emissions combined (WLTP) | Electric range combined (WLTP) |
|----------------------------------|---|--|---|--------------------------------|
| Škoda | | | | |
| Vision O | The vehicle is not yet offered for sale and is therefore not subject to Directive 1999/94/EC. Consumption and emission data under review. | | | |
| Enyaq Laurin & Klement 85 | n/a | 15.7 - 20.3 kWh/100km | n/a | 565 - 589km |
| Enyaq Sportline | n/a | 15.8 - 16.6 kWh/100km | n/a | 410 - 428km |
| Elroq 85 | n/a | 15,2 - 16,6 kWh/100km | n/a | 540 - 580km |
| Kaylaq | The vehicle is not offered for sale in Europe. | | | |
| Porsche | | | | |
| Macan S | n/a | 21,1 - 17,9 kWh/100km | n/a | 516 - 613km |
| Taycan Turbo S | n/a | 18.8-16.6 kWh/100km | n/a | 558 - 630km |
| Panamera 4S E-Hybrid | 10.4 - 9.3 l/100km | 28.6 - 26.0 kWh/100km | 33 -24 g/km | 83 - 91km |
| Porsche Taycan GTS Sport Turismo | n/a | 24.1 - 21.0 kWh/100km | n/a | 424 - 490km |
| Taycan 4 | n/a | 20.6 - 17.6 kWh/100km | n/a | 478 - 559km |
| Porsche 911 Carrera | 10,7 - 10,1 l/100km | n/a | 244 - 230 g/km | n/a |
| Porsche GT3 | 13,8 - 13,7 l/100km | n/a | 312 - 310 g/km | |

Range / consumptions / emissions

| Model | Fuel consumption combined (WLTP) | Electrical consumption combined (WLTP) | CO ₂ emissions combined (WLTP) | Electric range combined (WLTP) |
|---------------------------------|---|--|---|--------------------------------|
| Bentley | | | | |
| Continental GT Speed | 10.3 l/100 km | 28.1 kWh/100km | 29 g/km | n/a |
| Bentayga Speed | 14.7 l/100 km | n/a | 335 g/km | n/a |
| Lamborghini | | | | |
| Revuelto | 11,86 l/100km | n/a | 276 g/km | n/a |
| Urus S | 14.1 l/100km | n/a | 320 g/km | n/a |
| Urus SE | 2,08 l/100km | 39,5 kWh/100 Km | 51 g/km | n/a |
| Temerario | The vehicle is not yet offered for sale and is therefore not subject to Directive 1999/94/EC. Consumption and emission data under review. | | | |
| Seat / Cupra | | | | |
| Born | n/a | 14.9 - 16.7 kWh/100km | n/a | up to 594km |
| Tavascan VZ 250 kW 77kWh | n/a | 16.6 kWh/100km | n/a | up to 522km |
| Terramar VZ 1.5 e-HYBRID 200 kW | 0,4-0,5 l/100 km | 7,6-19,0 kWh/100 km | 10-12 g/km | n/a |
| Raval VZ Extreme | n/a | 16.1 kWh/100km | n/a | up to 381km |

Range / consumptions / emissions

| Model | Fuel consumption combined (WLTP) | Electrical consumption combined (WLTP) | CO ₂ emissions combined (WLTP) | Electric range combined (WLTP) |
|----------------------|---|--|---|--------------------------------|
| Audi | | | | |
| A5 | 7.7 – 4.8 l/100km | n/a | 176 – 125 g/km | n/a |
| Concept C | Vehicle is not yet offered for sale & is therefore not subject to Directive 1999/94/EC. Consumption & emission data under review. | | | |
| Q4 e-tron 55 | n/a | 16.8 – 19.5 kWh/100km | n/a | 449 – 523km |
| Q5 | 7.9–5.9 l/100km | n/a | 180–148 g/km | n/a |
| Q6L e-tron | The vehicle is not offered for sale in Europe. | | | |
| Q8 55 e-tron | n/a | 20.6 – 24.4 kWh/100km | n/a | 460 – 595km |
| S5 Avant | 7.5-7.9 l/100km | n/a | 169-180 g/km | n/a |
| A6L e-tron | The vehicle is not offered for sale in Europe. | | | |
| AUDI E7X | The vehicle is not offered for sale in Europe. | | | |
| Scout | | | | |
| Terra | Vehicle is not yet offered for sale & is therefore not subject to Directive 1999/94/EC. Consumption & emission data under review. | | | |
| Traveler | Vehicle is not yet offered for sale & is therefore not subject to Directive 1999/94/EC. Consumption & emission data under review. | | | |
| Jetta (China) | | | | |
| Jetta X | The vehicle is not offered for sale in Europe. | | | |