Co-funded by
the European Union

Kas man jāzina par **nākotnes mobilitāti?**

Matīss Zemītis

Group e-mobility Manager at “Moller Baltic Import”,
“Volkswagen” in Baltics and “Audi” in Latvia and Lithuania wholesaler.

Moller Baltic
Import

Moller Baltic

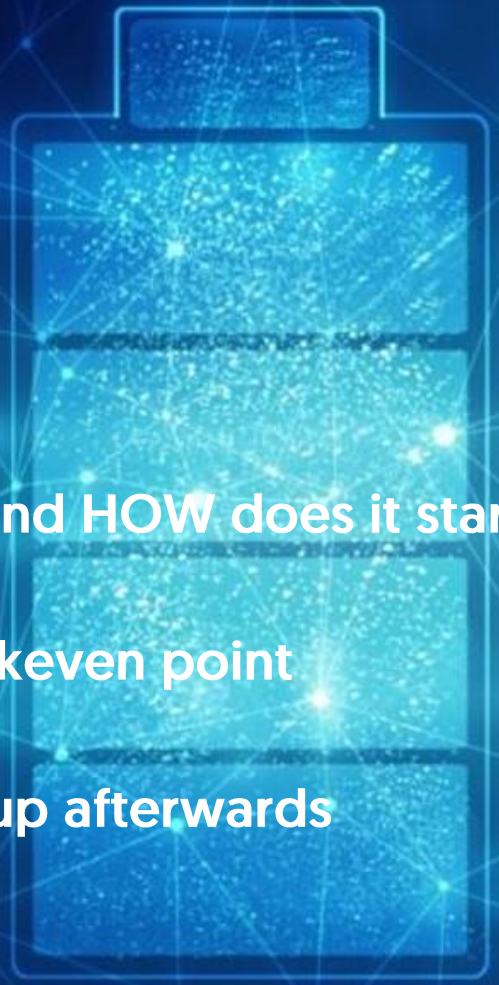
Import

part of **Moller** Mobility Group

27 locations across Baltic States

- 18 Volkswagen Full Function Dealers
- 5 Volkswagen Service Partners
- 5 Audi Dealers
- 1 Audi Service Partner
- 5 Multi-brand Partners with other Volkswagen Group Brands

Topics



1. Why switching from ICE?
2. RAW materials – where and HOW does it start?
3. Life cycle analysis – breakeven point
4. Where do batteries end up afterwards
5. Questions & answers

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1. Why switching from ICE?

Where are we coming from?

	Golf 3	Golf 5	Golf 7
Displacement	1390 cm^3	1390 cm^3	1395 cm^3
Power	44 kW (60hp) /4700	90 kW (122hp) at 5000/min	92 kW (125hp) /5000-6000
Torque at 1/min	116 Nm / 2800-3200	200 Nm with 1500-4000/min	200 Nm at 1500-4000/min
Consumption (l/100km, combined)	6.8 l	5.9 l	5.2 l
CO_2-Emission (combined)	163 g/km	139 g/km	116 g/km
European emission standard	3	5	6

Systematic transition to e-mobility

Relating to Audi models for the global market

2025
Production start of the last new combustion engine model

From 2026
Newly presented Audi models are exclusively electric models

2033
Production of combustion engines discontinues*

*China is an exception

Why switching from ICE?

Responsibility is the answer

Sustainability targets by EU

VOLKSWAGEN
GROUP

Sustainability goals from OEM's

Moller
Mobility Group

MMG sustainability and climate strategy

Child labour, forced labour, slavery

Disregard for occupational health and safety

Disregard for freedom of association

Unequal treatment in employment

The contracting/ use of private/ use of public Security forces in violation of human rights

Deprivation of decent wages

Non-environmental handling, collection, storage, disposal of waste

Production and use of persistent organic pollutants (Stockholm Convention)

Manufacture and use of mercury added products (Minamata Convention)

Export and import of hazardous waste (Basel Convention)

Harmful pollution of soil, water, air, noise emissions, and excessive water consumption

Unlawful eviction of land, forests and waters

Decarbonization

50.4% reduction targeted in production-related co_2 emissions by 2030.

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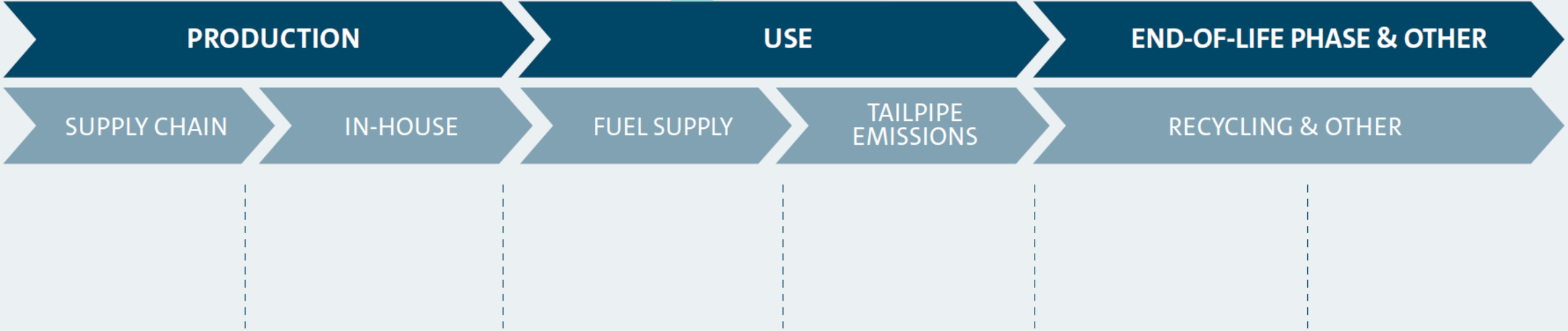
PRODUCTION
USE
END-OF-LIFE PHASE & OTHER
SUPPLY CHAIN
IN-HOUSE
FUEL SUPPLY
TAILPIPE EMISSIONS
RECYCLING & OTHER

What is the electric vehicle?

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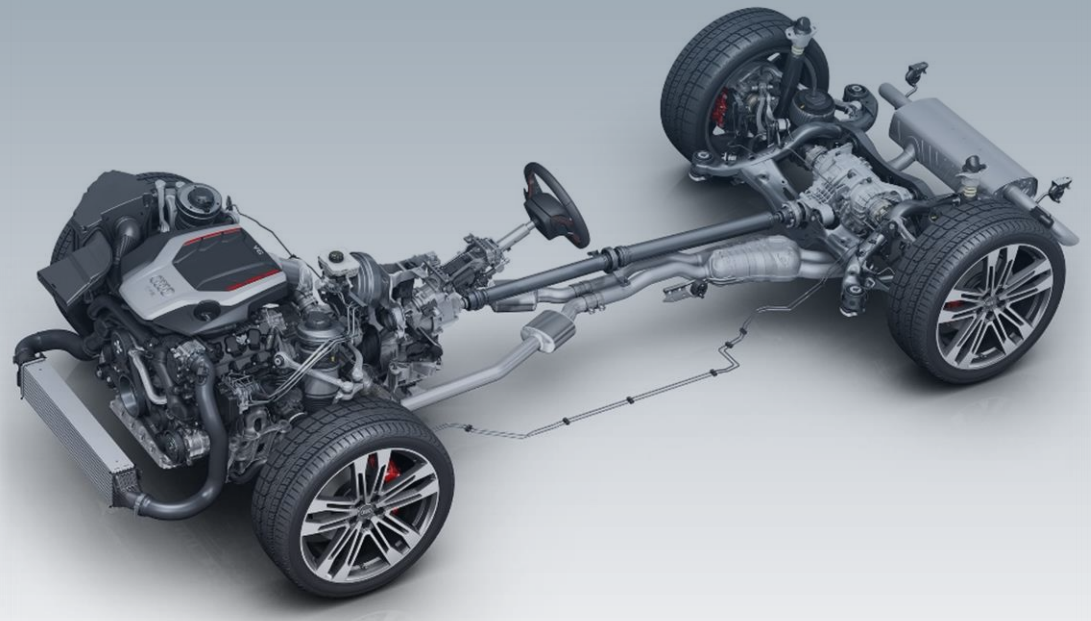
What is the electric vehicle?

If we compare it to a combustion (ICE) vehicle.

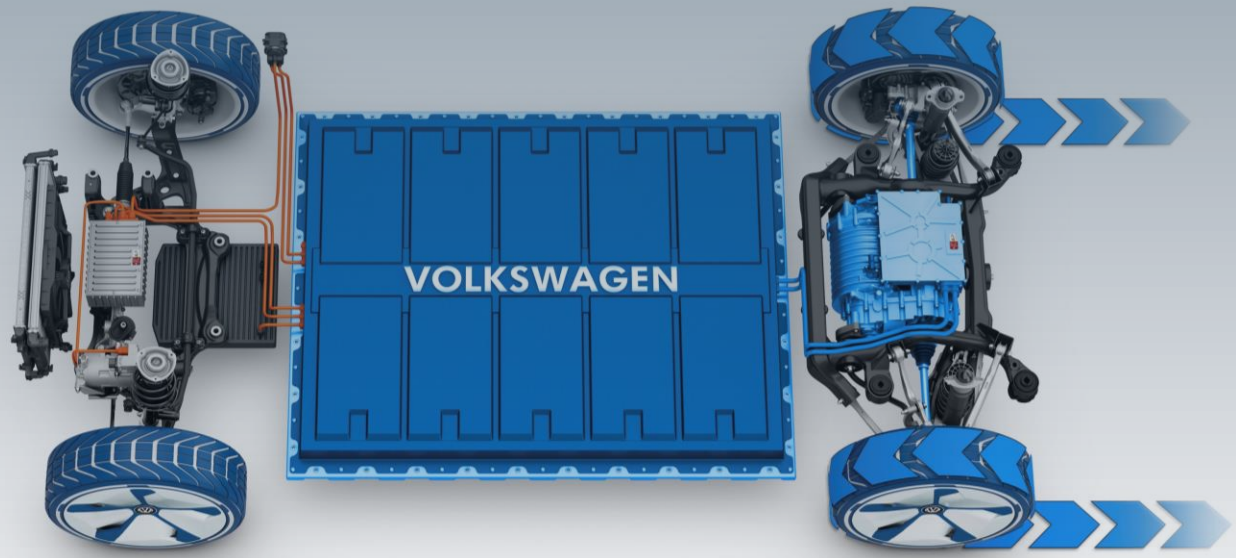
Average ICE powertrain

1400 components

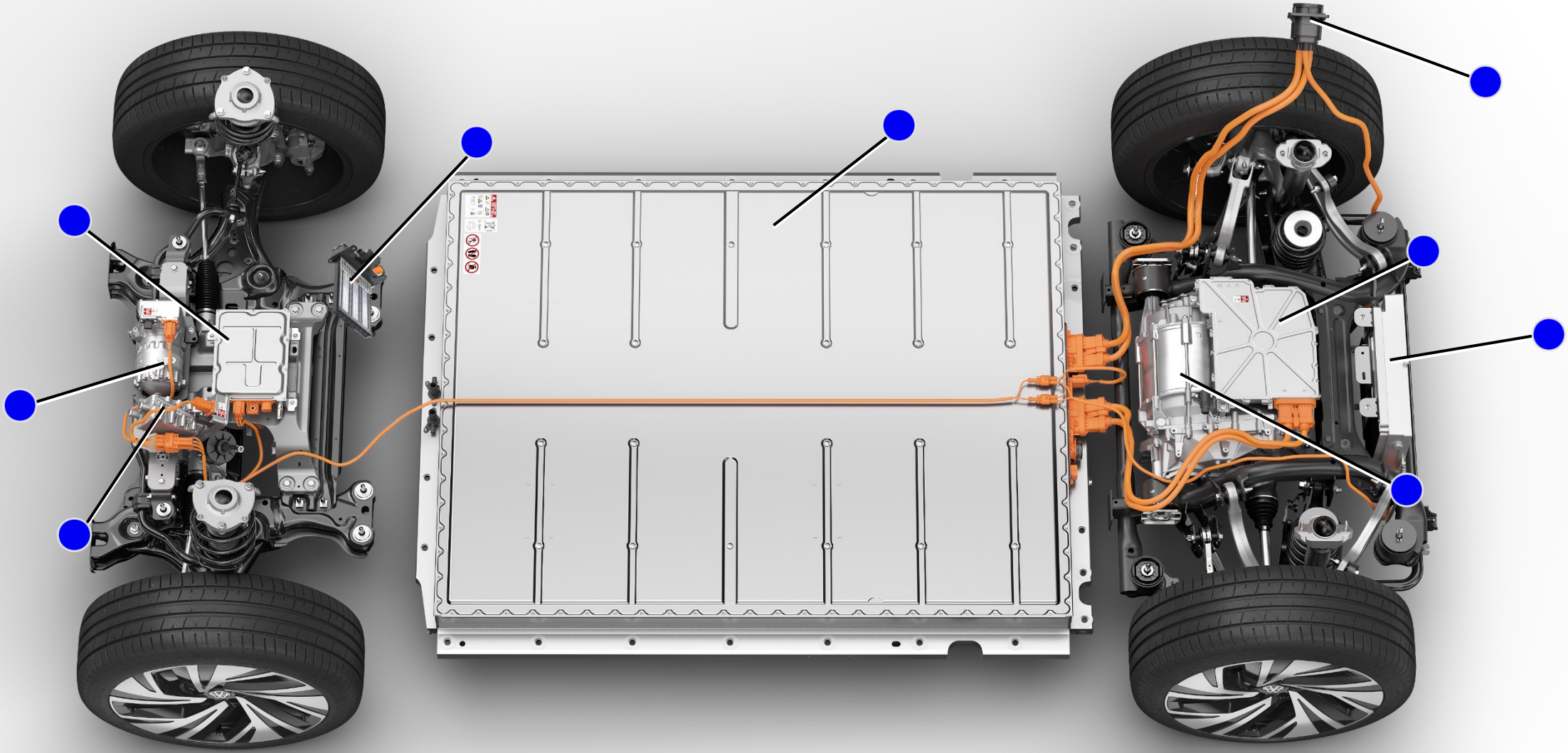


Average BEV powertrain

200 components

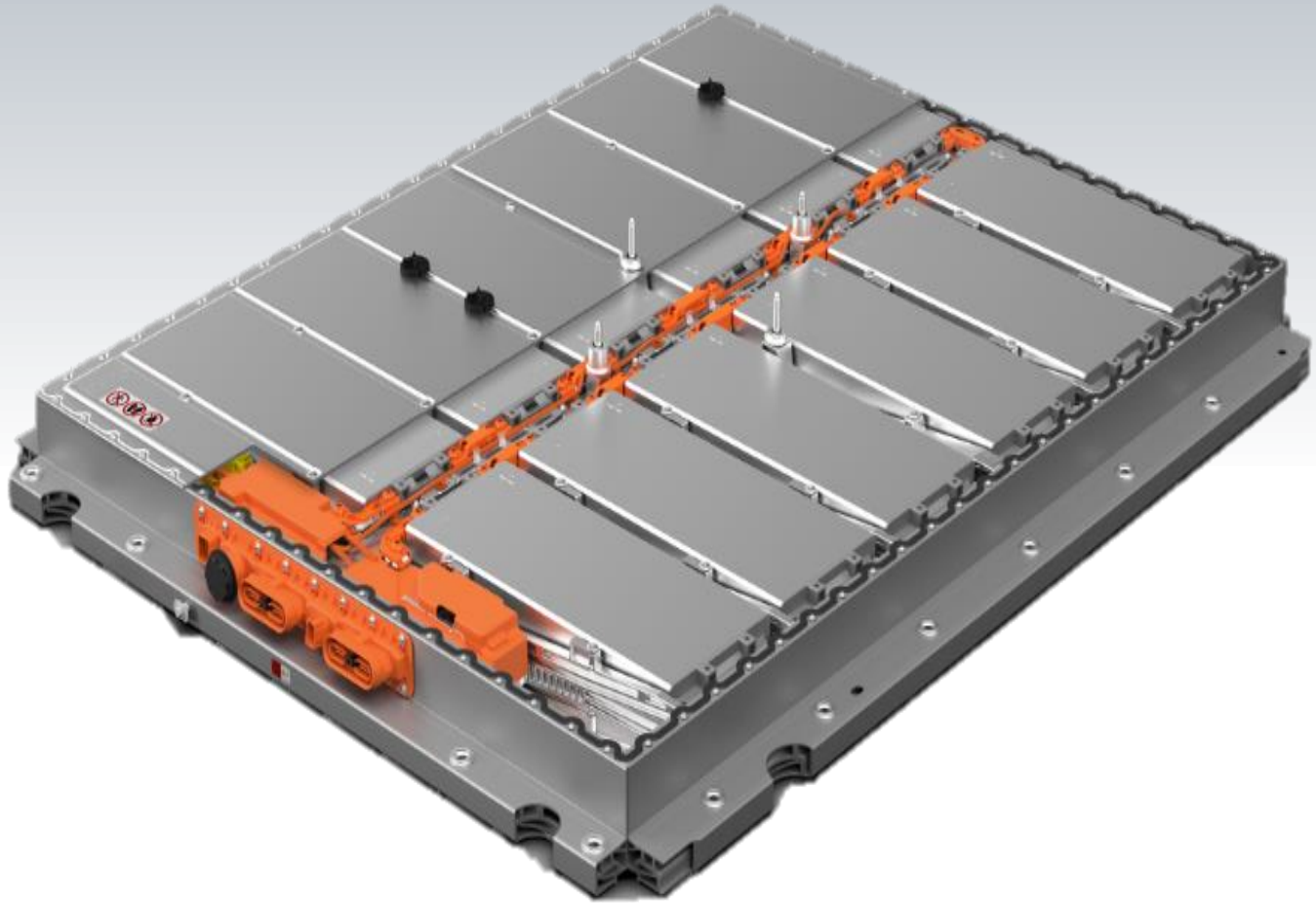


Overview of the HV system | MEB vehicle



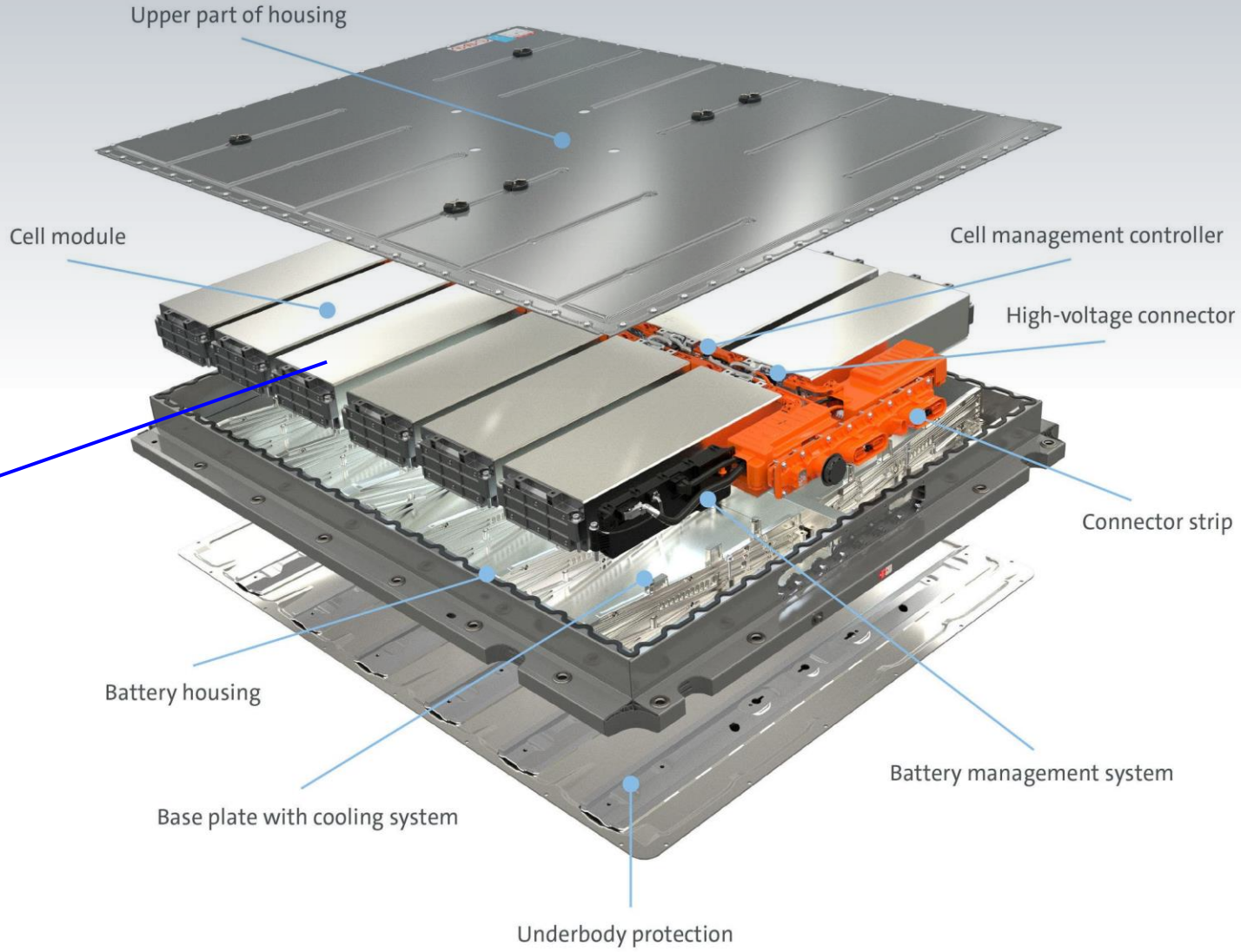
Modular battery

- Variable battery capacity
- High-power, high-energy density
- 100% repair level
- Highest level of safety
- 8 year / 160 000 km warranty
  - SoH >70% of initial capacity
- Fast high-power charging



What’s inside the housing?

Battery pouch cell



2. RAW materials where and HOW does it start?

RAW material awareness

VOLKSWAGEN
AKTIENGESELLSCHAFT

RESPONSIBLE RAW MATERIALS REPORT 2021

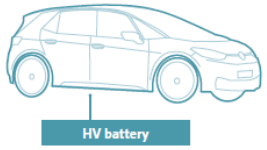
May 2022

NICKEL

VOLKSWAGEN
AKTIENGESELLSCHAFT

Ni
NICKEL

KEY APPLICATION

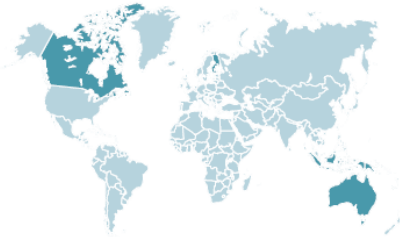


OUR APPROACH: RISK IDENTIFICATION AND RISK ASSESSMENT RESULTS

The Volkswagen Group does not source any of the battery raw materials – lithium, cobalt, nickel or graphite – directly. Therefore, we work closely with battery cell producers to engage with the upstream sector, increase supply chain transparency and make sure that battery raw minerals are produced and sourced responsibly. Since 2020, we have incorporated binding requirements into all new battery supply contracts to disclose upstream information up to the mine. In 2021, we continued our direct engagement with battery cell producers to collect this data through supply chain mapping questionnaires, analyze and assess it to identify responsible sourcing risks.

Through media screening and review of sector studies, we are monitoring nickel-specific risks in the world's leading nickel producing countries, such as Brazil, China, Guatemala, Indonesia, Madagascar, Papua New Guinea and Russia.

We identified the following countries of origin in our nickel supply chain: Australia, Canada, Finland, Indonesia, New Caledonia and Papua New Guinea.



KEY MATERIAL-SPECIFIC RISKS

- Child Labor
- Modern Slavery
- Systematic or widespread human rights abuses
- Human rights abuses committed by public or private security forces
- Support to non-state armed groups or public or private security forces
- Risks to workers' occupational health and safety
- Adverse environmental impacts
- Infringement on labor rights
- Discrimination and harassment
- Threats to indigenous people and communities

Nickel is one of the critical raw materials covered in the Drive Sustainability Raw Material Outlook, which provides data for risk identification and assessment of the material in our supply chains. In 2021, we began reviewing this data and will continue to assess it in 2022.

RISK MITIGATION ACTIONS TAKEN: FACTS AND FIGURES

We have been in direct dialogue with several major nickel mining companies and conducted 3 sustainability workshops to assess these companies' readiness against our responsible sourcing requirements. Our partners have been open to cooperation and information sharing, showing a high level of risk awareness and a good understanding of responsible sourcing topics. Resulting from our extensive risk assessment on nickel tailings treatment as well as deep sea mining, the Volkswagen Group as well as Scania have joined the Pledge against Deep Sea Mining in 2021. For more information, please see **Box 5** in this report or visit **No Deep Seabed Mining**.

OUTLOOK 2022

In 2022, we will continue implementing and expanding our supply chain mapping and audit program in close cooperation with our major battery suppliers. *As new members of IRMA, we plan to progressively apply the standard within our EV battery supply chain throughout 2022.*

Battery cell production

Volkswagen enters global battery business with “PowerCo”

Volkswagen Group and PowerCo SE launch site search for first gigafactory in North America

Sustainable and Affordable Batteries: PowerCo Develops „Gamechanger“ Technology for Cell Production

Batteries: deal on new EU rules for design, production and waste treatment

- Batteries to be easier to remove and replace
- Compulsory “digital battery passport”
- Consumer awareness
- Phase out of non-rechargeable portable batteries of general use by 2031
- According to the deal, a carbon footprint declaration and label will be obligatory for EV batteries

3. Life cycle analysis breakeven point

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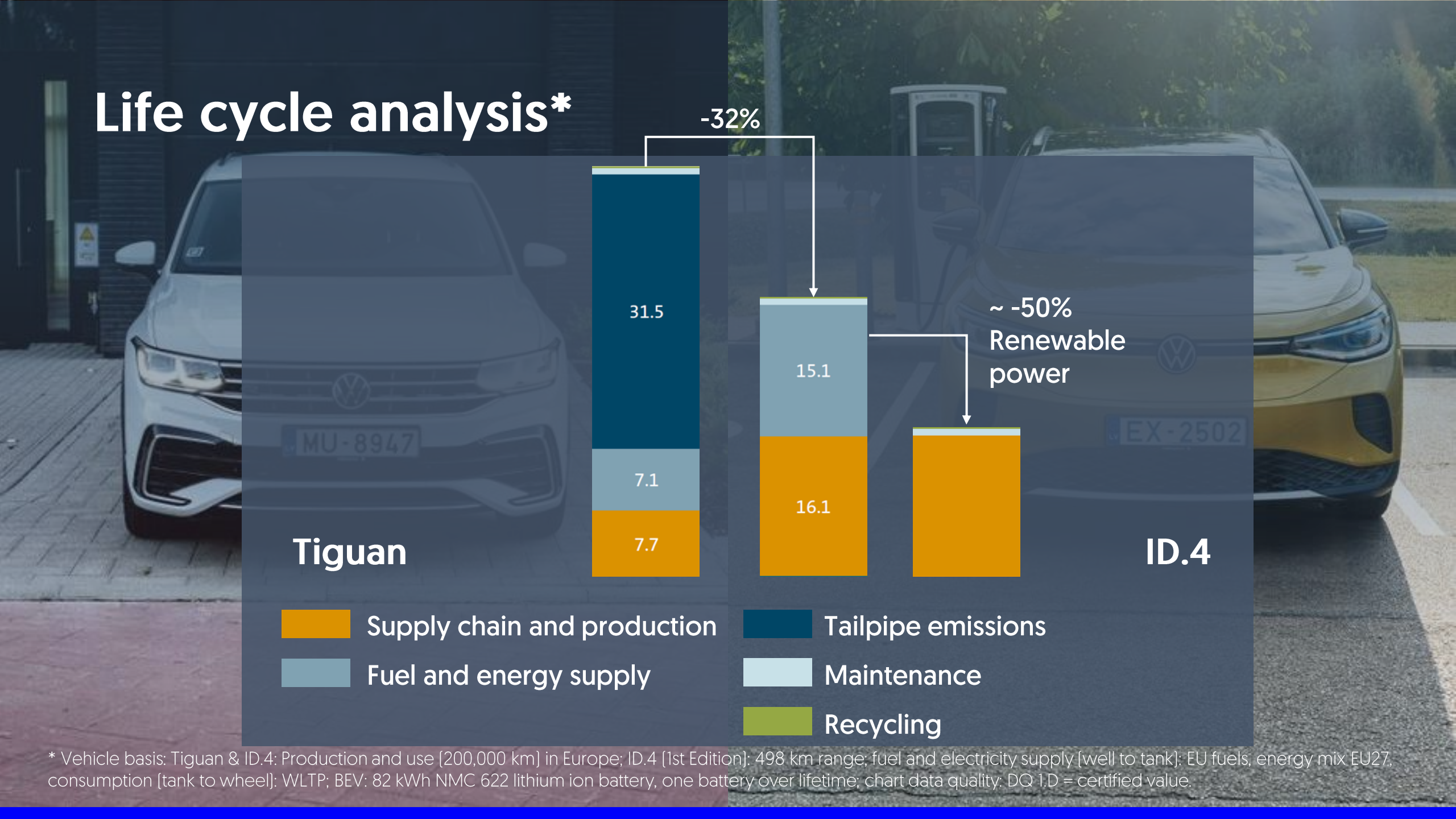
Life cycle analysis*



* Vehicle basis: Tiguan & ID.4: Production and use (200,000 km) in Europe; ID.4 (1st Edition): 498 km range; fuel and electricity supply (well to tank): EU fuels, energy mix EU27, consumption (tank to wheel): WLTP; BEV: 82 kWh NMC 622 lithium ion battery, one battery over lifetime; chart data quality: DQ 1.D = certified value.

4. Where do batteries end up afterwards

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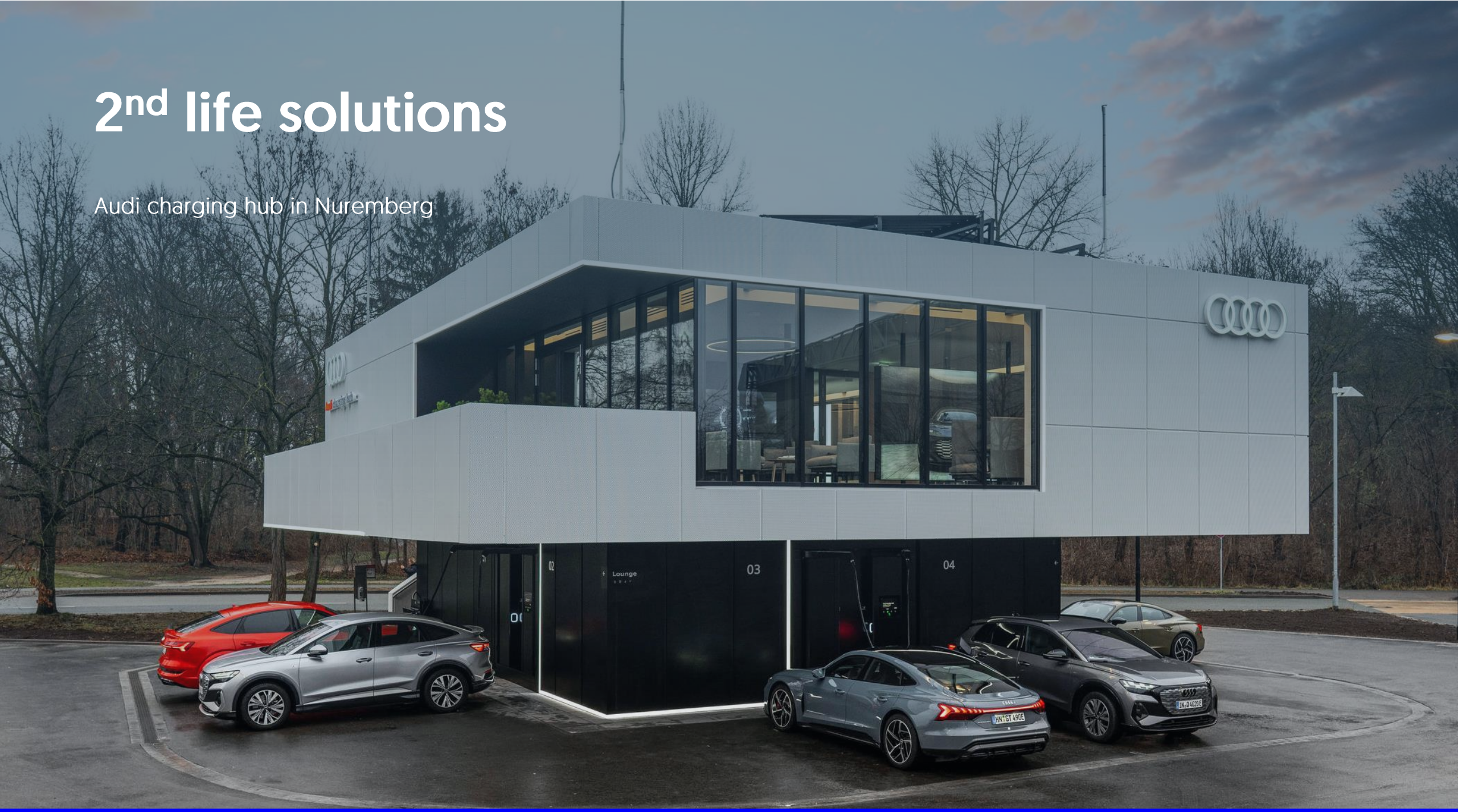
2nd life solutions

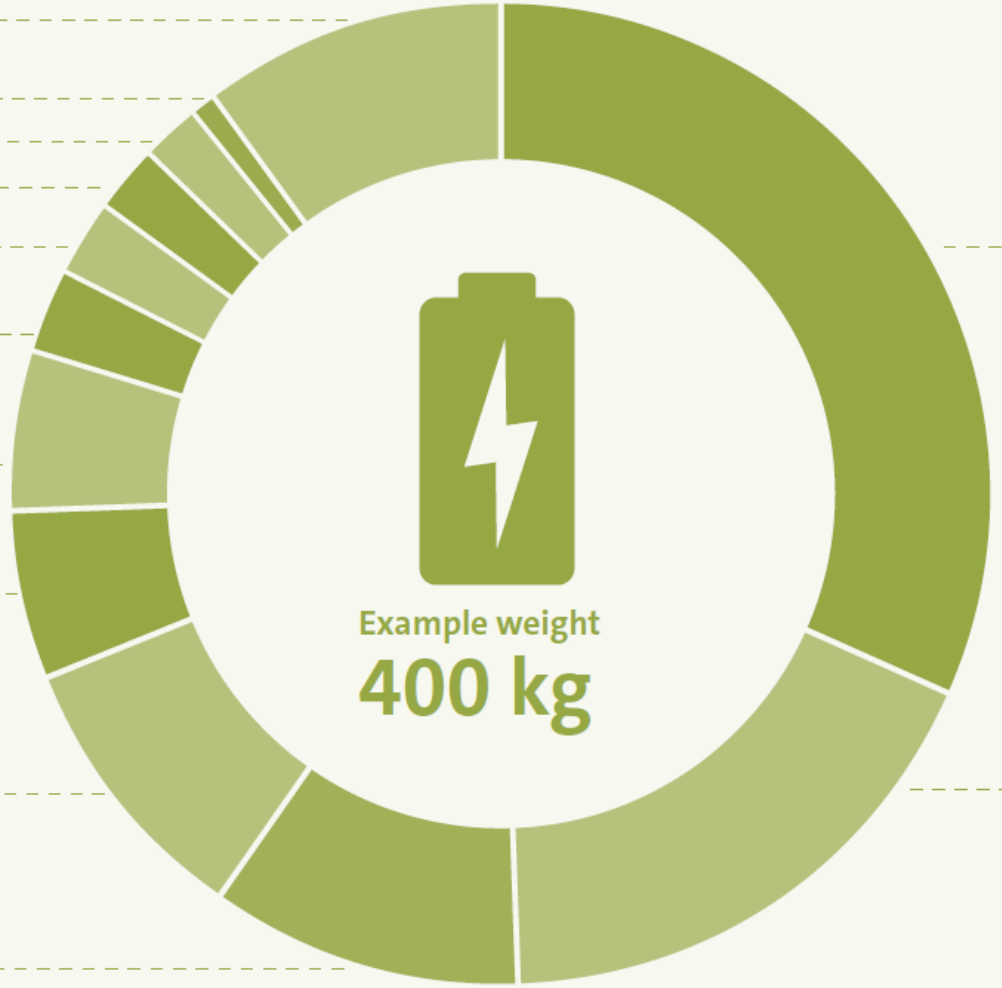
Audi charging hub in Nuremberg



2nd life solutions

Volkswagen DC power-bank

Valuable materials in a battery



Remainder 41 kg

Steel 3 kg

Lithium 8 kg

Electronics 9 kg

Cobalt 9 kg

Manganese 12 kg

Plastic 21 kg

Copper 22 kg

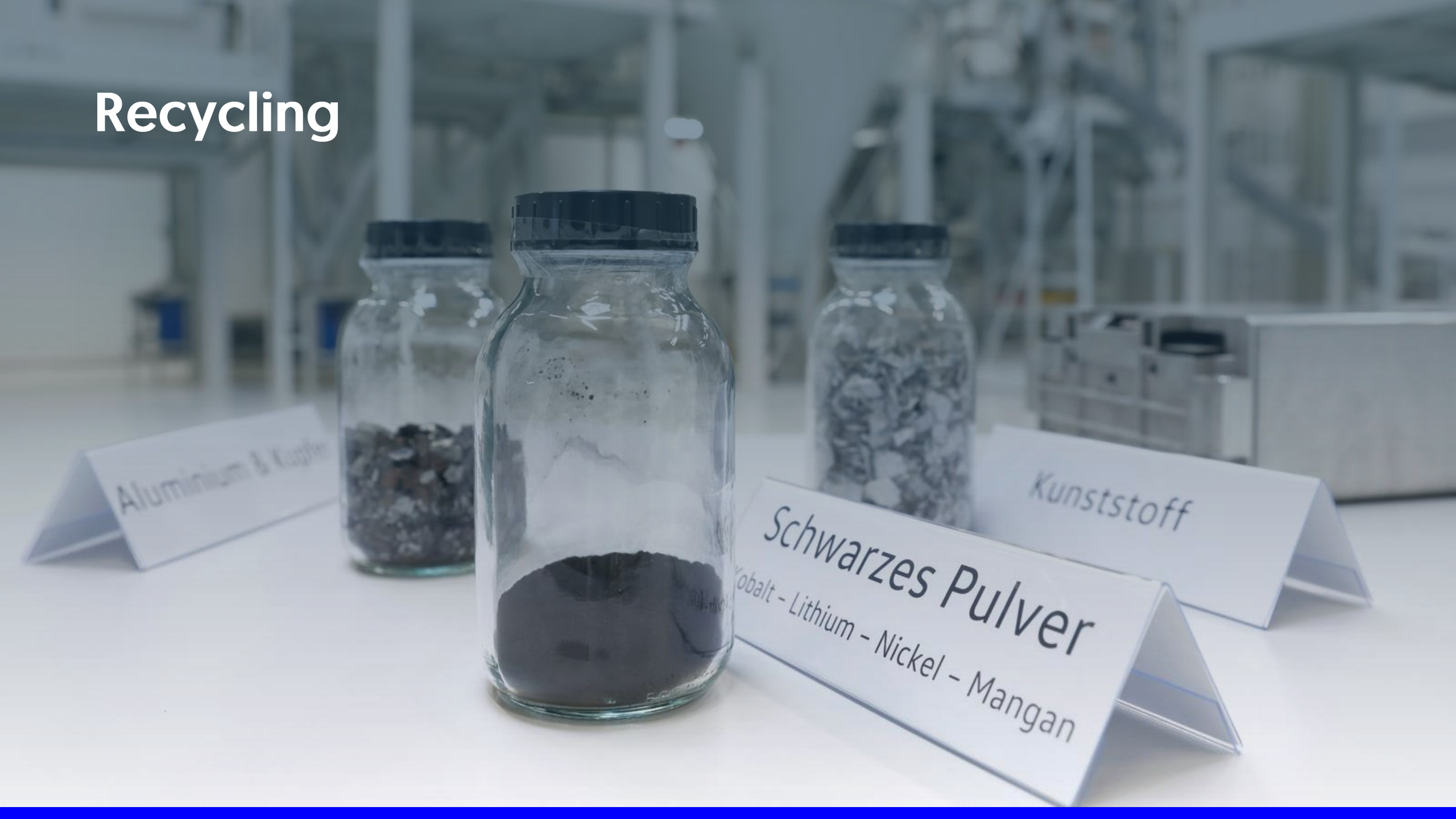
Electrolyte 37 kg

Nickel 41 kg

Aluminum 126 kg

Graphite 71 kg

Recycling

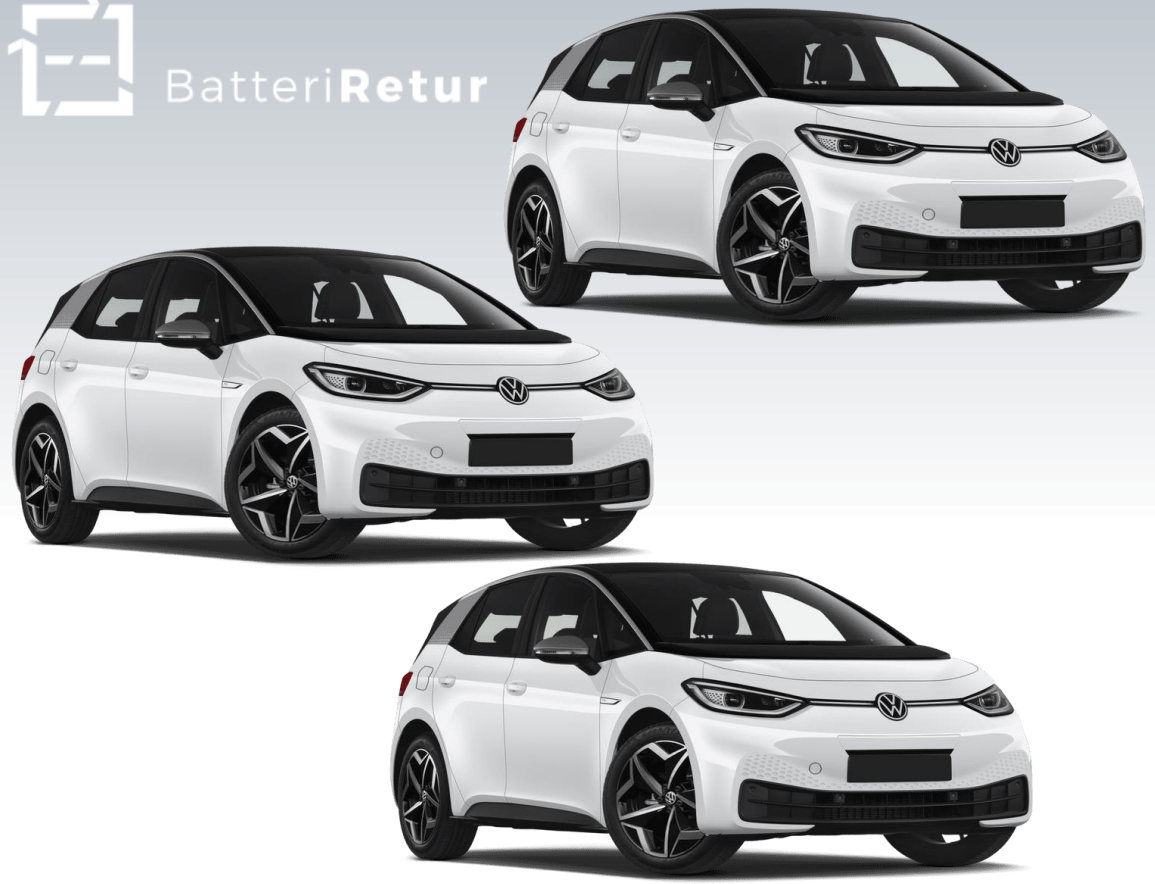


Is it always better to go for 2nd life solution?

Brutto capacity - 35,8 kWh

Brutto capacity - 55 kWh

BatteriRetur



5. Questions & answers

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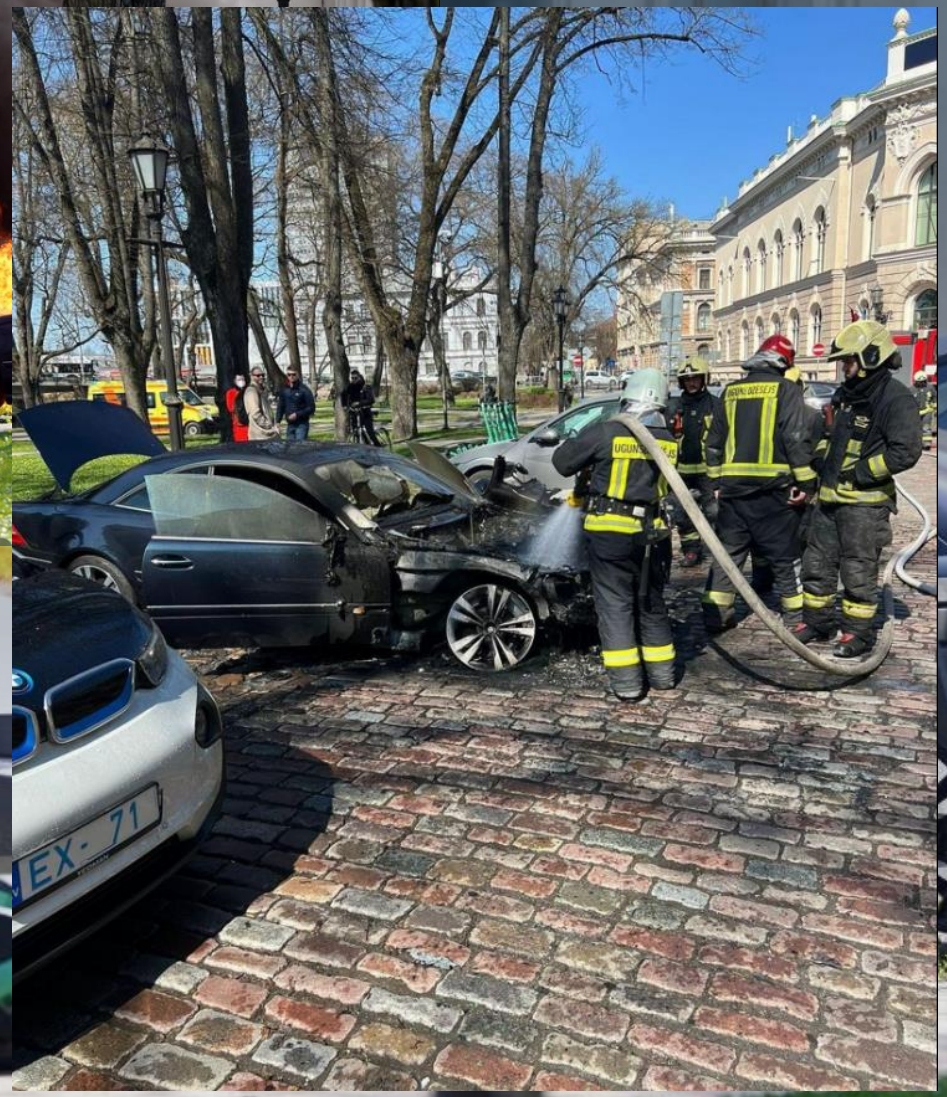
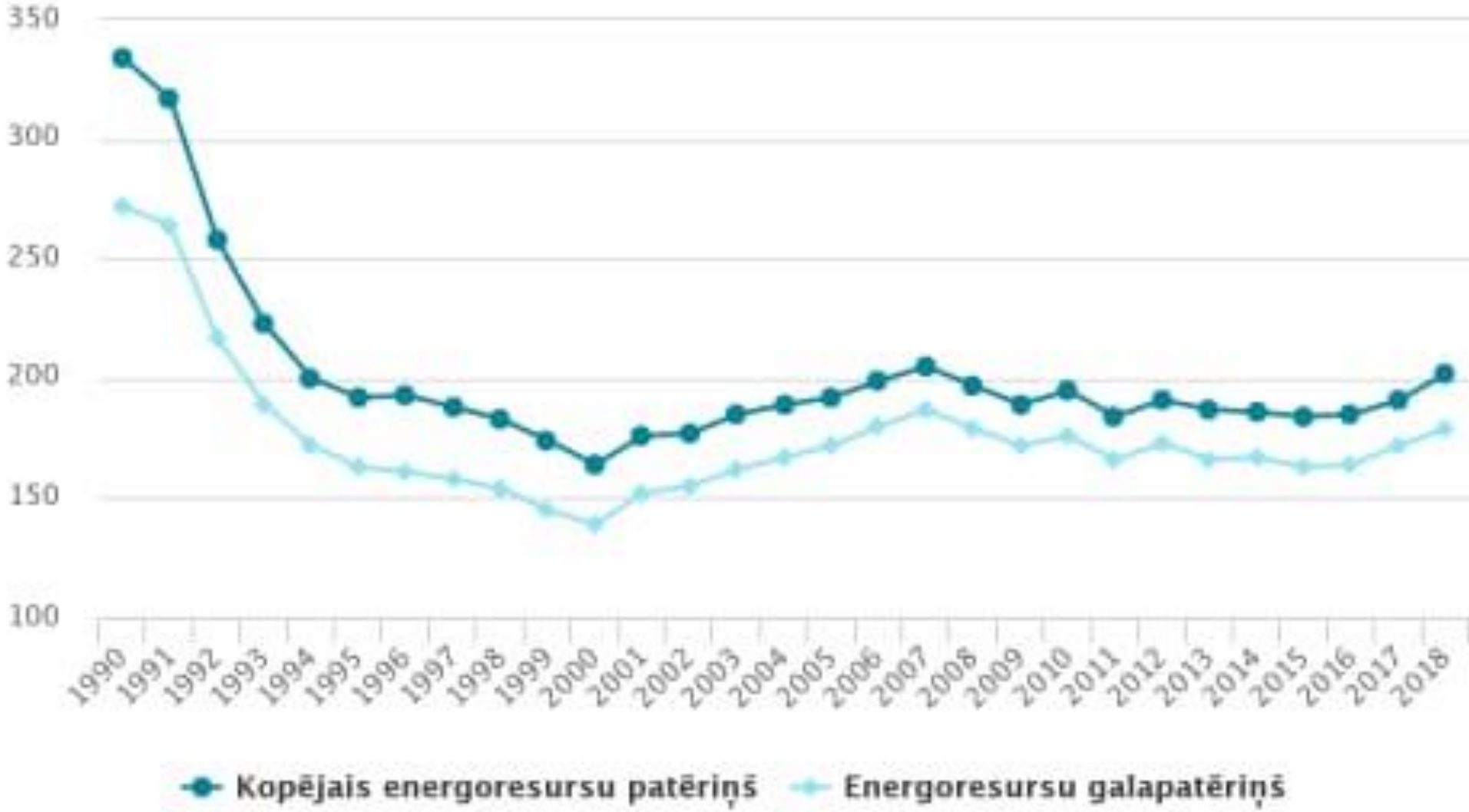
How safe is the battery?

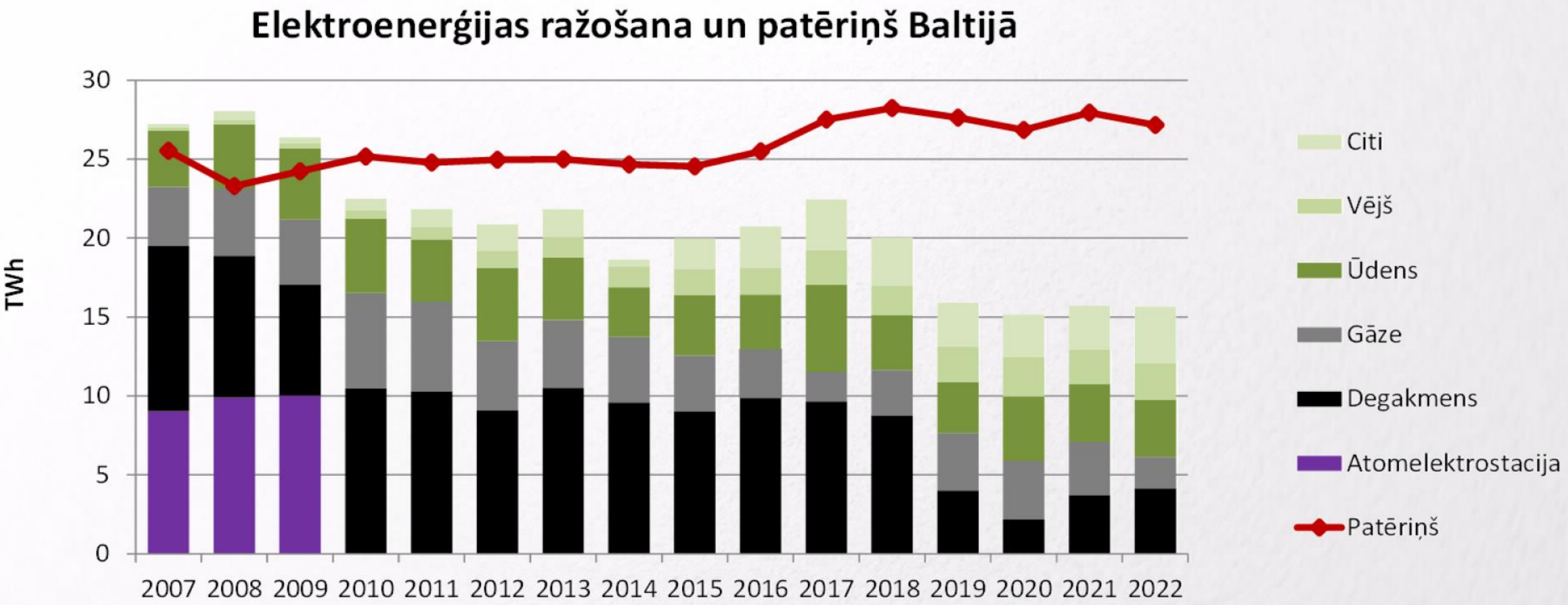


Energoresursu patēriņš Latvijā, 1990.–2018. gadā

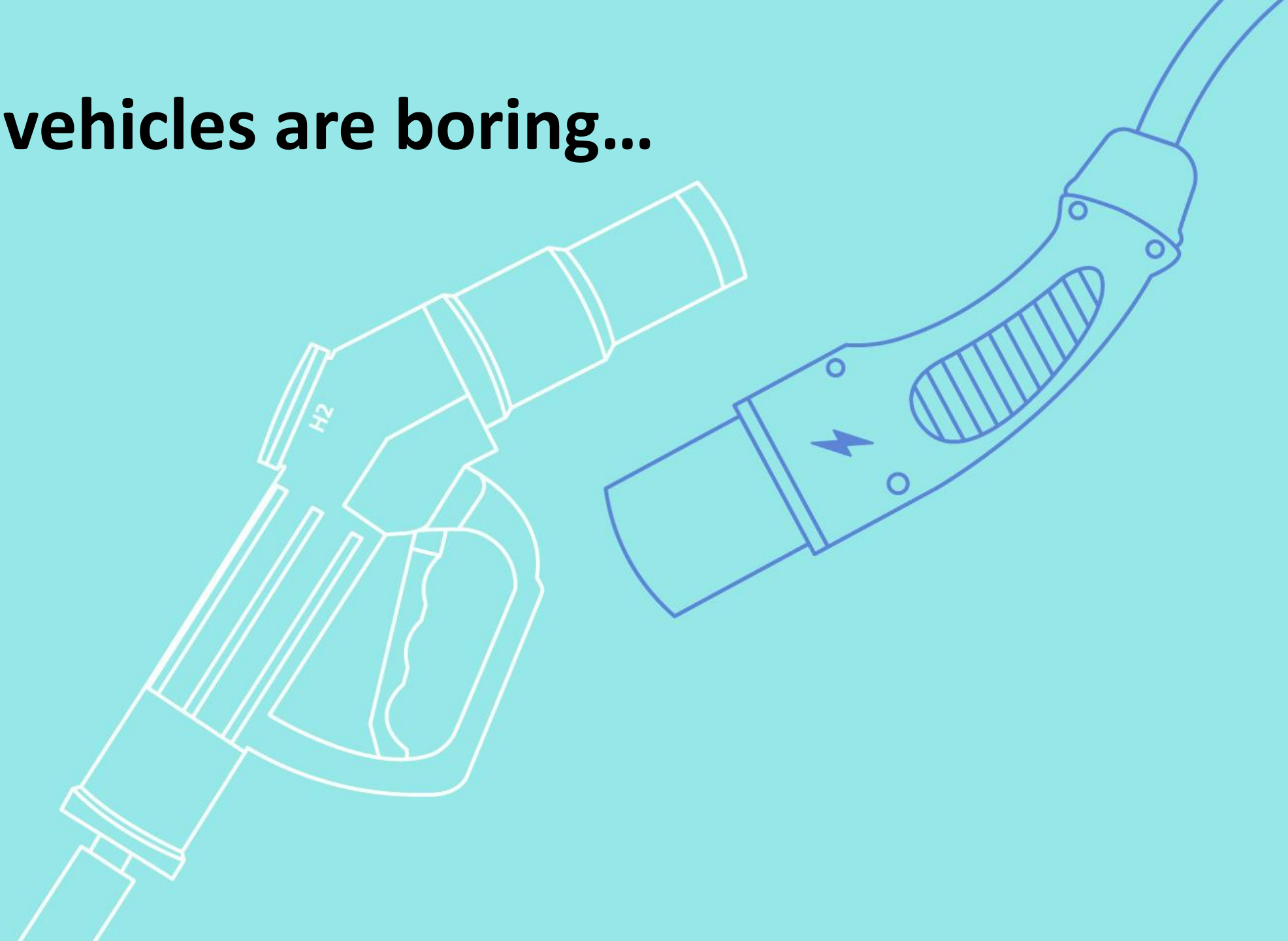
(petadžoulos)



ĢENERĀCIJAS STRUKTŪRA



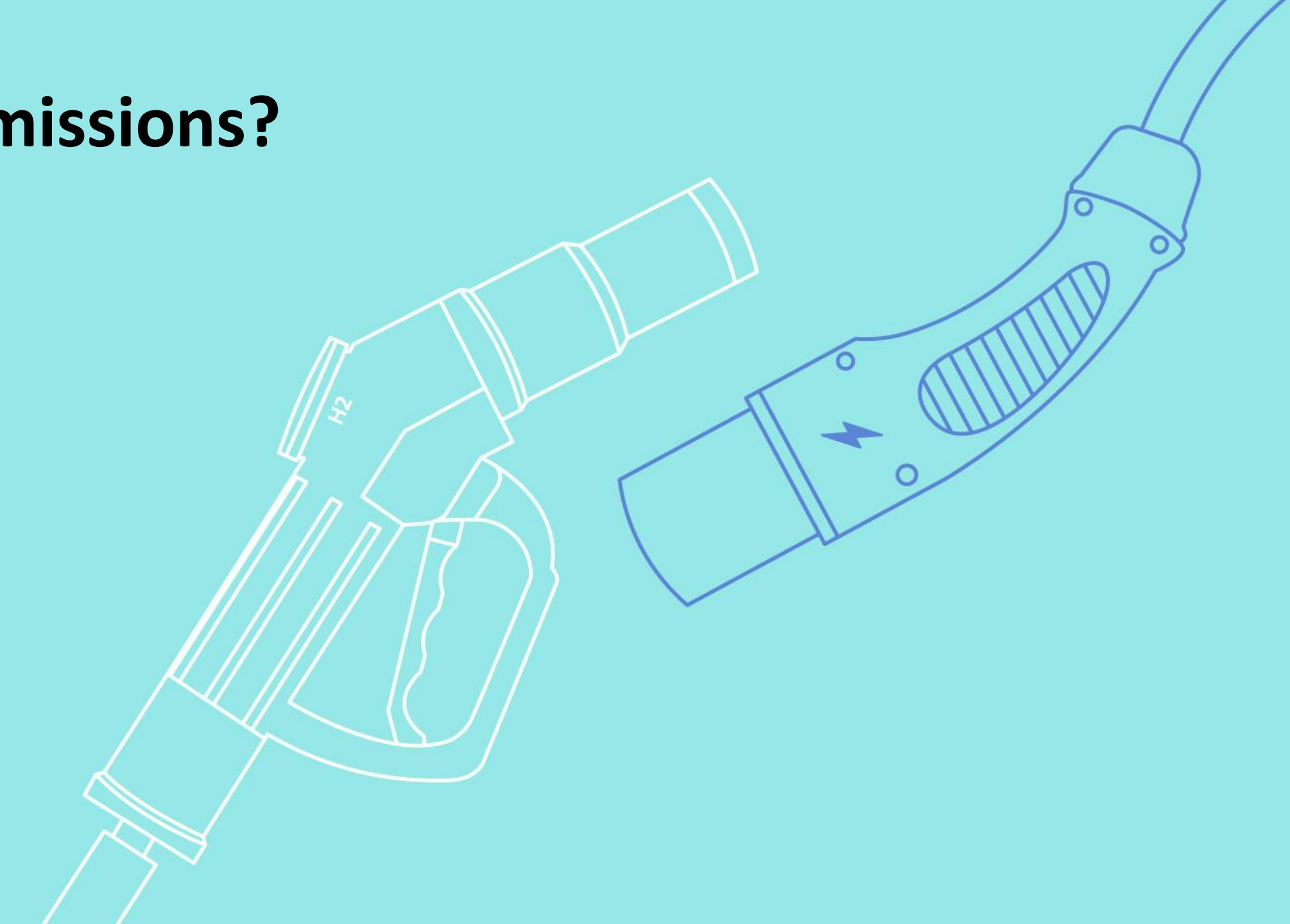
Electric vehicles are boring…




e-tron


ANSYS
BRIDGESTONE
Volkswagen
R
竞逐未来
RACE THE FUTURE
Castrol

Zero emissions?



5. Questions & answers

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Thank you!