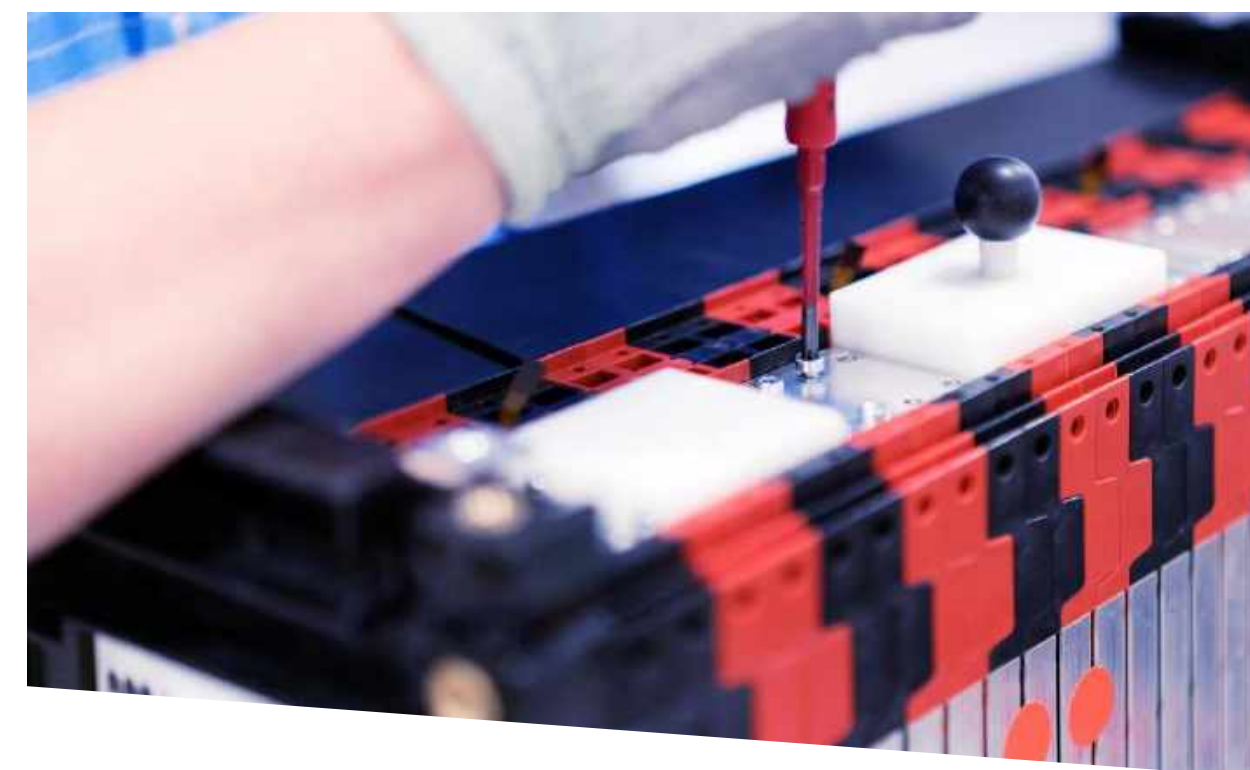
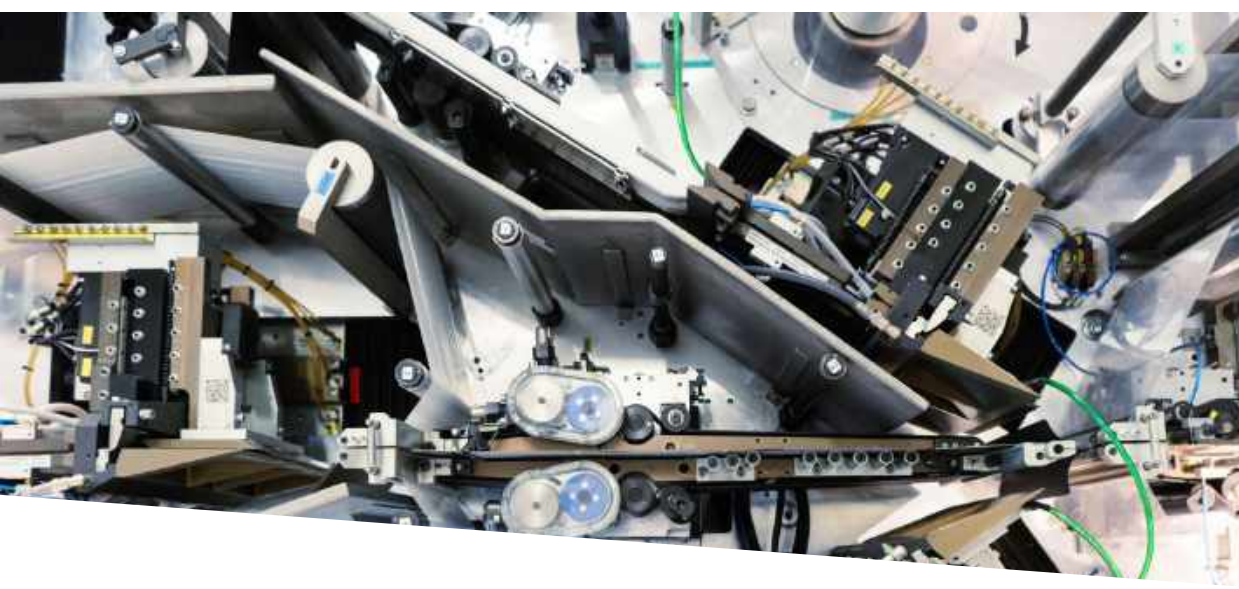


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Dachorganisation der Wirtschaft für
erneuerbare Energien und Energieeffizienz

Gerardo Gimeno

Vize President Sales Commercial Vehicles Leclanché SA



Powering the electrification of transport

 **Leclanché**
Energy Storage Solutions

AEE SUISSE, September 2020

01 Who are we and what do we do?

02 Capturing the eMobility wave –
Electrification is more than cars !

03 Full decarbonization of transport in 2050 ?



The Company



Li-ion Batteries Manufacturer with more than **100 years** experience in electrochemistry



LTO & G-NMC battery cells production in **Germany**



Battery Modules, Packs, Marine Racks, BMS Engineering and production in **Switzerland**



300 Employees, where >50 Engineers & 10 Phd's.



Continuous focus in R&D >**100 granted and filed patents**

The three business units



Add renewable energies to the network as dispatchable power on an as needed basis.

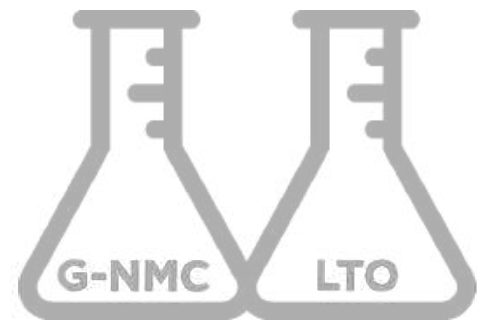


Design and produce specialised, custom made LV batteries for a wide range of demanding sectors (medical, military, AGV).



Deliver integrated Battery Packs & Racks for Commercial Vehicles, vessels & trains , with intelligent interface to the charging infrastructure

The energy storage solutions



Industry Benchmark **G-NMC and LTO chemistries** in terms of cycleability and life – Optimal for Fleet applications



G-NMC High Energy Density

Cells 60Ah – 206Wh/kg –
8000 Cycles at 80% DoD – 1C Charging



LTO High Power Cells

36Ah – 70 Wh/kg
20000 Cycles at 80% DoD – 4C Charging



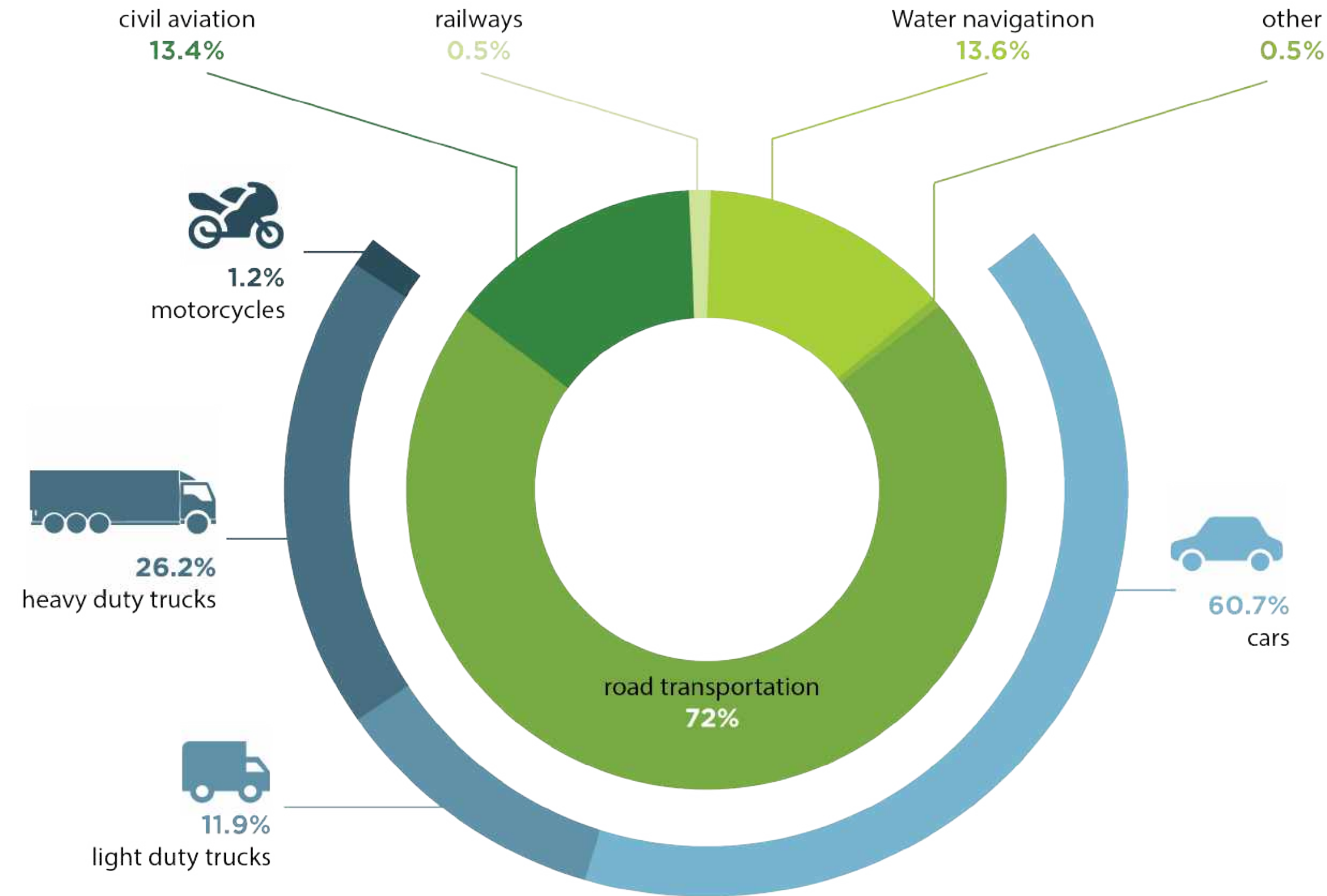
Robust battery pack design,
functional **Safe BMS** with remote monitoring



Own proprietary waterbased (solvent free) cell coating processes
& laminated ceramic separators

Capturing the eMobility Wave

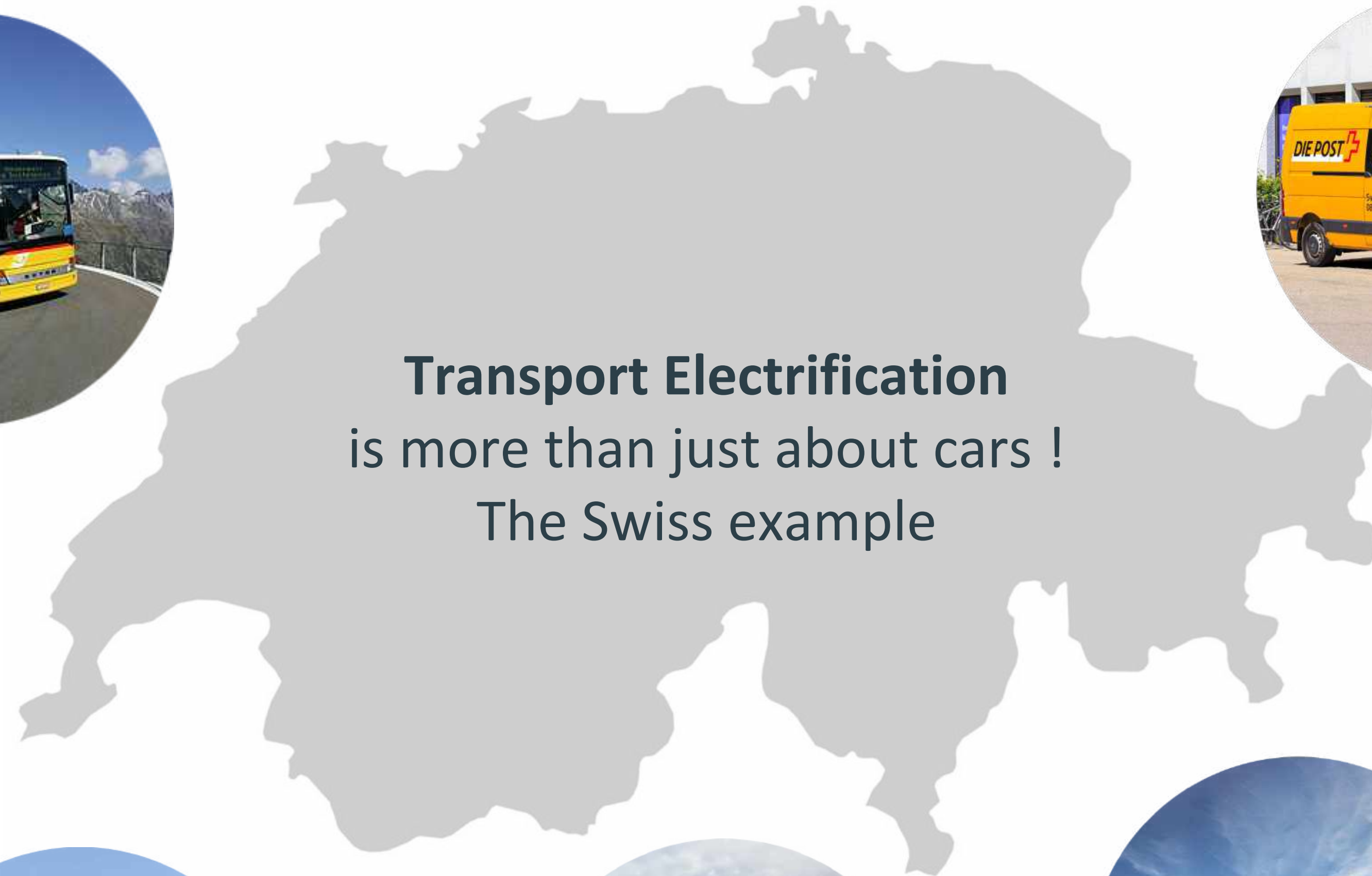
Transport CO₂ Emissions in the EU



Source: European Environment Agency

In total fleet vehicles create more than 40% of CO₂ emissions caused by transportation

Capturing the eMobility Wave



Transport Electrification
is more than just about cars !
The Swiss example



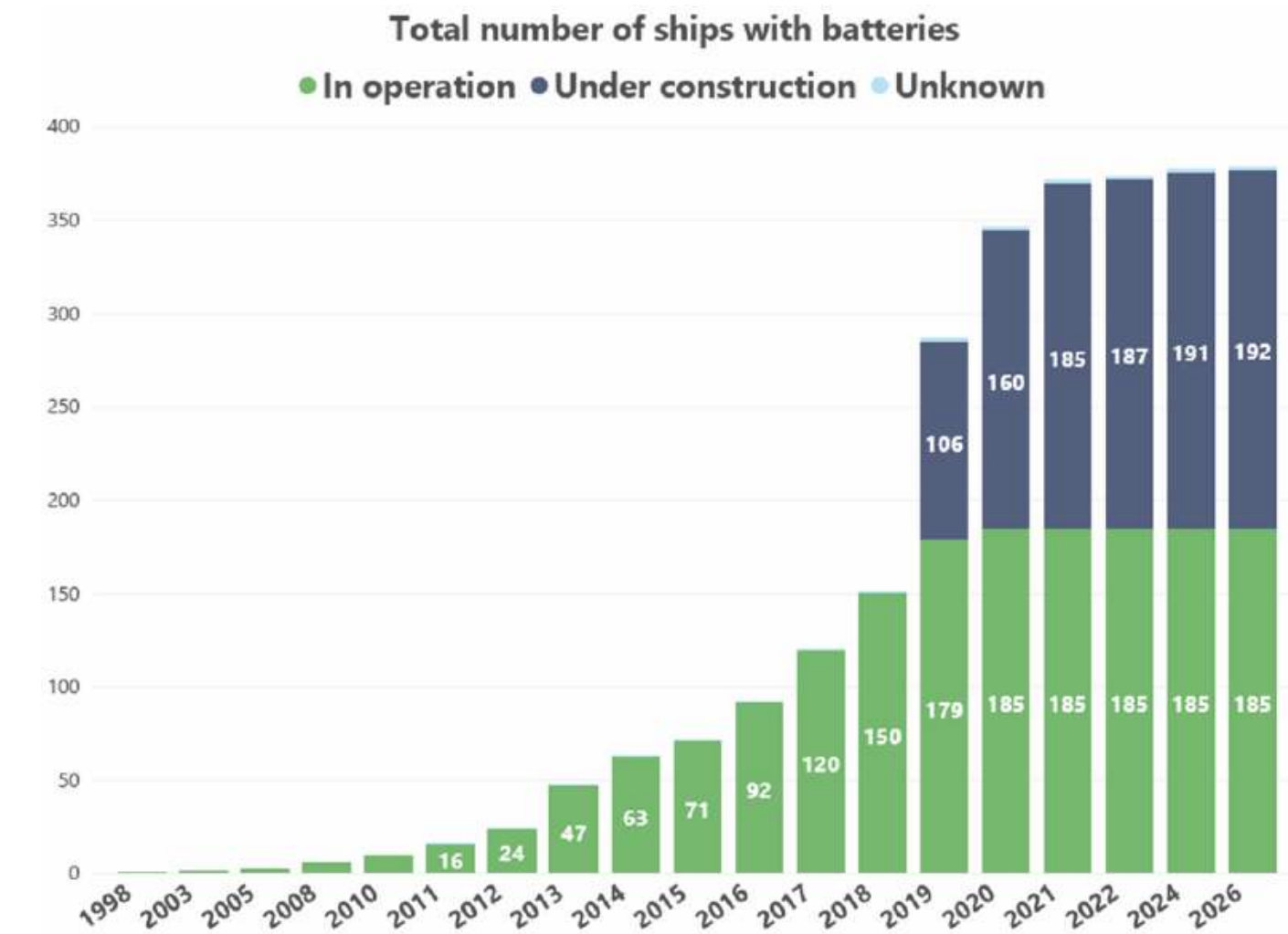
In 2018, in Europe, **over 138 million tonnes of CO2** came from Maritime transport

An electric ferry makes up for the CO2 pollution in battery production in just **1,4 months**

65-80% of Nordic ferry routes are suitable for electrical operation

Overall the demand for seaborne transport will increase with **60% by 2050**, with the pace of growth being **highest up to 2030**

Batteries enable **reduced noise and vibration** even at high speeds.



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- Marine Rack Systems – Modular Scalable & Flexible
- DNV-GL , RINA & DMA Certified
- Own Fire-fighting system
- Example: Ellen, 1st fully electric Ferry in Denmark



20% of rail traffic in Europe is operated using Diesel locomotion

35% of rail network in DE is not electrified, 62% in UK, 42% in FR

Cost of catenary overhaul electrification >800K€ in Western Europe

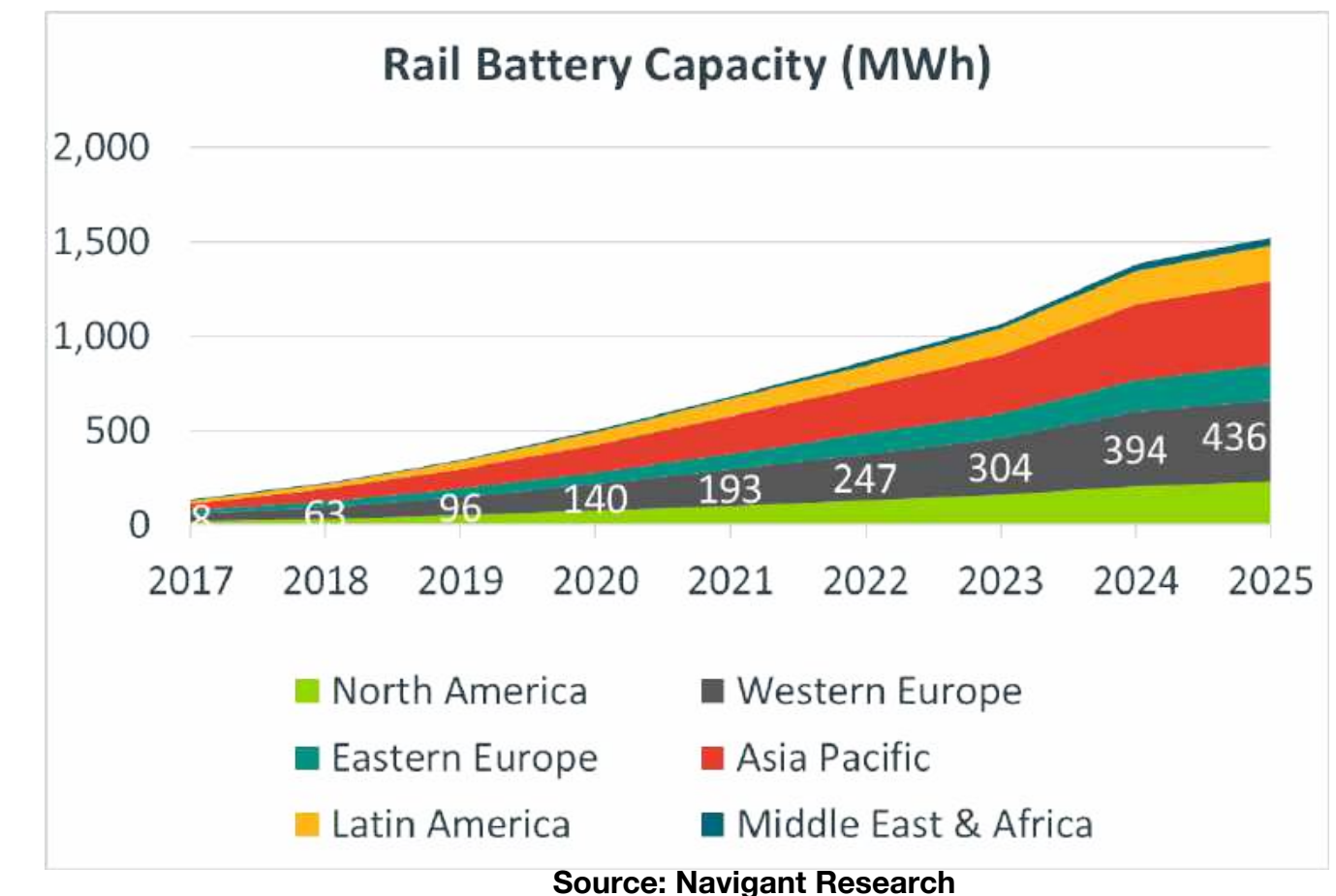
2/3 of the non-electrified sections are <70km in Germany

= 95% of all network can be covered by EMU & BEMU existing technologies.

Different studies show that **battery trains** are the best solution in terms of TCO to replace Diesel traction

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- High Energy density Traction Battery systems.
- Use of regenerative braking.
- Charging under overhaul line.
- Silent operation.
- Low operational cost.



A diesel 3 carriages train consumes about 1,4 lt. fuel per Km



Vans: LCVs in EU have grown emissions by **56%** since 1990.

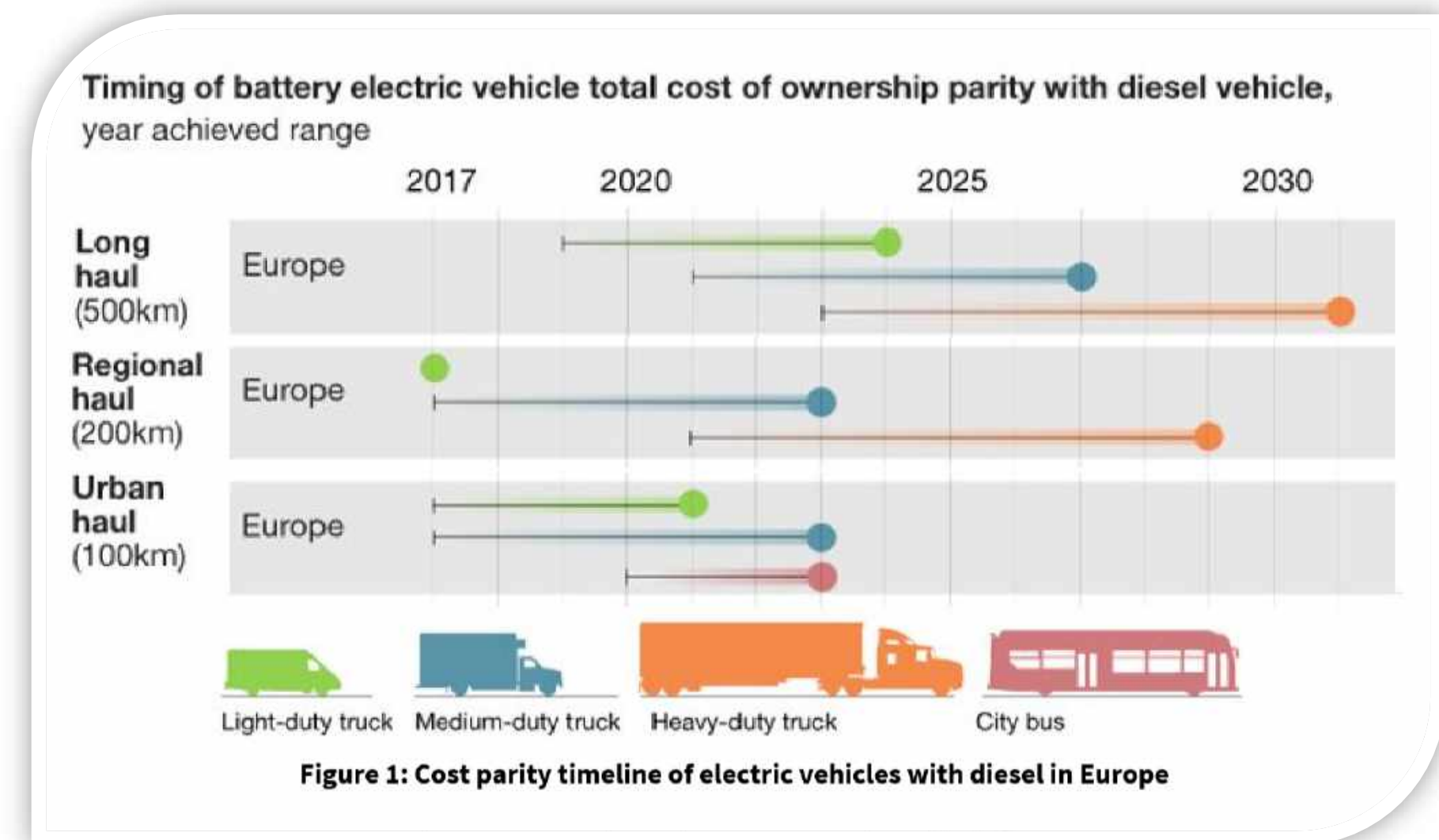
however with new policies by **2030** EU market can move to **100%** sales of Electric vans

Buses: **97%** of E-Buses currently are in China. NA and Europe are each projected to have 20K E-Bus sales by 2030 & **all Urban Buses** to be electric by **2025**.

Fuel-cell & BEV can be applied for short & long haul trucks nowadays. Sales of new E-Trucks are expected to reach **500K** units by 2030

Low operational costs for EVs: Studies show that TCO for EV regional hauler trucks is **-8%** vs. Diesel; **-10%** in refuse trucks –

source dana.com

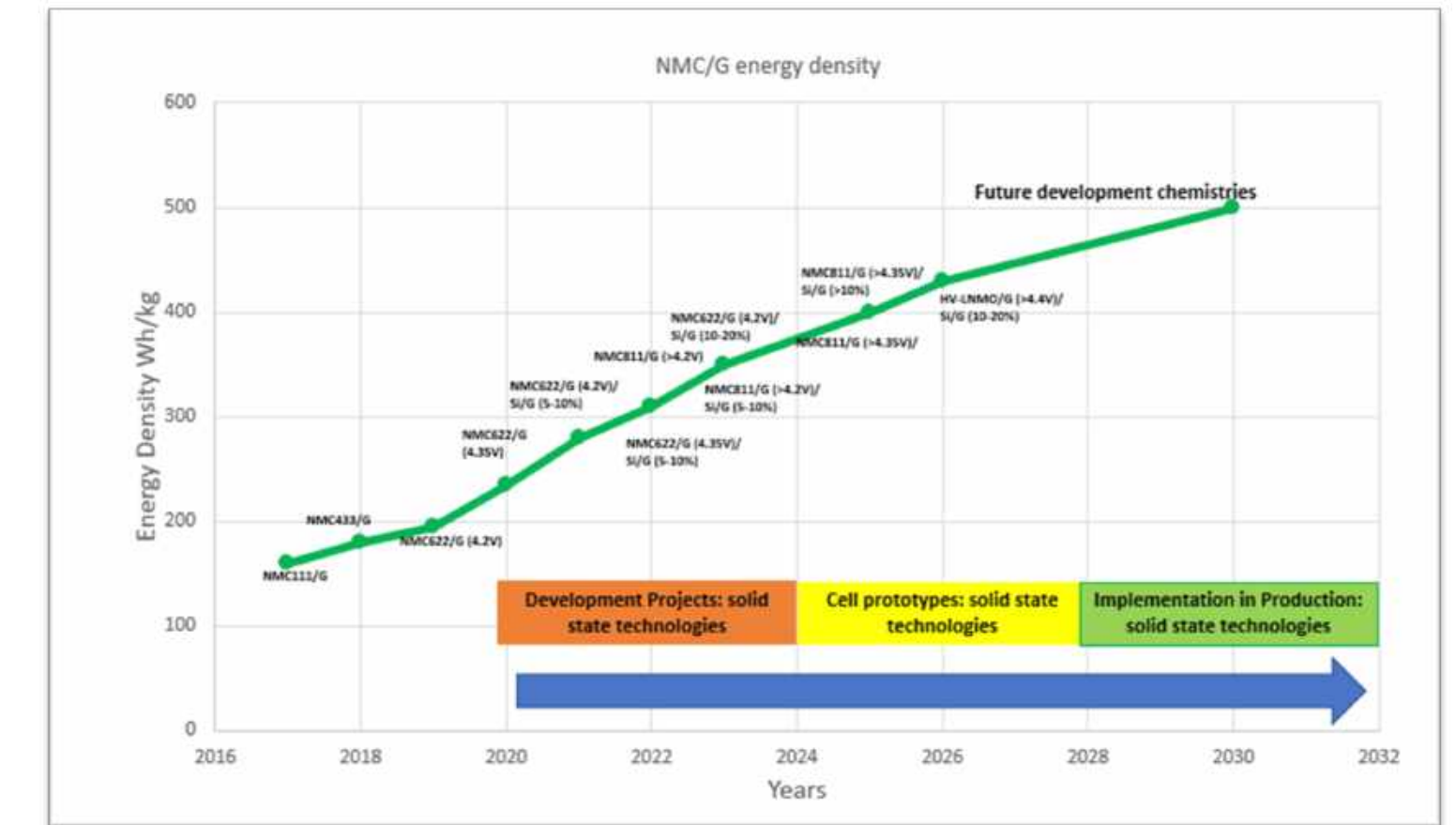
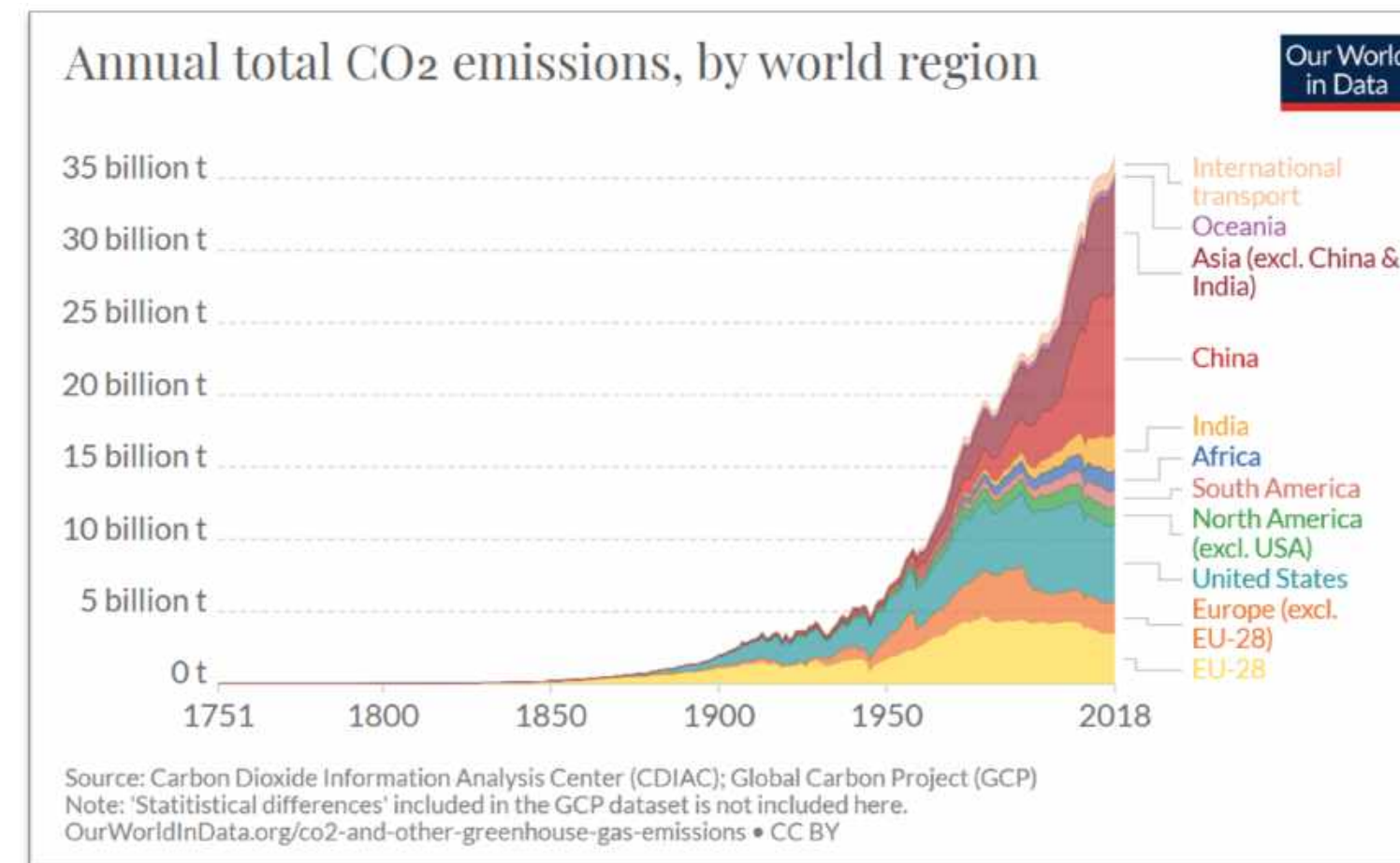
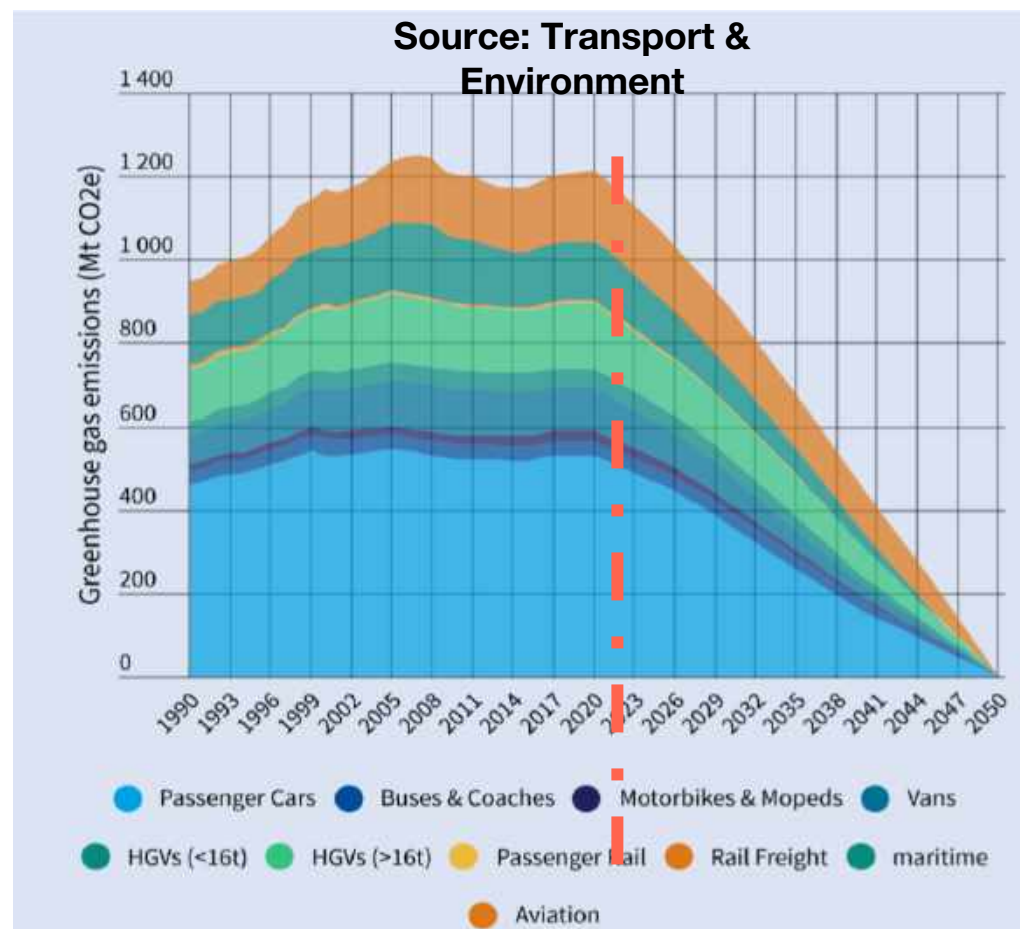


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- G-NMC high energy density scalable battery packs for E-Bus & E-Truck.
- Functional safe BMS and remote data logging.
- In different E-Bus applications using opportunity charging & battery swap systems.
- LTO batteries used in Fuel-cell trucks to manage peak power demand.



Full decarbonization of Transport in 2050 ?



Prices to reflect impact on environment

- Ending subsidies for fossil fuel, ICE Vehicles & their supply chain.
- Local governments to implement Bonus-malus Taxation
- Extend emissions trading scheme for maritime sector
- Zero emissions procurement strategies : More involvement from municipalities to States

Shift gear up on electrification targets

- 30%-'30 Rule for Trucks, Construction & Agri
- Phase out ICE Vans & buses by 2030
- Minimize air & Roadfreight : Shift - 2 Rail
- Battery technologies evolving quickly – Need same speed in charging infrastructure & Hydrogen production

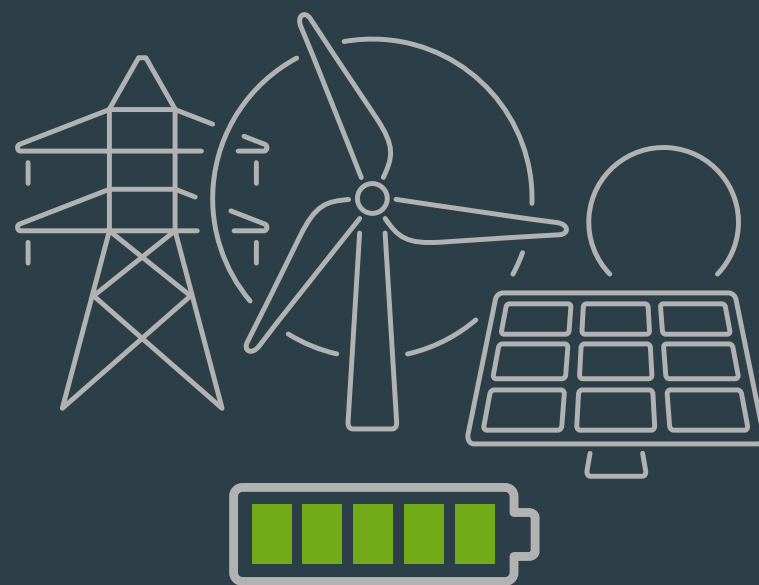
Need Global Approach

- Need Global Policies & Co-operation – EU Counts for 9% of Global CO₂ emissions only. Extend New Green Deals to BRICs
- EU Manufacturers playing an important role driving global demand to EV

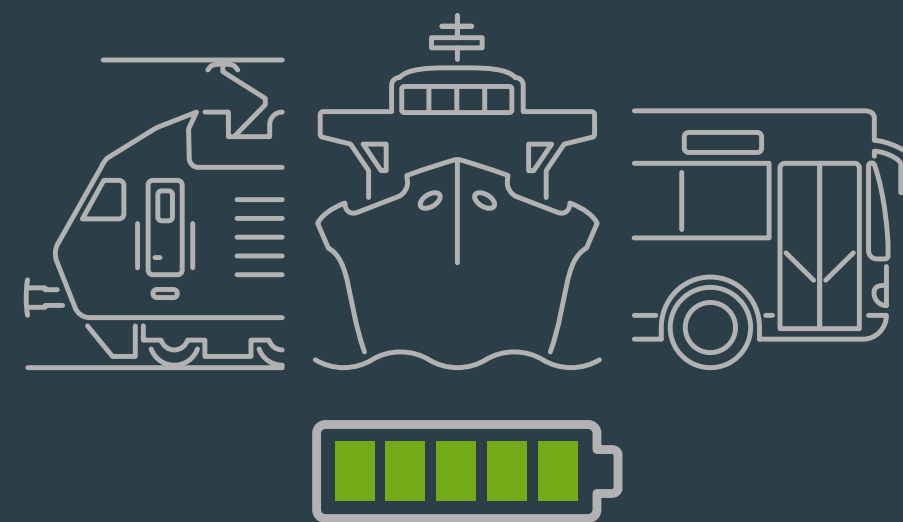


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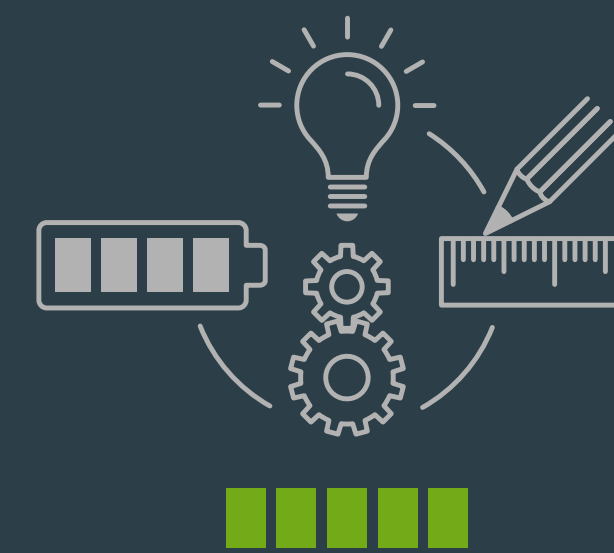
Thank you



**STATIONARY
SOLUTIONS**



**e-TRANSPORT
SOLUTIONS**



**SPECIALTY BATTERY
SYSTEMS**