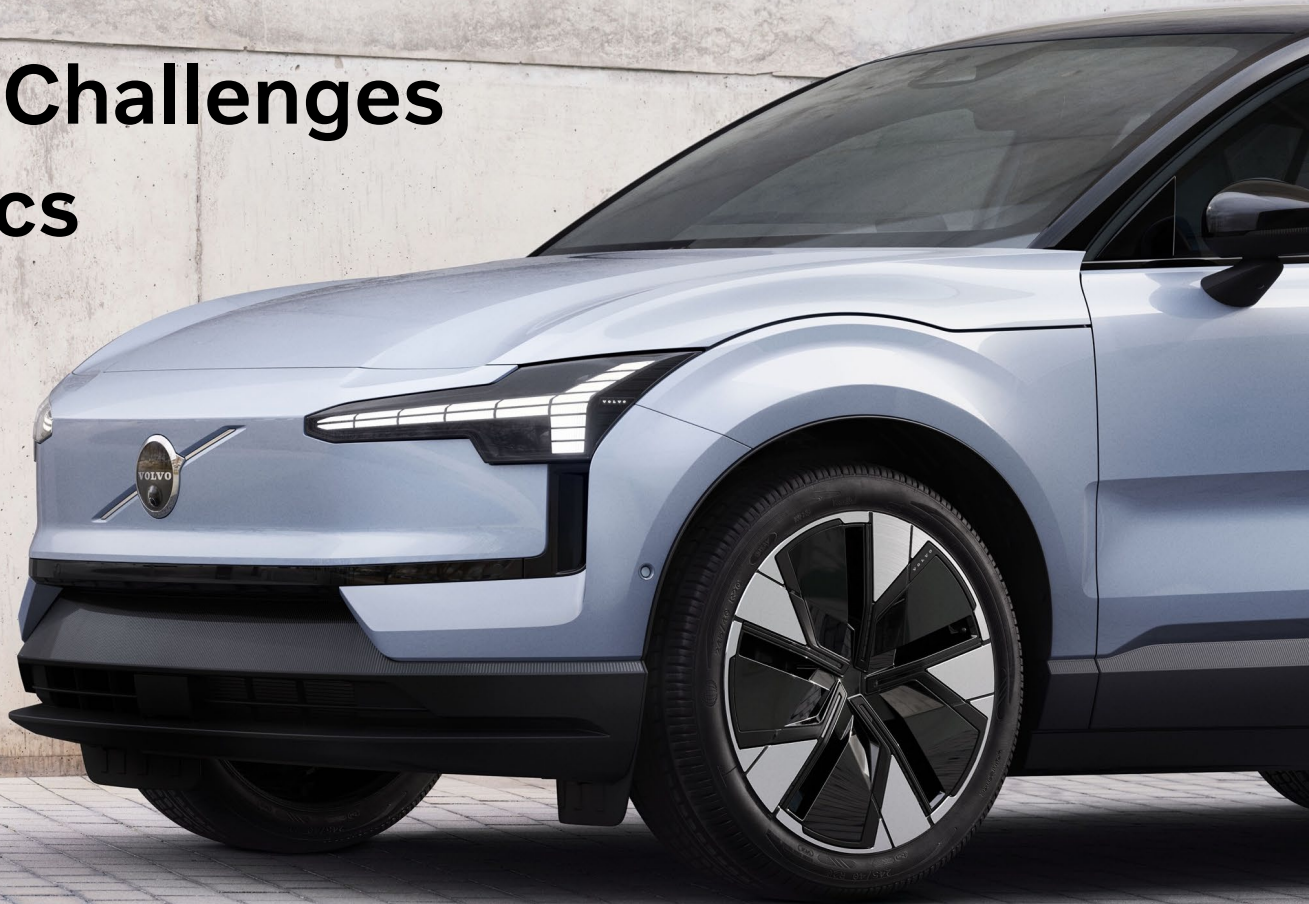


VOLVO

Opportunities and Challenges in Power Electronics



Riccardo Negri, Security Class: Proprietary

2024.05.16

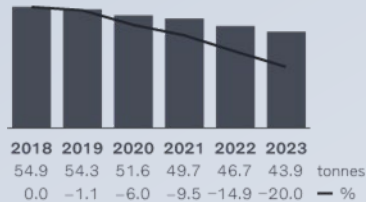
Our Ambitions

CO₂ EMISSION REDUCTION PER
AVERAGE VEHICLE

-75 % IN 2030

-40 % IN 2025

(-20 % IN 2023)



FULLY ELECTRIC VEHICLES (BEVS)
SHARE OF TOTAL SALES

100% IN 2030

50 % IN 2025

(**16%** IN 2023)



Geared for premium growth with a balanced portfolio

All models available are available as plug-in hybrids or fully electric. Since 2020 all new models have been fully electric. During 2023, we revealed two new cars, the EX30 in June and EM90 in November.



PLUG-IN AND MILD-HYBRIDS



FULLY ELECTRIC



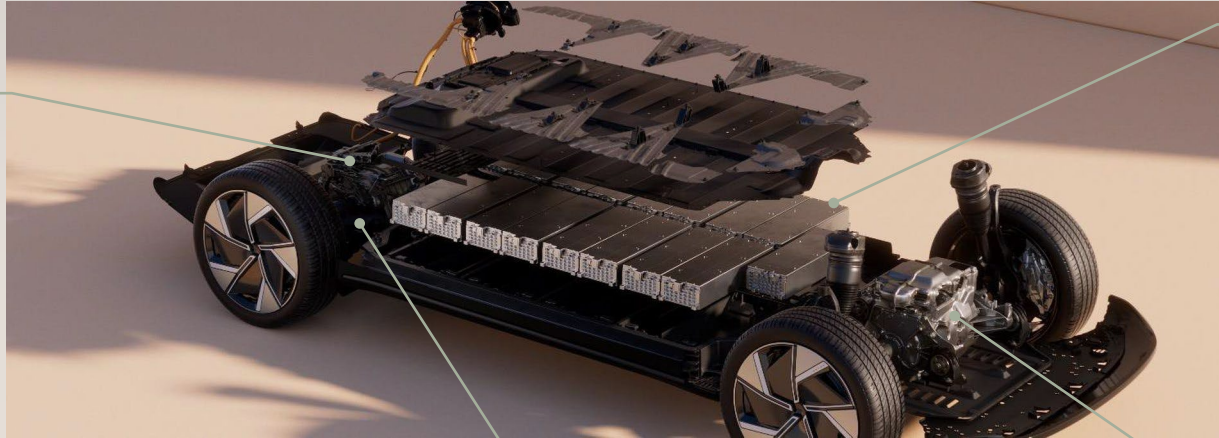
EX90 Twin Motor Performance



ERAD

200 kW / 490 Nm
PMSM
SiC Inverter

Floor Battery
111 kWh



EFAD
180 kW / 420 Nm
PMSM
SiC Inverter

On Board Charger
11 kW

*EFAD Electric Front Axle Drive
ERAD Electric Rear Axle Drive
PMSM Permanent Magnet Synchronous Machine
SiC Silicon Carbide*

SiC makes the difference

EC40 RECHARGE TWIN MOTOR

550km

WLTP range

+100km

compared
MY21

~30km

Range
increase due
to SiC



The in house Inverter journey in BEV

2019

Tier 1 suppliers

Mid Decade

First In house
Inverter

Master Power Electronics

FIVE REASONS TO GO IN HOUSE

SU STAIN ABLE



Secure design and component selection according our sustainability requirements

PR ODU CT



Optimize System Design of our Powertrains and Vehicles

TECH NOL OGY



Speed up new Technologies introduction

CUST OM ERS



Optimize Product attributes.
No one knows our customers better than us

FOR LIFE



Ensure Reliability and Quality

Next 3 Challenges

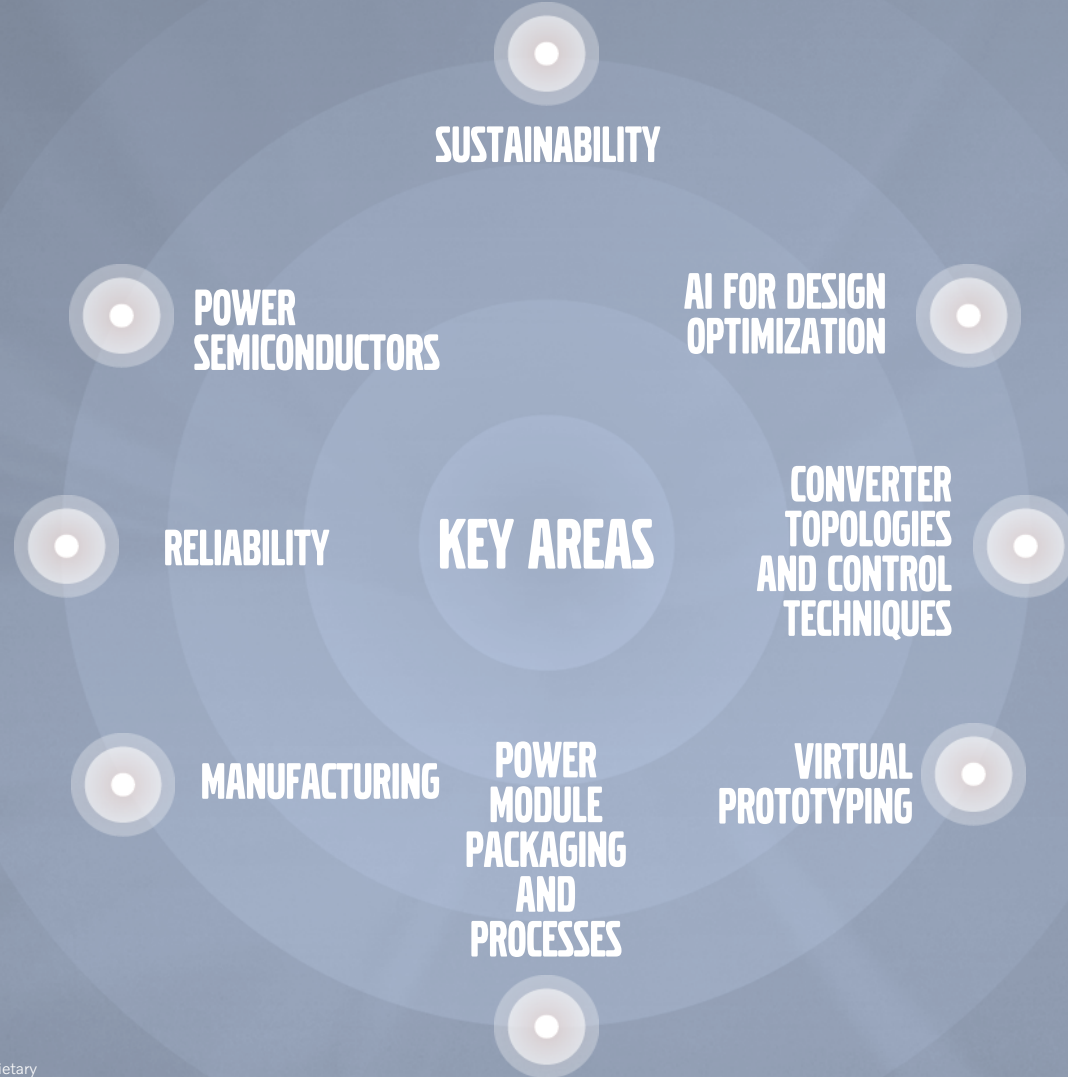
Secure supply chain: diversification and alternatives

Create a Power Electronics Ecosystem: Scaling up competence and infrastructure

Optimize Circularity and Sustainability without compromising performance and cost



V O L V O



Power Electronics Department

OUR NUMBERS

12

Teams

~170

People

2Technology
areas**10**Master
Thesis/Year**2**

Ongoing PhD

10+Advanced
engineering
projects

VOLVO

Thank you!

