

# REM2011 Thermal Management of Electric Vehicles

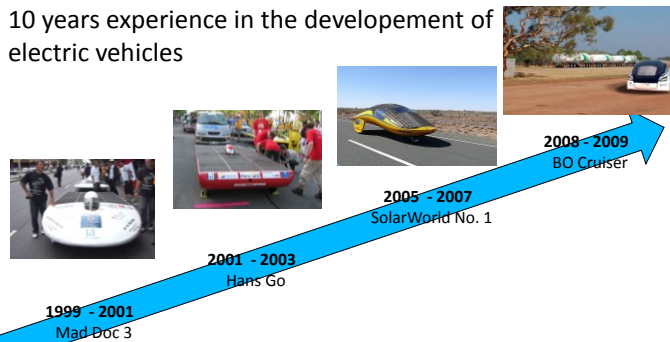
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## The Electric Vehicle Institute

10 years experience in the development of  
electric vehicles



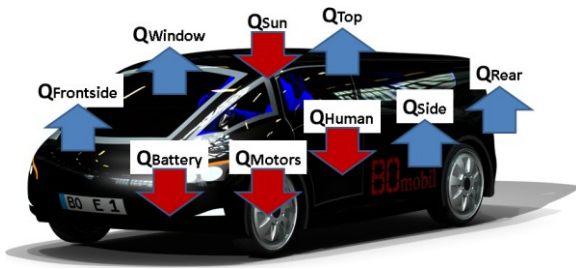
## The BOmobil Project

- length: 4.000 mm
- width: 1.690 mm
- height: 1.650 mm
- weight: ca.1000 kg
- load: 500 kg
- 4 wheel drive
- 4 hubmotors (a 15 kW)
- battery: LI-ION
- charging time: 6 h
- funded by german government



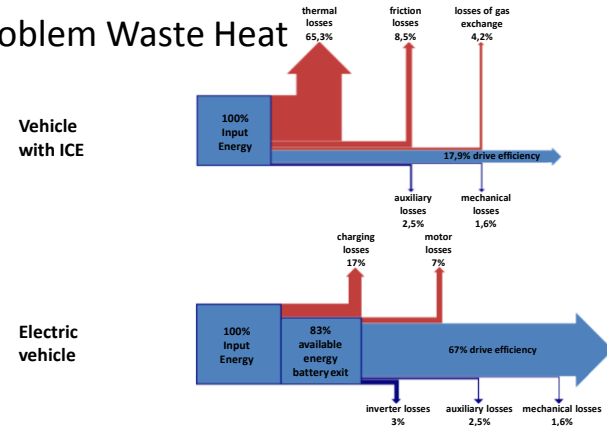
**Ziel2.NRW**  
Regionale Wettbewerbsfähigkeit und Beschäftigung

### Car Body – Heat convection



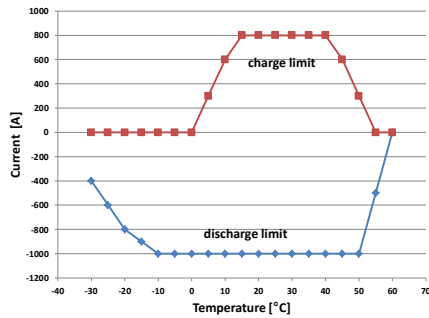
~6kW needed for heating ⇔ ~2,0kW available

### Problem Waste Heat

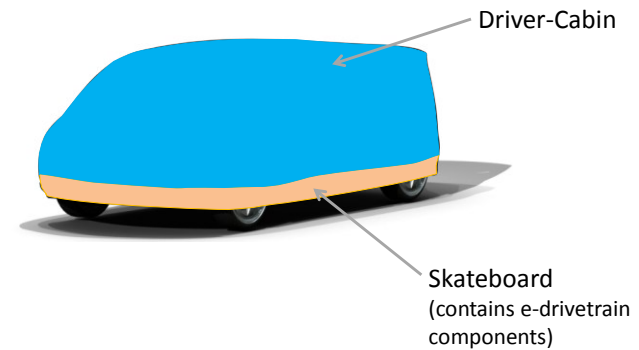


### Battery current / temperature limits

Battery system:  
LI-ION  
Energy:  
~27,5 kWh  
Voltage:  
~280V



### Thermal Zones of the BOmobil



## Thermalzones - Skateboard

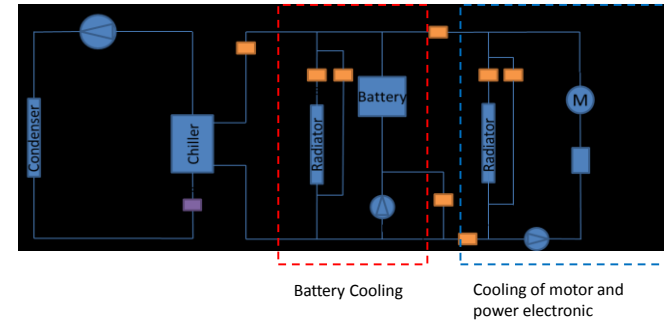
Heat source average 4kW (NEDC)



Contains:

- Battery system
- Power electronics
- Electric motors

## Thermal System



Battery Cooling

Cooling of motor and  
power electronic

Thank you!