



Solar World Congress 2025

03 - 07 November in Fortaleza, Brazil
in advance of COP30 in Belém, Brazil



Panel – The Battery Part

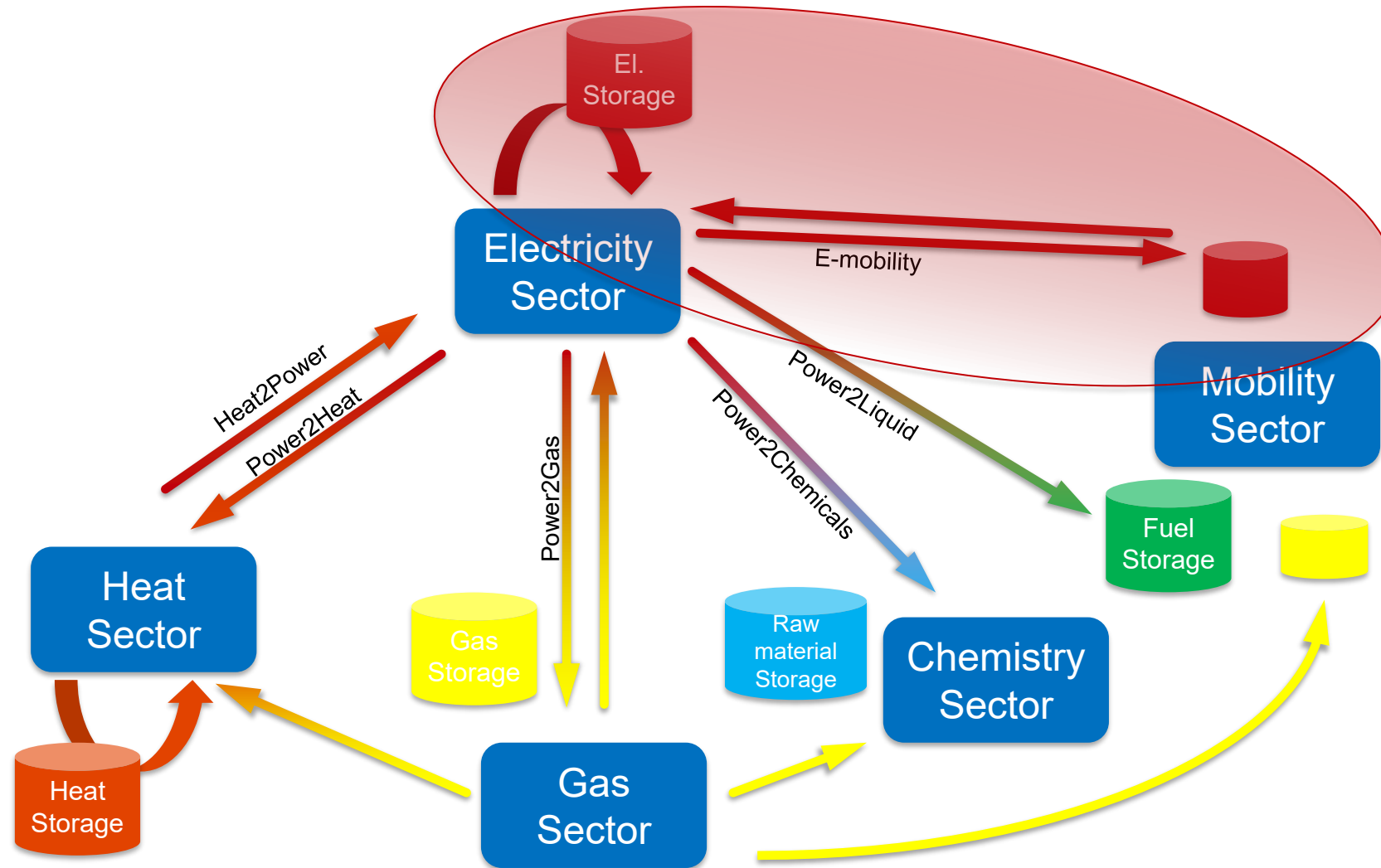
Ingo Stadler

Prof. Dr. habil. Ingo Stadler

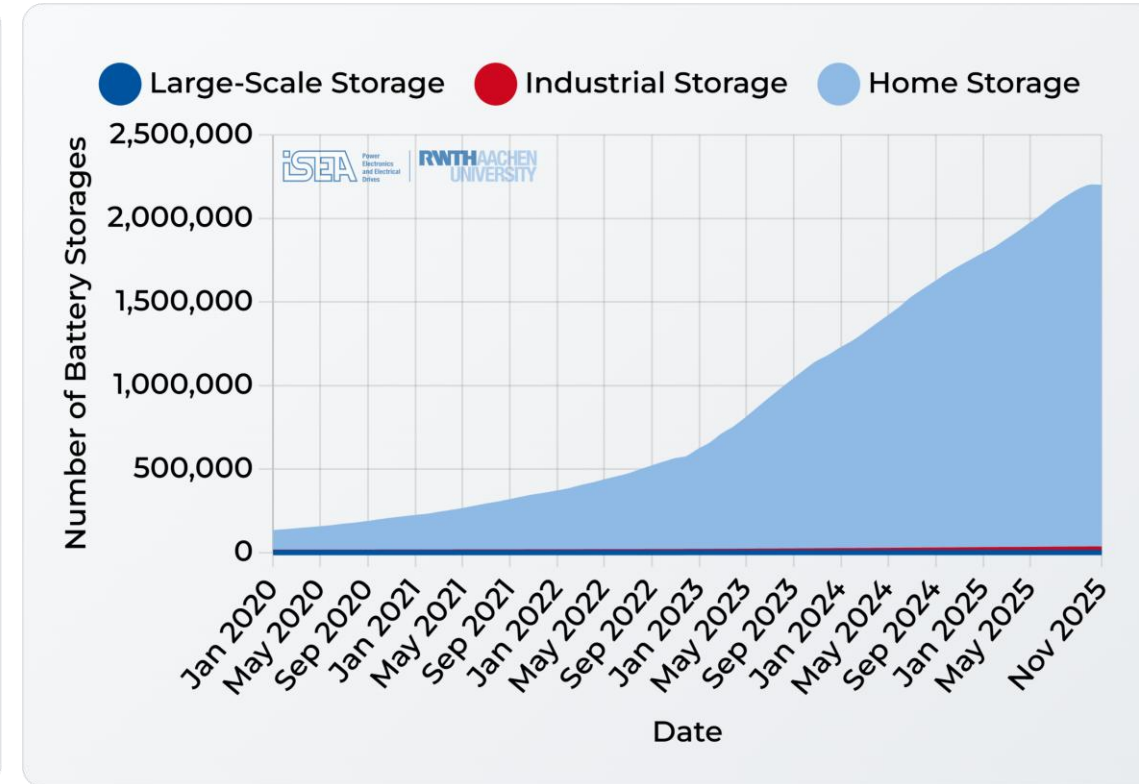
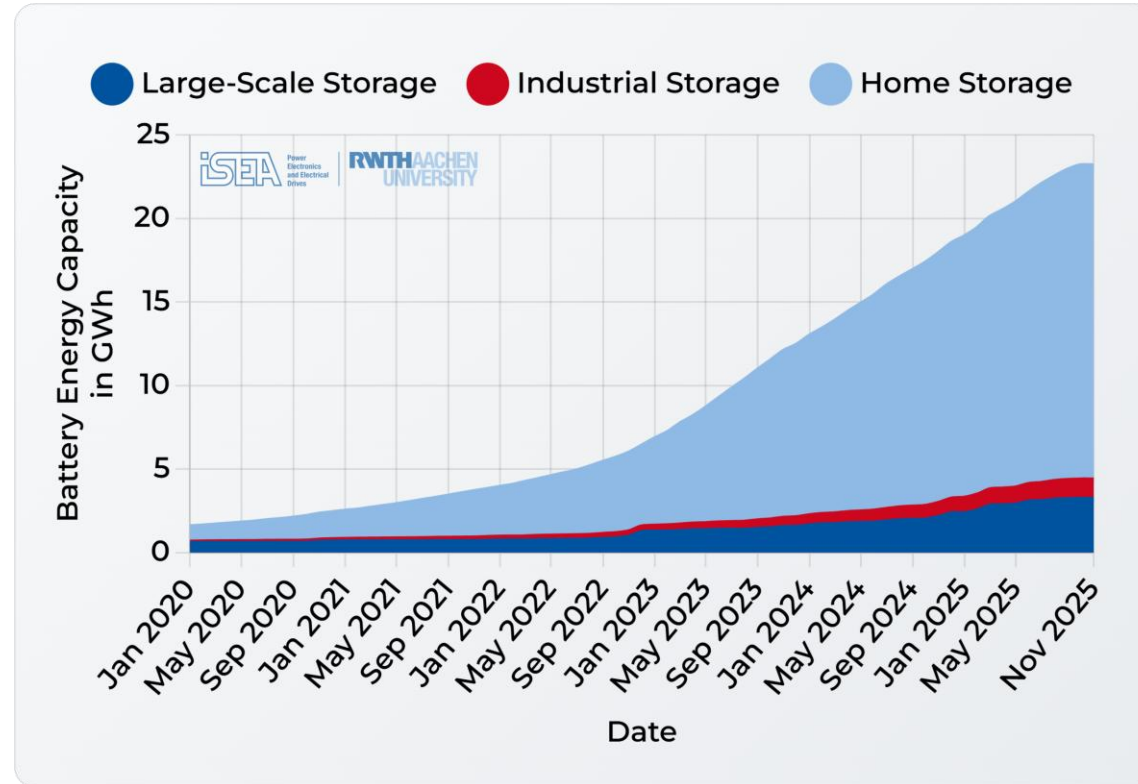
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Energy Sector Coupling

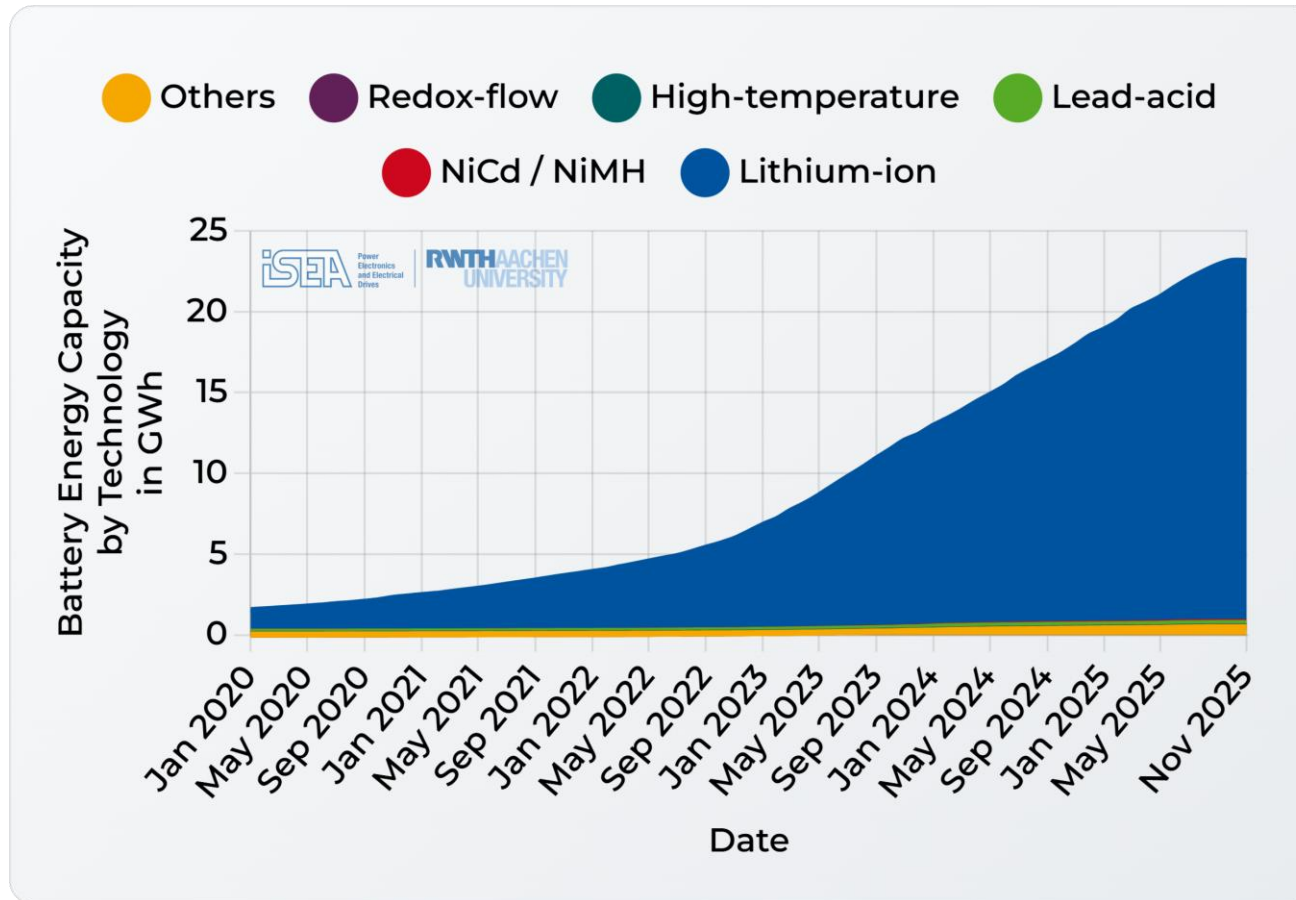


Battery Capacity in Germany



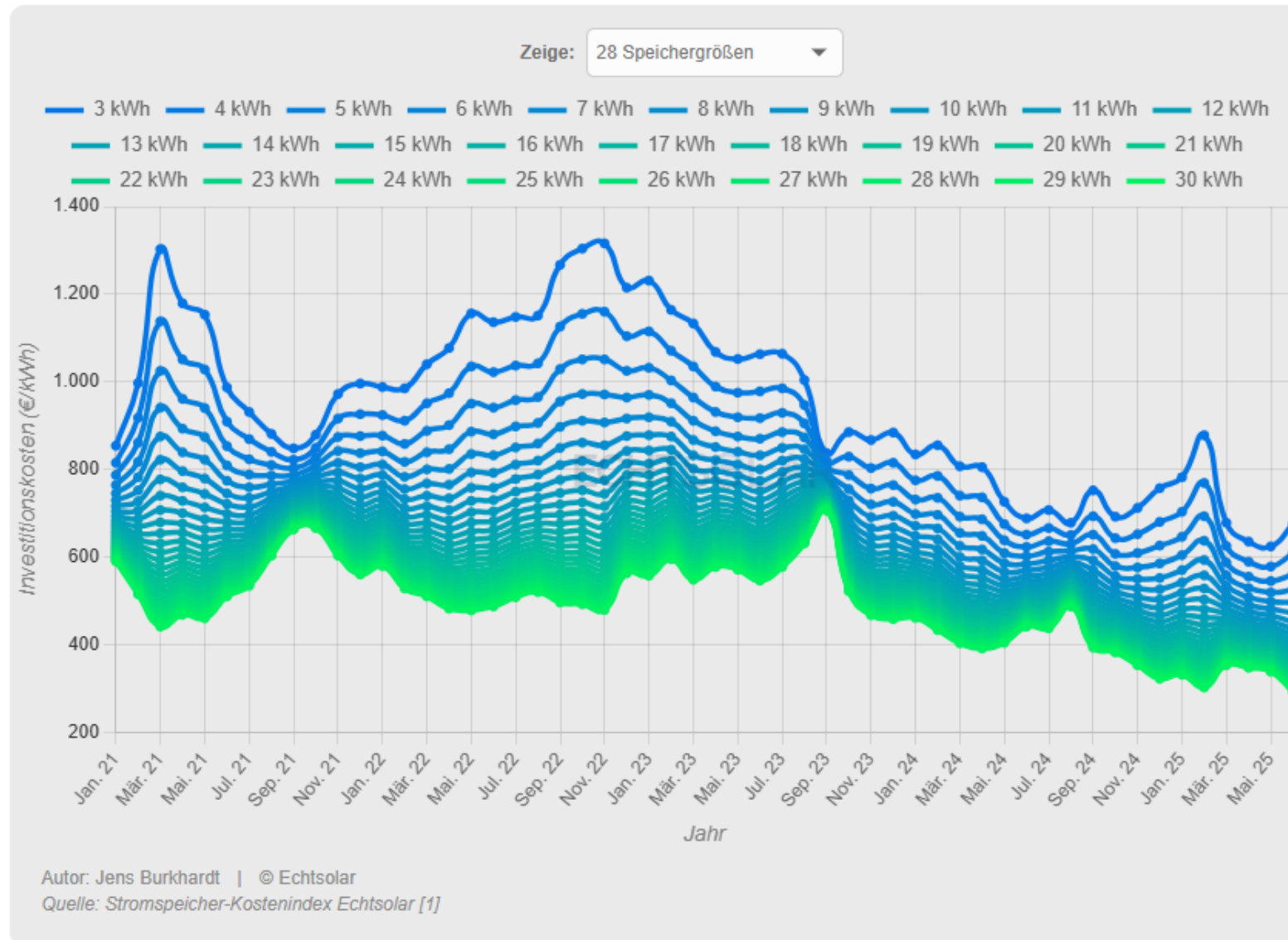
Source: battery-charts.de/battery-charts

Battery Capacity in Germany

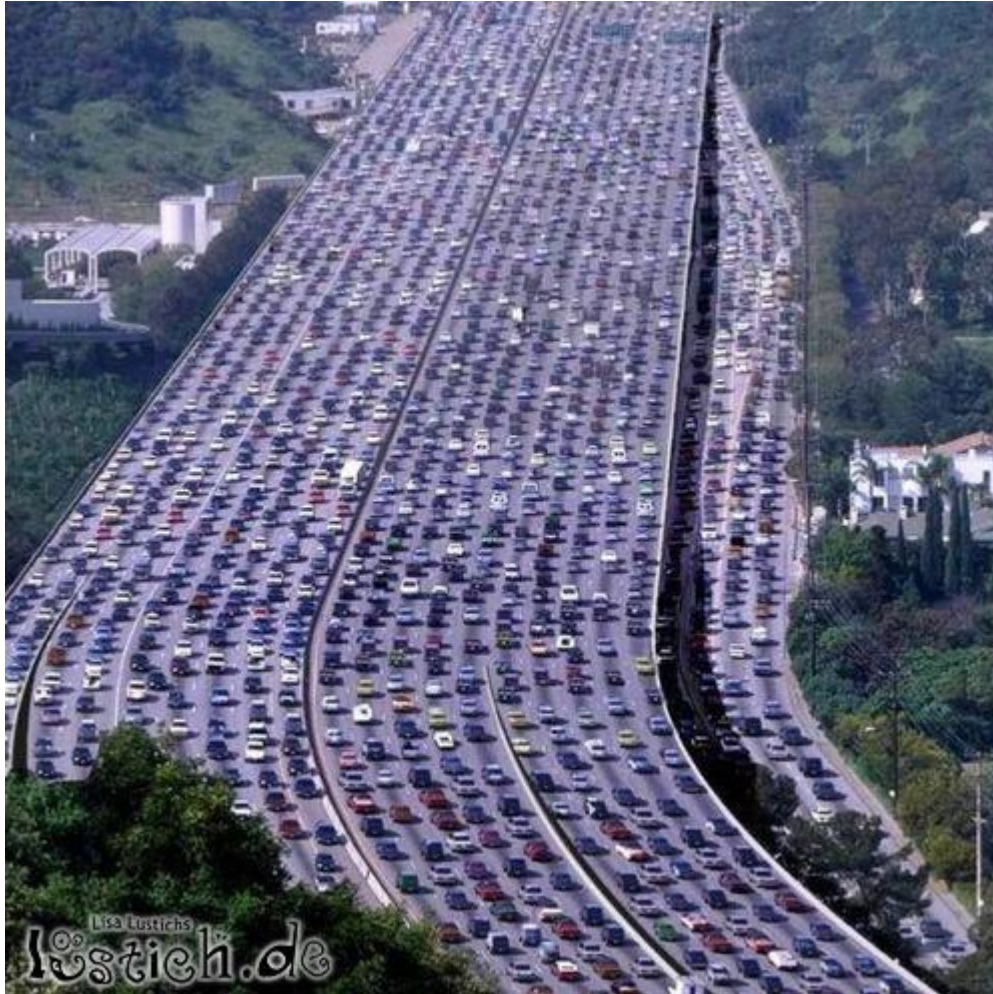


Source: battery-charts.de/battery-charts

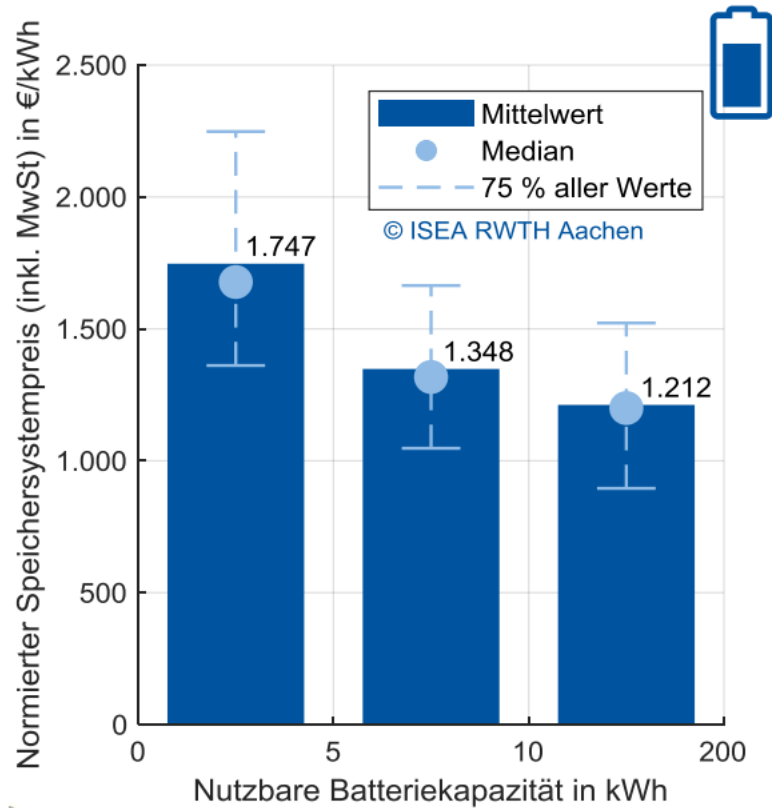
Battery SYSTEM Cost in Germany



We need less cars – but when we have them they should be battery driven electric cars!



Coupling of Energy Sectors – Battery Home Storage VS e-car



In the house

$750 \frac{\text{€}}{\text{kWh}}$



In the car

30.000 € including 40 kWh Batterie

$750 \frac{\text{€}}{\text{kWh}}$





17.000 euro
24,3 kWh
699 €/kWh

Cost of a car (€)

Battery Capacity (kWh)

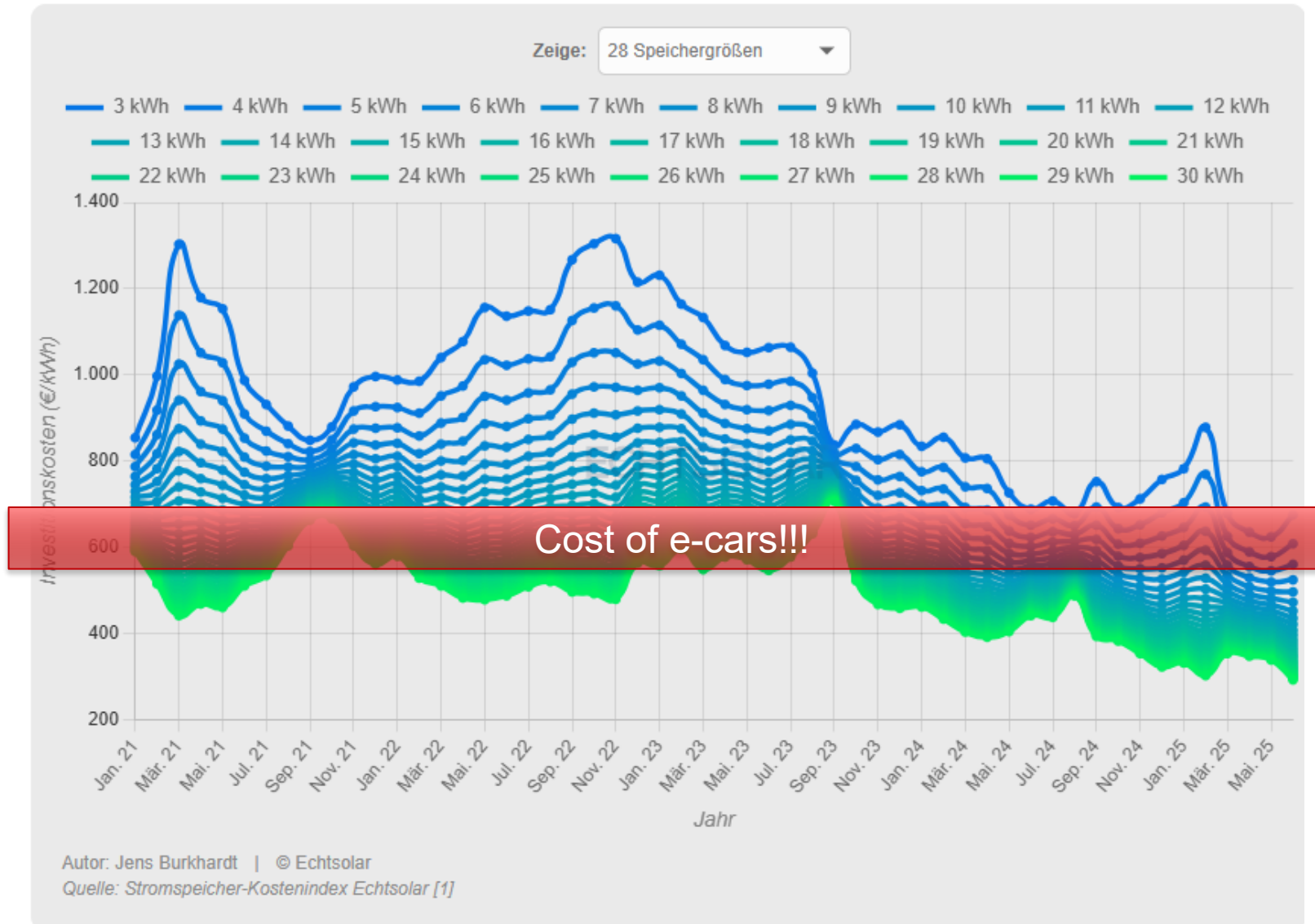
22.800 Euro
42 kWh
542 €/kWh



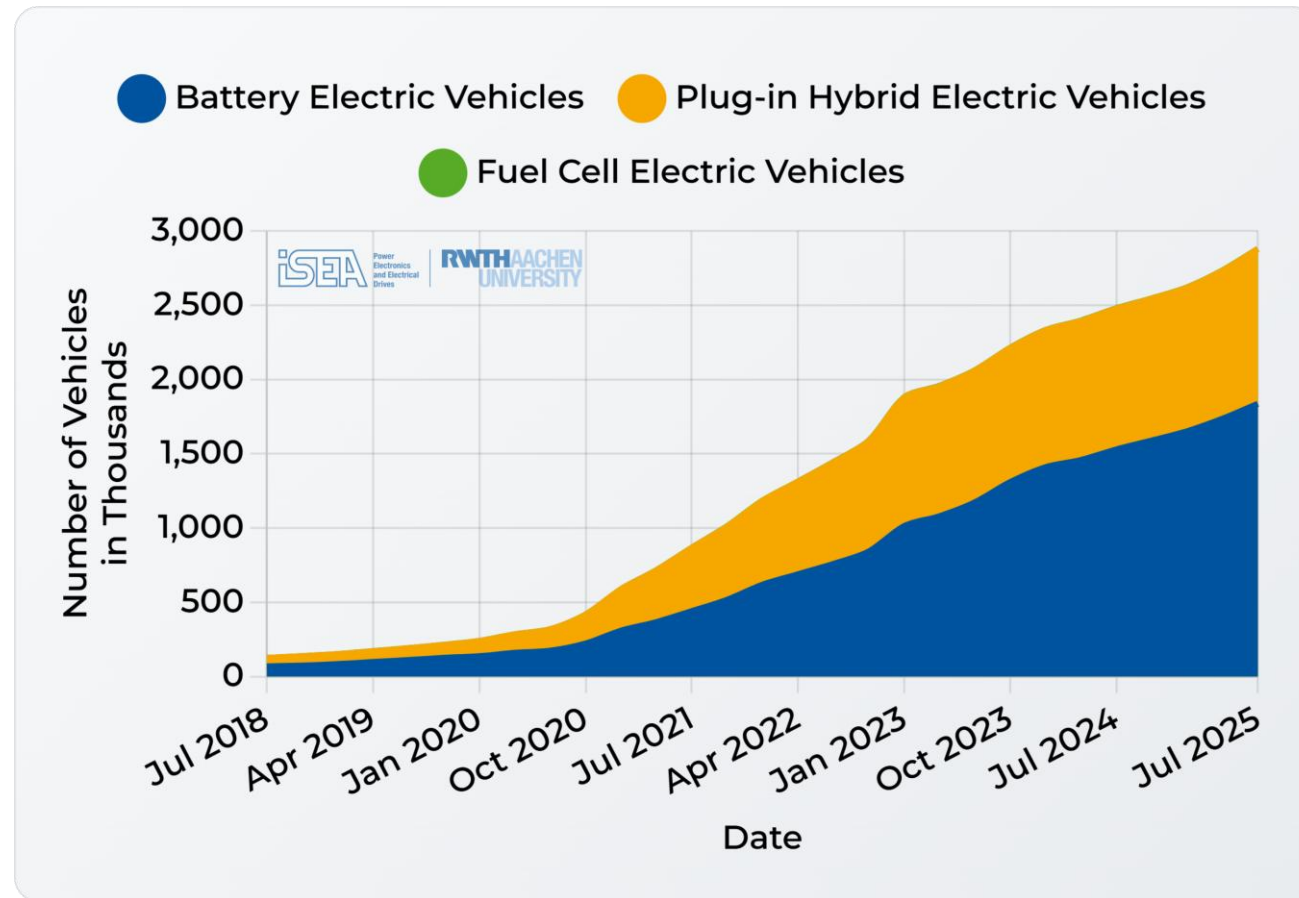
36.396 Euro
54 kWh
673 €/kWh



Battery SYSTEM Cost in Germany



Battery Capacity in Germany – e-cars



Source: battery-charts.de/mobility-charts

Battery Capacity in Germany – e-cars

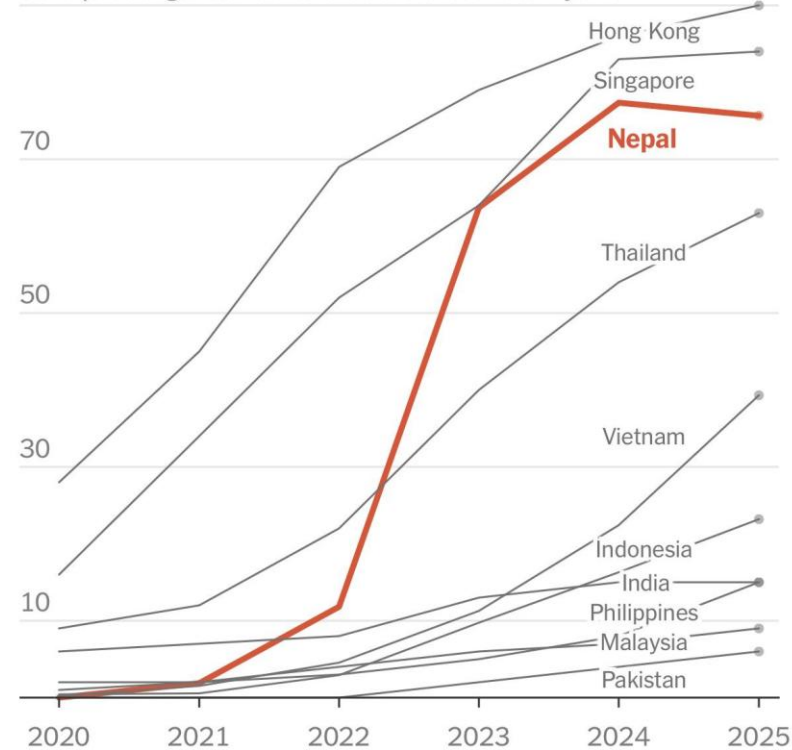


Source: battery-charts.de/mobility-charts

China's Neighbors Are Quickly Adopting Electric Vehicles

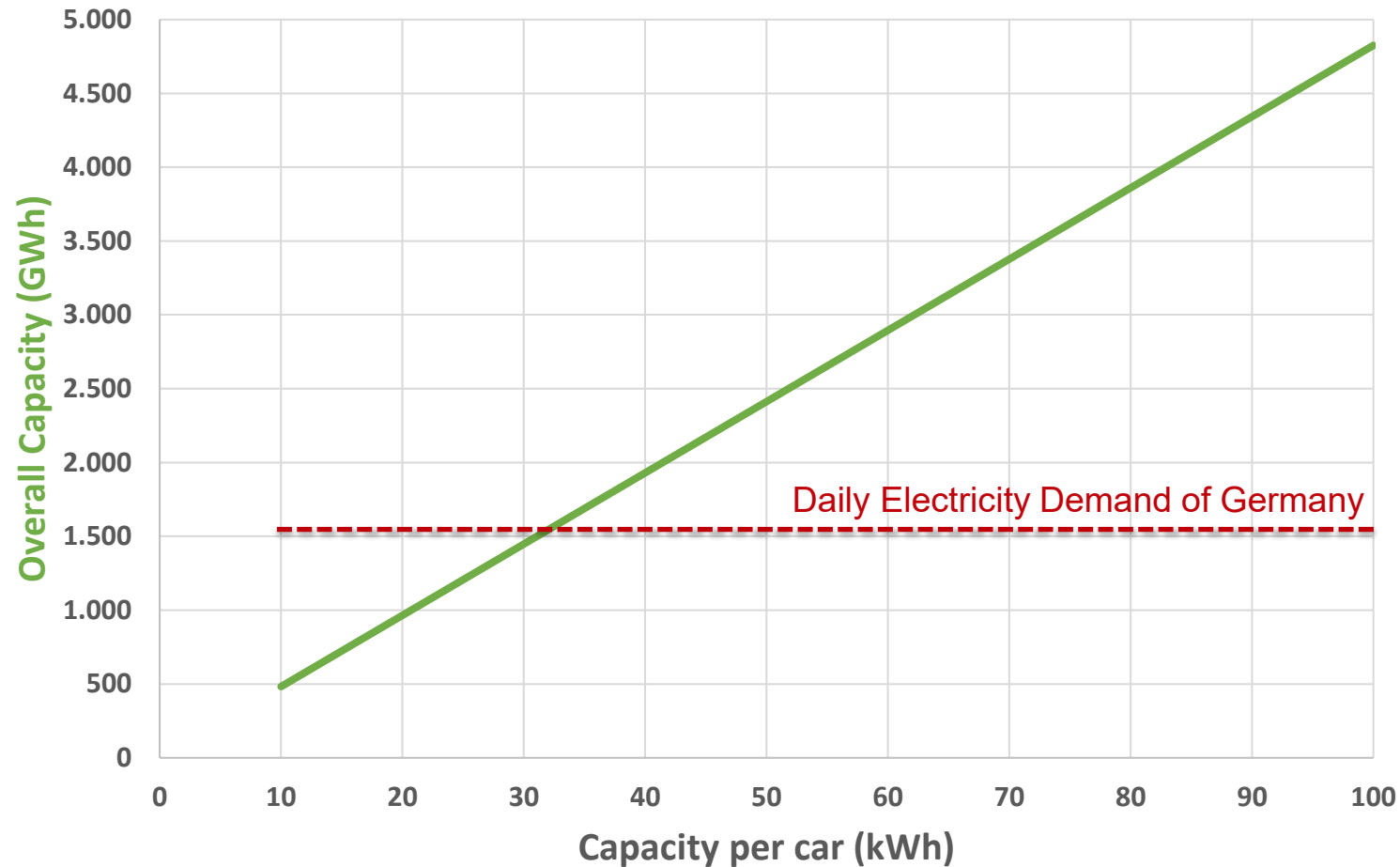
Cheap, imported battery-powered cars are taking over some markets in East Asia, while others lag behind.

90% passenger car sales that are electric or hybrid



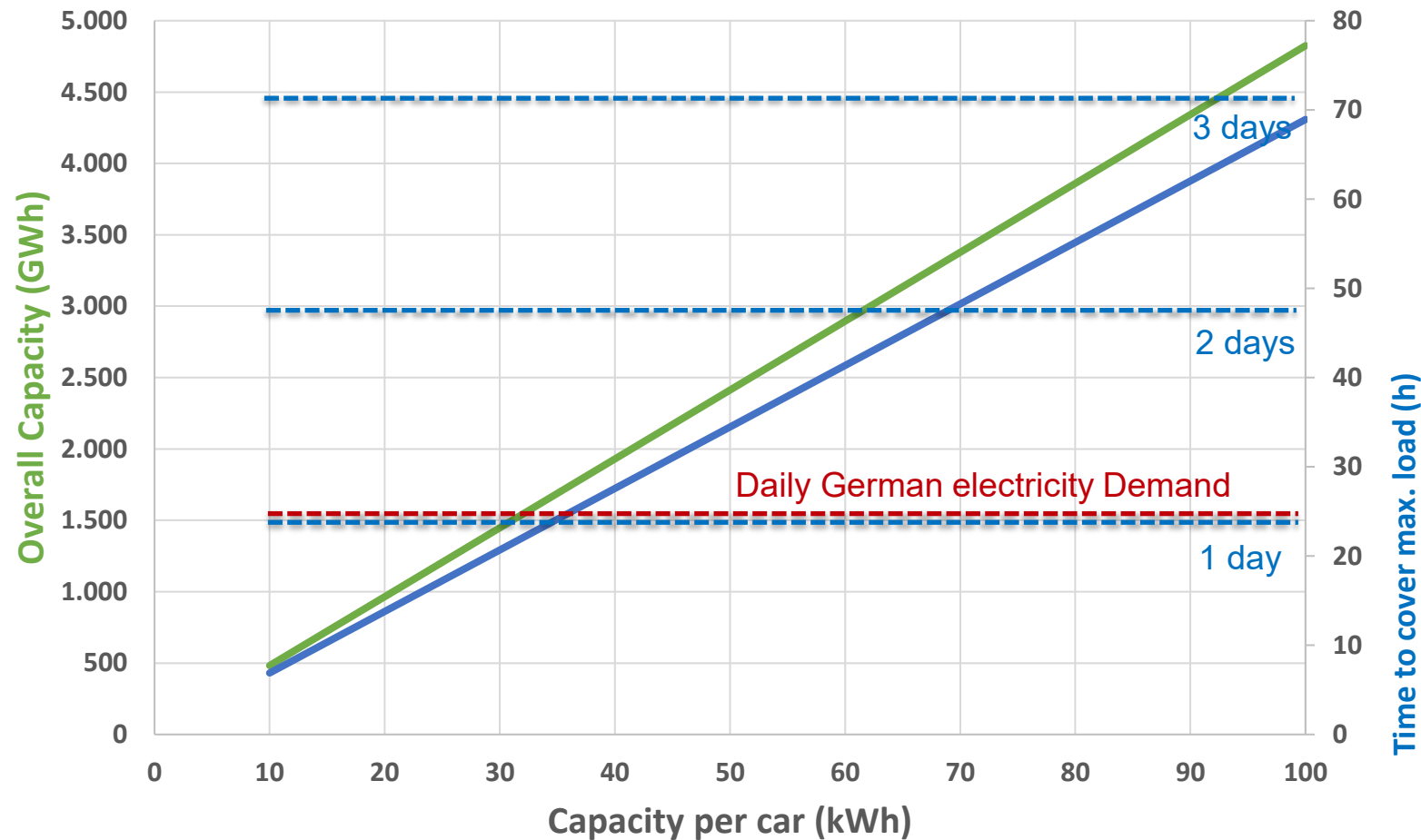
Nepal data represents imports, and is delineated by years starting and ending in July. • Source: Segment Y • By The New York Times

Energy Sector Coupling - E-cars



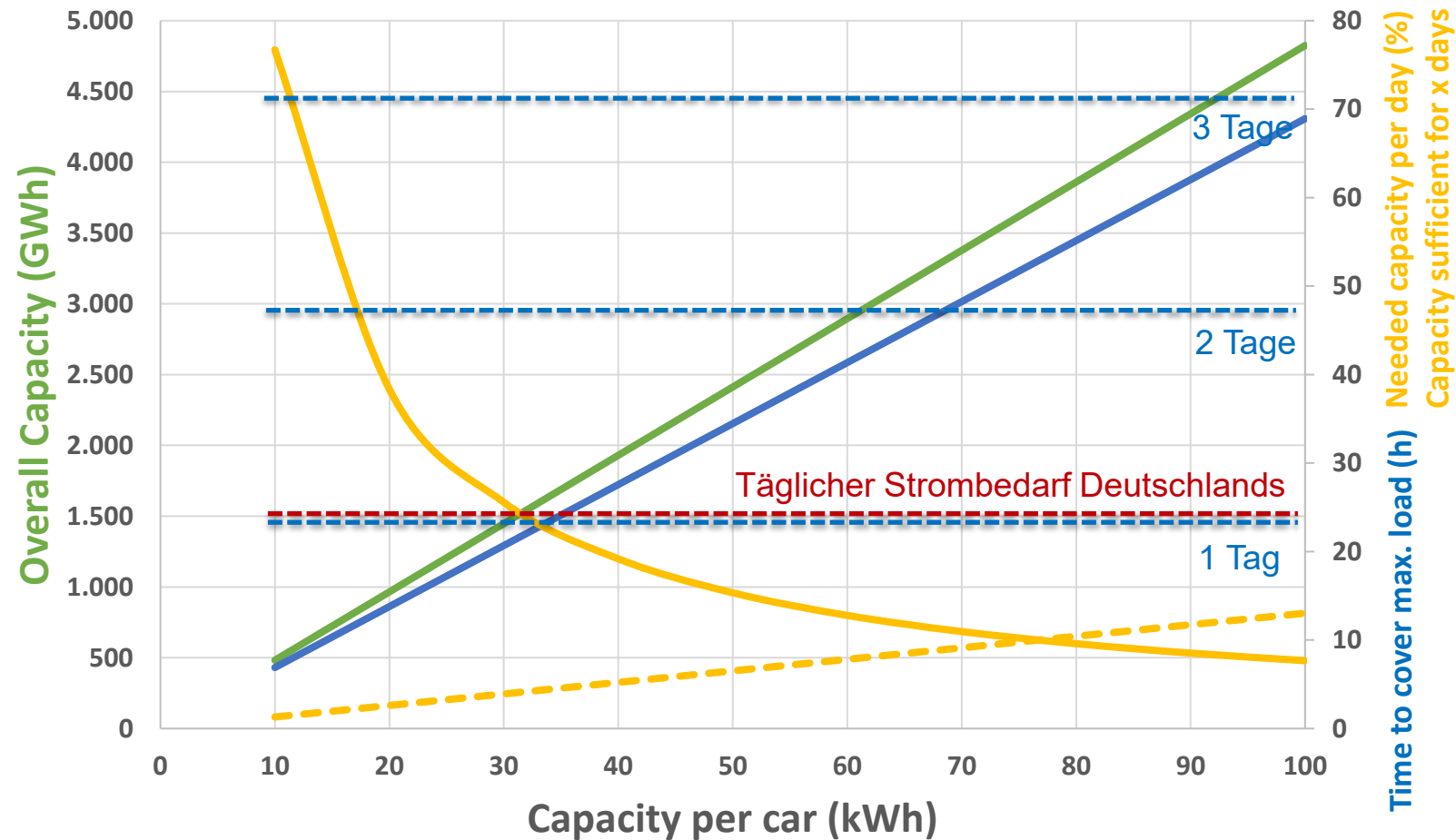
- ✓ Cars in Germany:
48.249.000
- ✓ Assumption: 100%

Energy Sector Coupling - E-cars



✓ Yearly maximum grid
load:
~ 70 GW

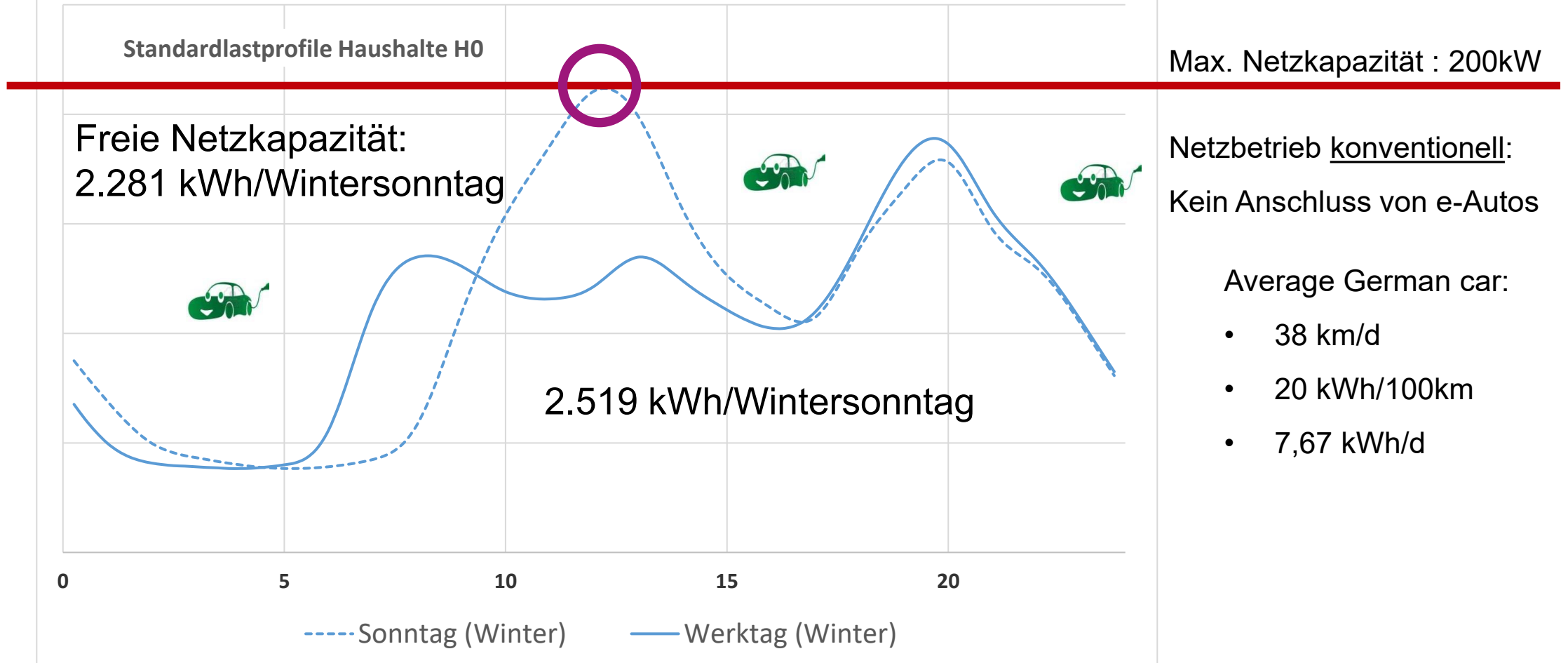
Energy Sector Coupling - E-cars



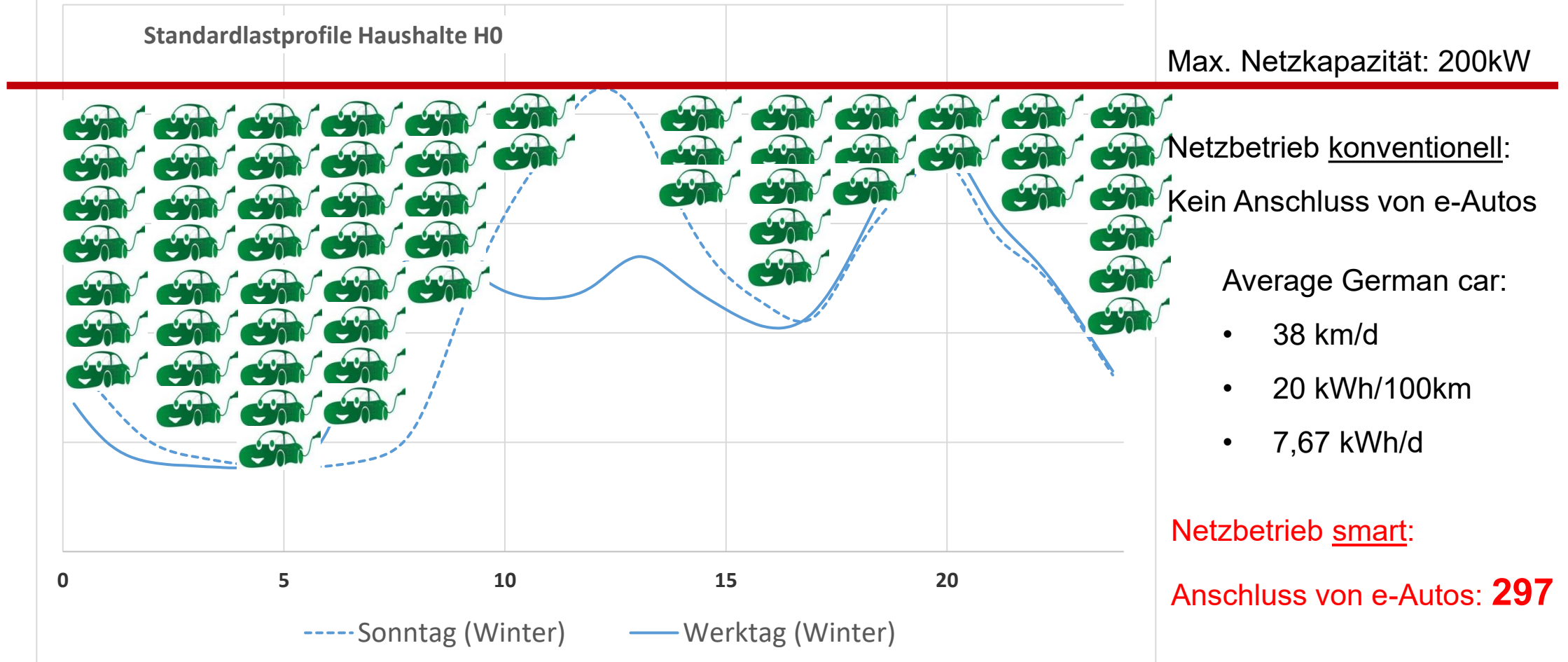
Average German car:

- ✓ 38 km/Tag
- ✓ 20 kWh/100km
- ✓ 7,67 kWh/day

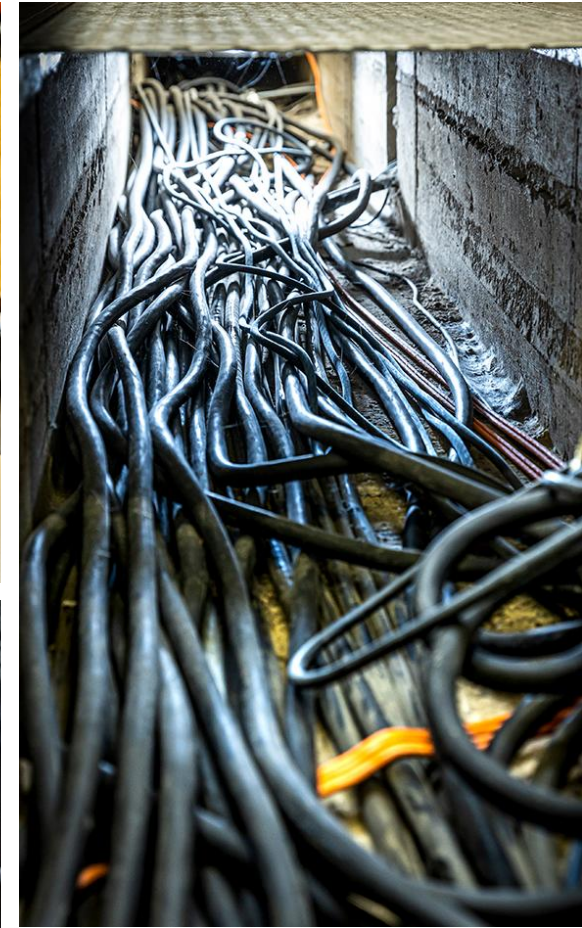
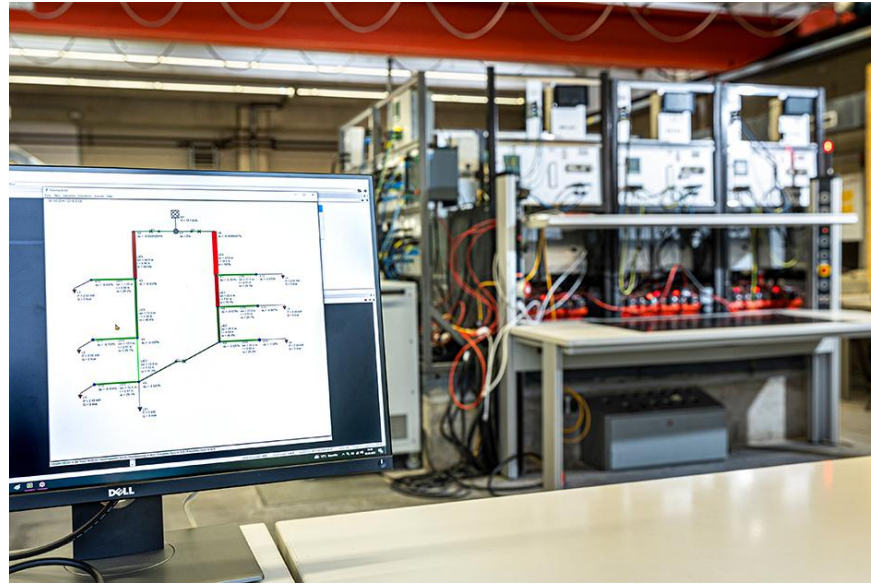
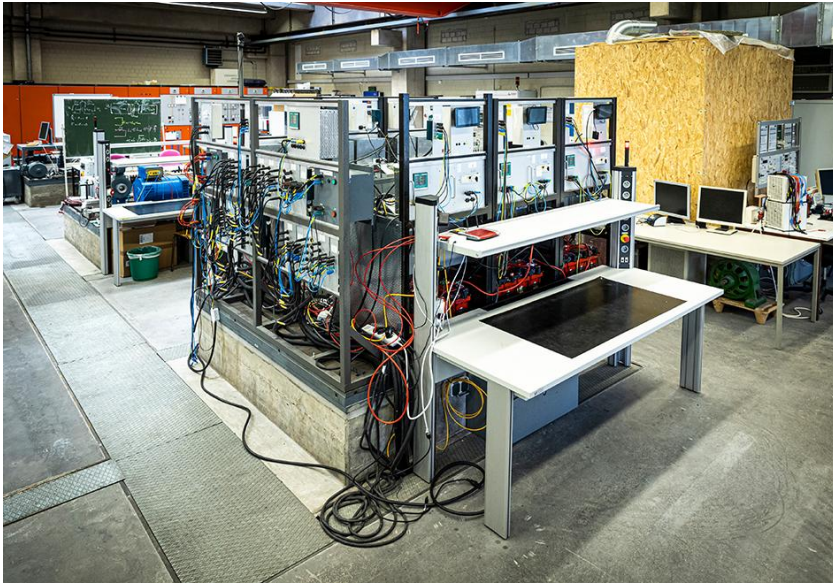
GridMaximizer Potential: Annahme: schwaches Netz, an Belastungsgrenze, auch ohne e-Autos und Wärmepumpen



GridMaximizer Potential: Annahme: schwaches Netz, an Belastungsgrenze, auch ohne e-Autos und Wärmepumpen



**Technology for climate neutral traffic is there!
At the same time they contribute to energy system stability!**



Prof. Dr. habil. Ingo Stadler, Prof. Dr. Eberhard Waffenschmidt
André Ulrich, Marcel Krämer, Sven Lorre, Dr. Sergej Baum
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