EV’s & Charging from a
Commercial vehicle perspective
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Commercial EV compared to car

- 4-8 times higher Energy consumption per km (electric city bus typically 1.3 kWh/km)
- Typical yearly driving distance up to 100,000 km. (urban vehicles usually < 30,000 km)
- High energy, power and daily use => severe battery req (energy throughput often >10 times higher per year).
- Commercial vehicle customers used to calculate TCO => easier to justify high capital investment when low operating cost.
- Not relying on public charging infrastructure (until en-route charging possible?)
- Charging power for in-use charging typically >200 kW.
EV Motivation

Pros

• Efficiency
• Energy cost
• CO2 emissions
• Energy supply
• Noise
• Electricity global "fuel" quality
• Realistic for large scale zero emission transport system

Cons

• Vehicle price (battery cost)
• Driving range (battery capacity)
• Load capacity (battery weight)
• Fueling/charging time
Charging challenge regardless of battery size

Time to charge 240 km
5 minutes

Energy storage for 240 km
150 kg diesel-tank

7 days
> 5 ton battery

9 hours
> 5 ton battery

4 hours
> 5 ton battery
Charging/battery trade-off

**Conventional**
- 240 km = 140 liter Diesel *(90 liter if Hybrid)*
- 240 km = 0.5 MWh electricity *(> 5 ton battery)*

**En-route static**
- 24 charges @ 250 kW for 5 minutes = 0.5 MWh
- 300...400 kg battery needed

**En-route Dynamic**
- Continuous charge @ 40 kW for 12 hours
- <100 kg battery needed
Conclusion
With En-route charging

Cons => Pros

• Vehicle price (battery cost)  
  Good

• Driving range (battery capacity)  
  Good

• Load capacity (battery weight)  
  Good

• Fueling/charging time  
  Optimum
The total HEV and BEV market value in 2024

Commercial vehicles are the winners!

Source: IDTechEx