Electric Vehicle Classification Based on Range and Fast Charging

Jai Kumar Gupta

13-04-2025

Range CLassification

CDF Analysis shows that approximately **22.45%** of EVs have a range of 250 km.

These lower-range EVs tend to be smaller, city-focused models—ideal for urban driving but less suited for long-distance travel.

Top 10 EVs with Range 250 km

Brand	Model	TopSpeed (km/h)	Range (km)	FastCharge (km/h)
BMW	i3 120 Ah	150	235	270
Nissan	Leaf	144	220	230
Volkswagen	e-Golf	150	190	220
Sono	Sion	140	225	270
Smart	EQ fortwo coupe	130	100	-
Smart	EQ fortwo cabrio	130	95	-
Smart	EQ forfour	130	95	-
Skoda	CITIGOe iV	130	195	170
SEAT	Mii Electric	130	195	170
Renault	Twingo ZE	135	130	-

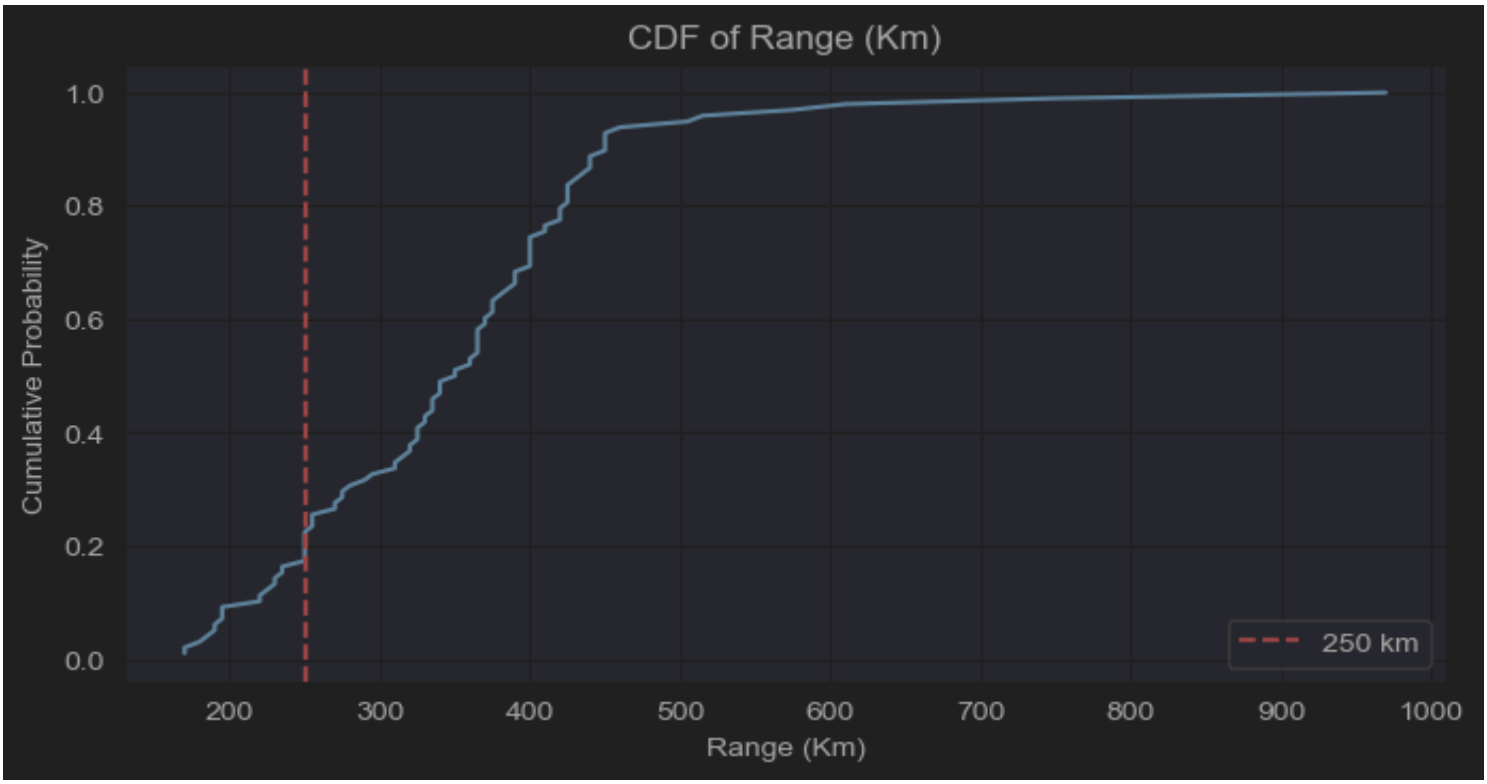
Insight: These models are typically compact and relatively affordable, but with limited long-range capabilities. A number of them (Smart, Skoda, SEAT) also lack ultra-fast charging.

Fast Charging Classification

Your PDF and Gaussian fit show a wide distribution in fast-charging capabilities.

Only **8.16%** of EVs support ultra-fast charging 800 km/h—highlighting this as a premium feature.

Ultra-Fast Charging EVs (800 km/h)



Insight: These models are typically compact and relatively affordable, but with limited long- range capabilities. A number of them (Smart, Skoda, SEAT) also lack ultra-fast charging.

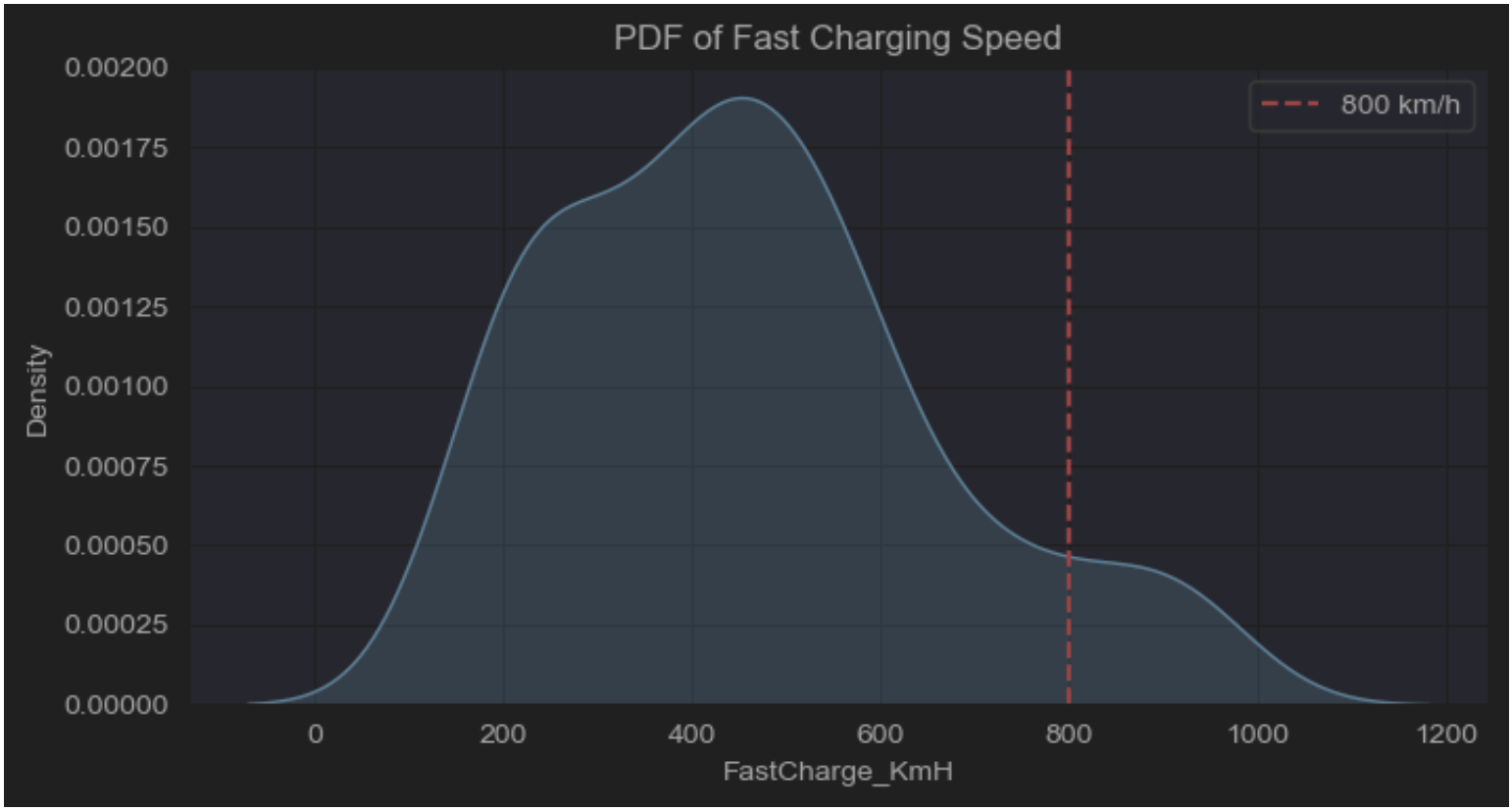
Fast Charging Classification

Your PDF and Gaussian fit show a wide distribution in fast-charging capabilities.

Only **8.16%** of EVs support ultra-fast charging 800 km/h—highlighting this as a premium feature.

Ultra-Fast Charging EVs (800 km/h)

Brand	Model	TopSpeed (km/h)	Range (km)	FastCharge (km/h)
Audi	e-tron GT	240	425	850
Porsche	Taycan 4S Plus	250	425	890
Porsche	Taycan Turbo	260	390	810
Tesla	Model 3 Long Range Dual Motor	233	450	940
Tesla	Model 3 Long Range Performance	261	435	910
Tesla	Model Y Long Range Dual Motor	217	425	930
Tesla	Model Y Long Range Performance	241	410	900
Tesla	Roadster	410	970	920



Insight: All of these belong to premium brands—notably Tesla, Porsche, and Audi. They're equipped not just with ultra-fast charging but also high range and performance, clearly targeting the long-distance and luxury market.

Key Takeaways

- The majority of EVs are still under the 250 km range mark, indicating either older tech or city-focused design.
- Ultra-fast charging is still niche, with only 8% of EVs supporting it, and mainly in high-end models.
- Tesla dominates the high-performance fast-charging segment, while brands like Smart and Renault serve the compact urban segment.
- There's a visible trade-off between affordability and performance—with affordable models compromising on range and charge speed.