NSF Workshop on Cyber-enabled Infrastructure to Support Carbon-neutral Electricity and Mobility

Empirical Analysis of Electric Vehicles' Charging Patterns - Case Study from Shanghai -

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Battery	^v Capacity
PHI	EV 9.1 kWh
PHI	EV 18.5 kWh
PHI	EV 15.2 kWh
BE	V 25.0 kWh
BE	V 35.0 kWh
BE	V 37.8 kWh
BE	V 48.3 kWh
BE	V 22.0 kWh

EV frequently returns its status:

- **SOC**, 0-100%
- Mileage by the odometer
- Location
- → **State**: traveling, charging, or parked.



Charging Power



Table: Slow-Charging	Ratio (SC	CR) for Differe	ent BEV Groups
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	S-BEV				L-BEV				
Capacity SCR	22.0 94%	25.0 94%	35.0 76%	37.8 11%	48.3 45%	25.0 67%	35.0 17%	37.8 1%	48.3 8%
Average SCR	69%				13%				

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Charging Load



Figure: Average charging load on the power grid per EV throughout a workday

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"Range Anxiety" (BEV)



choose to recharge when there

are 75-100 km range left in the

S-BEV users would choose vehicles whose battery can supply driving ranges **120 km** beyond their daily usage on average.



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(b) Remaining driving range before charging vs DVKT

battery.

Thank You

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