

Charging System	Advantages	Disadvantages
Overhead wiring (trolleybus)	Minimum battery amount on vehicle thus reducing vehicle weight, space required for batteries, and vehicle cost. Simple battery management system.	High infrastructure cost and limited route flexibility; electricity cost can be higher due to peak and off-peak day electricity consumption; high power requirements on the electric grid and high demand charge. ^a
Opportunity charging including ultrafast charging	Small to minimum battery amount on vehicle thus reducing vehicle weight, space required for batteries, and vehicle cost.	High infrastructure cost and limited route flexibility; electricity cost can be higher due to peak and off-peak day electricity consumption; high power requirements on the electric grid and high demand charge, but this can eventually be avoided with peak shaving. ^b
Fast charging	Increased vehicle range with lower battery quantity, thus reducing vehicle weight and cost.	Increased investment in chargers; higher electricity consumption charges are due to usage of day electricity; potentially high electricity demand charge.
Slow overnight charging	Minimum investment in charging, simple to manage, and usage of low-cost night electricity.	If this is the only charging approach used, then the vehicle will require a large battery set to have sufficient driving range, making the vehicle costly and heavy.
Battery swap	Less battery requirements on the bus if sufficient battery swap stations are available nearby.	Requires costly infrastructure and a larger amount of batteries in total; limited flexibility as battery swap systems are tied to vehicle brands.

^a A demand charge is a fee based on the highest rate, measured in kilowatt, at which electricity is drawn during any 15- to 30-minute interval in the monthly billing period. This is separate from the charge paid for the actual energy consumed, which is measured in kilowatt-hour.

^b On-site batteries can charge and discharge using direct current and connect to the grid through a large inverter. They can then charge from the grid at times when costs are lower, store the power, and release it when demand is higher. Through this, they can also level out the power demand posed on the grid and reduce the demand charge.

Source: Asian Development Bank.