Certified Specialist Programme in Fleet Electrification

Procurement and Lifecycle Cost Analysis

Procurement is the process of obtaining goods, services, or construction projects from an external source, often through a competitive bidding process. In the context of fleet electrification, procurement involves the acquisition of electric vehicles (EVs), charging infrastructure, and related services.

An essential aspect of procurement for fleet electrification is Lifecycle Cost Analysis (LCCA). LCCA is a method for assessing the total cost of ownership (TCO) of a product or system over its entire life cycle, including acquisition, operation, maintenance, and disposal. In fleet electrification, LCCA helps organizations compare the costs of traditional internal combustion engine (ICE) vehicles with EVs, taking into account factors such as fuel costs, maintenance costs, and government incentives.

Here are some key terms and vocabulary related to procurement and LCCA for fleet electrification:

1. Total Cost of Ownership (TCO): The total cost of owning and operating a product or system over its entire life cycle. TCO includes acquisition costs, operating costs, maintenance costs, and disposal costs.
2. Acquisition Costs: The upfront costs of purchasing a product or system, including any additional costs such as shipping, handling, and installation.
3. Operating Costs: The costs associated with using a product or system, such as energy or fuel costs, insurance, and taxes.
4. Maintenance Costs: The costs associated with maintaining a product or system, including repairs, replacements, and upgrades.
5. Disposal Costs: The costs associated with disposing of a product or system at the end of its life cycle, including recycling or disposal fees.
6. Fuel Costs: The costs associated with fueling a vehicle, including the cost of electricity for EVs.
7. Maintenance Intervals: The frequency at which a product or system requires maintenance, such as oil changes for ICE vehicles or software updates for EVs.
8. Payback Period: The amount of time it takes for the savings generated by a product or system to equal the initial investment.
9. Return on Investment (ROI): The financial benefit gained from an investment, expressed as a percentage of the investment cost.
10. Government Incentives: Financial incentives provided by government entities to encourage the adoption of EVs, such as tax credits or rebates.
11. Level 1 Charging: The slowest type of EV charging, using a standard 120-volt outlet. Level 1 charging typically provides 2-5 miles of range per hour of charging.
12. Level 2 Charging: A faster type of EV charging, using a 240-volt outlet. Level 2 charging typically provides 10-20 miles of range per hour of charging.

13. Direct Current Fast Charging (DCFC): The fastest type of EV charging, using a high-powered DC charger. DCFC can provide up to 80% of a battery's charge in 30 minutes or less.
14. Charge Point: A physical location where EVs can be charged, including both charging stations and charging infrastructure.
15. Charging Station: A standalone device that provides EV charging, typically with one or more charging ports.
16. Charging Infrastructure: The network of charging stations and related equipment that supports EV charging.
17. Open Charge Point Protocol (OCPP): A standardized protocol for communication between charging stations and charging management systems.
18. Charging Management System: Software that manages EV charging, including scheduling, monitoring, and reporting.
19. Vehicle-to-Grid (V2G): A technology that allows EVs to supply electricity back to the grid when not in use.
20. Smart Charging: A technology that optimizes EV charging based on factors such as time of use, grid capacity, and user preferences.

Practical Applications:

When procuring EVs and charging infrastructure for fleet electrification, LCCA can help organizations make informed decisions by comparing the TCO of different options. For example, an organization might compare the TCO of purchasing gasoline-powered sedans versus electric sedans, taking into account factors such as fuel costs, maintenance costs, and government incentives.

Challenges:

One challenge in procurement for fleet electrification is the upfront cost of EVs and charging infrastructure, which can be higher than traditional ICE vehicles and infrastructure. However, LCCA can help organizations see beyond the initial investment and understand the long-term savings associated with EVs.

Another challenge is the lack of standardization in EV charging, which can make it difficult to compare different charging options. However, open protocols such as OCPP can help organizations ensure compatibility and interoperability between charging stations and charging management systems.

Example:

Suppose an organization is considering replacing its fleet of 10 gasoline-powered sedans with electric sedans. The organization uses LCCA to compare the TCO of the two options, taking into account factors such as fuel costs, maintenance costs, and government incentives.

The organization finds that the upfront cost of the electric sedans is higher than the gasoline-powered sedans, but the lower fuel and maintenance costs of the electric sedans offset this difference over the life of

the vehicles. The organization also receives a government incentive for purchasing electric vehicles, further reducing the TCO.

Based on this analysis, the organization decides to purchase the electric sedans and install Level 2 charging infrastructure at its facilities. The charging infrastructure is compatible with the OCPP protocol, ensuring interoperability with the organization's charging management system.

The organization also implements smart charging technology, which optimizes EV charging based on factors such as time of use and grid capacity. This technology helps the organization reduce its electricity costs and minimize the impact of EV charging on the grid.

Conclusion:

Procurement and LCCA are essential aspects of fleet electrification, helping organizations make informed decisions about the acquisition and operation of EVs and charging infrastructure. By understanding key terms and vocabulary related to these concepts, organizations can ensure a successful transition to electric fleets.