Operational and Financial Performance of e-Buses - Expectations vs. Actuals

PRESENTED BY:
Hemender Kumar Gupta
Chief General Manager
Himachal Road Transport Corporation
cgmhrtc@gmail.com
9418000532

Himachal experience in running Electrical Buses received under FAME-I from DHI, GoI

- 25 electric buses (75:25), are being operated in Kullu Manali.
- Olectra-BYD
- Operational since October 2017

- 50 electric taxis(90:10) are being operated for end to end connectivity in important tourist destination since March 2018.
- Mahindra

- 50 electric buses in and around Shimla (60:40) PMI-FOTON, Capable of Fast Charging (30 minutes) being maintained without any AMC since February 2019

Electric buses for public transport - Challenges

- In absence of standard deliverable performance parameters , difficult to finalize technical specifications and huge difference in quoted rates for the identical products.
- In house technical knowhow and exposure is required for using the pure electric vehicles .
- Cost and time consumed for creating charging infrastructure is very high
- Availability of Required Skill levels
- Infrastructure of Charging batteries and alleged facilities including software and smart diagnosis tools for service of vehicle.
- Availability of discrete spare parts.

Policies push from GoI and State Governments are opening new opportunities.

TRAINING REQUIREMENT OF TECHNICAL MANPOWER

Availability of required skill levels

We can focus on following strategies in order to updating skill in the field of electro mobility.

1. **Add new scream in engineering on Electro mobility.**

2. **Add Short duration 6 Month to one-year Course for technicians on various streams by dividing the whole subject on micro level VIZ.**

A. Types of Battery and battery management system.
B. Battery Charging System.
C. Power Motor working & Logics.
D. Electrical vehicle air conditioning and Logics.
E. Electronic information system in electrical vehicle logics.
F. Logical fault diagnosis and servicing of electronic equipment

Skill Requirement of Service Engineer for electrical equipment servicing and maintenance of EV fleet

- **Mechanical /Electrical / electronics Engineer.**

1. Having knowledge of trouble shooting in a complex electrical /electronic circuit.
2. Having knowledge of Battery charging system.
3. Having knowledge to handle software's.

- **Comprehensive training needs to be imparted in following discipline.**

1. Battery Management System
2. CAN Communication & ECU Control management.
3. Training to Major Equipment power supply logic and controls.
4. Training on various vehicle Systems.
5. Training on vehicle controls and functions.

Skill Requirement of Service Technician for electrical equipment servicing

- **Electrical / electronics technicians (probably ITI certificate Holders)**

1. **Having Basic knowledge of Battery charging system.**
2. **Having Basic knowledge to handle software's.**
3. **Having Basic knowledge of trouble shooting in a complex electrical /electronic circuit.**

- **Basic training needs to be imparted in following discipline.**

1. **Battery Management System**
2. **Training CAN Communication & ECU Control management.**
3. **Training to Major Equipment power supply logic and controls.**
4. **Training on various vehicle Systems.**
5. **Training on vehicle controls and functions.**

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DISCUSSION POINTS

- Procurement Challenges
  - Setup/Daily driving/Charging and Maintenance etc.
- Training and handholding support provided by OEM
- e buses performance Operational/ Commercial
- Skills of different roles
  - Planning/Procurement/driving/Charging operation
  - Engineer/Technician Special training needs
- Training module/knowledge support

QUESTIONS
&
ANSWERS