Zhivo – Case Studies

Case Studies –Battery charger line setup (Project Management)

Project Overview

- **Objective: Support complete execution of battery charger production line setup in India (Mexico to India Production Line Transfer).**
- **Identification & verification of contract manufacturing partner**
- **Setup battery charger assembly line**
- **Launch production in India and PPAP.**

Project Execution Approach

Mexico-to-India Transfer -Phase 1: Discovery

- Multi-vendor Identification
- Due Diligence & Audits
- Commercial Finalization

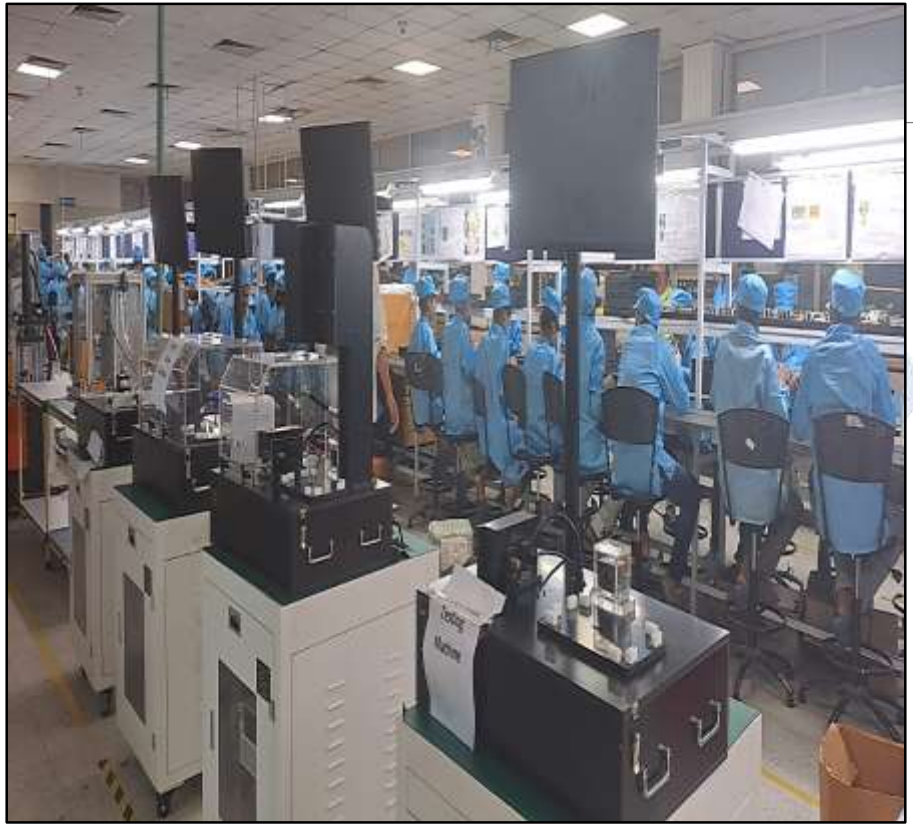
Mexico-to-India Transfer -Phase 2: Transition

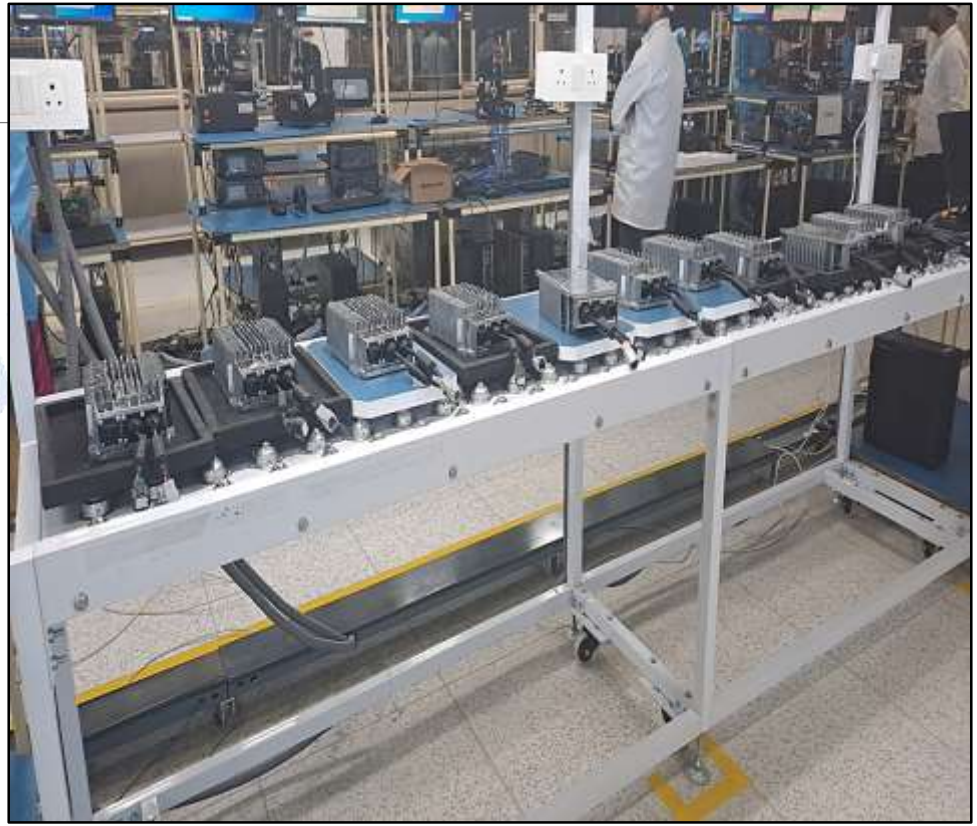
- Layout & Timeline Planning
- Global Asset Transfer (Mexico)
- On-site Line Installation

Mexico-to-India Transfer -• Phase 3: Stabilization

- Trial & Validation Runs
- PPAP Certification
- Full Production Ramp-up

Images





Images

Case Studies –Battery cooling system

BoM Overview & Baseline Cost

Background & Context

The client required a reliable **Battery Cooling System (BCS)** to ensure safe and efficient thermal management for EV battery packs. The initial design achieved performance targets but was cost-intensive, impacting competitiveness in the market.

Objective: **Reduce cost per kW without compromising performance, quality, or safety.**

Baseline (Before VAVE)

•**BoM Parts (Major):** Condenser, Fan, Pump, Coolant Tank, Aluminium & Rubber Hoses, Frame, Control Unit, Chiller, Valve, Compressor, Harnesses, Sensors, Mounting.

•**Cost per kW (Before VAVE): ₹39,000**

VAVE Actions (before vs. after visuals)

1. **Frame Material Optimization**
    1. Changed from Aluminum to **Mild Steel (MS) with powder coating**.
    2. Reduced raw material cost and simplified fabrication.
2. **Mounting Redesign**
    1. All mounting brackets redesigned for **lightweight and optimized geometry**.
    2. Reduced weight while maintaining strength.
3. **Cooling Architecture Simplification**
    1. Eliminated unnecessary **rubber and aluminum hoses**.
    2. Re-routed cooling flow for smoother performance and reduced leakage risk.
4. **Coolant Tank Redesign**
    1. Shifted from **metal (aluminum, welded, powder coated)** to **injection-moulded plastic**.
    2. Improved manufacturability and reduced cost significantly.
5. **Harness Optimization (HV & LV)**
    1. Harnesses redesigned considering new layout changes.
    2. Reduced cable length, weight, and connector cost.

Cost Comparison (₹39,000 → ₹32,700)

- **Cost per kW (After VAVE): ₹32,700**

- **Net Savings per kW: ₹6,300 (~16% reduction)**
- **Annual Savings Impact (Assuming 10,000 units/year):** ~₹63 Crores
- **Performance Impact:**
  - Thermal performance maintained within required limits.
  - Improved manufacturability and ease of assembly.
  - Reduced overall system weight by approx. **12%**.

Results & Savings Impact

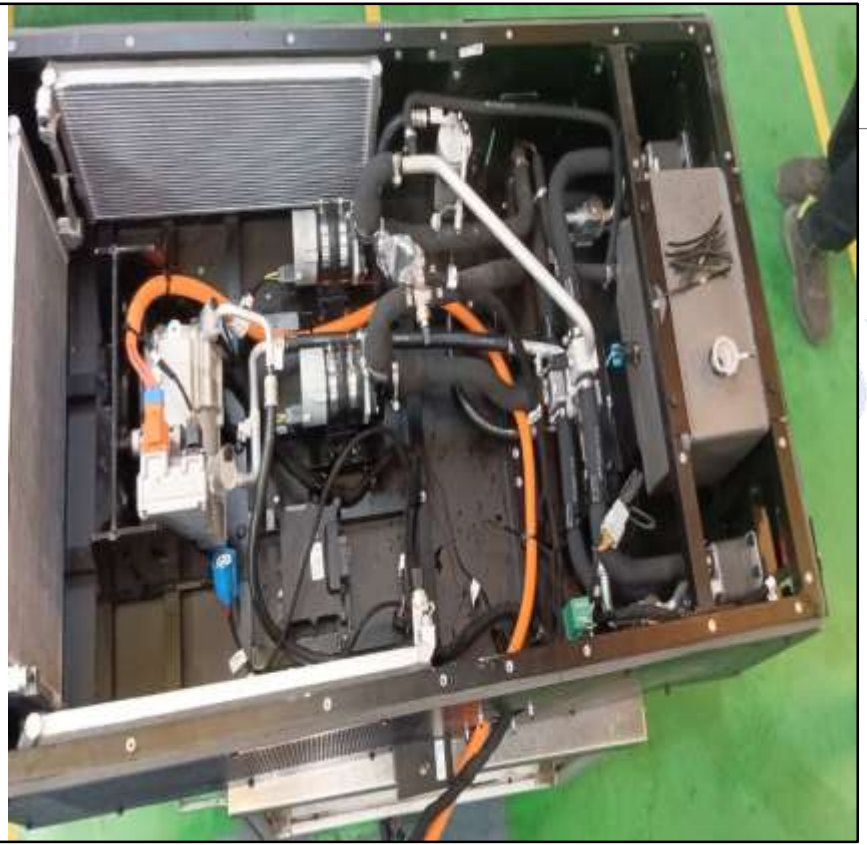
Quality & Validation

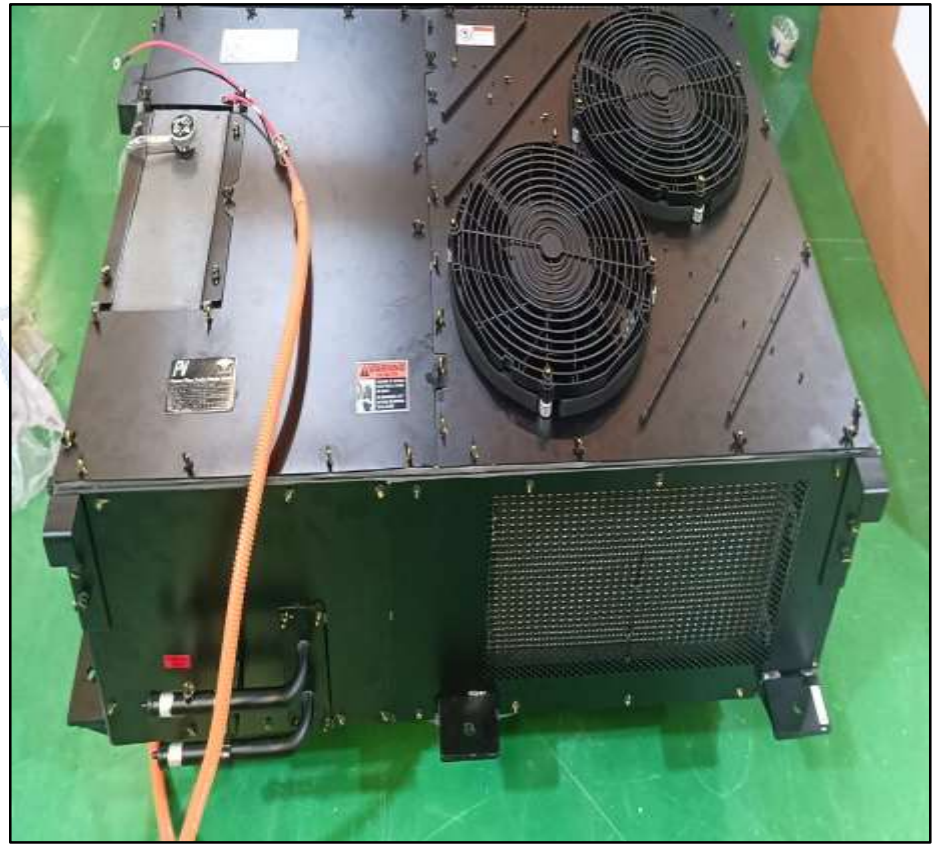
- Thermal performance tested under real driving conditions.
- Pressure & leakage tests performed on redesigned hoses and tank.
- Durability & corrosion resistance validated (MS frame + powder coating).
- Safety compliance maintained (ISO/AIS standards).

6. Strategic Value

- Enhanced cost competitiveness vs. global benchmarks.
- Increased localization of key components.
- Strengthened supplier ecosystem with more manufacturable design.
- Improved sustainability with reduced material wastage.

Product Image





Case Studies –Sleep-Sanity

Project Overview

- **Objective: Support complete execution of Sleep-Sanity product launch in India.**
- **Identification & verification of 4PL partner**
- **Build assembly & QC technical team**
- **Launch production in India**
- **Final packaging, storage & distribution**
- **Set up after-sales service & customer care**

Project Overview and Process