TACTICAL ENERGY INDEPENDENCE

The Mobile Hybrid Electrical Power (MHEP) System.

A Modular, Multi-Source Microgrid Solution for Defense, Disaster Relief, and Critical Infrastructure.

A JOINT DEVELOPMENT INITIATIVE PROPOSAL BY **VRUSHANK ELECTRAMECH.**

THE OPERATIONAL LIABILITY OF THE DIESEL TETHER

LOGISTICS RISK

Vulnerable Supply Chain.
High cost and security risk of transporting fuel to remote or hostile locations.

SIGNATURE MANAGEMENT

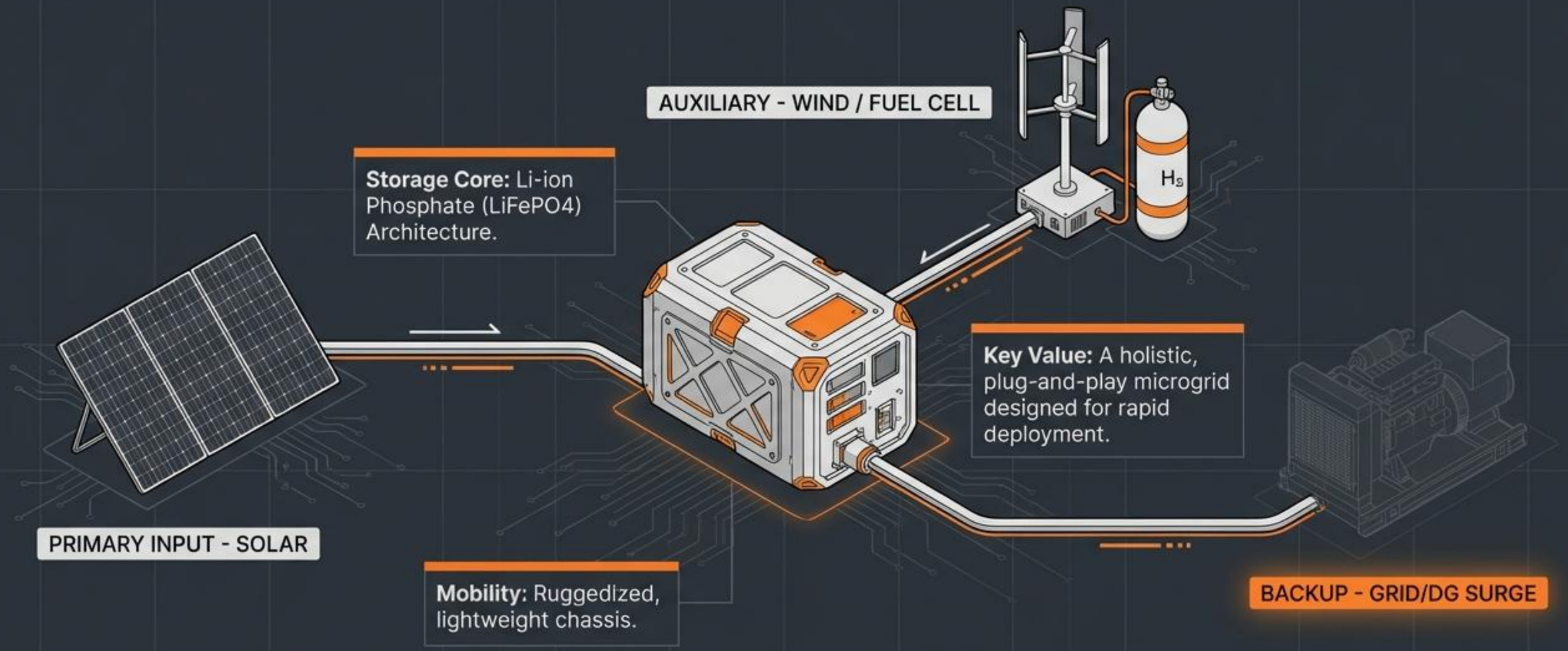
Compromised Stealth.
Thermal and acoustic noise from diesel generators reveals friendly positions to the enemy.

OPERATIONAL CONTINUITY

Single Point of Failure.
Mechanical reliance on combustion engines leads to frequent maintenance downtime.

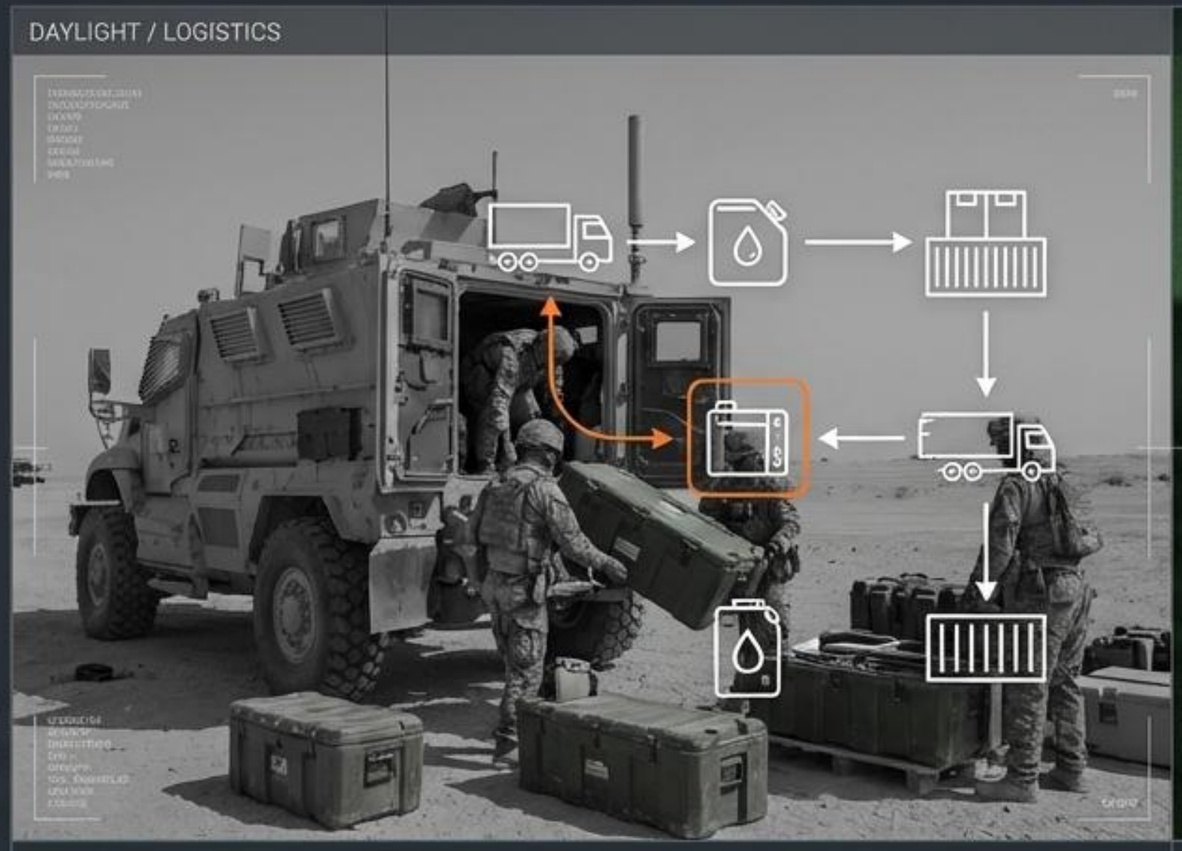
Modern operations require power that is as mobile and resilient as the forces deployed.

MHEP: DECOUPLING POWER GENERATION FROM LOGISTICS



Modern operations require power that is as **mobile and resilient** as the forces **deployed.**

STRATEGIC APPLICATION: FORWARD OPERATING BASES & STEALTH OPS



LOGISTICAL LIGHTNESS

- Reduces fuel convoy requirements by 60-80%.
- Lowers risk to personnel and transport vehicles.

SILENT WATCH CAPABILITY

- Zero-noise, zero-heat signature battery mode.
- Powers satellite uplinks and surveillance without revealing position.
- Low-harmonic power for sensitive electronics.

"Uninterrupted Command & Control, regardless of grid status."

MULTI-DOMAIN UTILITY: BEYOND THE BATTLEFIELD

RAILWAY MAINTENANCE

Powering heavy tools and lighting on remote tracks where grid access is impossible.

DISASTER RELIEF

Rapid deployment for medical camps and emergency comms when infrastructure collapses.

PORTS & COASTAL

Managing intermittent power needs in high-corrosion environments.

Power where the grid is impossible, impractical, or unreliable.

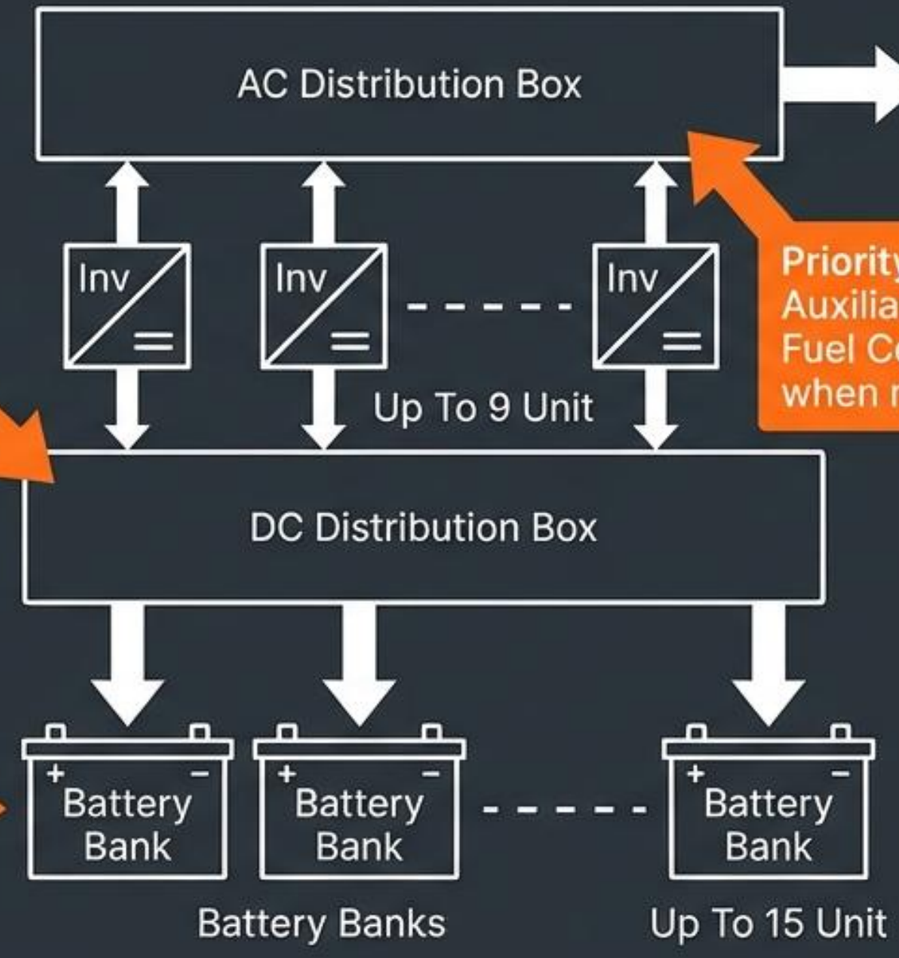
THE INTELLIGENT CORE: DYNAMIC POWER MANAGEMENT

Logic Steps:

Priority 1: Harvest Renewables (Solar/Wind).

Priority 2: Discharge Battery Storage

Priority 3: Engage Auxiliary (Gen-set/ Fuel Cell) only when necessary.



CUSTOM PMU LOGIC

The Custom Microprocessor-based PMU ensures seamless switching between sources without without power interruption, eliminating the need for manual intervention.

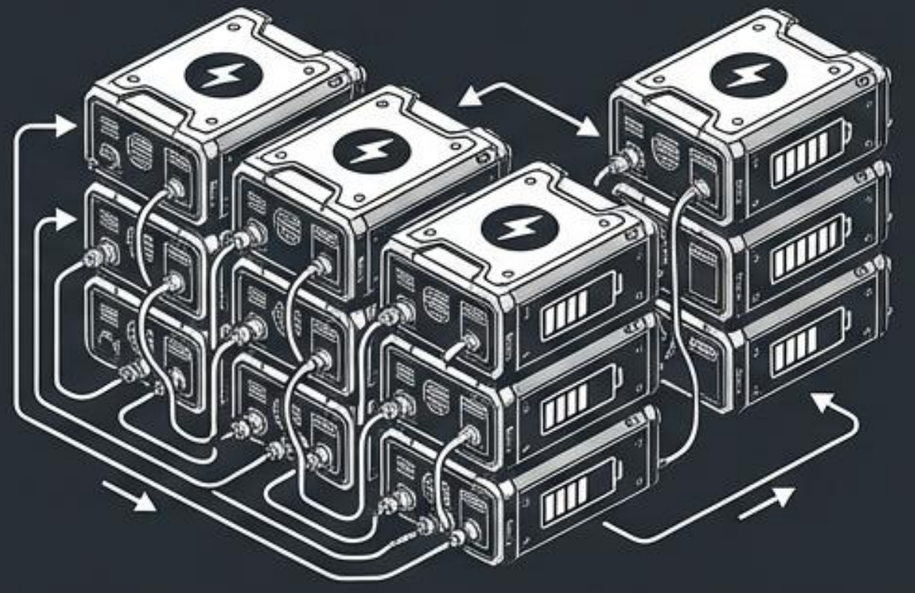
Power where the grid is impossible, impractical, or unreliable.

MODULAR ARCHITECTURE & TECHNICAL SPECIFICATIONS

SYSTEM CONFIGURATIONS

1	INVERTER OPTIONS	2.6KW, 4KW, up to 8KW
2	BATTERY MODULES	2.8KWh to 10KWh LiFePO4 packs
3	SOLAR INPUT	Flexible panels (2.5KW to 5KW arrays)
4	RUGGEDIZATION	IP Rated, Vibration & High-Temp Resistant

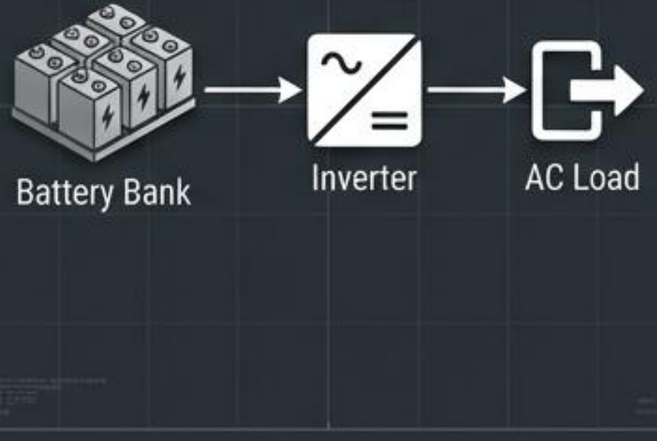
SCALABILITY: UP TO 9 UNITS IN PARALLEL



Designed for high vibration, humidity, and temperature extremes.

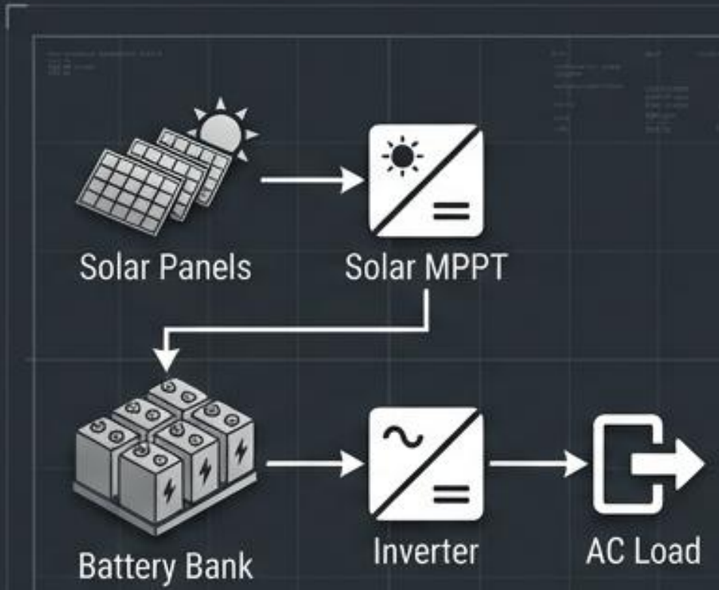
↗ Power where the grid is impossible, impractical, or unreliable.

ADAPTIVE MODES OF OPERATION



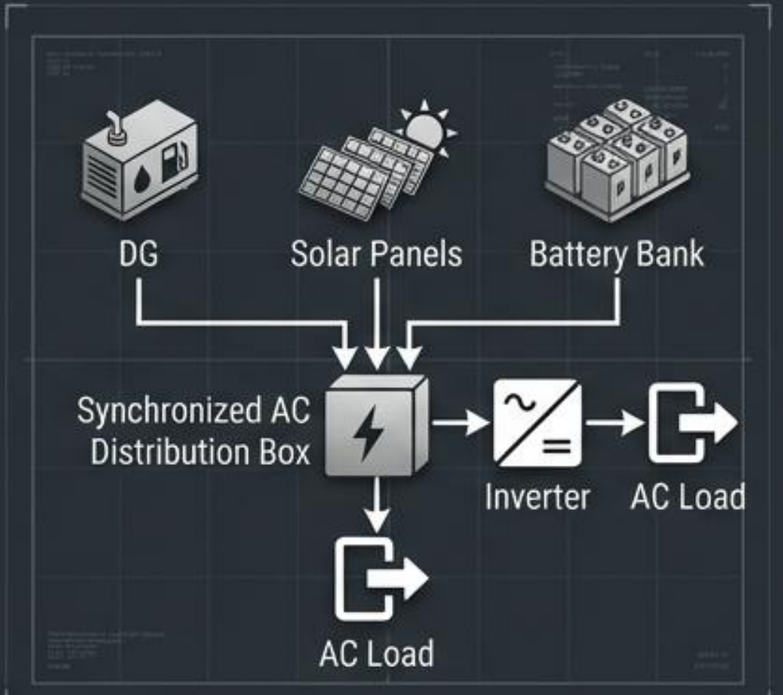
MODE A - SILENT/STEALTH

Off-Grid Standalone. Zero Signature.



MODE B - ECO-GENERATION

Solar Priority Charging.



MODE C - SURGE/HYBRID

Peak Load Management.

THE MHEP ADVANTAGE: COMPETITIVE LANDSCAPE

Feature	Diesel Generators	DRDO/SolarStik	MHEP (Vrushank)
Silent Operation	✗	✓	✓
Fuel Independence	✗	◔	✓
Plug-and-Play Simplicity (Non-Expert Use)	✗	✗	✓
True Mobility (Power-to-Weight)	✗	◔	✓

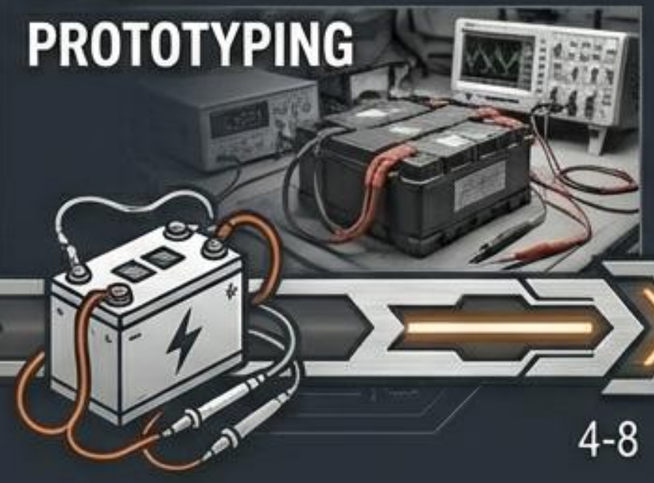
MHEP is designed from the ground up as a fully modular, infinitely scalable system, unlike static competitors.

↗ Power where the grid is impossible, impractical, or unreliable.

ROADMAP TO DEPLOYMENT

PHASE 1
DESIGN & SIMULATION

PHASE 2
PROTOTYPING



PHASE 3
FIELD TRIALS

1-3

4-8

12

FIELD DEPLOYMENT READY

DESIGN & SIMULATION

- DFMEA
- Concept Generation
- Component Selection

PROTOTYPING

- Battery Module Assembly
- Lab Testing
- IP Testing
- Battery Cycler Analysis

FIELD TRIALS

- Pilot Run
- User Acceptance Testing
- Final Production Samples

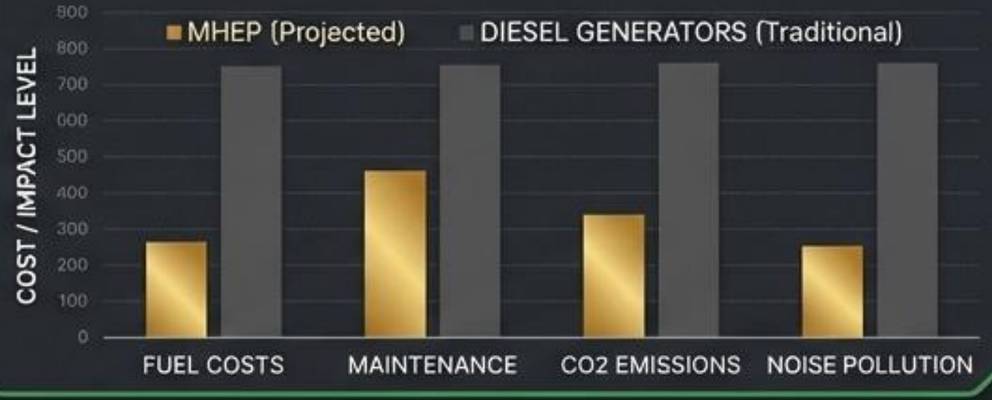
OPERATIONAL EFFICIENCY & ENVIRONMENTAL IMPACT.

ECONOMIC IMPACT

- Reduced fuel procurement costs
- Lower maintenance logistics
- Elimination of fuel transport security costs

ENVIRONMENTAL IMPACT

QUANTIFIABLE BENEFITS (ILLUSTRATIVE GRAPH)



Significant reduction in logistical footprint for forward-deployed units.

Power where the grid Is impoesible, impractical, or unreliable.

RESOURCE REQUIREMENTS & BUDGET ALLOCATION

- CONSUMABLES & MATERIALS (BATTERIES, SOLAR PANELS, INVERTERS) - 58%
- EQUIPMENT & TESTING - 18%
- DEVELOPMENT - 16%
- OTHER/CONTINGENCY - 8%

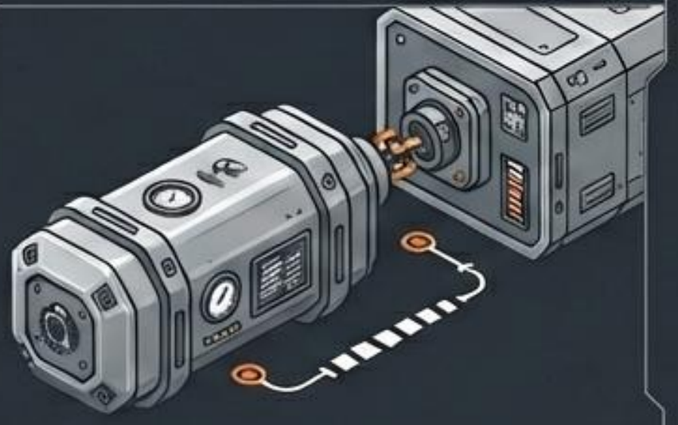
KEY TAKEAWAY:
CAPITAL EFFICIENT ALLOCATION FOCUSED ON HIGH-QUALITY PROTOTYPING AND RIGOROUS IP/ENVIRONMENTAL TESTING.

FUTURE OUTLOOK: INDIGENIZATION & THE CLEAN TRANSITION

INDIGENOUS TECH.

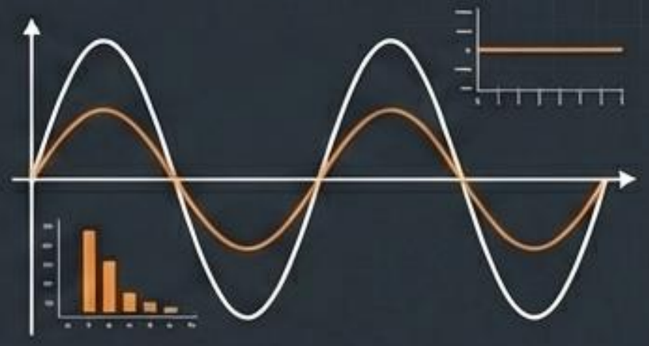
Development of a proprietary, Indian-made Battery Management System (BMS).

FUTURE-READY.



Transitioning auxiliary ports to standard Hydrogen Fuel Cell integration for long-duration silence.

GRID STABILITY.



Low-harmonic power conversion to protect sensitive defense electronics.

Power where the grid Is impoesible, impractical, or unreliable.

EMPOWERING THE FORCE. ANYWHERE. ANYTIME.

The MHEP system is not just an incremental improvement; it is a holistic reinvention of tactical power management.
We invite CSIR to partner in this joint development initiative.

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Power where the grid is impossible, impractical, or unreliable.