National Defense Center for Energy and Environment

# DIRECT CURRENT GROUND MICROGRID ARCHITECTURE (DCGMA)

## PROJECT OVERVIEW

The DC Ground Microgrid Architecture effort delivers a Tactical Microgrid Standard (TMS) compliant ground DC Microgrid. Using DC generators, a family of inverters, and Resilient Energy Storage Unit (ESU), the DC Ground Microgrid will reduce physical footprint, increase soldier readiness, enable flexibly, and increase ability to disperse power to support multi-domain operations.

The proposed microgrid is TMS compliant and composed of two 60 kW DC generators, a Resilient ESU, a 60kW inverter, a 30kW inverter, and a 15kW inverter. The microgrid will use DC as the main source of production and distribution of power allowing the inverters to be located at the point of need to provide that AC power required. The inverters, ESU, and generators will utilize TMS to enable remote monitoring of the microgrid and equipment metrics such as power flow, equipment status, and equipment status.

## BENEFITS

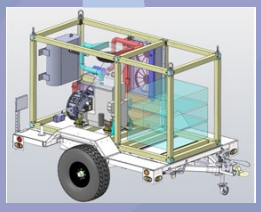
Stakeholder/Beneficiary: Program Executive Office Combat Support & Combat Service Support (PEO CS&CSS) – DOD fielding/procuring agent

Alleviated Logistic Burden: An important benefit of the DC architecture is the use of DC cabling. DC cabling is much lighter than AC cabling and thus alleviates the logistic burden associated with cabling. Additionally, placing the strict power quality requirements on the point of load rather than the generator itself allows the generators to be lighter meaning easier transportation requirements.

## PATH FORWARD

The completion of this project promotes:

- A new family of load following 60 kW generator sets that can be transported, emplaced and provide power within 30 minutes for critical loads in theater.
- A family of inverter systems capable of handling power surges of non-linear loads and correcting power factor.
- Delivery of Interface Control Documents, Tech Data Package, Performance Specification to PEO CS&CSS

DC generator

Point of Load inverter

**Representation of final DC Microgrid**

- 60kW DC generators, 60kW Point-of-Need Inverter, 30kW Point-of-Need Inverters
- DC power provided to AC loads through Point of Need inverters
- Microgrid Controller to optimize microgrid
- MIL-STD-3071 Tactical Microgrid Standard Complaint

**DoD Executive Agent**

Office of the Assistant Secretary of the Army for Installations, Energy, and Environment



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## FOR FURTHER INFORMATION

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