



NSIN PRESENTS  
**POWER PLAY**  
Electrifying Operations on the Edge



### Background

Energy, and the readily available access to power, undergirds each of the Department of Defense's (DoD) modernization efforts. Ensuring energy availability in austere and expeditionary environments — such as forward operating bases, remote installations, or conflict zones — presents a significant challenge for military planners. Because of geographic constraints or battlefield adversaries, logistics and re-supply efforts may be challenging to execute.

Major advances in energy storage technologies are helping to bridge the gap. Initiatives across the DoD are developing solutions focused on building battery longevity and resilience. However, batteries also have their shortcomings and are not the remedy for the aforementioned issues. The needs of the future battlefield will be increasingly electrified, resulting in a projected exponential rise in energy demand. Additional work is needed to make electronics and field equipment more efficient.



### The Challenge

Develop concepts, technologies, or systems to efficiently provide, store, or consume energy in an expeditionary environment.

### Focus Areas

#### ■ Power Consumption:

Advances in communications and computing technologies allow for vast amounts of data and intelligence to transmit to personnel in the field. However, the equipment needed to process and share this information requires a substantial amount of energy. A few questions:

- What software or hardware improvements exist that could increase data processing efficiency?
- Could existing technology be augmented to reduce its energy profile?
- What communication network design results in minimal energy demand?

#### ■ Microgrids and Batteries:

Given the potential challenges of remote installations, developing technologies to support microgrid and portable energy technologies is essential for military personnel. A few key questions:

- Are there ways to make renewable energy technologies more resilient and scalable?
- How do we best use alternative energy for 24-hour operations with low energy signatures?

- What sort of micro-grid designs and technologies could help deliver power in remote environments, or power networking in mobile conditions
- Are there ways to improve battery charging capabilities or extend the life of existing battery technologies?
- What alternative energy storage technologies can enable the use of intermittent renewable energies?

#### ■ Autonomous Power:

As autonomous systems perform more warfighting functions, the need for these platforms to sustain themselves with minimal or no human interaction is increasingly a reality. A few key questions:

- How can autonomous platforms recharge or refuel themselves without human assistance?
- What edge-computing and edge-AI/ML strategies reduce power/energy demand for autonomous platforms while enhancing operational capabilities?
- What maneuver strategies reduce power/energy demand for autonomous platforms while enhancing operational capabilities?

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<https://www.nsin.us/hacks>

**LOCATION:**  
Virtual

**EVENT DATES:**  
Oct. 25 - Nov. 10

**PRIZE TO TOP TEAMS:**  
\$15,000

### EVENT PARTNERS:

