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Directed Energy systems, in the electrified battlespace

Making the desirable practical through advanced power systems

Directed energy systems have the potential to transform strategic and tactical approaches, and offer new options to counter emerging threats.

Their entry requires dramatic change to military systems power specification, generation, storage and delivery.

This article outlines the possibilities of directed energy systems and how their development and deployment, as with other electrified battlespace technologies, will continue to be held back unless current approaches to military systems power specification, generation and delivery change radically.

Enabling Innovative Efficient Countermeasures to Asymmetric Threats

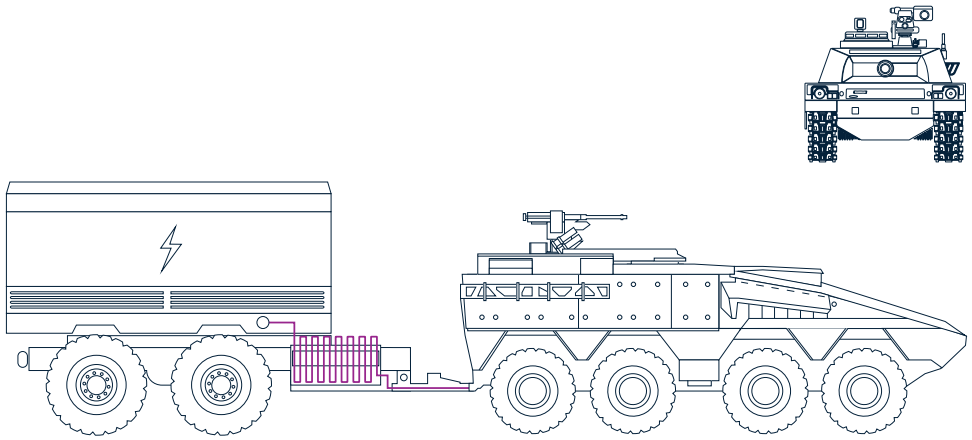
In a world where a simple quadcopter can shut down an international airport or disrupt operations, new solutions are critical. Operators can now launch sophisticated, co-ordinated attacks on a small budget, with little knowledge or prior training.

Laser and radio frequency (RF) systems are cost-effective options for defence; flexibly defending against innovative and improvised attacks – and, with the right power systems, can offer a practically "infinite magazine".

New Technologies Addressing Legacy Challenges

Unlike artillery, directed energy systems can achieve an objective such as neutralising a command and control node, located inside a building, without damaging the structure or causing harm to humans inside. The beam from an energy weapon can be invisible to the naked eye, generate no sound and may produce only a small smoke plume on contact with its target.

Producing the electricity to power these systems on-board the platform greatly reduces the logistical footprint of operations, the associated risk, timing constraints, cost, space and weight required for ammunition. Power sources innovation is essential.



Before: Deploying directed energy systems is limited by the power delivery capability and energy storage on the platform

Intelligence Disruption Key to Gaining Battlespace Advantage

Lasers can also be used to confuse enemy sensors or ignite hardware, while RF can disable electronics and communications systems, rapidly neutralising high volumes of low-value targets economically and decisively.

Powering directed energy systems

Power constraints mean that high-powered directed energy systems will most commonly be deployed on ships while lower-powered systems will be vehicle-mounted or carried by infantry.

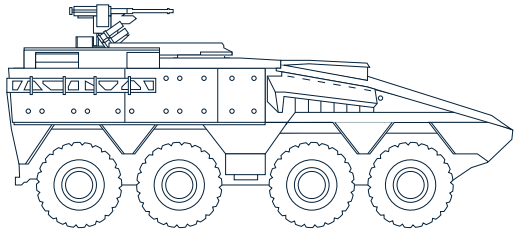
Effective deployment of all systems, regardless of size, relies on a revolution in the way energy is stored and delivered. Future power chains will include compact, ultra-high power batteries that deliver power where and when it is needed.

A modernised power infrastructure is required so that critical units can draw power quickly from multiple sources or share energy with other systems to meet operational demands.

Fighting Power Inertia to Deliver Electrified Battlespace Advantage

Servicing these new energy requirements without overburdening platforms or consuming already limited space and decision making capacity is as possible as it is critical. New capabilities must be introduced in tandem with suitable novel power systems, and the ability to define an integrated energy strategy.

The technology exists to defend, secure and protect in more economical, environmentally-friendly and effective ways. Now the energy strategy must change and adapt to reap the rewards and benefits the electrification of the battlespace can deliver.



After: A scaleable platform-integrated compact pulse power energy storage system allows widespread DES implementation

This whitepaper covers just one area of the future of power in the battlespace. For the bigger picture, please download our **Electrified Battlespace** report or other whitepapers and collateral from **www.QinetiQ.com/power**.

Or contact our team at **electricbattlefield@QinetiQ.com**