



 **Portable Power Requirements for FIST**
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• Future Infantry Soldier Technology (FIST)

■ Aim:

- Enhance the dismounted soldiers effectiveness through the application of advanced technologies, selected and integrated via a requirements-led systems engineering processes.
- Key capability areas are:
 - C4I (Command, Control, Communications, Computers and Intelligence)
 - Lethality (weapons and sighting systems)
 - Sustainability (logistics and power sources)
 - Survivability (Surveillance and Target Acquisition, signature management)
 - Mobility (weight and navigation)

■ Thales PCMO running Assessment Phase since April 2003

Role of the C4I Subject Matter Expert (SME)

- C4I System requirement definition and control
 - Definition of system requirements to satisfy user requirements
 - Consideration of user requirement, design constraint, technology maturity, and cost-effectiveness domains

- C4I System architecture and design
 - Verification of design wrt requirements
 - System/Component/User trials

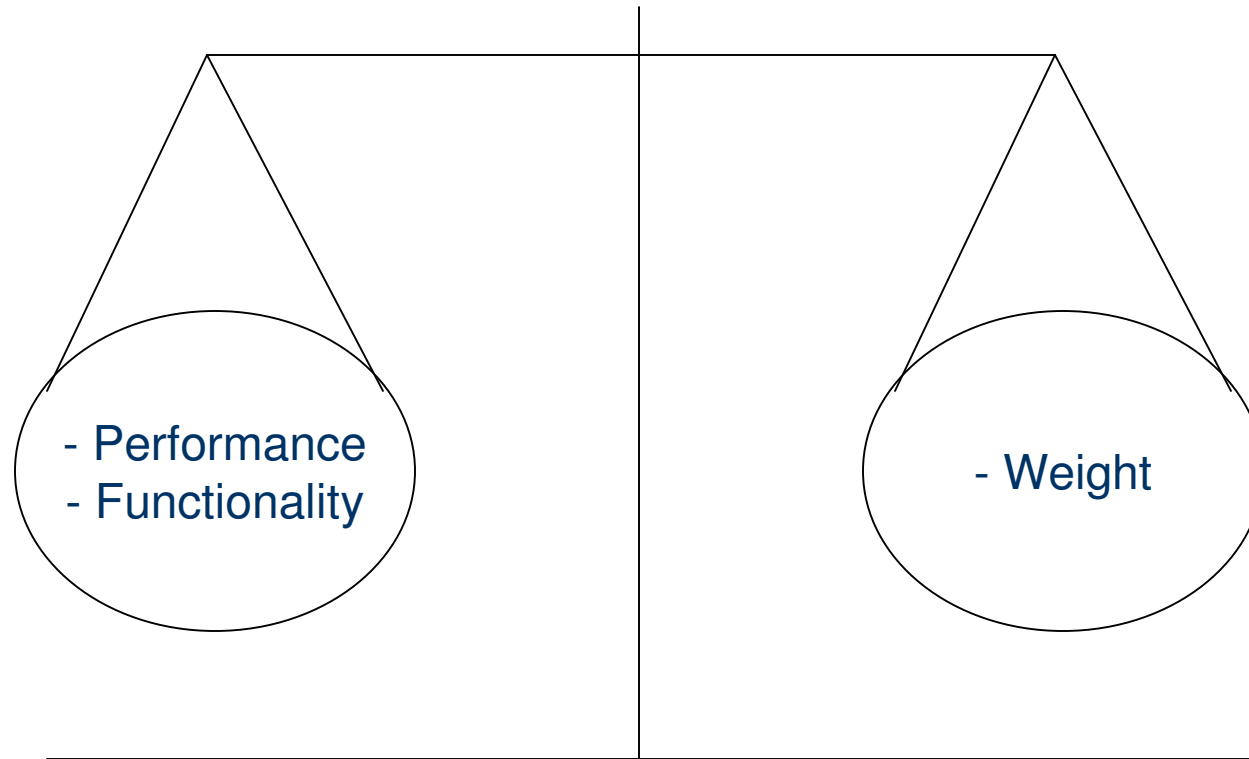
- Technology awareness
 - Radios, portable computers, displays, GPS, power, etc.
 - Technology Maturity awareness

- Prime functions of FIST C4I system:
 - **Communication** – Voice and data communications via radio
 - **Navigation** – Own position information and route following/planning via GPS and digital maps
 - **Situational Awareness** – Automatic blue force positional information and additional situational information
 - **Information Exploitation** – Planning, reporting, orders, etc.

- Key system components
 - Radio
 - Computing
 - Display
 - GPS
 - Power



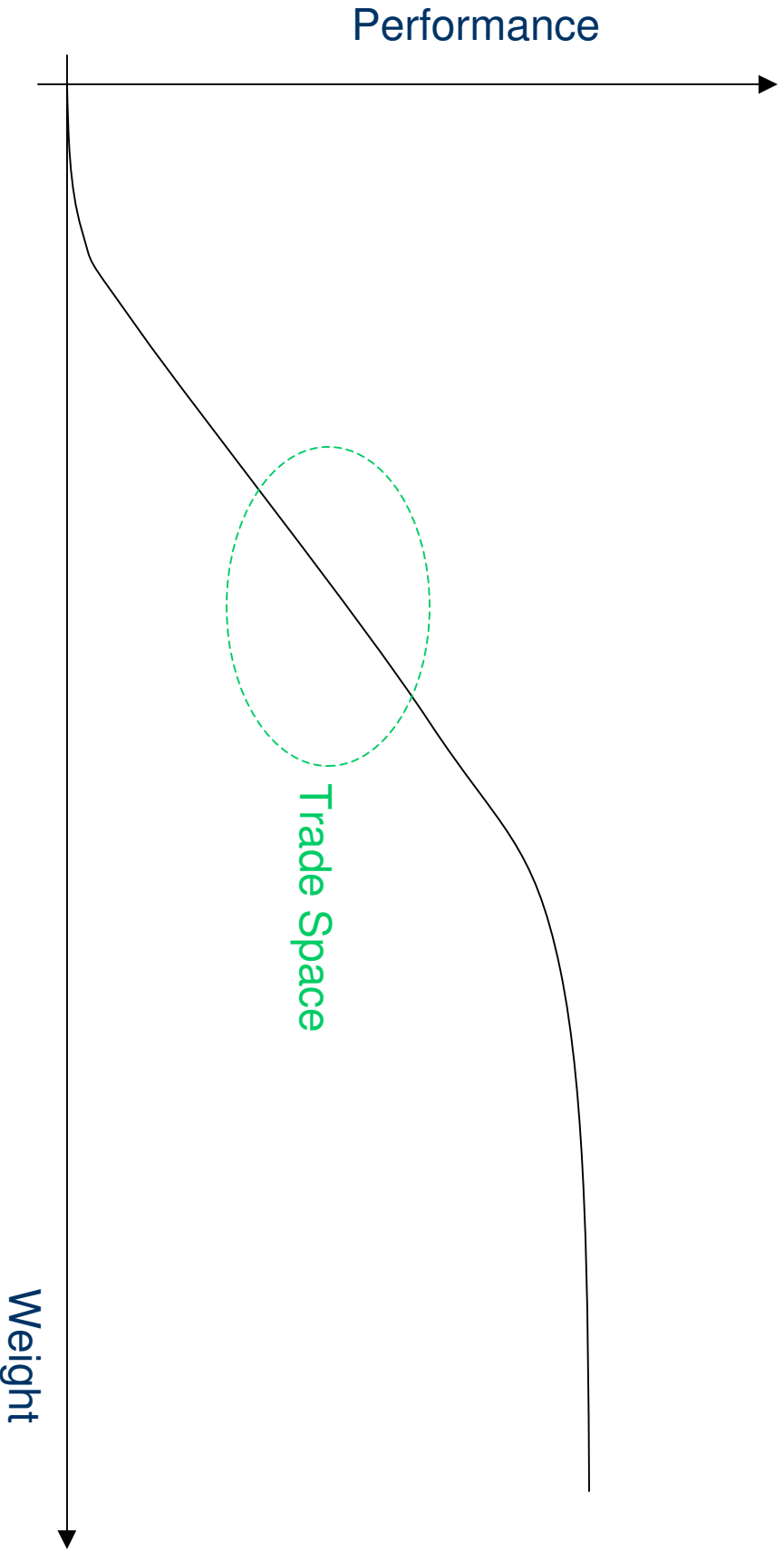
- User Power Requirements,
 - **Base system battery weight** (weight with one set of batteries)
 - **Mission battery weight** (weight required (no. batteries) for +48hrs)
 - **Battery swap frequency** (how often do they need replaced)
- Major Power Consumers,
 - **Radio** – range/bandwidth requirements drive power consumption
 - **Computer** – functionality requirements drive power consumption
 - **GPS** – Military GPS drives power consumption



- Capability benefit provided by increased performance and functionality must be weighed against capability loss due to increased weight.
 - Increased performance = increased power consumption = increased weight



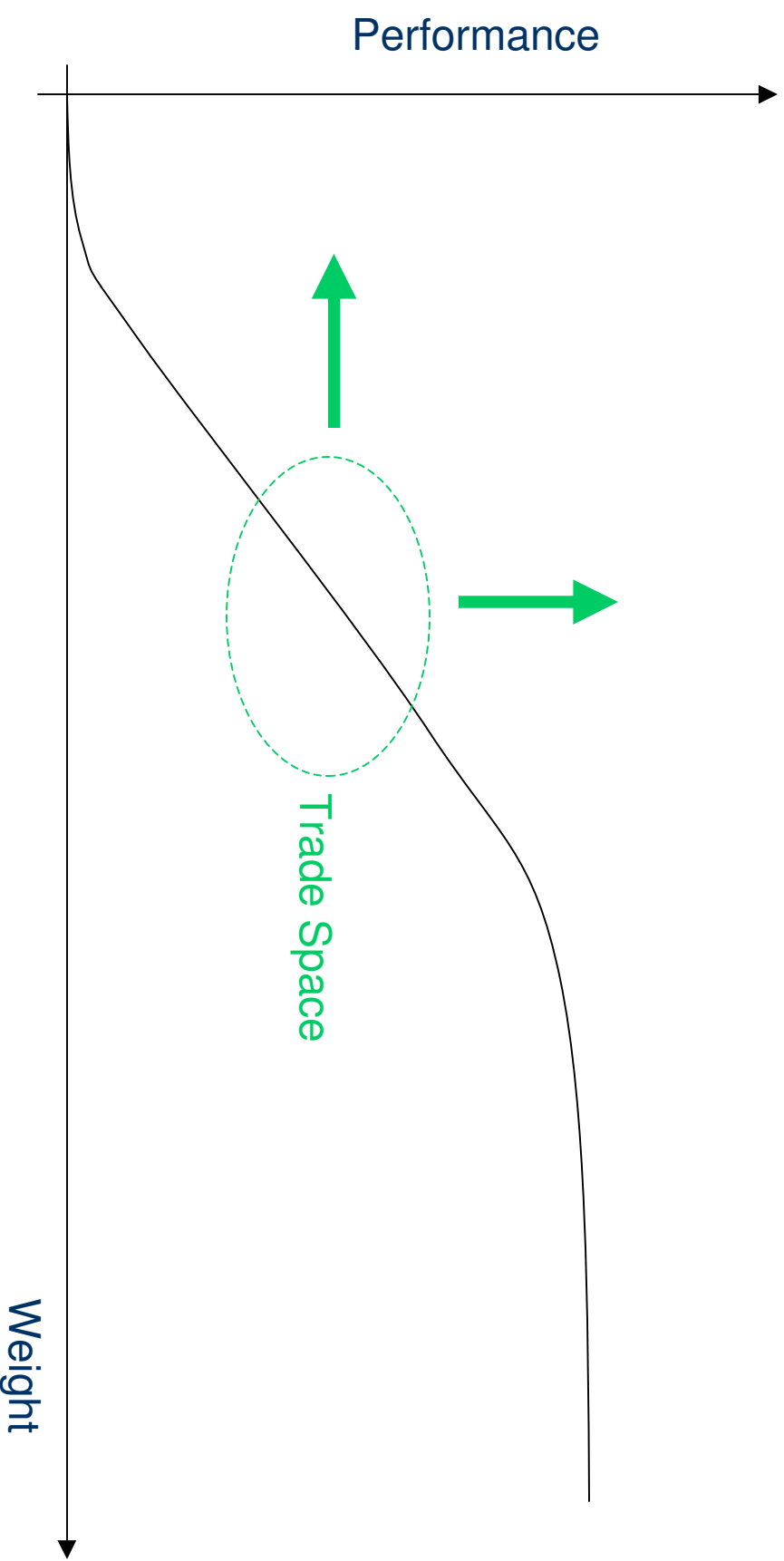
Performance-Weight Trade



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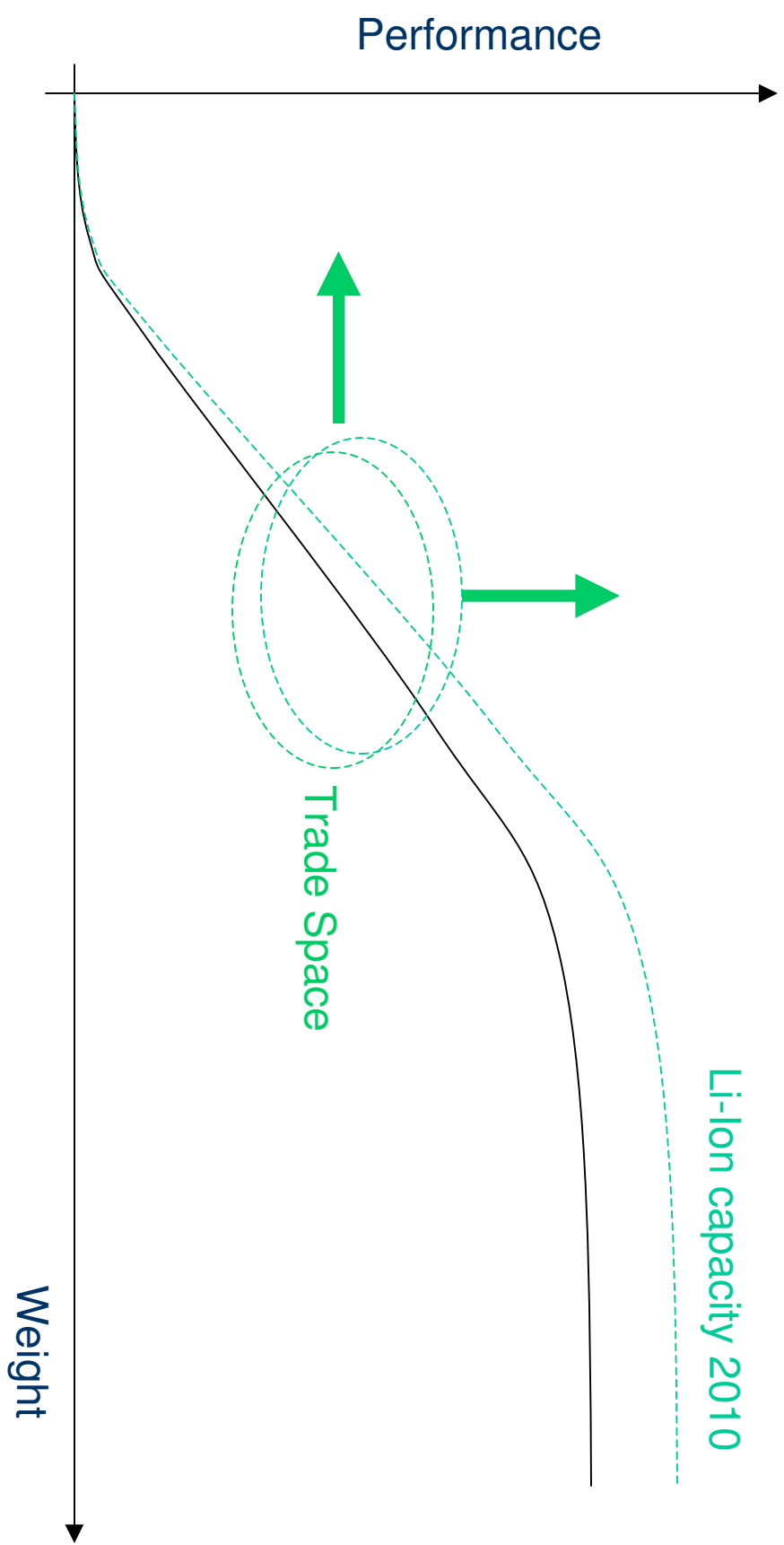
7 Land & Joint Systems

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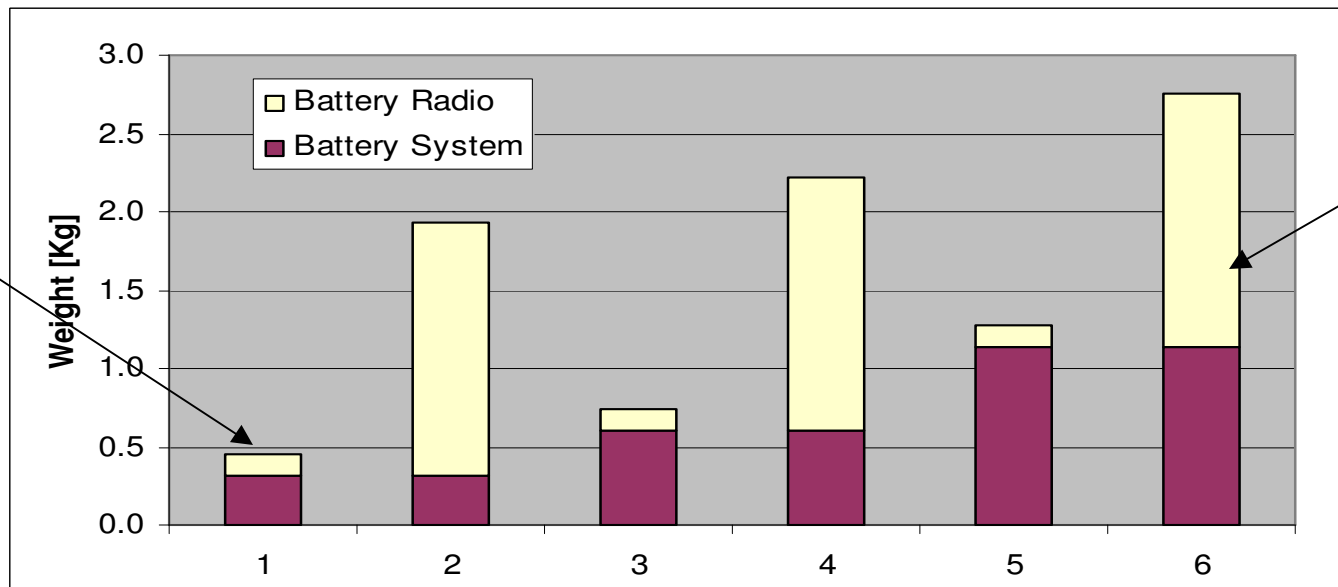


Performance-Weight Trade



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- Increase power density
 - Expected 10% increase every 3 years in Li-Ion secondary cells.
- Optimise power consumption
 - Large weight gains possible from system design decisions.



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What must new technology provide?



- Increased power density
- The power solution must be reliable
 - Technically mature
 - Robust and yet easy to use and carry in the military environment
 - Night and day, hot and cold, dry and soaking wet
- Minimise Size, Weight & Portability issues on the soldier
- Affordable
- Covert
 - Signature from sound / heat / exhaust must be at or below background