



DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

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 Director of Engineering

Wednesday, August 26, 2015
Duke Energy Convention Center
Cincinnati, OH



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Agenda

- Expeditionary Energy Demands
- Energy Security
- Solutions



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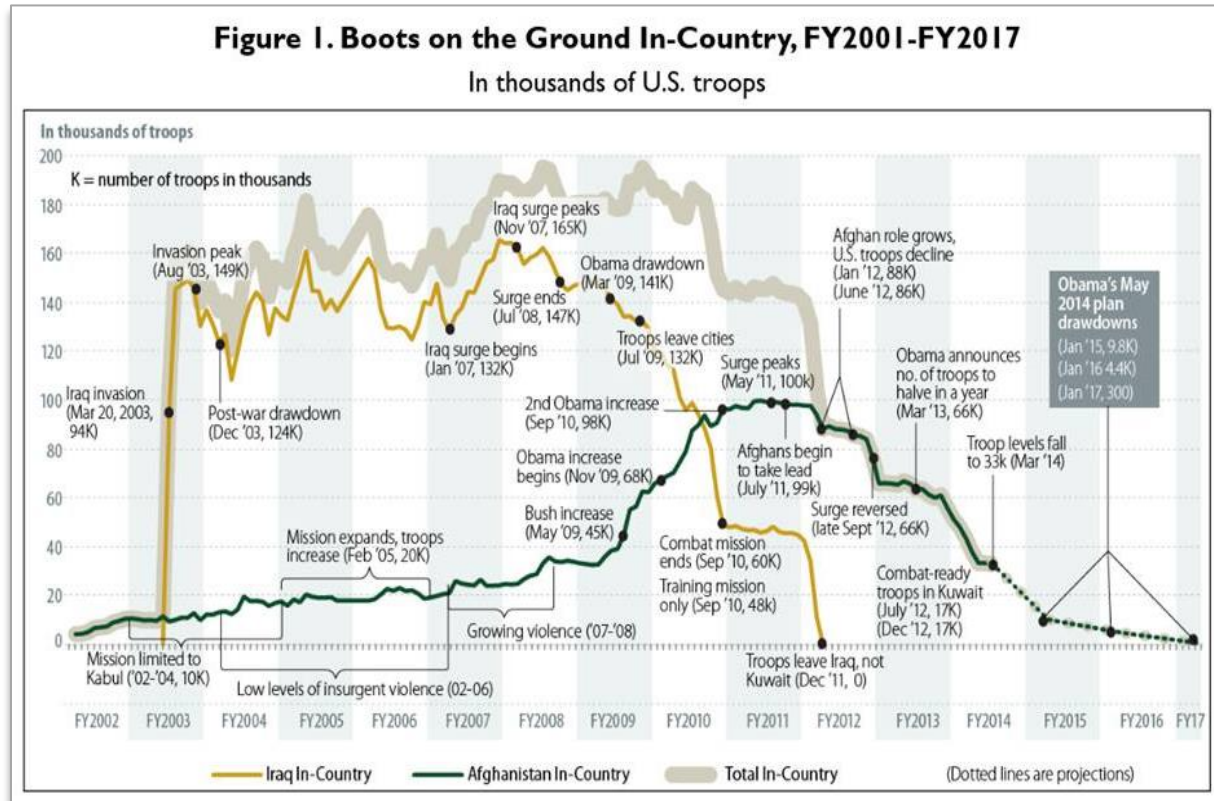


DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Expeditionary Energy Demands

- More Equipment
 - C4ISR
 - Basing/Billeting
 - Vehicles

- More Locations
 - Global War on Terror
 - Pacific Pivot
 - Africa
 - Europe/Asia



Source: <https://www.fas.org/sgp/crs/natsec/RL33110.pdf>





DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Energy Security

- Expeditionary demands met by oil
 - Financial resources
 - Ample market supply
 - Getting fuel to the end user



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Energy Security: Getting fuel to the end user

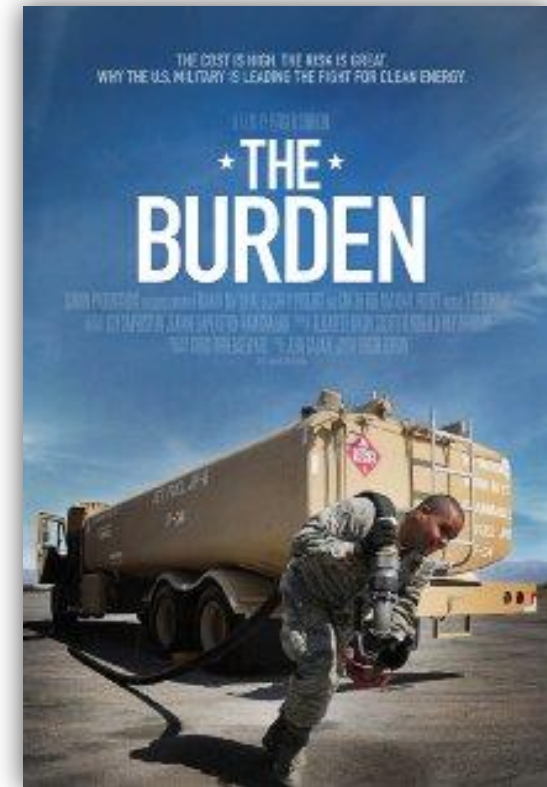
- Fuel Convoys Concerns
 - Easy Target
 - IED's, ambush attacks
 - Direct and immediate danger
 - Easily Disrupted
 - Hostile environments
 - Environmental issues
 - Vehicle service/failures
 - Danger to those dependent upon fuel for communication, medical, ISR





DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

- **Energy Security: Getting fuel to the end user**
 - Opportunity Cost
 - Escort required to protect convoy
 - Takes warfighters away from primary mission
 - Less safe for everyone
 - Logistics
 - Supply chain required to get fuel
 - Ports, countries, modes of transport
 - Base movement, battlespace dynamics
 - Politics
 - Cost
 - Fully burdened cost increases exponentially deeper onto the battlefield
 - Air transport and other expensive delivery options



The Burden Film, Roger Sorkin





DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Energy Security Solutions

- Reduce Demand
 - LED Lighting
 - Energy efficient facilities
- Increase Supply
 - More fuel
 - More convoys
 - Local grid
 - Unreliable
 - Easily disrupted
 - Renewables
 - Localized generation
 - Can be made reliable
 - Very difficult to disrupt





DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Renewable Energy Solution to Meet Expeditionary Warfighter Needs

- Power & Energy Profile
- Load Characteristics
- Rugged
- Reliable
- Simple
- Mobile



Scorpion Energy Hunter™, US Patent 8,539,724

US Military Academy, Camp Buckner, West Point, NY
Cadet Summer Training



UNITED STATES MILITARY ACADEMY
WEST POINT®

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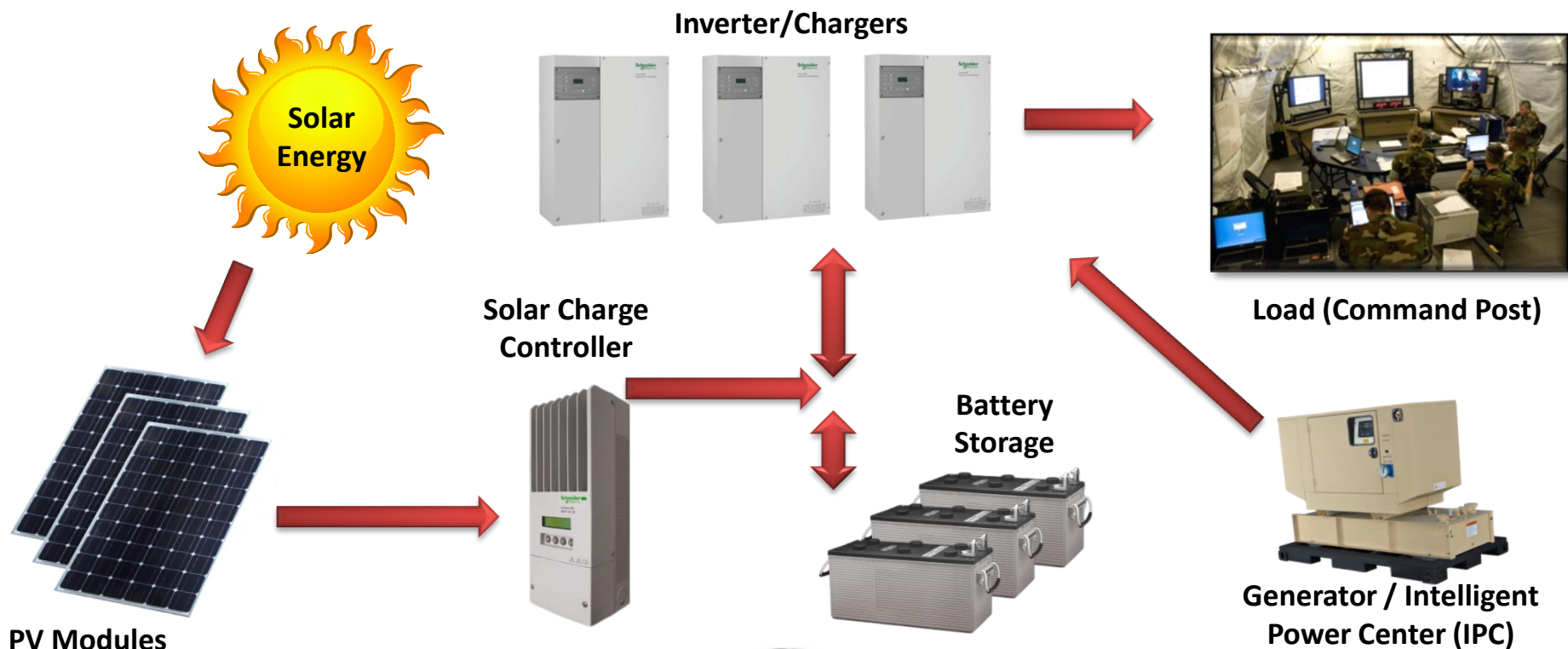
DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

- Renewable Energy Solution to Meet Expeditionary Warfighter Needs
 - Scorpion Energy Hunter™ Renewable Energy System
 - Turnkey, deployable system
 - Saving lives
 - Reduce fuel consumption in off-grid applications



DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

Operational Ease



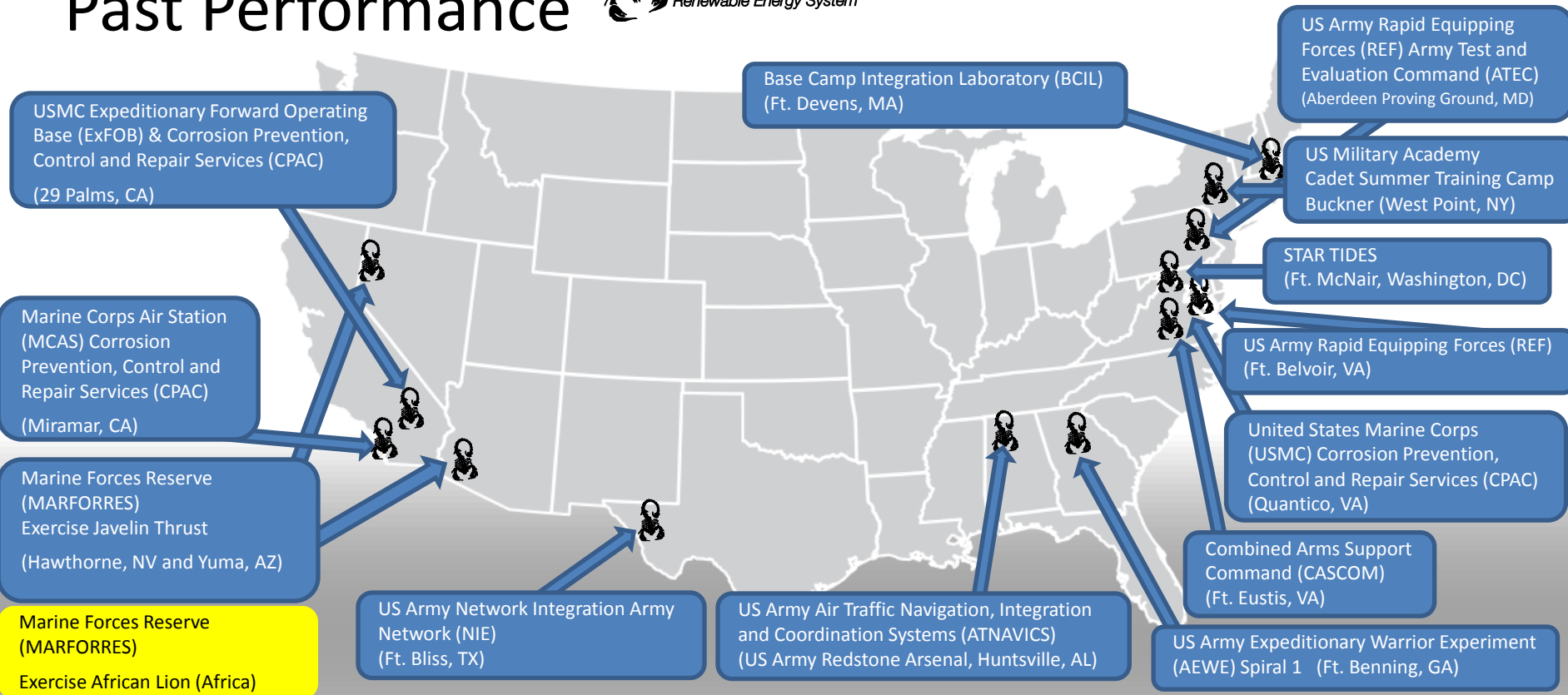
PV Modules

Generator / Intelligent Power Center (IPC)



DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

Past Performance



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Renewable Energy Solution to Meet Expeditionary Warfighter Needs

- Scorpion Energy Hunter™
 - Rugged Design Features
 - Containerized Packaging
 - Shock/Vibration Isolation
 - PV Module Racking
 - Battery Chemistry



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Renewable Energy Solution to Meet Expeditionary Warfighter Needs

- Scorpion Energy Hunter™
 - Reliable Design Features
 - Testing/Validation
 - Thermal
 - Renewable Input
 - Load Characteristics
 - EMI
 - Shock/Vibration



DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

Renewable Energy Solution to Meet Expeditionary Warfighter Needs

- Scorpion Energy Hunter™
 - Simple Set-up
 - Color-coded electrical connectors
 - Pinned mechanical connections
 - Simple hand tools



Sets up
in 90
minutes





DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Renewable Energy Solution to Meet Expeditionary Warfighter Needs

- Scorpion Energy Hunter™
 - Mobile Design Features
 - Intermodal container



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

■ Scorpion Energy Hunter™: Saving Lives

- Additional Benefits
 - Generator efficiency
 - Generator service/maintenance
 - Silent Operation
 - Not easily disrupted
 - Low maintenance
 - Green power
 - Fuel-less operation



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DEPLOYABLE HYBRID SYSTEM TO REDUCE EXPEDITIONARY WARFIGHTER'S ENERGY NEEDS

THANK YOU.



Scorpion Energy Hunter™ ~ US Patent 8,539,724

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CAGE CODE: 3NXK3
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