

# ENERGY FOR THE WARFIGHTER

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# Report Documentation Page

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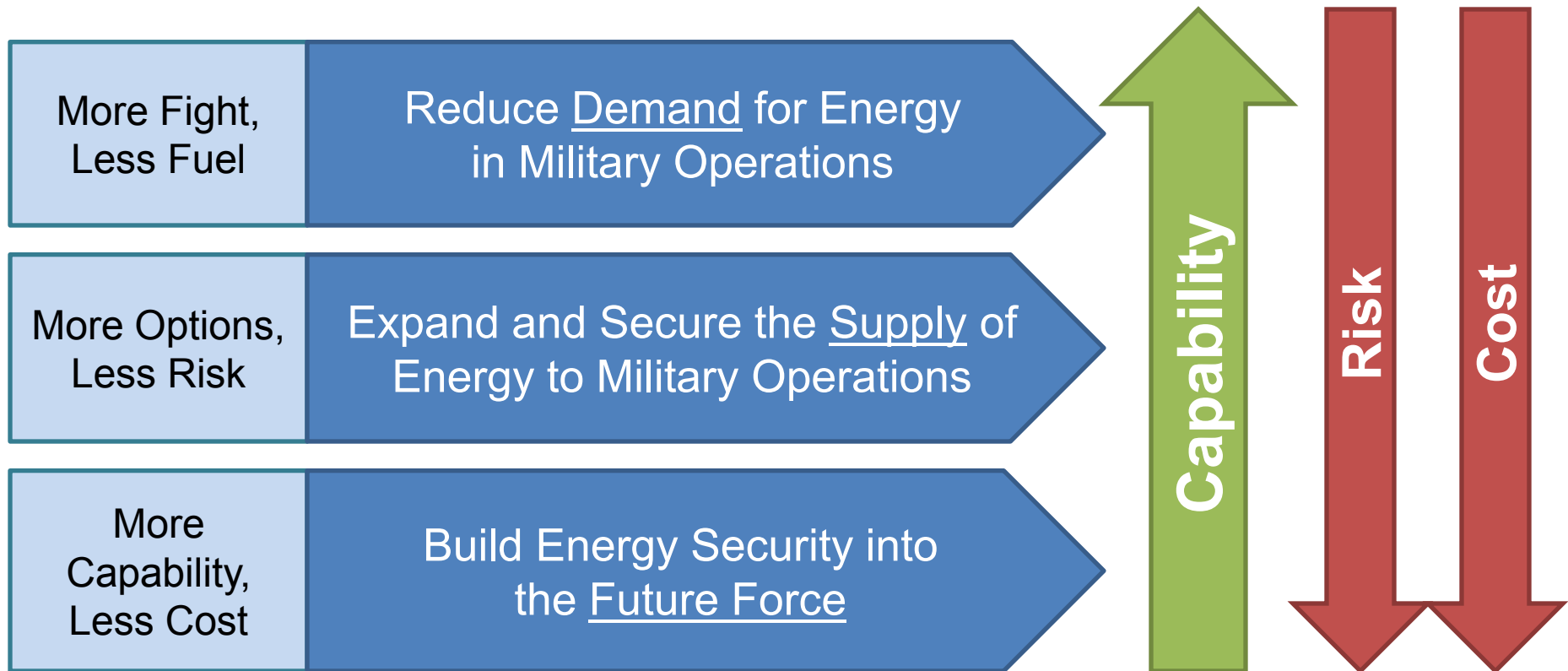
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# DoD Operational Energy Strategy

**U.S. armed forces will have the energy they require for 21<sup>st</sup> century military missions**



**First ever DoD-wide operational energy strategy released on 14 June 2011**



# Afghanistan Ground Truth

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- ❑ Dust & Chaos dominate the landscape
- ❑ Scheme of maneuver changes daily
- ❑ Fluid & dynamic list of enduring bases indentified in Afghan Basing Strategy 2.0



“Today’s warfighters require more energy than at any time in the past and that requirement is not likely to decline.”





# Changing Environment: Operational and Tactical Challenges



© Reuters

Requirements for operational energy today place lives at risk, divert combat forces, and affect regional relationships



# ***Addressing the Demand Side...***

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- For every gallon of generator fuel used it took seven gallons to transport it there**
  
- For every gallon of bottled water transported it took seven gallons of fuel to get it there**
  
- Generators were loaded at an average of 30%**
  - HVAC is 75% of Electrical demand**
  - 50% is lost by inefficient structures**

***...Increases the Tooth and reduces the Tail***



# ***Lessons Learned from the AOR***

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- **Warfighters won't always identify requirements or adequately define them**
- **We must identify measureable metrics/baseline upfront**
- **Integrate collection /monitoring plan early in the procurement phase – must be transparent to the warfighter**
- **Saving \$ or reducing dependency on fuel is not a top priority to tactical units; reliable energy, Soldier Welfare, FMC equipment is.**
- **We must operate in an open, transparent, and collaborative environment**
- **Transition must be addressed early in the process.**



# ***Operational Energy Division, USFOR-A JPIO***

## **Mission Statement:**

- The mission of the USFOR-A, JPIO Operational Energy Division (OED) is to improve operational capabilities and warfighter effectiveness by reducing our forces' reliance on petroleum fuels.**
  
- The OED will develop, coordinate, and implement materiel and non-materiel energy solutions, and will work with commanders across the CJOA-A to find opportunities to “unleash their units from the tether of fuel.”**
  
- OED efforts will align with the Afghanistan Basing Strategy (ABS 2.0)**



Energy solutions will not be a tactical distraction to the warfighter





# ***OED efforts emphasize reducing fuel use in the Afghan CJOA***

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## **□ Key initiatives:**

- **Execute centralized power generation projects**
- **Introduction of proven energy technologies into theater**
- **Implement LOGCAP Energy Savings Initiatives**

## **□ Key Successes:**

- **Enabled the operational fielding and demonstration of advanced power distribution technology in Afghanistan**
- **Facilitated award of 37 centralized power projects on enduring bases in Afghanistan**
- **Worked with CENCOM to established a forward-deployed operational energy office in Afghanistan**

***Success will require innovation & emerging technologies that contribute to the increased range & agility of the warfighter***



# ***What Does Success Look Like?***

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- ❑ Refocusing combat forces from protection of supply lines and fuel logistics to operational missions**
- ❑ Improving range, endurance, and reliability of ground, air, and naval forces and information assets**
- ❑ Lightening the logistics load and reducing vulnerability of fuel supply lines**
- ❑ Reducing the vulnerability of Forces involved with moving and protecting fuel on the battlefield**

***OEPP, CENTCOM and the USFOR-A JPIO OED will work together to improve operational capabilities and warfighter effectiveness by reducing our forces' reliance on petroleum fuels***



# Energy Management Solutions

- ❑ Pursue variety of initiatives that directly contribute to:
  - Reduction in the volume of fuel consumed by the larger, main operating bases
    - Centralized Power Projects
    - Distribution Projects
    - LOGCAP Energy Services Initiative
  - Reduction in the demand for fuel at the tactical edge, where the risk to soldiers and opportunity costs of delivery are the greatest
    - Soldier power
    - Alternative energy sources

## Views from Afghanistan



KAF 3MW Plant

Herat Spanish  
Dorms

CP Stone Tents

LNK Solar  
Panels



# Power Distribution





# Generators in Reserve



COP Tillman



# Fuel deliveries to the Edge





# Contingency Bases

## COMBAT OUTPOST TILLMAN

*Contingency bases are evolving locations that support military operations by deployed units & provide necessary support services for sustained operations*

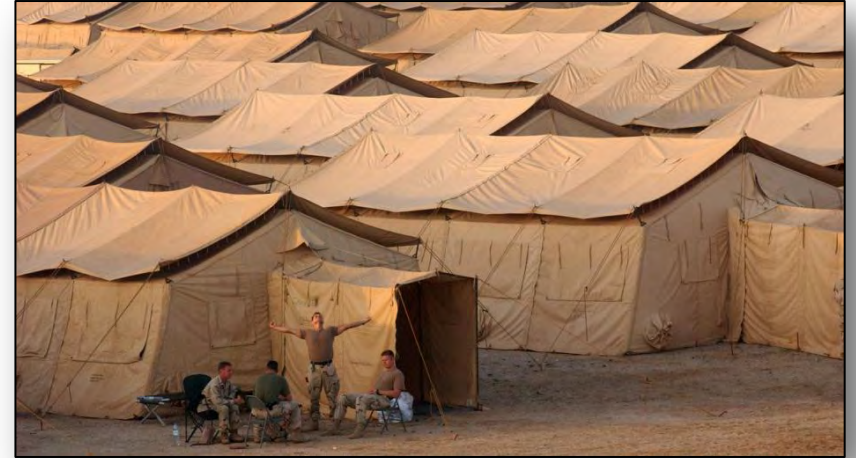




# Contingency Bases: a Vital Mission Capability



**Expeditionary and Temporary Structures require Electrical Power to Operate**



**Contingency Bases often rely on Mobile Power Plants**



**Expeditionary Bladders store Fuel at Forward Airfields**

*Operational Energy represents a key enabler for Contingency Base Camps*





# Contingency Bases: *Their Demand for Fuel*



**Overland Supply  
Convoys Traverse  
Difficult Terrain**



**Forward Units often  
Rely on Expensive  
Aerial Delivery Methods**



**Military Logistics Convoys  
supply Forward Bases, but  
Require a Large Amount of  
Equipment, Fuel, and  
Personnel**



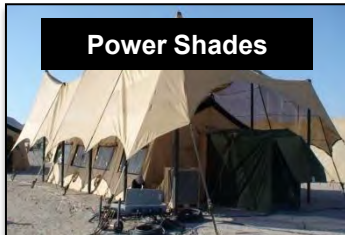
*We rely on a large and complex system to sustain contingency bases*



# Current Initiatives: Contingency Basing Solutions



Tent Liners



Power Shades



Solar Shade



Shelter System



Renewable Solutions

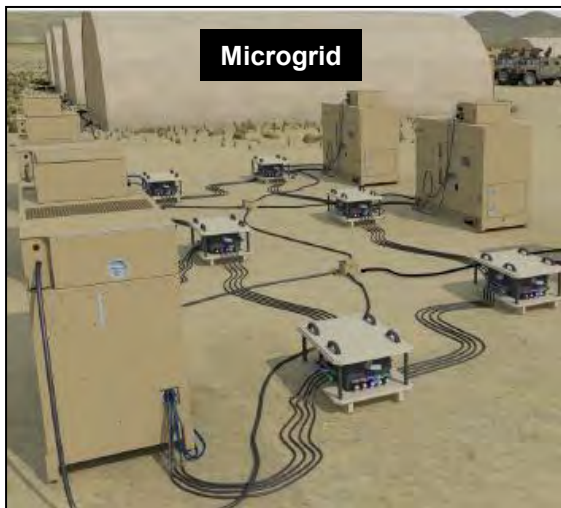


LED Lighting

Liners: 75% Energy Savings moving from R-1 to R-6  
Solar Shades: Up to 17% energy savings



Efficient Medium Sized Mobile Electric Power



Microgrid



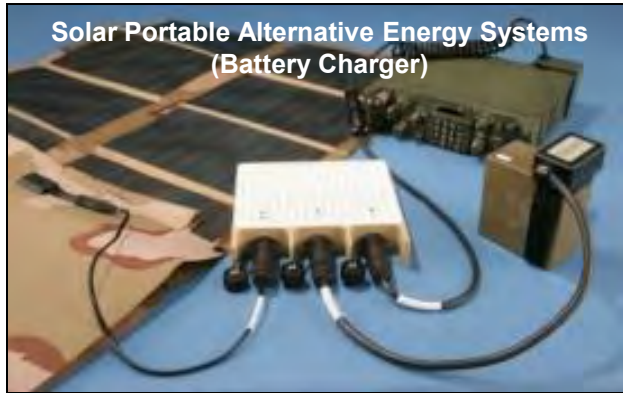
Improved Environmental Control Unit



Centralized Power Solution



# Current Initiatives: Soldier Power Solutions



300W Propane Fuel Cell	Solar Blanket w/Power Manager	Rucksack Enhanced Portable Power System	300W Methanol Fuel Cell	55W Methanol Fuel Cell	Conformal Battery

Cutting edge effort in developing advanced battery technologies to meet the military's growing need for innovative power and energy solutions



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# *Questions*