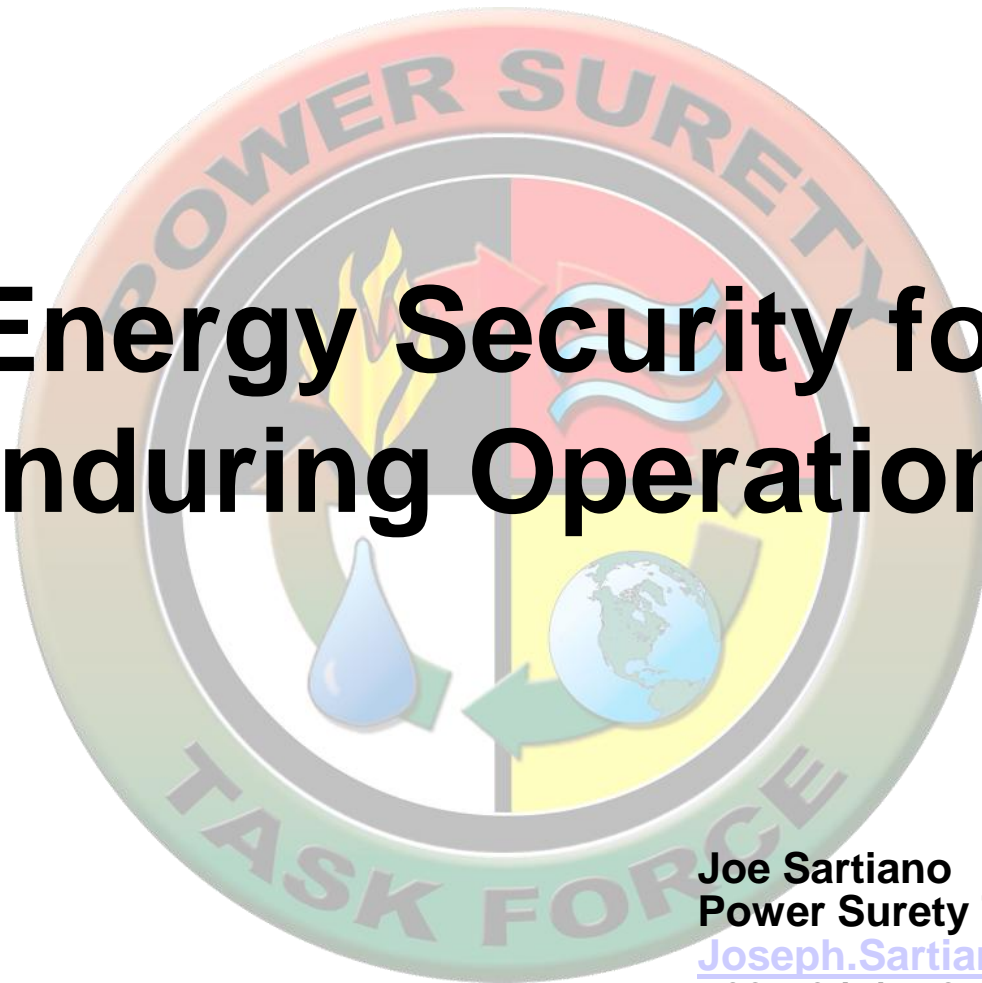




Energy Security for Enduring Operations



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Power Surety Task Force
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Confluence of Issues

...And the other is energy. ...It's not just an economical security issue, it's a national security issue.



President Bush, NBC Nightly News, 30AUG06

"Create good jobs by investing in renewable energy and new technologies for an energy independent America."



Nancy Pelosi, Press Release, 28 Jun 05

National Security

Economic Growth

Force Protection

Bottom-line

Power Surety

- Saves lives
- Impacts
 - Strategic
 - Operational
 - Tactical
 - Full Spectrum Contribution

... "reducing the military's dependence on fuel for power generation could reduce the number of road-bound convoys"...

Maj. Gen. Richard Zilmer, Defense News, AUG06



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Power Surety Task Force History



Transportable Hybrid Electric Power Station



Jul 06: MNF-West Renewable

Aug 06: REF Funds THEPS Development



Oct 06: REF establishes Power Surety Task Force



Before Spray Foam



After Spray Foam

Jan 07: Demand Reduction Demonstration at Ft. Benning



Iraq



Afghanistan



Kuwait

Summer 07: Demand Reduction in Kuwait, Iraq, Afghanistan, Horn of Africa



Ft. Irwin, CA

Oct 07 – Jan 08: Net Zero Structures Constructed at National Training Center, Ft. Irwin, CA



Dec 07: NZ+ JCTD Approved as Rolling Start



Feb 08: PSTF Transitions to OSD Energy Security Task Force

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PSTF Construct

Transparent Demand Reduction



**Supplemental
Alternative/
Renewable
Power**

**Systems
Engineering**

Energy is the New Bandwidth for Commanders

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Outreach



Iraq



National Training
Center



Combatant
Commands



Commercial
Industry and
Government
Labs



**Identifying Operational Needs and Technological
Capabilities**

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Initiatives

External Spray Foam



Iraq

Enduring Efficient Structure



Ft. Irwin



External Spray Foam



Afghanistan

External Spray Foam



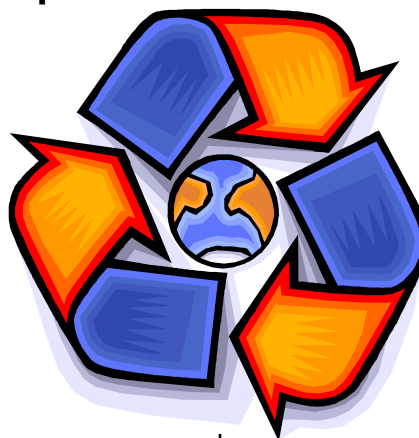
Djibouti

Tactical Hybrid Power



Ft. Irwin

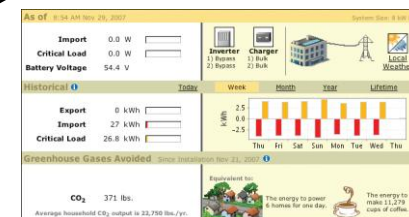
Transparent Demand Reduction



Supplemental
Alternative/
Renewable
Power



Systems
Engineering



Ft. Irwin

SolarStik



Iraq

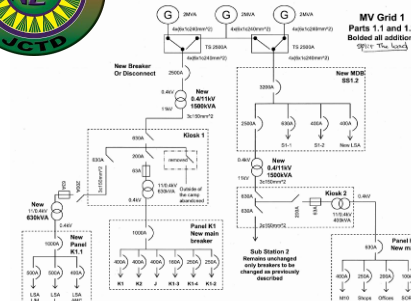
Tactical Hybrid Power--THEPS



Ft. Irwin



Camp Shocker, Iraq



Camp Slayer, Iraq



PSTF Project Involvement



Completed

- Spray Foam: Eskimo
- Transportable Hybrid Electric Power Stations (THEPS)
- Net Zero Structures (Monolithic Domes)
- Ft. Belvoir Housing Demo
- Tactical Garbage to Energy Refinery (TGER)
- Tactical Electric Solar Systems

Current

- Net Zero Plus JCTD
- Hawaii Housing Demo
- Iraq Home Power Demo
- Solar Powered Security Lights
- Joint Security Station Power (Aztec Survey)
- Defense Energy Fund
- Kuwait Crossing Tactical Hybrid Power Demo

Futures

- NZ+ Installations
- Installation Waste to Energy Power Plants
- Ft Irwin Housing Demo
- OSD Spray Foam Policy Letter
- Afghanistan Power Survey



Fundamentals

- **Fundamentals are not sexy...reduce demand *then...* size supply**
- **Rapid Model (our DNA from REF)**
 - Apply proven commercial strategies (like for-profit companies do...)
 - Demo (sole source)
 - If success, Warfighter buys (competitive)
 - Way ahead: transition to PM ***or...*** catalog (like GSA)/website where unit orders directly + IDIQ contract vehicle in every Unified Cmd (all services)



Demand Reduction Using Spray Foam Insulation

TRAINING AND MILITARY EXERCISE SITES

Can be used across the DoD Spectrum: I&E, Operations, Training, etc



National Training Center,
Ft. Irwin, CA



FORWARD OPERATING BASES



Camp Lemonier, Djibouti

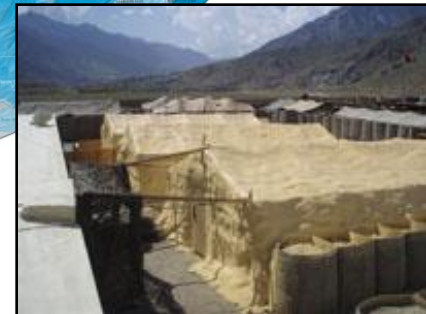
INSTALLATIONS



Ft. Belvoir, VA



Camp Victory, Iraq



FOB Naray, Afghanistan

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Current GLOC —

Results: Iraq Forward Operating Base Fuel Savings from Spray Foam

200K JP8
100K DF
12.2K MOGAS

MOSUL

Q-WEST

MNF-I initially plans 9M sq
ft of Spray Foam
CENTCOM predicts 50%
fuel savings for power
generation--180K gal/day
- Potential Cost Avoided

@ \$3/gal fuel:
\$540,000/day

@ \$20/gal fuel:
\$3.6M/day

SYRIA

AI ASAD

350K JP8
25K DF
10K MOGAS

AI Anbar

TQ

CEDAR II

1.0M JP8
250K DF
32K MOGAS

SAUDI
ARABIA

BUEHRING

ALI AL
SALEM

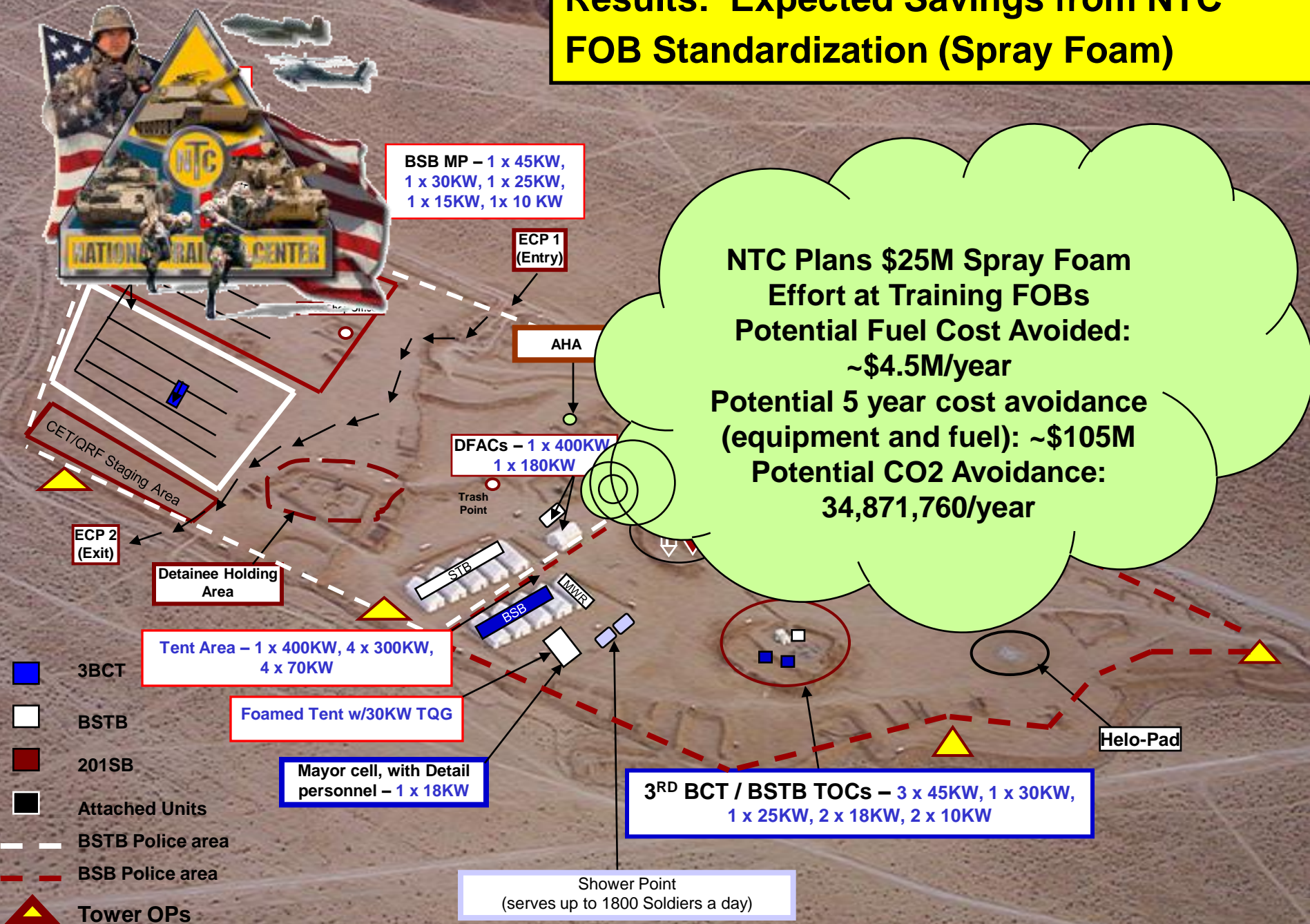
MINA ABDULLAH
TRUCK FILL STAND

KUWAIT

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- 3 GLOCS
- 3 Suppliers
- All Escorted From Border

Results: Expected Savings from NTC FOB Standardization (Spray Foam)





DoD Applications for Net Zero Structures and Sites



TRAINING AND MILITARY EXERCISE SITES

Can be used across the DoD Spectrum: I&E, Operations, Training, etc



National Training Center,
Ft. Irwin, CA

INSTALLATIONS



Ft. Belvoir, VA

Forward Operating Bases and Border Crossings



K-Crossing, Kuwait



USCENTCOM
Sponsored
Demonstration at
Ft. Irwin, CA



Estimated Benefits*: Net Zero Homes



**Spray-Foam insulation prevents
all air infiltration**

Control House (Phase I)

Spray Foam Attic (Phase II)

- Assume 30% utility savings
- ~\$2000 up-front cost / home
- Break Even Point in about 5 years

• Spray Foam Attic and Walls (Phase III)

- Assume 50% utility savings
- ~\$5500 up-front cost / home
- Break Even Point just over 8 years

• Spray Foam Plus Micro Power (Phase III)

- Assume 75% to 100% utility savings
- Energy secure -- capable of operating without grid

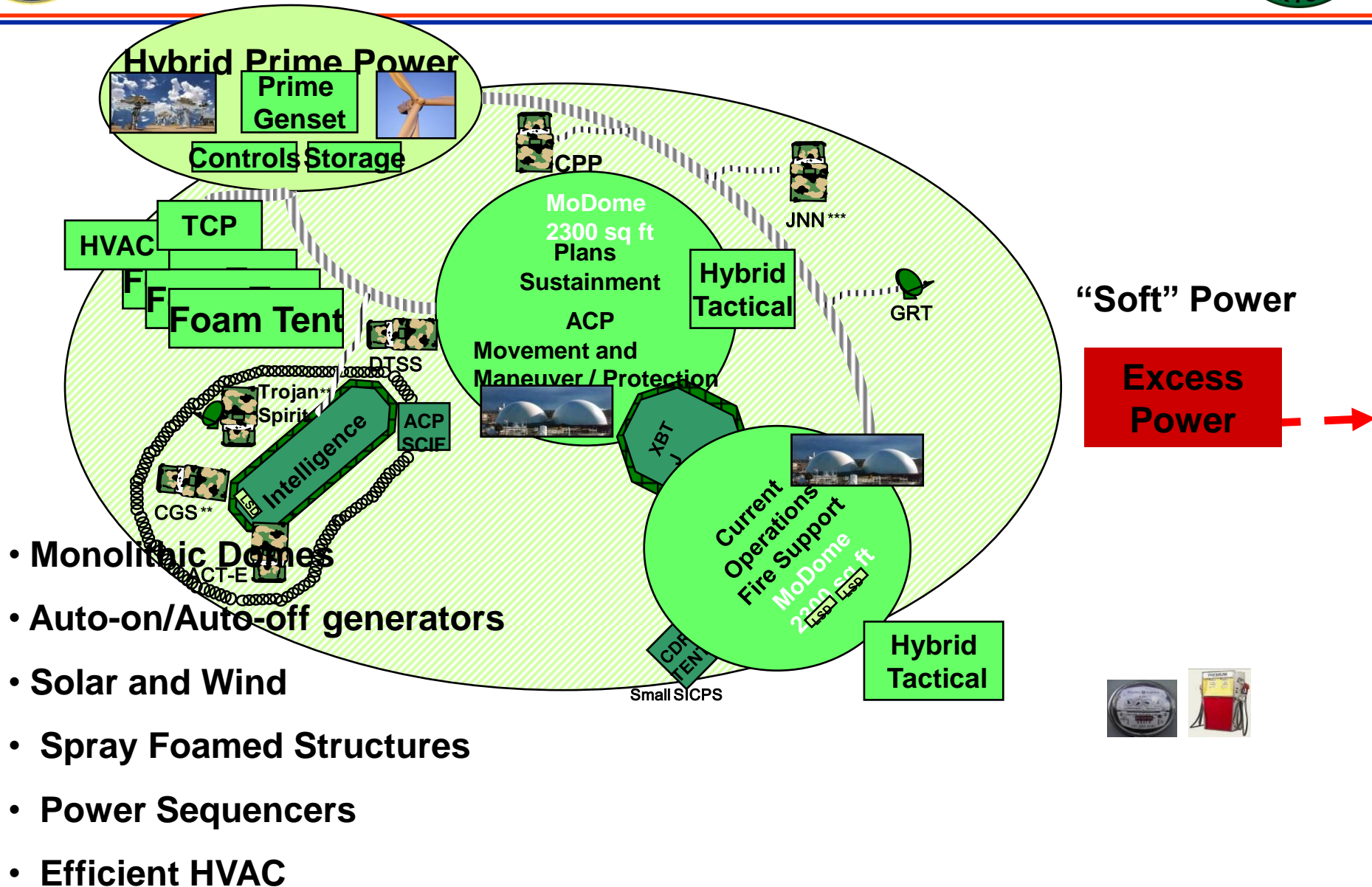


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* Reports forthcoming



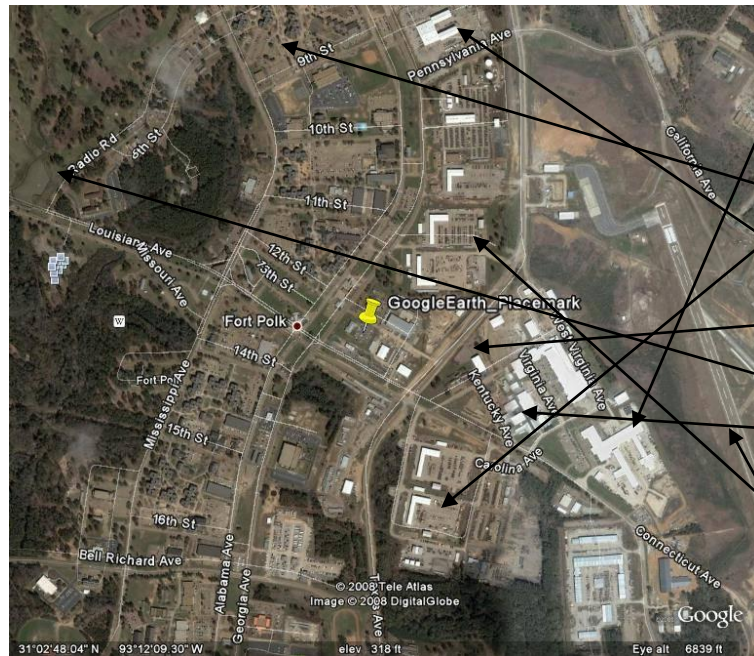
Net Zero Plus Technologies



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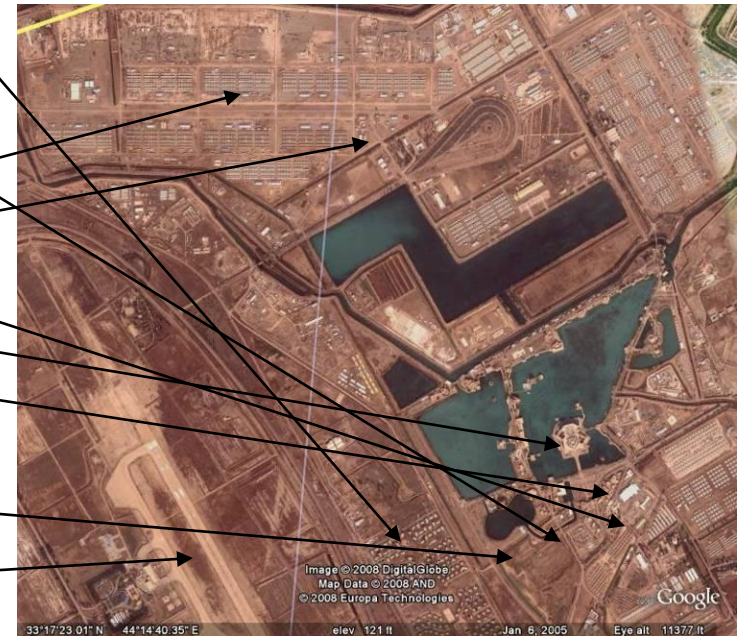


Deployed Installations???



Fort Polk, LA

HQ Buildings
PX
Housing
Mess Hall
Gym
MWR Facility
Movie Theater
SA ranges
Motor Pool
Air Field



Camp Victory, Iraq

...by Leveraging Experience and Expertise



Ft. Irwin Energy Installation of Excellence



- **NZ+ Demo—
Completed**
- **NZ+ JCTD—Working**
- **NZ+ Installation—
Great Potential**



National Training
Center, Ft. Irwin, CA



EUL, UESC
or other COA



External Spray
Foam



Net Zero Structure



Ground
Source Heat
Pump



LED



Tactical
Hybrid Power



High Density
Foam for
Fixed



LED Lighting



On-Demand
Hot Water



Micro Power/Hybrid
Prime Power



Micro Power/Tactical
Hybrid Power

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The Way Ahead

- Synchronize the Defense Energy Security Strategy
- Vet and prioritize emerging GWOT power requirements
- Reduce Operational Commanders reliance on fossil fuel products and enhance capability
- Holistic approach across entire DoD
- Defense Energy Revenue and Savings Fund
- Literally.....start at home



DoD as an Agent of Change



....By 20XX, the Pentagon will be a NET ZERO PLUS installation.



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