



The Defense Department's New Energy Initiative



Michael A. Aimone, P.E.
Director
Business Enterprise Integration
Office of the Deputy Under Secretary of Defense
(Installations & Environment)



America's Military Missions

We train...



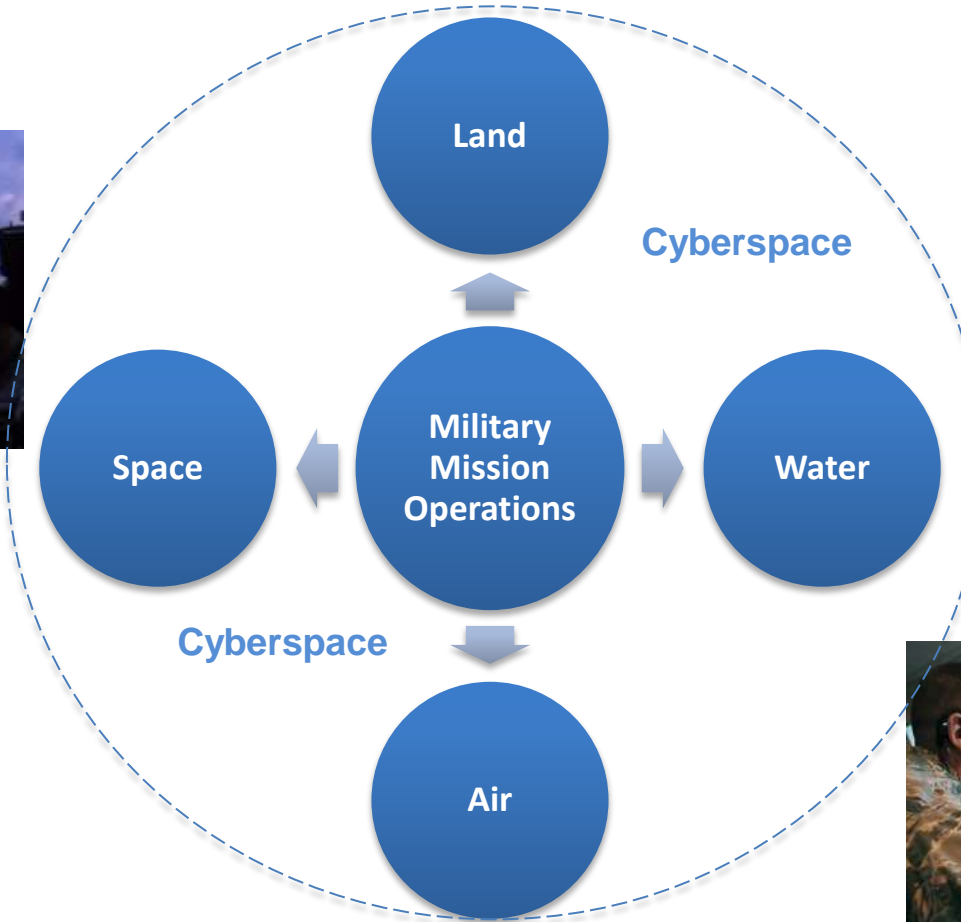
operate...



test...



and defend.





The Core Strategy

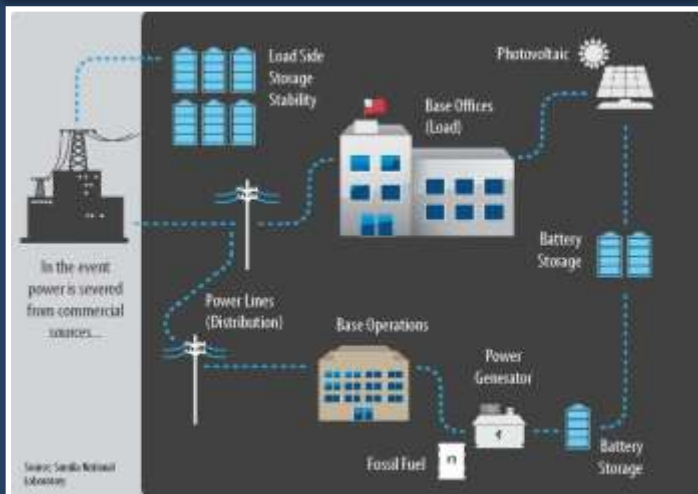
Reduce Demand



Expand Supply



Enhance Security



Advance New Technology

Installation Energy Test Bed: Roadmap

Agilities, Technology and Logistics

- Smart Secure Installation Energy Management**
 - Micro-grids
 - Energy Storage
 - Ancillary Service Markets
- Efficient Integrated Buildings**
 - Design, Retrofit, Operate
 - Enterprise Optimized Investment
 - Advanced Components
 - Intelligent Building Management
- On-Site Generation**
 - Cost Effective Renewables
 - Waste to Energy
 - Building Integrated Opportunities



DoD and Microgrids

The Specification

- **Combines dynamic demand load response with coordinated economic dispatch of on-site generation**
- **Operates in an intentional islanded mode as needed for national security missions**
- **Maximizes site energy resources and configurations**
 - Centralized heat and power generation
 - Distributed generation
 - Renewables and associated energy storage
- **Ensures economics and operates as part of the local utility market**

Primary goal of DoD installation microgrids is to provide energy security in a cost effective manner.

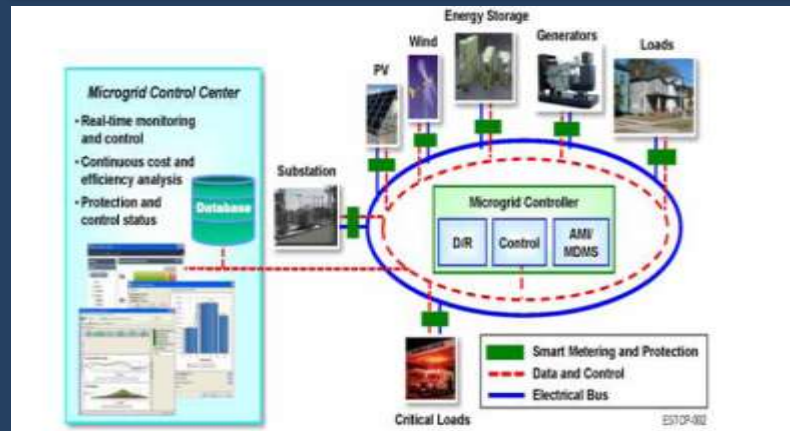


Installation Energy Test Bed: Smart Secure Installation Energy Management

Smart Microgrid at TWENTYNINE PALMS



Smart Microgrid at Fort Bliss



Sodium-Metal-Halide Battery Energy Storage System at TWENTYNINE PALMS



Zinc Bromide Flow Battery at Marine Corps Air Station Miramar





Western DoD Installations Solar Study: Nine Installations – 7 GW Renewable Energy Potential

Army

Fort Irwin

Navy

NAWS China Lake
NAF El Centro

Air Force

Edwards AFB
Nellis AFB (including
the Range
Creech AFB

Marine Corps

MCAGCC TWENTYNINE
Palms
MCLB Barstow
Chocolate Mountain Aerial Gunnery Range

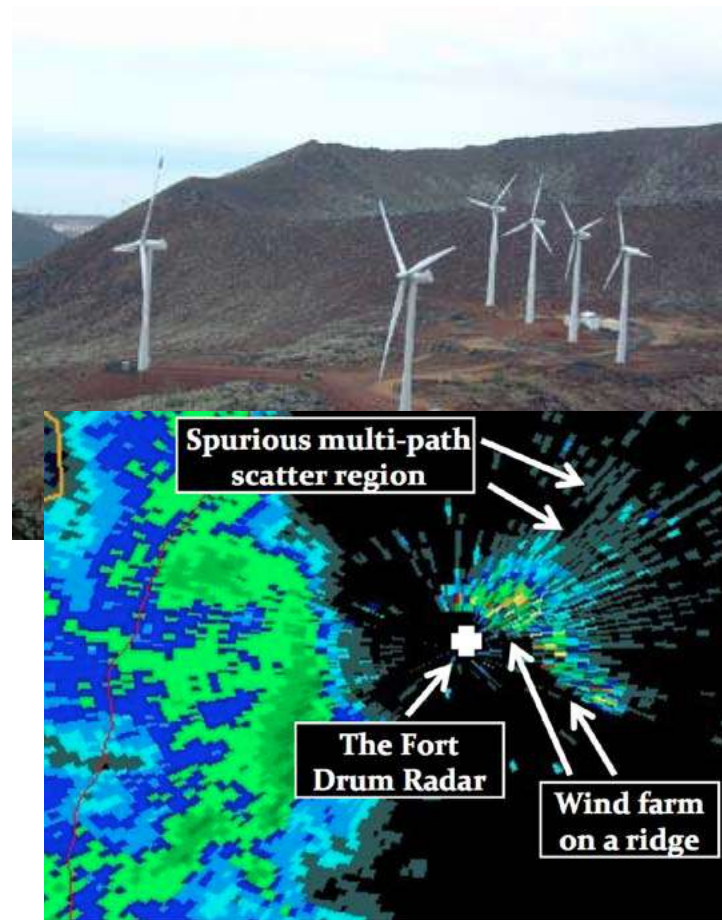


**Study restricted to land inside installation boundaries including Withdrawn Lands.*



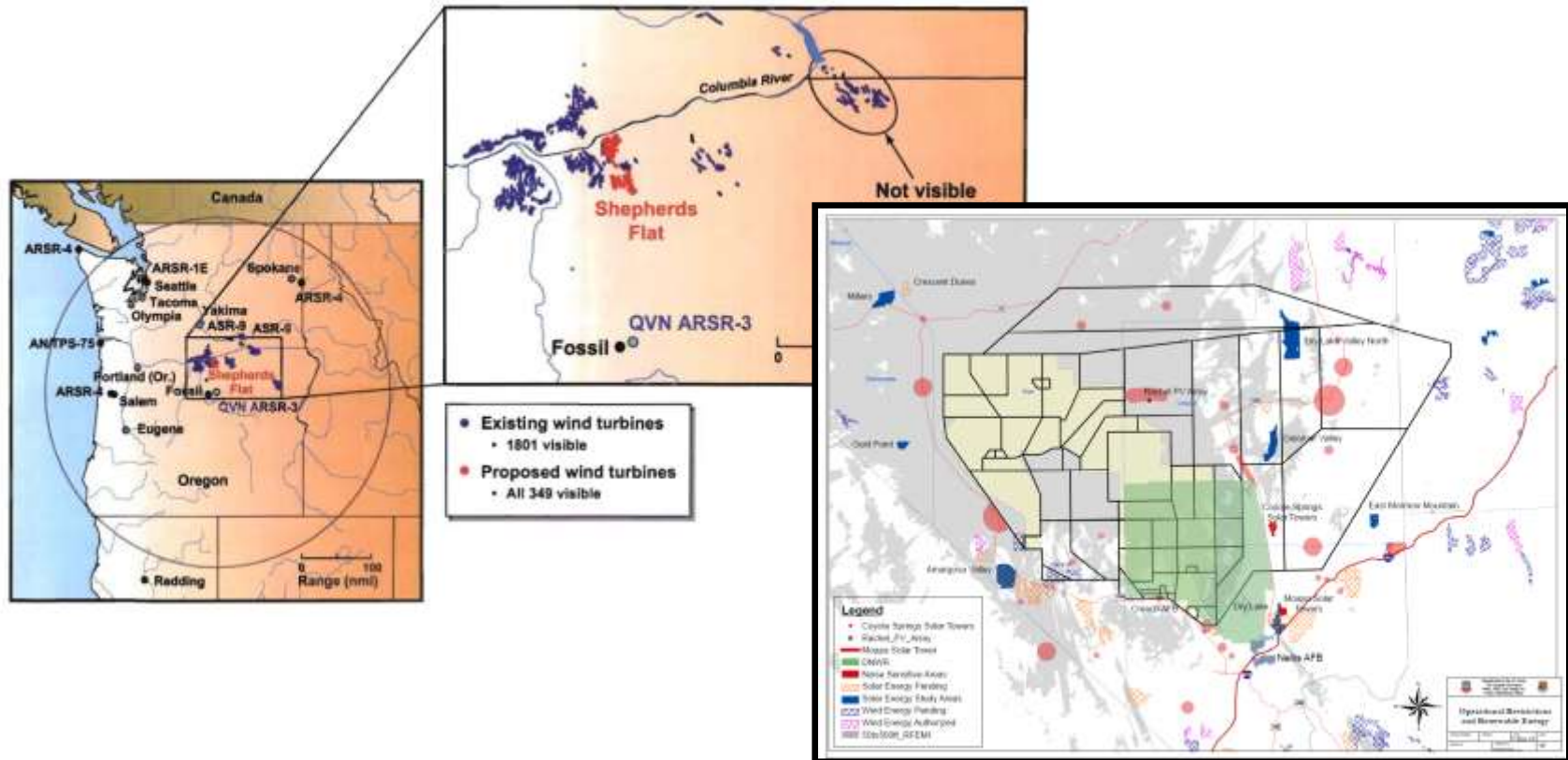
The Nexus of National Security & Renewable Energy

- **Unintended Consequences**
 - Rapid development of renewable technologies
 - Rapidly changing military technology research & development
- **Existing Policy and Processes**
 - Not up to date with changing technologies
 - Land use decision-making authorities fragmented across all levels of government





From Nellis to Shepherds Flat: A Call for Action



The Solution: Establish a clearinghouse for Renewable Energy Developers



Resulting Congressional Response: FY2011 NDAA, Section 358, as amended

- **Section 358 “Study Of Effects Of New Construction Of Obstructions On Military Installations And Operations”**
 - **Integrated review process**
 - **180-day backlog assessment**
 - **Identification of mitigation options**
 - **Comprehensive strategy for addressing military impacts of projects**
 - **Limited authority to object to projects**
 - **Ability to accept voluntary contributions for mitigation**



States Respond to Sustainability Challenges

State Laws Enacted Since 2003 Supporting Installation and Range Sustainability:

- Compatible Land Use Statutes (22)
- State Funding to Purchase Development Rights (12)
- Communication or Notification to Installation on Zoning Changes (16)
- “Dark Skies” Lighting Restrictions Near Training Areas (14)
- Real Estate Disclosure (7)

How can DoD best work with the State Energy Officials?



States Respond to Sustainability Challenges (cont.)

In-State Organizations Created to Engage a Range of Military Sustainability Issues:

- **State Military Advisory Commissions and Panels** – Created by state government to address military sustainability challenges, protect state and local economic interests and veterans issues. Over 30 states now have some type of organization to advise state government.
- **[DoD-Inspired] Commanders Councils** – Created by in-state installation and range commanders to engage state and local government, coordinate public policy positions and address encroachment, environmental compliance and community relations issues. Exist in Arizona, Florida, North Carolina and Texas.



DoD Siting Clearinghouse: Modeling Tools

- **Impact Analysis & Tools**
 - Projects assessed by all DoD Components across core missions
 - **Evaluation Criteria:**
 - **Green:** Minor to no impact on military operations
 - **Yellow:** Major impact to military operations but mitigation is possible
 - **Red:** Major impact to military operations that cannot be reasonably mitigated
 - **Mission Compatibility Analysis Tool (MCAT)**

| 3 x 3 Impact Analysis Matrix | | | |
|------------------------------|--------------------|-----------------------------------|---------------------------------------|
| | Minor or No Impact | Major Impact, Mitigation Possible | Major Impact, Mitigation NOT Possible |
| Training & Readiness | | | |
| LRR & Surveillance | | | |
| Test & Evaluation | | | |





Research & Development

- **Wind-Radar Interagency Field Test & Evaluation**
 - Multi-agency partnership led by DOE, DoD, DHS, & FAA
 - Through MIT Lincoln Labs and Sandia National Laboratory
 - Test Multiple Off-The-Shelf (OTS) Technologies
 - Baseline radar systems, including air traffic control and homeland defense
 - Test multiple OTS mitigation technologies
- **Radar Modeling Tool Development**
 - Improve modeling of the effects of wind turbines on radar systems





DoD Energy Partnerships



- **Overarching Goal**
 - Mission Assurance
- **Multiple Authorities**
 - Power Purchase Agreements (PPAs)
 - Up to 30 years – 10 U.S.C. § 2922a
 - Enhanced Use Lease (EUL)
 - Consistent with 10 U.S.C § 2662 and 10 U.S.C § 2911
 - Energy Savings Performance Contracts (ESPCs)
 - Utility Energy Service Contracts (UESCs)