Headquarters U.S. Air Force

Make Energy A Consideration in All We Do™

Towards an Independent Power Production Capability….

Responding the Defense Science Board Report on Energy Security

Michael A. Aimone, P.E.
Assistant Deputy Chief of Staff
(Logistics, Installations & Mission Support)
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The Defense Science Board Report

Task Force on DoD Energy Strategy

"More Fight – Less Fuel" (Feb 08)

- **The recommendations from the 2001 DSB Report "More Capable Warfighting Through Reduced Fuel Burden" not implemented**
- **Critical national security and Homeland Defense missions are at risk of extended outage from failure of the grid**
- **DoD lacks the strategy, policies, metrics, information, and governance structure to manage its energy risks**
- **Technologies available now to make DoD weapon systems more energy efficient, but they are undervalued, slowing their implementation**
- **There are many opportunities to reduce energy demand by changing wasteful operational practices and procedures**
- **Operational risks from fuel disruption require demand-side remedies; mission risks from electricity disruption to installations require both demand- and supply-side remedies**

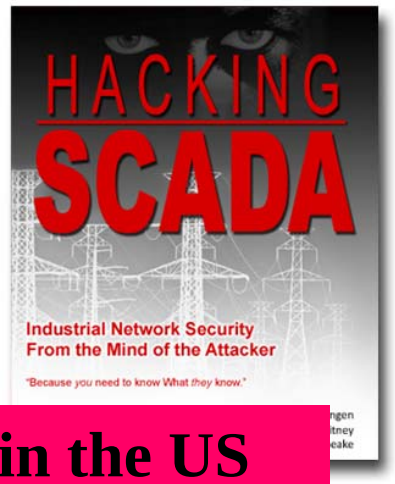
Recommendations of the DSB TF on Energy Security

Classified Annex (Jul 08)

- **(U) Establish a DOD Senior Energy Official**
- **(U) Establish a Cross-Functional Installation Risk Management Team**
- **(U) Conduct Installation Risk Management Studies at Specific Locations to Establish Procedures, and Develop Risk Assessment and Mitigation Team Skills**
- **(U) Partner with FERC and the State Public Service Commissions**
- **(U) Publish security estimates of the threat**
- **(U) Address Pandora/Aurora Threat**
- **(U) Address (other) Threats & Vulnerabilities to Critical Energy Infrastructure**

Power Systems are Vulnerable

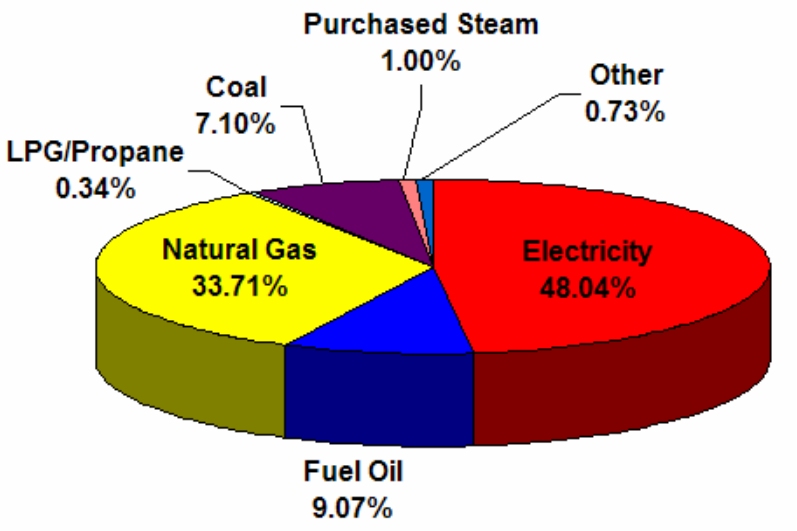
- Physical attacks to the grid is a long-know issue
  - Lovins' "Brittle Power" in early '80s
- Open sources report that CIA discloses to public they have information of Cyber attacks against Power system controls outside the US.
  - Has resulted in multi-city outage
  - Extortion is a motivation
- US Power systems have been probed
- Connectivity to substations & digital hardware exist
  - NERC Survey (modems, SCADA, Internet, etc…)
  - Restoration time is critical, availability is priority
- Parallels exist to EMP threat; mitigation strategies
- Short Term Outages well understood/contingency ops executed regularly for Wx, system failures



Extended Grid Outages an Unknown Experience in the US

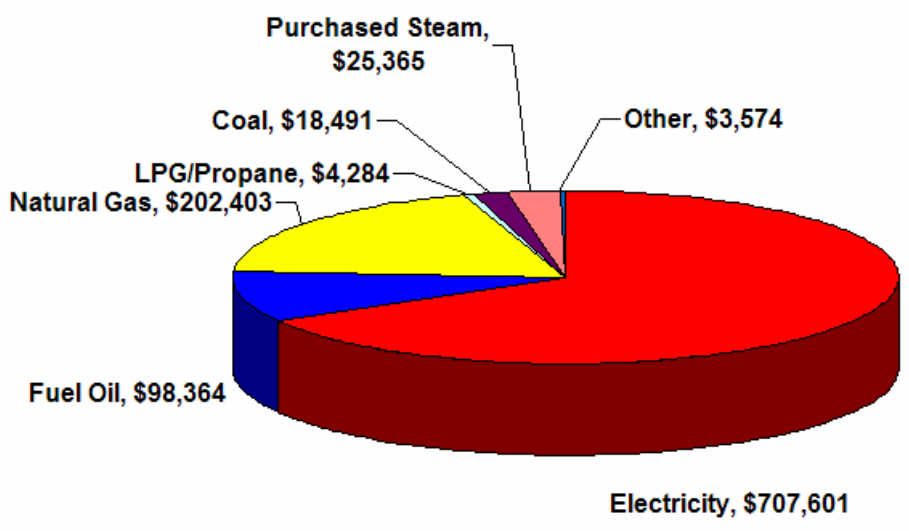
FY07 Air Force Facility Energy Use

USAF FY07 Facility Energy Use in MBTUs



71,161,000 million BTU

USAF FY07 Facility Energy Costs ($000)



$1.06 billion

SOURCE: FY07 ANNUAL ENERGY MANAGEMENT REPORT TO CONGRESS

Policy Framework

- **DoDI 3020.45, *Defense Critical Infrastructure Program (DCIP) Management*, 21 Apr 08**
  - **MilDeps must identify, prioritize, and assess critical assets and infrastructure dependencies vital to execution of required Combatant Command and Service capabilities**
  - **MilDeps must fund and resource a CIP program and develop and implement remediation plans**
- **DODI 4170.11, *Installation Energy Management*, 22 Nov 05, para 5.2.3**
  - **Directs Military Departments to take necessary steps to ensure the security of energy and water resources**
  - **Conduct Vulnerability Assessments, mitigate risks, and investigate off-base utility systems**
  - **Incorporate identified vulnerabilities into established Critical Asset Assurance Programs**
  - **Invest in Renewable energy sources and distributed energy systems, including off-base systems, if economical**
  - **Procurement Strategy: encourage partnerships with Defense Energy Supply Center for regional solutions**

DOD Response of the DSB TF on Energy Security

- **Define an active role for DOD in the Energy CIP's Government Coordinating Council**
- **Respond to the specific AURORA threat vector**
- **Quantify the other vulnerabilities/threats/risks to military installations**
- **Prioritize and implement mitigation strategies, to include:**
  - **Demand Reduction**
  - **Supply-side Assurance**
  - **Culture Change**

Towards an Independent Power Production Capability….

- **Renewables mandated – 13% by 2013 directed by law/EO, growing to 25% by 2025 by DOD policy**
  - **…. but is storage technologies lagging?**
- **Unconventional Fuels (H_2, CTL, Oil Shale, Bio-fuels) evolving**
  - **…. but shouldn't it be used for transportation sector (including aviation)?**
- **Small, packaged, intrinsically safe and secure nuclear power for installations**
  - **….. Working with DOE, can the Military as a first adopter?**
  - **….. How to solve the NIMBY issue?**
  - **….. Can it be cost effective?**
  - **….. Could it set up an opportunity for a "national security grid" in/around the military installation?**

Way Ahead

- **DOD work with DOE (and the industry) to define the possible role Nuclear Power might play on military installations**
  - **Build from the experiences of the 1950/60s**
  - **Define the pros/cons**
  - **Assess community support**
  - **Examine the economics**