



Army Energy Security



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Installations and Environment

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Leadership Supports Energy Initiatives

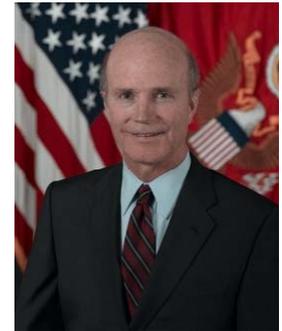


“...we will invest \$15 billion a year to develop technologies like wind power and solar power; advanced biofuels....”



**-President Obama
2/24/09**

“By making greater use of alternative and renewable energy, Army initiatives will bring energy savings and security to the Army, reducing the risk of power disruption.”



**-Pete Geren
Secretary of the Army**

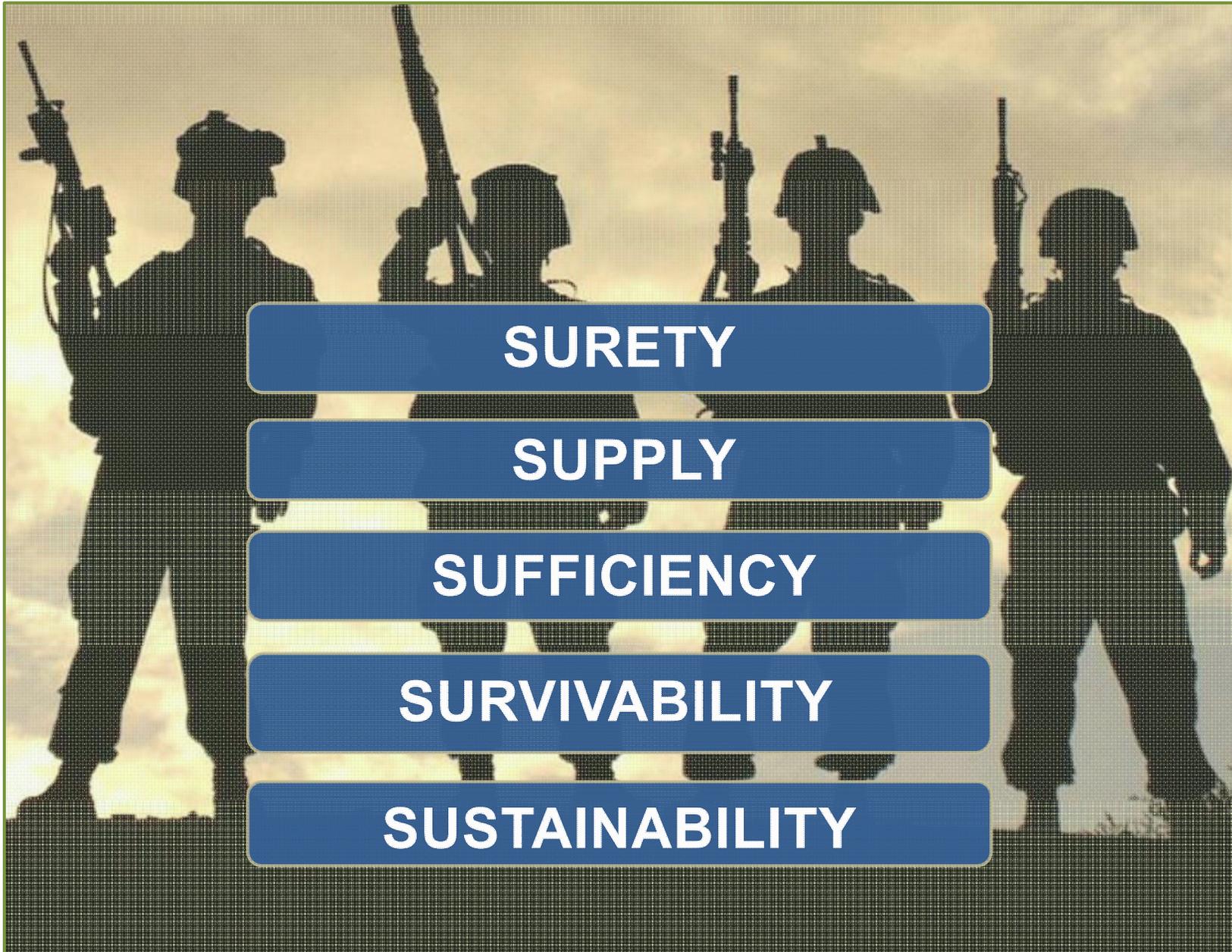


“By investing in groundbreaking research, making homes and businesses more energy efficient and deploying solar, wind, biomass and other clean energy, this budget will help ensure that America once again leads the world in confronting our global economic, energy and climate challenges.”

-Steven Chu, Secretary of Energy



ENERGY SECURITY



SURETY

SUPPLY

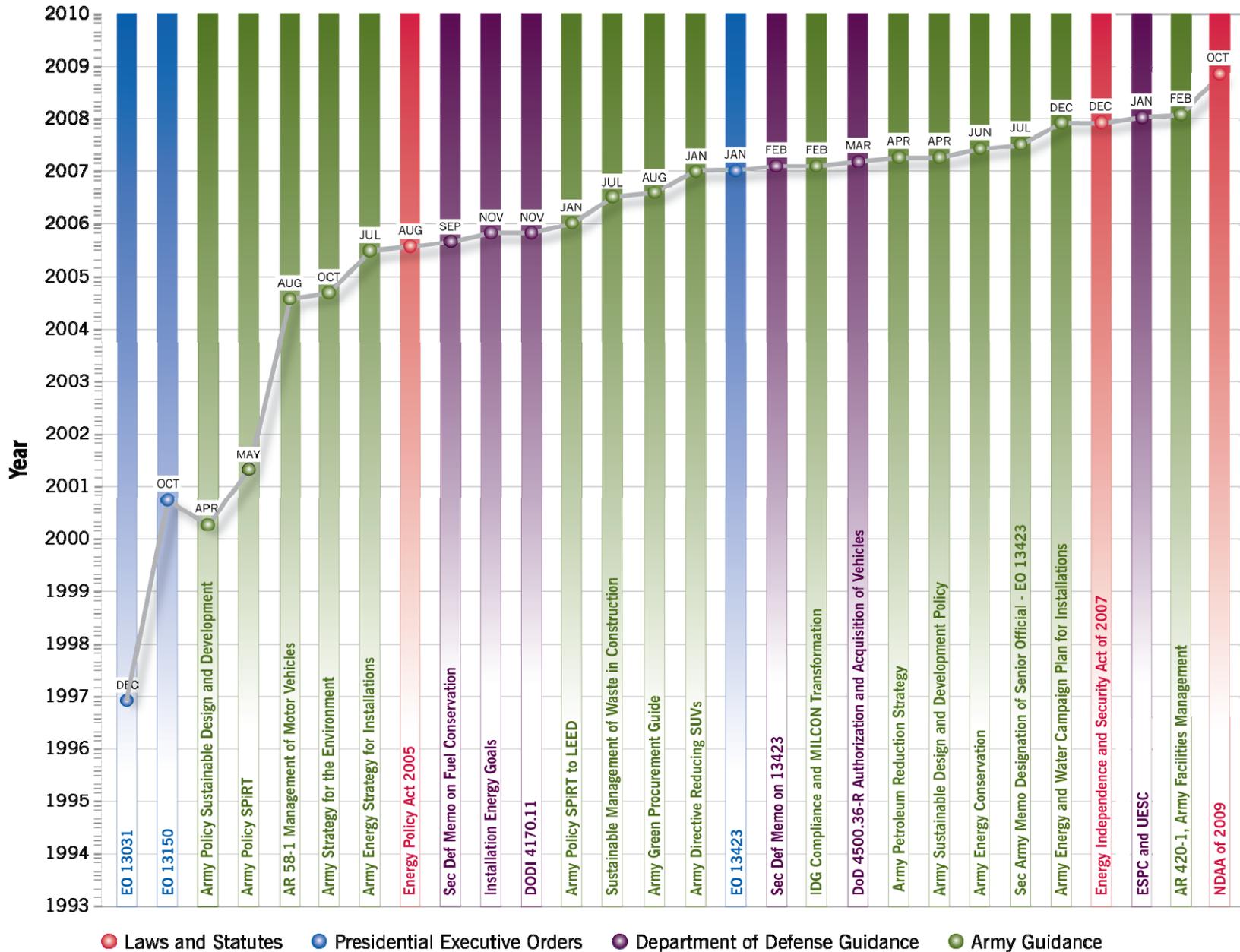
SUFFICIENCY

SURVIVABILITY

SUSTAINABILITY



Key Energy Directives





Directives and Metrics



Directive Topic	Energy Performance Target [Source]	Potential Army Metric
Installations energy use	Reduce by 30% by 2015 from 2003 baseline [EO 13423 / EISA 2007]	% Installation energy savings relative to 2003 baseline
Non-tactical vehicle (NTV) fuel consumption	Reduce 2% annually through 2015, 20% total by 2015 - 2005 baseline [EO 13423]	% NTV fuel savings relative to 2005 baseline
Electricity from renewable sources	A voluntary "sense of Congress" goal - 25% by 2025 [EISA 2007 / NDAA 2007]	% of Army energy use provided by renewable / alternative sources
Fossil fuel use in new/renovated buildings	Reduce 55% by 2010; 100% by 2030 relative to 2003 level [EISA 2007]	% Fossil fuel use reduction in new / renovated buildings relative to 2003 level
Hot water in new/ renovated buildings from solar power	30% by 2015 if life cycle cost-effective [EISA 2007]	% of new / renovated buildings with hot water from solar
Non-petroleum fueled vehicles use (ethanol, natural gas)	Increase by 10% annually [EO 13423]	% annual increase in non-petroleum fueled vehicle use
Energy metering for improved energy management	Meter electricity by Oct 2012 [EPAAct 2005] Meter natural gas and steam by Oct 2016 [EISA 2007]	% completion of metering planned for electricity, natural gas and steam



Army Energy Security Implementation Strategy



Strategic Energy Security Goals (ESGs)

ESG 1. Reduce Energy Consumption

ESG 2. Increase Energy Efficiency Across Platforms and Facilities

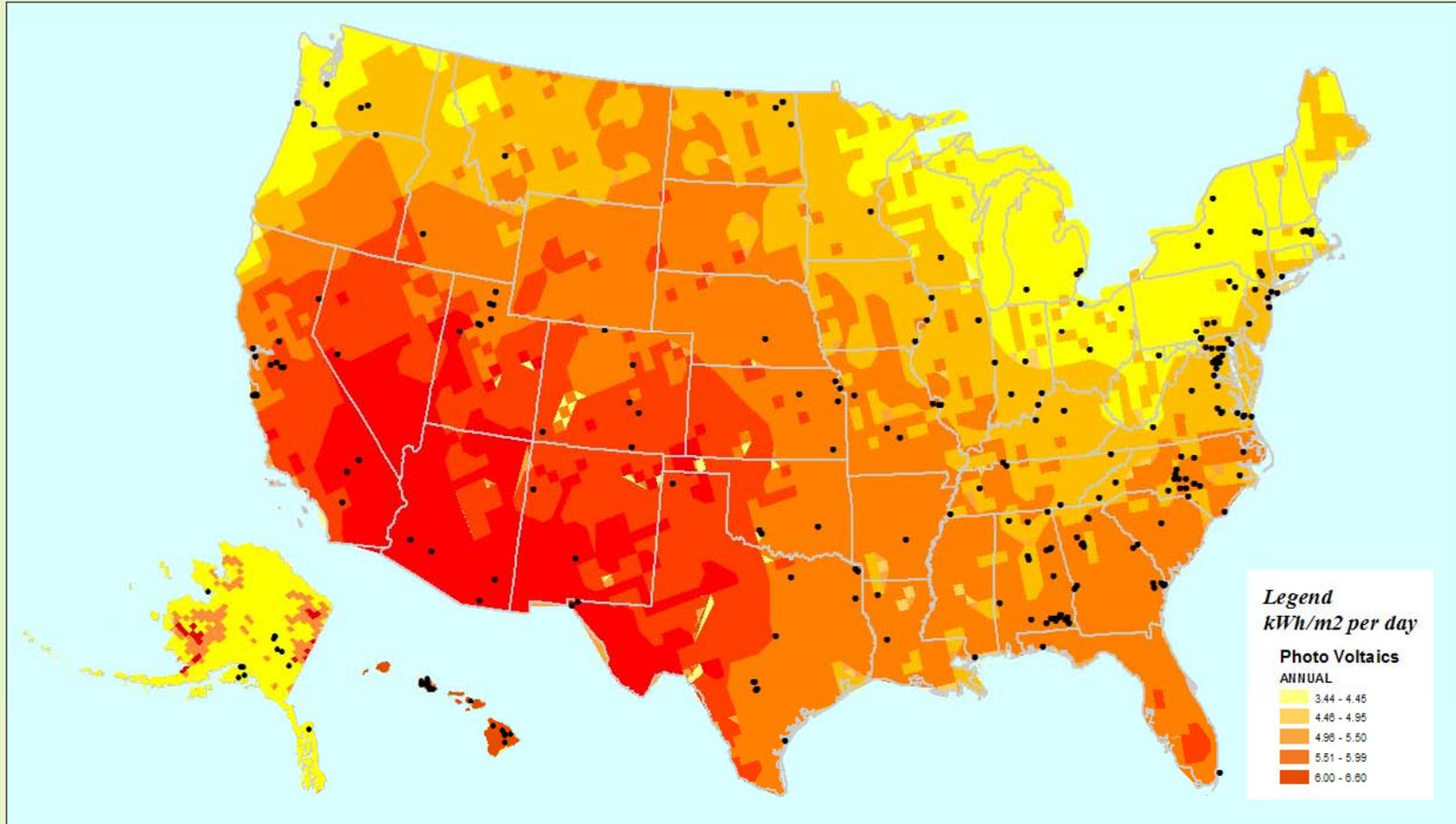
ESG 3. Increase Use of Renewable / Alternative Energy

ESG 4. Assure Access to Sufficient Energy Supplies

ESG 5. Reduce Adverse Impacts on the Environment



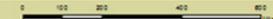
Solar Energy Potential



Map Document: (C:\DCCEED\o\Energy\SOLAR\SOLAR.mxd)
3/9/2009 -- 2:14:09 PM
Albers Projection
Central Meridian: -96
1st Std Parallel: 20
2nd Std Parallel: 60
Latitude of Origin: 40

U.S. Army Installations Solar Energy Potential

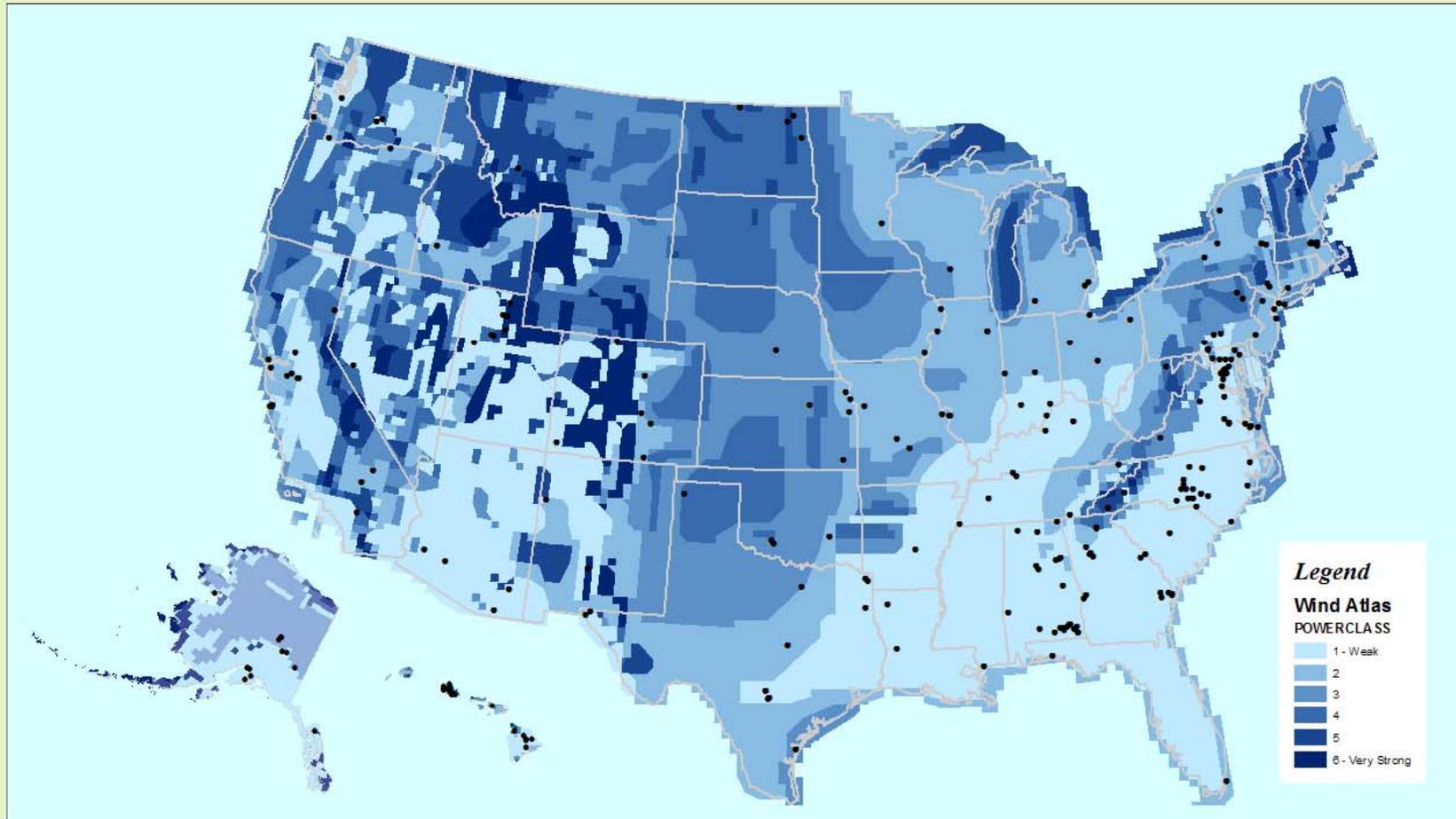
Scale for lower 48 and Hawaii: 1:17,000,000
Scale for Alaska: 1:40,000,000



Solar Potential Map (Photo Voltaics)
from National Renewable Energy Lab maps
and active Army installations from
National Geospatial Intelligence Agency (NGA) data services
Source: ESRI Data & Maps CD
Created in ArcGIS 9.3 using ArcInfo (Concurrent Technologies Corporation)



Wind Energy Potential



Map Document: (C:\Documents\NDCEE\DoDEnergy\WIND\WIND.mxd)
6/27/2009 1:25:43 PM

Albers Projection
Central Meridian: -96
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Latitude of Origin: 40

U.S. Army Installations Wind Energy Potential

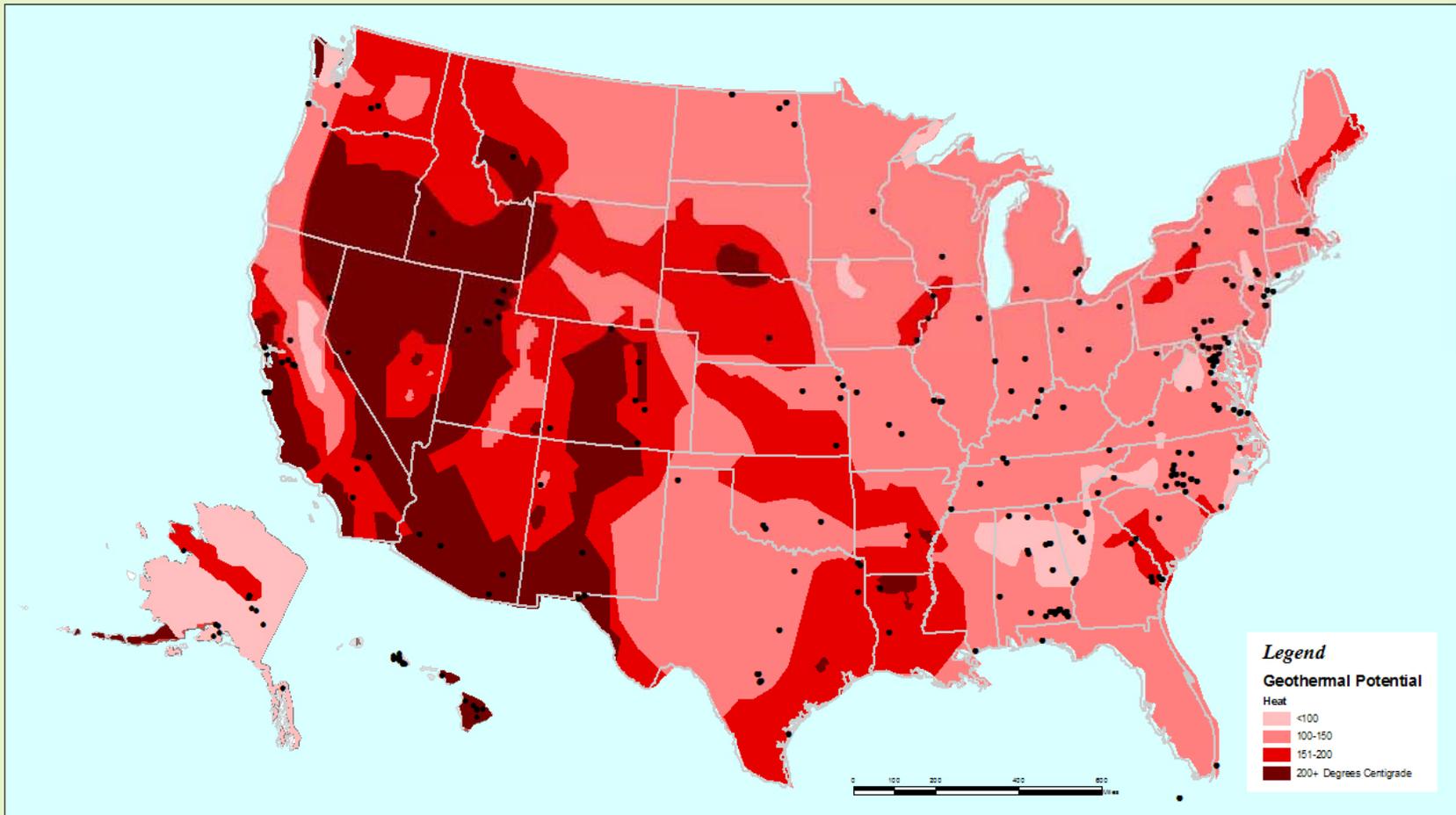
Scale for lower 48 and Hawaii 1:17,000,000
Scale for Alaska: 1:40,000,000



Biomass Potential Map
from National Renewable Energy Lab maps
and active Army installations from
National Geospatial Intelligence Agency (NGA) data services
Created in ArcGIS 9.3 using ArcInfo (Concurrent Technologies Corporation)



Geothermal Energy Potential



Map Document: (C:\Documents\NDCEE\DoDEnergy\GEO_THERMAL\GEO_THERMAL.mxd)
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Latitude of Origin: 40

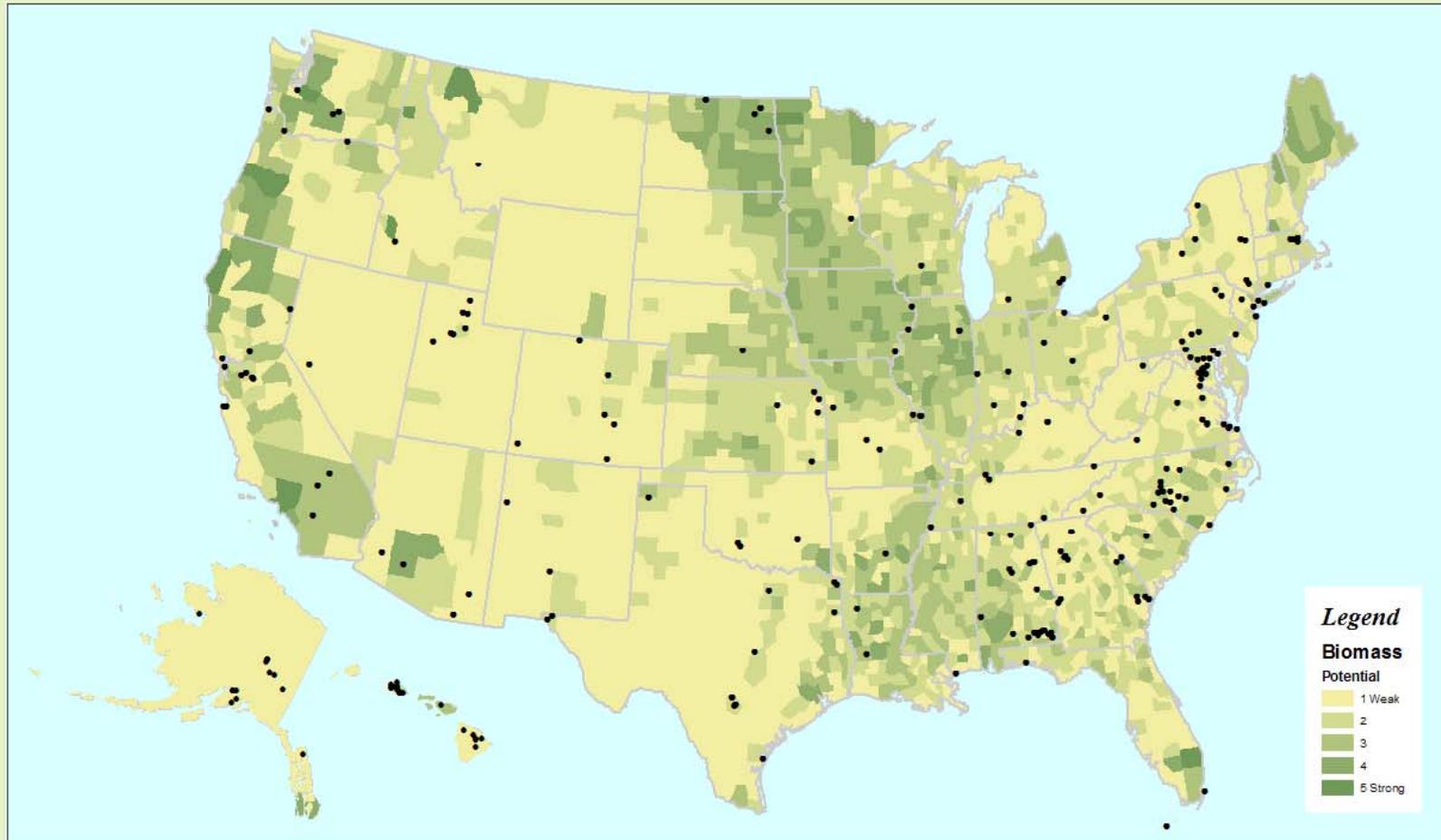
U.S. Army Installations Geothermal Energy Potential

Scale for lower 48 and Hawaii: 1:17,000,000
Scale for Alaska: 1:40,000,000

GEO_THERMAL Potential - Geothermal Education Office - c.2000
source: <http://geothermal.mar.mil/geopresentation/sld099.htm>
and active Army installations from National Geospatial Intelligence Agency (NGA) data services
Using ArcGIS 9.3 ESRI (Concurrent Technologies Corporation)



Biomass Energy Potential

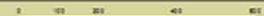


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Albers Projection
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2nd Std Parallel: 60
Latitude of Origin: 40

U.S. Army Installations Biomass Energy Potential

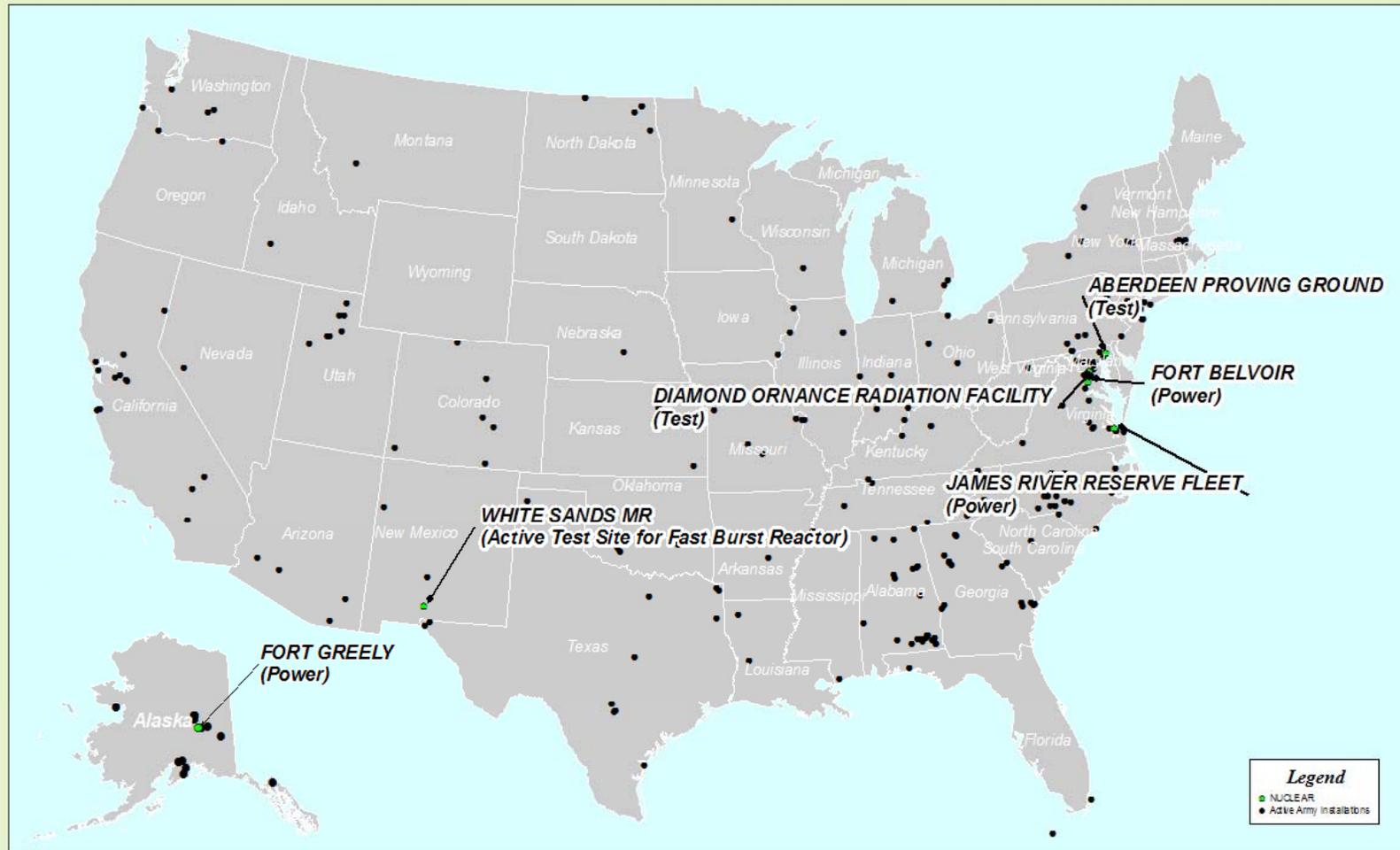
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Biomass Potential Map
from National Renewable Energy Lab maps
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Source: ESRI Data & Maps CD
Created in ArcGIS 9.3 using ArcInfo (Concurrent Technologies Corporation)



Nuclear Energy Potential



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Albers Projection
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Latitude of Origin: 40

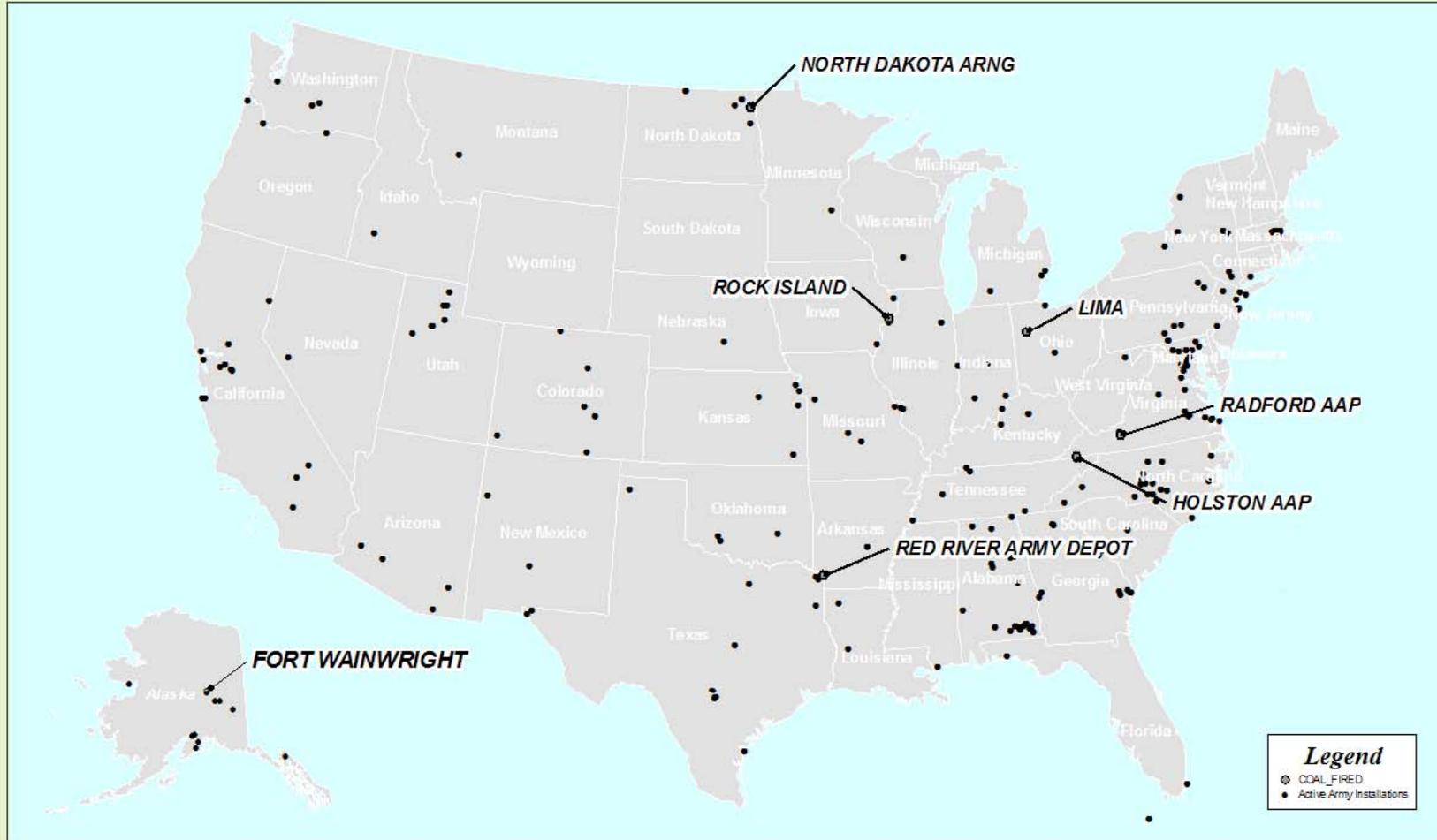
U.S. Army Installations Nuclear Energy Potential

0 55 110 220 440
Scale for lower 48: 1:17,000,000
Scale for Alaska: 1:40,000,000

Sources: ESRI Data & Maps CD
NREL RENEWABLE ENERGY DATA
WWW.NREL.GOV
Army Energy Security Task Force Maps
Created in ArcGIS 9.3 using ArcInfo
Concurrent Technologies, Tobyhanna

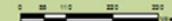


Coal Energy



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Albers Projection
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 Latitude of Origin: 40

U.S. Army Installations Coal Energy Potential



Scale for lower 48: 1:17,000,000
 Scale for Alaska: 1:40,000,000

Source: ESRI Data & Maps CD
 NREL RENEWABLE ENERGY DATA
 WWW.NREL.GOV
 Created in ArcGIS 9.3 using ArcInfo
 Concurrent Technologies Corporation



Major Army Energy Initiatives



Develop 500 MW Solar Thermal Energy Plant at Fort Irwin, CA

- Supports Energy Security for the Installation
- Estimated \$20.8M utility cost reduction to Army over 25 years
- Partnership with Industry through Enhanced Use Lease (EUL) and Power Purchase Agreement (PPA)
- Developer Announced July 09



Build 30 MW Geothermal Power Plant at Hawthorne Army Depot, NV

- Meet all of Hawthorne's electrical power requirements
- Releases essentially no greenhouse gas emissions
- Available 24/7
- Partnership with Navy and USACE



Establish Biomass Waste-to-fuel Technology Demonstrations

- Potential to turn five tons of cellulosic waste per month into diesel or jet fuel
- Reduce landfill waste and petroleum purchases
- Partnership with Defense Energy Support Center (DESC)



Major Army Energy Initiatives



Implement Energy Savings Performance Contract (ESPC) at Fort Leavenworth, KS

- Help meet energy consumption reduction directive of 30% by 2015
- ESPC Contractor paid from actual installation cost savings



Acquisition of Electric / Hybrid vehicles

- Army Order of 502 hybrid vehicles
- Acquisition of 4000 Low Speed Electric Vehicles (LSEV)
- Largest Federal Electric & Hybrid fleets



Tactical Fuel Logistics & Protection



EXAMPLE

2007 Kuwait/OIF/OEF Fuel to FOB (M gal)...	431
Fuel trucks needed.....	140,075
Convoys needed.....	9,332
Soldiers per convoy trip (Fuel trucks, protection, other support).....	120
Soldier trips.....	644,360
Fewer Soldier trips.....	6,444

(Resulting from 1% Fuel Savings)



Deployed Operations – “Beans, Bullets and BTUs”



The Challenge

- Fuel logistics, management and protection are key for contingency operations

Key Energy Opportunities

- Distributed Generation
- Tactical Grid Management
- Renewable/Alternative Power
- Lightweight, Flexible, Structural, or Integrated Solar
- Alternative Fuels
- Standardized Deployable Kits
- High Efficiency Systems
- Leveraging Local Opportunities





AMERICAN RECOVERY & REINVESTMENT ACT PROJECTS



- Energy Conservation Investment Program (ECIP)
 - 17 Projects; 13 Installations
 - \$32M

- Sustainment, Restoration, And Modernization (SRM)
 - 280+ Projects
 - \$365M; \$222M NGB

- Research, Development, Test and Evaluation (RDT&E)
 - \$75M
 - Advanced Power Electronics Ground Systems Testbed
 - High Temperature Silicon Carbide Semiconductors
 - Ultra Low Energy Community Systems
 - Energy Security Audit & Islanding Methodology
 - Lightweight, Flexible, Cost Effective Solar Energy Photovoltaics
 - Smaller, Lighter Cogeneration and Absorption Environmental Control
 - Microgrid Field Scale Demonstration



ANY QUESTIONS?



YOU CAN **RUN**.

YOU CAN **HIDE**.

BUT, YOU BETTER TURN
YOUR **LIGHTS OFF!**

**SAVING ENERGY IN-THEATER
AND AT HOME.**

