EXECUTING FOR ENERGY SECURITY AND RESILIENCE: NOW AND INTO THE FUTURE

ENERGY HUNTSVILLE

R. Paul Robinson
Chief, Energy Division
Engineering & Support Center, Huntsville
U.S. Army Corps of Engineers
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AGENDA

- Huntsville Center Charter
- Policy Changes -- Focus on Energy Security-Resilience (ES/R)
- Implications of Policy Changes on Execution
- Examples of high-profile ES/R Projects
- Innovations and a Vision of the Emerging Future
- Opportunities -- Renewables and Other
- Doing Business with the Corps
Huntsville Center has programmatic / functional boundaries in lieu of geographical boundaries. We execute programs and projects that:

- Are national or broad in scope
- Require integrated facilities or systems that cross geographical division boundaries
- Require commonality, standardization, multiple site adaption, or technology transfer
- Require a centralized management structure for effective control of program development, coordination and execution
- Require functions to be performed that are not normally accomplished by a HQUSACE organizational element

ABOUT THE ENERGY DIVISION...

- $500M reimbursable business unit ($200-250M in obligations, $200-300M in 3rd party capital investments)
- USACE Installation Support Center of Expertise (ISCX) for energy programs
- Executed over $1 billion in 3rd party financed capital investments
- Innovation is part of our DNA
It is now undeniable that the homeland is no longer a sanctuary... attacks against our critical defense, government, and economic infrastructure must be anticipated.

- National Defense Strategy 2018

Secretary of Defense shall include energy security and resilience goals in 10 USC 2911 and establish metrics and standards for the assessment of energy resilience.


Each agency shall prioritize actions that... enhance the resilience of Federal infrastructure and operations...; implement energy efficiency measures; reduce potable and non-potable water consumption; utilize performance contracting to achieve energy, water, building modernization and infrastructure goals.
WHAT IS ENERGY / WATER SECURITY?

In simple terms... it is about “access and securing it....battening down the hatches”

"Having assured access to reliable supplies of energy and water and the ability to protect and deliver sufficient energy and water to meet mission-essential requirements."


The Army will reduce risk to critical missions by being capable of providing necessary energy and water for a minimum of 14 days
WHAT IS ENERGY RESILIENCE?

In simple terms... it is about “flexibility and recovering quickly”

10 USC 101 (e) (6)
The term energy resilience means the ability to avoid, prepare for, minimize, adapt to, and recover from anticipated and unanticipated energy disruptions in order to ensure energy availability and reliability sufficient to provide for mission assurance and readiness, including task critical assets and other mission essential operations related to readiness, and to execute or rapidly reestablish mission essential requirements.

10 USC 2912 & 2913
Allows energy savings to fund resiliency and pursue cyber secure micro-grids
LEVERAGE ALTERNATIVE (3RD PARTY) FINANCING

NDAA: Amends 10 USC 2911
- To make energy security and energy resilience the focus of DODs energy policy
- To include goals to enhance energy resilience to ensure the Department has the ability to prepare for and recover from energy disruptions
- To leverage third-party financing

"Each landholding command will plan program, budget and execute energy and water projects that close energy and water security gaps and reduce risk. Landholding commands will prioritize projects in existing programs, including use of third-party resources..."

Utilize performance contracting to achieve energy, water, building modernization and infrastructure goals
- Executive Order 13834
FOCUS ON CYBERSECURITY

Key Takeaways:

- Cybersecurity integral to delivering energy security solutions
  - No longer an afterthought…must be front-center!
  - Must meet Risk Management Framework (RMF) – connecting to a network (DOD Instruction 8510.01, Risk Management Framework for DoD Information Technology (IT), 28 July 2017)
  - Defense-in-Depth Principles – multi-layering for system security (DOD Instruction 8500.01, Cybersecurity, 14 March 2014)

- Various ongoing initiatives to enhance cybersecurity and agility to cyber threats will affect energy systems…likely to change the paradigm
  - Efficiency and speed of accreditation (Authority to Operate -- ATO)
  - Ensuring interoperability, scalability, functionality, repeatability (reciprocity)
  - Standardization
  - Randomization
  - Cost Savings

- Early adopters can gain market advantage

- Cybersecurity requirements in the Defense Federal Acquisition Regulation (DFAR) and National Institute of Standards and Technology (NIST) are starting to gain traction
FOCUS ON CYBERSECURITY (CONTINUED)

- Issued to improve the Nation’s cyber posture
- Focuses efforts on modernizing Federal information technology infrastructure, working with state and private sector
- Reflects the strong partnership across the Federal Government and with industry partners
- Information technology and data should be secured responsibly
- **President holds agency heads accountable** for managing cybersecurity risk
- Mandates agencies to utilize framework consisting of standards, guidelines and best practices to manage cybersecurity risk, *Framework for Improving Critical Infrastructure and Cybersecurity, Version 1.1*, National Institute of Standards and Technology 16 April 2018
FOCUS ON PROTECTING DATA

Key Takeaways:

- Management of data integral to delivering energy solutions
  - *No longer an afterthought…must be front center!*
  - Understanding network conditions/connectivity are an integral consideration in driving energy solutions
  - Need to visualize, understand, and control energy systems with speed, reliability, and precision (ensure mission assurance) and to do it safely

- Need for continuous monitoring (part of cybersecurity), the ability to secure, troubleshoot, and enable effective planning efforts and business decision making

- DoD can no longer accept loss of sensitive data to cyber attacks
FOCUS ON PROTECTING DATA (CONTINUED)

- DFAR 252.204-71012:
  - Requires compliance with National Institute of Standards and Technology (NIST) Special Publications (SP) 800-71
  - Deadline for compliance was 31 December 2017
  - Regardless of compliance with government standards, guidance prescribes preventive ways to mitigate risk from being hacked

- Enterprise Energy Information Management (EEIM) *(Office of the Under Secretary of Defense, 26 June 2012)*
  - Standards for the integration and aggregation of data
  - Automated data collection
  - Structured energy data requirements
  - Information risk management
  - Advanced analytic capability

- GSA Federal Risk Management Program (FedRAMP) *(Cloud-Based Computing and Service Providers)*
  - Others: DISA Cloud Support Services; Army Enterprise Computing Operations Service Center/ACCENT
  - Provides standard approach to security assessment, authorization and continuous monitoring for cloud services
  - Enables agencies to rapidly adapt from legacy IT to mission-enabling, secure, cost-effective cloud-based IT

Necessitates protection of any covered defense information in terms of storage, transmission, and delivery!
Requires a big picture understanding, systems approach and thinking
- Larger scale projects, more holistic, fence-to-fence
- **Renewable energy** (when feasible) are a component of a broader, integrated solution
  - “All-The-Above” approach, renewables not an end, but a means to an end when practical

Solutions increasingly more complex
- Multi-dimensional, multi-layered solutions
- Modeling and optimization

Requires more robust upfront planning to identify critical infrastructure, energy consumption, demand, state of conditions on the ground, planning gaps, vulnerabilities, and potential value streams
- Informed by energy assessment and energy plans
- Codified and integrated as part of installation master plans
- Incorporate energy security and resilience features into MILCON project development
Dealing in the world of Operational Technology (OT)
- Consists of hardware and software systems that monitor and control physical equipment and processes to manage critical infrastructure, such as water, oil & gas, energy, and utilities
- Convergence of communications/IT networks, energy information management, cybersecurity, technology, distributed energy/power system design coming together into one integrated solution
- Update policies/UFCs/UFGSs to address the medium/high voltage OT environment
- Adopt an agile posture to integrate cyber, data management, and systems for energy security and resilience to meet mission requirements

Alternative financing performance acquisitions serve as an enabler to achieving goals
- Facilitates Cost vs Savings tradeoffs; minimizes use of appropriations
- Efficiency (savings) more pertinent to paying for energy security and resiliency solutions
- Stakeholder collaboration and innovation critical to reducing the overall cost footprint

NOTE:
It seems the overall trend to define and enhance the cybersecurity posture will be increasing requirements on manufacturers, ESCOs, and others doing business with DoD (i.e., RMF, DFAR 252, APL, etc.)
Integrated, smart interoperable energy solutions that deliver energy security and resilience and maximize the value of the asset

- Designing for intelligence and capturing value streams
- Leveraging alternative finance to support a fiscally constrained environment

Standardization / utilization of frameworks (see backups)

- Make the complex simpler
- Example: Department of Defense Architectural Framework (DODAF) *(DoD CIO Memorandum 28 May 2009)* -- Facilitates operational view suited to large systems with complex integration and interoperability challenges

A different way of thinking

- Critical thinking and analysis -- think systems
- Innovation, imagination, creativity, and ability to adapt

Industry Innovation

- Looking to Industries’ ingenuity and supporting education

Strategic Partnerships

- Stakeholder collaboration key
IDEAL ENERGY SECURITY & RESILIENCE PROJECT

- Potential $100-150M capital investment project
- Supports trend for larger more holistic projects
- Proposed phasing to mitigate risk
- Uses savings to deliver energy security and resilience

Key recommended energy conservation measures (ECM’s):

Delivering energy security and resiliency:
- Combined heat and power (CHP)
- Electrical peak shaving reciprocating internal combustion engines (RICE)
- Battery energy storage system/micro-grid
- Black start capability

Delivering efficiency/improvements:
- Chilled water plant improvements
- Lighting improvements
- HVAC improvements
- Water and sewer conservation
- Data center cooling system improvements
- Advanced conservation voltage reduction (CVR)

Recommended ECM’s to investigate further during Feasibility Study:
- Controls upgrades
- Chilled & hot water and steam distribution system improvements
- Plug load reduction
- Building envelope improvements
- H&RP boiler improvements
- Sewer system heat recovery
- Refrigeration optimization
- Medium temperature chilled water system
- Energy distribution system improvements
- Desiccant dehumidification
- Fuel cell installation
- Cooling tower VFD installation
- Steam to hot water conversion
US ARMY GARRISON KWAJALEIN ATOLL ESPC

IDEAL ENERGY SECURITY & RESILIENCE PROJECT (B)

- $150-250M+ capital investment phased project
- 2018 – in execution; 2019 – Phase 2 planned; 2020 – Future Phases
- Supports trend for larger more holistic projects
- **Phasing** established to mitigate risk
- Uses savings to deliver energy security and resilience

**Phase 1: Key ECMs:**
- Renewable energy and micro-grid consisting of:
  - 2.4 MW solar PV
  - 2 MW / 3 MWh containerized battery storage
  - Distributed cyber-secure micro-grid controls
- Replacement of window ACs with high-efficiency split systems:
  - Interior and exterior LED lighting
  - Building envelope sealing

* Showing 9.4% energy and 55% diesel reduction

**Phase 2: Key ECM’s**
- **Sea water air conditioning (SWAC) system** (1st in DoD, 8th in world) in synergy with desalinization plant

**Future Phases: Key ECM’s**
- Large scale solar PV, small wind turbines, large remote wind turbines, battery storage and micro-grid with controls
A different approach…

- Implementation of energy security and resilience via multiple programs and funding streams
  • ESTCP proposal facilitated DoD CIO to start development of control systems Approved Products List (APL)
  • ERCIP: implementing a centralized data visualization management system integrating multiple systems (energy monitoring and control system, micro-grid, CCTV, badging, facility alarm systems, etc.)
  • ESTCP: micro-grid with backup commercial generation integrated with military generators (Operational Energy), 13 facilities supporting critical data centers

- Innovation and use of best practices
  • USACE: Utilizing operational technology - software defined network (OT-SDN) in a closed restricted network achieving functionality, system integration, and cybersecurity
  • DOE: Utilizing ADDSec software (Cybersecurity for Energy Delivery Systems – CEDs) randomizes IP addresses to improve cybersecurity
  • Closed restrict network offers test-bed to prove/validate functional and cybersecurity requirements

- Planning
  • Microgrid PH1 – 3.5MW combined cooling, heat/power (CCHP tri-generation) for prime and backup generation
  • Microgrid PH2 – 7.5MW backup power for remaining 300 area with backup to garrison main cantonment
  • End State: Transition energy related technology between garrison energy environment to operation/tactical energy environment where they are mutually supportive and interchangeable
INNOVATIONS AND A VISION OF THE EMERGING FUTURE

DoD Architectural Framework (DoDAF)
Common Operating View

Big Data & Analytics

Four Pillars of Execution
Program/Project Management

APL Control Systems
(Approved Products List)

OT-SDN
(Operational Technology Software Defined Networking)
DoD is an industrial Internet-of-Things (IOT), 500+ installations, thousands of devices

Building the “Lego blocks” for ease and speed of connectivity at minimal cost
- Modular principle
- Standardized process for facility-related controls
- Products/systems qualified for cybersecurity and type authorizations
- Facilitates interoperability, functionality, scalability, and repeatability (reciprocity)

Concept initiated at Huntsville Center 2015 (Energy-APL)

Approved for development by OSD August 2018
Operational Technology Software Defined Networking (OT-SDN)

Programmable networking – we engineer/control data and flow
- Deny-by-default
- Closed restricted network

Concept facilitates speed, reliability, precision = Mission Assurance

Mitigates safety issues, arc flashing in medium and high voltage systems

DoD/DOE pilots for technology transfer
- Ft Belvoir leading the way with operating OT-SDN (Elmendorf AFB, USCG Kodiak, Las Vegas VA, Bangor Naval Base)
- Providing R&D environment for integrated OT efforts
- Ft Belvoir: Fusing installation/battlefield environments to be interchangeable and mutually supportive
INNOVATIONS AND A VISION OF THE EMERGING FUTURE

Big Data & Advanced Analytic Capability

EEIM and DFAR 252.204

Systems-of-systems, metadata

Automated collection, aggregation, integration, and visualization

Vital to the control and management of critical infrastructure, ensuring operations of mission-critical functions

The cloud is a reality with Microsoft, Amazon, and others approved as cloud service providers (CSPs) for the DoD

- A future “Energy” Cloud?
- Energy systems must be installed for future “Energy” cloud integration
INNOVATIONS AND A VISION OF THE EMERGING FUTURE (CONTINUED)

- Transactive Energy / Blockchain -- peer-to-peer virtual power market
  - Leverage assets to participate in market place for ancillary services
  - Capture all value streams of the asset, optimizing for maximum efficiency
  - Otis National Guard microgrid – bringing economic benefits to base and regional grid by participating in utility demand-response and region’s frequency services market

- Other Transaction (OT) Authority -- 10 U.S.C. 2371b
  - Excellent for dynamic, evolving and complex environments like the energy space
  - Streamlined approach (outside FAR) for carrying out prototype projects and transitioning successes into follow-on production
    - Spur innovation, attract leading-edge technologies, adapt business practices
    - “Proof of concept” principles through industry partnerships and ingenuity
  - Increasingly supporting Program Executive Offices (PEOs)
ALTERNATIVE FINANCED BUSINESS OPPORTUNITIES

3rd PARTY FINANCED

ESPC:
FY19 $471M – 16 Projects
  $ 20M – Project Facilitators for DoE Federal Energy Management Program
FY20 $139M – 5 Projects

UESC:
FY19 $153M – 5 Projects
FY20 $461M – 11 Projects

PPA:
FY19 $26M – 1 Project

FY19 $670M
FY20 $600M

Note: Dollar values represent total estimated third-party (non-appropriated) capital investment of projects
RENEWABLE ENERGY BUSINESS OPPORTUNITIES

Awarded and Operational:
Anniston Army Depot, Alabama - Solar PV (OEI, Alabama Power EUL)
Fort Rucker, Alabama - Solar PV (OEI, Alabama Power EUL)
Fort Gordon, Georgia - Solar PV (OEI, Georgia Power EUL)
Fort Stewart, Georgia Solar PV (OEI, Georgia Power EUL)
Fort Benning, Georgia - Solar PV (OEI, Georgia Power EUL)
Fort Campbell, Kentucky - Solar PV and Wind Hybrid (OEI, DLA PPA)
Fort Huachuca, Arizona - Solar PV (OEI, GSA Areawide)
Redstone Arsenal, Alabama - Solar PV (OEI, USACE HNC PPA)

FY19/20 Pipeline:
Fort Carson, Colorado – 7.5 MW Solar PV (USACE-HNC, PPA)
Los Alamitos – 16 MW Solar PV (OEI, Competitive Lease)
Fort Benning 2 – 13 MW Solar PV (OEI, Sole Source Lease)
Fort Sill – 14 MW Solar PV (OEI, Sole Source Lease)
Camp Roberts – 2.5 MW Solar PV (OEI DLA PPA)
Cape Cod – 0.5 MW Solar PV (USACE-HNC, PPA)
Ceiba, Puerto Rico – 0.65 MW Carport Solar Array (ERCIP)
<table>
<thead>
<tr>
<th>Project Title / Project Description</th>
<th>Project Location (specific)</th>
<th>District Contracting Activity</th>
<th>Type of Work</th>
<th>Estimated Award Range</th>
<th>Anticipated Sources Sought</th>
<th>Set-Aside Category</th>
<th>Anticipated Solicitation Date</th>
<th>Anticipated Award Date</th>
<th>Additional Info</th>
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<tbody>
<tr>
<td>Install 650kW Carport Solar Array</td>
<td>Ceiba, Puerto Rico</td>
<td>LRL</td>
<td>Renewable Energy</td>
<td>D/B</td>
<td>$1M - $5M</td>
<td></td>
<td>March 2019</td>
<td>May 2019</td>
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<td>Convert Steam Lines to Hot Water</td>
<td>Camp Ederle, Italy</td>
<td>NAU</td>
<td>Energy Conservation</td>
<td>D/B</td>
<td>$1M - $5M</td>
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<td>July 2019</td>
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<td>Install Substation Interconnection</td>
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<td>SWT</td>
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<td>March 2019</td>
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<td>Install Hydroelectric Turbine</td>
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<td>SAS</td>
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<td>D/B</td>
<td>$1M - $5M</td>
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<td>May 2019</td>
<td>July 2019</td>
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<tr>
<td>Install Recirculating Air in Test Cells</td>
<td>Detroit Arsenal, MI</td>
<td>LRL</td>
<td>Energy Conservation</td>
<td>D/B</td>
<td>$1M - $5M</td>
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<td>Feb 2019</td>
<td>March 2019</td>
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</table>
ENERGY ACQUISITION VEHICLES

ESPC: $1.5B MATOC, 13 Energy Service Companies

UESC: GSA Area-Wide Contracts, Basic Ordering Agreements (BOA), Agency Master Agreement / Model Agreements

PPA: $7B MATOC and stand alone contracts

REM: $40M IDIQ, 5 companies

CUP: $9.8M MATOC, 5 small business utility consultants
INFORMATION ABOUT UPCOMING OPPORTUNITIES

- All actions over $25,000 are published on Federal Business Opportunities (www.fbo.com)

- Small Business Conferences

- Announcements of Business Opportunity Conferences, Trade Fairs and other federally attended or sponsored liaison meetings in your area

- Corps of Engineers Division, District and Laboratory websites

- Visit the Huntsville Center website at URL: http://www.hnc.usace.army.mil

Small Business Resources:

Federal Business Opportunities
SBA Learning Center. The U.S. Small Business Administration.
SBA District Offices
Size Standard Tools
Women-Owned Small Businesses
Office of Small & Disadvantaged Business Utilization
SBA 8(a) Business Development Program
HubZone Program
Service-Disabled Veteran-Owned Businesses
Procurement Technical Assistance Program
System for Award Management
Dynamic Small Business Search Database
USA Spending.gov Web Site
Small Business Loan
SB Outreach Events
North American Industry Classification System (NAICS)
Obtaining a DUNS Number
Huntsville Center Main Web Site
USACE Huntsville Small Business Web Site
USACE Huntsville Contracting Web Site
Small Business -- Headquarters U.S. Army Corps of Engineers
STAY ALERT!
Sources sought/requests for information:

- Always respond to announcements on the Federal Business Opportunities website that match with your firm’s capabilities
- Huntsville Center uses formal solicitation procedures and publishes public notices for major program actions, predominate utilizing best value, negotiated procedures
- **Investigate potential subcontracting opportunities with prime contractors:**
  - http://www.hnc.usace.army.mil
  - http://web.sba.gov/subnet/
- More and more of our products and services are being purchased from General Services Administration (GSA) schedules ([http://www.gsa.gov](http://www.gsa.gov))
The pivot to Energy Security and Resiliency (ES/R) has occurred as shown in Executive Order, National Defense Authorization Act (legislation), and agency policy.

Policy supports and encourages utilization of third party financed acquisitions to implement ES/R solutions:
- Alternative finance will continue to play a central role in delivering ES/R solutions in light of a fiscally constrained environment.
- Alternative finance offers a mechanism to leverage savings from energy/water conservation measures to pay for ES/R (tradeoff).

ES/R projects are more holistic and complex:
- Many moving pieces that must be seamlessly integrated.
- Protection of our networks and data are critical to achieving ES/R and ensuring mission assurance.
- Requires more extensive planning, forethought, and teamwork.

The energy space is dynamic and continues to evolve quickly:
- We look to Industries’ innovation and ingenuity to help propel us forward.

Renewable opportunities will be, more likely than not, a part of a broader integrated solution.

Continue to develop and expand strategic partnerships to better support the Army and Nation.

USACE is a leader in energy execution efforts supporting the Army and beyond.

TAKE AWAYS
VISION:
The preeminent energy Center of Expertise and Organization of Choice for delivering full-scale energy services within the Federal government, bringing unparalleled leadership to resolving the most pressing energy challenges and leading the way as an enabler of strategic partnerships and global provider of holistic, comprehensive, integrated, and optimized energy management solutions in support of the Army, DoD, Federal agencies, and the Nation.

MISSION:
Manage execution of the Army’s portfolio of energy programs, serving the needs of Army Landholding Commands, Civil Works, DoD, and Federal agencies worldwide by providing specialized technical expertise, project, and acquisition services and delivering innovative, resilient, and sustainable energy strategies and solutions in support of national interests.
FOUR PILLARS OF SUCCESS

- Provide a starting point of design; build in engineering and security enhancements
- Optimize design/network
- Building in energy security and resiliency
- Common operational view

- Security and continuous monitoring
- Manage critical infrastructure
- Informed decision making
- Visualize environment
- Trouble-shooting
- Standardized database

- Risk Management Framework
- Continuous monitoring
- Type accreditation and standardization

- To use the right tools/equip.
- Speed, accuracy, and reliability
- Assure life safety

ARCHITECTURAL FRAMEWORK

E.O. 13693
DoD CIO
Clinger-Cohen Act

Covered Defense Information

E.O. 13693
DFARS 252.204-7012
NIST SP 1800-7a,b,c
IEC 61850

Cyber Security

E.O. 13636
DoDI 8510.01
NIST SP 800-37
NIST SP 800-82
NIST SP 800-161
NIST SP 800-171

Industrial Control Systems

EO 13636
UFC 3-500 series
UFC 4-010-06
IEC 62443
IEEE Std 242
IEEE Std 37.1
ANSI-NETA
IEEE 1547/2030
(mandatory)
Continuous Monitoring

POWER SYSTEM DISTRIBUTION: OPERATIONAL TECHNOLOGY ENCLAVE
Medium and High Voltage

Note -- HNC execution enclave for technology medium/high voltage energy space developed from DoD Architectural Framework (DoDAF) originally designed for IT and modified to meet new emerging technology requirements.
### NAICS Codes for Energy

Sustainable, Renewable Energy, and Water Reduction

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>22111</td>
<td>Hydroelectric Power Generation</td>
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<td>22112</td>
<td>Fossil Fuel Power Generation</td>
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<tr>
<td>22114</td>
<td>Solar Electric Power Generation</td>
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<tr>
<td>22117</td>
<td>Biomass Electric Power Generation</td>
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<tr>
<td>22118</td>
<td>Other Electric Power Generation</td>
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<td>22121</td>
<td>Electric Bulk Power Transmission</td>
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<td>22122</td>
<td>Electric Power Distribution (UESC)</td>
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<td>22120</td>
<td>Natural Gas Distribution (UESC)</td>
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<td>22130</td>
<td>Water Supply and Irrigation Systems (UESC)</td>
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<td>22132</td>
<td>Sewage Treatment Facilities</td>
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<tr>
<td>22133</td>
<td>Steam and AC Supply</td>
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<td>54130</td>
<td>Engineering Services/Construction Services (ESPC, REM, EEAP)</td>
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<tr>
<td>54151</td>
<td>Computer System Design Services (UMCS, AMP)</td>
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<tr>
<td>54161</td>
<td>Other Management Consulting Services (CUP)</td>
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<td>ENERGY SERVICE COMPANIES (ESCOs)</td>
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<tr>
<td>W912DY-15-D-0051</td>
<td>Southland Energy</td>
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</table>
# POWER PURCHASE AGREEMENT (PPA) MATOC HOLDERS

## Wind (11 companies)
- **Ameresco Inc., Framingham, MA**
- **Cobra Industrial Services Inc., Houston, TX**
- **Dominion Energy Inc., Richmond, VA**
- **EDF Renewable Energy, San Diego, CA**
- **Emerald Infrastructure, San Antonio, TX**
- **Enel Green Power North America, Andover, MA**
- **M. Arthur Gensler Jr., & Associates Inc., Arlington, VA**
- **New Generation Power Inc., Chicago, IL**
- **Siemens Government Technologies Inc., Arlington, VA**
- **Stronghold Engineering Inc., Riverside, CA**
- **Turn Key Power Consortium LLC, Orlando, FL**

## Biomass (10 companies)
- **Ameresco Inc., Framingham, MA**
- **ECC Renewables LLC, Burlingame, CA**
- **EDF Renewable Energy, San Diego, CA**
- **Emerald Infrastructure, San Antonio, TX**
- **Energy Systems Group LLC, Newburgh, IN**
- **Honeywell International Inc., Golden Valley, MN**
- **New Generation Power Inc., Chicago, IL**
- **Siemens Government Technologies Inc., Arlington, VA**
- **Stronghold Engineering Inc., Riverside, CA**
- **TransGen Energy Inc., Rockville, MD**

*Denotes a small business*

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Continued >
### PPA MATOC HOLDERS (CONTINUED)

<table>
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<th>Solar (29 companies)</th>
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<tr>
<td>Acciona Energy North America Corporation, Chicago, IL</td>
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<td>AES Distributed Energy Co., Boulder, CO</td>
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<tr>
<td>Ameresco Inc., Framingham, MA</td>
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<td>Apex Wind Energy Holdings LLC, Charlottesville, VA</td>
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<td>Bay Electric Company Inc., Newport News, VA</td>
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<td>BITHENERGY Inc., Baltimore, MD</td>
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<td>Bright Light Federal LLC, Littleton, CO</td>
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<td>Cobra Industrial Services Inc., Houston, TX</td>
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<td>Constellation NewEnergy Inc., Baltimore, MD</td>
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<td>Distributed Sun LLC, Washington, DC</td>
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<td>Dominion Energy Inc., Richmond, VA</td>
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<th>Solar (continue)</th>
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<td>Ecoplexus, San Francisco, CA</td>
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<tr>
<td>EDF Renewable Energy, San Diego, CA</td>
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<td>Enel Green Power North America, Andover, MA</td>
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<tr>
<td>Energy Matters LLC, Arlington, VA</td>
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<tr>
<td>Energy Ventures LLC, Rockville, MD</td>
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<tr>
<td>Indian Energy LLC, Newport Beach, CA</td>
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<tr>
<td>Johnson Controls Government Systems, Milwaukee, WI</td>
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<td>Legatus6 LLC, Chevy Chase, MD</td>
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<td>New Generation Power, Chicago, IL</td>
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<td>NRG Energy Inc., Princeton, NJ</td>
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<td>Siemens Government Technologies Inc., Arlington, VA</td>
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Denotes a small business

Continued >
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<tr>
<th>Solar (continued)</th>
<th>Geothermal (5 Companies)</th>
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<tr>
<td>SunLight General Capital LLC, New York, NY</td>
<td>ECC Renewables LLC, Burlingame, CA</td>
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<td>Sunpower Corporation, Richmond, CA</td>
<td>Enel Green Power North America Inc., Andover, MA</td>
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<tr>
<td>Third Sun Solar LLC, Athens, OH</td>
<td>New Generation Power Inc., Chicago, IL</td>
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Denotes a small business
# Commercial Utilities Program (CUP) MATOC Holders

<table>
<thead>
<tr>
<th>Company</th>
<th>Point of Contact</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brubaker &amp; Associates, Inc. (BAI)</td>
<td>Maurice Brubaker</td>
<td>(636) 898-6725</td>
<td><a href="mailto:mbrubaker@consultbai.com">mbrubaker@consultbai.com</a></td>
</tr>
<tr>
<td>Exeter Associates, Inc.</td>
<td>Christina Mudd</td>
<td>(410) 992-7500</td>
<td><a href="mailto:cmudd@exeterassociates.com">cmudd@exeterassociates.com</a></td>
</tr>
<tr>
<td>NewGen Strategies and Solutions, LLC</td>
<td>Joe Mancinelli</td>
<td>(720) 633-9509</td>
<td><a href="mailto:JMancinelli@newgenstrategies.net">JMancinelli@newgenstrategies.net</a></td>
</tr>
<tr>
<td>Utility Management Services, Inc.</td>
<td>Janessa Goldstein</td>
<td>(910) 793-6232</td>
<td><a href="mailto:JGoldstein@utilmanagement.com">JGoldstein@utilmanagement.com</a></td>
</tr>
<tr>
<td>Acme Utility Consultants LLC</td>
<td>Bob Starling</td>
<td>(256) 325-5840</td>
<td><a href="mailto:bobstarling@knology.net">bobstarling@knology.net</a></td>
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