



**The National Academies of Sciences
*Committee on Advanced Nuclear Reactors***

Army Energy Program

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(Installations, Energy & Environment)***

**AMERICA'S ARMY:**

PEOPLE FIRST – WINNING MATTERS

Army's Universe

**Land Acreage**

	<u># of Parcels</u>	<u>Total Acres</u>
AMC/IMCOM (GF)	24,236	11,972,702
AMC/IMCOM (AWCF)	1,451	203,185
ARNG	2,165	891,974
USAR	1,640	400,420
OTHER	1,128	84,322
	30,620	13,552,603

Buildings

	<u># of Facilities</u>	<u>Total SqFt</u>
AMC/IMCOM (GF)	110,284	813,900,715
AMC/IMCOM (GF) - Leased	3,364	16,576,311
AMC/IMCOM (AWCF)	11,290	57,741,664
AMC/IMCOM (AWCF) - Leased	75	3,508,957
ARNG	10,519	52,196,414
ARNG - Leased	83	190,475
USAR	4,321	43,511,209
USAR - Leased	37	822,770
OTHER	815	9,040,064
OTHER - Leased	3,190	12,296,022
Building Total	143,978	1,009,784,601

Linear Structures Total

83,457

Structures Total

95,641

Facility Total Count**323,076****Total Plant Replacement Value** \$587,114,498,308**Army Installations**

AMC/IMCOM (GF)	67
AMC/IMCOM (AWCF)	10
ARNG	48
USAR	3
OTHER	8
	136

Utility and Mobility

Road Bridges	2,210
Railroad Bridges	106
Paved Roads (Lane Miles)	25,479
Dams	262
Railroad Track (Miles)	1,100
Utility Systems - Army Owned (US)	183
Utility Systems - Privatized (US)	159
Waterfront facilities	22
Multi-Use Airfields	59
Heliports	21

ISR Infrastructure (ISR-I) Rating

	<u>Avg</u>	<u># Q3/Q4</u>	<u>% Q3/Q4</u>
AMC/IMCOM	Q2	22,959	17.89%
ARNG	Q2	21,121	32.42%
USAR	Q2	2,386	22.29%
OTHER	Q1	11	2.83%
		46,477	22.72%

Installation Supported Population

Military	526,508
Civilian	645,508
Family Members	620,120
Retired Military	408,917
Retiree Family Members	1,398,791
	3,599,844

Family Housing (Dwelling Units)

Owned	10,272
Leased	3,597
Privatized	85,164
	99,033

Lodging (Guest Rooms)

Official	1,862
Privatized (PAL)	13,219
Rec Lodging	1,765
Armed Forces Recreation Ctrs	2,002
	18,848

Barracks (Spaces)

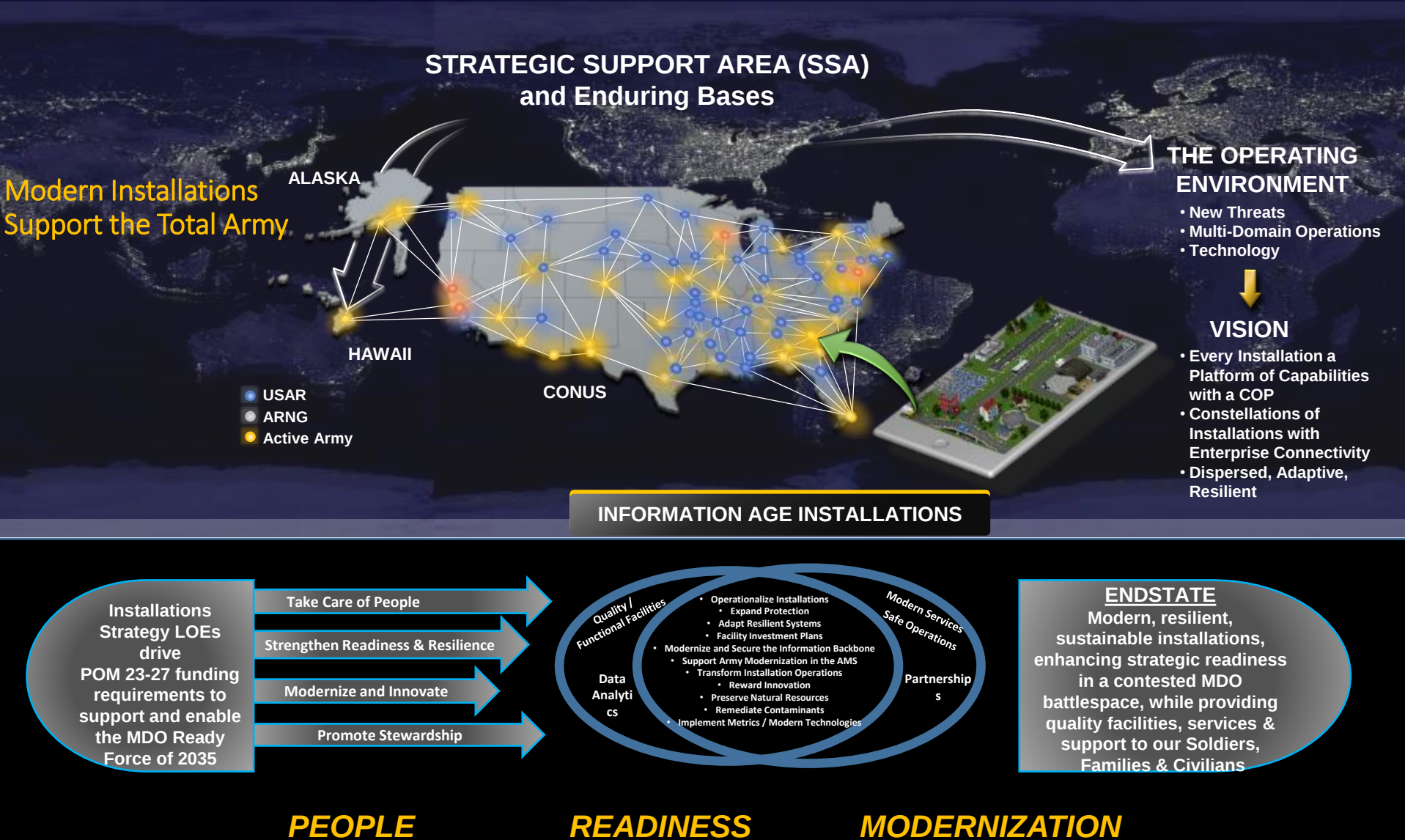
Permanent Party (PP)	190,578
Privatized (PP Bedrooms)	2,411
Training	103,595
Leased	681
ORTC	186,447
	483,712



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Army Installations Strategy (AIS)





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Army Installation Energy and Water Strategic Plan

VISION

Army installation energy and water infrastructure supporting critical missions in the Strategic Support Area will be:

RESILIENT

Ensure energy and water for critical missions under all conditions



Anniston Army Depot
Solar Array

EFFICIENT

Manage energy and water use to meet requirements effectively and sustainably



Ft. Irwin, CA
Water Treatment Plant

AFFORDABLE

Manage energy and water costs to enable the Army to refocus investment



Ft. Carson, CO
Battery Energy Storage System

Our installations must make energy and water choices that allow installations to maintain critical operations during an unexpected grid outage.



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Threats to Energy and Water Resilience

PHYSICAL



Sniper Attack on California Power Grid, 2013
Physical or kinetic attack on Army or utility grid infrastructure remains a persistent reality.

NATURAL



California Wildfires, August 2020, Susanville, CA
The frequency and duration of severe weather events and a changing climate are national security issues with potential impacts to Army missions, operational plans, and installations.

CYBER



Ransomware Attack closed Colonial Pipeline, May 2021
We face cyber-enabled attacks on our facility-related control systems and surrounding utility grids.

Failure to modernize and enhance installation capabilities to project power, defend capabilities, create efficiencies, and preserve and protect resources risks the Army's ability to deploy forces in support of MDO to meet the requirements of the National Military Strategy.

Army Installations Strategy



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Resourcing & Executing Energy and Water Efficiency and Resilience

• Private Equity

- Real Estate Outgrants (e.g. lease, easement)
10 U.S.C. § 2667, 10 U.S.C. § 2668

• Private Equity capable with Army payments

- Power Purchase Agreements *10 U.S.C. § 2922a*
- Utilities Privatization (UP) *10 U.S.C. § 2688*

• Third Party Financing

- Energy Savings Performance Contracts (ESPCs)
42 U.S.C. § 8287 et seq. and 10 U.S.C. § 2913
- ESPC ENABLE
- Utility Energy Service Contracts (UESCs),
42 U.S.C. § 8256(c) and 10 U.S.C. § 2866 and 2913

• Upfront DoD or Army Appropriated Funds

- Operations and Maintenance (O&M)
- Military Construction (MILCON)
- Energy Resilience and Conservation Investment Program (ERCIP) *10 U.S.C. § 2914, 10 U.S.C. § 2802*
- Availability and Use of Energy Cost Savings (REFoRM) *10 U.S.C. § 2912*

• No Cost/ Low Cost Efforts

- Personnel Behavior Modifications and Establishing Energy-conscious culture

• Department of Energy Grants

- Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) *42 USC § 8256 (b)*

• DoD Office of Local Defense Community Cooperation (OLDCC) Grants *10 USC §2391*

- Military Installation Sustainability
- Defense Community Infrastructure Program (DCIP)

• DoD Technology Grants

- Strategic Environmental Research & Development Program (SERDP) *10 U.S.C. §2901 - 2904*
- Environmental Security Technology Certification Program (ESTCP) *10 U.S.C. §2901 - 2904*

• State, Local, and Utility Company Rebates, Tax Deductions, and Grants

- Ability to use are often location and contract-vehicle and/or asset ownership dependent

• Alternative Contract Execution Authorities (using “normal” Appropriated Funds)

- Utility Service Contracts (*FAR Part 41*)
- Other Transaction Authority (OTA), *10 U.S.C. 2371b*
- Intergovernmental Support Agreements (IGSAs)
10 U.S.C. 2679



Existing statutory authorities

10 USC 2922a* - Power Purchase Agreement (PPA) Contracts up to 30 years for provision of production facilities and purchase of energy

- Army consumption from energy generation facility located on- or off-site
- Competition required for all new PPA solicitations
- Approval authority: Office of the Secretary of Defense

FAR 41 – General Services Administration (GSA) Area wide

- Utility services for up to 10 years
- Army provides servicing utility site access to host rate-based energy generation on-site
- OEI utilizing Authorizations for existing GSA Areawide contracts
- Approval authority: Mission and Installation Contracting Command

10 USC 2668* - Easement

- Granting rights-of-way access to military lands to promote public interest
- Army issues an easement to utility for on-site energy generation/storage
- Approval authority Land Holding Command

10 USC 2667* - Lease

- Lease non-excess property to promote national defense or public interest
- On-site generation provides secure location to reestablish power for installation and community after outage
- Requires fair market value obtained in cash or in-kind
- Approval authority: U.S. Army Corps of Engineers HQ

Typical Business Models

PPA /Lease

GSA/
Easement

Stand-alone
Lease/
Easement

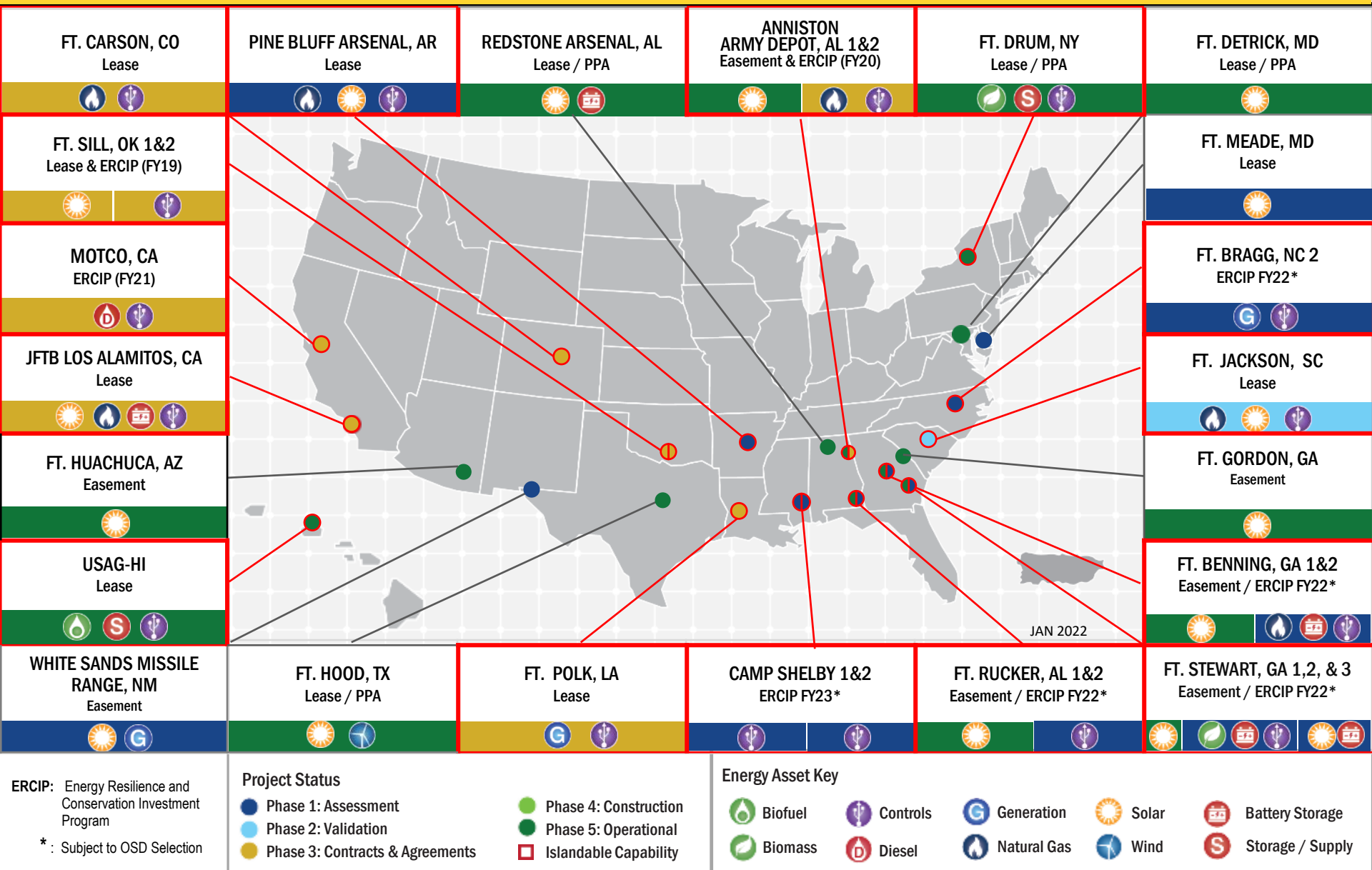


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Current Energy Projects Portfolio





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U.S. Army Garrison - Hawaii

- Located behind the fence line / above tsunami inundation zone
- Provides “Black Start” capability
- Provides secure power for Schofield Barracks, Field Station Kunia, and Wheeler Army Airfield.



Real Estate Outgrant (Lease) / In-Kind Consideration
Funded, owned, operated and maintained by Hawaiian Electric Company
50 MW multi-fuel generation plant on 8 acres



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Fort Hood, TX



Lease / In-Kind Consideration combined with Power Purchase Agreement
Funded, owned, operated and maintained by Apex Clean Energy
50 MW offsite wind power & 15 MW onsite solar generation on 130 acres



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Redstone Arsenal, AL



Photo Credit:
Rising Tide Aerial
Cinema

Real Estate Outgrant (Lease) / In-Kind Consideration combined with Power Purchase Agreement
Funded, owned, operated and maintained by Sun Power

10 MW Onsite Solar Generation on 67 acres & 1 MW / 2 MW-hour Battery Energy Storage System



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Fort Drum, NY



Real Estate Outgrant (Lease) / In-Kind Consideration combined with Power Purchase Agreement

Funded, owned, operated and maintained by ReEnergy Holdings

60 MW Biomass Facility provides 100 percent of Ft. Drum's electricity



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Forts Benning, Gordon, & Stewart, GA



Ft. Stewart



Ft. Gordon



Ft. Benning

Real Estate Outgrant (Easement) / In-Kind Consideration
Funded, owned, operated and maintained by Georgia Power Company
Three 30 MW solar generation projects



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Anniston Army Depot, AL ERCIP Project



ERCIP & Existing Renewable Energy Project:

- At Anniston Army Depot (ANAD), FY20 ERCIP funding will be used to execute a 7.5 megawatt (MW) microgrid and contingency generation project
- The microgrid system will combine 2.6 MW of the existing grid-facing solar array with three 2.5 MW reciprocating internal combustion engine generators
- The existing, privately funded, 7 MW solar array is fully operational, provides onsite generation, supply diversity and is microgrid compatible.
- This is an example of how the Army is combining authorities to achieve energy resilience across our installations.



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Joint Forces Training Base – Los Alamitos, CA

**The Army is working with Industry to develop a
Privately Funded Microgrid at JFTB-LA.**
A lease execution is anticipated within the next few days
and a Groundbreaking Event in May/June.

Real Estate Outgrant (Lease) / In-Kind Consideration
Bright Canyon Energy would fund, own, operate and maintain the project
28 MW Solar Array; 20 MW/40 MWh BESS; & 3 MW Backup Diesel Generator



NDAA Section 327

- Report to Congress
- Pilot nuclear reactor program at DoD or DOE facility by 2027
 - Potential DoD and DOE locations
 - Assessment of technologies and stakeholders
 - Identified micro-reactor requirements
- Not to exceed 50 MW

SCO vSMR (Project PELE)

- March 2020 – 3 contracts issued for vSMR designs
- Expeditionary deployment
 - Reduce logistical burden
 - Reduce Soldier exposure to enemy action
 - Provide increased self sustainment in contested domains
- Produce 1 to 5 MW
- Transportable (truck, rail, ship, C-17)



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For Latest Updates



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ARMY ENERGY
#PowerToWin



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BACK UP



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2922a Contracts for Energy or Fuel for Military Installations

(a) Subject to subsection (b), the Secretary of a military department may enter into contracts for periods of up to 30 years-

(1) under section 2917 of this title; and

(2) for the provision and operation of energy production facilities on real property under the Secretary's jurisdiction or on private property and the purchase of energy produced from such facilities.

(b) A contract may be made under subsection (a) only after the approval of the proposed contract by the Secretary of Defense.

(c) The costs of contracts under this section for any year may be paid from annual appropriations for that year.

(d) The Secretary concerned shall ensure energy security and energy resilience are included as critical factors in the provision and operation of energy production facilities under this section.

10 USC 2922a is the contracting authority for the long-term (thirty years) purchase of energy. 10 USC 2922b states a preference for procuring energy systems that use solar energy or other renewable forms of energy whenever such procurement is possible, suited to supplying the energy needs of the military department, consistent with the energy performance goals and energy performance plan for the Department of Defense.

With respect to the production and purchase of energy under 10 USC 2922a, DOD has stated in its most current policy entitled Guidance on the Development of Energy Projects dated 3 NOV 2016, that 10 USC 2922a applies to “any type of energy production facility, not just geothermal or renewable energy.” Thus, on its face, the DOD policy suggests that 10 USC 2922a would apply to procurement of energy produced by any form of generation source.