Resilient Counties: Engaging Local Utilities in Energy Planning

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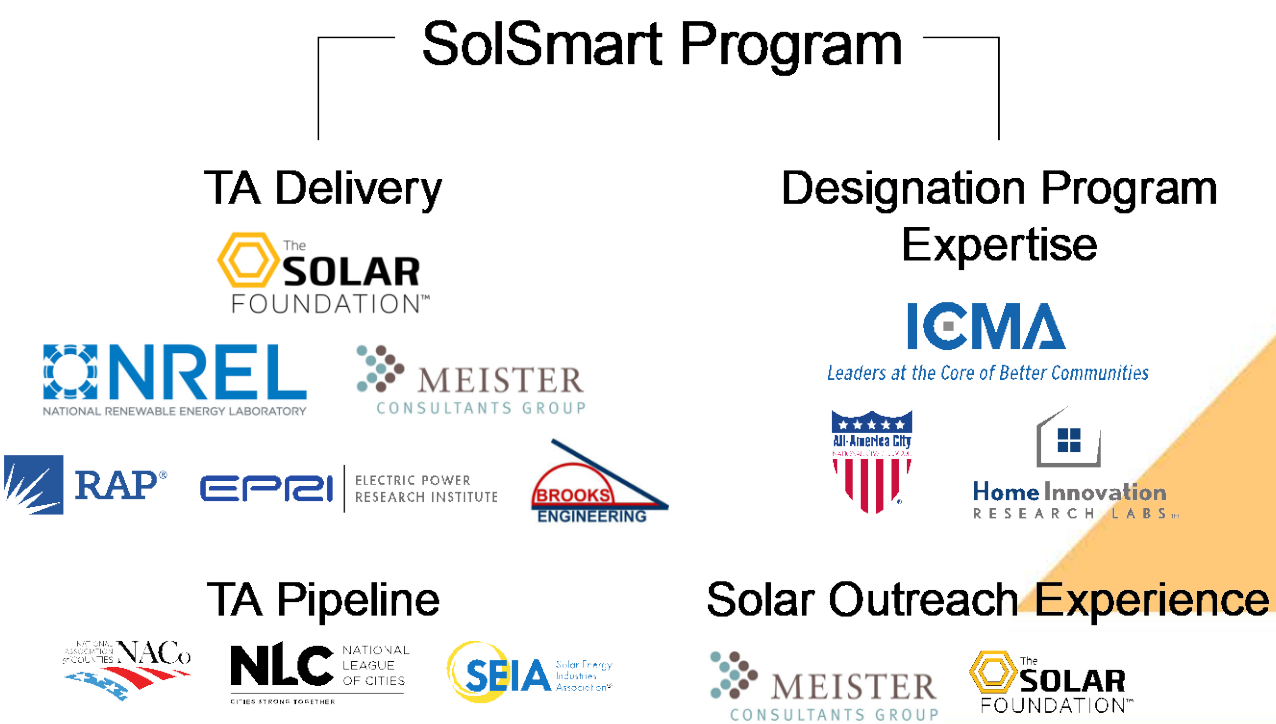
SolSmart Program

Project Goal: Provide technical assistance to communities across the U.S. to help facilitate solar development activity and SolSmart designation in ~300 localities. Chief aims include: empowering communities to make PV installation more time and cost efficient, increasing prospects for solar company and workforce growth, and making solar energy systems more affordable for consumers.



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➢ How can solar support local resilience and provide mutual benefit to your county, your utility and your local residents and businesses?

The Energy Resilience Challenge

Problem Statement: Energy Planning is Integral for Local Resilience
Energy is central to responding to disruptions with resilience and your utility is integral to designing a resilient local grid. Solar is being used in a number of places to support local energy resilience.

Core Question: How can your county engage your local utility in a conversation on planning for resilience with solar?

- Solutions exist. A number of communities have successfully engaged their utility in planning for solar development and some have specifically engaged in collaborative resilience projects.
- Many of these documented cases follow a common blueprint

A Strategic Blueprint

What are the steps for devising a solar development strategy collaboratively with your utility?

Step 1: Perform a resource situation analysis

Step 2: Articulate community wants

Step 3: Assess the short-term

Step 4: Assess the long term

Step 5: Build a collaborative tactical plan

Step 1: Perform a Resource Situation Analysis

- What is the utility's load forecast and resource portfolio?
  - Next year and over the next 10 years?
  - What is the load-resource balance?
- How much of the utility's near-term need is fulfilled by existing contracts?
  - Resource needs? (incremental resources)
  - Resource opportunities? (complementary resources)
- How will the utility's need change over time?
  - Load growth
    - ✓ *Exogenous drivers & beneficial electrification*
  - Resource commitments
    - ✓ *Expiring contracts & retiring generation*

Step 2: Articulate Community Wants

- What are the core drivers of community aspiration?
  - Sustainability, resiliency, employment/economic growth
  - What does success look like over the next 1 to 5 years?
  - What does success look like 5 to 10 years out?
- Who wants to help?
  - Local businesses
  - Non-profits - churches and community organizations
  - Individuals, households and multi-family communities
- How does solar contribute?
  - Role of rooftop solar
  - Role of community solar
  - Role of grid scale solar

Step 3: Assess the Short-Term

- Assess load growth
  - Are there beneficial electrification opportunities that match community aspirations and build electricity load?
- Identify specific needs where incremental resources are needed
- Identify specific opportunities where complementary resources would be beneficial
- Identify barriers that stand in the way of solar meeting needs and fulfilling opportunities

Step 4: Assess the Long-Term

- Assess load growth.
  - What economic trends and beneficial electrification opportunities are consistent with community aspirations?
- Identify probable timeframes when incremental resource needs will emerge.
- Identify probable time frames when complementary resource needs will emerge.
- Identify timeframes by which barriers to solar development will need to be addressed and overcome.

Step 5: Build a Collaborative Tactical Plan

- Initiate a collaborative implementation process with your utility and community leaders.
- Decide: What can we do now?
  - What type of solar is wanted and needed?
  - What barriers will we overcome?
  - Who will help?
- Decide: What should we do next?
  - What type of solar is wanted and needed next?
  - What barriers will we overcome?
  - Who will help?

Collaborative Planning: Will County

Background

- Will County Illinois is one of the fastest growing counties in the country
- Building and zoning codes for residential solar, wind and geothermal (2012)
- 10 solar developments as of September 2016 (IKEA, Schools, more)
- Achieved a SolSmart Gold Designation
- The latest project engaged ComEd, Cypress Creek and local officials

Will County

Features of Cypress Creek Project

- SolSmart helped with zoning, decommissioning and utility engagement
- Worked with land owner to get 48 acre parcel permitted
- Worked with Cypress Creek to secure incentive opportunities
- Supported Cypress Creek in establishing a contract with ComEd for energy sales

Collaborative Planning: Ft. Collins Community Solar

Background

- Ft Collins Utilities (FCU) motivated to meet customer desires for sustainability
  - Climate Action Plan
  - Renewables objectives
- Local residents expressed interest in community solar, its accessibility cost effectiveness
- Steering committee formed to assess options, potential risks and rewards.
- FCU opted to partner with 3rd party vendor (Clean Energy Collective – CEC), selected via open-bid process
  - CEC developed the Riverside Community Solar Array;
  - CEC responsible for initial/ongoing program administration and O&M

Ft. Collins Community Solar

Structure

- PV generation flows directly to FCU under mutually-agreed, 25-yr contract
- Customers purchase panels, receive monthly bill credits
  - Credit rate adjusted annually via escalation factor
- Customers can sell their panels or transfer credits if they move
- Participants can log in via website or smartphone app to view system production, etc.

Economics

- Cost per panel: $1,128.50
  - FCU rebate ($1/W), 30% ITC reduces cost per panel to $485
- 3, 5, 7, 10, 20 year low interest loans offered thru Sooper Credit Union
- Estimates of monthly bill credit vary
  - CEC: one panel will produce ~$33 in bill savings in 1st year, up to $1,122 in lifecycle savings

Riverside Community Solar Array

- Commissioned July 2015
- 620 kW, 2,035 modules (305 W)
- Sited on brownfield
- Fully subscribed

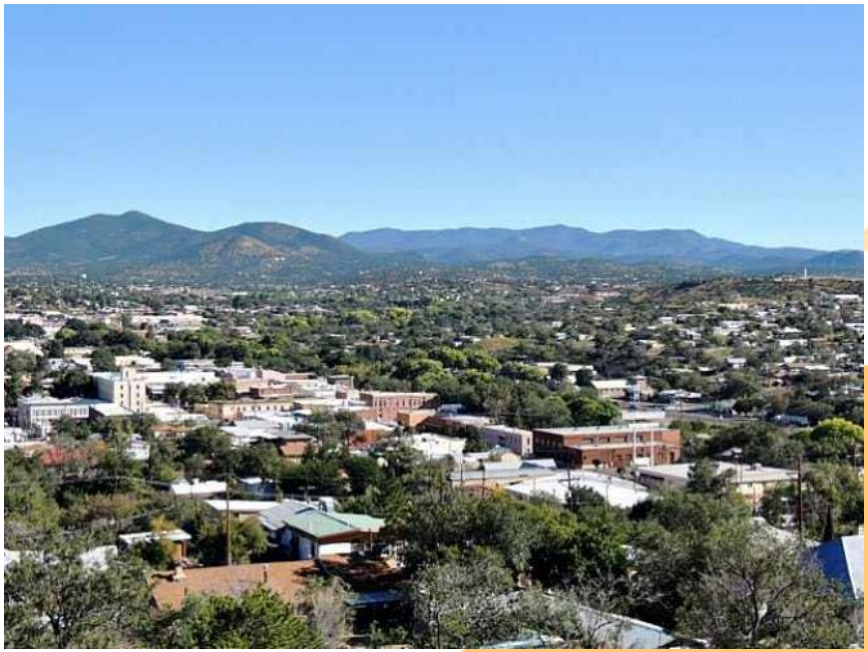
For more information:
http://www.fortcollinscommunitysolar.com

Collaborative Planning: Kit Carson

Kit Carson Electric Co-op and the city of Taos are one of a few places that have begun negotiating their way out of power supply contracts to pursue local economic development and solar.

Drivers:

- City of Taos has sustainability goals and wants to reduce consumption of fossil fuels, including propane.
- G&T contract limited solar generation to 5% and contract extended to 2040.
- Desire for more local economic development, including solar PV.
- Desire for more transparency over ratemaking.



"Seeking more renewables, Kit Carson Co-op exits relationship with Tri-state G&T," Utility Dive, June 29, 2016

Financials

The Exit Fee:

- Kit Carson negotiated an exit fee from Tri-State G&T of $37 million.
  - The basis of the $37 million number is confidential but the CEO of Tri-state noted, “We have reached a mutual and amicable agreement to part ways. The agreement is fair and equitable, and protects the interests of all the association’s members.”
- Kit Carson initiated a competitive RFP which resulted in a 10-year contract with an energy provider which will save its 30,000 customers $50 million in power supply costs over 10 years.

Shrinking demand:

- Kit Carson has been under-collecting on revenues since the closure of a mine in 2014.
- The New Mexico PRC approved a $2 million rate increase in December 2016 to cover its revenue deficiency.
  - It appears this is separate from the power supply costs associated with the self-supply contract.

Aspirations

"Something had to change, and we hope this facilitates that change. The model we are creating is the model of the future," Kit Carson Co-op CEO Luis Reyes, Jr.

Initial Implementation:

- New contract includes a 1 MW solar installation that meets 8% of supply.
- Kit Carson has an aspirational goal of producing 100% of its summer peak from solar by 2023, with a focus on community solar farms.
  - This would require 30 MW of solar capacity by 2023.

"We wanted more renewable energy resources both local and in the portfolio. We wanted more flexibility and shorter contracts. Guzman brings that to the table," CEO Luis Reyes, Jr.

Collaborative Planning for Resiliency

Some cities and counties are building microgrids that support local grid resiliency. Many of these projects include solar energy resources. The US military is developing solar-based microgrids to ensure energy security and continued operation during emergencies and prolonged outages.

Notable examples:

- Buffalo
- Salt Lake City
- Military Bases

A Few Key Advantages of Using Solar for Emergencies/Resilience

- ✓ Solar is increasingly cost-effective compared to diesel-fueled backup generators
- ✓ Not dependent on fuel storage or functioning fuel delivery supply chain following a disaster
- ✓ Minimal maintenance required
- ✓ Generates electricity and can provide grid services during routine (non-emergency) operations
- ✓ Lots of partnership opportunities for host, utility, and third parties to share benefits and minimize costs

Case Study: Salt Lake City
(A Solar Market Pathways Project)

Purpose: Emergency Preparedness for Critical Facilities and Businesses.

Goals: Include integrating solar+storage into healthcare facility's emergency management plans and help businesses plan for emergencies.

Strategy: Develop 10-year solar deployment plan for Utah.

Progress and Current Status

Progress:

Workshop for businesses to help plan for emergencies; working with a local healthcare facility to determine the feasibility of integrating solar+storage.

Current Status:

Developing a roadmap for implementation of solar PV projects with storage at healthcare facilities.

Salt Lake City Public Safety Bldg.

- LEED Platinum
- First “net zero energy” public safety building in the US
- 380 kW of rooftop PV
- 30% of panels wired to provide electricity to the building during grid outages

Case Study: Buffalo-Niagara Microgrid

Motivation:

- Seeking to revitalize the local economy and community through DER, smart grid and clean-tech (NY REV).
- A Solar City gigafactory in Buffalo also provided impetus.

Notable Application:

- Buffalo-Niagara Medical Campus

Information gathered from "The Buffalo-Niagara Microgrid Incorporates Many into One," Andrew Burger, Microgrid Knowledge, April 18, 2017.

Facilities and Features

Facilities:

- BNMC is made up of 13 individual medical service organizations.
- Public/private sector organizations collaborating with distributed energy asset developers and the utility (National Grid).

Features:

- CHP (e.g. micro-turbines, internal combustion engines, fuel cells)
- Solar PV
- Battery energy storage
- Electric chillers
- Absorption chillers
- Boilers
- Thermal storage (e.g. hot water, cold water, ice)
- Dual-fuel natural gas/diesel generators

Analysis

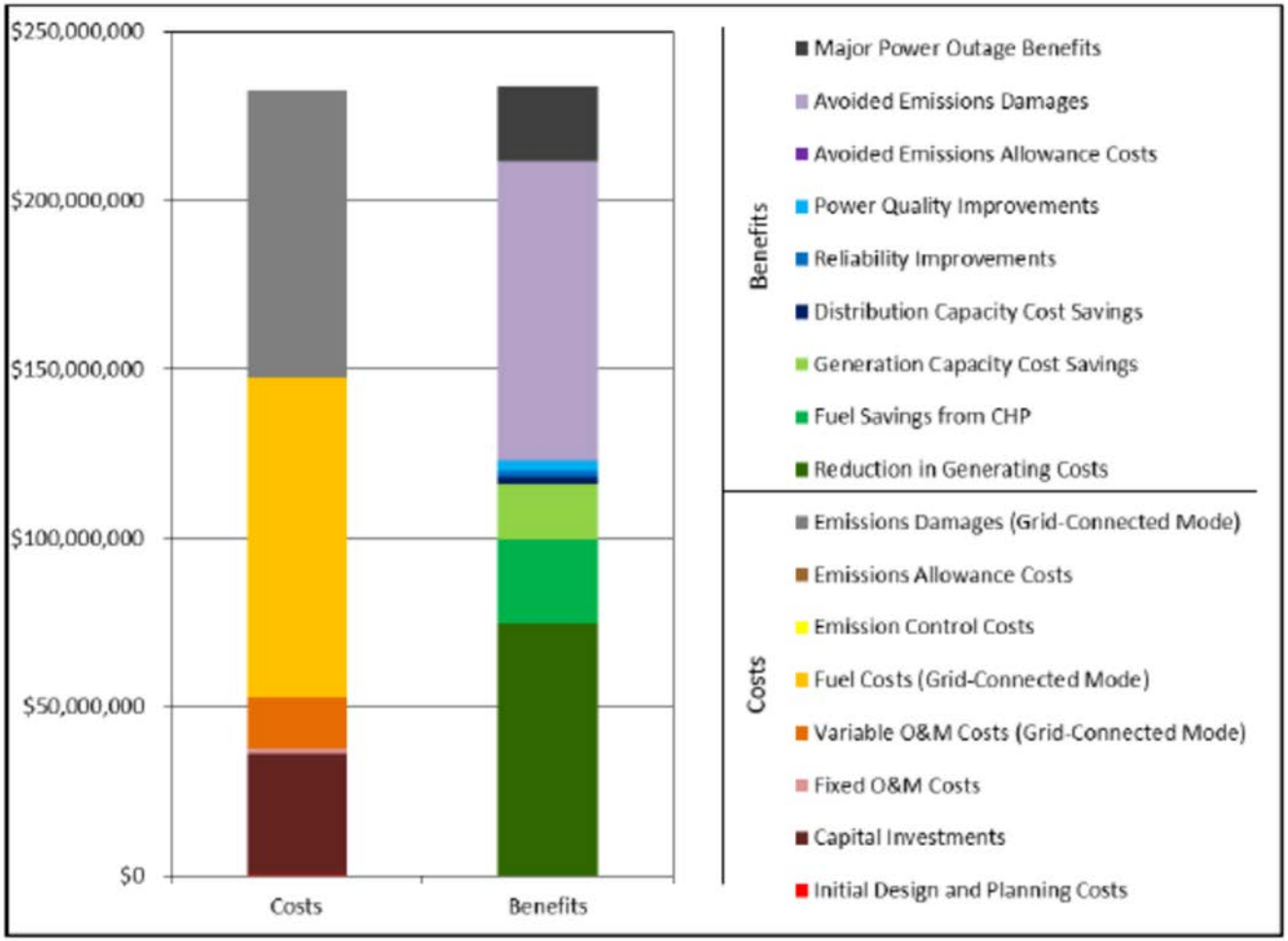
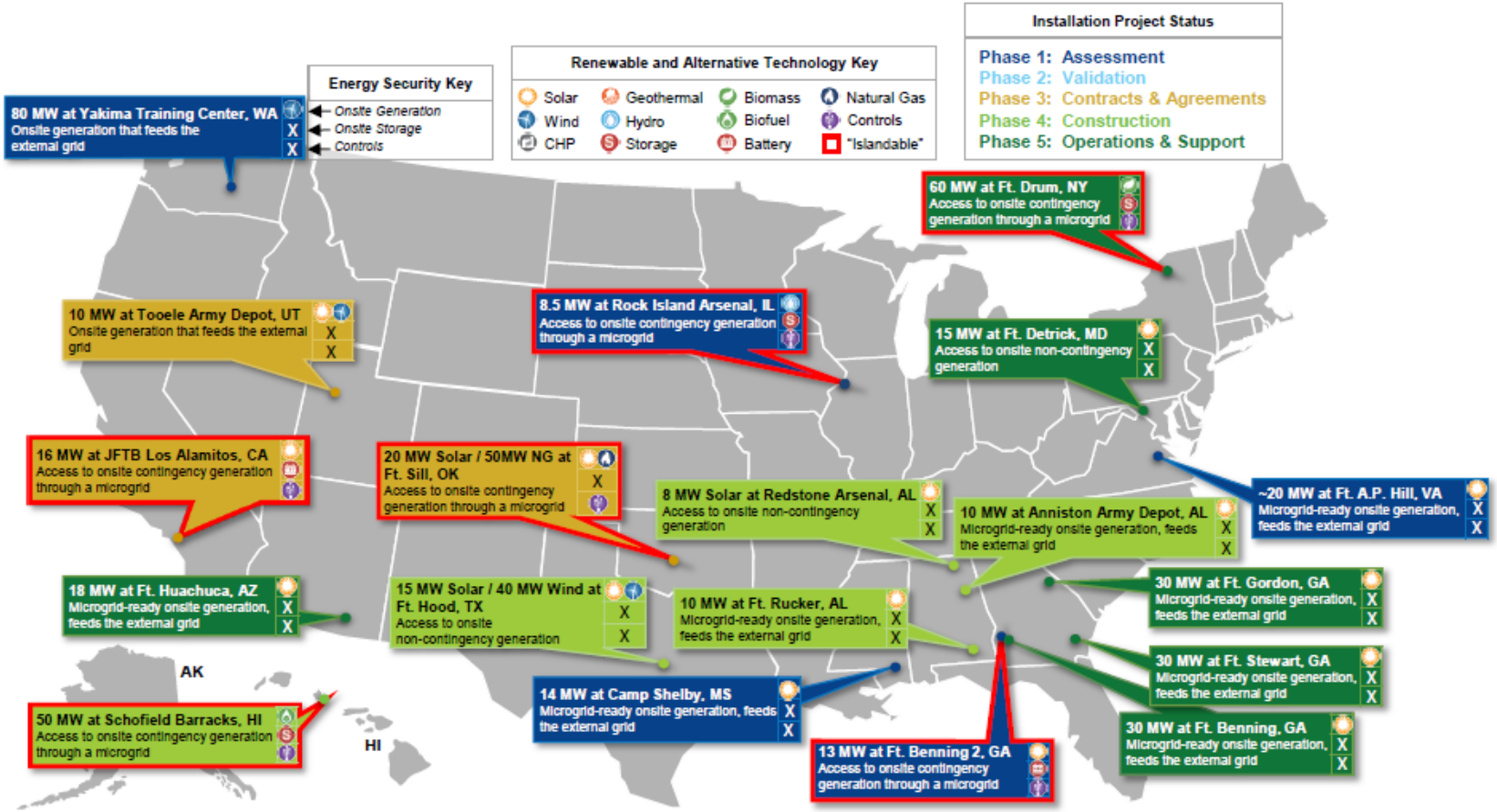


Figure 4.2. Present Value Results, Scenario 2 (Major Power Outages Averaging 0.3 Days/Year; 7 Percent Discount Rate)

Case Study: U.S. Army

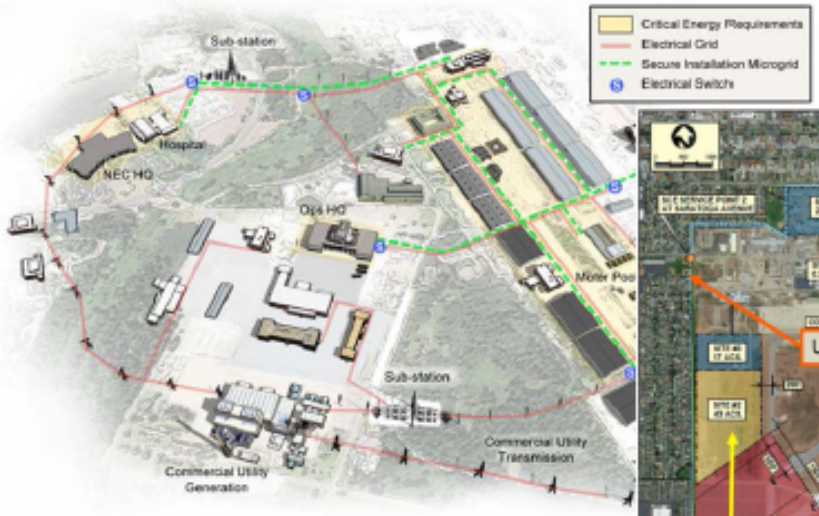


Increasing Energy Security and Resiliency Across Army Installations

Example of a US Army Project

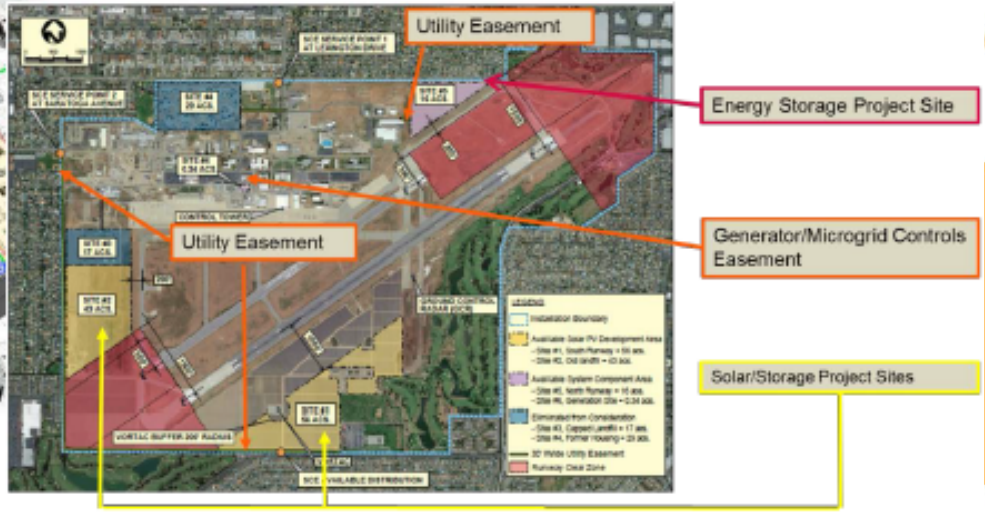
Army proposed outgrant of 115 acres at JFTB Los Alamitos

- Developer would construct, own, operate and maintain 16 MWs of solar power, energy storage, and microgrid components
- During normal ops, the developer sells power to the grid
- During contingency ops, the developer would provide islandable power for critical loads for min 7 – max 30 days

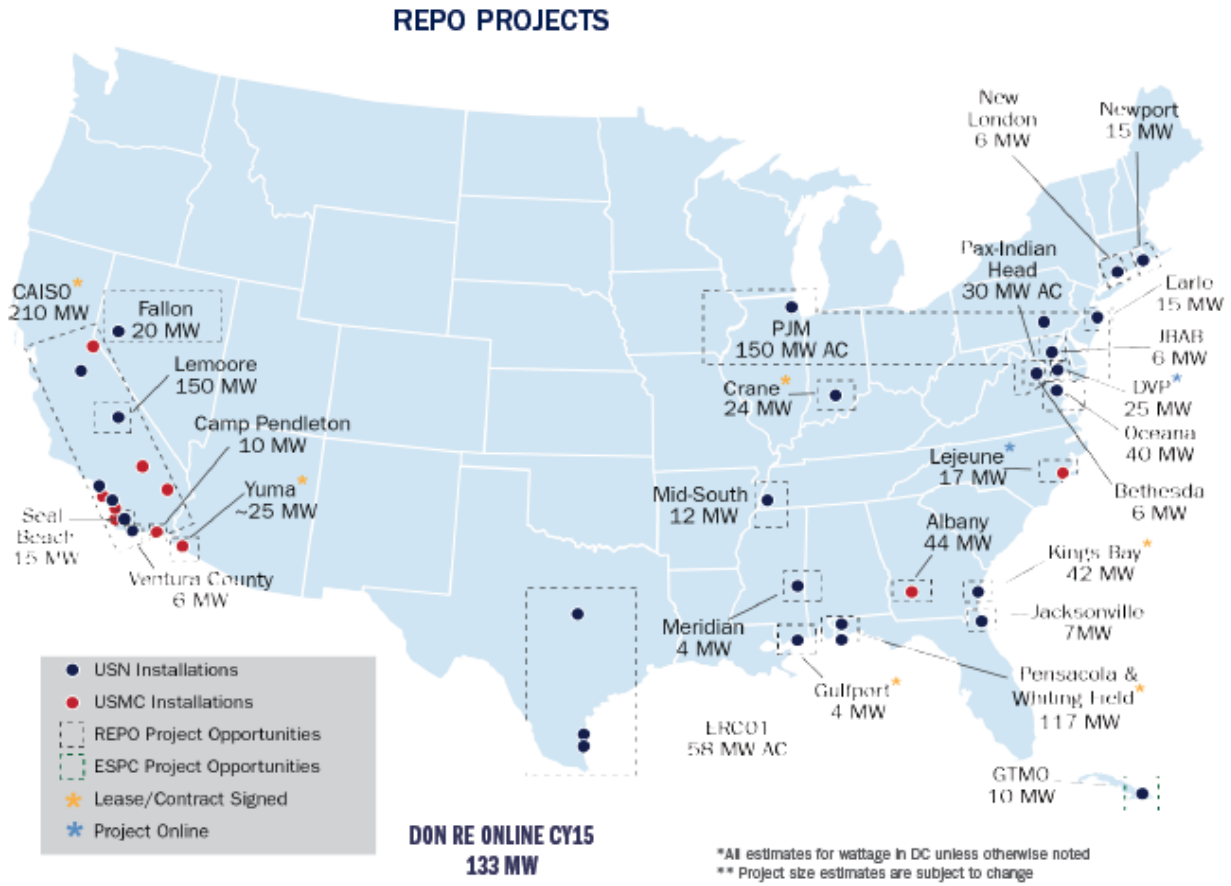


Notional Army Microgrid

Project Development Concept



Case Study: Navy/Marine Corps



Example Marine Corps Project

- Solar + storage microgrid demonstration project for one critical facility at Miramar Air Station (CA)
- 230 kW carport PV plus 30 kW rooftop PV
- ZnBr flow battery and microgrid controls
- Demonstrated ability to power this facility for >5 hours in islanded mode

Minnesota National Guard Example

- 10 MW solar array and microgrid at Camp Ripley
- Built and owned by Minnesota Power
- Utility leases land on the base for the PV array
- Power goes to grid during normal operations, but serves the base during emergencies and outages

Concluding Thoughts

What collaborative strategies can be pursued with your utility to encourage PV development in a manner that provides mutual benefit among stakeholders?

Strategies:

1. Perform a resource situation analysis
2. Articulate community wants
3. Assess the short term
4. Assess the long term
5. Build a collaborative tactical plan

Tactical Ideas:

- Address barriers in a timely way
- Consider:
  - ❖ Community solar
  - ❖ Microgrids for resiliency
  - ❖ Mutually beneficial self-supply options

Questions?

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