

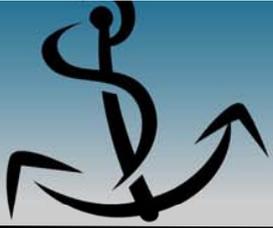
# Charting a Course to Energy Independence

**Providence, RI**  
**August 9-12, 2009**

## *Renewable Projects – Getting Started*

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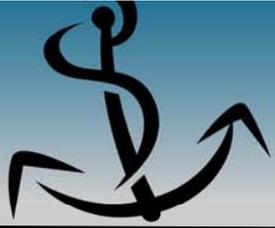
# Presentation Overview

- Renewable project considerations & challenges
- Federal contract options for renewable projects
- Example projects
  - ▣ **Attend Doug Dahle's 4-5 pm renewable session today for more renewable project examples**
- Other applicable GovEnergy sessions
- FEMP resources



# RE Project Considerations & Challenges

- Renewable project screening, detailed assessment for projects that pass screening step
- Financial incentives (see: <http://www.dsireusa.org/>)
- Renewable energy certificate (REC) ownership and potential sale
  - ☐ Purchase replacement RECs to get credit towards federal renewable goal if RECs are sold
- Utility rate impacts such as tariff change, standby charges, etc.
- Metering – real-time access to generation information may be useful



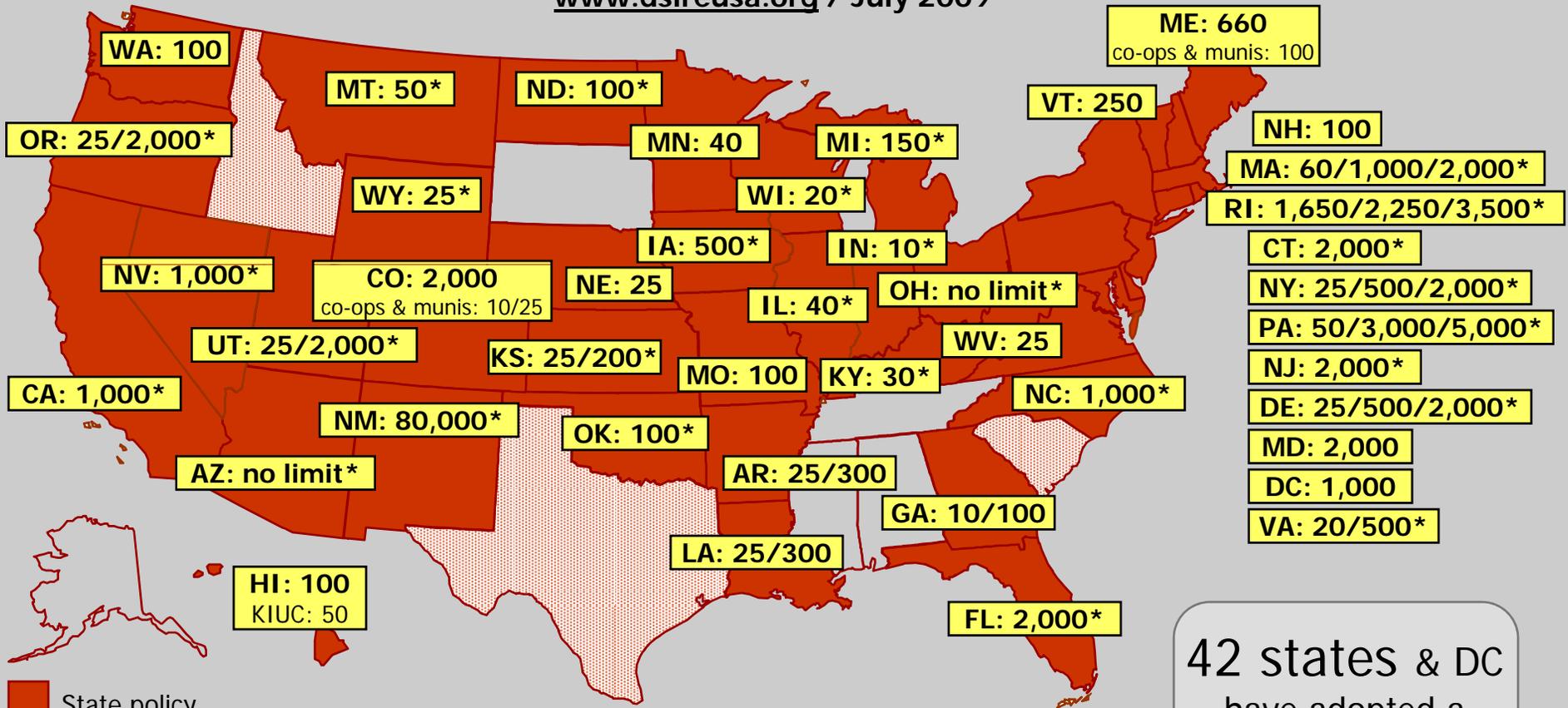
# RE Project Considerations & Challenges

- National Environmental Policy Act (NEPA) and other environmental, safety & health requirements
  - ▣ Stormwater management
- Permitting requirements
- Land, infrastructure (road, fence, electrical) and other requirements
- Water availability (for most concentrated solar power & biomass)
- Interconnection and net metering
- Ownership



# Net Metering

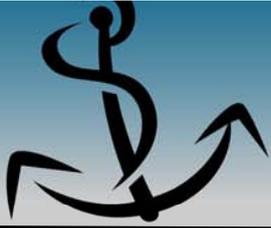
[www.dsireusa.org](http://www.dsireusa.org) / July 2009



42 states & DC have adopted a net metering policy

\* State policy applies to certain utility types only (e.g., investor-owned utilities)

Note: Numbers indicate system capacity limit in kW. Some state limits vary by customer type, technology and/or system application. Other limits might also apply.



# Federal Contracting Options

- Energy Savings Performance Contracts (ESPC)
- Utility Energy Service Contracts (UESC)
- Power Purchase Agreements (PPA)
- Utility Renewable Electric Service Contract (URESC) - PPA with utility
- Enhanced Use Lease (EUL)
- Other renewable project implementation options include appropriations and equipment lease



# ESPC

- Typically bundle RE with EE, although stand-alone RE projects do occur
- Energy Services Agreement (ESA) concept – PPA within ESPC (no signed contracts yet)
  - ▣ Private ownership to allow tax incentive eligibility
- FEMP conducts renewable screening for every new ESPC project  
[http://www1.eere.energy.gov/femp/financing/espcs\\_techplanning.html](http://www1.eere.energy.gov/femp/financing/espcs_techplanning.html)



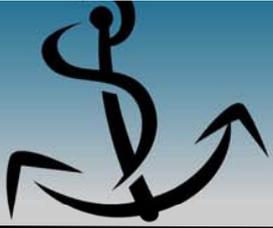
# ESPC Pros/Cons

## Pros

- 25 year contract length - fits well with higher renewable energy paybacks
- Performance guaranteed
- O&M can be included as part of contract
- Site can require renewables
- Project Facilitator assigned - FEMP funded through Initial Proposal/Preliminary Assessment
- Excess electricity/thermal energy sale allowed (EISA provision)

## Cons

- Not easy to incorporate tax incentives (ITC, PTC, accelerated depreciation)
  - ▣ ESCO/financier must own equipment for tax incentive eligibility
- Fixed price contract can be challenging due to renewable fuel pricing & variance in fuel quality/quantity
- Site O&M increases the performance risk



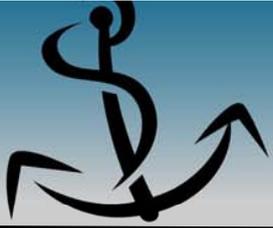
# ESPC Example

## Naval Base Coronado Photovoltaic Project



- 750kW Parking Lot Photovoltaic System
  - Shaded parking for 444 vehicles
  - Provides 3% of peak summer demand
- \$7.7M installed cost, \$3.6M CA. incentives
- \$228k annual savings, 9.9 yr SPB w/incentives
- M&V: Option A using PVWatts analysis for savings; electric meter installed to monitor performance

[http://apps1.eere.energy.gov/news/news\\_detail.cfm/news\\_id=6152](http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=6152)

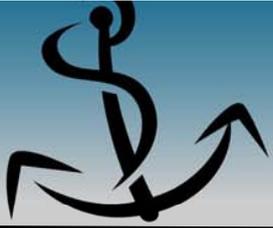


# ESPC Example

## USCG Baltimore, Maryland Landfill Gas



- Boiler Conversion to LFG Cogeneration Plant
  - 4 MW Electricity
  - 8,000 lb/hr Steam
- 15 year contract length
- Project Investment : \$15.0 million
- Annual Savings: \$2.5 million
- Offsets 18,000,000 kWh/yr and 71,000 decatherms/yr of Natural Gas
- Operational: April 2009

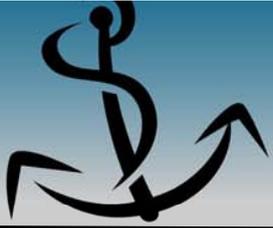


# ESPC Example

## 29 Palms Photovoltaic Project



- 1.3 MW
- Completed September 2003
- Implementation cost = \$6.5M
- Incentives = \$4.5M
- Estimated annual savings over \$500k



# UESC

- Typically bundle RE with EE, although stand-alone RE projects do occur
- UESC contract options – areawide contract (AWC), basic ordering agreement (BOA), site specific contract
- FEMP renewable screening proposed for next year



# UESC Pros/Cons

## Pros

- UESC contract term 10 to 25 years, varies by agency
  - GSA legal opinion states that extended utility agreements are allowed. (p. 75-77 of new UESC Enabling Documents)
  - EISA Section 513 prohibits agency policies that limit maximum contract term for a period shorter than 25 years.
- Utilities are now eligible for renewable investment tax credit (utility must own renewable plant)
- Interconnection and tariff/standby issues should be minimal with utility ownership
- Utilities are interested in a wide range of project sizes (large and small)
- Existing relationship

## Cons

- Not all utilities offer UESCs
- Utility may have limited renewable experience, may be uncomfortable with renewable projects

*(Note: Ask for FEMP assistance to overcome barriers.)*



# UESC Example

## Marine Corps Logistics Base Barstow Wind Project

- 1.5 MW wind turbine
- \$4.6 million cost financed by Southern California Edison
  - \$6.1M total, minus \$1.5M rebate
- \$515k annual savings
- 15 year term





# UESC Example

## Camp Pendleton Photovoltaic Project

- 75 kW PV project with 116,000 KWh/year estimated production (actual production has been higher)
- Bundled with various EE measures
- Total project cost was \$11.2 Million,
- Simple payback 7.8 years, SIR 1.94
- Contract term is 10 years
- Projected annual savings is 62,377 MMBTUs.
- Total projected California solar incentive covers approximately 33% of project costs
- On-line since July 2008

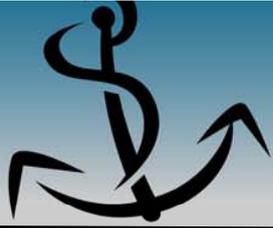




# UESC Example

## Washington Gas Projects

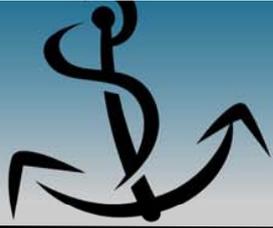
- FDA in Maryland
  - Solar air preheat on several animal barns
  - \$14 million total investment
- USGS in Virginia
  - Solar air preheat to keep generator warm and reduce electric lube oil sump heater use
  - Boiler air pre-heat using existing metal siding
  - Roof-top solar panels were installed during re-roofing
  - Includes an air path underneath to pre-heat air
- HHS - 10 buildings re-roofed and resided to heat outside air for animal buildings
- NIH – various solar air heating systems



# Power Purchase Agreement (Customer-Sited)

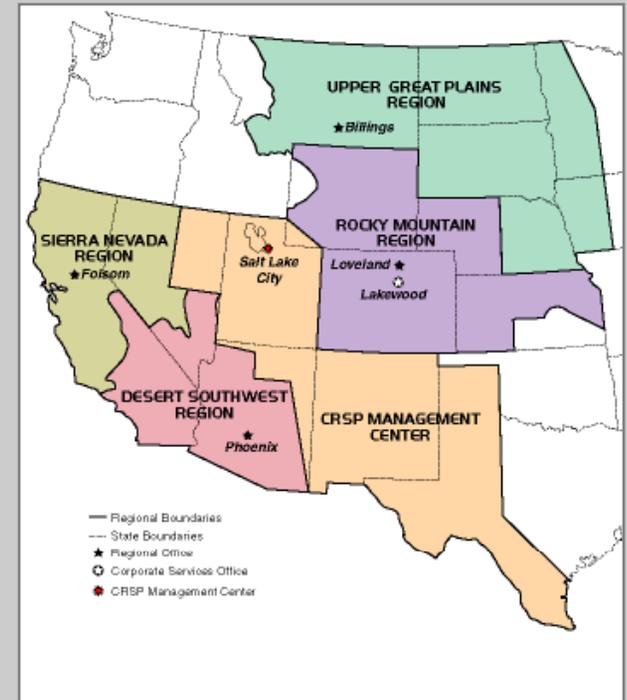
- Private entity installs, owns, operates and maintains customer-sited (behind the meter) renewable equipment
  - Site purchases electricity (or possibly thermal energy) through power purchase agreement
- 
- **Pros**
    - ☐ RE developer eligible for tax incentives, accelerated depreciation
    - ☐ No agency up-front capital required
    - ☐ RE developer provides O&M
    - ☐ Minimal risk to government
    - ☐ Usually known long term electricity price for portion of site load
  - **Cons**
    - ☐ Transaction costs
    - ☐ Limited federal sector experience

Attend PPA panel on Tuesday from 2-3:30 pm



# Key PPA Issue – Contract Length

- PPA contract length - long term best (preferably 20 years)
  - ☐ FAR Part 41 authority is only 10 years
  - ☐ DOD 2922A – 30 year authority (with Sec. Def. approval)
- Long term contract options
  - ☐ Congressional proposals
  - ☐ Western Area Power Administration
    - Long term contract authority (20 years or more)
    - Site must select renewable developer
  - ☐ Long term land use agreement requiring the developer to give federal agency right of first refusal on purchase of the power at a pre-determined price.





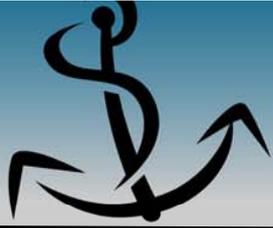
# Other PPA Issues

- Contracting organization
  - ☐ Option: Defense Energy Support Center Renewable Team (John Nelson/Andrea Kincaid)
    - <https://www.desc.dla.mil/DCM/DCMPPage.asp?pageid=589>
- Is PPA model legal in the state/utility service territory?
- Are there Commission approval requirements?
- Is the renewable developer subject to Commission oversight?
- Land use agreement required – lease, easement, license, other
- End of contract options
- Bid evaluation



# PPA Examples

	<b>Nellis AFB, NV</b>	<b>Fort Carson, CO</b>	<b>NREL, CO</b>	<b>GSA Sacramento, CA</b>
<b>Size</b>	15 MW, 140 acres including closed landfill	2 MW, 12 acre former landfill	.72 MW, 5.4 acres	.5 MW
<b>Type</b>	Ground Mounted, Single Axis Tracking PV	Ground Mounted, Fixed PV	Ground Mounted, Single Axis Tracking PV	Roof-top PV
<b>Contract Length</b>	Indefinite with 1 year termination	17	20	10
<b>Land Use Agreement</b>	Lease	Lease	Easement	License
<b>Procurement and Contracting Agent</b>	Site	Site, in partnership with Western	Site, in partnership with Western	Site
<b>RECs</b>	Sold to utility	Sold to utility	Sold to utility	Retained by renewable developer



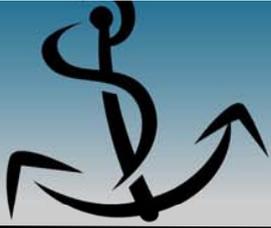
# Utility Renewable Electric Service Contract (URESC)

- Contract with local serving utility for the purchase of electricity from utility owned, utility operated on-site renewable generation.
  - ☐ No example projects yet
  - ☐ Energy Lawyers and Contracting Working Group is developing template agreement (**Tuesday 4-5 pm session will address this topic**)
  - ☐ Use FAR 41.501c4 (52.241-5 Contractor's Facilities), along with GSA Areawide Contract
  - ☐ Land use agreement (lease or other) may not be required
  - ☐ 40 USC 591 – federal sites must abide by state law
    - Only allowed to use authorized electric providers, unless site is in a state with a competitive electricity market



# Enhanced Use Lease (EUL)

- Only certain agencies have an EUL authority
- EUL is a real estate agreement
- The lease is competed (rather than the energy purchase, as in a PPA)
- Payment or in-kind consideration
- Attend EUL session on Tuesday, August 11 from 10:30 - 12



# EUL Example

## Fort Irwin

- Notice of Opportunity to Lease (bids were due 4/17)
- Approximately 500 MW at 5 Fort Irwin sites
- In-kind services equal to or greater than fair market value of land
- Developer conducts NEPA EIS
  - ☐ Fort Irwin will conduct an environmental baseline study as a part of the lease documents.
- Developer selection announced July 30, 2009 – Clark and Acciona Solar Power
  - ☐ First phase: More than 500 MW solar thermal/PV by 2022
- <http://eul.army.mil/ftirwin/>



# Using Appropriations

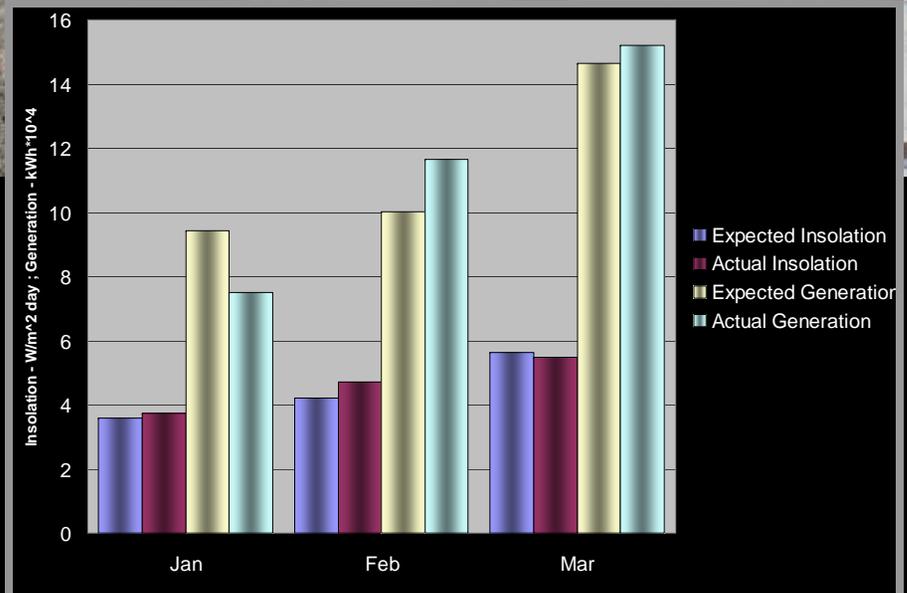
- GSA Supply Schedule for small solar projects

<http://www.gsaelibrary.gsa.gov/ElibMain/SinDetails;jsessionid=www.gsaelibrary.gsa.gov-52cc0%3A446117b3%3Ae18334633d31dfd?scheduleNumber=56&executeQuery=YES&specialItemNumber=206+3>

- O&M contract is strongly recommended
- Pursue all incentives (<http://www.dsireusa.org/>) with federal site eligibility
  - ☐ Attend Utility Rebates and Incentive Guidance session from 2-3:30 pm on Tuesday, 8/11 for information on how to accept incentives
- May be possible to sell high quality RECs (usually solar)
  - ☐ Purchase replacement RECs to get credit towards federal renewable goal

# Appropriations Example Project GSA Denver Federal Center(1.19MWdc)

- This PV system generated 1,726,000 kWh in 2008, 14% more than contract required (10% of the DFC campus peak electrical load, 2.5% of total DFC kWh)
- Collectors at 20 degree fixed tilt
- Requires 6 acres of land
- First cost was \$6.9 Million (\$5.8/Watt), GSA owned
- Incentives - \$200K
- REC = 1,525 MWh, \$240/MWh for 20 years.





# FEMP Assistance & Resources

- Renewable screening/assessments to evaluate cost effectiveness of renewable project options
  - ☐ FEMP conducts renewable screening for every ESPC project
  - ☐ Similar UESC screening proposed for FY10
- Project facilitation
- Workshops and webinars  
<http://www1.eere.energy.gov/femp/news/events.html>
- FEMP web site (including new PPA page)  
<http://www1.eere.energy.gov/femp/financing/mechanisms.html>



# FEMP Assistance & Resources

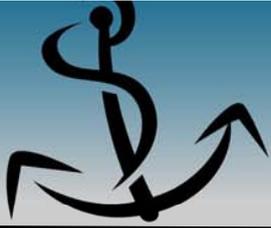
- FEMP Focus PPA article (Fall 2007)  
[http://www1.eere.energy.gov/femp/newsevents/fempfocus\\_article.cfm/news\\_id=11218](http://www1.eere.energy.gov/femp/newsevents/fempfocus_article.cfm/news_id=11218)
- EPA solar PPA web site  
<http://www.epa.gov/greenpower/buygp/solarpower.htm>
- UESC Enabling Documents - **available at the FEMP booth** and on web - <http://www1.eere.energy.gov/femp/financing/uescs.html>
- Federal Utility Partnership Working Group (FUPWG)
  - ☐ [http://www1.eere.energy.gov/femp/financing/uescs\\_fupwg.html](http://www1.eere.energy.gov/femp/financing/uescs_fupwg.html)
  - ☐ Next meeting November 18-19, 2009 in Ontario, CA (sponsored by S. California Edison)
- Renewable Guidebook (update coming this fall)  
[http://www1.eere.energy.gov/femp/renewable\\_energy/renewable\\_powerresources.html](http://www1.eere.energy.gov/femp/renewable_energy/renewable_powerresources.html)



# FEMP Contacts

## Federal Financing Specialists (FFSs)

- **Scott Wolf** (MT, WY, UT, CO, NM, TX, LA, AL WA, OR, ID, CA, NV, AZ, HI, Pacific Islands)  
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- **Doug Culbreth** (KY, AR, TN, NC, SC, MS, AL, GA, FL, PR, VI)  
**919-870-0051, [carson.culbreth@ee.doe.gov](mailto:carson.culbreth@ee.doe.gov)**
- **Tom Hattery** (PA, NJ, WV, VA, MD, DE, DC, NY, NH, VT, ME, MA, CT, RI)  
**301-829-2061, [thomas.hattery@ee.doe.gov](mailto:thomas.hattery@ee.doe.gov)**
- **Gordon Drawer** (ND, SD, NE, KS, MN, WI, IA, MO, IL, MI, IN, OH)  
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# FEMP Contacts

## UESC

- David McAndrew, DOE HQ/FEMP  
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- Karen Thomas, National Renewable Energy Laboratory (NREL)  
**Karen.Thomas@nrel.gov, 202-488-2223**
- Additional FEMP, national laboratory, utility, and agency contacts are available on p.255 – 259 of the UESC Enabling Documents

## ESPC

- Bill Raup, DOE HQ/FEMP  
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- Doug Dahle, NREL  
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## PPA

- Mark Reichhardt, DOE HQ/FEMP  
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- Chandra Shah, NREL  
**chandra.shah@nrel.gov, 303-384-7557**



# Summary

- Various methods for acquiring, contracting and financing renewables
    - ▣ More emphasis on renewables over-all
    - ▣ PPA becoming more common – faster growth expected if long term RE contract authority is passed
  - FEMP funded renewable screening should result in more RE projects
  - ESPC and UESC allow for bundling with energy efficiency (always remember EE first!).
  - Get assistance from the experts
- 
- Attend other GovEnergy sessions – renewable track, PPA, EUL, Energy Lawyers and Contracting Working Group (PPA Template & Rebate sessions)
  - Check out the FEMP booth for UESC Enabling Documents and other helpful information