RECs and PPAs

Greater Yellowstone Interagency Climate Action Plan Working Session
April 19 – 22, 2010

Presenter
Alicen Kandt
Presentation Overview

- Renewable Energy Certificates (REC)
  - REC Benefits and Considerations
  - REC Purchase Options
- Power Purchase Agreements (PPA)
  - PPA Case Studies
- Resources
Renewable Energy Credits (REC)
Renewable Energy Certificates (RECs)

- Also referred to as Green Tags, Tradable Renewable Certificates, Green Energy Certificates/Credits, etc.

- A renewable facility produces two distinct products that can be unbundled and sold separately:
  - Generic electricity (sold into the local grid)
  - RECs (the environmental attributes of power generated from renewable electric plants)

- No renewable energy is physically delivered to your site; you purchase only the environmental attributes of renewable generation.
  - RECs are purchased *in addition to* electricity

- For sites where renewable power delivery is restricted because of physical or institutional barriers, this product may be your agency’s best option.
Renewable energy generation

Electricity

Environmental and other renewable attributes

“Renewable Energy”

“Renewable Energy Certificates”
REC Benefits & Considerations

- No transmission or ancillary services are required.
  - REC’s have no physical constraints.
- No impact to your existing power supplier (utility bill does not change).
- Green your “leased” facility.
- Aggregate REC purchase for multiple sites.

**What RECs do not provide:**
- REC’s do not offer protection against fuel price volatility.
- A purchase of REC’s will not guarantee the physical integration of renewable energy into your local power supply system.

**Note:**
- Consider EO13514 greenhouse gas emission goals when making a REC purchase as emission benefits vary considerably by region.
E-Grid Regions and CO\textsubscript{2} Equivalent Emission (lbs/MWh) – Non Baseload

Table with emission factors: http://cfpub.epa.gov/egridweb/ghg.cfm

Highest

Values in Red are above national average (i.e., SRVC at 1790)

Values in Green are below national average, (i.e., SRMV at 1261)

Lowest

Values in Red are above national average (i.e., SRVC at 1790)

Values in Green are below national average, (i.e., SRMV at 1261)
Western Area Power Administration (WAPA) – WAPA has a Federal Renewable Resources for Federal Agencies (RRFA) Program
- Annual REC procurement
- Nominal annual fee (FEMP covers the RFP development and procurement costs)
- Randy Manion
  - (720) 962-7423
  - manion@wapa.gov
- http://www.wapa.gov/powerm/pmtags.htm (See program brochure at bottom of web site.)

Defense Energy Support Center (DESC) – Periodic REC RFPs throughout the year for both civilian and Dept. of Defense sites
- Andrea Kincaid
  - (703) 767-8669
  - Andrea.Kincaid@dla.mil
- John Nelson
  - (703) 767-8523
  - john.nelson@dla.mil

General Services Administration – Infrequent REC RFPs
Power Purchase Agreements (PPA)
Customer-Sited Power Purchase Agreement

- Private entity installs, owns, operates and maintains customer-sited renewable equipment
- Site purchases electricity through power purchase agreement (PPA)

Pros
- RE developer (or partner) eligible for tax incentives, accelerated depreciation
- No agency up-front capital required
- RE developer provides O&M
- Minimal risk to government
- Known long term electricity price for portion of site load
- On-site projects are encouraged for meeting federal RE goal and are eligible for double bonus (good alternative to purchasing RECs)
- Can help with energy security goals

Cons
- Transaction costs
- Limited federal sector experience
Key Considerations

- Who owns the land and/or building(s) and who pays the utility bill? Is there a management company involved?

- Gather utility bills and other energy use information (such as sub-meter data) - utility tariff type, rate & demand charge structure (peak/non-peak, TOU, etc)
  - Competitive electric supply contract information (if applicable)
  - Compare energy usage information to renewable generation

- Assess renewable options and select a project - renewable type, project location(s), estimated size
  - Renewable project initial cost effectiveness analysis to determine project viability taking into account rates, pertinent utility policies (standby charges, potential tariff impacts, net metering, feed-in tariffs, etc), incentives and REC markets

- Is the PPA model legal in the state/utility service territory?
  - Partial PPA legality information posted on DSIRE at http://www.dsireusa.org/summarymaps/index.cfm?ee=1&RE=1
PPA Legality

3rd-Party Solar Power Purchase Agreements (PPAs)

www.dsireusa.org / April 2010

At least 14 states + PR authorize or allow 3rd-party solar PPAs

- Authorized by state or otherwise currently in use
-Apparently disallowed by state or otherwise restricted by legal hurdles
-Status unclear or unknown

Note: This map is intended to serve as an unofficial guide; it does not constitute legal advice. Seek qualified legal expertise before making binding financial decisions related to a 3rd-party PPA. See following slides for authority references.
State policy applies to certain utility types only (e.g., investor-owned utilities)

Note: Numbers indicate individual system capacity limit in kW. Some limits vary by customer type, technology and/or application. Other limits might also apply.
Renewable energy certificate (REC) ownership

- Ensure that PPA contract explicitly spells out REC ownership
- Solar RECs may be very valuable
- If RECs are sold, then must use “REC swap” option for credit towards EPAct RE goal and on-site double bonus
  - Sell valuable RECs, purchase cheaper national RECs
  - Federal Renewable Guidance
    http://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf
RPS Policies with Solar/DG Provisions

State renewable portfolio standard with solar / distributed generation (DG) provision
State renewable portfolio goal with solar / distributed generation provision
Solar water heating counts toward solar provision

www.dsireusa.org / March 2010

16 states + DC have an RPS with solar/DG provisions
Key Considerations

Other renewable considerations – ex. height concerns and coordination with FAA for wind

Electrical considerations -
- Gather electrical drawings and other pertinent site information
- Who owns site utility lines (federal agency or utility)?
- Tie-in options (choose RE size/location that is compatible with the site electrical system)
- Any expected electrical upgrades required?
- Is your site tied to a network distribution system?
- Inverter location options
- Include drawings and other information as part of RFP package
PPA Contract Length

- Long term best: at least 10 years, preferably 20
- Possible authorities:
  - FAR Part 41 – Utility Services (10 year authority)
    - GSA authority, delegated to certain agencies
  - FAR Part 41 Program Guidance Instructions (PGI)*
  - FAR Part 12 – Acquisition of Commercial Items (5 year authority)
  - FAR Part 15 – Contracting by Negotiation
  - DOD 2922A – 30-year authority, requires Secretary of Defense approval
  - Congressional proposals for long term renewable contracting authority

* Used for Nellis AFB indefinite term contract, with one year termination notice

http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/dfars/PGI%20241_2.htm#TopOfPage
Key Considerations

PPA Contract Length (continued)

- Western Area Power Administration (Western) Option
  - Long term contract authority - at least 20 years
  - Federal agencies in Western’s service territory can use Western as the contracting agent
    - Site selects renewable developer and brings to Western (Western currently does not do RFPs)
  - Examples: NREL, Fort Carson
  - Nominal fee for Western’s services
  - Renewable Resources for Federal Agencies (RRFA) program
  - Randy Manion
    - (720) 962-7423
    - manion@wapa.gov
  - http://www.wapa.gov/powerm/pmtags.htm (See program brochure at bottom of web site.)
Key Considerations

Coordinate with the local utility –

- VERY important to notify the utility early on in project development
- Interconnection requirements – application, cost, study requirements and timeframe; interconnection agreement
- Utility rate impacts – possible tariff change, standby charges, etc.
- Renewable system tie-in options: What is acceptable to the utility?
  - Simpler if entire site is on one meter. Separate electrical lines may be required if buildings are individually metered (unless the utility will allow connection on the utility side of the meter).
- Net Metering (and Feed-In Tariff if applicable) rules
Key Considerations

- Investigate National Environmental Policy Act (NEPA) and other state/local environmental and permitting requirements
  - Crucial to investigate requirements early in process

- Stormwater management – EISA Section 438 and other local requirements

- New EPA Rule to control discharge of pollutants from construction sites (erosion and sediment control measure requirements)
  

- Water availability (for most concentrated solar power and biomass)
Key Considerations

- Choose contracting agency
  - Site or other agency contracting staff
  - Defense Energy Support Center (DESC) Renewable Team
    - Leads: Andrea Kincaid/John Nelson
  - Sites in western U.S. can utilize Western Area Power Administration as contracting agent. They negotiate & sign the PPA contract (once renewable developer is selected)

- Develop Request for Proposal or other procurement document

- Issue RFP and distribute widely
  - FedBizOpps
  - Green Power Network (http://apps3.eere.energy.gov/greenpower/financial/)
  - Applicable renewable industry association
  - Other

- Site visit/tour and pre-proposal meeting

- Evaluate bids, award contract (Evaluation Options include low price/technically acceptable (LPTA), best value, low price)
Nellis AFB PV Project in NV

- 14.2 MW single axis ground mounted PV on 140 acres including closed landfill
- PPA price – 2.2¢/kwh
- Estimated first year electricity savings = $1 million, after standby charges
- FAR Part 41 utility service contract
- Indefinite term with one year termination notice (using FAR Part 41 PGI)*
- 20-year ground lease
- Ribbon cutting event December 2007
- RECs sold to Nevada Power (for state RPS solar set-aside)
- Performance Monitoring web site http://mypowerlight.com/Commercial/kiosk.aspx?id=1dd14d57-7840-4b2d-af0a-0fe0fdd5c872

*http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/dfars/PGI%20241_2.htm#TopOfPage
NREL PV Project in CO

- 720 kW (1200 MWh) single-axis tracking, ~ 5 acres
- 20-year PPA contract (utilizing Western)
- 20-year easement
- RECs sold to Xcel Energy for RPS solar set-aside (20 year contract)
- PPA price equal to or less than utility electricity prices (based on EIA projections)
- Operational December 2008
- Additional PV projects
  - 100 kW roof-top (operational)
  - 1 MW ground-mounted (operational)
  - 750 kW roof-top for new building that is under construction
Fort Carson PV Project in CO

- 2 MW, 3200 MWh in first year (~2% of Ft. Carson’s load)
- Fixed, non-escalating energy rate
- 17-year contract, with 3 year option (utilizing Western)
- No cost 20 year lease (using 10 USC 2667 lease authority)
- RECs sold to Xcel Energy (20 year contract)
- Ground-mounted, fixed system covering 12 acre former landfill
- First Solar thin film, 25 year warranty
- Came on-line December 2007
GSA Sacramento PV Project in CA

- 0.5 MW roof-top PV (thin film)
- 10-year contract
- Price matched to utility energy rate, with price floor
- Utility rebate and federal incentives (30% tax credit & accelerated depreciation) - pay for approximately 1/2 cost
- License for use of roof
- Renewable developer retains RECs
- Came on-line March 2008
USCG Petaluma PV Project in CA

- 855 kW ground-mounted, fixed PV on slightly less than 4 acres
- PPA price is 13¢/kWh in the first year, with 3.5% annual escalation
- One year contract with 24 one year renewal options
- Irrevocable 25 year license
- Developer receives 25¢/kWh California Solar Initiative (CSI) performance based incentive (PBI) payments for first 5 years
- Site retains RECs
- Came on-line April 2010
<table>
<thead>
<tr>
<th></th>
<th>Nellis AFB, NV</th>
<th>Fort Carson, CO</th>
<th>NREL, CO</th>
<th>GSA Sacramento, CA</th>
<th>USCG Petaluma, CA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>14.2 MW, 140 acres including closed landfill</td>
<td>2 MW on 12 acre closed landfill</td>
<td>0.72 MW, 5.4 acres</td>
<td>0.5 MW</td>
<td>0.85 MW on ~4 acres</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Ground Mounted, Single Axis Tracking PV</td>
<td>Ground Mounted, Fixed PV</td>
<td>Ground Mounted, Single Axis Tracking PV</td>
<td>Roof-top PV</td>
<td>Ground Mounted, Fixed PV</td>
</tr>
<tr>
<td><strong>PPA Contract Length</strong></td>
<td>Indefinite with 1 year termination</td>
<td>17 with 3 yr option</td>
<td>20 years</td>
<td>10 years</td>
<td>1 yr with 24, 1 yr options</td>
</tr>
<tr>
<td><strong>Land Use Agreement</strong></td>
<td>Lease (20 yrs)</td>
<td>Lease (20 yrs)</td>
<td>Easement (20 yrs)</td>
<td>License (10 yrs, included in PPA)</td>
<td>Irrevocable License (25 years)</td>
</tr>
<tr>
<td><strong>Procurement and Contracting Agent</strong></td>
<td>Site</td>
<td>Site, in partnership with Western</td>
<td>Site, in partnership with Western</td>
<td>Site</td>
<td>Site</td>
</tr>
<tr>
<td><strong>RECs</strong></td>
<td>Sold to utility</td>
<td>Sold to utility</td>
<td>Sold to utility</td>
<td>Retained by renewable developer</td>
<td>Transferred to site</td>
</tr>
</tbody>
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Renewable screening/assessments to determine potential cost effective renewable projects

- FEMP conducts renewable screening for every new ESPC project. This screening also available for UESC and other potential renewable projects

Project Facilitation

- Market research assistance
  - Applicable incentives and/or solar REC market
  - Possible utility bill impacts (tariff/competitive electric supply changes, standby charges, etc.)
  - Interconnection, net metering and other applicable policies/requirements
- Assistance with other requirements such as land use agreement (lease, easement, license, other)
- RFI/RFP/Opportunity Notice
- Bid evaluation
DSIRE Database

• DSIRE = Database for State Incentives for Renewables and Efficiency
  • [http://www.dsireusa.org/](http://www.dsireusa.org/)

• Provides information on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency.
  • Rebates
  • Loans
  • Production incentives
  • Net-metering laws
Resources

Chandra Shah, National Renewable Energy Laboratory (NREL)
chandra.shah@nrel.gov, 303-384-7557

Rich Brown, Lawrence Berkeley National Laboratory (LBNL)
REBrown@lbl.gov, 510-486-5896

Mike Warwick, Pacific Northwest National Laboratory (PNNL)
mike.warwick@pnl.gov, 503-417-7555  (for DOD sites)

FEMP Focus article (Fall 2007, p. 16-17)

FEMP PPA web site (includes a Sample Document page with sample RFP, land use and other documents)
http://www.eere.energy.gov/femp/financing/power_purchase_agreements.html

EPA Solar PPA web site (for all sectors, not just federal)
http://www.epa.gov/greenpower/buygp/solarpower.htm

EPA Solar PPA 7/28/09 webinar (for all sectors, not just federal)
http://www.epa.gov/greenpower/events/july28_webinar.htm