Innovative Procurement Models for Renewable Electricity

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Innovative Procurement Models for Renewable Electricity

U.S. EPA’s Green Power Partnership

Friday, April 10, 2015
Campus Sustainability in the Northeast Conference
Amherst, Massachusetts
Speakers & Agenda

Speakers
- Anthony Amato, ERG – Contractor to U.S. EPA’s Green Power Partnership
- Erin Moore, Sustainability Engagement Manager, Cornell University

Agenda
- Basics of Green Power
  - Procurement options
  - Power Purchase Agreements
- Status of Green Power Use within Higher Education
- EPA’s Green Power Partnership
- Cornell University
  - Climate action plan
  - Renewable electricity case studies
  - Lessons learned
What is Green Power?

- Subset of renewable energy - representative of resources and technologies that offer the highest environmental benefit.
- Electricity generated from natural resources that replenish themselves over short periods of time, including the sun, wind, moving water, organic plant and waste material (biomass), and the Earth’s heat (geothermal).
- Must be from “new” facilities placed into service within last 15 years.
- Must be from the “voluntary” market.
Renewable Energy Certificates (RECs) – Making Green Power Possible

- A REC is the legal instrument that conveys to its owner the right to claim the associated environmental attributes of a generating resource
  - In essence RECs represent the “renewable-ness” of the power
  - Analogous to patents, both convey ownership of something that is intangible and are a market incentive
- A REC is created for every Megawatt-hour of renewable electricity generated and delivered to the utility grid
- A REC includes the following information:
  - Type of renewable resource
  - Location of renewable resource
  - Date stamp or vintage of generation
  - Emissions profile of the generating resource
  - Unique identification number
- Electricity from a renewable resource in the absence of owning the associated RECs is considered null or generic power and has the same environmental profile as the residual grid electricity mix – RECs make it renewable!
1. **Renewable Energy Certificates (RECs)**
   - The environmental “attributes” of electricity generated from renewable resources (1 REC = 1 MWh)
   - Attributes are based on the generation technology type and age, geographic location, and time of generation
   - Does not include the underlying electrons – “unbundled”

2. **Utility Supplied Green Power Products**
   - Green power offered by utility suppliers that is generated from renewable sources
   - “Bundled” product that includes both the RECs and underlying electrons

3. **Self-financed On-site Generation**
   - Install a renewable system on-site (e.g. solar panels, wind turbine)
   - Produces both electricity and RECs from the on-site source

4. **Power Purchase Agreement (PPA) for Renewables**
   - Usually a long-term contract to procure RECs and underlying electrons from a specific project, can be signed pre- or post-project development
   - Can be from onsite or offsite project
Emergence of New Green Power Solutions

- Utility Green Power Programs (1997)
- Community Choice Aggregation (2013)
- What’s Next? Virtual PPAs?
- Unbundled RECs (2002)
- Utility-scale Offsite PPAs (2010)
- Community Solar Gardens (2014)
GPP Summary Statistics 2014: Annual Green Power Use by Product Type

Graph showing the annual green power use from 2009 to 2014, with a breakdown of Off-site PPA, On-site, Marketing, Pricing, and REC.

Pie chart showing the higher education product breakdown with 55% for REC, 10% for On-site, 11% for Marketing, and smaller percentages for other categories.
Utility-Scale PPAs – Ideal Off-taker Characteristics

- Large electricity user with dense load center (college campus or tech data center)
- Financial stability/credit-worthiness
- Focus on longer timeframes
- Open to thinking outside of the box
- Looking to reduce carbon footprint

**Benefits**
- Potential cost savings
- Long-term predictable pricing
- Tangible, clear association with specific renewable energy facility
- Naming rights/branding opportunities with renewable energy facility
- Potential reduction in carbon footprint (with REC ownership)

**Challenges**
- Not legal in certain states
- Change in risk profile
- Investment grade credit required
- Longer timeframe procurement process
- Complexity / Outside of core competencies
- Performance risk
Power Purchase Agreements

Corporate Purchaser’s Cost of Electricity After Entering into a Wind PPA

Source: OwnEnergy
PPA Price Trends for Solar and Wind

Unsubsidized Levelized Cost of Energy Comparison

Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies under some scenarios; such observation does not take into account potential social and environmental externalities (e.g., social costs of distributed generation, environmental consequences of certain conventional generation technologies, etc.) or reliability-related considerations (e.g., transmission and backup generation costs associated with certain Alternative Energy generation technologies).

Source: DOE 2014

Source: Lazard 2014
Value Proposition of Renewables for a College Campus

- Meet environmental objectives
  - Sustainability goals
  - Carbon footprint reduction targets
  - American College & University Presidents Climate Commitment
- Manage risk
  - Reduce exposure to fossil-fuel price volatility
  - Deploys quickly & scales up easily
- Drive economic development
  - Higher ed commitments are financeable
  - Domestic energy supply
  - New U.S. jobs

- Enhance school brand
  - Prospective students
  - Host communities
  - Peer institutions
- Attract & retain students
  - Sustainability and green power is a hot topic on campus
- Incorporate green power into research initiatives & curricula
Current Status: Green Power in Higher Education

EPA’s Green Power Partnership

- 134 College and University Partners
  - 86 REC contracts
  - 49 Utility Market contacts
  - 92 onsite systems
  - 12 off-site PPAs
- Green power use totaling nearly 2.6 billion kWh
  - Equates to ~5% of voluntary green power market
  - Equivalent to the electricity use of 250,000 average American homes for one year

American College & University Presidents’ Climate Commitment

- 695 Signatories committed to becoming climate neutral
  - Purchased electricity currently constitutes ~40% of their GHG emissions
- 244 Schools committed to Tangible Action #5
  - Within one year of signing commitment, begin purchasing or producing at least 15% of institution's electricity consumption from renewable sources
Green Power Partnership Overview

- **Summary**
  - The U.S. EPA’s Green Power Partnership is a free, voluntary program that encourages organizations to use green power as a way to reduce the environmental impacts associated with conventional electricity use.

- **Objectives**
  - Reduce U.S. greenhouse gas emissions
  - Expand the voluntary green power market
  - Standardize green power procurement as part of best practice environmental management
  - Provide recognition platform for organizations using green power in the hope that others follow their lead

- **Current Status**
  - 1,300 Partners using 28 billion kWh of green power annually, equivalent to the annual carbon dioxide emissions from electricity use of more than three million average American homes.
EPA’s 1,300 Green Power Partners
Partnership Requirements

- EPA supports Partners’ procurement of green power by offering advice, technical support, tools and resources, and recognition.
- Partners agree to procure green power and provide an annual update.
- In return, EPA commits to:
  - Provide public recognition
  - Provide procurement and communications assistance, as requested
  - Provide a brief description of the Partner's green power use on EPA’s website

<table>
<thead>
<tr>
<th>If your annual electricity use is:</th>
<th>Partnership Benchmark</th>
<th>Leadership Benchmark</th>
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<tr>
<td>Over 100,000,000 kWh</td>
<td>3% of your use</td>
<td>30% of your use</td>
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<tr>
<td>10,000,001-100,000,000 kWh</td>
<td>5% of your use</td>
<td>50% of your use</td>
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<td>10% of your use</td>
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<tr>
<td>Under 1,000,000 kWh</td>
<td>20% of your use</td>
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Program Resources for Procuring Green Power

**The Partnership Offers:**
- Green Power Locator Tool
- Green Power Equivalency Calculator
- Guide to Purchasing Green Power
- Resource Library featuring example contracts and solicitations
- Webinars showcasing best practices
- Issue whitepapers

New Video!

**Green Power Locator**
Click on your state to find information about green power options available to you.

**Guide to Purchasing Green Power**

**RECs: Green Power Possible**
EPA’s Green Power Partnership: Helping You Leverage Your Green Power Use

- **Credible Benchmarks & GHG Quantification**
  - Metrics for “How much green power is enough?”
  - Definition of eligible renewables & products
  - GHG reduction guidance and calculations

- **Planning & Implementation Resources**
  - Green power locator
  - Purchasing strategy guidance
  - Marketing and communications support

- **Recognition**
  - Top Partner Lists
  - Use of the Partner mark
  - Green Power Leadership Awards
  - Promotional opportunities

- **Best Practices & Innovation**
  - Collaborative solar procurement
  - New contract mechanisms
Want to Know More?

- **Basic Information**
  - An overview of Green Power Partnership is available on EPA’s Web site [www.epa.gov/greenpower](http://www.epa.gov/greenpower)
  - To see EPA’s Top 30 College and University Partners, please visit: [www.epa.gov/greenpower/partners/top30ed.htm](http://www.epa.gov/greenpower/partners/top30ed.htm)
  - To see EPA’s College & University Green Power Challenge, please visit: [www.epa.gov/greenpower/partners/hi_ed_challenge.htm](http://www.epa.gov/greenpower/partners/hi_ed_challenge.htm)

- **More Questions?**
  - Anthony Amato, ERG (contractor), 781-674-7225, anthony.amato@erg.com
RECs & Power Grid
Example: Oklahoma State’s Power Purchase Agreement for Wind

- 20 year arrangement with OG&E
- OSU is purchasing 110 million kWh/year, or 67% of power for Stillwater campus
- Projected to save in excess of $10,000,000 over the life of the 20-year contract.