Financing Solar Projects through Power Purchase Structures

CENTRAL STATES WATER ENVIRONMENT ASSOCIATION
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AZIMUTH ENERGY  |  THE POWER BUREAU
Overview

Introductions

Financing Structures
- Owner Financing
- Third Party Financing

Procuring Power Purchase Agreements
- Roadmap
- Calendar
- Tools

Discussion
Introductions

Marc Lopata, PE
- President and Principal Engineer, Azimuth Energy (US Midwest) – Develop, engineer, construct and finance of solar, wind and microgrid projects
- President, Free Island Energy (Tortola, BVI) – Solar, wind, diesel-hybrid, and microgrid EPC and finance in Caribbean Basin, Indian Ocean and Africa
- Project finance, operate, and maintain (O&M) experience on over 100 projects, from 25kW to 600kW, using PPA’s and operating leases

Mark Pruitt
- Principal, The Power Bureau – Energy Planning and Procurement
- Principal, Illinois Community Choice Aggregation Network – Municipal aggregation planning, procurement, and management services.
- Former Director, Illinois Power Agency – Wholesale Electricity Procurement for Ameren and ComEd (including Renewable Portfolio Standard)
- Former Program Director, Energy Resources Center – Retail Electricity and Natural Gas purchasing manager for 32 state agencies and local municipalities
Financing Structures: Overview

Need for Financing with Solar PV Projects
  ◦ New capital cost
  ◦ New maintenance costs

Revenue Streams that Support Solar PV
  ◦ Avoided Costs – Electricity supply/capacity/transmission/distribution/tax costs
  ◦ New Revenue – SREC sales, Tax Credits, Depreciation, Grants

General Financing Structures
  ◦ Owner Financed – Cash, Debt
  ◦ Third Party Financed – Leases, Power Purchase Agreements
Owner Financed: Cash Purchase (A)

Host finances project on its own, but cannot capture tax incentives

- Cash Reserves
- Operating Funds

Advantages
- Low Cost of Capital
- Most transparent
- Only internal parties

Disadvantages
- Long term payback

Cash Purchase without tax incentives (500kW, $1M, $0.09/kWh)
Owner Financed: Cash Purchase (B)

Host finances project on its own, and captures tax incentives
- Cash Reserves
- Operating Funds

Advantages
- Low Cost of Capital
- Most transparent
- Only internal parties
- Tax incentives accelerate payback period
  - Investment Tax Credits
  - Depreciation

Disadvantages
- Not an option for non-profits

Cash Purchase with tax incentives (500kW, $1M, $0.09/kWh)
Owner Financed: Debt Supported

Host finances project with its own funds
- Loans
- Bonds

Advantages
- Low Cost of Capital
- Reasonable payback period

Disadvantages
- Non-profit entities cannot take advantage of tax incentives:
  - Investment Tax Credits
  - Depreciation

Owner Financed Example: 20 year tax free bonds @ 2% = 20% IRR
Third-Party Financed: General

Developer finances project capital with outside financial sources, and the host makes scheduled payments to the Developer

- Lease payments
- Power purchases

Advantages

- All incentives monetized, projects that were impossible without incentives now are viable

Disadvantages

- Higher cost of capital to Host

**Third Party Example:** 10 year tax free bonds @ 6% = 36% IRR
### Third-Party Finance: Options

<table>
<thead>
<tr>
<th>Operating Lease</th>
<th>Capital Lease</th>
<th>Power-Purchase Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>◦ Host pays fixed periodic fee, equivalent to expected energy production</td>
<td>◦ Host pays fixed periodic fee, equivalent to expected energy production</td>
<td>◦ Host pays only for energy produced</td>
</tr>
<tr>
<td>◦ Host carries “technology risk”</td>
<td>◦ Host carries “technology risk”</td>
<td>◦ Eliminates “technology risk”</td>
</tr>
<tr>
<td>◦ Lessor takes all tax credits</td>
<td>◦ Lessor takes NONE of the tax credits</td>
<td>◦ Hedges against fluctuating utility and energy market costs</td>
</tr>
<tr>
<td>◦ Lessor responsible for O&amp;M cost</td>
<td>◦ O&amp;M may be Host’s responsibility</td>
<td>◦ PPA provider responsible for O&amp;M cost</td>
</tr>
<tr>
<td>◦ End-of-term cost is “fair market value”</td>
<td>◦ End-of-term cost is nominal</td>
<td>◦ More complicated agreement, difficult to work for smaller projects</td>
</tr>
</tbody>
</table>
Power Purchase Agreement: Structure

A. Negotiated Agreement
   ◦ Duration, prices, deliverables, etc.

B. Energy Deliveries
   ◦ As metered

C. Regular Payments
   ◦ Purchase the energy generated
   ◦ Negotiated price and schedule

D. Export Excess Energy to Grid
   ◦ Through local utility

E. Receive regular Utility Services
   ◦ Continued relationship

Developer
- Coordinates finance, design, construction on Host’s site
- Captures all incentives
- Monitors and maintains PV system

Host
- Receives power from on-site PV system and utility
- Pays developer for delivered electricity

Utility
- Provides regular electricity service
- Provides net metering
- May reset PLC/NSPL to reflect on-site peak generation capacity

A. Agreement
B. kWh/kW deliveries
C. Regular Payments
D. Excess kWh
E. Regular kWh/kW services
Power Purchase Agreement: Opportunity

IPA Solar REC Procurement
- Illinois Power Agency secures RECs for RPS compliance needs of default rate customers
- Special legislation directed the IPA to secure $30 million of Solar RECs in the near term
- 5-Year purchase agreements to purchase Solar RECs from Illinois-based solar PV assets
- 3 procurement cycles (June 2015, November 2015, Spring 2016)

June Procurement Results

<table>
<thead>
<tr>
<th>Product</th>
<th>Sub-25 kW</th>
<th>25-500 kW</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (#RECs)</td>
<td>Identified System</td>
<td>Forecast Quantity</td>
<td>Identified System</td>
</tr>
<tr>
<td>Avg Winning Bid Price ($/REC)</td>
<td>$172.74</td>
<td>$168.00</td>
<td>$101.09</td>
</tr>
</tbody>
</table>

$134.84/REC equates to approximately $33.50/MWh produced by a 25kW system over a 20 year
Power Purchase Agreement: Roadmap

Purpose
- Position projects to take advantage of IPA Solar-REC procurement in November

Benefits
- Focuses expediting RFP process
- Envisions conditional vendor selection
- Focuses on Power Purchase Agreements

Requirements
- Internal staff resources
- External Engineering Review
- Board coordination

1. Preparation
   - Set project goals and preferences
   - Assemble team and data

2. Issuance
   - Finalize solicitation documents
   - Distribute Request for Proposals

3. Receive and Review Proposals
   - Focus on Questions
   - Focus on Value

4. Interviews
   - Start with most expensive
   - Identify what’s missing

5. Scoring
   - Focus on Value and Risk
   - Settle on top proposers

6. Selection
   - Best and Final Offers
   - Conditional Selection

7. IPA Auction
   - Develop response strategy
   - Joint submittal

8. Go / No-Go Decision
   - Review IPA Results
   - Decide to proceed

9. Contract Execution
   - Negotiate final PPA language
   - Board Action
Power Purchase Agreement: Calendar

1 Jul
1 Aug
1 Sep
1 Oct
1 Nov
1 Dec

NOTICE TO BOARD

BOARD ACTION

[CATEGORY NAME]
[CATEGORY NAME]
[CATEGORY NAME]
[CATEGORY NAME]
[CATEGORY NAME]
[CATEGORY NAME]
[CATEGORY NAME]
Power Purchase Agreement: Tools

Model Solicitation

- Focuses on Power Purchase Agreements
- Checklist for internally-generated materials
- Core solicitation documents and respondent forms

Potential Bidder List

- Not comprehensive, but a good start for distribution

Model Agreements

- Can be amended to meet internal requirements
Power Purchase Agreement: Solicitation

Request for Proposals Package
- Buyer Information – Site drawings, elevations, historical electricity consumption, interconnection
- Process – Initial RFP issuance, questions, submittals, engineering review, bidder interviews, Final RFP issuance (if necessary), best and final offer submittals, conditional selection, IPA proposal coordination, IPA results evaluation, contract execution (may be conditional)
- Calendar – Due dates and planned actions by staff, IPA, and Board

Specifications
- General minimum performance standards for equipment and systems
- Minimum financial performance thresholds

Bidder Response Forms
- Company background – Ownership, experience, location, structure, insurance, finances
- System Proposal - Proposed equipment, specifications, warranties and performance
- Financial Proposal – Price, term, structure
Power Purchase Agreement: Bidder List

Contents
- Company Name
- Contact Name
- Phone Number
- E-mail
- Website address

Sources
- Illinois Solar Energy Association
- Bidder lists from recent IPA Renewable Energy Credit procurements
# Power Purchase Agreement: Agreement

<table>
<thead>
<tr>
<th>Engineering, Procurement &amp; Construction</th>
<th>Operations &amp; Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>◦ Contract Price Schedule</td>
<td>◦ Services Description</td>
</tr>
<tr>
<td>◦ System Design</td>
<td>◦ Price and Payment</td>
</tr>
<tr>
<td>◦ Equipment Specifications</td>
<td>◦ Term</td>
</tr>
<tr>
<td>◦ Warranties</td>
<td>◦ Access</td>
</tr>
<tr>
<td>◦ Site Access</td>
<td>◦ Reporting</td>
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<tr>
<td>◦ Construction Scheduling</td>
<td>◦ Standards of Performance</td>
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<tr>
<td>◦ Performance Testing</td>
<td>◦ Defaults</td>
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<tr>
<td>◦ Liens</td>
<td>◦ Indemnity</td>
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<tr>
<td>◦ Defaults</td>
<td>◦ Site Access</td>
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<tr>
<td>◦ Indemnifications</td>
<td>◦ Insurance</td>
</tr>
<tr>
<td>◦ Insurance</td>
<td>◦ Maintenance Schedule</td>
</tr>
<tr>
<td>◦ Assignment</td>
<td>◦ Assignment</td>
</tr>
</tbody>
</table>
Key Internal Decisions

Value Definition
- Near Term Price, Long Term Hedge, Policy Fulfillment

Price to Meet or Beat
- What is the price at which a project presents value to the organization?

Optimal Project Size
- What size project makes sense based on physical or financial limitations?

Investment Threshold
- What costs is the organization willing to absorb to develop the solar opportunity?
Thank you for your time and consideration

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