Strategies and Resources for Local Jurisdiction Solar PV Procurement

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Introductions

Grow Solar
- An initiative of the Midwest Renewable Energy Association to promote solar installations in Minnesota, Wisconsin and Illinois (sponsored by the US Department of Energy).

Illinois Green Economy Network (IGEN)
- Grow Solar program manager for activities in Illinois

Metropolitan Mayors Caucus and Elevate Energy
- Grow Solar project partners responsible for outreach and coordination

The Power Bureau
- Grow Solar technical advisor responsible for site evaluations and solicitations

IAWA & CSWEA
- Industry associations representing the wastewater and water resource entities in the Midwest
Solar Background: Technology

Solar Photovoltaic (PV) Technology
- Converts solar irradiance into electricity

Applications
- Single panels or multiple panels (‘arrays’)
- Roof-mounted or ground-mounted
- Distributed (on-site use) or grid connected (exported off-site)

Benefits
- Sustainable and non-emitting source of energy
- Long life-cycle for equipment (20+ years)
- Can offset all or a portion of traditional utility costs
Solar Background: Policies

Renewable Portfolio Standard

- Sets a goal of 25% renewable energy by 2025
- Applies to areas in Illinois served by Commonwealth Edison, Ameren, and MidAmerican
- Goals must be met by electricity supply provider (either the utilities or a retail electricity supplier)

Solar Specific Items

- Solar Carve Out: 6% of annual RPS goal
- Compliance verified by the purchase of Solar Renewable Energy Credits (SRECs)
- Allows for net metering
Solar Background: Cost Trends

Note: Median installed prices are shown only if 20 or more observations are available for a given year and customer segment.
Solar Background: Finance

**Typical sources finance for solar PV installations -**

- **Avoided Energy Costs**
  - Peak Period Energy Supply + Capacity

- **Tax Incentives**
  - Investment Tax Credit (30% of capital cost for installation) + Accelerated Depreciation

- **SREC Sales (1 SREC per 1,000 kWh of solar generation)**
  - $20-150 per SREC

- **Grants**
  - Illinois Department of Commerce and Economic Opportunity
  - Illinois Clean Energy Community Foundation
Why POTW’s

**Net-Zero-Energy Wastewater Treatment**
- Focus on generating on-site power resources to support water treatment activities

**Focus on sustainability**
- Many view POTW’s as natural resource agencies

**Large energy users**
- Can support a range of potential solar project sizes and configurations

**Long-term view and planning**
- Sustained focus on engineering and capital project planning

**Creditworthiness**
- Make an attractive counterparty for solar developers
Finance and Funding: Self-Finance

**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
- Cannot capture tax benefits

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

Break Even
Finance and Funding: Third-Party

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

Break Even

Power Purchase Agreement
Finance and Funding: Third-Party

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

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**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
POTW Solar Project Approach

Objectives
- Identify sites where solar could have high potential value
- Provide a pathway for soliciting offers from qualified solar developers

Benefits
- Provides a preview for project economics
- Allows POTW to eliminate low-value projects

General findings regarding solar value
- Higher value in ComEd region
- Power Purchase Agreements allowed for better economics than direct purchases
Case Study: DeKalb Sanitary District

Initial Project
- Identified 10 potential sites
- Ground- and roof-mounted systems

Economic Evaluations
- Using very conservative assumptions
  - 2 vacant sites eliminated
  - 6 remaining sites showed potential
  - 3 ground sites had the best potential (assuming a 1% per year increase in grid electricity supply)
- Current site electricity costs: $0.069/kWh
  - Electricity supply (volume related elements only)
  - Distribution (volume-related elements only)
  - Taxes (volume-related elements only)
Case Study: DeKalb Sanitary District

Bid Results
- Lead bidder combined the three ground-mount locations into a single offer:
  - kW AC Capacity: 1,360.80
  - kWh AC Output Year 1: 1,805,509
  - kWh AC Output 20-Years: 34,394,955
  - Total Area Requirement: 208,200 sq. ft.
- Also included utilizing battery storage to improve system functionality

Economics (20 Year PPA)
- Fixed price without escalations
  - SRECs sold at $100: $0.049/kWh
  - SRECs sold at $0: $0.059/kWh
Discussion

Thank you for your time and consideration

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