

Financing Solar Projects through Power Purchase Structures

CENTRAL STATES WATER ENVIRONMENT ASSOCIATION

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AZIMUTH ENERGY | THE POWER BUREAU



Overview

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- Third Party Financing

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- Tools

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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

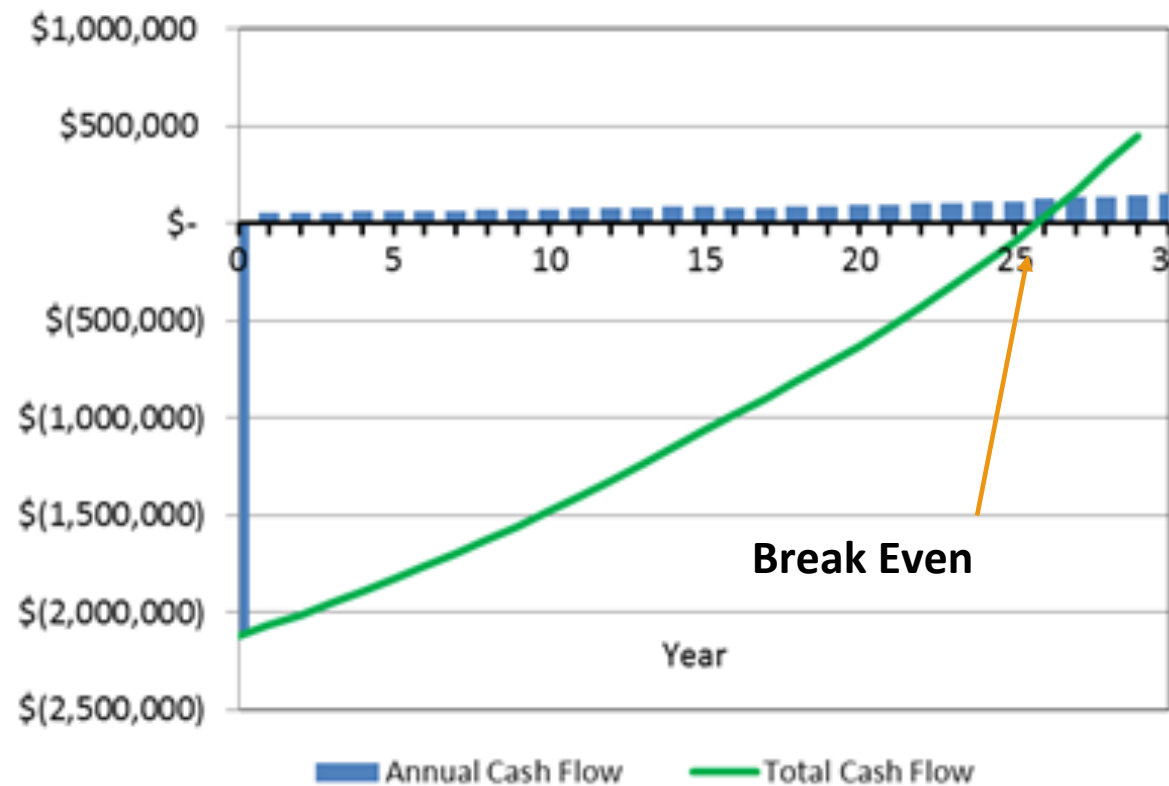
- Cash Reserves
- Operating Funds

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

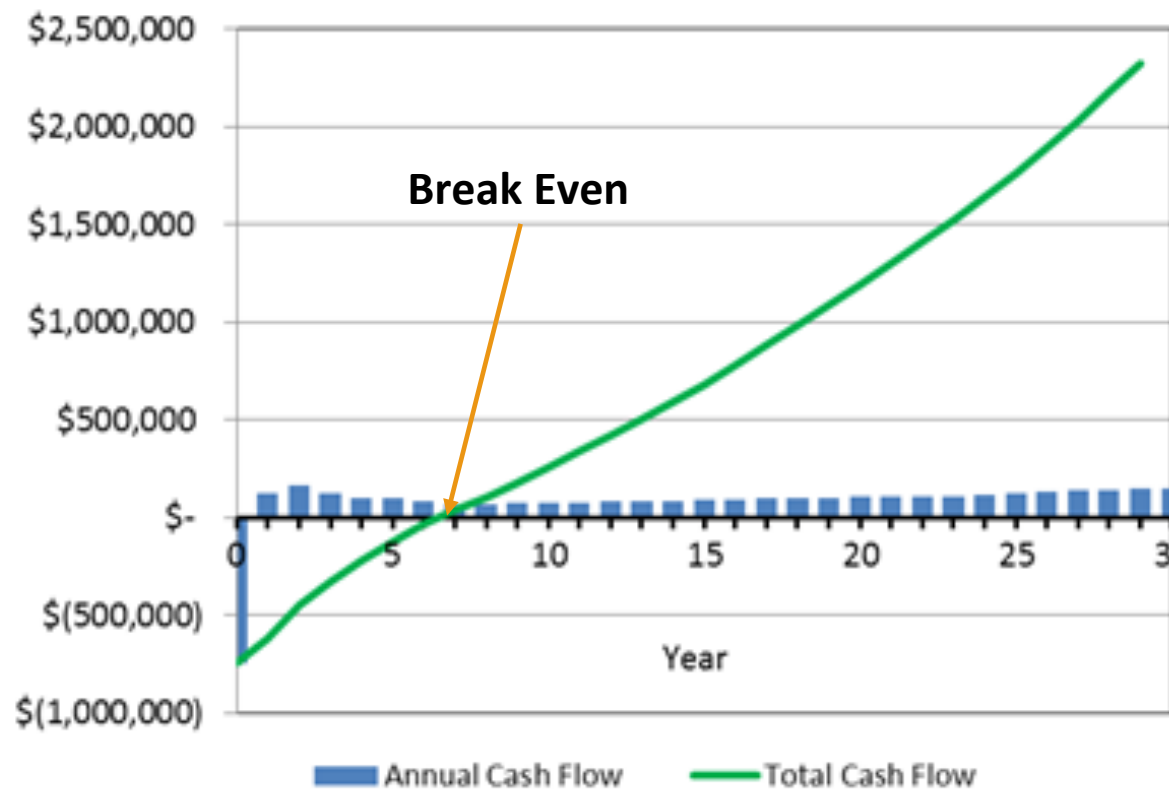
- Cash Reserves
- Operating Funds

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

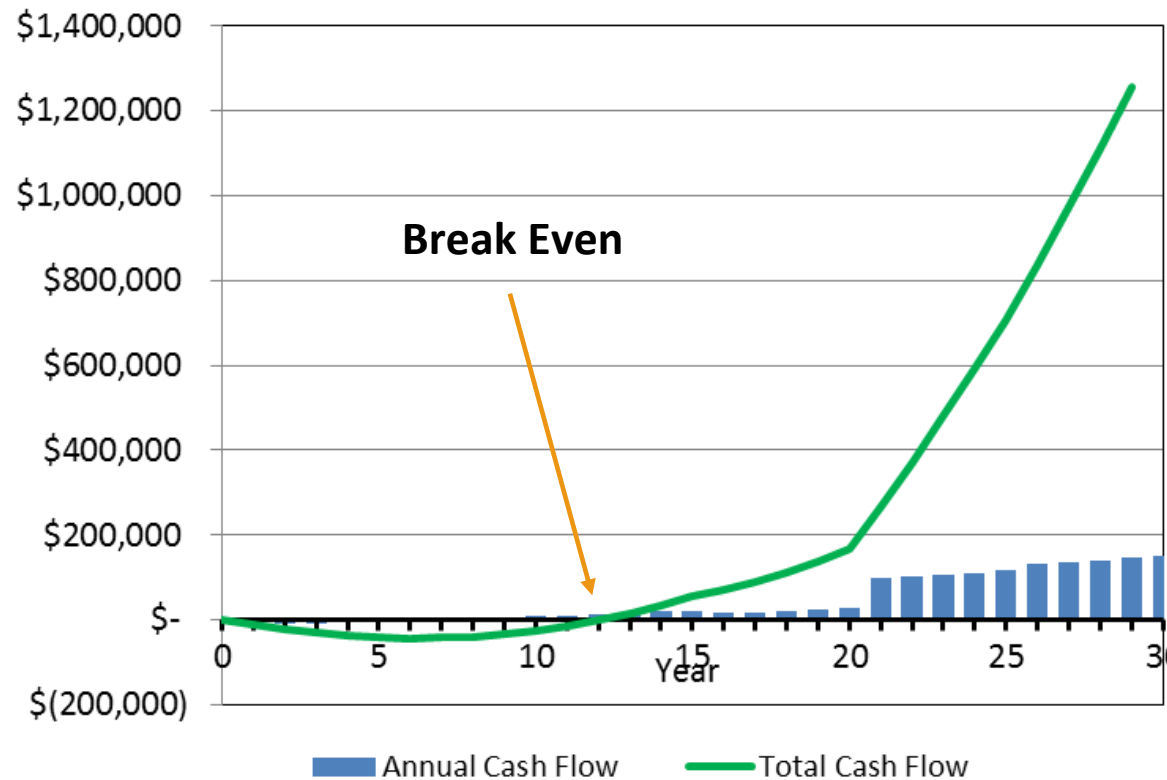
- Loans
- Bonds

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

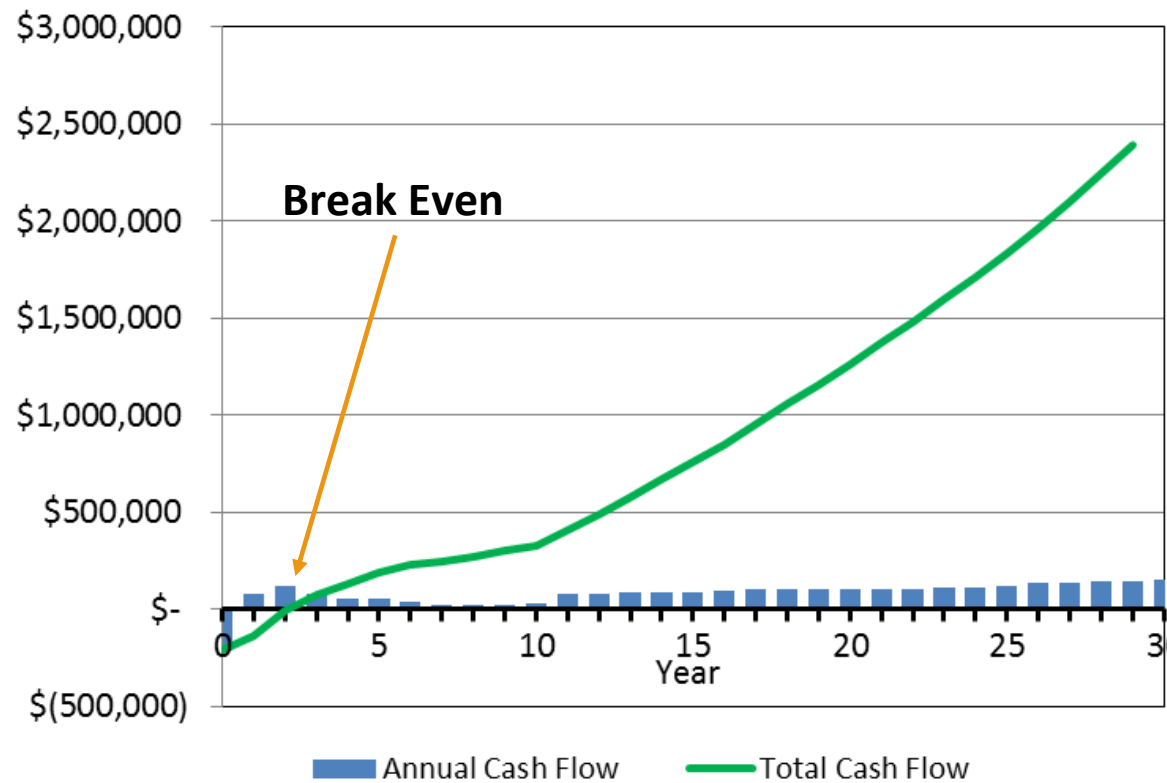
- Lease payments
- Power purchases

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

Operating Lease

- Host pays fixed periodic fee, equivalent to expected energy production
- Host carries “technology risk”
- Lessor takes all tax credits
- Lessor responsible for O&M cost
- End-of-term cost is “fair market value”

Capital Lease

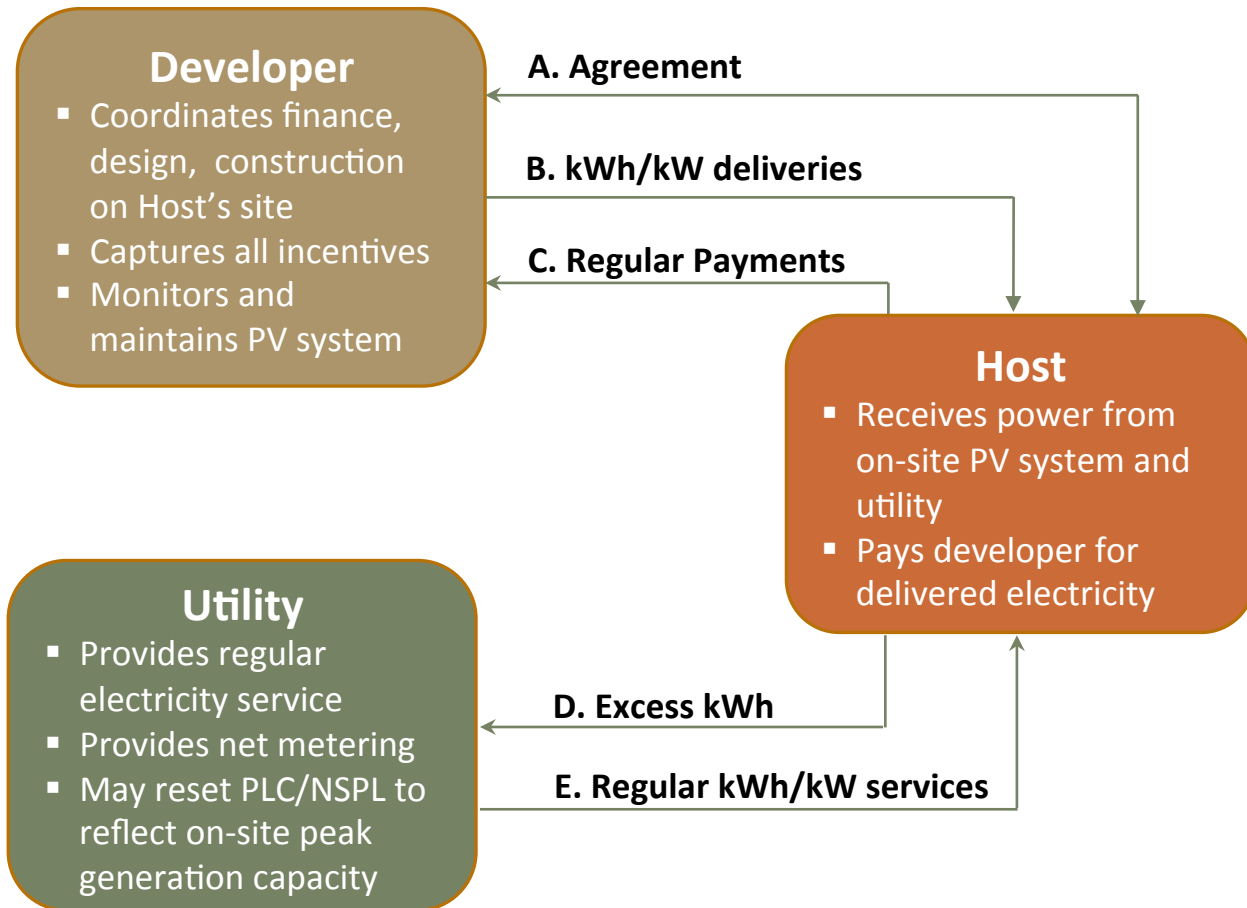
- Host pays fixed periodic fee, equivalent to expected energy production
- Host carries “technology risk”
- Lessor takes NONE of the tax credits
- O&M may be Host’s responsibility
- End-of-term cost is nominal

Power-Purchase Agreement

- Host pays only for energy produced
- Eliminates “technology risk”
- Hedges against fluctuating utility and energy market costs
- PPA provider responsible for O&M cost
- More complicated agreement, difficult to work for smaller projects

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



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

Average Winning Bid Prices¹ and Quantities By Product and Contract Type.

Product	Sub-25 kW		25-500 kW	Total
Contract Type	Identified System	Forecast Quantity	Identified System	
Quantity (#RECs)	2,296	16,245	18,541	37,082
Avg Winning Bid Price (\$/REC)	\$172.74	\$168.00	\$101.09	\$134.84

\$134.84/REC e
approximately \$3
produced by a 25
over a 20

Power Purchase Agreement: Roadmap

Purpose

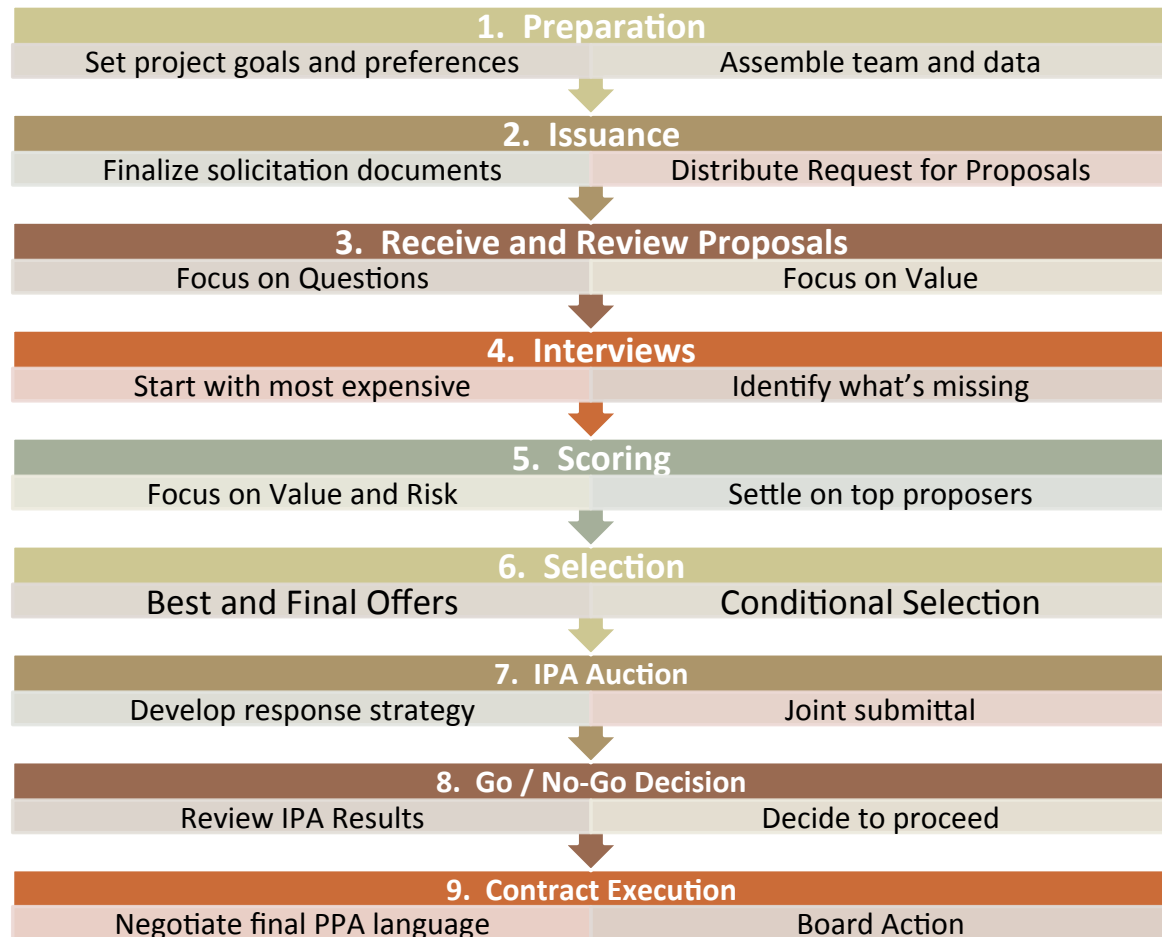
- Position projects to take advantage of IPA Solar-REC procurement in November

Benefits

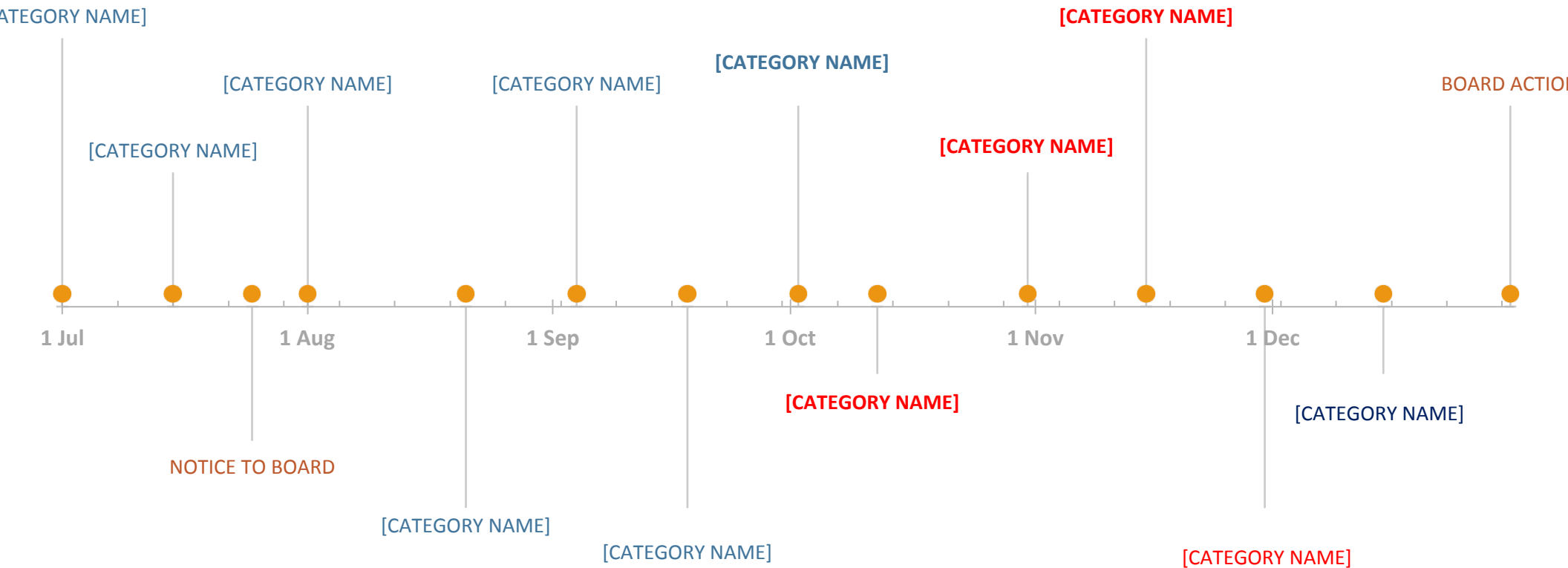
- Focuses expediting RFP process
- Envisions conditional vendor selection
- Focuses on Power Purchase Agreements

Requirements

- Internal staff resources
- External Engineering Review
- Board coordination



Power Purchase Agreement: Calendar



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

Engineering, Procurement & Construction

- Contract Price Schedule
- System Design
- Equipment Specifications
- Warranties
- Site Access
- Construction Scheduling
- Performance Testing
- Liens
- Defaults
- Indemnifications
- Insurance

Operations & Maintenance

- Services Description
- Price and Payment
- Term
- Access
- Reporting
- Standards of Performance
- Defaults
- Indemnity
- Site Access
- Insurance
- Maintenance Schedule
- Assignment

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?

Discussion

Thank you for your time and consideration

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