PV Development Considerations for US Universities
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TurningPoint Energy Overview

- Denver-based clean-tech development, advisory and investment firm with a focus on:
  - **Developing** solar, storage, and related clean-tech projects for commercial and utility clients
  - **Advising** utilities, public sector entities, solar companies and emerging new clean-tech companies on go-to-market strategies, mergers and acquisitions, organizational systems, processes, tools and efficiencies
  - **Investing** in solar projects, emerging clean-tech companies and unique opportunities
- Combined $1.7 billion (540 MW+) in developing, financing, installing and servicing solar and energy efficiency projects over the last 12 years throughout North America
### TurningPoint Energy Current Projects

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Image</th>
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<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; 1.98MW AC Community Solar in TX</td>
<td><img src="image" alt="Mid-South Synergy" /></td>
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<tr>
<td>1MW AC NM with No ITC</td>
<td><img src="image" alt="Springer Electric Cooperative" /></td>
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<tr>
<td>25MW AC in NM</td>
<td><img src="image" alt="Tri-State Generation and Transmission Association" /></td>
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<tr>
<td>DOE-backed MREA Solar for Universities</td>
<td><img src="image" alt="MREA" /></td>
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<tr>
<td>500kW AC Elementary School in CO</td>
<td><img src="image" alt="Xcel Energy" /></td>
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**Developing 2017 – 2022 Pipeline of New Projects Across the US**
Description

PV Development Considerations for US Universities

Content outline

- Section 1 – Structuring Solar Development Teams
- Section 2 – Best Practices and Rules of Thumb for PV Development
- Section 3 – University Financial Options for PV Investment
- Section 4 – Best Practices for PV Procurement
SECTION 1

STRUCTURING SOLAR DEVELOPMENT TEAMS
What is the Solar Development Process?

Solar Project Development Steps

- Origination
- Development
- Financing
- Engineering, Procurement & Construction (EPC)
- Operations & Maintenance (O&M)
Our Focus to Start: Origination, Development & Financing

Solar Project Development Steps

- Origination
- Development
- Financing
- Engineering, Procurement & Construction (EPC)
- Operations & Maintenance (O&M)

What We Will Focus on For Our Efforts
Origination

Project Origination Steps

- Utility Solar Project & Building Energy Analysis
- Site Selection
- Economics Analysis
- Feasibility Level Layout / Design
- Permitting & Interconnection Qualification
Development

Project Development Steps

- Land Development Studies (geotech, environmental, survey, etc.)
- Local, State and Federal Permitting
- Interconnection application, study process and agreements
- Stakeholder education and buy-in to the Project/s
- Confirmation of Financing Sources / Path to Success
Financing

Project Finance Steps

- Validation of Origination Assumptions for Financial Modeling
- Financial Structuring Analysis / Validation
- Procuring Solar Financing Industry Utilizing All Development Stage Documentation
- Financing Company Negotiations
SECTION 2

BEST PRACTICES AND RULES OF THUMB FOR PV DEVELOPMENT
Development Best Practices
– Start with the End in Mind
Development Best Practices – Start with the End in Mind

1. Know your economic profile before you start
2. Maximize / standardize design efficiencies
3. Selecting the right site/s
4. Development / permitting
5. Interconnection
6. Standard template / form for site visits
7. Other areas where projects survive….or die
Other Ways Projects Survive...Or Die

- Contracts, lawyers and what is allowed per university charter / bylaws / local law / state law vs. what solar industry can accept to finance contracts
- Expectations and politics not aligned (or change mid-process) from faculty to staff to administration to executive team
- Ever changing policy and program by the utility, utility commission, state government
- Not selecting the right company that can actually deliver through procurement
- Unknown state and local tax requirements for a project
- Ever-changing price of electricity and forecasts
SECTION 3

UNIVERSITY FINANCIAL OPTIONS FOR PV INVESTMENT
Solar Financial Structures
Solar Project Structure Options

Easiest (& Lowest Value) to Most Complex (& Highest Value)

- Buy Solar RECsa on the Open Market Only
- Lease Land / Roof Only
- Buy Solar Electricity Only
- Energy Generation Asset for Operations
- Solar as an Investment for University Endowment Fund
Solar Project Structure Options – Third vs. First Party

First big decision is ownership decision and what level of complexity and risk your culture will allow for.
Solar Financing Realities and Success Factors

• Financial models are proprietary in the solar industry...no one shares
• Validate your internal return / price targets and requirements up front
• Get a credible third party to accurately model your project early. It’s worth the consulting fee as the rest of the process will demonstrate.
• Because of the federal ITC, most projects are third party owned (90%+) and remember that means rates of return in the 7-9% pre-tax, 12 – 15%+ post-tax
• Be ready to share three years audited financials and your credit rating with the solar market
• Solar project investors are different for different project shapes and sizes
One More Solar Financing Reality

Project Finance Process

Developers

- Respond to RFPs
- Develop projects
- Sometimes build
- A few remaining vertically integrated groups do 2 of 3 steps

Aggregators

Financing Arrangers

Actual investors

- Pension funds
- Banks
- Large IPPs
- Yield Cos...for now

- Vertically integrated shops
- Hedge funds
- Pure finance shops
SECTION 4

BEST PRACTICES FOR PV PROCUREMENT
The Rules of Good Procurement

Know thy self.

Be upfront and brutally honest with your stakeholders and solar industry.

If you do this, you will get what you want, or at least be efficient with your time and find out what you can have.
Best Practices for PV Procurement

• The further your project is developed, the less change you will see from beginning procurement to signed contract

• Know your objective and outcomes pre-RFI, pre-RFQ or pre-RFP upfront

• Assemble a procurement review team that matches your development team

• Notify a broad enough spectrum of the solar industry to get best results (but not so broad you get chaos)
Thank You

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