Investment Options and Industry Returns – Development Process Overview

DOE Office of Indian Energy
Tribal Leader Forum Series
San Diego, CA
May 14, 2014
Outline

• Introduction
• Investing across life cycle
• Risk, return, motivations
• Conclusion
OIE Development Process - Touchstone

1. PROJECT POTENTIAL: Data Collection and Opportunity Assessment

2. PROJECT OPTIONS: Strategy and Detail

3. PROJECT REFINEMENT: Planning and Development

4. PROJECT IMPLEMENTATION: Financing and Construction

5. PROJECT OPERATIONS AND MAINTENANCE

Comprehensive Energy Plan
Basic Relationships Drive Investment

1. Potential
2. Options
3. Refinement
4. Implementation
5. Operations & Maintenance

Market Strategy
Project Development
Construct
Operate

BUY LOW
SELL HIGH

Value
Uncertainty
Basic Relationships

• IN GENERAL, investment in earlier stages of development is aimed at using the money to move up the value chain.

• RISK, however, does not follow the same path as unknowns, because early-stage investments can be illiquid, and become stranded.

• Development risk, vs. Construction risk, vs. Operational risk.
Investment Risk Across Life Cycle

1. Potential
2. Options
3. Refinement
4. Implementation
5. Operations & Maintenance

Market Strategy → Project Development → Construct → Operate

Risk → Development Risk Capital → Construction Finance → Asset Finance

CTC
Concurrent Technologies Corporation
Investment Risk Differs in Development

• Investment risk moves contrary to basic relationships (lower unknowns = lower risk) during development phase.

• Investments cannot realize value of the asset (operational cash flows) until sufficient capital is available to build and commission the project.

• Development investments are “taken out” by construction financing which in turn is taken out by asset financing. Each earns a return when the next comes in.
Returns Across Life Cycle – Relative Examples

Development Financing
- 30% IRR*
- No debt
- Varies by situation

Construction Financing
- 10% IRR*
- Possible Debt
- Varies by situation

Asset Financing
- 6% IRR*
- Debt likely
- Varies by situation

* Numbers are relative to each other; actual returns will vary.
Considerations

**Development Investment**
- Experience/Expertise
- Risk Management – iterative, incremental investment
- Risk mitigation (i.e. diversification)
- Small projects vs. large projects
- Risk for all parties
  - Land owner expenses
  - Developer expenses
- Controlling fatal flaws
- Maintaining margin
- Sunk costs – killing a project

*Numbers are relative to each other; actual returns will vary.*
Considerations

**Construction Investment**
- Funding Contingencies
- Experience
- Assignment of Risk
- Cost/Quality/Schedule
- Tax Equity
  - Important element in capital costs
  - Valuable “buy down” of upfront costs
  - Benefits other parties – energy user, land owner, cash equity
  - Complicates ownership and control issues – legal issues

*Numbers are relative to each other; actual returns will vary.*
Considerations

Asset Investment

- Timing – vs. tax equity
- Cash on cash returns
- Non-energy revenue (RECs)
- Stabilized cash flows
- O&M budgets
- Reserves
- Using debt effectively
- End of useful life

* Numbers are relative to each other; actual returns will vary.
### SIX STAGES FOR VALUATION

<table>
<thead>
<tr>
<th>Development</th>
<th>Construction</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>EPC</td>
<td>COD</td>
</tr>
<tr>
<td>- 20MW proposal</td>
<td>- Selected EPC partner</td>
<td>- Fully commissioned project</td>
</tr>
<tr>
<td>- Site control</td>
<td>- PPA approved by CPUC</td>
<td>- Initiate long-term O&amp;M provider</td>
</tr>
<tr>
<td>- Site evaluation</td>
<td>- Completed interconnection studies</td>
<td>- Arranged Long-term O&amp;M agreement</td>
</tr>
<tr>
<td>- Land secured</td>
<td>- Filed interconnection application</td>
<td>-</td>
</tr>
<tr>
<td>- “project experience”</td>
<td>- Initiated permitting studies</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- Applied for RAM</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- Submitted CUP application, local permits</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- RAM: PPA signed with PG&amp;E</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>- Completed interconnection studies</td>
<td>-</td>
</tr>
<tr>
<td>Note: RAM = Renewable Auction Mechanism, CUP = Conditional Use Permit, GIA = Generation Interconnection Agreement. NTP = Notice to proceed.</td>
<td>- Signed GIA</td>
<td>- Final NTP</td>
</tr>
<tr>
<td>Source: Bloomberg New Energy Finance</td>
<td>- Received permitting approval</td>
<td></td>
</tr>
</tbody>
</table>
ASSET VALUATION BY PROJECT DEVELOPMENT PHASE (MEDIAN OF SURVEY RESULTS, $/W)

Note: Valuation for a 20MW, single-axis tracking, c-Si PV project located in Fresno County, Central Valley, California. The hypothetical project is expected to reach commercial operation in 2014 with a 20-year PPA with PG&E under the Renewable Auction Mechanism.

Source: Bloomberg New Energy Finance

US solar outlook, 13 March 2013
ASSET VALUATION ACROSS DEVELOPMENT AND CONSTRUCTION/OPERATION PHASES, BY TOTAL SUBMISSIONS AND INVESTOR AND DEVELOPER MEDIAN SUBMISSION PRICE ($/W)

Source: Bloomberg New Energy Finance
Conclusions

• Renewable energy projects can provide attractive investment opportunities for variety of players throughout the life cycle.

• Investments should be considered in context with system of risks and value along life cycle.

• Motivations of investor need to be considered – financial returns may not be only metric (but risk context may be).

• Many factors matter - project size, type, purpose, and perspective of investor (financier, consumer, community, 3rd party).

• Tax equity investment can be complicated but, often has benefits for all parties – offtaker, owners, later-stage cash investors.
Thank You

Bob Springer
Sr. Principal Program Manager
springer@ctc.com
303-513-6739