

CLEANPATH VENTURES

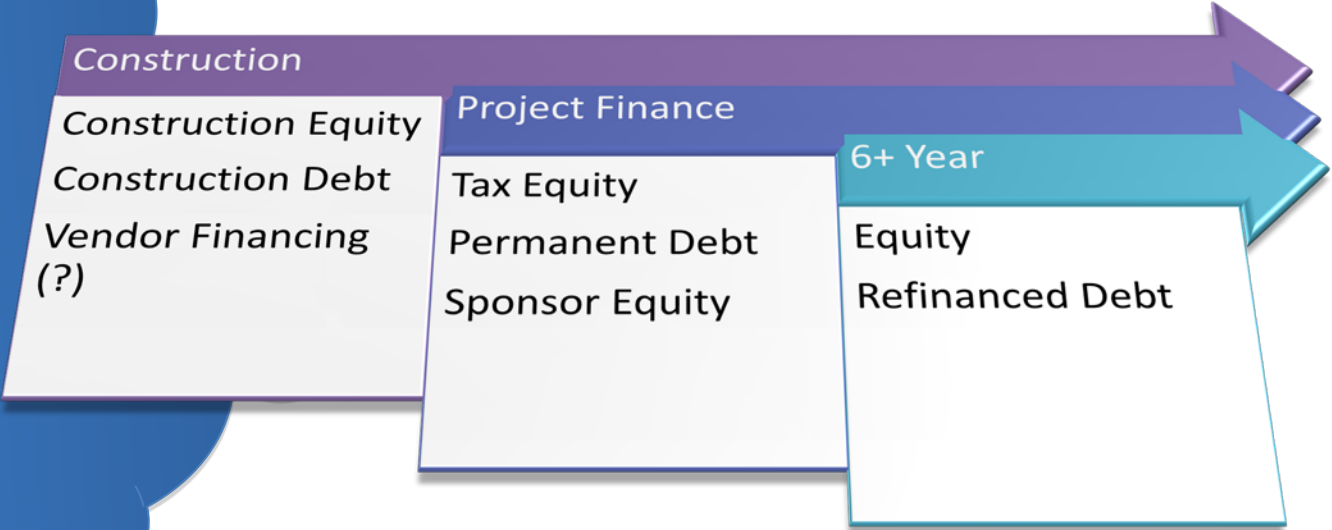


## Financial Investors' Perspective on Quality Assurance

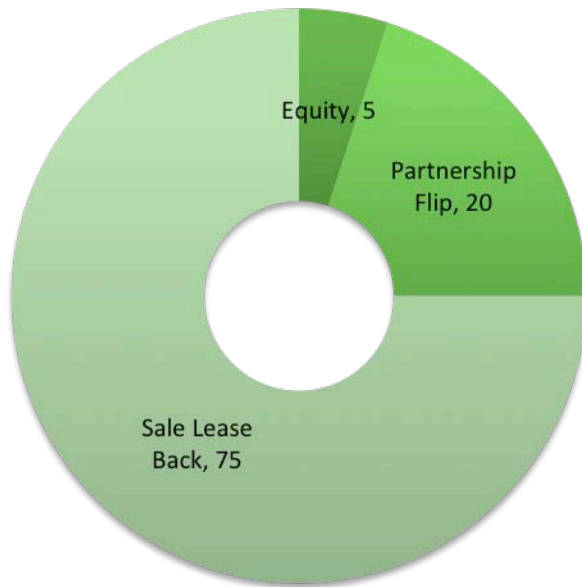
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# the path to clean energy

Technology  
Innovation &  
Quality  
Improvement



# Monetizing Tax Advantage Project Performance 2011



100% Depreciation  
30% ITC – Cash Grant

Sale Lease Back	Partnership	Equity
System is owned by the bank and leased back to the project sponsor	System benefits flow to tax equity and debt investors then 'flip' to sponsor	Complete equity ownership

# Importance of Quality

- Larger systems are attracting lower NO risk capital
- Systems will have more complex power interaction with the grid
- Large systems will FAIL resulting in review of quality
- 25+ years is a VERY long time

# Monetizing Quality Assurance

- Translate technical Challenges
  - Lower degradation
  - Higher yield
  - Project level impacts
- Investment Challenges
  - Bank book acceptance
  - Predict long term production
  - Independent Engineer education

# PV System Performance

Analysis of financial impact of  
increased performance

# Who benefits from high performance?

- Over-performance has little benefit for debt/tax equity
- Debt/Tax Equity viewed as risk assurance for the future
  - Fills reserve accounts
  - Raises confidence for future re-financing options
- Disappointing to sponsor
  - Higher yield would have meant more money
- Independent Engineer too conservative?
  - 3 years of data isn't enough but to complain
  - Weather resource is complex and a 2 year dataset may not be indicative

	Debt	Sponsor	Tax Equity
Partnership	No	Complicated	No
Sale-Lease Back	No	Yes	No
Cash Deal	Yes	Yes	No

# Planned Performance

Impact of increases to underwritten  
yield due to QA and Innovation



# Case Study

## Increase Production during Operation

- Assumptions
  - Quality Assurance and technology program
  - Guarantees 1% yield increase
  - 12,500 kWp (50,000 250W module)
  - Costs \$1/module (\$50k)
  - PPA Levelized at \$130/MWh
  - 15% Cost of Capital
- Analysis
  - IRR: 60+% for 20 years
  - Simple Payback: <2 years
  - \$30k/year; \$200k Net Present Value
  - **NO GO?**

# NO Go?

- Investment Challenges
  - Debt & Tax Equity convinced NO net negative potential consequence
    - NO/Limited benefit if systems are meeting DSCR
    - Potential for negative impact is rarely 0
  - Sponsor has to be convinced to focus resources
    - Outside the business plan
    - Activation energy too great
    - Investment is at risk for many years
    - Does not build pipeline or sell product
    - NPV \$200k versus Development Fee profit of \$5,000k+
- Technology Challenges
  - Predictability of performance is challenging
  - 20 years is a very long time
  - Potential of negative impact

# Implications of performance

Yield	100%	101%	102%	103%	105%	109%
Development Fee	5,300	5,900	6,500	7,000	8,800	10,400
% Increase		10%	20%	31%	51%	95%

12.5 MW System

Base Yield: 1950 kWh/kWp

7% Unlevered Return

- Day 0 is extremely important
- Predictability, viability, and solid sponsorship is essential.
- Every 1% increase in yield increases the project profitability 10%
- 3% increase in yield is worth MILLIONS of dollars on day 0
- Increases in Development Fee goes directly to sponsor

# Conclusions

- Performance is extremely important
- Quality MUST lead to better performance -- Under-performance is universally unacceptable
- Over performance is marginally valuable for operating assets
- Higher underwritten performance dramatically impacts profitability
- Sell products to good stewards. Good product is a result of the construction and care
- Technology needs to focus on predictability of performance
- Quality Assurance and Innovation need to focus on pre-operational assets
- Standards and Protocols are essential for accurate modeling to increase and yield
- Spend the money to identify, procure, AND DEFEND quality

# Thank YOU!

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CLEANPATH

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