



Investment Options and Industry Returns – Development Process Overview

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

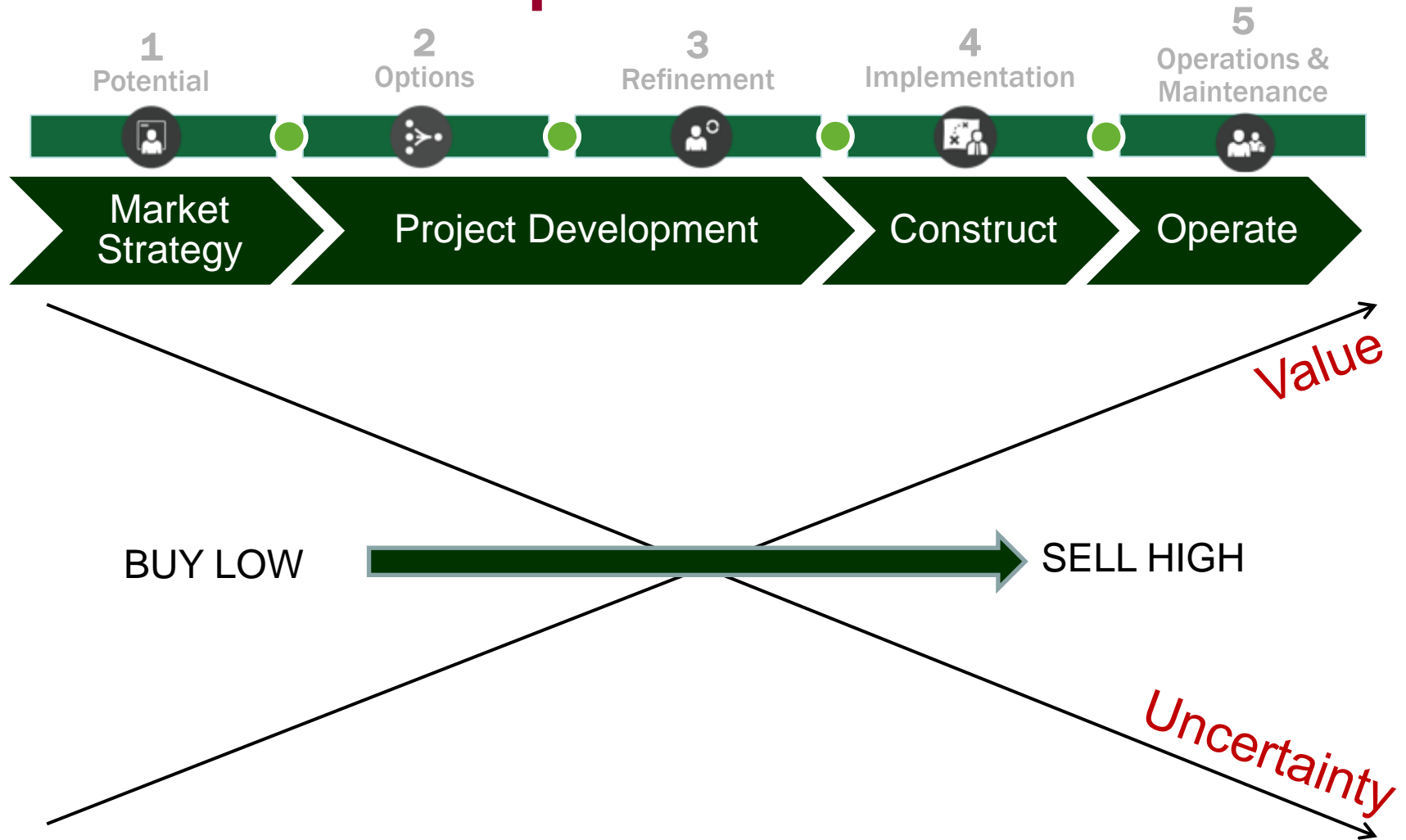
Outline

- Introduction
- Investing across life cycle
- Risk, return, motivations
- Conclusion

OIE Development Process - Touchstone



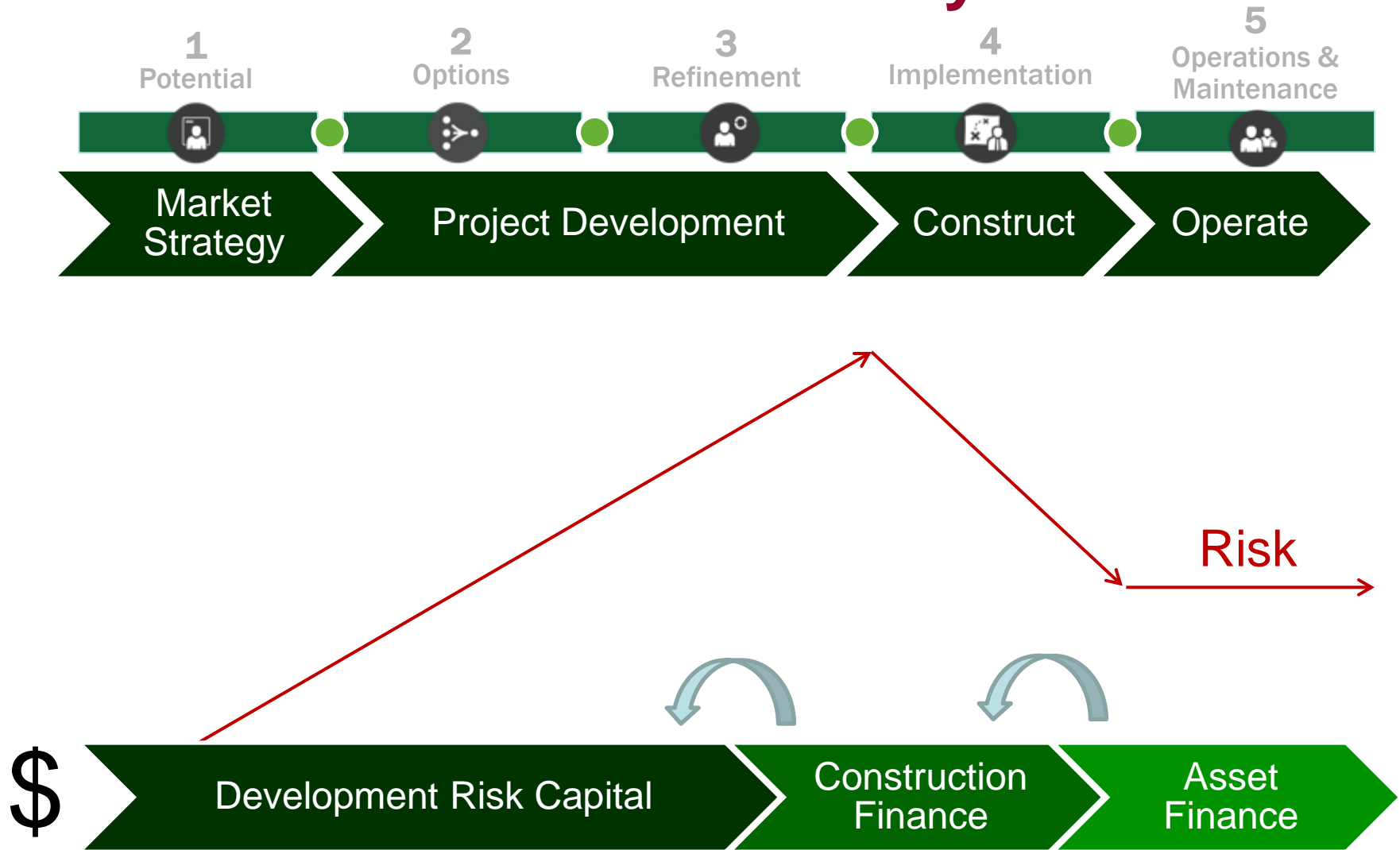
Basic Relationships Drive Investment



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.

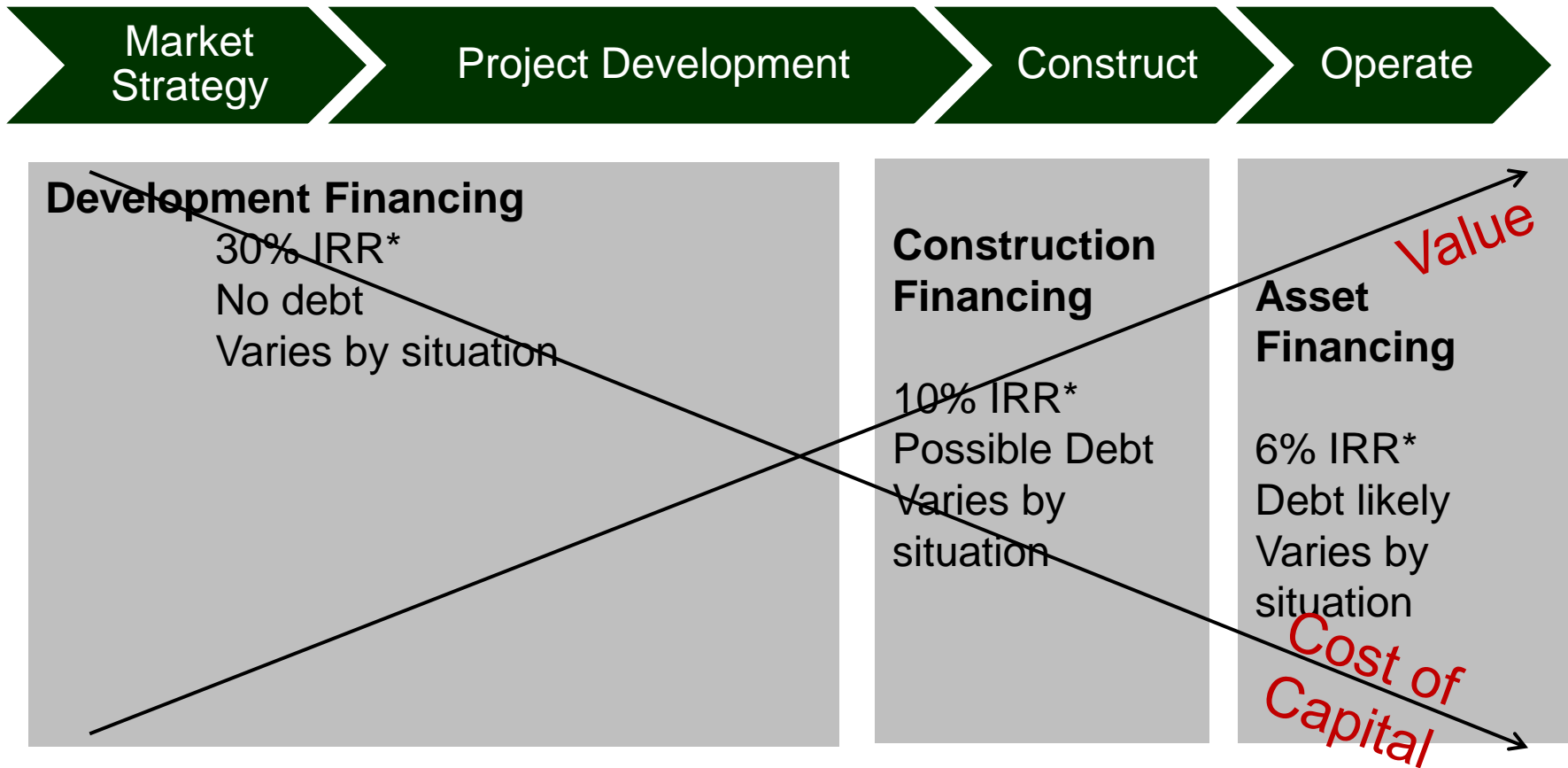
Investment Risk Across Life Cycle



Investment Risk Differs in Development

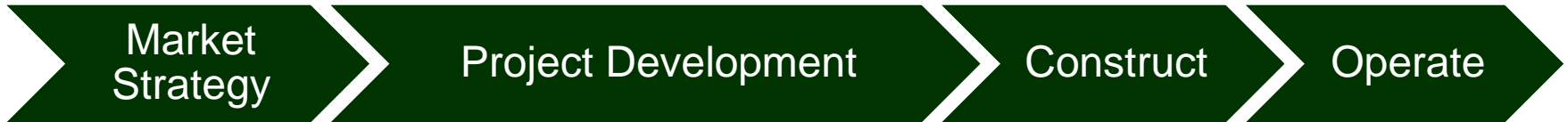
- Investment risk moves contrary to basic relationships (lower unknowns = lower risk) during development phase.
- Investments cannot realize value of the asset (operational cash flows) until sufficient capital is available to build and commission the project.
- Development investments are “taken out” 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



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

Considerations

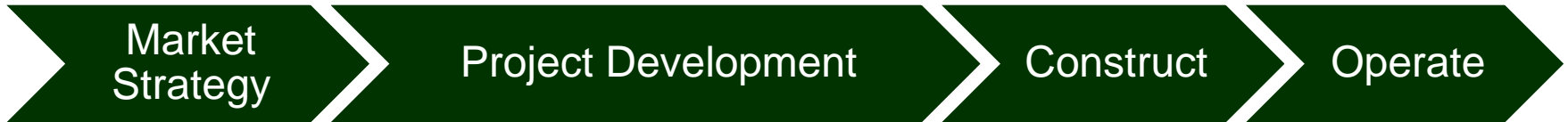


Development Investment

- 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

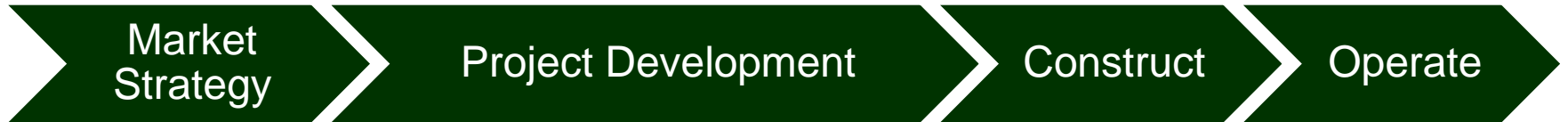


Construction Investment

- 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

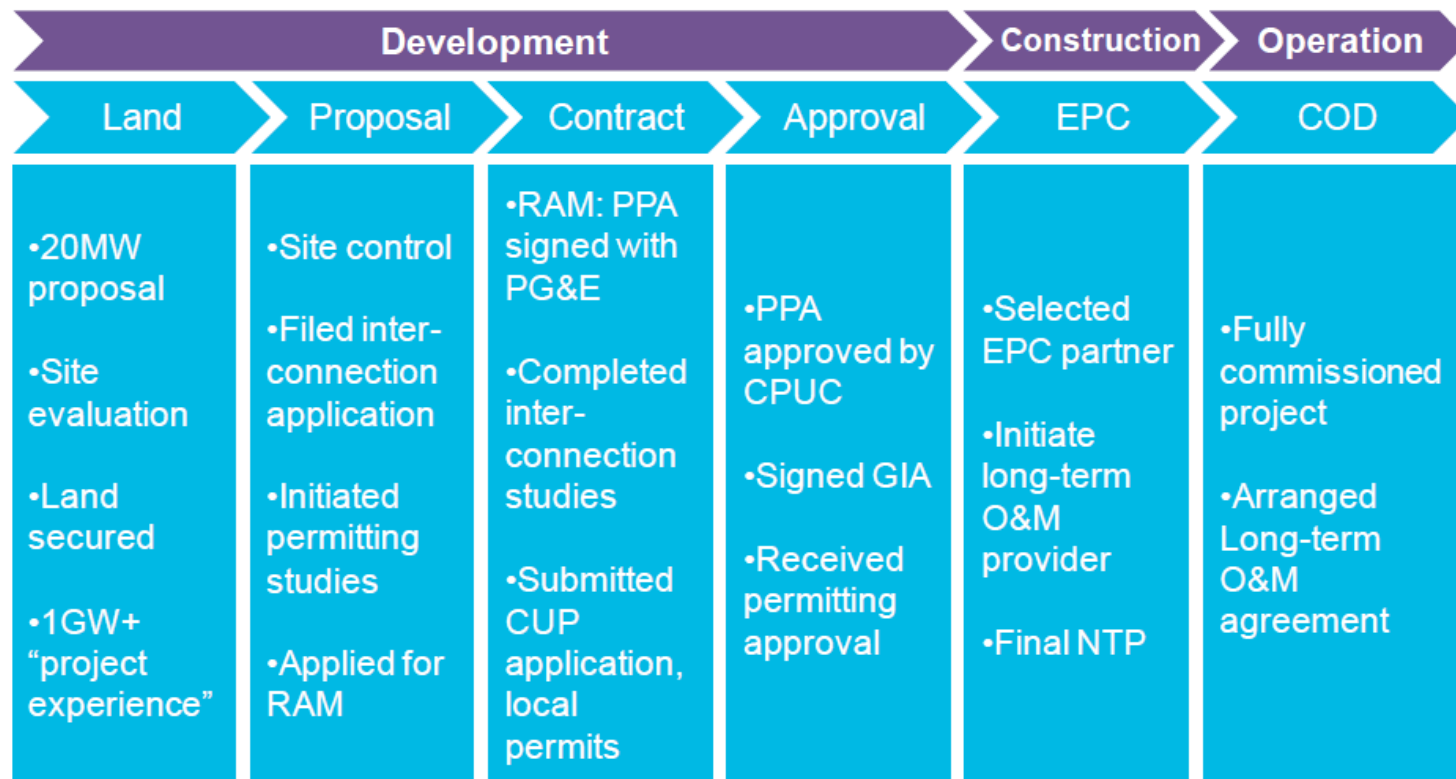


Asset Investment

- 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

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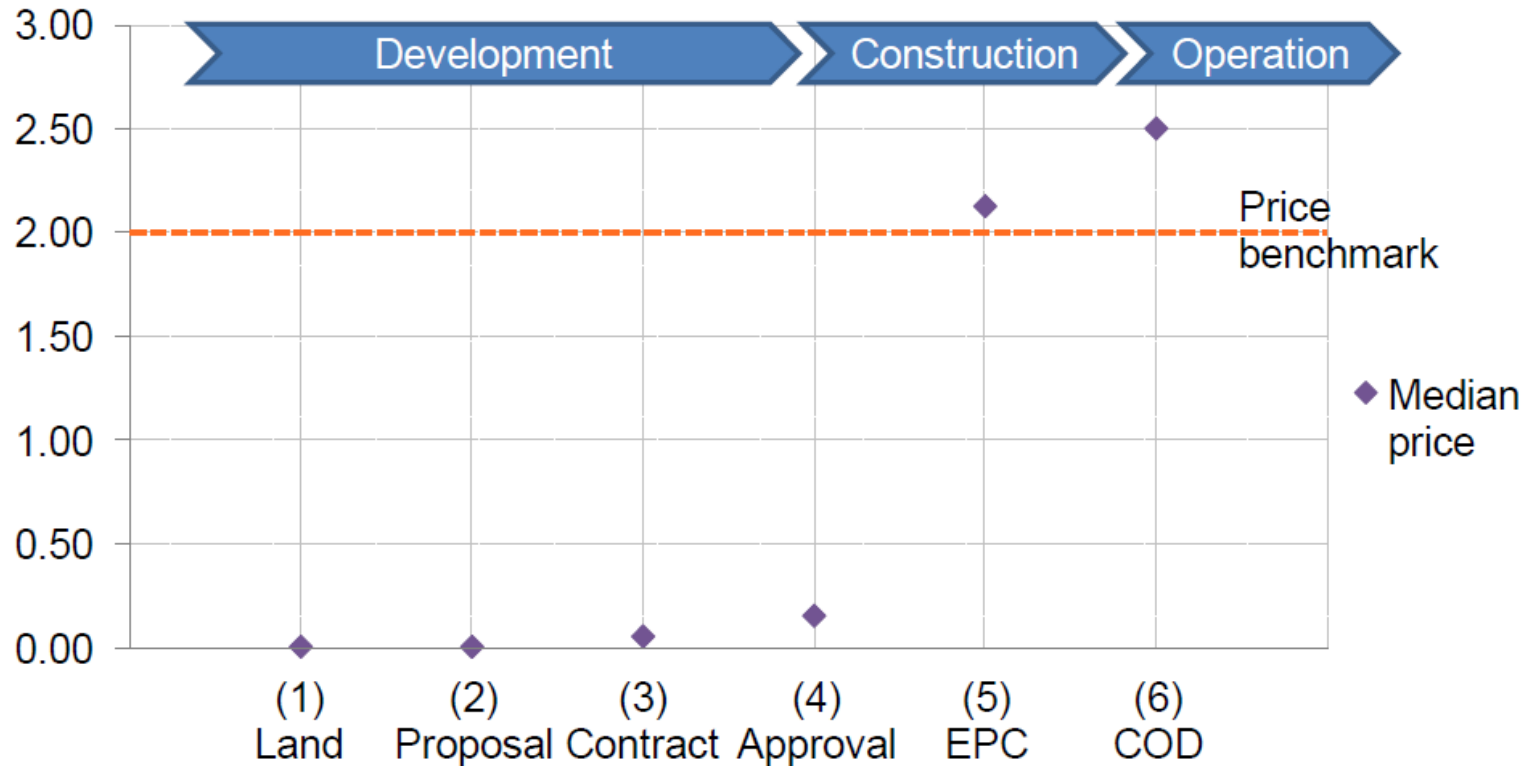
SIX STAGES FOR VALUATION



Note: RAM = Renewable Auction Mechanism. CUP = Conditional Use Permit. GIA = Generation Interconnection Agreement. NTP = Notice to proceed.

Source: Bloomberg New Energy Finance

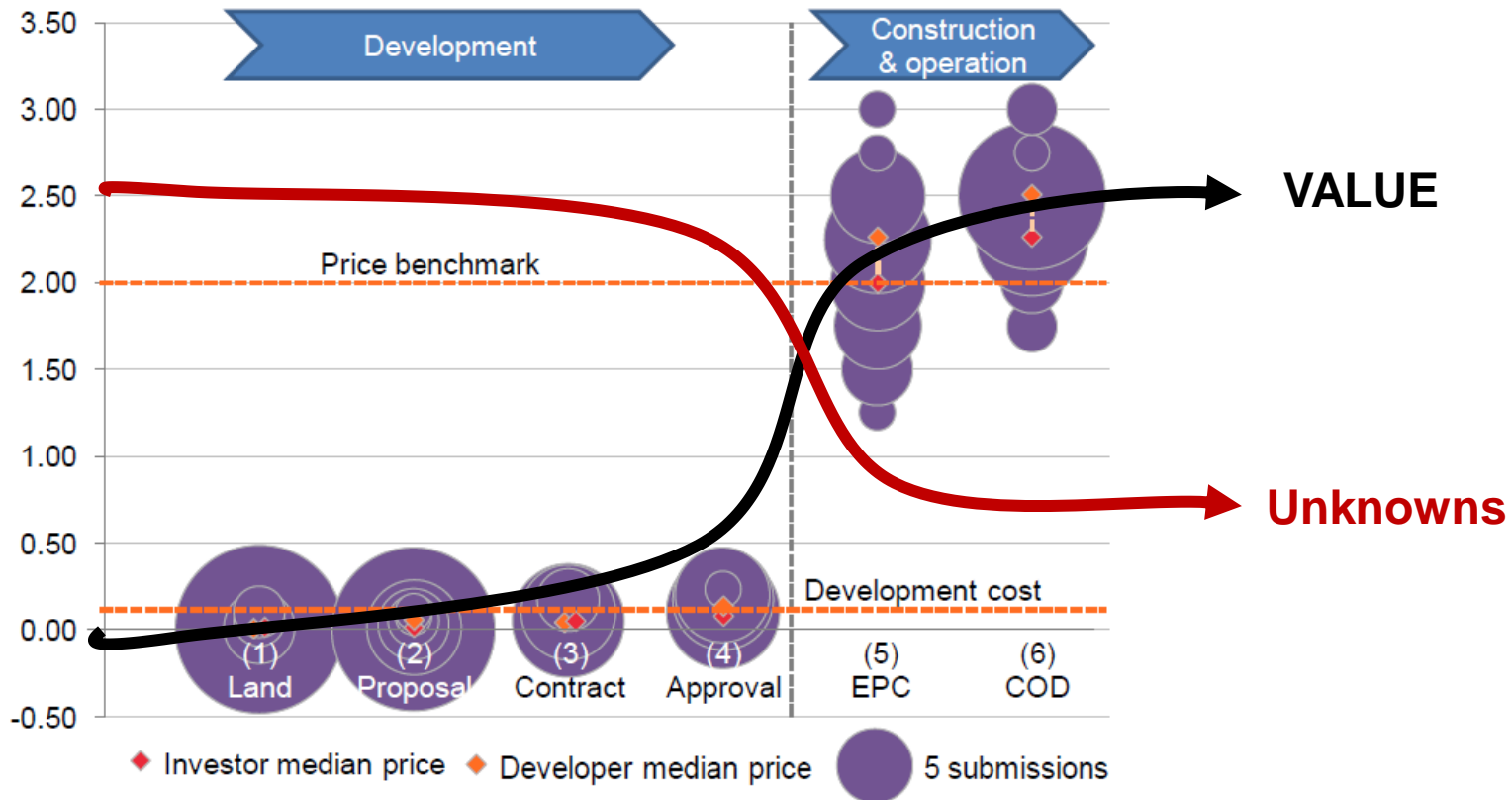
ASSET VALUATION BY PROJECT DEVELOPMENT PHASE (MEDIAN OF SURVEY RESULTS, \$/W)



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

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

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