



**Wind Power  
Business Models:  
Deal Structures and Economics  
Project Financing Overview**

**Mohammed Alam  
Alyra Renewable Energy Finance LLC**

---

**Steve Krebs  
Baker Botts L.L.P.**

**Wind Power Development Tutorial**

**Hotel Derek  
Houston, TX  
November 29, 2007**



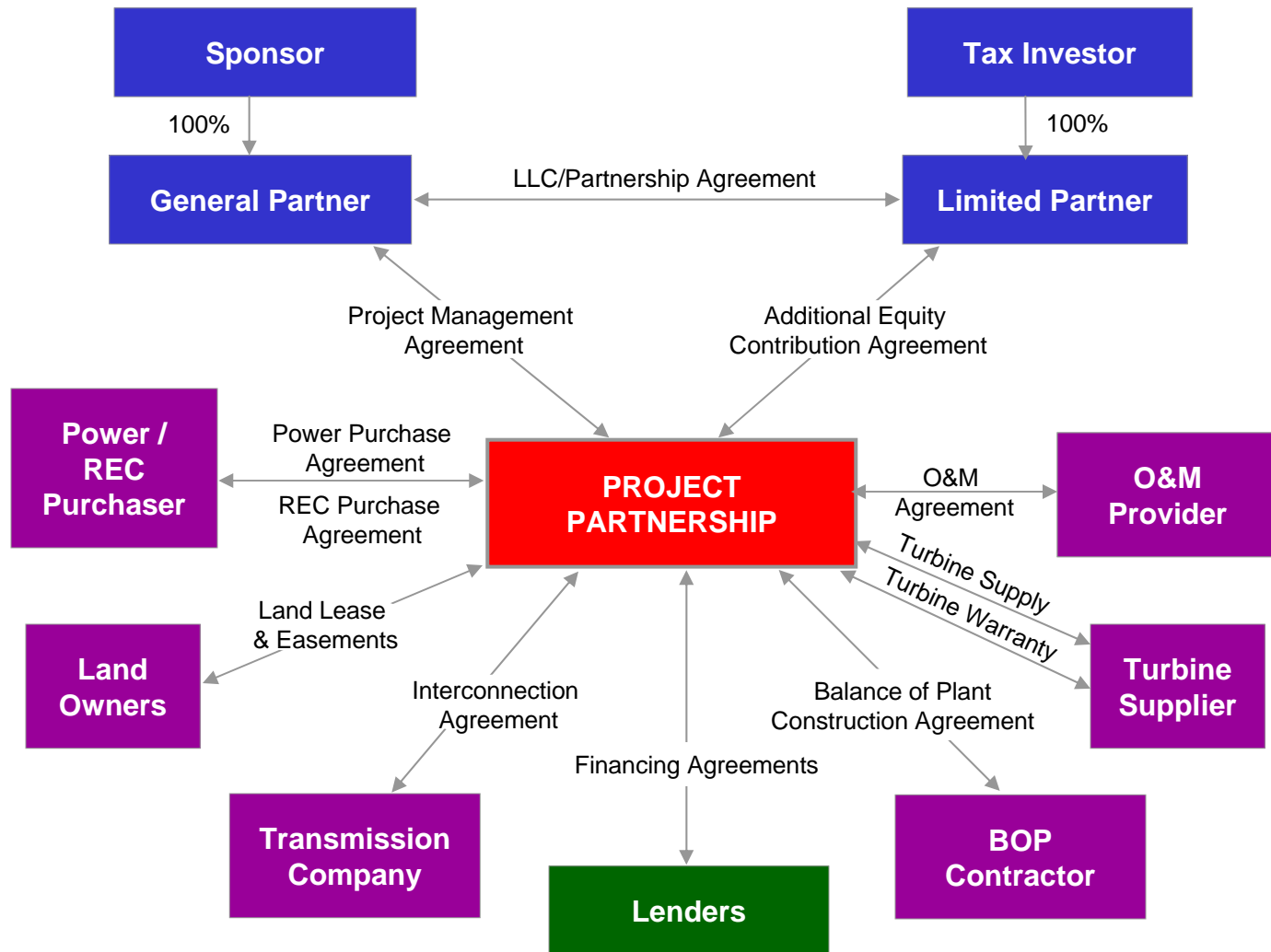
## Agenda

---

- Operating Structures
  - Project Contracts
  - Sources of Wind Power Project Economics
  - Financing Structures
  - Project Risks & Mitigation
  - Questions
- 



# Operating Structure of a Typical Wind Project



## Project Contracts

- Partnership/Limited Liability Company Agreement
  - Special Purpose Entity
  - Management Rights
  - Cash Flow/Tax Attribute Allocation
  - Limited Liability
  - Segment Cash Flows
  - Maximize Incentives
- Additional Equity Contribution Agreement
  - Capital Contributions
  - PTC Monetization
- Power Purchase Agreement
  - Sale of Energy, Environmental Attributes
  - Access to Projects' Capacity
  - Credit Support



## Project Contracts (cont'd)

- Construction Contracts
  - Turbine Supply
  - Balance of Plant
- Land/Lease/Easement
  - Control of Site
- Operating Agreements
  - Turbine Warranty
  - O&M Agreement
  - Project Administration Agreement
- Access to Grid - Interconnection Agreement
- Credit Agreement/LLC Agreement/Security Documents
  - Financing/Conditions/Covenants/Representations
  - Security Agreement, Collateral, Cash Flow Waterfall
  - Consents of Project Contract Counterparties

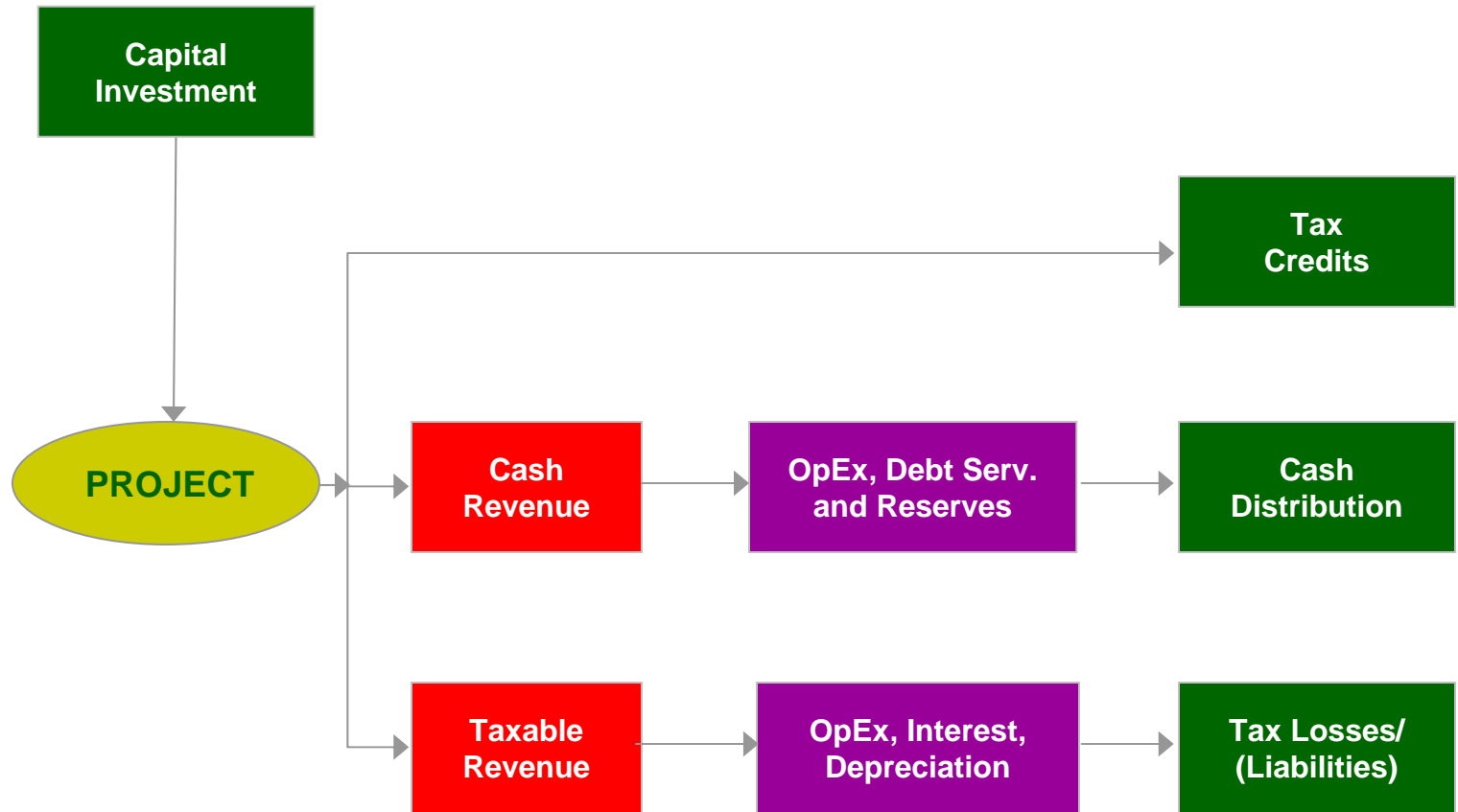


## Sources of Cash and Tax Benefits

- Project Revenue
  - Energy Sales
  - REC Sales
  - GHG
- Federal Tax Credits
  - PTC
- Accelerated Tax Depreciation
  - MACRS
- State Incentives
  - Sales and Property Tax Abatements
  - Production Based Incentives
  - Other Incentives



# Wind Power Project Economics



## Federal Tax Credits – by Technology

TECHNOLOGY	PTC*	ITC	DEPRECIATION
Wind	10 yrs \$0.020/kWh	No	5 year MACRS
Closed-Loop Biomass	10 yrs \$0.020/kWh	No	5 year MACRS
Open-Loop Biomass	10 yrs \$0.010/kWh	No	5 year MACRS
Geothermal	10 yrs \$0.020/kWh **	10%**	5 year MACRS to, but not including transmission; rest 20 year MACRS
Solar	No	30% to end of 2008 10% thereafter**	5 year MACRS
Small Irrigation Power	10 yrs \$0.010/kWh	No	20 years MACRS
Municipal Solid Waste	10 yrs \$0.010/kWh	No	7 year MACRS
Qualified Hydropower	10 yrs \$0.010/kWh	No	20 years MACRS
Qualified Fuel Cell	No	10% (not greater than \$500 per Kw of capacity to end of 2008)	7 year MACRS
Qualified Microturbine	No	10% (not greater than \$200 per Kw of capacity to end of 2008)	15 year MACRS

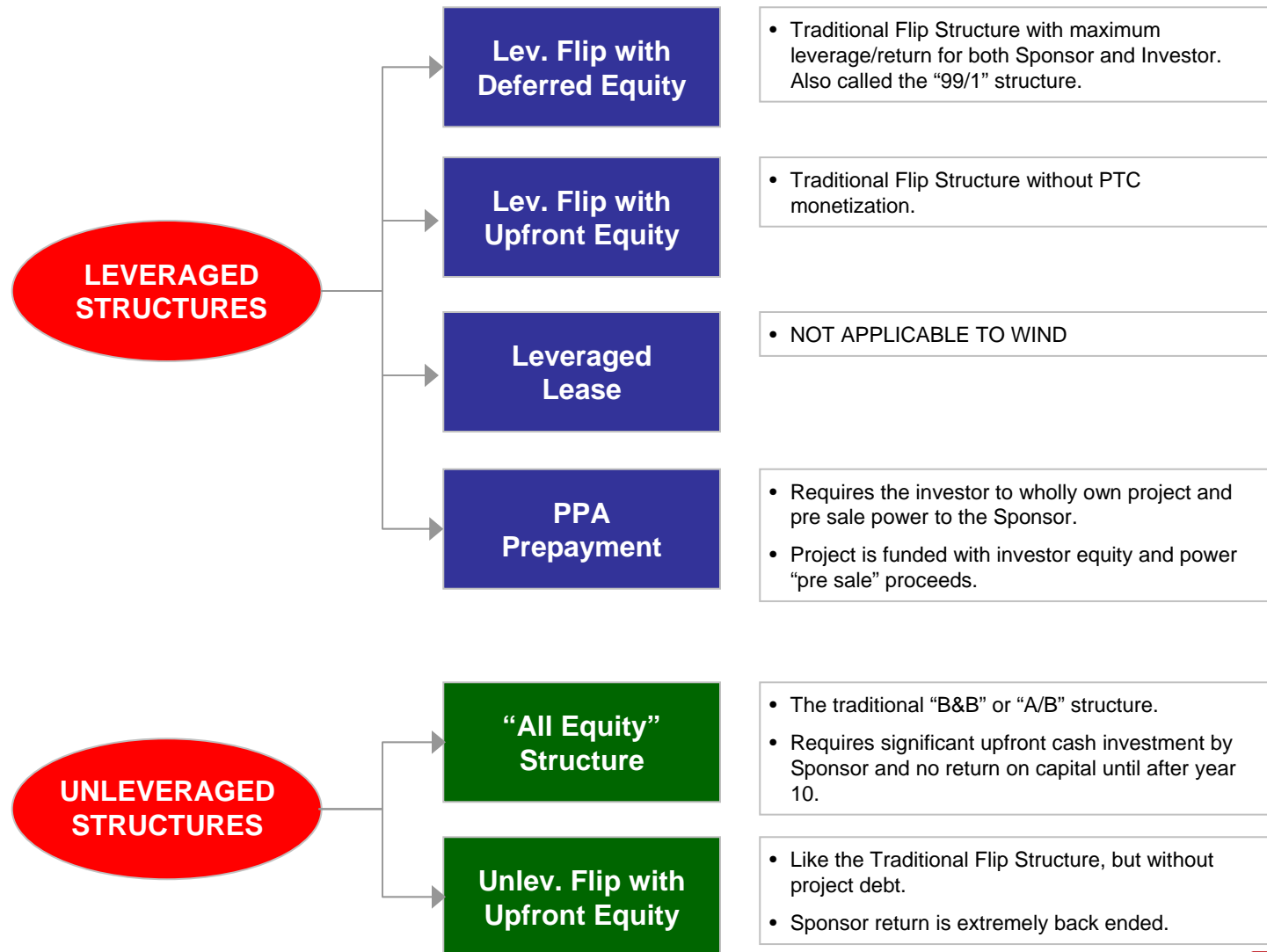
\* PTC subject to annual inflation adjustment, using the GDP deflator, and round up to the first decimal

\*\* Cannot take both PTC and ITC

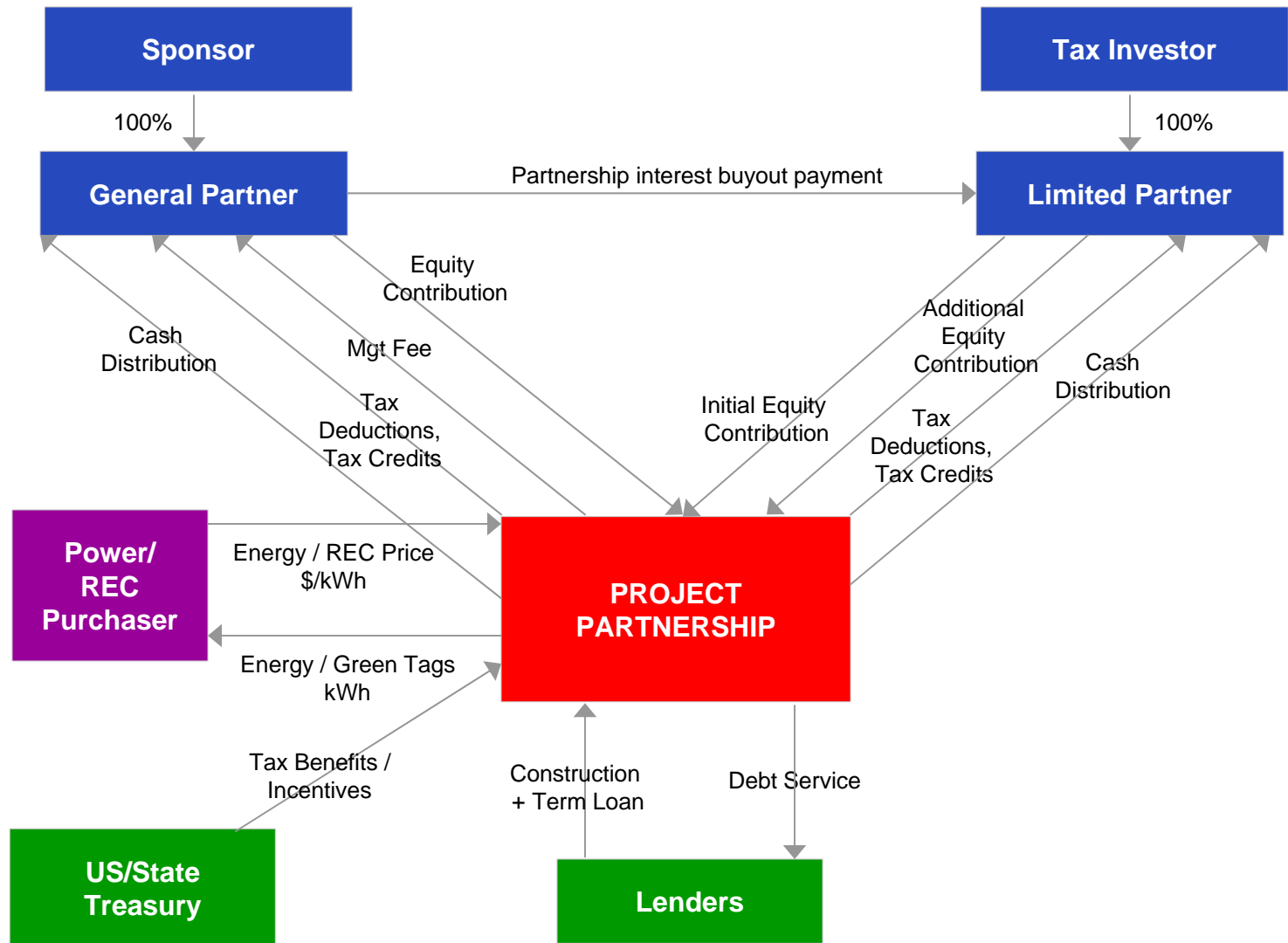




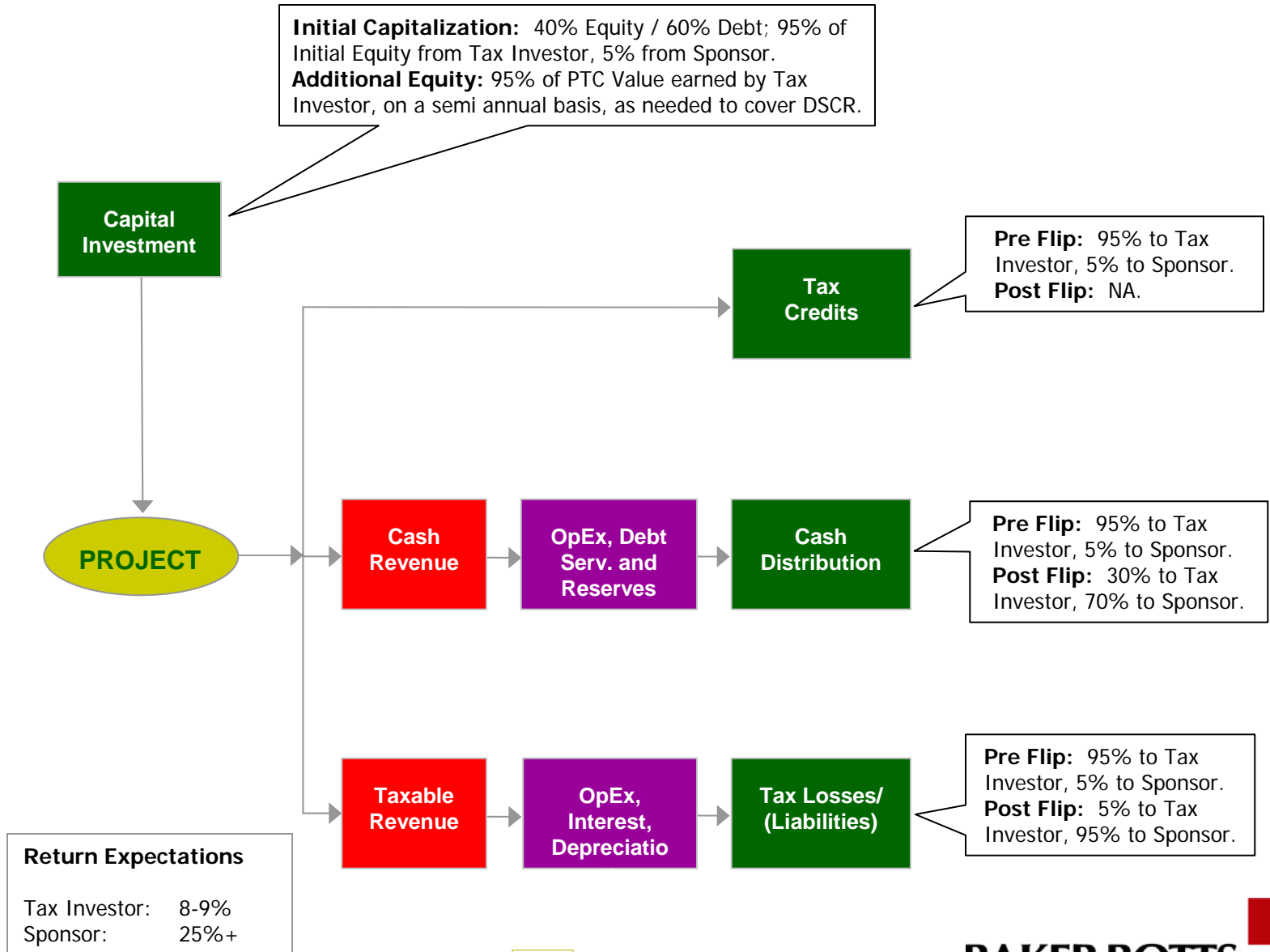
# Wind Power Financing Structure Alternatives



# Financing/Ownership – Flow of Funds



# Leveraged Flip with Deferred Equity (PAYGo)



## Leveraged Flip Structure Example – Wind

- Project is funded by a combination of debt and equity
  - 60% Project Finance Debt
  - 40% Equity
    - 95% of equity from Tax Investor
    - 5% of equity from Sponsor
- Tax Investor also agrees to contribute additional equity semiannually, according to the value of PTCs earned in that period (PAYGo).
- Debt is secured/repaid by project revenue and the semiannual additional equity contributions.
- For the first 10 years (or until the Tax Investor reaches its target IRR), 95% of the cash and tax benefits are allocated to the Tax Investor.
- After that, the allocation reverses and majority of cash and tax benefits are allocated to the Sponsor (the Flip).
- At the point when the Flip occurs, Sponsor has right to buy out Tax Investor at fair market value of the Tax Investor's expected cash flow.
- Sponsor receives a development fee at financial closing and a management fee annually.



## Leveraged Flip Structure Example - Wind

### General Assumptions

Technology	Wind
Project Size	100.5 MW
Capacity Factor	37%
Project Cost	\$189 mill \$1900/kW
Development Fee	\$9 million
Annual Mgt. Fee	\$120 K
PPA Price (inflated 2%)	\$50/mWh
EBITDA (Year 1) \$MM	\$13 mill
Flip Occurs	Year 10

### Allocations

	Pre Flip		Post Flip	
	Inc./Loss	Cash	Inc./Loss	Cash
Sponsor	5.0%	5.0%	95.0%	70.0%
Tax Investor	95.0%	95.0%	5.0%	30.0%

### Project Capitalization

	\$ MM	%
Debt	\$ 115.5	61.0%
Initial Equity	\$ 73.8	39.0%
Tax Investor Equity	\$ 70.1	37.1%
Sponsor Equity	\$ 3.7	2.0%

### Debt Terms

Tenor	16 Years, with 9 year avg. life
Pricing	7.5% average
DSCR	1.4x minimum / 1.5x average
DSR Reserve	\$8 million (6 Month DS)

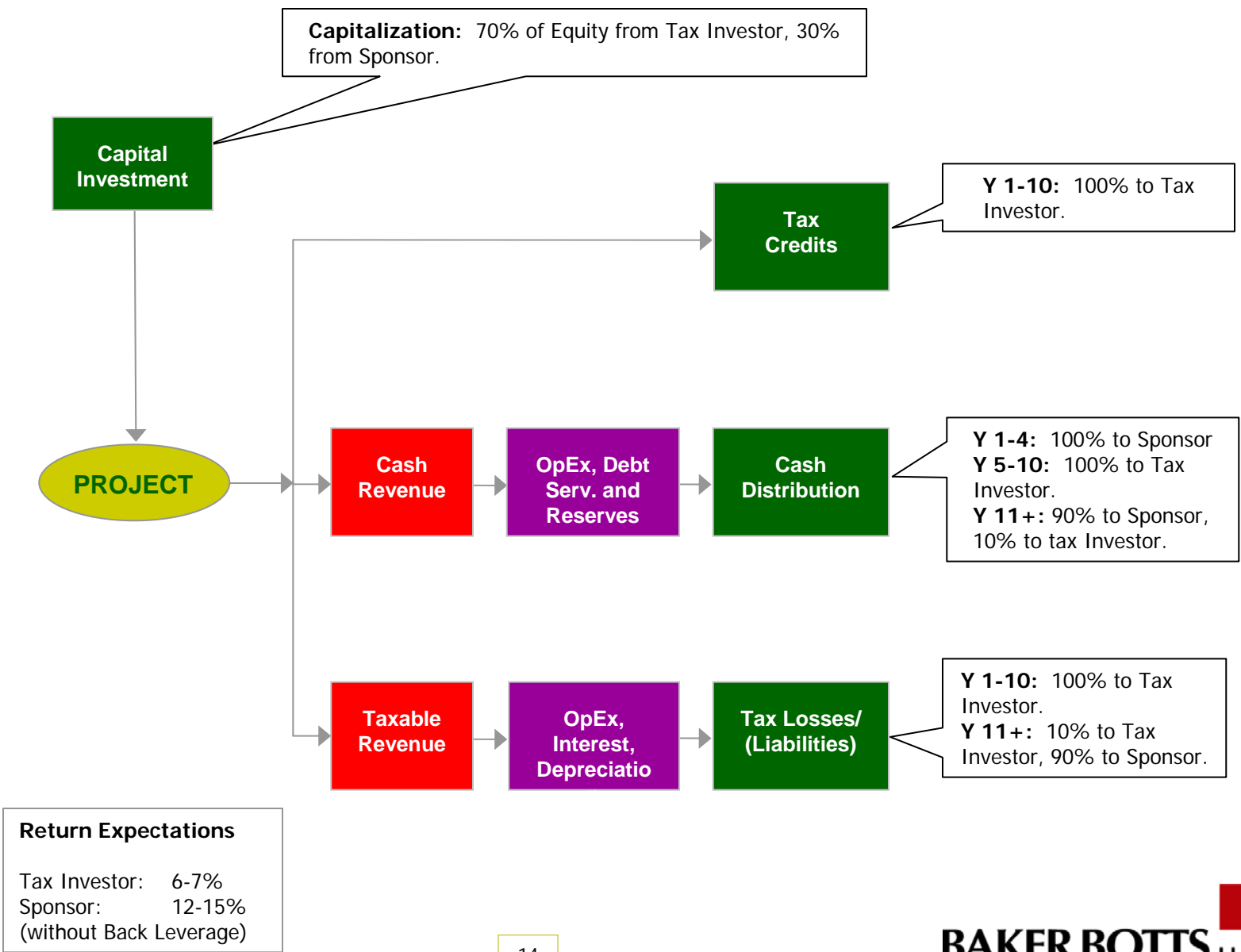
### Equity Returns

	10 Year	20 Year
Tax Investor	9.5%	10.0%
Sponsor*	30.0%	35.0%

\*Excluding Fees; Assuming full utilization of tax benefits allocated



# "All Equity" Structure



## All Equity Structure Example - Wind

- Project is fully funded by equity
  - 70% Tax Investor equity
  - 30% Sponsor equity
- 100% of the project cash is distributed to the Sponsor in the first 4-5 years (geared just to return all cash invested by Sponsor).
- After that, 100% of the project cash is distributed to the Tax Investor until year 10 or until Tax Investor reaches its target IRR.
- During the first 10 years or until Tax Investor reaches its target IRR, 100% of tax benefits are allocated to the Tax Investor.
- After the Tax Investor reaches its target IRR, the allocation reverses and majority of cash and tax benefits are allocated to the Sponsor (the Second Flip).
- At the point when the Second Flip occurs, Sponsor has right to buy out Tax Investor at fair market value of the Tax Investor's expected cash flow.
- Sponsor receives a development fee at financial closing and a management fee annually.



## All Equity Structure Example - Wind

### General Assumptions

Technology	Wind
Project Size	100.5 MW
Capacity Factor	37%
Project Cost	\$180 mill <i>\$1800/kW</i>
Development Fee	\$9 million
Annual Mgt. Fee	\$120 K
PPA Price (inflated 2%)	\$58/mWh
EBITDA (Year 1)	\$16 mill
Flip Occurs	Year 5 and 10

### Project Capitalization

	\$ MM	%
Tax Investor Equity	\$ 122.1	67.8%
Sponsor Equity	\$ 58.0	32.2%

### Equity Returns

	10 Year	20 Year
Tax Investor	6.75%	7.0%
Sponsor*	0.0%	12.0%

### Allocations

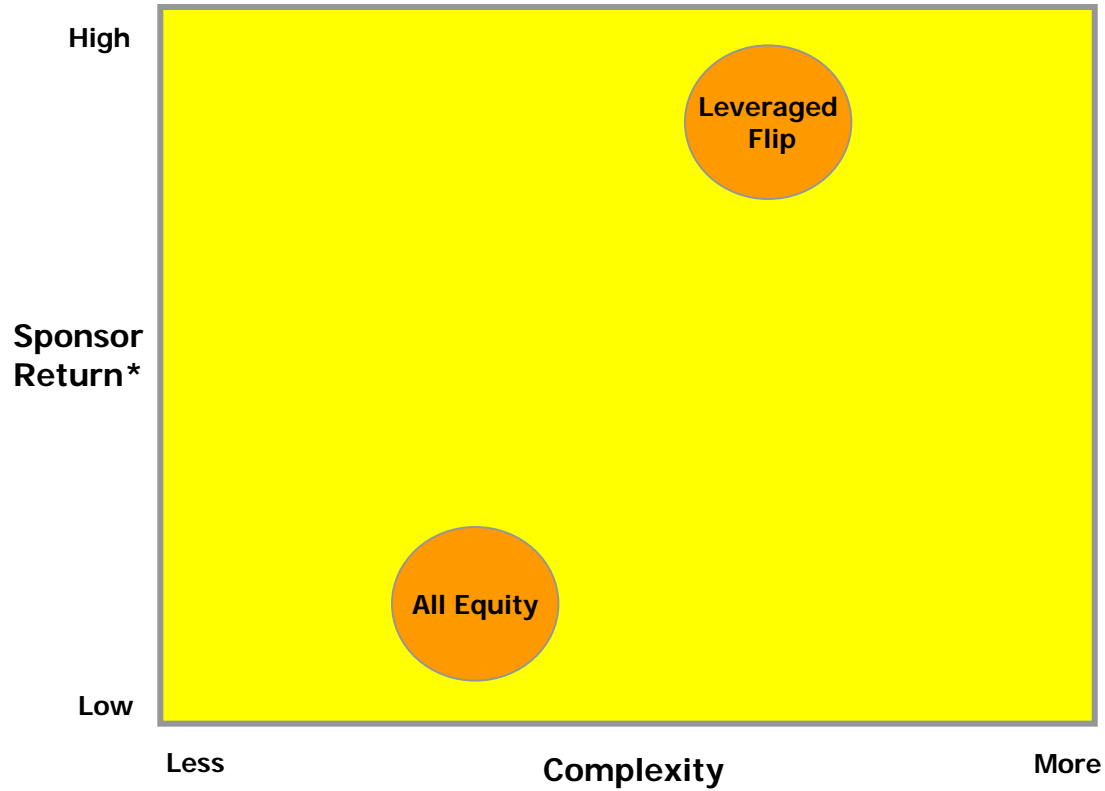
	Year 1-4		Year 5-10		Year 11-20	
	<i>Inc./Loss</i>	<i>Cash</i>	<i>Inc./Loss</i>	<i>Cash</i>	<i>Inc./Loss</i>	<i>Cash</i>
Sponsor	0%	100%	0%	0%	95%	95%
Tax Investor	100%	0%	100%	100%	5%	5%

\*Excluding Fees





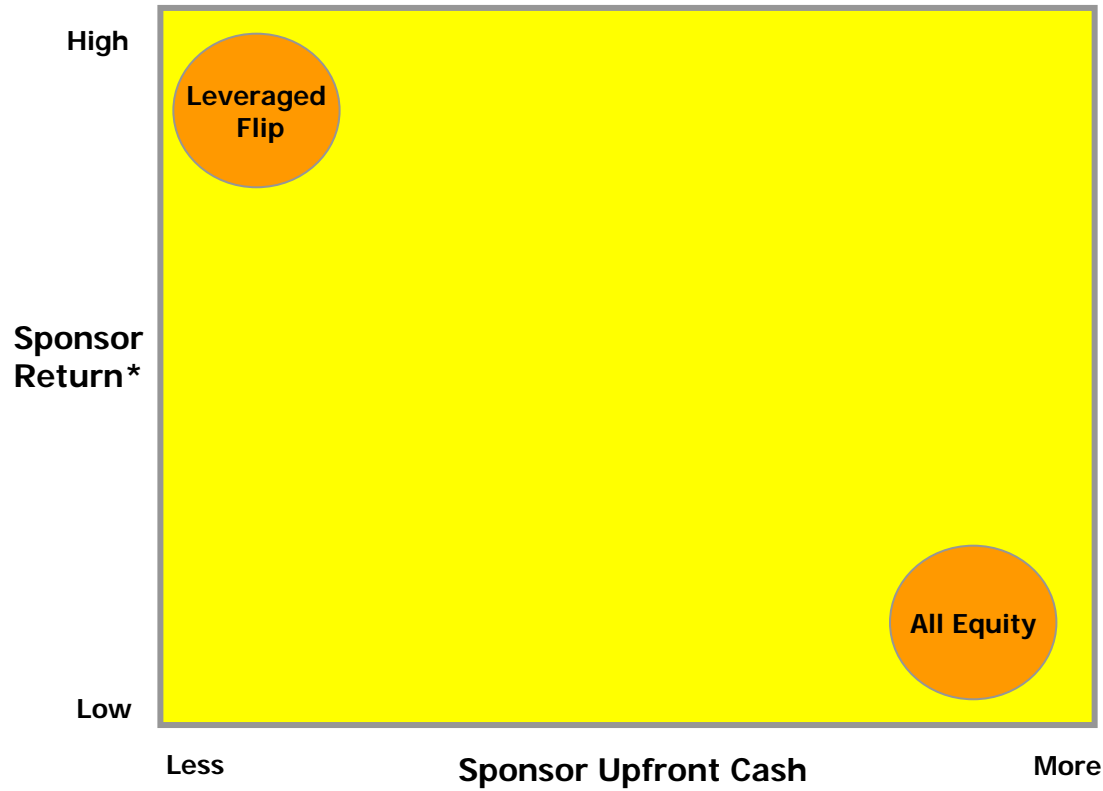
# Financing Structure Alternatives – Pros and Cons



\* After accounting for financing costs, fees



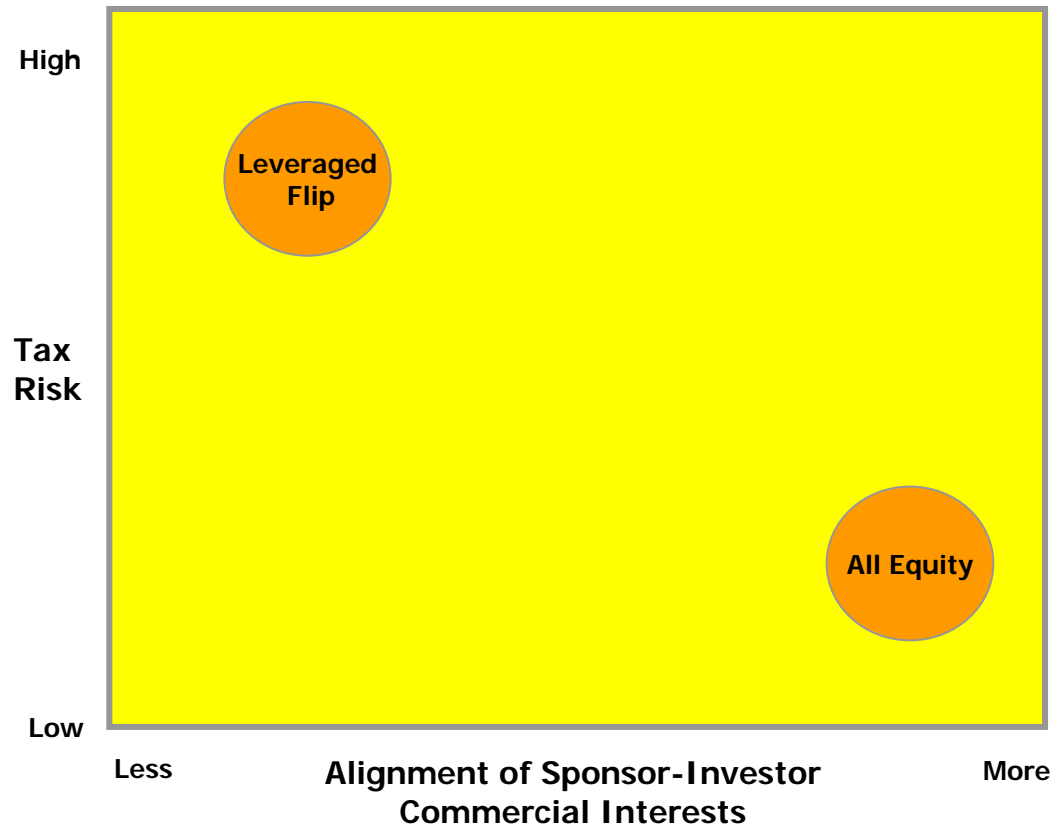
# Financing Structure Alternatives – Pros and Cons



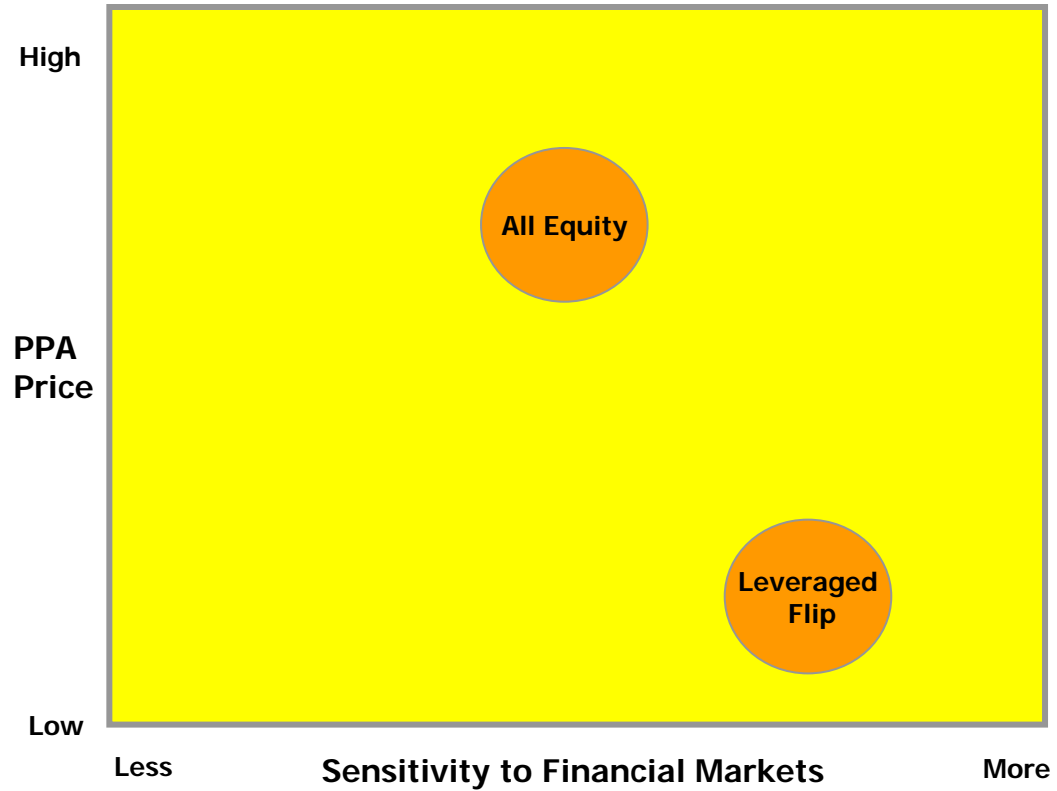
\* After accounting for financing costs, fees



## Financing Structure Alternatives – Pros and Cons



## Financing Structure Alternatives – Pros and Cons



## Principal Risks and Mitigants

### Funding Follows Quality Cash Flow

- Lenders & Investors seek quality cash flows.
- Quality cash flows produce stable margins, robust debt service coverages and leverage.
- Stable cash flows produced by appropriate structuring, risk identification and allocation.
- Due diligence and contractual structuring facilitate appropriate risk allocation.



## Risk Identification & Allocation

- Lenders look for stable cash flows. Identify risks by asking how could the project fail?
  - Completion
  - Operating
  - Technology
  - Revenue
  - Tax & Political Risks
  - Change of Law
- This list is not nearly exclusive
- Seek to reduce collective risk of the structure
- Efficient structuring allocates risk to best able to bear or control



## Completion Risk

Risk project is not completed on time, on budget and capable of operating as expected.

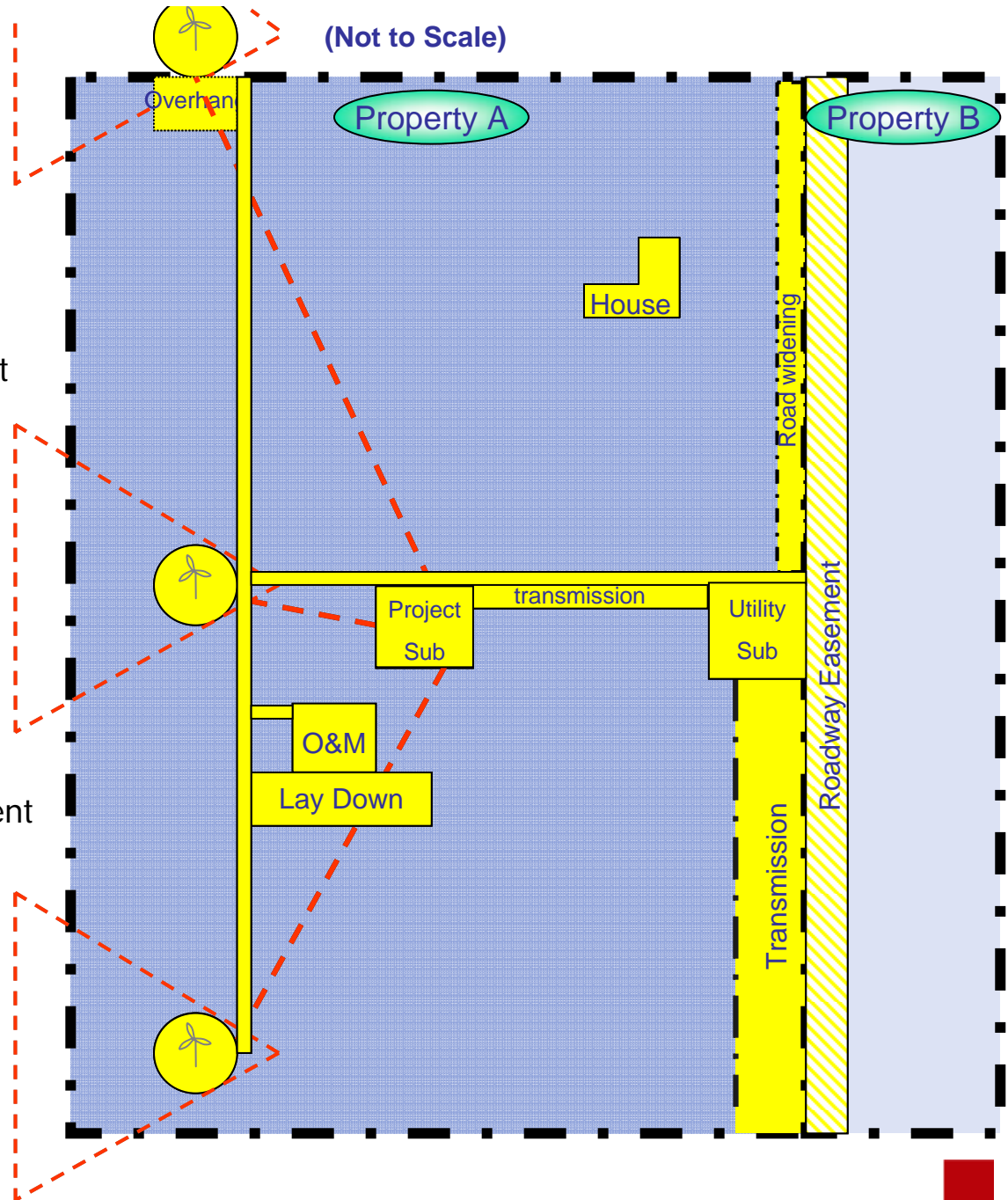
- Traditional Completion Risk Mitigants
  - Site Control
  - Turnkey Contracts
    - Proven creditworthy contractor
    - Fixed cost, date certain and scope
    - Liquidated damages
    - Performance bonds/retainage
  - Proven Technology and Designs
  - Due Diligence
  - Insurance
  - Contingency Amounts



## Site Control

### ■ Elements

- Wind turbine area
- Wind area easement
- Overhang/Setback
- Project substation
- Collection
- Construction
- Utility substation
- O&M building
- Road access
- "Piggyback" easement
- Road widening
- Transmission
- Effects





## Periods During the Lease Term

- Option or Development Period
  - in context of lease or separate option
- Construction Period
  - triggered by commencement of construction of wind turbines
- Base Period
  - triggered by commercial production of electricity; main period of commercial operations
- Extensions
  - may be applicable to different portions of the term



## Compensation During Various Periods

- Option and Development Periods
  - fixed sums per acre per year (with possibly a minimum total amount), payable monthly or annually
  - net tower fee (per tower per year)
  - extra one-time fee for extension exercise
- Construction Period
  - one-time installation fee per MW
    - payable in one or two installments
    - no payment on re-powering
- Base Term
  - production payments
    - based on MW production (prorated based on project)
  - royalty/minimum royalty
    - based on percentage of "gross revenues" (prorated based on MW's on premises vs. project)
    - percentage may increase with time
    - "gross revenues" typically include electricity sales revenue, REC payments and typically exclude tax credits, proceeds from sale of the project
    - may include minimum royalty floor (i.e., fixed amount per MW per year)



## Wind Project Completion Risk Issues

- Site control
- Permits
  - Possible Delay - NIMBY
  - Environmental and Regulatory
- No wraps for wind projects
  - TSA/BOP Installation
- Suppliers strike back
  - Availability & Cost
  - Down Payments
  - Delivery Flexibility
  - Warranties



## Wind Project Completion Risk Issues (cont'd)

- Tightly crafted Supply & Installation
  - Proven contractor and design
  - Fixed cost/scope/schedule
  - Liquidated damages - cover loss revenues/debt service/PTCs?
  - Credit issues with contractors performance bonds/retainage/LOCs/guarantees
- Liability caps
- Warranty terms significantly affecting the bottom line
- Qualifying for PTC and other Incentives
- Interconnection upgrades



## Investor Completion Risk Mitigants

- Independent Engineers
- Sponsor guarantors
- Government guarantors
- Funded reserves or security and budget contingencies to fund cost overruns and completion costs
- Sufficient equity and contingent equity
- Completion tests that demonstrate physical, legal, financial, operational completion
- Legal Opinions



## Operating Risk

The risk that the project, once complete, will not perform as expected.  
Mitigated by:

- experienced, creditworthy operator
- safety, security and environmental safeguards
- permits
- perform PPA and interconnection agreements
- incentives for good performance
- O&M reserves
- insurance
- equipment & service warranties
  - Link to PPA capacity & performance standards to supplier warranties



## Revenue Risk

- The risk that the project will not have adequate cash for debt service, costs and return to sponsors.
  - Resource
    - Wind Resource
    - Technology
    - Market and Engineer Studies
    - Interconnection Studies
  - PPA/Firm Offtake - Term
    - As available, must take
    - Energy Only, usually RECs
    - Pricing fixed (with escalator) or, less favorable, indexed to gas/power markets
    - Capacity payment rare if not dispatchable
  - PTC - in service by 12/31/08
  - RECs - State, Formative, Uncertain
  - GHG - More Uncertain



## Revenue Risk (cont'd)

- Major Issues
  - Changes in Markets
  - Output Guarantees
  - Credit Support
- Major Issues – Wind
  - Transmission
  - Scheduling
  - Curtailment





## Other Power Purchase Agreement Issues

- Coordinate with other project/financing arrangements
- Completion requirements
- Default, damages for breach and termination
- Force majeure
- Financing
  - Strong offtake yields financing with less equity, more leverage, lower reserves, longer tenor, lower costs, easier distribution conditions.





## Merchant Wind Project Trends

- PPAs bundle Power and RECs, often with low prices
- RECs/GHG attributes may have attractive upside
- Wind has low break even costs versus historical energy prices
- Major Issues - Merchant
  - Not true Merchant as pre-Enron
  - Manage Volatility and Attract Financing
  - For Hedging/Synthetic PPAs
    - Wind Resource Characteristics
    - Liquid Spot Market - Day ahead/Hour ahead
    - Historical Price Data
    - Transmission Constraints, Low Curtailment Risk
    - Low Imbalance Penalties
    - Long Settlement/Mitigating Structures
  - Some Issues
    - Project left with more Operational/Scheduling Risk
    - Regulatory Risk - REC/Market Structure Change
    - Credit
    - Intercreditor Issues



## Baker Botts Renewable Energy Practice

- 60+ renewable projects – wind, biomass and solar projects
- M&A include 's sale to , 's sale to  ,  
 sale to  BABCOCK & BROWN , 's investment in  
 ,  ENERGY SPECTRUM CAPITAL as seller in 's  IPO
-  in \$263MM financing –  2006 Renewable Deal of Year
-  ,  , and  in project development
-  ,  Direct Energy , and  in tax equity deals
- Counsel to  IPO and sale to 
-  in solar deals
- Members –  (Legislative & Transmission Committee), 
- Experience in all aspects – PPAs, turbine supply and warranty, Portfolio finance, tax equity, site control, PTCs, RECs, interconnection, state and local tax, incentive monetization, JV structuring, BOPs, permitting, tax, environmental, O&M and IP
- Over 35 lawyers with renewable experience; 750 attorneys worldwide with full service and international capabilities
- Top 3 law firms worldwide for service to energy industry



AUSTIN  
DALLAS  
DUBAI  
HONG KONG  
HOUSTON  
LONDON  
MOSCOW  
NEW YORK  
RIYADH  
WASHINGTON



©2007 Baker Botts LLP

## Renewable Energy Projects Require **DEEPER INNOVATION.**

As one of the top legal firms in the energy sector, Baker Botts has a deep record of achievement in renewable energy. Our innovative work for Horizon Wind Energy won *Project Finance's* 2006 North America Renewables "Deal of the Year" award. Our experience spans the renewable energy space, including:

- Project counsel in the development of over 35 wind power projects in 13 U.S. states
- Sellers' counsel in the sale of two of the largest wind power development companies in the U.S.
- Developers' counsel in the purchase of over 2,500 MWs of wind turbines
- Borrowers' counsel in wind project and turbine supply financings
- Issuer's counsel in the pending IPO of an ethanol producer
- Counsel to a private equity fund investing in a greenfield biofuels plant

We've used our decades-long experience in and understanding of the energy industry to solve the new and unique issues involved in the development, structuring, siting, financing, operation and purchase and sale of renewable energy projects. Our premier team of transactional and project development and finance lawyers draws upon the firm's complementary practices – in energy regulation, environmental, federal, state and local tax, real estate, bankruptcy, litigation, antitrust, and intellectual property – to address the myriad needs of our wind and renewable energy clients.

**BAKER BOTTS**  **LLP**

*For more details, visit [www.bakerbotts.com](http://www.bakerbotts.com)*  
**DEEPER UNDERSTANDING. BETTER SOLUTIONS.**

*"One of the World's Leading Firms for Business  
in Energy and Natural Resources,"  
2006 Chambers Global*





A firm imbued with a singular focus and rich experience in renewable energy, Alyra provides financial advisory services exclusively to the renewable energy sector. The firm specializes in M&A/cross-border joint ventures and structured tax equity/project finance. Alyra's clients include leading renewable energy companies in North America and Europe, institutional investors, national renewable energy research laboratories and Federal and state energy agencies.

Alyra was founded in January 2004 by Mohammed Alam, following his energy banking career with Fortis Capital Corp., where he led a range of origination, structuring and restructuring of renewable and conventional power transactions. Before Fortis he worked at GE Capital's Capital Markets Group, providing structuring and advisory services to GE's Latin American power and infrastructure transactions. Earlier, he started his finance career at Brown Brothers Harriman, focusing on emerging markets research. Mr. Alam holds a Master's in Public and Private Management degree with a meritorious scholarship from the Yale School of Management and a BS, summa cum laude, from the University of Massachusetts.

**CURRENT MANDATES**

Advisor to buyer regarding a potential wind portfolio acquisition (\$400-500 million)

.....

Advisor to investor regarding a potential investment/strategic joint venture in solar thermal (\$100+ million)

.....

Advisor to investor regarding a potential investment/strategic joint venture in solar PV (\$250+ million)

Recent Completed Transaction:  
Sole Advisor  
to Duke Energy regarding Duke's acquisition of the wind power assets of Tierra Energy (May 2007)



# Thank You

Steve Krebs  
Partner and Head, Renewables Practice  
Baker Botts L.L.P.  
One Shell Plaza  
910 Louisiana  
Houston, TX 77002  
Phone: 713.229.1467  
Fax: 713.229.7767  
*stephen.krebs@bakerbotts.com*  
[www.bakerbotts.com](http://www.bakerbotts.com)

Mohammed Alam  
President  
Alyra Renewable Energy Finance LLC  
56 Main Street  
Suite 207  
Northampton, MA 01060  
Phone: 413.341.3600  
Fax: 413.341.3601  
*mohammedalam@alyra.net*  
[www.alyra.net](http://www.alyra.net)

