

# Renewable Project Business Models: Deal Structures and Economics Project Financing Overview

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Infocast's Renewable Power Project Finance - The Tutorial  
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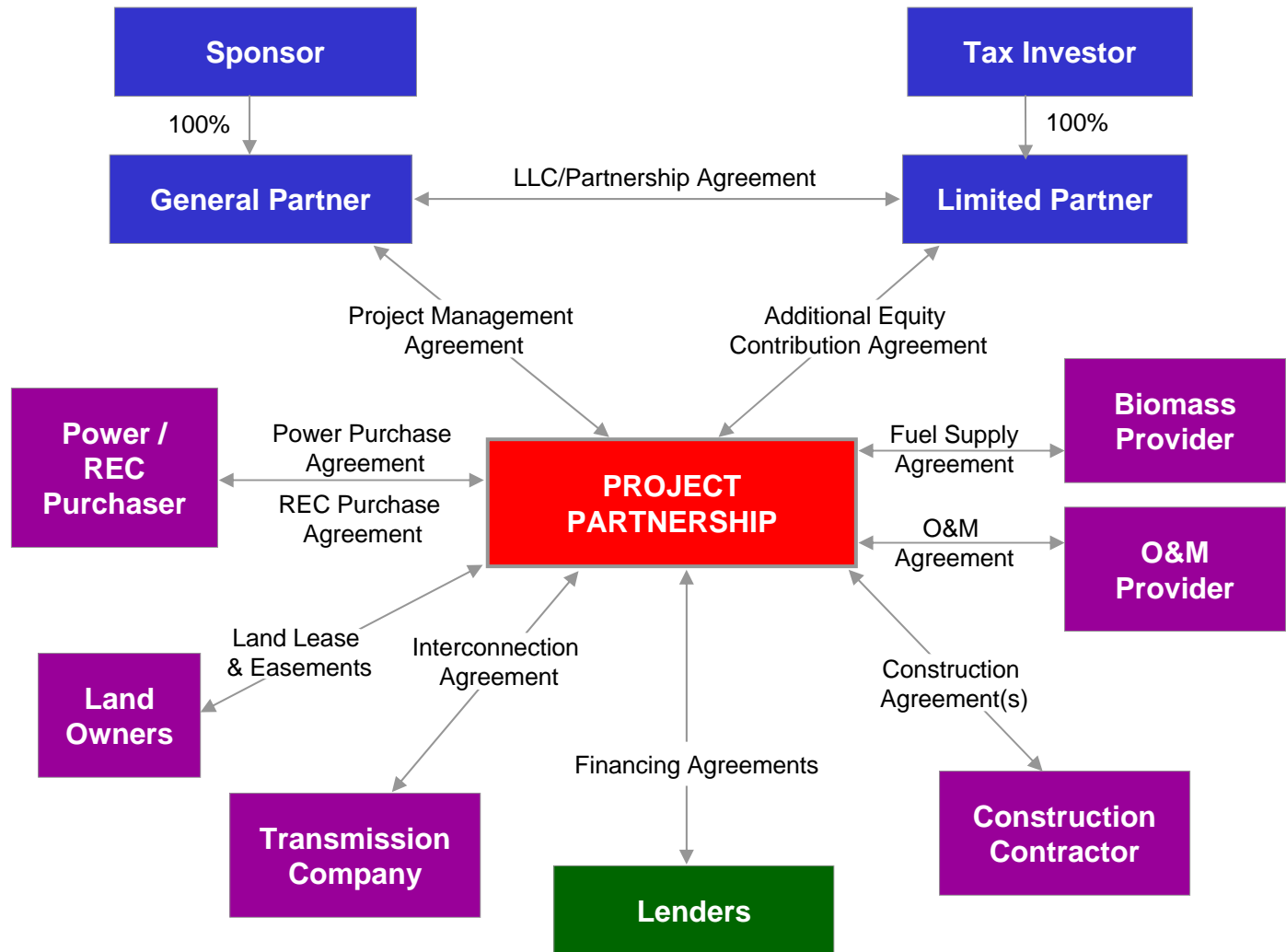
# Agenda

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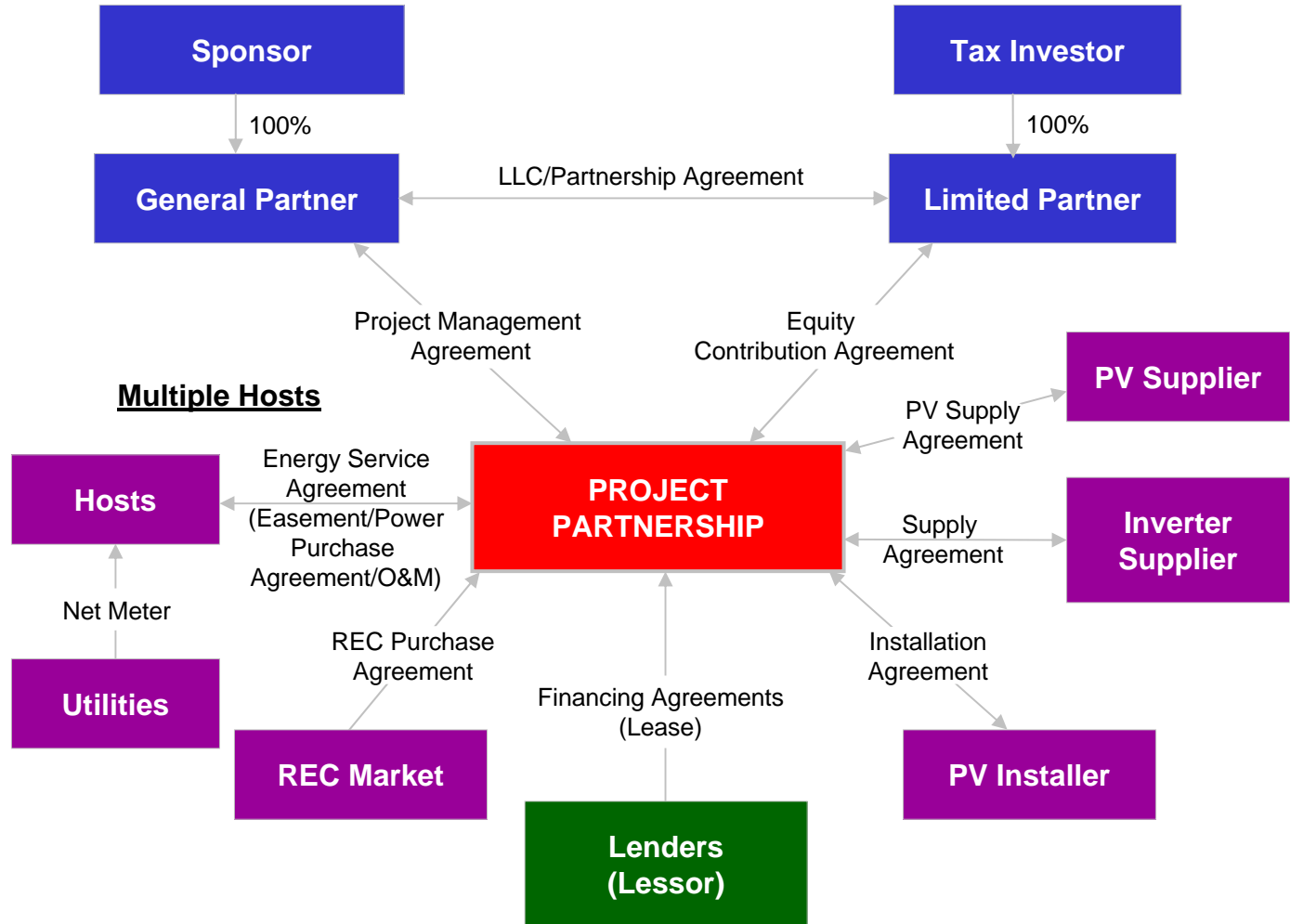
- Operating Structures
  - Project Contracts
  - Sources of Renewable Energy Project Economics
  - Financing Structures
  - Project Risks & Mitigation
  - Questions
- 



# Operating Structure of a Typical Wind/Biomass Project



# Operating Structure of a Typical PV Rooftop Solar 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 (Wind/Biomass)
  - Sale of Energy, Environmental Attributes
  - Access to Projects' Capacity
  - Credit Support



## Project Contracts (cont'd)

- Energy Service Agreement (Solar)
  - Sells Power
  - Access to Site
  - Maintain Equipment
- Construction Contracts
  - Turbine/PV/Inverter Supply
  - Warranty
  - Balance of Plant/Installation
- Land/Lease/Easement
  - Control of Site
- Access to Grid
- Credit Agreement/Lease/Security Documents
  - Financing/Conditions/Covenants/Representations
  - Security Agreement, Collateral, Cash Flow Waterfall
  - Consents of Project Contract Counterparties

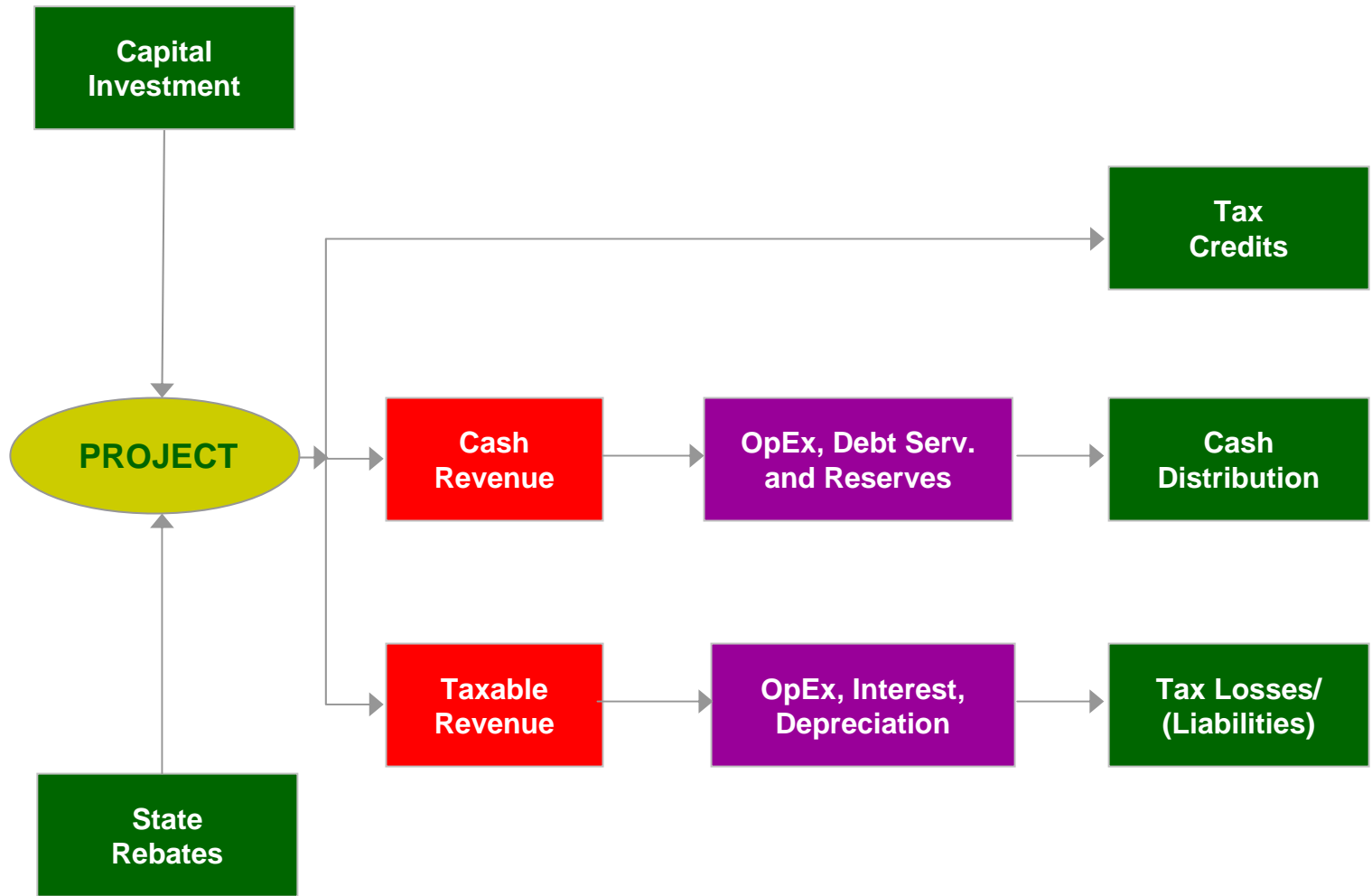


## Sources of Cash and Tax Benefits

- Project Revenue
  - Energy Sales
  - REC Sales
- Federal Tax Credits
  - PTC
  - ITC
- Accelerated Tax Depreciation
  - MACRS
- State Incentives
  - Sales and Property Tax Rebates
  - Capital Cost Rebates
  - Other Incentives



# Renewable Energy Project Economics





## Federal Tax Credits – by Technology

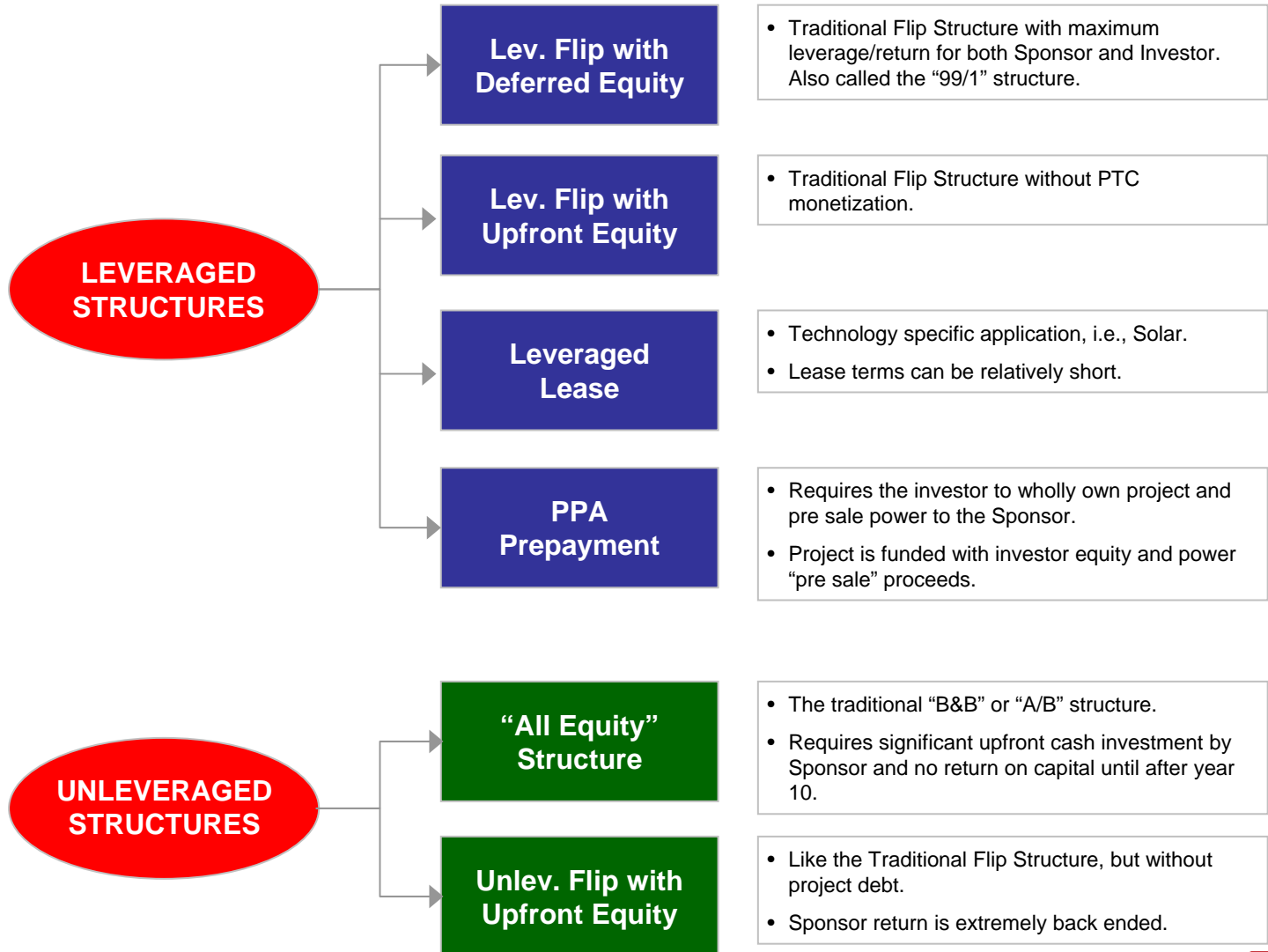
TECHNOLOGY	PTC*	ITC	DEPRECIATION
Wind	10 yrs \$0.020/kWh	No	5 year MACRS
Closed-Loop Biomass	10 yrs \$0.020/kWh	No	5 year MACRS
Open-Loop Biomass	10 yrs \$0.009/kWh	No	5 year MACRS
Geothermal	10 yrs \$0.019/kWh **	10%**	5 year MACRS to, but not including transmission; rest 20 year MACRS
Solar	10 yrs \$0.019/kWh**	30% to end of 2008 10% thereafter**	5 year MACRS
Small Irrigation Power	10 yrs \$0.009/kWh	No	20 years MACRS
Municipal Solid Waste	10 yrs \$0.009/kWh	No	7 year MACRS
Qualified Hydropower	10 yrs \$0.009/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

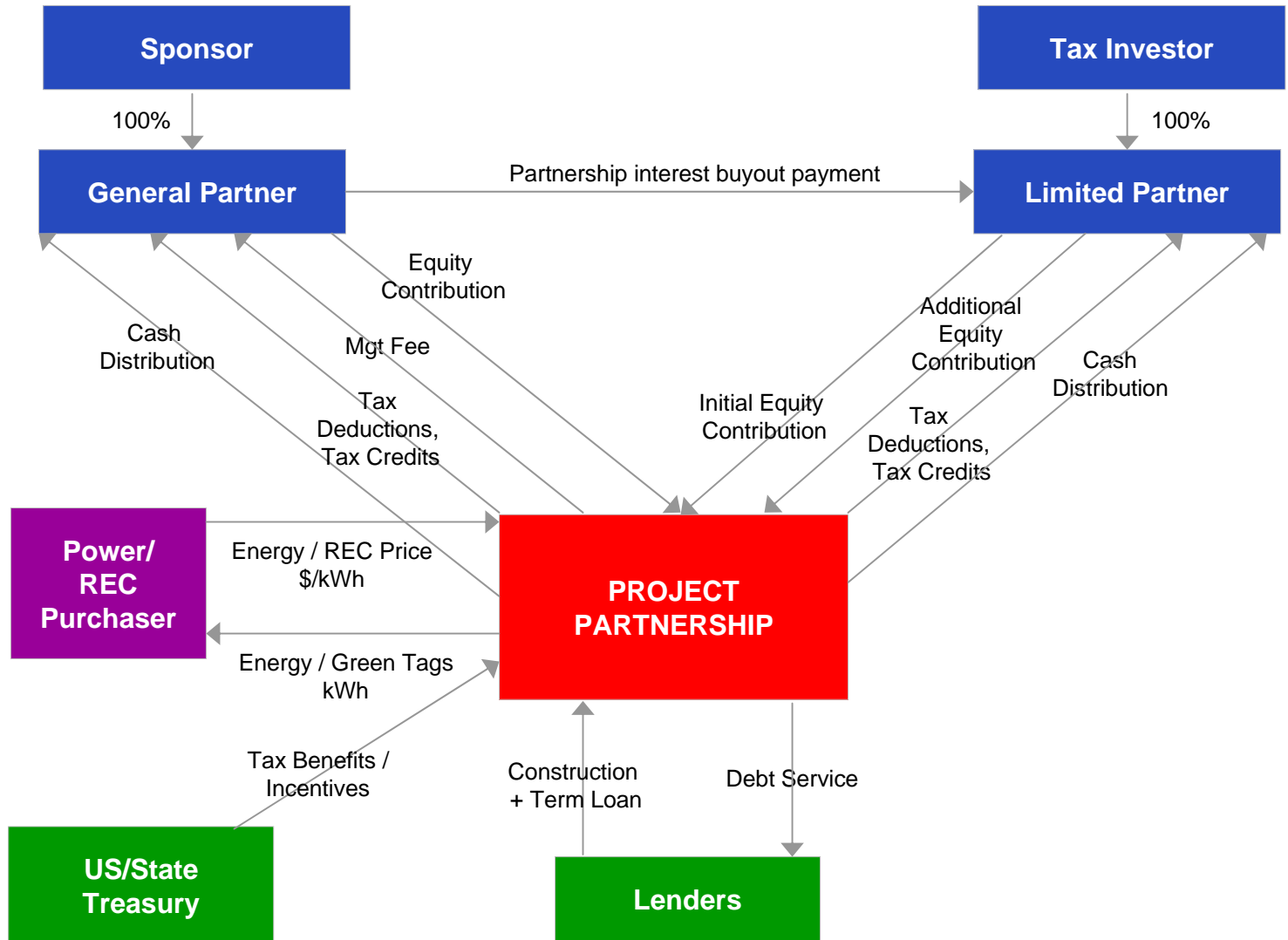
\*\* Cannot take both PTC and ITC



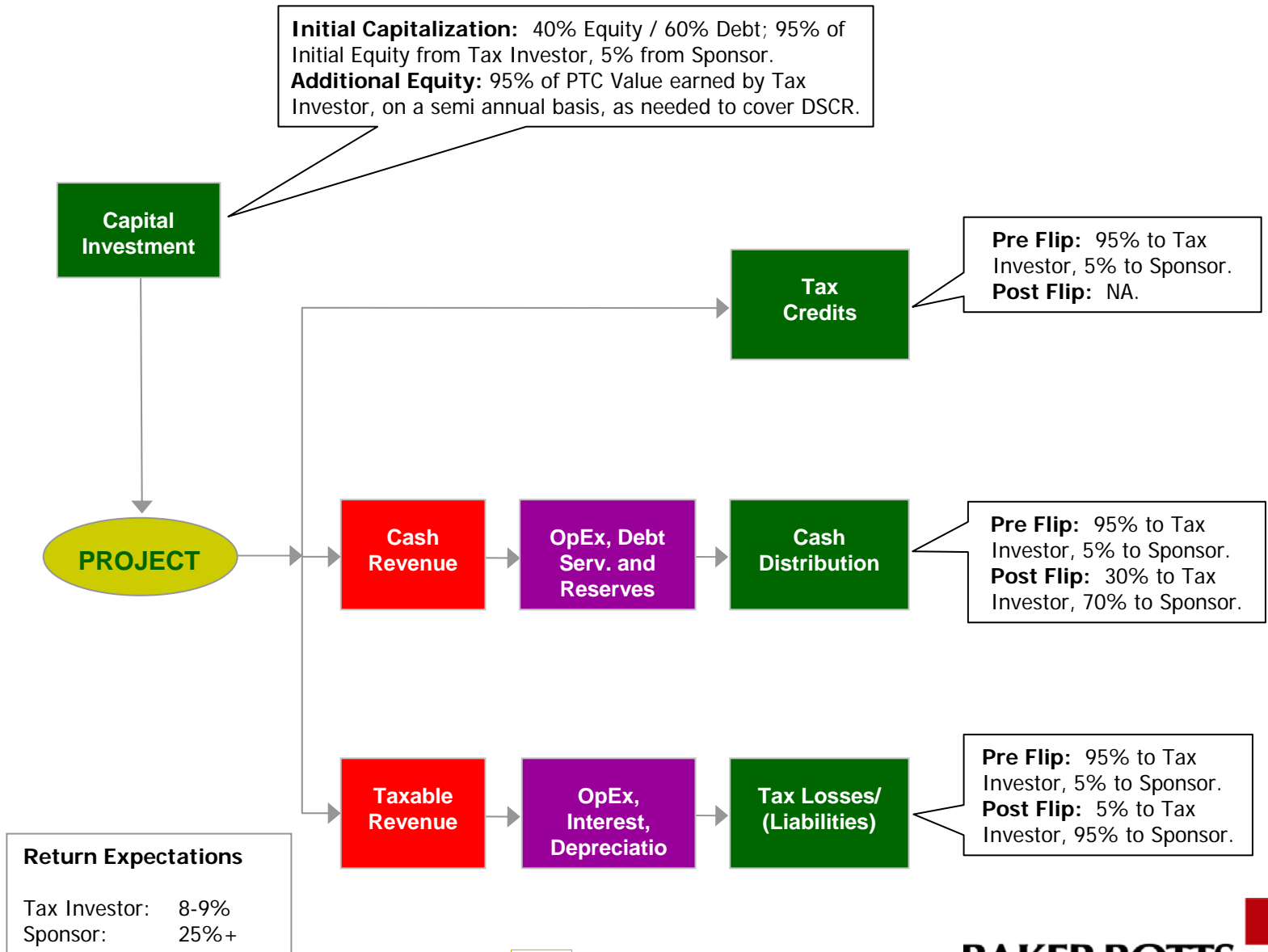
# Renewable Energy Financing Structure Alternatives



# 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)

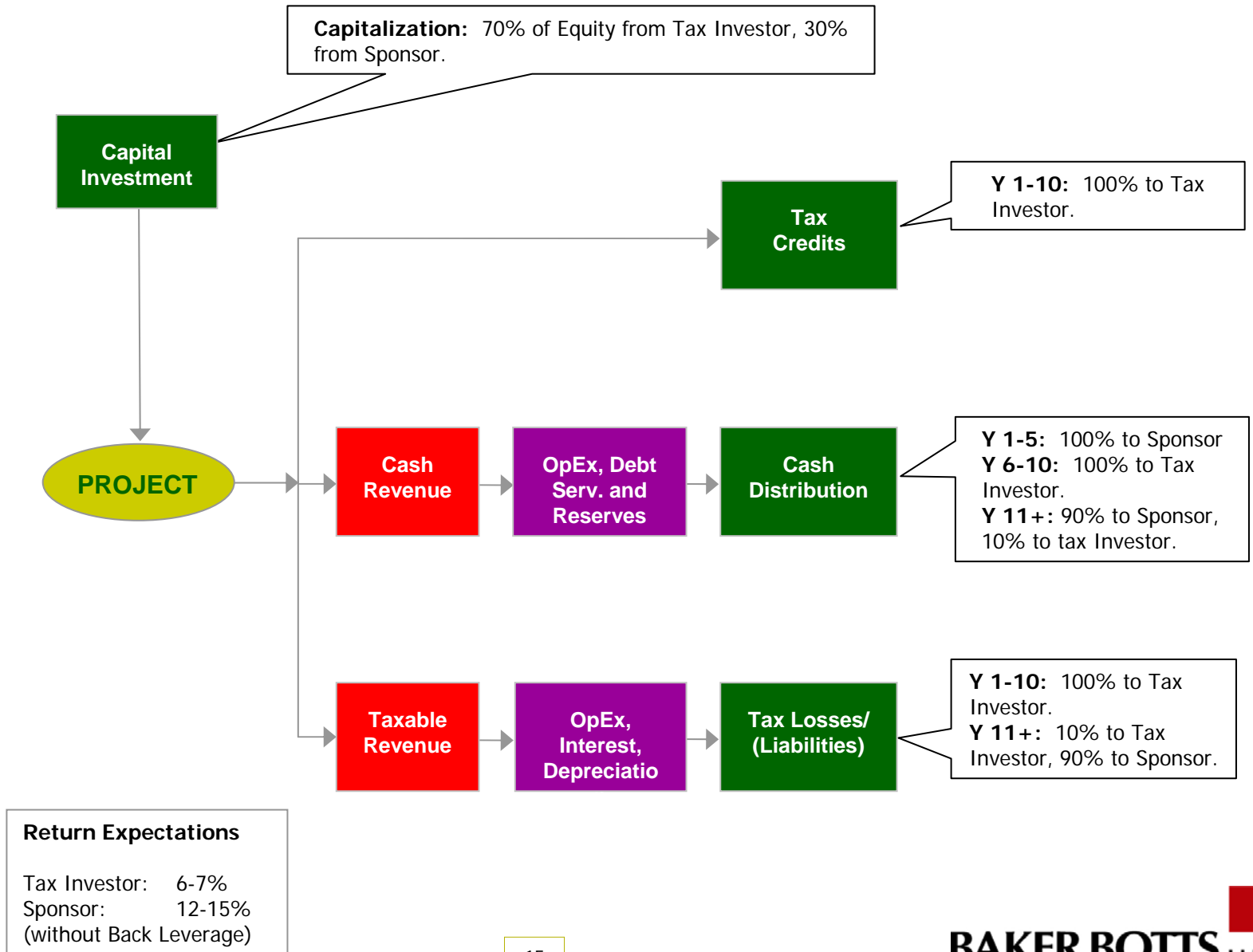
### Equity Returns

	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

<u>Project Capitalization</u>	<u>\$ MM</u>	<u>%</u>
Tax Investor Equity	\$ 122.1	67.8%
Sponsor Equity	\$ 58.0	32.2%

<u>Equity Returns</u>	<u>10 Year</u>	<u>20 Year</u>
Tax Investor	6.75%	7.0%
Sponsor*	0.0%	12.0%

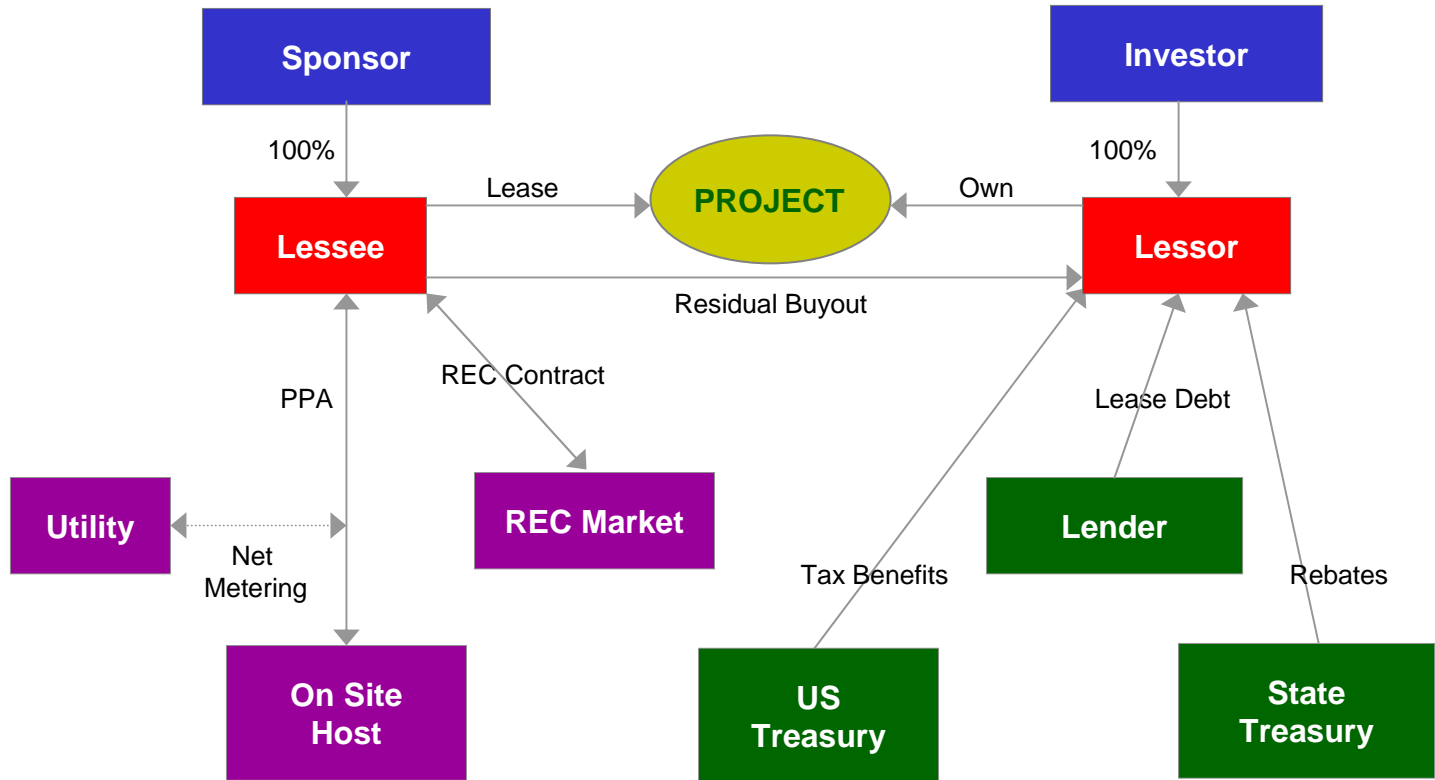
### Allocations

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

\*Excluding Fees



# Solar PV Leveraged Lease Structure



Return Expectations	
Tax Investor:	8 – 9%
Sponsor:	25%+



## Leveraged Flip Structure Example - Solar PV

- Project is funded by a combination of debt and equity
  - 50% Project Finance Debt
  - 50% Equity
    - 99% of equity from Tax Investor
    - 1% of equity from Sponsor
- Debt is secured/repaid by project revenue and the semiannual additional equity contributions.
- Until the Tax Investor reaches its target IRR (generally within 6-10 years), 99% 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 - Solar PV

### General Assumptions

Technology	Solar PV
Project Portfolio Size	10 MW
Capacity Factor	12.6%
Project Cost	\$59.4 mill
Net Proj Cost After St. Rebate	\$41.6 mill
Development Fee	\$1.7 mill
Annual Mgt. Fee	\$100 K
PPA Price (inflated 2%)	\$120/mWh
REC Price (Year 1)	\$200/mWh
EBITDA (Year 1)	\$3.2 mill
Flip Occurs	Year 6
Inv. Tax Credit	30%

Project Capitalization	\$ mill	%
Debt	\$ 17.3	41.5%
Equity	\$ 24.3	58.5%
Tax Investor Equity	\$ 24.1	57.9%
Sponsor Equity	\$ 0.2	0.6%
Total Capitalization	\$ 41.6	100.0%

### Debt Terms

Tenor	14 Years, with 7.5 year avg. life
Pricing	7.5% average
DSCR	1.4x minimum / 1.5x average
DSR Reserve	\$900 K

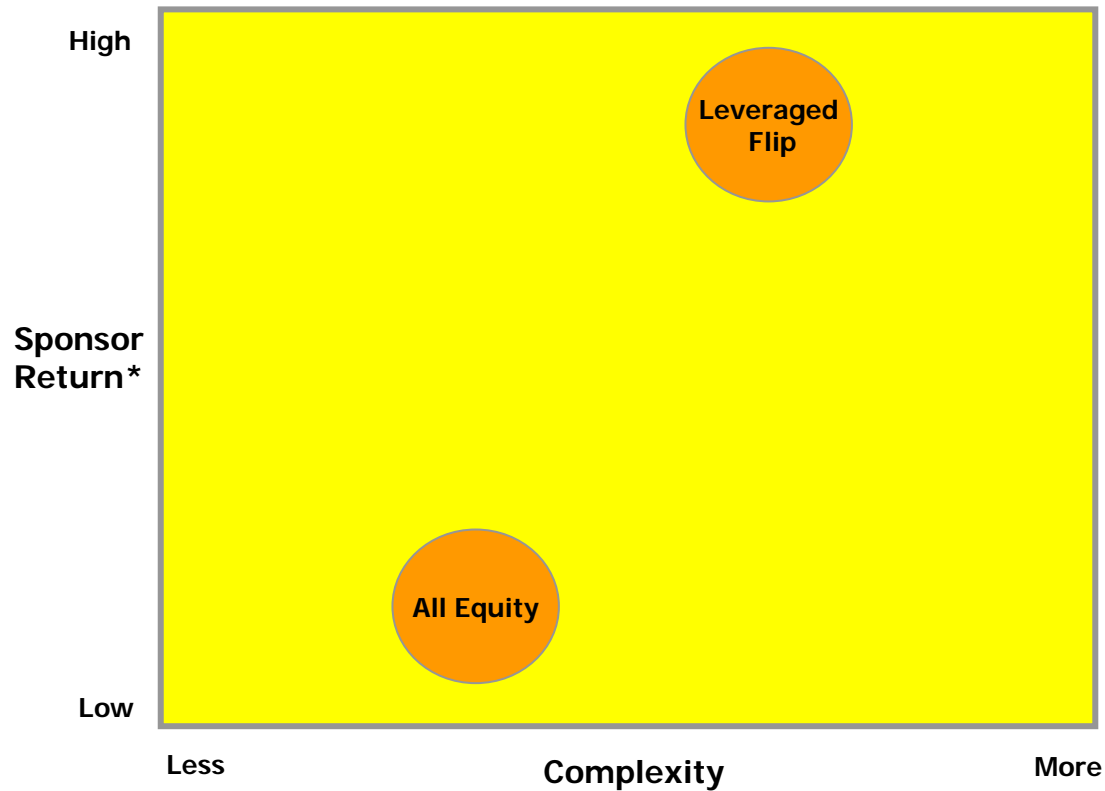
Allocations	Pre Flip		Post Flip	
	Inc./Loss	Cash	Inc./Loss	Cash
Sponsor	1.0%	1.0%	95.0%	70.0%
Tax Investor	99.0%	99.0%	5.0%	30.0%

Equity Returns	6 Year	20 Year
Tax Investor	9.8%	9.8%
Sponsor*	9.8%	39.9%

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



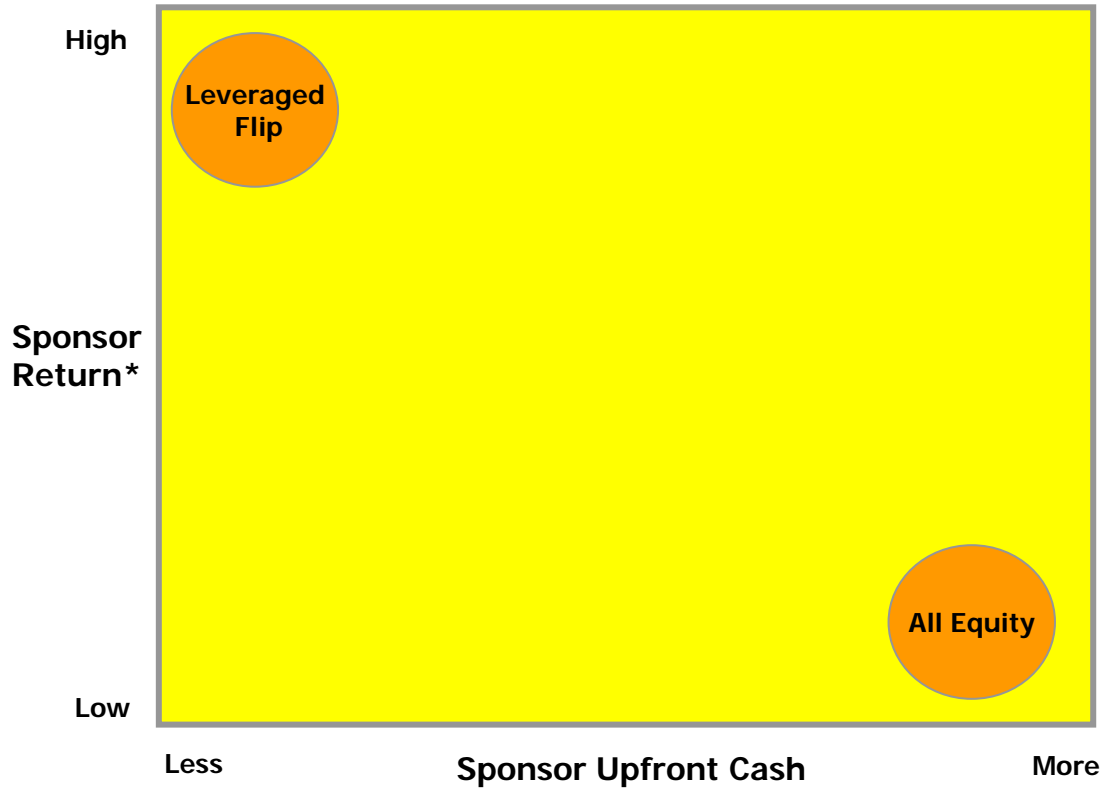
# Financing Structure Alternatives – Pros and Cons



\* After accounting for financing costs, fees



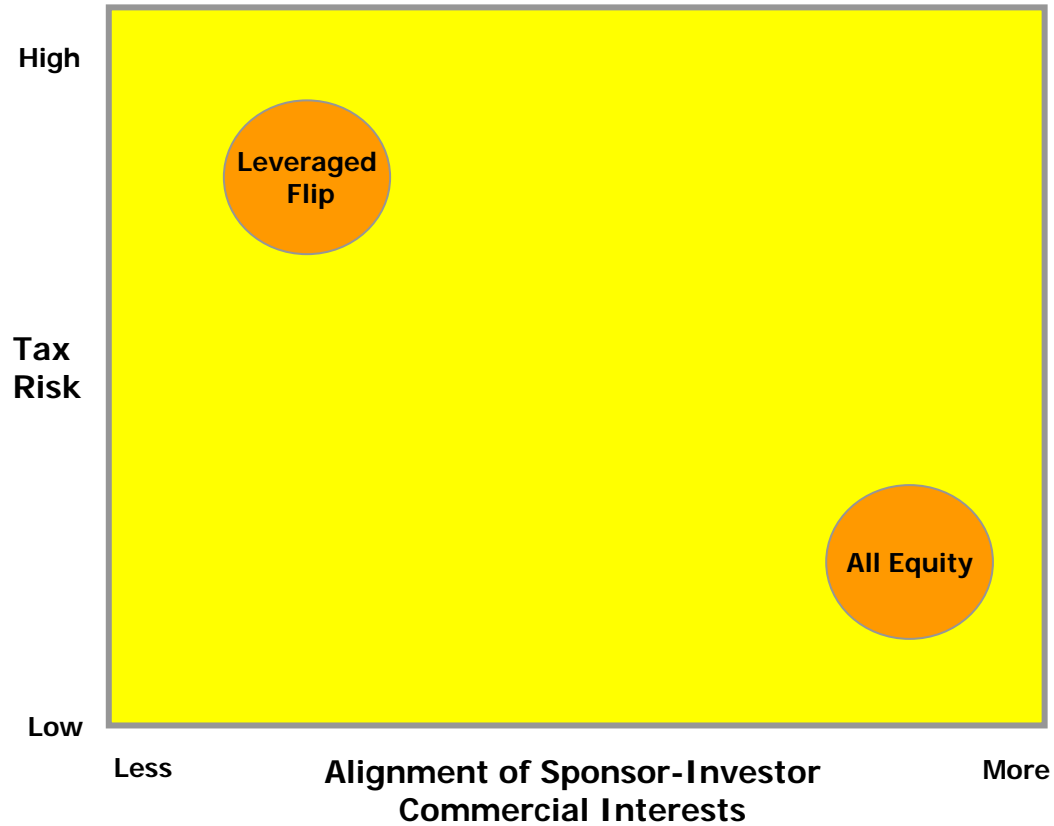
# Financing Structure Alternatives – Pros and Cons



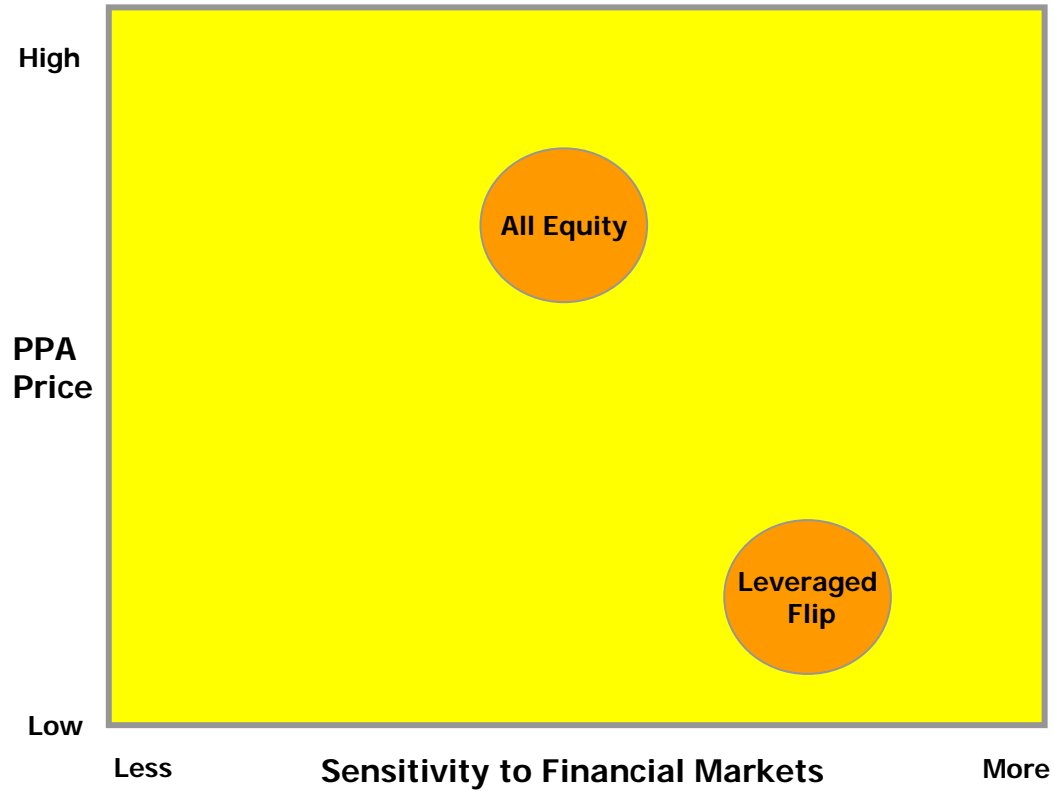
\* After accounting for financing costs, fees



# 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 bearer



# Completion Risk

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

- Traditional Completion Risk Mitigants
  - 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



# Renewable Project Completion Risk Issues

- Site control
- Permits
  - Possible delay - NIMBY
  - Environmental and regulatory
- No wraps for wind and PV projects
  - TSA/BOP installation
  - PV/Inverter installation
- Suppliers strike back
  - Availability & Cost
  - Down payments
  - Delivery flexibility
  - Warranties



## Renewable 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 Incentives
- Interconnection upgrades
- Transport connection (Biomass)



## 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/ESA 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/Sun/Biomass Feedstock
    - Technology
    - Market and Engineer Studies
  - PPA/Firm Offtake - Term
    - Wind/Solar 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
- Major Issues – Biomass
  - Feedstock Supply
  - Correlation of Inputs & Outputs
- Major Issues – PV
  - Numerous Customers
  - Standard Form ESA
  - Duration of Incentives



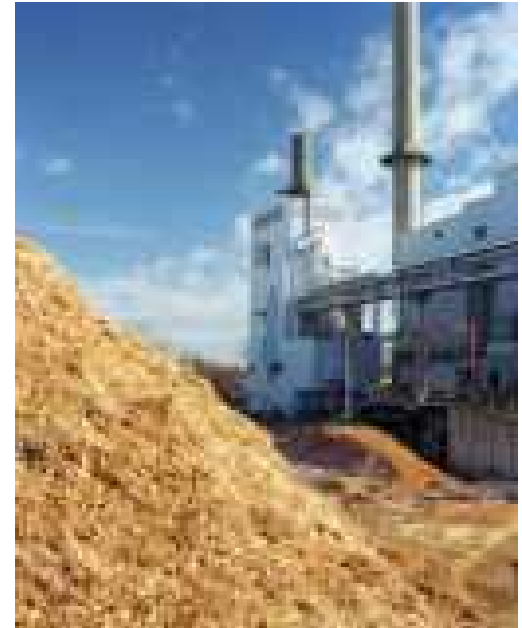
## Other Power Purchase Agreement/ESA Issues

- 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.





















# Successful Commodity-based Projects

- Major Issues - Merchant
  - Manage volatility
  - Hedging/Synthetic PPAs
  - Market Characteristics - Liquidity
  - Scheduling
- Distribution
- Low-cost producer
- Commodity Risk Management
  - Market knowledge
  - Purchasing power



# Baker Botts Renewable Energy Practice

- 45+ wind projects

- M&A include  's sale to  ,  's sale to  ,  
 sale to  BABCOCK & BROWN ,  's investment in  
 ,  PPM Energy 's purchase of AREC,   
as seller in  's AIM IPO,  's purchase of Top of Iowa  
 in \$263MM financing -  2006 Renewable Deal of Year  
Counsel to  IPO (ethanol)  
Represent  ,  and  in project development  
 Direct Energy in second lien PPA for tax equity deal  
Experience in all aspects – PPAs, turbine supply and warranty, Portfolio finance, tax equity, site control, PTCs, RECs, interconnection, local tax, JV structuring, BOPs, permitting, tax, environmental, & O&M  
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



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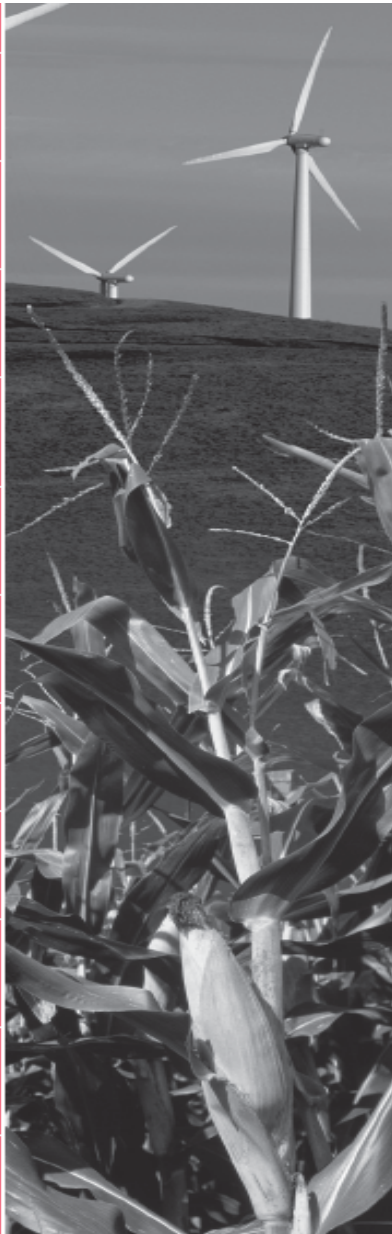
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## Renewable Energy Projects Require **DEEPER INNOVATION.**

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.

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in Energy and Natural Resources,"  
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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.

**Alyra's most recent completed transaction was Duke Energy's acquisition of the wind power assets of Tierra Energy (May 2007), in which Alyra acted as the sole advisor to Duke.**



# Thank You

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