

Wind Project Financing Structures: A Review & Comparative Analysis

~ Report Summary Presentation ~

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Introduction

- The financing of wind projects varies from that of conventional power projects due to the different characteristics of each:
 - Wind projects have higher capital costs but lower operating costs (e.g., no fuel costs)
 - Whereas Federal tax support for conventional power is distributed throughout the entire fuel cycle (from exploration/extraction through emissions controls), Federal tax support for wind power is concentrated primarily at the power generation stage
- The two principal Federal tax incentives available to wind projects are the production tax credit (“PTC”) and accelerated depreciation deductions (together, known as “Tax Benefits”)
- Tax Benefits provide a significant value to wind projects, but also complicate wind project finance, since most wind project developers lack sufficient Federal income tax liability to use the Tax Benefits efficiently
- In response, multiple financing structures have emerged to attract investors, manage risks, and allocate Tax Benefits to entities able to use them efficiently
- These financing structures are the underlying focus of this report

Purpose of Report

The purpose of the report is three-fold:

- 1) To survey recent trends in the financing of utility-scale wind projects in the United States
- 2) To describe the seven principal financing structures through which most utility-scale wind projects (excluding utility-owned projects) have been financed from 1999 to the present
- 3) To analyze the potential impact of these seven structures on the levelized cost of energy from wind power

The year 1999 is used as a starting point because it marks the advent of the recent expansion in wind power growth in the U.S.

History of Modern Wind Finance

1999-2002: Dominated by “Strategic Investors”

- Tax-motivated investors (“Tax Investors”) with a long-term strategic interest in the wind sector (e.g., FPL Energy)
- Smaller developers unable to use Tax Benefits often had little choice but to sell their projects to a Strategic Investor

2003-2006: Rise of the “Institutional Investor”

- More-passive Tax Investors (e.g., JP Morgan) get involved
- New structures allow ongoing ownership stake for developer

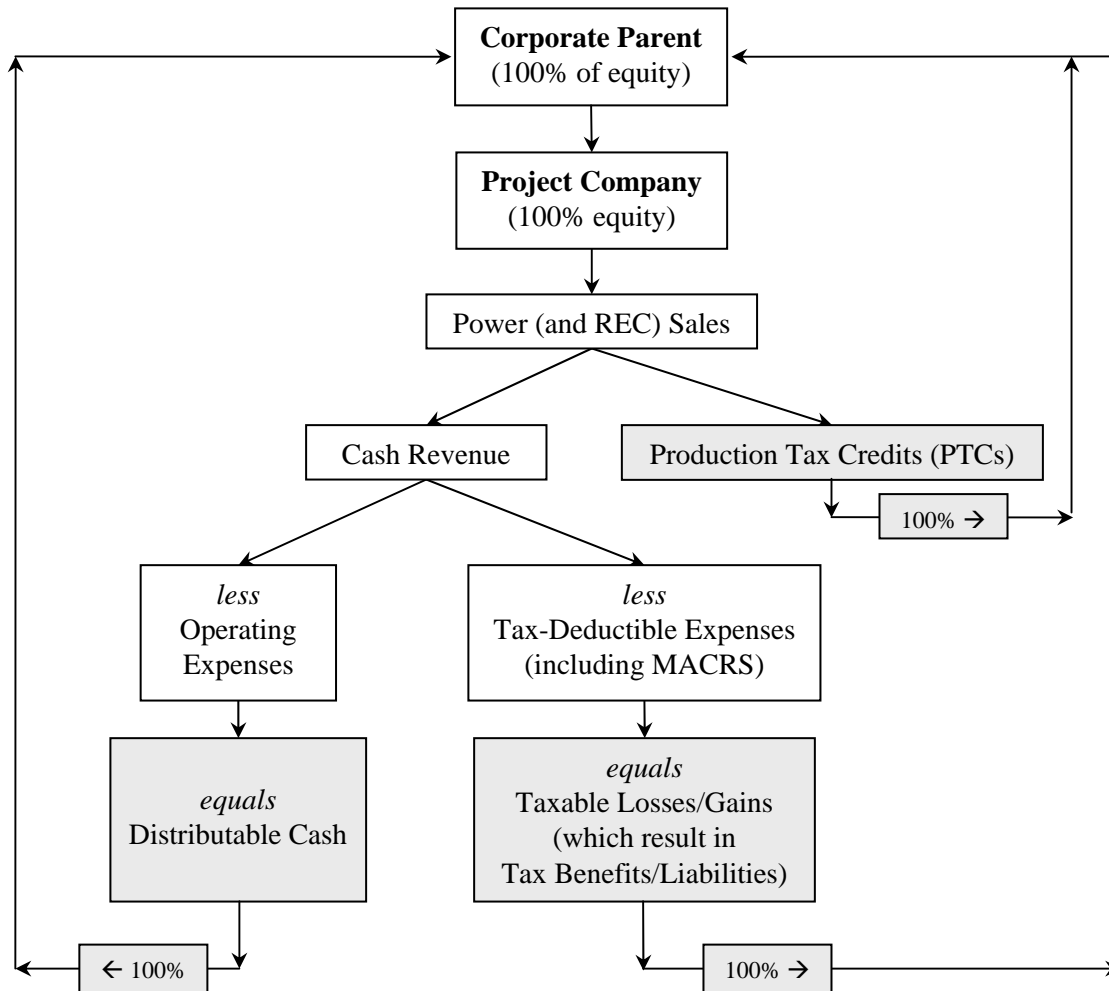
2003-2006: Declining cost of equity and debt capital

- New investors attracted to the wind sector creates competition
- Increasing competition and comfort with financing structures reduces cost of both debt and equity capital

Seven Structures Examined

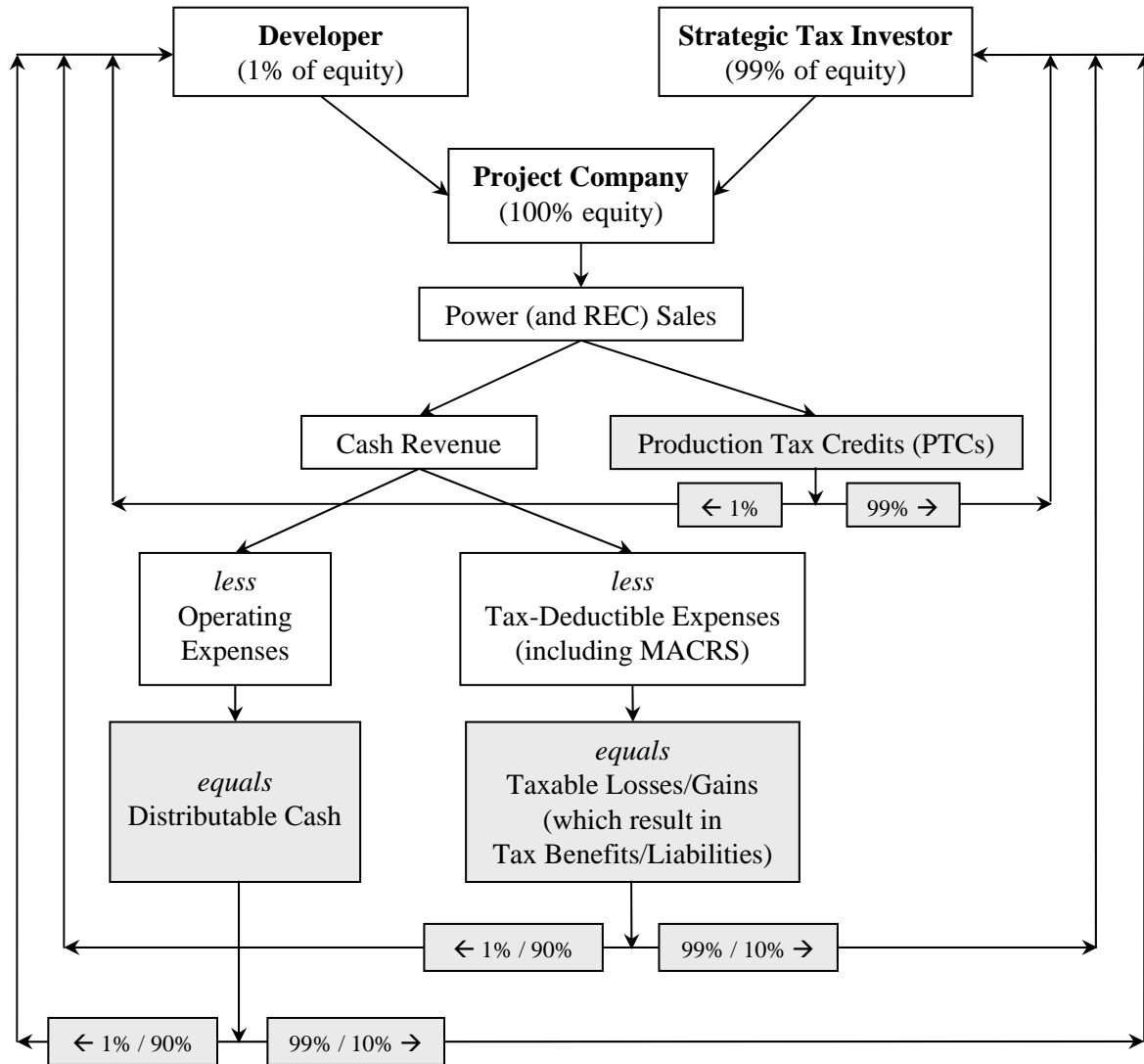
Financing Structure Name	Project Capital Structure	Likely Equity Investors	Brief Description of Structure Mechanics
Corporate	All equity	Developer (corporate entity)	Corporate entity develops project and finances all costs. No other investor or lender capital is involved. Corporate entity is able to utilize Tax Benefits (no flip).
Strategic Investor Flip	All equity	Developer and Strategic Investor	Strategic Investor contributes almost all of the equity and receives a <i>pro rata</i> percentage of the cash & Tax Benefits prior to a return-based flip in the allocations.
Institutional Investor Flip	All equity	Developer and Institutional Investor	Institutional Investor contributes most of the equity and receives <i>all</i> of the Tax Benefits and, after the developer has recouped its investment, <i>all</i> of the cash benefits, until a return-based flip in the allocations.
Pay-As-You-Go ("PAYGO")	All equity	Developer and Institutional Investor	Institutional Investor finances much of the project, injecting some equity up-front and additional equity over time as the PTCs are generated. Includes a return-based flip in the allocations.
Cash Leveraged	Equity and debt	Developer and Institutional Investor	Based on the Strategic Investor Flip structure, but adds debt financing. Likely involves Institutional Investors, rather than Strategic Investors. Loan size/amortization based on the amount of cash flow from power sales.
Cash & PTC Leveraged	Equity and debt	Developer and Institutional Investor	Similar to the Cash Leveraged structure, but the loan size and amortization profile are based on the cash flow from power sales <i>plus</i> a monetization of the projected PTCs from the project.
Back Leveraged	All equity (but developer uses debt outside of the project)	Developer and Institutional Investor	Virtually identical to the Institutional Investor Flip, but with the developer leveraging its equity stake in the project using debt financing.

Corporate Structure



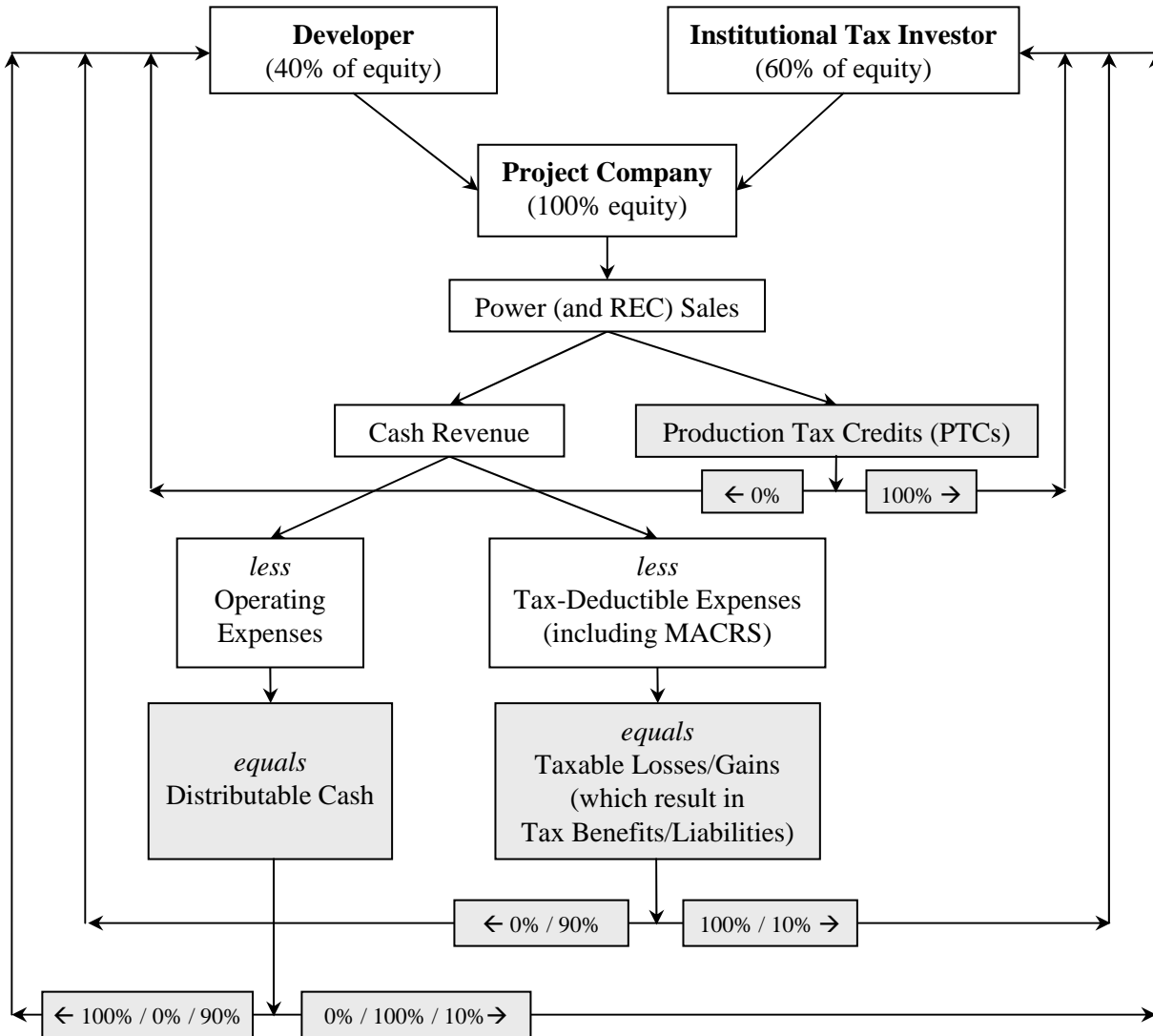
- All-equity structure with one investor
- Corporate parent funds 100% of the costs of the project as equity in the project company
- 100% of each benefit stream flows to parent:
 - Distributable cash
 - Tax Benefits: (a) taxable losses and gains, and (b) PTCs
- With just one investor, there is no “flip” in the allocation of cash and Tax Benefits

Strategic Investor Flip



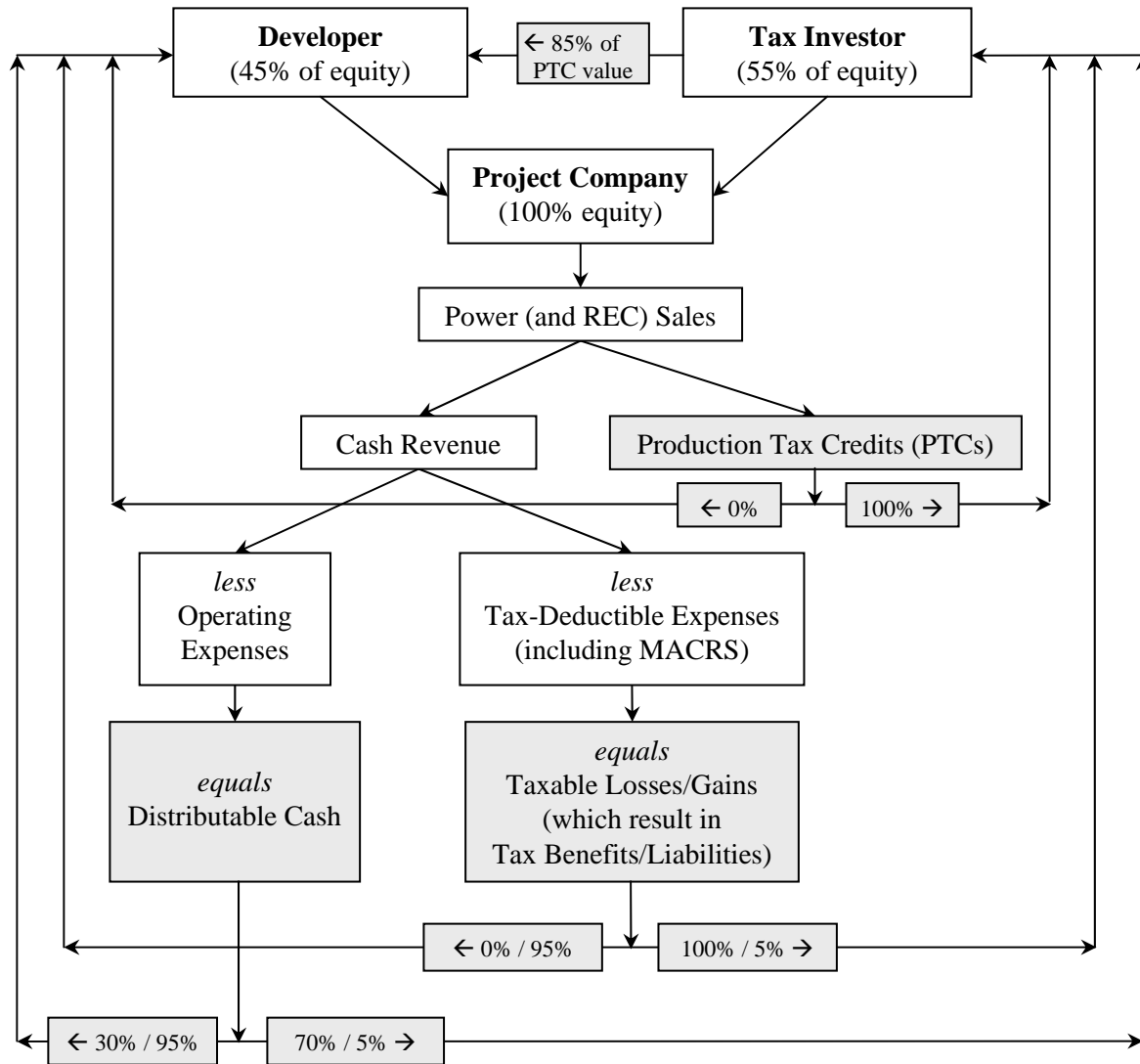
- All-equity structure with two owners
- Tax Investor (“TI”) provides vast majority (e.g., 99%) of equity
- Each party receives a pro rata share of the cash and Tax Benefits until TI IRR target (“Flip Point”) is reached
- After Flip Point is reached, virtually all allocations go to developer
- Note, the first percentage figure in each box is the pre-flip allocation, the second is the post-flip allocation

Institutional Investor Flip



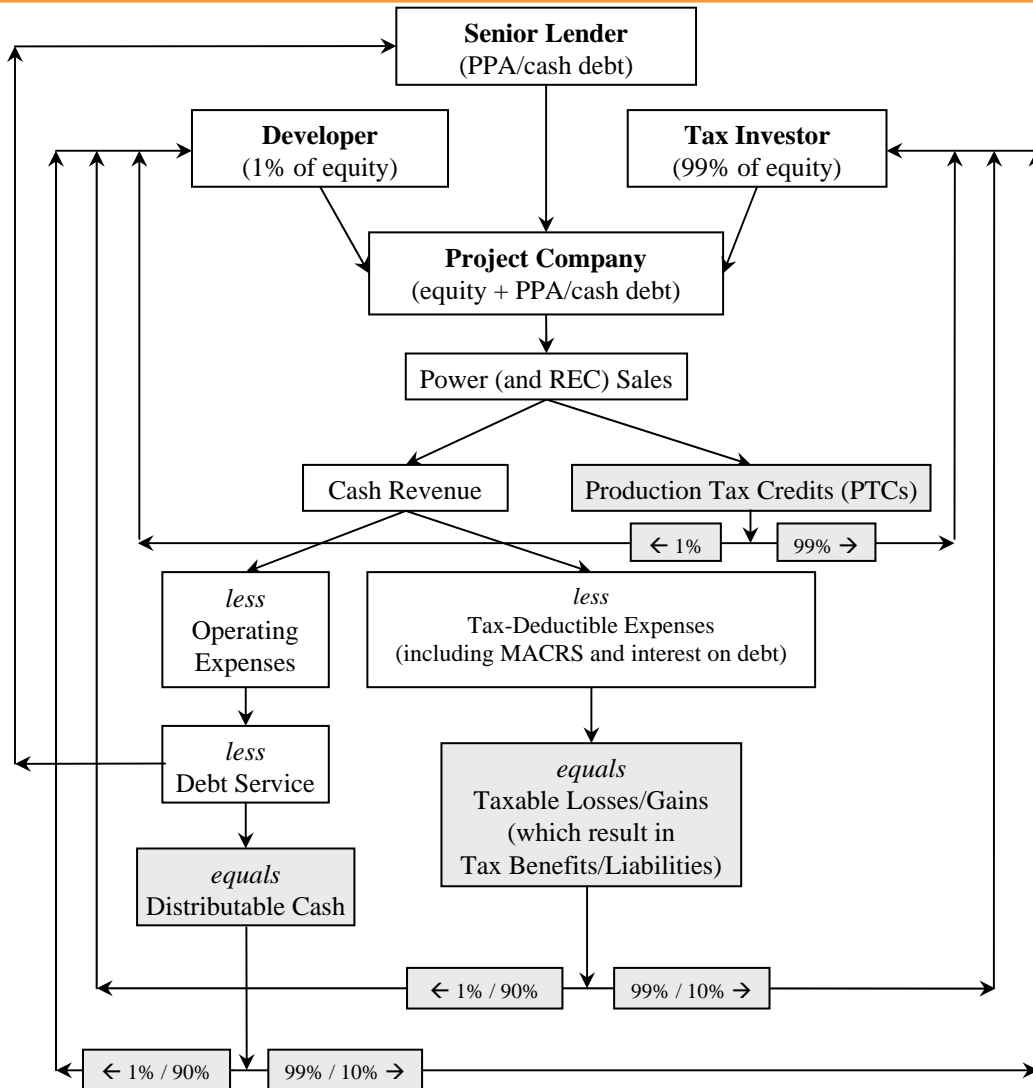
- All-equity structure with two owners
- TI provides a majority (e.g., 60%) of equity
- Pre-Flip Point, there are bifurcated allocations:
 - Cash: initially 100% to developer until return of investment; then 100% to TI
 - Tax Benefits: 100% to TI
- After Flip Point is reached, virtually all allocations go to developer

Pay-As-You-Go (PAYGO)



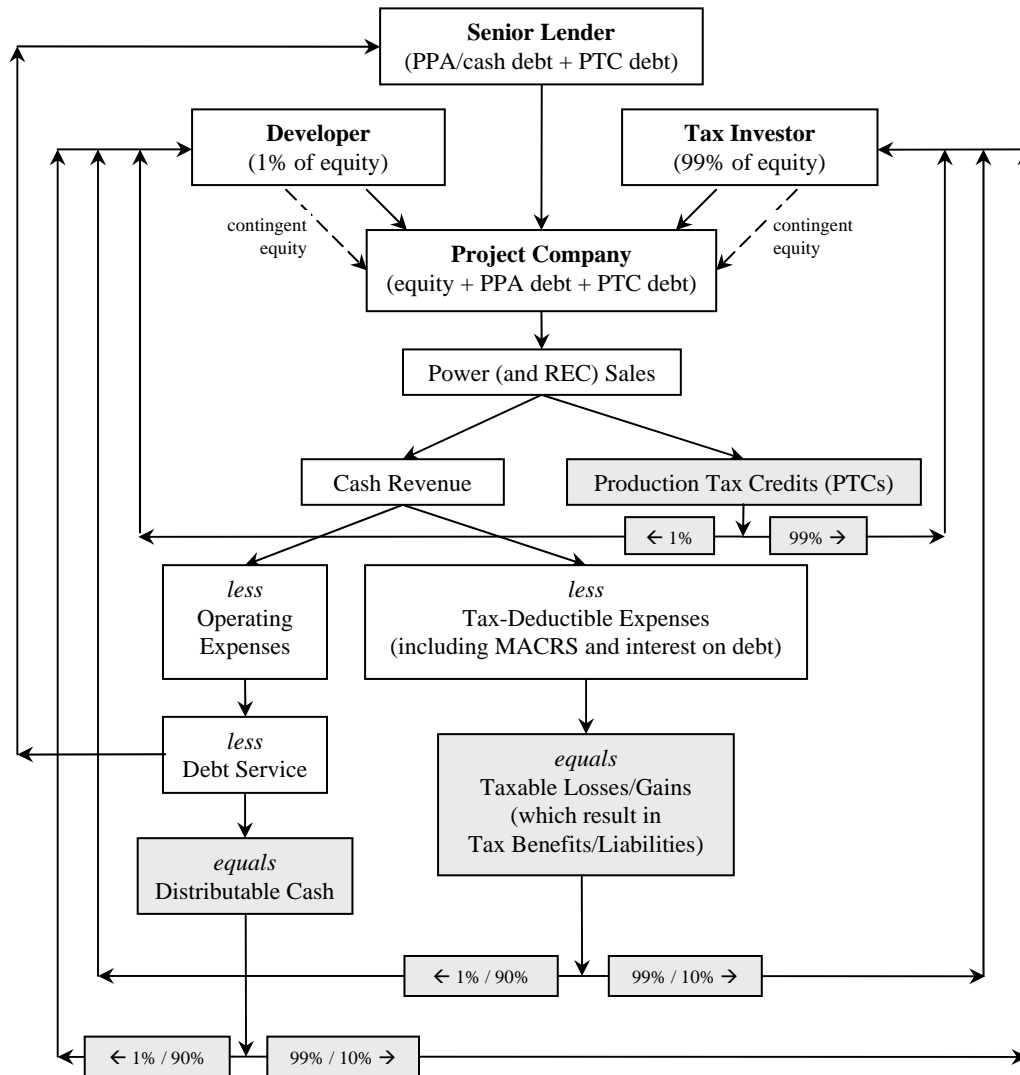
- All-equity structure with two owners
- TI provides a majority (e.g., 55%) of equity up-front
- TI makes additional payments as PTCs are generated, based on value of PTCs (e.g., 85%)
 - Most often payments are made directly to the developer
- Pre-Flip Point, TI receives all of the Tax Benefits and a majority (e.g., 70%) of the cash
- Post-Flip Point, virtually all allocations go to developer

Cash Leveraged



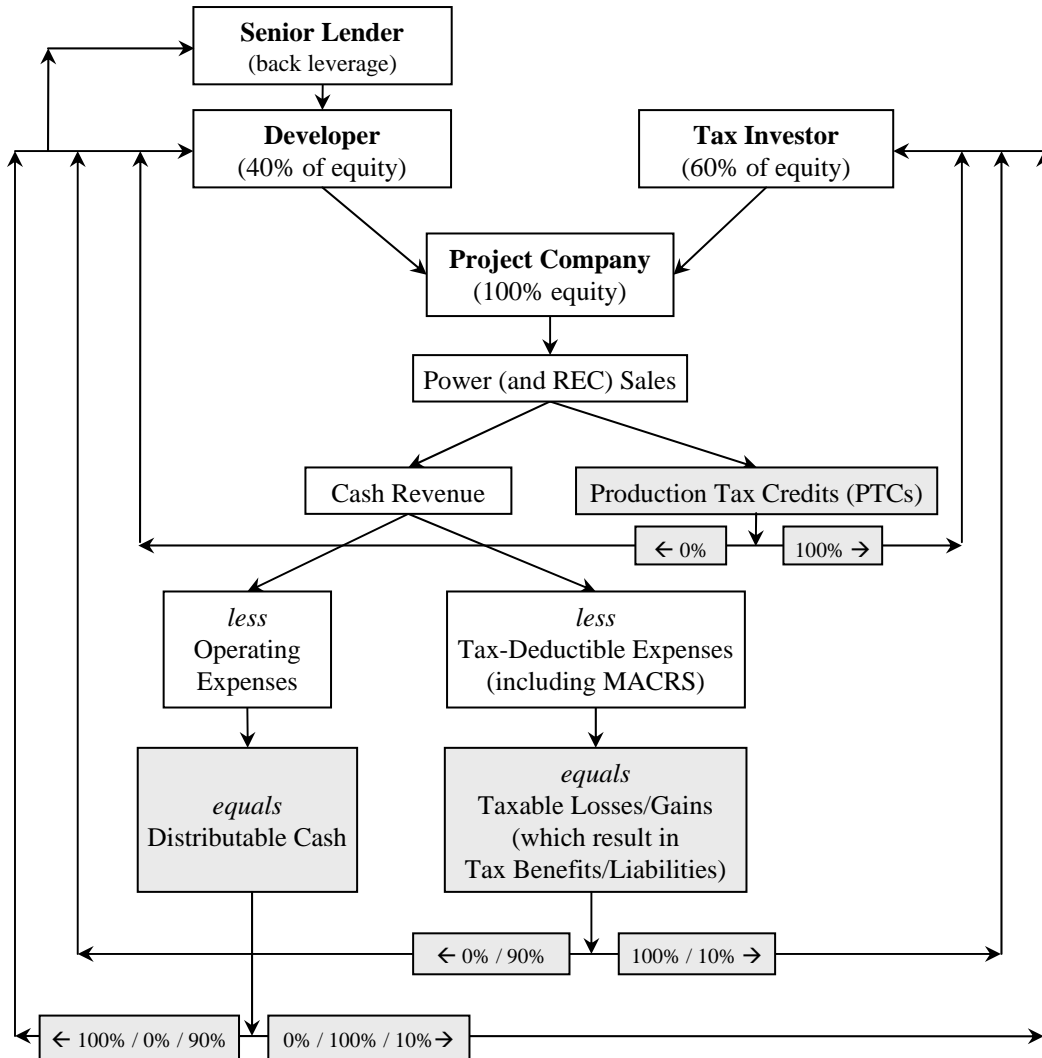
- Two equity owners and project-level debt based on cash generated
- Lenders have first lien on project assets
- TI provides vast majority (e.g., 99%) of equity
- Each party receives a pro rata share of the cash (after debt service) and Tax Benefits until Flip Point
- After Flip Point is reached, virtually all allocations go to developer
- Note: interest payments are tax-deductible, thereby decreasing taxable income

Cash & PTC Leveraged



- Two equity owners and project-level debt based on cash and PTCs generated
- Lenders have first lien on project assets
- Equity parties guarantee additional annual equity contributions, if necessary, to cover shortfall caused by PTC debt
- TI provides vast majority (e.g., 99%) of equity
- Each party receives a pro rata share of the cash (after debt service) and Tax Benefits until Flip Point
- After Flip Point is reached, virtually all allocations go to developer
- Note: interest on both tranches of debt is tax-deductible

Back Leveraged



- All-equity structure with two owners, similar to Institutional Investor Flip structure
- TI provides a majority (e.g., 60%) of equity
- Developer funds part of its equity with debt borrowed at its company-level, outside of the project
- Pre-Flip Point bifurcated allocations:
 - Cash: initially 100% to developer until return of investment; then 100% to TI
 - Tax Benefits: 100% to TI
- After Flip Point is reached, virtually all allocations go to developer

Choosing a Structure

- Developers decide which financing structure best meets their needs for a given project based on multiple considerations
- The table below lists several non-exhaustive scenarios with differing combinations of these developer considerations

Scenario	Developer can use Tax Benefits	Developer can fund project costs	Developer wants to retain stake in project ownership / ongoing cash flows	Developer wants early cash distributions	Project has low projected IRR	Project already exists (refinancing / acquisition)	Most suitable financing strategy or structure:
1	No	No	No	Yes	N/A	No	Sell project to a Strategic Investor
2	Yes	Yes	Yes	No	No	No	Corporate
3	No	Limited	Yes	No	No	No	Strategic Investor Flip
4	No	Limited	Yes	Yes	No	No	Institutional Investor Flip
5	No	Limited	Yes	No	Yes	No	Cash Leveraged or Cash & PTC Leveraged
6	No	Limited	Yes	Yes	No	Yes	Institutional Investor Flip
7	No	Yes	Yes	Yes	N/A	Yes	Pay-As-You-Go
8	No	Limited	Yes	Yes	Yes	No	Back Leveraged

Modeling Approach

- Constructed a simplified Excel-based pro forma financial model to create a template of an indicative wind project as the common basis for illustrating the effects of each financing structure
- Input assumptions to the model fall within three categories:
 - **Market:** reflect the broad market conditions experienced by most utility-scale wind projects developed and financed in the last several years (e.g., long-term PPA, credit-worthy counterparty, proven technology)
 - **Common:** project-specific characteristics common to all financing structures (e.g., capacity factor, O&M costs, hard project costs)
 - **Structure-Specific:** assumptions specific to each structure (e.g., equity contribution levels, cost of debt and equity, benefit allocations)
- For each structure, the model calculates a 20-year levelized cost of energy (“LCOE”) that enables the project to cover its operating costs and satisfy the return requirements of lenders (if any) and equity providers

Key Modeling Inputs and Results

	Cash & PTC Leveraged	Cash Leveraged	Institutional Investor Flip	Back Leveraged	PAYGO	Strategic Investor Flip	Corporate
Assumed Installed Project Costs							
Hard Cost (\$/kW)	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Soft Cost (\$/kW)	229	215	183	183	183	183	125
Total Cost (\$/kW)	1,829	1,815	1,783	1,783	1,783	1,783	1,725
Tax Investor After-Tax Return (The 10-year target IRR is a model input, while the 20-year IRR is a model output)							
10-Year Target IRR	9.25%	9.00%	6.50%	6.50%	6.50%	6.50%	N/A
20-Year IRR	9.67%	9.29%	7.12%	7.12%	7.02%	7.02%	N/A
Assumed Loan Terms							
All-in Interest Rate	6.70%	6.70%	N/A	6.70%	N/A	N/A	N/A
Tenor (maturity)	15 years	15 years	N/A	calculated	N/A	N/A	N/A
Developer After-Tax Return (Except for the Corporate 20-year IRR, the developer returns are all model outputs)							
10-Year IRR	9.25%	9.00%	0.00%	-10.08%	5.75%	6.50%	6.64%
20-Year IRR	33.15%	30.58%	10.44%	11.91%	11.52%	37.44%	10.00%
20-Year NPV (\$000 @ 10%)	7,208	7,540	1,578	4,673	7,811	20,745	0
20-Year Levelized Cost of Energy (LCOE)							
Nominal \$/MWh	48	50	53	53	59	61	63

Model Results – Discussion

- The comparative nature of the analysis means that these results are best considered relative to one another – i.e., to illustrate the relative impact of financing structures – rather than individually or on an absolute basis.
Note: the LCOE figures will change under different assumptions.
- The two structures with the lowest LCOEs use project-level debt
 - However, debt is not widely used in the current market
 - Reasons include both factors in favor of other structures (perceived simplicity, standardization, speed) and factors against using debt (perceived cost, complexity, loss of control, little-improved IRR)
- Variations in the LCOE across financial structures (assuming the same underlying template project) are driven by the different assumptions made regarding the required equity returns and the cost of debt
 - Although these assumptions are intended to reflect current market conditions, in practice these parameters are often project-specific and highly negotiated.
- Section 4.2 of the report provides more-detailed modeling results

Observations and Future Trends

- Financing structures have evolved to meet specific developer needs and investor requirements, and this evolution will continue as long as the sector attracts new investment capital
- After being out of favor, leveraged structures seem to be gaining popularity
 - Rising turbine costs put pressure on returns (need leverage boost)
 - Longer-term PTC eligibility window allowing for the time needed to close
 - Tax Investors gaining comfort with bringing on lenders
- Recent developer consolidation trend will have several implications:
 - Creates larger developers with greater financial resources who can de-link project financing from construction deadlines, thereby allowing the use of new financing tools such as portfolio finance
 - Influx of foreign capital with little U.S. tax liability means passive Tax Investors will still be required to monetize Tax Benefits
- In some markets (e.g., Texas, New York), investors are becoming increasingly comfortable with commodity hedges in lieu of long-term PPAs
- Utility (both IOU and POU) ownership is increasing; POUs require specialized structures (not reviewed here) to capture Tax Benefits
- Portfolio financings are gaining popularity

For More Information

1) Download the full report at:

<http://eetd.lbl.gov/ea/emp/reports/63434.pdf>

2) Contact the authors:

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