Driving Renewable Energy Growth Through Effective Public Policy

A Financial and Policy Analysis of Cash Grants, Tax Credits and Pass-Through Tax Structures (MLPs and YieldCos)

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To my family, thank you for teaching me the value of service and citizenship. There is an old story of a father and son walking up a mountain. The son turns to his father and says,

"Be careful where you walk, because I am following in your footsteps."

As if words can suffice for a lifetime of inspiration and virtue: thank you for everything. To have the opportunity to follow in the footsteps of my family remains one of the greatest privileges I have ever known.

Abstract

Energy and environmental concerns have motivated policymakers to support renewable energy technology development through various tax policies. Currently, the majority of renewable energy projects in the U.S. benefit from tax credit incentives. The associated tax equity financing structure has received criticism for its inefficient use of taxpayer resources relative to other policies, including the Section 1603 Cash Grant. The cash grant provided renewable energy developers with the option to receive a cash injection in lieu of the prevailing tax credit during 2009 to 2011.

Conversely, renewable energy developers have begun to form dividend-oriented investment vehicles that house renewable energy assets with long-term power purchase agreements in a manner that parallels the master limited partnership (MLP) for conventional oil and gas companies. The relatively recent structure, known as a YieldCo, has lowered financing costs while providing renewable developers with access to an alternate investor base with a more competitive source of capital.

Through the contribution of a proprietary framework for evaluating the financial impact of various public policies, this thesis seeks to evaluate the relative cost effectiveness of cash grants, tax credits and pass-through tax structures (MLPs and YieldCos) in achieving government policy objectives. The financial model helps determine how efficient each policy is in furthering renewable energy development for each dollar in government tax expenditures. The analysis is supported by a sensitivity analysis of the parameters of the financial model.

Although the financial model corroborated existing literature with regards to cash grants being approximately twice as efficient as tax credit incentives, the financial analysis ultimately found pass-through structures to be the most efficient policy solution for furthering renewable energy growth. The ancillary benefits of the pass-through structure, including enhanced liquidity and borrowing cost improvements, propel the business structure ahead of the other policy options in terms of their efficient use of taxpayer resources. Government policy should support pass-through structures, either by facilitating market environments that accommodate YieldCo growth or by legislating the widespread introduction of the MLP structure to the renewable energy industry.

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1. Introduction

Energy plays an essential role in contemporary society, supporting systems that meet vital human needs such as shelter, sustenance, transportation and employment. Although the U.S. populace accounts for less than 5 percent of the global population, the nation consumes 19 percent of the world's energy (9.5 percent of which comes from renewable energy sources).[1] The U.S.'s heavy reliance on fossil fuels, primarily imported petroleum products, present energy security concerns, while greenhouse gas emissions associated with the production and consumption of conventional energy progressively heighten the effects of global climate change.

Renewable energy cost curves have improved dramatically, but financing challenges and the inherent capital-intensive nature of renewable projects have continued to hinder the competitive growth of the industry. Accordingly, federal programs have been implemented to further the development of the sector by helping renewable energy projects overcome financing hurdles. The predominant public policies intended to drive clean energy growth include tax credits, cash grants, loan guarantees and renewable portfolio standards at the state-level.

In recent years, most renewable projects in the U.S. have benefitted from tax equity investments. Tax equity investors are generally large investment banks and insurance companies who partner with project developers to capitalize on federal tax credits for renewable technologies. Since renewable projects generally lack the sufficient tax liabilities necessary to enjoy the full benefit of a tax credit, developers are often forced to enter highly specialized and costly tax equity financing structures. Following the global financial crisis in 2008, the tax equity market decelerated and renewable energy development slowed. In recognition of the fact that tax-based policy incentives are ineffective when tax burdens are low, Congress instituted the option to receive an equivalent cash grant in lieu of the prevailing investment tax credit incentive in *The American Recovery and Reinvestment Act of 2009* (ARRA 2009).[2] When renewable energy companies and research reports deemed the cash grant to be a more effective use of taxpayer resources relative to a tax credit, policymakers began reevaluating current policies in search of a more effective policy mechanism for the renewable energy sector.

While prevailing tax policies for the renewable energy industry traditionally focus on production or investment measures, pass-through tax structures derive their tax benefit from corporate structure, which in turn reduces costs of capital. The cost of capital, which includes both the cost of equity and the cost of the debt, is the return investors require to ensure that a capital-budgeting project is worthwhile. The main pass-through structure within the broader energy industry is the master limited partnership (MLP). An MLP is a business structure that benefits from avoiding the corporate level taxation of a C-corporation, and whose ownership interest units are traded as securities in financial markets, like corporate stock. Currently, a partnership must derive 90 percent of its income from qualifying sources, including commodities, conventional energy sources and other depletable resources.[3] Renewable projects do not legally qualify for the MLP corporate structure, while traditional oil and gas competitors have been benefiting from the preferential tax treatment coupled with the liquidity of a publicly traded company for decades. The MLP Parity Act would provide the renewable energy industry with the same advantageous tax status and with access to a larger pool of investors.

As the industry continues to mature, the market appetite for renewable investments continues to rise. Accordingly, a handful of large renewable energy developers have begun to form Yield Companies (YieldCo), an alternate pass-through structure known as 'synthetic MLPs.' Like MLPs, YieldCos also generate power under long-term purchase agreements and distribute much of their cash flow to shareholders. The rise of the YieldCo has further validated the pass-through structure and has incentivized developers to create yield-oriented investment vehicles by offering exposure to an alternative investor pool with a more competitive source of equity capital.

This thesis seeks to analyze the relative effectiveness of cash grants, tax credits and pass-through tax structures in supporting renewable energy development through a financial model based on a comparable companies analysis of leading solar developers. The proprietary financial model contributes a framework for policymakers to evaluate the relative financial impacts of public policies supporting renewable energy development. The policies were evaluated on their relative efficiencies in directly converting government tax expenditures into incremental free cash flow for a hypothetical solar energy company. Key findings are shown in the aside Table 1.

Table 1: Key Findings

($ in millions)	Base Case	Cash Grant	Tax Credit	Pass-Through Tax Status
Net Present Value (NPV) of Free Cash Flow (FCF) *8% Discount Rate*	326.0	365.9	345.7	374.5
ΔNPV of FCF Relative to Base Case *% Growth*	-	39.9 *12%*	19.7 *6%*	48.4 *15%*
Weighted Average Cost of Debt and Tax Equity	5.0%	5.0%	6.4%	4.0%
Net Present Value (NPV) of Tax Revenue Loss *3% Discount Rate*	-	44.6	44.6	38.7
ΔNPV of Tax Revenue Loss Relative to Base Case	-	44.6	44.6	38.7
Effective Tax Rate	(35%)	(35%)	(35%)	0%
Tax Credit Benefit *As a % of Capital Expenditures*	-	*30% of expenditures until 2016, 10% thereafter*	*30% of expenditures until 2016, 10% thereafter*	-
Δ(Base) NPV of FCF / Δ(Base) NPV of Tax Revenue Loss *A measure of the cash flow benefit to the company relative to the tax revenue loss for the government*	-	**89%**	**44%**	**125%**

The aforementioned solar company model determined that pass-through structures (MLPs / YieldCos) are the most efficient, followed by cash grants, then tax credits. In other words, each $1 in tax revenue loss for the government resulted in a direct $1.25 increase to the company's free cash flow when operating under the pass-through structure, $0.89 for cash grants, but only $0.44 for tax credits. The ancillary benefits associated with the pass-through structure, including a lower cost of capital and enhanced liquidity, ultimately position the structure as a more effective policy for advancing renewable energy growth relative to a cash grant or a tax credit. These results are accompanied by a sensitivity analysis, which further emphasizes the importance of costs of capital; the policies are able to unlock incremental benefits that exceed the tax revenue loss when lowering renewable energy companies' costs of capital.

From the government's perspective, the pass-through structure is a more efficient use of taxpayer resources relative to the prevailing cash grant and tax credit policies. In the current policy landscape, the YieldCo is the most efficient compromise between government objectives and private-sector renewable energy growth. Accordingly, policymakers should further encourage renewable developers to benefit from pass-through structures, either through supporting YieldCos or by passing the MLP Parity Act.

2. Renewable Energy Policy Landscape

2.1 Motivation for Renewable Energy Public Policy

Throughout much of American history, commerce and industrial energy needs were met entirely from domestic reserves, as the United States contains an abundant supply of natural resources. However, a robust, growing economy fueled by rapid industrialization and population growth eventually fostered the need to enlist foreign energy sources to supplement domestic supplies.[4] The implications of such dependence on foreign energy importation, coupled with price volatility concerns driven by supply fluctuations, have underpinned the importance of reliable energy sources in U.S. public policy discourse.

Since the 1970s, U.S. energy tax policy has sought to achieve two broad objectives. First, policymakers have attempted to reduce dependence on oil imports by enhancing domestic energy investments and production tax subsidies.[28] Second, environmental concerns have resulted in tax code benefits for a variety of renewable and energy efficiency technologies. The Obama Administration has since continued to stress the importance of investments in renewable energy projects and infrastructure. As President Obama noted in his 2011 State of the Union Address, clean energy investments can strengthen domestic energy security, facilitate job creation and support environmental goals.[5] Yet, the U.S. currently remains heavily reliant on fossil fuel energy sources. In 2011, approximately 48 percent of electricity was produced from coal-burning power plants.[4]

2.2 Overview of Current Renewable Energy Policies

Federal programs have been implemented to help capital-intensive renewable energy projects overcome financing hurdles and further the development of the industry. The primary, federal policy mechanisms encompass tax incentives and cash grants. Recent public policies that offer direct or indirect forms of financial support to promote the large-scale commercialization of renewable energy technologies include:

(1) Investment Tax Credit (ITC),
(2) Section 1603 Cash Grant,
(3) Production Tax Credit (PTC),
(4) Department of Energy Loan Guarantee Program and
(5) Renewable Portfolio Standards *(State-Level Policy)*

Investment Tax Credit (ITC)

Although the ITC was first legislated to increase production of oil and natural gas, the oil embargo of 1973 and the Iranian Revolution ultimately led to a policy shift towards conservation and alternative energy. As a result, the Energy Tax Act of 1978 first established ITCs for renewable energy.[9] The current ITC is available to a variety of renewable energy technologies (including solar, fuel cells, small wind turbines, geothermal systems, micro-turbines and combined heat and power), from now through December 31, 2016.[9] For solar projects, the ITC is equal to 30 percent of total expenditures, with no maximum credit limit, but the credit amount is expected to step down to 10 percent of expenditures in 2017. Contrary to the PTC, the ITC is not linked to the actual generative performance of the project, but rather is derived from capital investments in property and equipment. The JCT estimates that the ITC will generate $2.3 billion in tax revenue losses over the 2011 to 2015 budget window, nearly all of which is due to solar technology investments.[10] The ITC has been criticized for its inefficient use of taxpayer resources; the consequential tax equity financing structure often prevents government tax expenditures from directly achieving its goal of driving renewable energy growth.

Table 2: Business Energy Investment Tax Credit (ITC)

Resource Type	In Service Deadline	Credit Amount
Solar	December 31, 2016	30% of expenditures
Fuel Cells	December 31, 2016	30% of expenditures
Small Wind Turbines	December 31, 2016	30% of expenditures
Geothermal Systems	December 31, 2016	10% of expenditures
Microturbines	December 31, 2016	10% of expenditures
Combined Heat and Power (CHP)	December 31, 2016	10% of expenditures

Source: U.S. Department of Energy (DOE)

Section 1603 Cash Grant

Following the global financial crisis in 2008, tax equity investors were facing liquidity constraints, as both the tax equity market and renewable energy development slowed. In order to fill the investment gap in renewable energy markets, Congress established the Section 1603 Cash Grant in the ARRA 2009.[2] The Section 1603 Cash Grant, which was authorized between 2009 and 2011, offered eligible renewable energy developers with a cash grant equivalent to 30 percent of a project's total eligible cost basis in place of the traditional ITC incentive.[11] During its tenure, the Section 1603 program funded $21.6 billion to over 95,000 projects, while installing 29.6 GW in new electricity capacity.[11]

Production Tax Credit (PTC)

The Energy Policy Act of 1992 established the Renewable Electricity Production Tax Credit (PTC) as a primary federal incentive for renewables. Although solar thermal is a qualifying technology under the PTC, the policy has generally targeted wind energy projects in practice.[6] The PTC is a per-kilowatt-hour tax credit received by qualifying energy technologies for electricity generation. Therefore, the benefit of the PTC is directly linked with project performance. In addition to wind technologies, the federal tax credit was extended to also include biomass, geothermal, landfill gas, municipal solid waste, qualifying hydroelectric, and marine and hydrokinetic power generation.[6] Prior to the PTC's construction deadline on December 31, 2013, wind projects received a 2.3¢ per-kilowatt-hour credit. Including the current lapse, the PTC has expired four times during the past 15 years, leading to subsequent boom-and-bust investment cycles in wind energy.[7]

Table 3: Renewable Energy Production Tax Credit (PTC)		
Resource Type	**Begin Construction Deadline**	**Credit Amount**
Wind	December 31, 2013	2.3¢/kWh
Closed-Loop Biomass	December 31, 2013	2.3¢/kWh
Open-Loop Biomass	December 31, 2013	1.1¢/kWh
Geothermal Energy	December 31, 2013	2.3¢/kWh
Landfill Gas	December 31, 2013	1.1¢/kWh
Municipal Solid Waste	December 31, 2013	1.1¢/kWh
Qualified Hydroelectric	December 31, 2013	1.1¢/kWh
Marine and Hydrokinetic (150 kW or larger)	December 31, 2013	1.1¢/kWh

Source: U.S. Department of Energy (DOE)

Department of Energy (DOE) Loan Guarantee Program

Title XVII of the Energy Policy Act of 2005 authorizes the DOE to provide support for innovative clean energy technologies through loan guarantees.[12] In a loan guarantee agreement, the federal government pledges to cover the full debt obligation of a loan in the event of a borrower default, which materially reduces the borrowing costs for the loan guarantee recipient. Federal loan guarantees fill a unique gap in the market by increasing investments to clean energy projects that otherwise may not have been able to procure private sector financing. The DOE program has authorized $32.4 billion in loan guarantees to companies including Tesla Motors, Inc. and Solyndra, Inc.[12] The Loan Guarantee Program helped establish one of the world's largest wind farms, the largest concentrated solar power plant in the world and the largest utility scale photovoltaic generation facility.[12] In December 2013, the DOE issued a solicitation for applications from qualifying Advanced Fossil Energy Projects; under this solicitation, the DOE is authorized to grant loan guarantees through November 30, 2016.[13]

Renewable Portfolio Standards *(State-Level Policy)*

A renewable portfolio standard (RPS) is a regulatory mandate, currently only at the state-level, to increase energy production from renewable and other alternative energy sources to fossil and nuclear generation. Currently, 29 states and Washington, D.C. have renewable portfolio standards, while 9 states have renewable portfolio goals.[14] RPSs are common at that state-level, and in some European countries, and are most effective in driving renewable energy growth when coupled with accommodating federal policies (e.g. PTC).

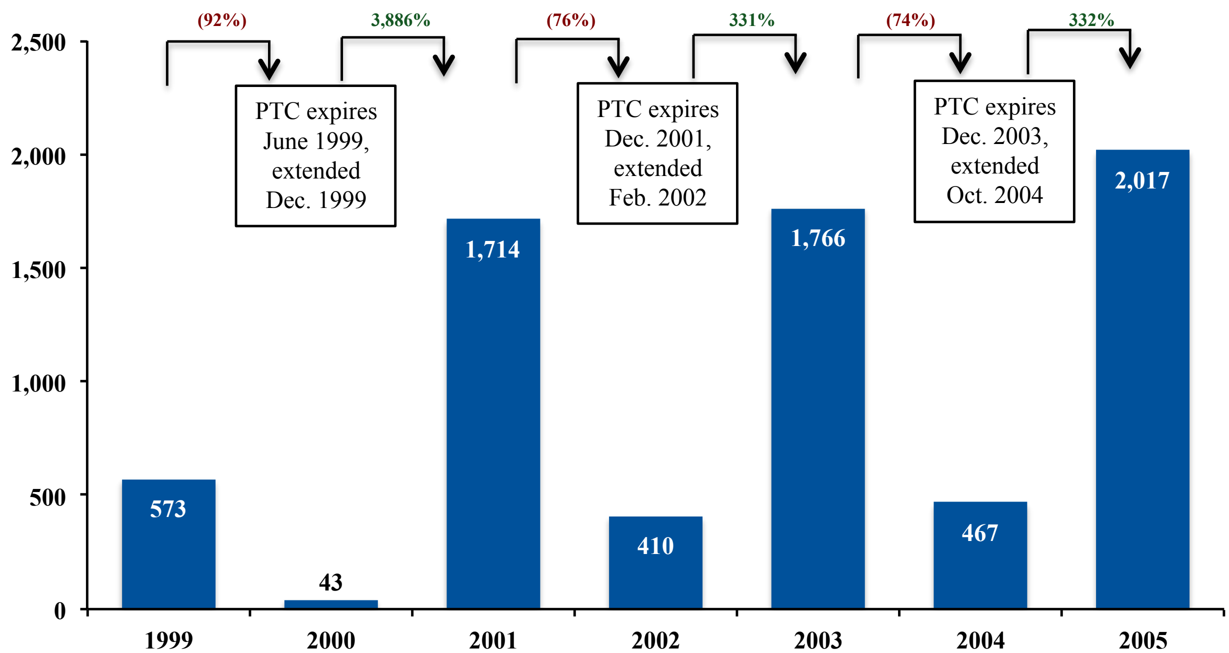
3. Relative Effectiveness of Cash Grants and Tax Credits in Driving Renewable Growth

This section aims to analyze the relative efficiencies of current public policies within the clean energy sector, building on existing literature. Although current policies have helped grow total renewable energy capacity, concerns persist regarding the consistent stability of recent public policies, the complexity of the tax equity structure and the inefficiencies of the PTC and ITC relative to the Section 1603 Cash Grant.

3.1 Regulatory Risks Associated with Cash Grants and Tax Credits Inhibit Sustained Development

The inconsistent durability of prevailing public policies within the clean energy sector has resulted in boom-and-bust investment cycles, shaking investor confidence. The Section 1603 program was only authorized briefly during the 2009–2011 period, while the ITC is expected to step down from 30 percent of a project's eligible cost basis to 10 percent in 2017.[15] A 20 percent tax credit reduction can materially affect the financial health and outlook of the renewable energy industry. Furthermore, each time the PTC has expired, wind project instillation rates have fallen dramatically, as shown below. The regulatory risk associated with an uncertain and evolving policy landscape has inhibited the steady development of renewable technology project instillations.

Figure 1: U.S. Wind Project Instillations (MW)



Source: Bloomberg New Energy Finance, AWEA

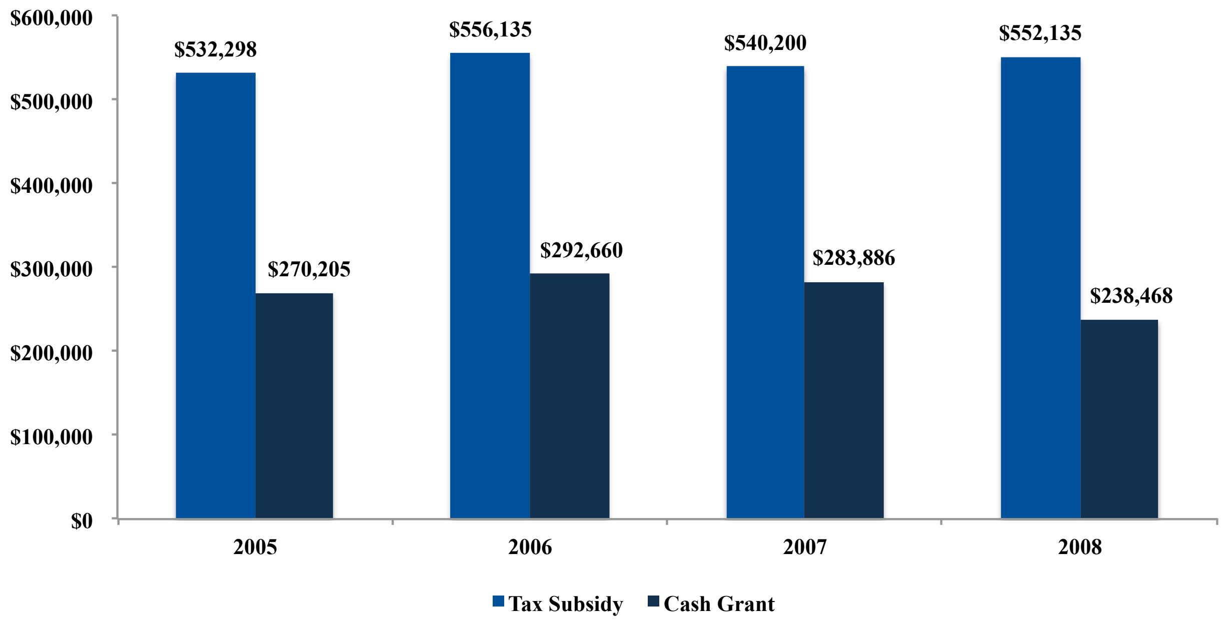
3.2 Tax Credits Facilitate Tax Equity Capital Structures and Elevate Financing Costs

Tax credit structures (PTC and ITC) are not an ideal fit for renewable energy projects. According to Felix Mormann, a faculty fellow at Stanford's Steyer-Taylor Center for Energy Policy and Finance, policymakers overlooked the fact that renewable energy projects lack, "the quintessential requirement to benefit from tax credits."[15] This quintessential requirement is a high enough tax bill to offset the tax credits. Most renewable energy developers are either small in size or lack sufficient profitability to generate adequate tax liabilities and reap the full benefits of the tax credit. Renewable projects have been incentivized to lower their tax burdens even further to benefit from the Modified Accelerated Cost Recovery System (MACRS), which enables developers to depreciate their project values on an accelerated five-year timetable.[16] The accelerated depreciation timetable allows companies to lower their Generally Accepted Accounting Principles (GAAP) Pre-Tax Income, resulting in a lower tax provision or, in the presence of a net operating loss (NOL), an offsetting tax benefit in the future.

Consequently, a specialized pool of third-party tax equity investors, primarily investment banks and insurance companies led by JP Morgan and GE Capital, stepped in to provide tax equity financing in exchange for interest payments and the tax credit benefit. A tax equity investment can help the project grow, allowing the developer to incur larger tax liabilities and, consequently, more tax benefits. There have only been approximately two-dozen sophisticated and highly profitable investors that are willing and able to provide tax equity investments to renewable energy projects, and the market demand is highly cyclical.[15] During the recent global economic recession, the number of tax equity investors shrank to 11 investors from the already low pool of around 20, as the tax equity investment market shrunk by over 80 percent (from $6.1 billion in 2007 to $1.2 billion in 2009).[15] Following the financial crisis, the tax equity market rebounded to $6 billion in deal volume for solar and wind projects in fiscal year 2011, but there are still less than 20 total investors in the tax equity market.[15] Due to the fact that a relatively small fraction of the greater investment community participates in the tax equity market, project developers compete over a tight supply of potential tax equity investment. A power imbalance protrudes between tax equity investors and project developers, which enables investors to secure favorable deal terms. Consequently, the large financial firms are able to collect a 7+ percent share on each dollar of tax expenditure associated with renewable energy projects.[27] In addition, a tax equity investor must be confident that a company is willing to produce tax liabilities through the maturity of the tax equity facility. Accordingly, the risk and term structures associated with tax equity investments increase a project's financing costs above traditional debt financing levels.

In response to the halt in the tax equity market during the global financial crisis, Congress established the Section 1603 Cash Grant program in ARRA 2009. The program enabled renewable energy companies to receive an equivalent cash grant in lieu of the prevailing ITC incentive. Renewable projects were now faced with the option to choose between the two policies. Consequently, the National Commission on Energy Policy commissioned Bloomberg New Energy Finance (BNEF) to analyze the effectiveness of the ITC and PTC in driving renewable energy growth relative to the Section 1603 Cash Grant. The study sought to determine which policy deploys taxpayer resources in the most efficient manner by measuring capacity instillation additions relative to government tax expenditures. During 2005–2008 there were nearly 19 GW of new wind capacity installed, which resulted in a $10.3 billion tax credit liability to the federal government.[16] According to the BNEF analysis, the federal government could have achieved the same amount of new wind capacity through approximately $5 billion in cash grant expenditures.[16] In other words, one dollar in cash has been approximately twice as effective in facilitating the development of wind generation as compared to one dollar of tax credits. The primary results from the BNEF analysis are shown below.

Figure 2: Projected Cost to Federal Government of Adding 1 MW of New Wind Capacity



Source: Bloomberg New Energy Finance PTC Ridge vs. Debt Valley financial model

Through the tax equity financing structure, a renewable developer only receives a portion of the allotted tax credit benefits, while the balance is transferred to the tax equity investor. Federal tax expenditures do not directly achieve their objective of delivering benefits to the renewable energy industry under the current tax credit incentive system. In a period when federal national debt levels have eclipsed $17 trillion, the efficient use of taxpayer resources is critical. As demonstrated by the BNEF analysis, a transition to a cash grant program as opposed to the prevailing tax credit may lead to equivalent capacity instillations for roughly half of the taxpayer resources. Such findings have encouraged policymakers to reevaluate the effectiveness of current policies within the clean energy sector and search for new policy mechanisms, including those that may exist outside of the traditional tax-credit realm. Policymakers have proposed the widespread introduction of the MLP corporate structure as a potential policy solution for renewable energy development. Renewable energy developers have begun to form YieldCos, which also benefit from low corporate-level taxation given the pass-through structure's ability to access accelerated depreciation rates under current tax policy.

4. Pass-Through Structures: Master Limited Partnership Overview

4.1 History of Master Limited Partnerships

A master limited partnership is a pass-through corporate structure whose ownership interests are traded in units on financial markets, like corporate stock. MLPs are able to operate with the liquidity of a publicly traded partnership, while avoiding the entity level taxation of a C-corporation. Rather than being taxed at the corporate entity level, MLPs are taxed on the quarterly distributions issued to their limited partners, similar to a corporate stock dividend. Since Apache Oil Company became the country's first MLP in 1981, the asset class has grown to a market capitalization of approximately $480 billion.[17]

Congress first created the MLP structure in the 1980s in response to the energy crisis of the 1970s. The corporate structure was established to drive investment into the energy sector (primarily for oil and gas exploration, production, refining, storage and transportation) by offering tax advantages to investors.[18] After Congress passed the Tax Reform Act of 1986, which lowered the top marginal individual income tax to a rate below the top marginal corporate tax, a large amount of partnership businesses began to structure themselves as MLPs, including the Boston Celtics.[18] The same Act also implemented passive loss rules that prevent investors from using MLP deductions to offset other income sources, but the policy did not stop companies from registering into the business partnership structure. The success of the MLP structure eventually led to concerns that a large number of corporations would become MLPs, avoid corporate taxes and, ultimately, erode the corporate tax base. As a result, Congress modified the regulations of MLPs in 1987, stating that the publicly traded partnerships would be considered C-corporations for tax purposes. The MLP structure would only be available to companies that generated at least 90 percent of its income from "qualifying sources," including royalties, rents and conventional natural resources (e.g. oil, natural gas, petroleum products, coal, timber and other minerals).[18] Since, there have been two additional amendments to the prevailing MLP legislation. First, in 2004 the American Jobs Creation Act extended the potential MLP investor base by allowing mutual funds to invest in MLPs.[18] Second, the recent Emergency Economic Stabilization Act of 2008 (EESA 2008) expanded the definition of qualifying income to include the transportation and storage of ethanol and biodiesel, as well as activities encompassing industrial sources of carbon dioxide.[18] It is important to note that the current MLP qualification continues to explicitly exclude "inexhaustible resources," or renewable energy technologies.

Table 4: MLPs vs Other Corporate Structures

Structure	MLPs	LLCs	Royalty Trusts	REITs	Corporations
Security Type	Units	Units	Units	Units	Shares
Tax Level	Unit Holder	Unit Holder	Unit Holder	Unit Holder	Corp., Shareholder
Tax Filing	K-1	K-1	K-1	K-1	1099s
Payments	Distributions	Distributions	Distributions	Distributions	Distributions
Tax Treatment of Payments	80% + Tax Deferred	80% + Tax Deferred	Ordinary Income	50% + Tax Deferred	15-34% Tax Rate
Primary Investor Base	Retail	Retail	Retail/Institutional	Retail/Institutional	Institutional
Governance	Poor	Better	Poor	Better	Good
Voting Rights	No	Yes	No	No	Yes
General Partner	Yes	No	No	No	No
Incentive Distribution Rights (IDRs)	Yes	No	No	No	No

Source: Credit Suisse Oil & Gas Primer

4.2 The MLP Parity Act (MLPPA)

Policymakers have proposed a potential change in the qualifying criteria for MLPs to include renewable energy technologies. The widespread introduction of MLPs to the renewable energy industry can be legislated through changes to the qualifying income criteria in a manner that parallels the qualification expansions in the aforementioned EESA 2008. U.S. Senator Chris Coons (D-DE) has spearheaded the effort behind the MLPPA, which would amend such qualifications. Senator Coons views the bill as a means to "level the playing field" by granting renewable energy developers with access to the tax and financing advantages their fossil fuel-based counterparts have been experiencing for decades.[19] The bill initially received bipartisan co-sponsorship and, in September 2012, was referred to the Committee on Finance; however, some critics have indicated that they would not support the MLPPA until tax credit incentives for renewable energy projects are eliminated.[17] Senator Coons opposed the elimination of the PTC and ITC in exchange for MLPPA support, and the bill has since remained trapped in committee.[20]

4.3 Incentive Distribution Rights Align General Partner Compensation with Limited Partner Interest

MLPs are limited partnerships with one or more general partners (GPs) and several limited partners (LPs). The GPs typically hold a 2 percent ownership stake and manage the partnership.[15] The LPs provide capital in exchange for cash distributions, but have no say in the partnership's management or operational execution.[15] GPs and LPs interests are aligned in the corporate structure through incentive distribution rights (IDRs), which grant GPs with a preferred share of the partnership's distributions. Typically, 49 percent of the ownership stake is issued to the public as common unit, while the remaining 49 percent of the units are subordinated and held by the financial sponsor or parent company related to the GPs for IDRs. The subordinated units essentially create 2-to-1 free cash flow coverage levels for common unit holders; free cash flow at the MLP would have to decrease by 50 percent before common unit holders' distributions are reduced. As quarterly distributions to the LPs rise, IDRs to GPs increase. As shown in the sample table below, up to 11.5 percent the LPs would collect 98 percent of the distribution rights, and each incremental yield gain above the 11.5 percent hurdle rate will be shared as indicated below.[3]

Table 5: MLP Incentive Distribution Rights Sample Tiers

Yield (X)	Limited Partners	General Partner
$X \leq 11.5\%$	98%	2%
$11.5\% < X \leq 12.5\%$	85%	15%
$12.5\% < X \leq 15\%$	75%	25%
$X > 15\%$	50%	50%

Source: Latham & Watkins LLP

MLPs often pay out virtually all of their distributable cash flows to LPs, except for the capital that management considers necessary to conduct and grow business operations. Although the IDR structure increases the likelihood that the parent-GP will ensure that the MLP reaches its dividend growth targets for LPs, "high split," IDRs can be problematic for the partnership. In high split IDR situations, the GP can claim 50 percent of incremental cash distributed by the MLP, stifling growth and burdening cash flow generation. The IDRs incentivize GPs to grow distribution yields for LPs, but may increase the cost of capital in the long run, as each new distribution must generate sufficient returns to cover both GP and LP shares.

4.4 MLP Structure Has a Strong, Proven Track Record Within the Energy Sector

The attractiveness of the MLP structure itself can draw investors who otherwise may not have been willing or able to participate in renewable projects. MLPs as an asset class provide investors with superior risk-adjusted returns, attractive income-generating yields (typically falling in the 6 to 7 percent range), preferential tax treatment and low correlation to other asset classes.[23] The increased investment appetite for MLPs combine with the benefits of lower costs of capital to make MLPs (and other pass-through partnerships) an effective policy solution in driving energy development broadly.

Superior Risk-Adjusted Returns

Low Volatility, Low Standard Deviation, Low Correlation to Broader Market

Table 6: Performance Metrics

Metric	MLPs	REITs	Utilities	S&P Oilfield Services	S&P E&P Index	S&P 500
Compound Annual Growth Rate (CAGR) *10-year through 2/28/14*	15.1%	8.8%	6.4%	12.0%	**15.5%**	7.2%
Standard Deviation	4.7%	7.4%	**3.8%**	9.2%	7.8%	4.2%
Correlation to S&P 500	**0.47**	0.76	0.53	0.66	0.60	1.00
Beta *Volatility measure relative to broader market*	0.52	1.34	**0.48**	1.44	1.11	1.00
Sharpe Ratio (Risk-Adjusted Return) *Excess Return / Volatility*	**2.5**	0.7	0.8	0.9	1.5	0.9
Alpha *Measure of performance beyond systematic risk/return profile (Beta). Alpha is often considered the portion of returns provided by managerial selection and performance*	**9.7%**	0.4%	1.2%	3.2%	7.9%	0.0%

As of 2/28/14; Source: Alerian, Thomson Reuters, Credit Suisse

5. Pass-Through Structures: YieldCo Overview

5.1 Yield Companies (YieldCo or 'Synthetic MLP')

While MLPs remain exclusive to oil, gas and other conventional energy competitors, renewable energy developers have recently begun to create publicly traded yield-generating companies known as YieldCos. Similar to an MLP, a YieldCo is a dividend-oriented company that distributes up to 90 percent of its available cash flow to shareholders, including both GPs and LPs. The current MACRS tax depreciation system enables renewable energy developers to use an accelerated depreciation timetable. Therefore, YieldCos can report accounting losses, ultimately replicating the tax benefits of an MLP structure. Both YieldCos and MLPs are characterized by the ownership of energy infrastructure with contracted long-term contracted cash flows, most of which is distributed to shareholders. In addition, both business structures generally maintain close partnerships with a parent or financial sponsor in order to drive growth through announced drop-downs.[29] YieldCos typically enter Right-Of-First-Offer (ROFO) agreements with its sponsor/parent, which covers a predetermined group of assets that are likely to be dropped-down over time to the YieldCo. For instance, NRG Yield's parent company, NRG Energy, would consider selling another 1,500MW to NRG Yield, or approximately 50 percent of its current capacity levels.[29]

NRG Yield became the first publicly traded YieldCo in July 2013, when NRG Energy (the parent company) sold approximately 35 percent of the company in an initial public offering (IPO).[29] Since, YieldCos have grown to reach a combined market capitalization of greater than $10 billion, with five new YieldCos going public over the last twelve-month period.[29] NRG Yield's share price has more than doubled since its IPO, while even the weakest performing YieldCo entities have impressively appreciated by approximately 25 percent.

Table 7: MLP and YieldCo Comparison

Investment Characteristic	MLP	YieldCo
Most Available Cash Flows Distributed to Investors	Yes	Yes
Own Energy Infrastructure	Yes	Yes
Focus on Growth of Dividends / Distributions	Yes	Yes
Dividends / Distirbution Tax Deferral Potential	Yes	Yes
Limited or No Cash Taxes at Entity Level	No Tax	Limited Tax
Dividends / Distributions Taxed at Lower Qualified Rate	Ordinary Income	Dividend Tax Rate
General Partner and Incentive Distribution Rights Inclusion	Yes	Sometimes
Voting Rights	No	Yes
Tax Reporting	K-1	1099

Source: Morgan Stanley Research

5.2 Incentives for Forming a YieldCo

Developers find YieldCos to be attractive for several reasons. First, the pass-through structure facilitate higher valuations for renewable energy assets relative to if the same assets were housed within a utilities parent company.[29] Traditional utilities and merchant power companies are valued based on Price/Earnings or Enterprise Value/EBITDA multiples. Such valuation methodologies are 'capital structure neutral,' meaning that they do not consider the benefits associated with lower cash tax expenses, maintenance capital expenditures and financing costs. On the other hand, YieldCos are typically valued based on Cash Flow Available for Distribution and the subsequent yield for shareholders. Therefore, by placing renewable assets into a YieldCo structure, renewable developers receive higher valuations for those assets, as investors generally base valuations in a methodology that considers the lower tax provisions and borrowing costs associated with pass-through structures. Second, with regards to debt, YieldCo borrowing costs have been around the 5 percent range despite leverage levels of 5.0x to 7..0x EBITDA; meanwhile, equity dividend yields have fluctuated between a low 2 and 5 percent.[29] These financing costs compare well to recent asset acquisitions, which have ranged in about the 10 to 12 percent range for debt borrowing costs with a 7 to 9 percent equity dividend yield.[29]

> **"If these higher multiples persist, owning a yield vehicle will provide (renewable developer) sponsors with an attractive equity currency to buy assets or gain access to capital at a significantly lower cost than otherwise available."**
>
> – Moody's Investor Service
>
> Source: Moody's Announcement *New MLP's, Yieldcos Expected in the Utilities/Power Sector (March 20, 2014)*

5.3 Risks to YieldCo Investors

As a substantial majority of the YieldCo entities' cash flows are distributed to shareholders, YieldCos (and MLPs) are heavily reliant on financial markets to raise capital and fund growth.[29] Therefore, capital markets risk persists; a rise in the cost of debt or equity capital for YieldCos can hinder the entities' ability to generate cash flow for distributions. However, YieldCos that are more focused on ROFO drop-downs can continually grow with modest levels of capital markets activity, since those YieldCos have a telegraphed pipeline of potential assets for acquisition that may already have project-level debt attached to them.[29] In addition, YieldCos contain liquidity risk, especially as compared to the more mature MLP asset class. Most YieldCos today have relatively small market capitalizations; the largest YieldCos are around $3 to $4 billion, most of which is owned by the parent company/sponsor.[29] Consequently, YieldCo daily trading volumes are relatively low, which means it cannot be traded as easily as other assets in the market. As YieldCo entities grow and more companies form YieldCo structures, trading volumes will increase over several years.

6. Financial Analysis: Methodology

6.1 Financial Model Assumptions Based on Solar Comparable Companies Analysis

The renewable energy industry has received a multitude of support from various public policies. Throughout the sector, most direct financial support has come in the form of tax credits and cash grants. Prevailing discourse has examined the relative effectiveness of cash grants and tax credits in achieving policy objectives. The relative inefficiency of the tax credit incentive, especially compared to the cash grant program, prompted policymakers to seek alternative policy solutions, including the MLP structure. Accordingly, this thesis seeks to analyze the relative efficiency of cash grants, tax credits and pass-through tax structures (MLPs and YieldCos) as policy options for facilitating renewable energy industry. Using a model based on existing solar companies, this thesis contributes a detailed, fundamental analysis of the implications the various policies can have on the financial health and outlook of a renewable energy developer (*see Appendix*). In addition this thesis seeks to further renewable policy discourse by financially evaluating pass-through limited partnerships side-by-side with cash grants and tax credits. The goal of the analysis was to determine how the different policies affect a renewable developer's free cash flow relative to the subsequent tax revenue loss to the government. The most effective policies will convert tax expenditures directly into incremental free cash flow, with minimal cash leakage (e.g. tax equity interest payments).

In order to model a hypothetical solar company, a comparable companies analysis was conducted on five of America's largest solar power developers, manufactures, providers, installers and operators: SolarCity, First Solar, Canadian Solar, Inc., SunPower and Vivint Solar. The analysis was used to determine key business metrics including margins, enterprise valuation multiples, cost of debt, capital expenditures and working capital requirements. The main assumption inputs in the financial model that were derived from the comparable companies analysis are shown below.

Table 8: Solar Comparable Companies Analysis ($ in millions)

LTM 6/30/14		EV	Total Debt	EV/Debt	Cash	EBITDA	Debt/EBITDA	Revenue	Gross Profit	Operating Income	Pre-Tax Income	Δ Working Capital	Cash Int. Expense	Capex
SolarCity	(SCTY)	5,876	840	7.0x	405	(179)	-4.7x	221	65	(225)	(177)	126	(10)	(10)
First Solar.	(FSLR)	4,499	195	23.1x	1,349	651	0.3x	3,529	883	409	378	187	(10)	(225)
CanadianSolar	(CSIQ)	2,503	1,176	2.1x	341	212	5.6x	2,101	388	195	56	(485)	(65)	(23)
SUNPOWER	(SPWR)	4,331	1,110	3.9x	988	330	3.4x	2,496	581	231	42	(14)	(46)	(35)
vivint.solar	(VSLR)	1,692	141	12.0x	25	292	0.5x	483	355	(53)	(125)	*N/A*	*N/A*	(9)
Average		**3,780**	**692**	**9.6x**	**622**	**261**	**1.0x**	**1,766**	**454**	**111**	**35**	**(47)**	**(33)**	**(60)**

Source: Bloomberg, figures represent last twelve-months as of June 30, 2014

Table 9: Financial Model Assumptions Derived From Solar Comparable Companies Analysis

LTM 6/30/14	**Gross Margin** (Gross Profit / Revenue)	**EBITDA Margin** (EBITDA / Revenue)	**EV/ EBITDA**	**Pre-Tax Margin** (Pre-Tax Income / EBITDA)	**ΔWC as a % of Revenue**	**Capex as a % of Revenue**	**Int. Expense / Total Debt**	**Cash / EV**
Rounded Average	25.0%	15.0%	14.5x	13.5%	2.5%	3.5%	5.0%	16.0%

Source: Bloomberg, last twelve-months as of June 30, 2014

6.2 Independent Variable: Income Generation and EBITDA Levels

The hypothetical solar company in the financial model was built using the solar comparable companies analysis. The model simulated the effects a cash grant, a tax credit and pass-through corporate structure have on a singular solar company's free cash flow generating ability. A company's ability to generate free cash flow determines its ability to service its debt obligations, reinvest into the business and accelerate long-term growth. Free cash flows were calculated after accounting for the effect the various policies have on tax provisions and cash interest payments. To isolate the effects the policies have on free cash flow conversion in the model, the company operates with identical revenues, gross margins, EBITDA margins and pre-tax income margins throughout the policy cases. EBITDA is a non-GAAP metric that stands for earnings before interest, taxes, depreciation and amortization. EBITDA measures a company's profitability and is used to represent a company's true ability to generate cash flow irrespective of tax policy, depreciation strategy, capital structure and interest expense (which vary between policy scenarios). Although the policies directly influence a renewable company's tax provisions and interest expenses, the solar company generates the same EBITDA levels across the policy cases. In addition, the pre-tax margin figure is taken from the solar comparable companies analysis in order to accurately reflect the size of a solar company's tax provision relative to its revenues throughout the various policy cases. Working capital and capital expenditure levels were in line with the comparable companies analysis and were held constant across the policy options to reflect the same core business needs. It is important that the solar company has the same normalized profitability prior to the changes in capital and tax structures that result from the policy cases in order to accurately determine thee policies' relative effects.

Figure 3: Independent Variable Appendix Reference

Independent Variable: Income Generation & EBITDA

	Base Case			
Company Financials by Tax Policy ($ in millions)	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**
Income Summary Assumptions	12/31/14	12/31/15	12/31/16	12/31/17
Revenues	1,000	1,270	1,613	2,048
Growth (Year-over-Year) (1)		*27.0%*	*27.0%*	*27.0%*
Cost of Goods Sold	(750)	(953)	(1,210)	(1,536)
Gross Profit	250	318	403	512
Gross Margin	*25.0%*	*25.0%*	*25.0%*	*25.0%*
EBITDA	**150**	**191**	**242**	**307**
EBITDA Margin	*15.0%*	*15.0%*	*15.0%*	*15.0%*
Change (bps)		*0 bps*	*0 bps*	*0 bps*
Pre-Tax Income	20	26	33	41
Pre-Tax Margin	*13.5%*	*13.5%*	*13.5%*	*13.5%*

6.3 Dependent Variable: Effects of Policy Scenarios on Cash Flow, Financing Costs and Tax Provisions

Free cash flow (FCF) represents the cash that a company generates after outlaying the capital required to maintain business operations, service debt obligations and cover tax provisions. In other words, FCF represents EBITDA after considering tax policy and capital structure requirements. Free cash flow was selected as a means of explaining how the different tax and corporate structures affect a company's ability to convert its income into growth. From the government's perspective, measuring the amount of tax expenditures relative to the amount of cash flow gained to the company provides insight into the portion of tax expenditures that reach the company after accounting for federal taxes and other costs associated with the underlying policy scenario. Free cash flow is the cash the company generates after realizing the effects of the tax policies. At a high level, free EBITDA levels drive cash flow available to investors, less debt and tax equity service, as most other outflows are relatively modest.

Free Cash Flow (FCF) = EBITDA – Cash Int. Expense – Cash Tax Provision – Δ Working Capital – Capital Expenditures
Free Cash Flow (FCF) = Cash from Operations – Capital Expenditures

<u>Base Case</u>

The cost of debt in the base case is 5 percent (rounded average from the comparable companies analysis) and the company incurs the conventional 35 percent corporate tax rate. The government does not experience any tax revenue loss. A 5 percent interest rate was held consistent as a baseline for traditional debt financing throughout the policy scenarios, except for in the pass-through status scenario (4 percent interest rate) to reflect the structure's affect on reducing costs of capital. The base case represents a solar company operating in an environment without benefitting from any renewable energy tax policy (cash grant, tax credit, pass-through structure). The solar company's enterprise value was determined by the EBITDA multiple derived from the solar comparable companies analysis. The model also assumes a constant, modest leverage level across all policy scenarios. In the tax credit case, the same aggregate leverage level (2.0x EBITDA) was applied between tax equity and traditional debt financing.

<u>Cash Grant</u>

In the cash grant case, the company incurs the same 35 percent corporate tax rate as in the base case, but also receives a tax benefit equivalent to 30 percent of capital expenditures through 2016, until the benefit steps down to 10 percent of expenditures. The tax revenue loss to the government is equal in value to the tax credit benefits to the company. The cash grant does not necessitate tax equity financing (like in the tax credit scenario), and thus incurs the same debt financing costs as the base case. The cash grant scenario replicates the effects of receiving a cash injection in lieu of the prevailing investment tax credit incentive.

Tax Credit

In the tax credit scenario, the company experiences the same corporate tax provisions and tax benefits as the cash grant, while the foregone government tax expenditure is the tax credit benefits to the company (equal in value to the cash grant scenario). However, in the tax credit case the company enters a tax equity financing structure. According to BNEF, the average tax equity yield jumped from a normalized 6 percent to 9 percent following the recent global financial crisis. Accordingly, the model assumes a 7 percent interest rate for tax equity financing.

The tax equity market is relatively opaque, but BNEF estimates that tax equity generally constitutes 60 percent of capital expenditures[16] On the other hand, solar companies including SolarCity tend to have tax equity leverage levels closer to 80 percent.[25] Accordingly, the model assumes a 70 percent tax equity level relative to its total financing, or the sum of both tax equity and debt facilities. The change in the company's capital structure composition to include more tax equity, and less debt, in the tax equity scenario ultimately leads to a higher weighted average cost of capital for the company. A higher borrowing cost drags on both cash flow generation and a company's growth outlook. The extent to which tax equity financing hinders a renewable energy development is dependent on the amount and cost of tax equity invested at the company level and the cost of the tax equity facility itself. A sensitivities analysis was conducted to demonstrate how such assumptions could affect the results of the financial model.

Pass-Through Structure

In the pass-through scenario, the solar company incurs no cash tax provision at the entity level. Therefore, the tax revenue loss is equivalent to the corporate tax rate provision, which the government would have collected had the entity not registered under the pass-through structure. Like the other policy scenarios, the pass-through case assumes total financing levels of 2.0x EBITDA, but the accompanying lower cost of capital is reflected through a lower 4 percent interest rate on the debt facility.

Figure 4: Dependent Variable Appendix Reference

Effects of Policy Scenarios: Debt & Tax Equity Service + Tax Provision + Operating & Maintenance Expenses

Dependent Variable: Δ Free Cash Flow (Solar Company) / Δ Tax Revenue Loss (Government)

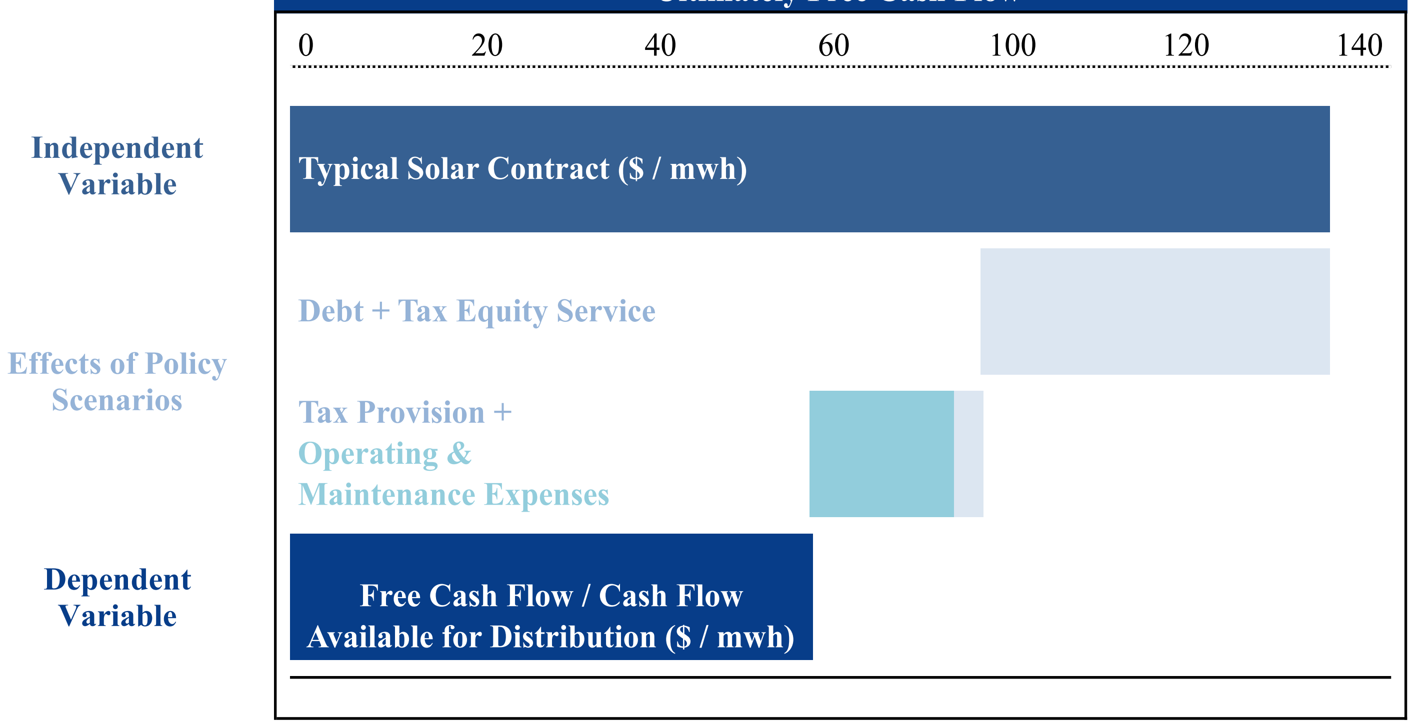
Effects of Policy Scenarios: Debt & Tax Equity Service + Tax Provision

Cash Flow Summary				
EBITDA	150	191	242	307
Debt Cash Interest Expense (5.0% Rate / 4.0% for Pass-Through)	(15)	(19)	(24)	(31)
Tax Equity Cash Interest Expense (7.0% Rate)	-	-	-	-
Tax Provision	(7)	(9)	(11)	(15)
Effective Tax Rate	*(35%)*	*(35%)*	*(35%)*	*(35%)*
Tax Benefit	-	-	-	-
Effective Tax Credit (% of Capex)	-	-	-	-
Working Capital	(25)	(32)	(40)	(51)
Cash from Operations	103	131	166	211
Capital Expenditures	(35)	(44)	(56)	(72)
Free Cash Flow (Cash Flow Available for Distribution)	**68**	**86**	**110**	**139**
FCF Conversion (as a % of Revenue)	*6.8%*	*6.8%*	*6.8%*	*6.8%*
NPV of Free Cash Flow (8% Discount Rate)				**$326.03**
NPV of Tax Revenue Loss (3% Discount Rate)				-
($\Delta_{(Base)}$ NPV FCF / $\Delta_{(Base)}$ NPV Tax Revenue Loss)				-
EBITDA - Capex	115	146	185	236
Balance Sheet Summary				
Cash	348	442	561	713
Total Debt	300	381	484	615
Tax Equity	-	-	-	-
Enterprise Value	2,175	2,762	3,508	4,455
EV / EBITDA	14.5x	14.5x	14.5x	14.5x
Credit Statistics				
Total Debt / EBITDA	2.0x	2.0x	2.0x	2.0x
Tax Equity / EBITDA	-	-	-	-
EV / Total Debt	7.3x	7.3x	7.3x	7.3x
EV / Tax Equity	-	-	-	-
EBITDA / Total Interest	10.0x	10.0x	10.0x	10.0x
(EBITDA - Capex) / Total Interest	7.7x	7.7x	7.7x	-7.7x
FCF / Total Debt	22.6%	22.6%	22.6%	22.6%
FCF / Tax Equity	-	-	-	-

6.4 Key Metric: $\Delta_{BaseCase}$ Free Cash Flow / $\Delta_{BaseCase}$ Tax Revenue Loss

Consistent with U.S. government financial models, the net present value of the incremental tax revenue loss is calculated using a 3 percent discount rate. The net present value of the incremental free cash flow is determined using an 8 percent discount rate; typically the private sector uses a higher discount rate than the government. A higher discount rate implies that the future is valued less (a dollar is more valuable today, relative to a dollar tomorrow), possibly as a result of a relatively riskier or uncertain forecasted outlook. The key metric serves as a measure of the relative efficiencies at each policy converts tax expenditures into incremental free cash flow for a renewable energy developer. Free cash flow is the cash the company generates after considering depreciation strategy, tax provisions and interest expenses (which is determined by the policy scenarios). The metric helps establish the relative abilities of the policies to effectively deploy taxpayer resources by measuring the cash flow benefit to the company relative to the tax revenue loss for the government under each policy scenario. This metric will help determine how efficient each policy is in furthering renewable energy development for each dollar in government tax expenditures.

Figure 5: Policy Scenarios Influence Financing Costs, Tax Provision and Ultimately Free Cash Flow



Source: Company Data, Morgan Stanley Research

7. Financial Analysis: Results

Table 10: Key Findings				
($ in millions)	**Base Case**	**Cash Grant**	**Tax Credit**	**Pass-Through Tax Status**
Net Present Value (NPV) of Free Cash Flow (FCF) *8% Discount Rate*	326.0	365.9	345.7	374.5
ΔNPV of FCF Relative to Base Case *% Growth*	-	39.9 *12%*	19.7 *6%*	48.4 *15%*
Weighted Average Cost of Debt and Tax Equity	5.0%	5.0%	6.4%	4.0%
Net Present Value (NPV) of Tax Revenue Loss *3% Discount Rate*	-	44.6	44.6	38.7
ΔNPV of Tax Revenue Loss Relative to Base Case	-	44.6	44.6	38.7
Effective Tax Rate	*(35%)*	*(35%)*	*(35%)*	*0%*
Tax Credit Benefit *As a % of Capital Expenditures*	-	*30% of expenditures until 2016, 10% thereafter*	*30% of expenditures until 2016, 10% thereafter*	-
Δ(Base) NPV of FCF / Δ(Base) NPV of Tax Revenue Loss *A measure of the cash flow benefit to the company relative to the tax revenue loss for the government*	-	**89%**	**44%**	**125%**

7.1 Summary of Results by Policy Scenario

Base Case

With the 35 percent corporate tax rate and a 5 percent interest rate for its debt obligations, the base case generated $326 million in FCF over the 2014 to 2017 period. The government experiences no tax revenue loss, as the company is not capitalizing on any renewable energy tax policy. The base case scenario serves as a reference point to evaluate the effectiveness of the subsequent policy options.

Cash Grant

The cash grant case leveraged the federal grant to generate approximately $366 million in FCF, or a $40 million net increase above the base case. From the government's perspective, the company still outlays the 35 percent corporate tax rate but now receives a tax credit based on capital expenditures. The tax revenue loss is equivalent to the tax credit benefit the company receives (30 percent of expenditures through 2016, 10 percent thereafter). Accordingly, the government tax loss in the cash grant scenario was approximately $45 million. Therefore, each $1 increase in tax revenue loss resulted in a direct $0.89 increase in free cash flow at the given 8 and 3 percent discount rates for free cash flow and tax revenue loss, respectively. The financial model reached the same conclusion as BNEF in determining that cash grants are approximately twice as effective in deploying taxpayer resources relative to tax credits.

Tax Credit

In the tax credit scenario, the government tax expenditures are equal to those in the cash grant ($45 million). However, the company's higher cost of debt leads to higher cash interest expenses, which ultimately drains FCF. Consequently, the company generated $346 million in FCF, or a $20 million net increase above the base case scenario. Although tax credits have played, and continue to play, an instrumental role in renewable energy growth, the policy inefficiently allocates taxpayer resources. The tax credit policy option was 44 percent efficient in converting tax expenditures into incremental FCF to a renewable energy developer. Each $1 increase in tax revenue only resulted in a direct $0.44 increase in free cash flow. Accordingly, the financial model corroborated Bloomberg's conclusion, which stated that government expenditures through cash grants are twice as effective in driving renewable energy development than expenditures through tax credits. From the company's perspective, the tax equity financing structure elevates costs of capital, hindering a renewable energy project's financial growth outlook and ability to attract investors.

Pass-Through Tax Status

In the pass-through case, the company incurs no tax provision at the entity level. Therefore, the tax revenue loss is equivalent to the corporate tax rate provision, which the government would have collected had it not been for the pas-through structure. The tax revenue loss for the pass-through scenario was $39 million, lower than in both the tax credit and cash grant cases. The company leveraged its advantaged tax status to generate $375 million in FCF, or a net gain of $48 million above the base case. Although the pass-through structure resulted in lower FCF generation relative to the cash grant, pass-through structures are relatively more efficient in directing tax expenditures towards their policy objectives. In the pass-through structure, there is no actual transaction that takes place between the government and the company, as is the case with a cash grant or a tax credit. Instead, the company keeps the tax revenue loss from the outset through its pass-through tax status, limiting cash leakage inefficiencies in the process.

7.2 Pass-Through Structures (MLPs and YieldCos) Most Efficiently Deploy Taxpayer Resources

Cash grants and the pass-through structures were both relatively efficient in their use of taxpayer resources according to the financial model. However, the financial analysis revealed that pass-through tax structures are more efficiently able to convert tax expenditures into free cash flow for renewable energy developers. The ancillary benefits that come with a pass-through tax status position the business structure as the optimal alignment of interests between policy objectives and investor incentives for the renewable energy industry. Pass-through structures are more beneficial to both the government and the private sector in facilitating renewable energy growth. The absence of taxes at the corporate level provides MLPs and YieldCos with a lower cost of capital, or the cost of obtaining capital through debt, equity or tax equity.[23] A lower cost of capital increases the pass-through structure's relative attractiveness to investors by enabling such companies to pursue projects that might not be feasible for a taxable corporation. It is important to also note that the pass-through structure is designed as a dividend-oriented mechanism; the company does not keep all of the cash flow gain it receives from its tax benefit, but rather distributes most of its available cash flow to shareholders.

The pass-through structure serves as an efficient vehicle to manage steady, cash flow generating assets for a parent company, who can then efficiently distribute yield-oriented dividends to investors and, ultimately, attract a larger investor base. MLPs and YieldCos, for instance, raise capital from a retail investor base, which helps democratize the future growth of the nation's renewable energy. While the prevailing tax credit structure limits investments to the small community of tax equity investors, pass-through structures open the renewable energy industry to an alternative pool of investors with a competitive source of equity capital.

Certain renewable energy companies with relatively mature assets have already begun to capitalize on pass-through tax advantages, as evident by the upsurge in publicly traded YieldCos.[24] Similar to MLPs, YieldCos are pass-through corporate structures that house assets and offer investors with dividends supported by a high payout ratio and stable cash flows. Notable YieldCos include NRG Yield, Pattern Energy and NextEra Energy Partners. Renewable developers are able to synthetically replicate the benefits of an MLP through the YieldCo structure. Like an MLP, a YieldCo pays out most of its distributable cash flow, while avoiding the corporate level taxation of a C-corporation. Unlike MLPs who derive their tax benefit from direct IRS approval, YieldCos rely on the current depreciation system in America. The Modified Accelerated Cost Recovery System (MACRS) allows renewable energy developers to depreciate qualifying assets on a five-year timetable. An accelerated depreciation table allows the firm to continually incur accounting losses, while receiving offsetting tax benefits in the future. The rise in the YieldCo structure offers a proof-of-concept for pass-through business partnerships by demonstrating that the structures can effectively raise capital to drive renewable energy development.

8. Sensitivity Analysis and Limitations of Analysis

8.1 Implications of Sensitivity Analysis: Importance of Unlocking a Lower Cost of Capital

The results of the financial model are contingent on the assumptions built into the model. As previously discussed, most of the assumptions were derived from a comparable companies analysis of leading solar developers and providers. However, the relative effectiveness of the policies in converting tax expenditures into incremental free cash flow was influenced by the parameters surrounding tax equity and traditional debt financing partnerships. The level of debt and tax equity affects the results of the model, in addition to their respective borrowing costs. Therefore, a sensitivity analysis was conducted in order to determine how different levels and costs of financing would affect the results of the financial analysis. Key findings are shown in Table 11 below.

Table 11: Sensitivity Analysis Summary

% = Δ(Base) NPV FCF / Δ(Base) NPV Tax Revenue Loss		**(Total Debt + Tax Equity) / EBITDA**		**% Tax Equity / (Total Equity + Total Debt)**
		0.0x	**2.0x**	
Cash Grant Interest Rate	**3.0%**	89%	89%	0%
	5.0%	89%	89%	0%
	7.0%	89%	89%	0%
Tax Credit Interest Rate Spread (Relative to 5.0% Base Case)	**-2.0%**	89%	89%	0%
	0.0%	89%	89%	0%
	+2.0%	89%	89%	0%
	-2.0%	89%	**135%**	70%
	0.0%	89%	89%	70%
	+2.0%	89%	**44%**	70%
	-2.0%	89%	**154%**	100%
	0.0%	89%	89%	100%
	+2.0%	89%	**25%**	100%
Pass-Through Structure Int. Rate Spread (Relative to 5.0% Base Case)	**-2.0%**	88%	**162%**	0%
	0.0%	88%	88%	0%
	+2.0%	88%	**13%**	0%

As Table 11 shows, the efficiency of the cash grant policy remained static across the various sizes and costs of the financing facilities. Therefore, since the results are compared relative to a base case scenario, the cash grant remains equally as effective as long as the company continues to operate with the same debt levels and interest rates as the base case scenario. A cash grant does not materially affect a company's borrowing costs like a tax credit or pass-through structure would.

In addition, the sensitivity analysis revealed that each policy scenario would be equally efficient in the absence of any financing facilities (either debt or tax equity) or when the size and borrowing cost of those financing facilities is unchanged from the policies relative to a base case scenario. In practice, tax equity raises cost of capital while advantages from valuation uplifts and low entity-level taxation help lower the cost of capital for a pass-through tax structure. Rather than adjusting the base case scenario to match the cost of capital of the company under the various policy scenarios, the sensitivity analysis measured the relative cost of capital spreads between the policies and the base case scenario. The sensitivity analysis showed that both tax credits and pass-through structures would most effectively deploy taxpayer resources when operating with a cost of debt below that expected from traditional debt financing costs. Therefore, policymakers should search for policy solutions that lower a company's cost of capital, in order to receive the greatest benefits for each dollar of tax revenue loss.

8.2 Limitations of Analysis

Hypothetical Company Based on Solar Developers Without YieldCos

The most substantial limitation to the financial analysis is that it was conducted on a hypothetical company. In practice, the companies that operate under the various policy scenarios often contain very different characteristics. For instance, a pass-through structure would generally incur greater debt levels as compared to a company operating under a tax credit incentive as a result of the associated lower cost of capital. In the proprietary financial model, the company's key income generation metrics and financing levels were held constant in order to isolate the effects of the policies. The solar companies that were used for the comparable companies analysis do not have YieldCos or other pass-through structures, which facilitates the comparison of a solar company before and after registering as a pass-through business partnership. The analysis into pass-through structures can be further improved by using actual YieldCo companies' data. Since there are relatively few YieldCos in existence currently, it is possible to evaluate the entire asset class in a robust manner; an actual analysis into the tax benefits received by each YieldCo can provide policymakers with exact metrics into the effectiveness of the structure in converting tax expenditures into incremental free cash flow for a renewable developer. A financial model of NRG Yield is included in the Appendix for reference. The effects of the policy will vary from one entity to another depending on business needs and capital structure requirements.

Current Market Environment May Heighten Appeal of Pass-Through Structures

Largely a result of the monetary policy of the Federal Reserve, financial markets are currently in an ultra-low interest rate environment. Therefore, dividend-oriented asset classes, including MLPs and YieldCos, may be relatively more attractive to investors in search for yield. Although pass-through structures have weathered business cycles in the past, it is important to note that the impressive recent performance of YieldCos and other pass-through structures is partially supported by an equity-led bull market and low interest rate environment. Renewable developers and policymakers alike should be concerned with how YieldCos will perform in the strong likelihood of a rising rate environment over the next several years.

Emphasis on Debt Side of Cost of Capital Relative to the Cost of Equity

Most of the cost of capital analysis in the proprietary financial model focuses on the cost of debt rather than the cost of equity. As pass-through structures facilitate liquidity enhancements by allowing shares to trade publicly on an exchange with a more competitive source of equity capital. These structures can lower cost of equity, in addition to the reduction in the cost of debt that was seen in the proprietary financial model. More analysis can be conducted to determine the effects that publicly traded vehicles have on lowering the cost of equity for renewable technology developers.

9. Conclusion: Policy Recommendations

9.1 Government Policy Should Favor Cash Grants in Lieu of Tax Credit Incentives

The financial analysis was in line with the BNEF conclusion in determining that cash grants are approximately twice as effective in deploying taxpayer resources relative to tax credits. Although the tax credit is likely to be renewed, policymakers should consider legislating an optional cash grant program in lieu of the traditional tax credit incentive, particularly during turbulent periods in the tax equity market. An accompanying low guarantee program can lower project funding costs for renewable developers while renewable portfolio standards can encourage renewable technology investments. The federal government would more effectively achieve its policy objectives with taxpayer resources by favoring cash grant policies over tax credit programs.

9.2 Government Policy Should Support Accommodating Market Environment for YieldCos

In the United States, approximately 30 states have some form of a renewable portfolio standard. Accordingly, there will be a continual increase in renewable energy capacity, which has doubled over the last 5-years.[29] According to Morgan Stanley Research, renewable energy capacity is expected to double again by the end of the decade, as approximately $150 billion will be invested into renewable technology projects.[29] YieldCos are likely to be involved in the forecasted upsurge in renewable energy development. As YieldCos are the only available pass-through structure to the renewable energy industry today, the structure can help drive renewable energy growth by providing developers with lower financing costs and access to a broader investor base.

Similar to MLPs, the performance of YieldCos can be tied to access to capital, including both equity and debt. A rising rate environment is likely to present obstacles for YieldCos in meeting their growth objectives. Therefore, the Federal Reserve can best support renewable energy development by facilitating a gradual increase in interest rates, to ease the eventual increase in borrowing costs for YieldCos and their investors. In addition, the government can benefit from supporting YieldCos who focus on Right-Of-First-Offer (ROFO) drop-down asset acquisitions for growth, since those YieldCos are less dependent on access to capital markets. Furthermore, the government can benefit from supporting YieldCos that have modest incentive distribution right (IDR) agreements; ‘high split’ agreements that can result in up to a 50 percent distribution share for the general partner can inhibit a renewable developer’s stable free cash flow generation.

YieldCos are able to replicate the tax advantages of an MLP due to the nature of the depreciation and tax credits generated by the YieldCo structure. Technologies that qualify under the ITC are also eligible to depreciate their assets on an accelerated 5-year timetable under the current Modified Accelerated Cost Recovery System (MACRS). The accelerated depreciation allows renewable technology companies to create accounting paper losses, which effectively reduces tax burdens through offsetting future tax credit benefits. Policymakers should stress the importance of supporting this depreciation benefit for renewable energy technologies in order to facilitate the formation of the YieldCo structure. In the current renewable energy policy landscape, the intersection of government policy objectives and renewable energy development are best met by the significant growth opportunity in YieldCos.

9.3 The Widespread Introduction of MLPs to the Renewable Energy Industry

Although cash grants (Section 1603 Cash Grant) and the pass-through structures (MLPs and YieldCos) were both relatively efficient in their use of taxpayer resources, the financial analysis revealed that pass-through tax structures are more efficiently able to convert tax expenditures into free cash flow for renewable energy developers. Although MLPs are widely considered the gold standard for extracting yield in the energy industry, it remains unavailable to the developing renewable industry. The introduction of MLPs (or other pass-through tax structures) to renewable energy projects raises concerns regarding the corporate tax base, since MLPs would allow such projects to forego corporate-level taxation. In 1987, the "qualifying income" stipulation for MLP eligibility was implemented in direct response to concerns about corporate tax base erosion.[21] Allowing renewable energy companies to structure as MLPs would result in tax revenue losses, but the budget implications of the MLP structure should be analyzed relative to the current policy options. According to the Joint Committee on Taxation (JCT), the revenue impact of the MLPPA would be just $307 million over 5 years; over the same period, the JCT estimates that tax credit support for renewable energy projects will result in $12.6 billion in tax revenue losses.[22] The JCT forecast alleviates concerns regarding MLPs' ability to erode the corporate tax base and may boost support for the MLPPA. From the government perspective, MLPs can serve as a cost effective policy solution for driving renewable energy growth.

Typically, MLPs have been used to finance proven technologies with stable cash flows. From the private investor perspective, critics of the MLPPA contest that a renewable energy company's cash flows are too volatile for the MLP structure, whose valuation relies on stable, quarterly distributions.[18] However, as the technology and broader renewable industry continue to mature and earn the trust of more risk-averse investors, like investment banks and corporations, renewable energy investments may rapidly increase. Once a renewable energy asset is operating efficiently, it immediately begins to generate returns for investors. The MLP structure would be a viable option for securing additional capital for renewable projects with long-term power purchase agreements. Such projects would fit the MLP structure in a similar manner to a midstream pipeline with long-term fee-based contracts.

From the renewable industry perspective, it is clear that the pass-through structure can drive renewable energy growth by lowering the cost of capital and facilitating access to a greater investment base. Regardless of the MLPPA, renewable energy companies will continue to create YieldCo entities. The government's interests are aligned with renewable energy companies in this instance, since taxpayer resources most effectively achieve policy objectives through the pass-through structure, as shown in the financial model. Under the current policy landscape (in the absence of the MLPPA), renewable energy companies are well positioned to capitalize on the government tax expenditures being allocated to the renewable energy industry through the formation of YieldCos.

The optimal policy solution for driving renewable energy growth is the pass-through tax structure due to its ability to efficiently convert taxpayer resources into free cash flow, while lowering costs of capital and offering access to an alternative investor base with a competitive source of capital. Policymakers can help drive renewable energy growth by encouraging pass-through structures, either through supporting the YieldCo business structure or through the widespread introduction of MLPs to the renewable energy industry.

Company Financials by Tax Policy ($ in millions)	Base Case FY 2014	Base Case FY 2015	Base Case FY 2016	Base Case FY 2017	Cash Grant FY 2014	Cash Grant FY 2015	Cash Grant FY 2016	Cash Grant FY 2017	Tax Credit FY 2014	Tax Credit FY 2015	Tax Credit FY 2016	Tax Credit FY 2017	Pass-Through Tax Status FY 2014	Pass-Through Tax Status FY 2015	Pass-Through Tax Status FY 2016	Pass-Through Tax Status FY 2017
Income Summary Assumptions	12/31/14	12/31/15	12/31/16	12/31/17	12/31/14	12/31/15	12/31/16	12/31/17	12/31/14	12/31/15	12/31/16	12/31/17	12/31/14	12/31/15	12/31/16	12/31/17
Revenues	1,000	1,270	1,613	2,048	1,000	1,270	1,613	2,048	1,000	1,270	1,613	2,048	1,000	1,270	1,613	2,048
Growth (Year-over-Year) (1)		*27.0%*	*27.0%*	*27.0%*		*27.0%*	*27.0%*	*27.0%*		*27.0%*	*27.0%*	*27.0%*		*27.0%*	*27.0%*	*27.0%*
Cost of Goods Sold	(750)	(953)	(1,210)	(1,536)	(750)	(806)	(867)	(932)	(750)	(806)	(867)	(932)	(750)	(806)	(867)	(932)
Gross Profit	250	318	403	512	250	269	289	311	250	269	289	311	250	269	289	311
Gross Margin	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*	*25.0%*
EBITDA	**150**	**191**	**242**	**307**	**150**	**191**	**242**	**307**	**150**	**191**	**242**	**307**	**150**	**191**	**242**	**307**
EBITDA Margin	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*	*15.0%*
Change (bps)		*0 bps*	*0 bps*	*0 bps*		*0 bps*	*0 bps*	*0 bps*		*0 bps*	*0 bps*	*0 bps*		*0 bps*	*0 bps*	*0 bps*
Pre-Tax Income	20	26	33	41	20	26	33	41	20	26	33	41	20	26	33	41
Pre-Tax Margin	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*	*13.5%*
Cash Flow Summary																
EBITDA	150	191	242	307	150	191	242	307	150	191	242	307	150	191	242	307
Debt Cash Interest Expense (5.0% Rate / 4.0% for Pass-Through)	(15)	(19)	(24)	(31)	(15)	(19)	(24)	(31)	(5)	(6)	(7)	(9)	(12)	(15)	(19)	(25)
Tax Equity Cash Interest Expense (7.0% Rate)	-	-	-	-	-	-	-	-	(15)	(19)	(24)	(30)	-	-	-	-
Tax Provision	(7)	(9)	(11)	(15)	(7)	(9)	(11)	(15)	(7)	(9)	(11)	(15)	-	-	-	-
Effective Tax Rate	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*(35%)*	*0%*	*0%*	*0%*	*0%*
Tax Benefit	-	-	-	-	11	13	17	7	11	13	17	7	-	-	-	-
Effective Tax Credit (% of Capex)	-	-	-	-	*30%*	*30%*	*30%*	*10%*	*30%*	*30%*	*30%*	*10%*	-	-	-	-
Working Capital	(25)	(32)	(40)	(51)	(25)	(32)	(40)	(51)	(25)	(32)	(40)	(51)	(25)	(32)	(40)	(51)
Cash from Operations	103	131	166	211	113	144	183	218	109	139	176	209	113	144	182	231
Capital Expenditures	(35)	(44)	(56)	(72)	(35)	(44)	(56)	(72)	(35)	(44)	(56)	(72)	(35)	(44)	(56)	(72)
Free Cash Flow (Cash Flow Available for Distribution)	**68**	**86**	**110**	**139**	**78**	**100**	**126**	**146**	**74**	**94**	**120**	**138**	**78**	**99**	**126**	**160**
FCF Conversion (as a % of Revenue)	*6.8%*	*6.8%*	*6.8%*	*6.8%*	*7.8%*	*7.8%*	*7.8%*	*7.1%*	*7.4%*	*7.4%*	*7.4%*	*6.7%*	*7.8%*	*7.8%*	*7.8%*	*7.8%*
NPV of Free Cash Flow (8% Discount Rate)				**$326.03**				**$365.90**				**$345.74**				**$374.46**
NPV of Tax Revenue Loss (3% Discount Rate)				-				$44.63				$44.63				$38.73
($\Delta_{(Base)}$ NPV FCF / $\Delta_{(Base)}$ NPV Tax Revenue Loss)				-				**89%**				**44%**				**125%**
EBITDA - Capex	115	146	185	236	115	146	185	236	115	146	185	236	115	146	185	236
Balance Sheet Summary																
Cash	348	442	561	713	348	442	561	713	348	442	561	713	348	442	561	713
Total Debt	300	381	484	615	300	381	484	615	90	114	145	184	300	381	484	615
Tax Equity	-	-	-	-	-	-	-	-	210	267	339	430	-	-	-	-
Enterprise Value	2,175	2,762	3,508	4,455	2,175	2,762	3,508	4,455	2,175	2,762	3,508	4,455	2,175	2,762	3,508	4,455
EV / EBITDA	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x	14.5x
Credit Statistics																
Total Debt / EBITDA	2.0x	2.0x	2.0x	2.0x	2.0x	2.0x	2.0x	2.0x	0.6x	0.6x	0.6x	0.6x	2.0x	2.0x	2.0x	2.0x
Tax Equity / EBITDA	-	-	-	-	-	-	-	-	1.4x	1.4x	1.4x	1.4x	-	-	-	-
EV / Total Debt	7.3x	7.3x	7.3x	7.3x	7.3x	7.3x	7.3x	7.3x	24.2x	24.2x	24.2x	24.2x	7.3x	7.3x	7.3x	7.3x
EV / Tax Equity	-	-	-	-	-	-	-	-	10.4x	10.4x	10.4x	10.4x	-	-	-	-
EBITDA / Total Interest	10.0x	10.0x	10.0x	10.0x	10.0x	10.0x	10.0x	10.0x	7.8x	7.8x	7.8x	7.8x	12.5x	12.5x	12.5x	12.5x
(EBITDA - Capex) / Total Interest	7.7x	7.7x	7.7x	-7.7x	7.7x	7.7x	7.7x	7.7x	6.0x	6.0x	6.0x	6.0x	9.6x	9.6x	9.6x	9.6x
FCF / Total Debt	22.6%	22.6%	22.6%	22.6%	26.1%	26.1%	26.1%	23.8%	82.5%	82.5%	82.5%	74.7%	26.0%	26.0%	26.0%	26.0%
FCF / Tax Equity	-	-	-	-	-	-	-	-	35.3%	35.3%	35.3%	32.0%	-	-	-	-

(1) Morgan Stanley Research forecasts a 27% CAGR for the entire distributed generation segment between 2013 - 2020, even considering a possible Investment Tax Credit (ITC) step down to 10% after 2016.

Key Findings				
($ in millions)	Base Case	Cash Grant	Tax Credit	Pass-Through Tax Status
Net Present Value (NPV) of Free Cash Flow (FCF) *8% Discount Rate*	326.0	365.9	345.7	374.5
ΔNPV of FCF Relative to Base Case *% Growth*	-	39.9 *12%*	19.7 *6%*	48.4 *15%*
Weighted Average Cost of Debt and Tax Equity	5.0%	5.0%	6.4%	4.0%
Net Present Value (NPV) of Tax Revenue Loss *3% Discount Rate*	-	44.6	44.6	38.7
ΔNPV of Tax Revenue Loss Relative to Base Case	-	44.6	44.6	38.7
Effective Tax Rate	*(35%)*	*(35%)*	*(35%)*	*0%*
Tax Credit Benefit *As a % of Capital Expenditures*	-	*30% of expenditures until 2016, 10% thereafter*	*30% of expenditures until 2016, 10% thereafter*	-
Δ(Base) NPV of FCF / Δ(Base) NPV of Tax Revenue Loss *A measure of the cash flow benefit to the company relative to the tax revenue loss for the government*	-	**89%**	**44%**	**125%**

Cash Grant Sensitivity

		Total Debt / EBITDA				
		0.0x	**1.0x**	**2.0x**	**3.0x**	**4.0x**
Interest Rate	**3.0%**	89.0%	89.0%	89.0%	89.0%	89.0%
	4.0%	89.0%	89.0%	89.0%	89.0%	89.0%
	5.0%	89.0%	89.0%	**89.0%**	89.0%	89.0%
	6.0%	89.0%	89.0%	89.0%	89.0%	89.0%
	7.0%	89.0%	89.0%	89.0%	89.0%	89.0%

Pass-Through Sensitivity

		Total Debt / EBITDA				
		0.0x	**1.0x**	**2.0x**	**3.0x**	**4.0x**
Interest Rate Spread (Pass-Through - 5.0% Base Case)	**-2.0%**	88.0%	125.0%	162.0%	199.0%	237.0%
	-1.0%	88.0%	106.0%	**125.0%**	144.0%	162.0%
	0.0%	88.0%	88.0%	88.0%	88.0%	88.0%
	+1.0%	88.0%	69.0%	51.0%	32.0%	13.0%
	+2.0%	88.0%	51.0%	13.0%	-24.0%	-61.0%

Tax Equity Sensitivity

		Tax Equity / (Tax Equity + Total Debt)					
		00.0%	**25.0%**	**50.0%**	**70.0%**	**80.0%**	**100.0%**
Interest Rate Spread (Tax Equity - 5.0% Base Case Traditional Debt Financing)	**-2.0%**	89.0%	105.0%	122.0%	135.0%	141.0%	154.0%
	-1.0%	89.0%	97.0%	105.0%	112.0%	115.0%	122.0%
	0.0%	89.0%	89.0%	89.0%	89.0%	89.0%	89.0%
	+1.0%	89.0%	81.0%	73.0%	67.0%	64.0%	57.0%
	+2.0%	89.0%	73.0%	57.0%	**44.0%**	38.0%	25.0%
	+3.0%	89.0%	65.0%	41.0%	22.0%	12.0%	-7.0%

		Free Cash Flow Discount Rate (Solar Company)														
		6.0%			**7.0%**			**8.0%**			**9.0%**			**10.0%**		
		Cash Grant	Tax Credit	Pass-Through	Cash Grant	Tax Credit	Pass-Through	Cash Grant	Tax Credit	Pass-Through	Cash Grant	Tax Credit	Pass-Through	Cash Grant	Tax Credit	Pass-Through
Tax Revenue Loss Discount Rate (Government)	**1.0%**	89%	44%	125%	87%	43%	121%	85%	42%	118%	83%	41%	116%	82%	41%	113%
	2.0%	91%	45%	128%	89%	44%	125%	87%	43%	122%	85%	42%	119%	84%	42%	116%
	3.0%	93%	46%	132%	91%	45%	128%	**89%**	**44%**	**125%**	87%	43%	122%	86%	43%	119%
	4.0%	96%	47%	135%	93%	46%	132%	91%	45%	128%	89%	44%	125%	88%	44%	122%
	5.0%	98%	48%	139%	96%	47%	135%	94%	46%	132%	92%	45%	129%	90%	45%	125%

Solar Comparable Companies Analysis ($ in millions)														
LTM 6/30/14		EV	Total Debt	EV/Debt	Cash	EBITDA	Debt/EBITDA	Revenue	Gross Profit	Operating Income	Pre-Tax Income	Δ Working Capital	Cash Int. Expense	Capex
SolarCity	(SCTY)	5,876	840	7.0x	405	(179)	-4.7x	221	65	(225)	(177)	126	(10)	(10)
First Solar	(FSLR)	4,499	195	23.1x	1,349	651	0.3x	3,529	883	409	378	187	(10)	(225)
CanadianSolar	(CSIQ)	2,503	1,176	2.1x	341	212	5.6x	2,101	388	195	56	(485)	(65)	(23)
SUNPOWER	(SPWR)	4,331	1,110	3.9x	988	330	3.4x	2,496	581	231	42	(14)	(46)	(35)
vivint.solar	(VSLR)	1,692	141	12.0x	25	292	0.5x	483	355	(53)	(125)	*N/A*	*N/A*	(9)
Average		**3,780**	**692**	**9.6x**	**622**	**261**	**1.0x**	**1,766**	**454**	**111**	**35**	**(47)**	**(33)**	**(60)**

Source: Bloomberg, figures represent last twelve months as of June 30, 2014

Master Limited Partnerships Comparable Companies Analysis ($ in millions)													
LTM 6/30/14		EV	Total Debt	EV/Debt	Cash	EBITDA	Debt/EBITDA	Revenue	Gross Profit	Operating Income	Δ Working Capital	Cash Int. Expense	Capex
Enterprise Products Partners L.P.	(EPD)	90,459	18,363	4.9x	242	4,729	3.9x	50,625	3,655	3,460	(44)	(782)	(3,147)
Williams Partners L.P.	(WPZ)	33,765	11,797	2.9x	716	2,177	5.4x	6,511	1,777	1,379	(11)	(366)	(3,281)
Energy Transfer	(ETP)	47,279	17,566	2.7x	1,120	3,543	5.0x	49,195	2,923	2,488	(0)	(903)	(3,144)
Kinder Morgan	(KMP)	65,162	21,769	3.0x	268	5,544	3.9x	14,633	4,414	3,926	(146)	(854)	(3,218)
Access Midstream Partners	(ACMP)	16,588	3,805	4.4x	37	667	5.7x	1,159	462	334	(46)	(40)	(1,034)
Average		**50,651**	**14,660**	**3.6x**	**477**	**3,332**	**4.8x**	**24,425**	**2,646**	**2,317**	**(49)**	**(589)**	**(2,765)**

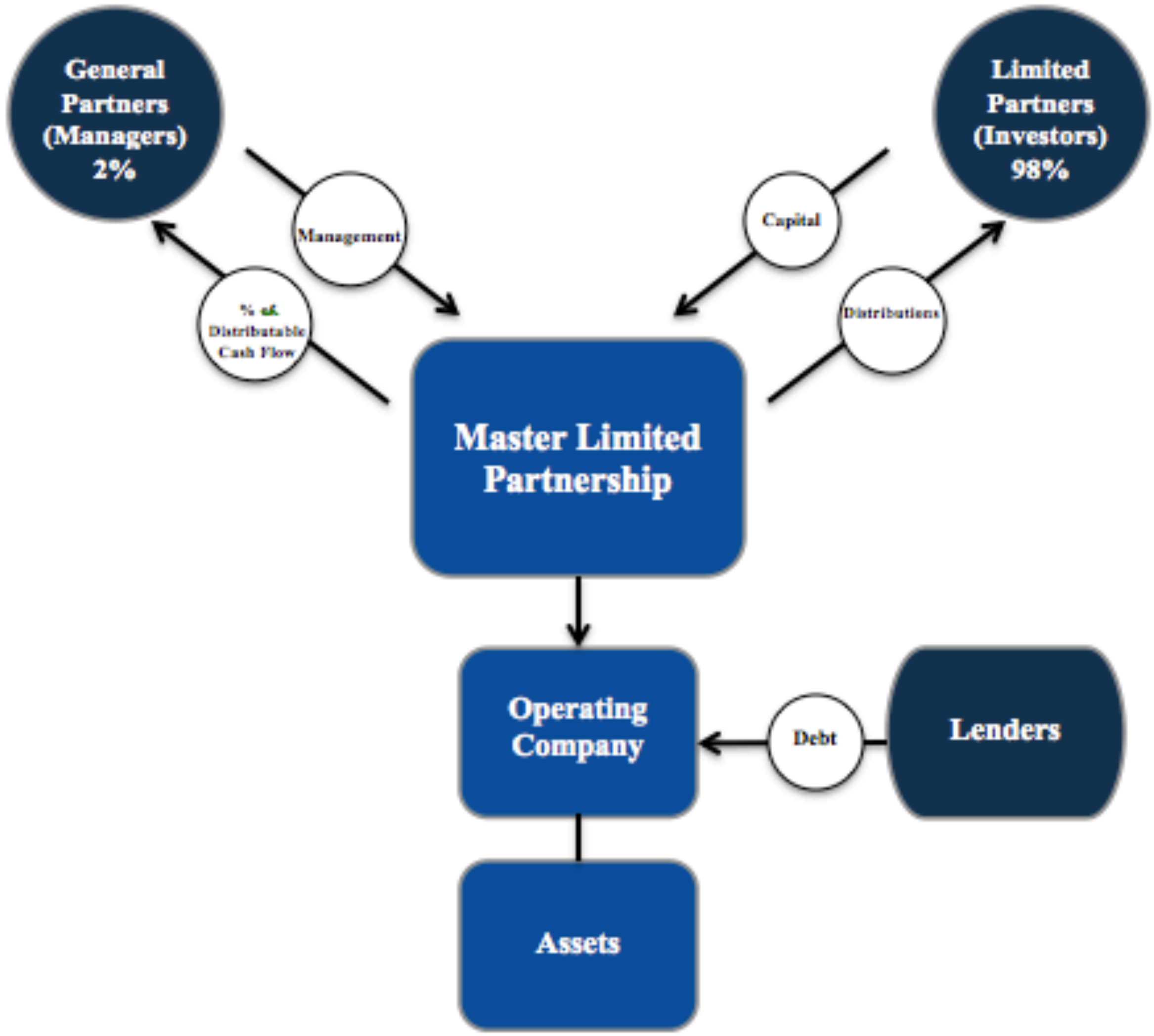
Source: Bloomberg. Figures represent Last Twelve Months as of June 30, 2014.

Financial Model Assumptions Derived From Solar Comparable Companies Analysis								
LTM 6/30/14	**Gross Margin** (Gross Profit / Revenue)	**EBITDA Margin** (EBITDA / Revenue)	**EV/ EBITDA**	**Pre-Tax Margin** (Pre-Tax Income / EBITDA)	**ΔWC as a % of Revenue**	**Capex as a % of Revenue**	**Int. Expense / Total Debt**	**Cash / EV**
Rounded Average	25.0%	15.0%	14.5x	13.5%	2.5%	3.5%	5.0%	16.0%

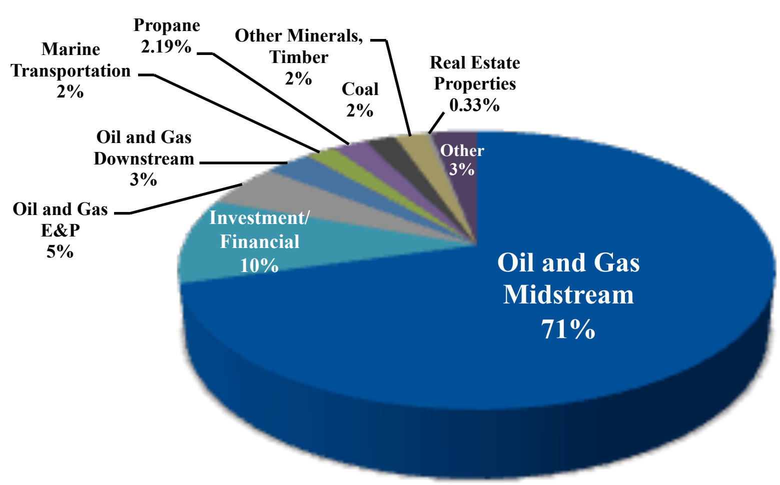
MLP Distribution Growth Matrix ($US in Millions, Unless Noted $/Unit Below)	Source of Capital 100% Retained DCF	 40% Debt / 60% Retained DCF	 40% Debt / 60% Common Units
General Assumptions			
Incremental Capital Deployed (New Investment)	**$ 1,461.0**	**$ 1,733.0**	**$ 2,603.7**
Assumed Unlevered Return on Capital	**10.00%**	**10.00%**	**10.00%**
Financing Assumptions			
Retained Distributable Cash Flow (DCF)	$ 1,461.0	$ 1,039.8	$ -
New Equity	-	-	1,562.2
# of LP Units Issued to Fund Investment	*-*	*-*	*24.8*
New Debt	-	693.2	1,041.5
Reference MLP Unit Price	*$66.50*	*$66.50*	*$66.50*
Current 10-yr. Weighted Average Cost of Capital (40% Debt / 60% Equity)	*N/A*	*3.93%*	*5.08%*
Distributable Cash Flow			
Assumed Expected Cash Flow from New Investment	146.1	173.3	260.37
Less: Interest Expense Associated with New Debt Issued		(27.2)	(40.9)
Distributable Cash Flow	**146.1**	**146.1**	**219.5**
Less: Distributions Attributed to New Units Issued	-	-	(69.4)
Incremental DCF Available for All Units	**146.1**	**146.1**	**150.1**
Existing # of Distribution Bearing LP Units	913.1	913.1	913.1
New LP Units Issued	-	-	24.8
Total Distribution Bearing LP Units	913.1	913.1	937.9
Distribution Increase per LP Unit from New Investment	**$0.16**	**$0.16**	**$0.16**
Current Annualized Distribution	$2.80	$2.80	$2.80
% Increase	*5.70%*	*5.70%*	*5.70%*

Source: Enterprise Products Partners L.P. Analyst Conference Presentation (2014)

Master Limited Partnership Corporate Structure



Source: Latham & Watkins LLP



MLP Market Capitalization by Sector

Source: NAPTP, Market Capital as of 9/30/13

YieldCo Comparable Companies Analysis					
$ in millions	**Abengoa**	**NextEra Energy Partners**	**NRG Energy**	**Pattern Energy**	**SunEdison (TerraForm)**
Current Generation Capacity (MW)	1,010	990	3,047	1,434	525
Right of First Offer (ROFO) Generation (MW)	1,521	1,550	469	441	935
ROFO Transmission (Miles)	5,875	-	-	-	-
ROFO Water Infrastructure (M ft^3 / day)	19	-	-	-	-
Additional Sponsor Qualifying Generation (MW)	ND	11,460	1,600	-	-
Regions	US/LatAm/Spain	US/Canada	US	US/Canada/LatAm	US/Canada/LatAm
Asset Types (Currently as of July 2014)	Generation/Trans.	Solar/Wind	Generation	Wind	Solar
General Partner	No	Yes	No	No	Yes
2015 Yield Estimate (%)	3.2%	2.2%	3.3%	4.8%	3.5%
2016 Yield Estimate (%)	4.9%	2.7%	3.9%	5.6%	4.8%
Target Annual Growt (%)	10-12%	12-15%	15-18%	10-12%	15
Growth (Years) - w/ ROFO + Additional Assets	7	15	6	2	3
Market Cap (Public + Private)	$3,225	$3,348	$3,340	$2,100	$1,002
Public Ownership (%)	31%	19%	34%	65%	23%

Source: Company Data, Morgan Stanley Research Estimates

NRG Yield, Inc. Financials ($ in millions)	FY 2012	FY 2013	Q1 2014	Q2 2014	Q3 2014	Q4 2014E	FY 2014E	FY 2015E
Income Summary	12/31/12	12/31/13	3/31/14	6/30/14	9/30/14	12/31/14	12/31/14	12/31/15
Segment Revenues								
Conventional	-	82	28	61	65			
Renewables	33	79	17	30	48			
Thermal	142	152	65	43	48			
Corporate	-	-	-	-	-			
Total Revenues	175	313	110	134	161	158	683	1,040
% Growth		*78.9%*					*118.2%*	*52.2%*
COGS	(112)	(127)	(53)	(45)	(52)			
Gross Profit	63	186	57	89	109			
Gross Margin	*36.0%*	*59.4%*	*51.8%*	*66.4%*	*67.7%*			
Change (bps)		*2342 bps*						
SG&A	(7)	(7)	(2)	(2)	(3)			
D&A	(25)	(51)	(17)	(36)	(34)			
Operating Income	31	128	38	51	70			
Other Income (Expenses)	(8)	(11)	(17)	(15)	(29)			
EBIT	23	117	21	36	41			
Adj. EBITDA	**99**	**244**	**69**	**109**	**140**	**137**	**455**	**585**
Adj. EBITDA Margin	*56.6%*	*78.0%*	*62.7%*	*81.3%*	*87.0%*	*86.7%*	*66.6%*	*56.3%*
Change (bps)		*2138 bps*						
Cash Flow Summary								
Adj. EBITDA	99	244	69	109	140	137	455	585
Cash Interest Expense	(17)	(55)	(19)	(29)	(40)	(43)	(131)	(203)
Cash Tax Provision	-	-	-	-	-	-	-	-
Working Capital	6	(3)	(25)	(25)	16	19	(15)	(15)
Other	(30)	(45)	(9)	2	5	-	(30)	(35)
Cash from Operations	58	141	16	57	121	113	293	470
Maintenance Capital Expenditures	(5)	(8)	(3)	(4)	(3)	(7)	(17)	(18)
Other Items	(26)	(42)	11	(15)	(24)	(117)	(131)	(292)
Cash Available for Distribution (CAFD)	**27**	**91**	**24**	**38**	**94**	**(11)**	**145**	**160**
CAFD Conversion as a % of EBITDA	*27.3%*	*37.3%*	*34.8%*	*34.9%*	*67.1%*	*-8.0%*	*31.9%*	*27.4%*
Change (bps)		*1002 bps*						
Adj. EBITDA - Maintenance Capex	94	236	66	105	137	130	438	567
Balance Sheet Summary								
Cash and Equivalents	22	36	420	87	372	350	350	320
Senior Notes	-	-	-	-	500	500	500	500
Project-Level Debt	781	1,133	1,058	1,675	3,258	3,258	3,258	3,400
Total Debt	807	1,133	1,381	1,999	4,083	4,083	4,083	4,225
Total Assets	1,964	2,313	2,534	3,236	5,899	5,950	5,950	6,250
Enterprise Value (17.0x)	1,683	4,148	4,692	6,052	7,106	7,735	7,735	9,945
Credit Statistics								
Senior Debt / EBITDA	0.0x	0.0x	0.0x	0.0x	3.6x	3.6x	1.1x	0.9x
Total Debt / EBITDA	8.2x	4.6x	20.0x	18.3x	29.2x	29.8x	9.0x	7.2x
EV / EBITDA	17.0x	17.0x	68.0x	55.5x	50.8x	56.5x	17.0x	17.0x
EV / Senior Debt	-	-	-	-	-	-	-	-
EV / Total Debt	2.1x	3.7x	3.4x	3.0x	1.7x	1.9x	1.9x	2.4x
EBITDA / Interest	5.8x	4.4x	3.6x	3.8x	3.5x	3.2x	3.5x	2.9x
(EBITDA - Capex) / Interest	5.5x	4.3x	3.5x	3.6x	3.4x	3.0x	3.3x	2.8x
CAFD / Senior Debt	-	-	-	-	-	-	-	-
CAFD / Total Debt	3.3%	8.0%	1.7%	1.9%	2.3%	-0.3%	3.6%	3.8%
Operating Metrics								
Renewable MWh sold (in millions)	464	963	227	404	497			
Thermal MWht sold (in thousands)	1,517	1,679	667	493	532			

Source: NRG Yield Company Data and SEC Filings

Investment Tax Credit (ITC)	■ Eligible solar, fuel cell and small wind projects receive a tax credit equal to 30% of total expenditures ■ The ITC is expected to drop down to 10% in 2017
Section 1603 Cash Grant	■ During the program's tenure from 2009 - 2011, the grant offered eligible developers with a cash injection equal to 30% of a project's total cost basis in place of the traditional ITC incentive
Production Tax Credit (PTC)	■ A per-kilowatt-hour tax credit granted to qualifying energy technologies for electricity generation (e.g. 2.3¢ / kWh for wind)
Department of Energy Loan Guarantee Program	■ In a loan guarantee agreement, the federal government pledges to cover the full debt obligation in the event of a borrow default, which materially reduces the borrowing cost for the loan guarantee recipient
Renewable Portfolio Standard (RPS)	■ A regulatory mandate to increase energy production from renewable energy sources ■ Such standards currently only exist at the state level and in select European nations

Glossary

Cost of Capital: Including both the cost of equity and the cost of the debt, cost of capital is the return investors require to ensure that a capital-budgeting project is worthwhile. A higher cost of capital implies that a project is relatively riskier, and thus requires a higher rate of return compensation for its investors.

EBITDA: Earnings before interest, taxes, depreciation and amortization. EBITDA measures a company's profitability and is used to represent a company's true ability to generate cash flow irrespective of tax policy, depreciation strategy, capital structure and interest expense (which vary between policy scenarios).

General Partner: The general partner (GP) generally retains a 2 percent ownership stake in an MLP and manages the daily operations of the business partnership. GPs are eligible to receive incentive distributions, which attempt to align GP interests with the limited partners.

Incentive Distribution Rights (IDRs): IDRs are typically held by the general partner, or the associated parent-sponsor company, and allows GPs to receive an increasing portion of quarterly distributions after reaching target distribution thresholds. As long as the IDR does not excessively burden cash flow generation, the IDR structure aligns the interests of both the GP and the LP.

Limited Partner: The limited partner provides capital to an MLP or pass-through structure, but has no role in the operations or management of the business partnership. The LP receives cash flow distributions in exchange for its capital contribution.

Maintenance Capex: The capital expenditure expenses that a business incurs in order to maintain core business operations. This includes, but is not limited to, funds necessary to repair or replace fixed assets.

Master Limited Partnership (MLP): An MLP is a business structure that benefits from avoiding the corporate level taxation of a C-corporation, and whose ownership interest units are traded as securities in financial markets, like corporate stock. Currently, a partnership must derive 90 percent of its income from qualifying sources, including commodities, conventional energy sources and other depletable resources. Renewable energy technologies are not eligible to register as MLPs.

Yield Company (YieldCo): Like MLPs, YieldCos also house assets that generate power under long-term purchase agreements and distribute much of their cash flow to shareholders. The rise of the YieldCo has further validated the pass-through structure and has incentivized developers to create publicly traded yield-oriented investment vehicles by offering exposure to an alternative investor pool with a more competitive source of equity capital. The current tax depreciation system enables renewable developers to use an accelerated 5-year depreciation timetable; therefore, YieldCos can report accounting losses, ultimately replicating the tax benefits of an MLP structure through offsetting future tax credits.

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