



# Master Limited Partnerships and Real Estate Investment Trusts: Opportunities and Potential Complications for Renewable Energy

David Feldman and Edward Settle

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## Executive Summary

Master Limited Partnerships (MLPs) and Real Estate Investment Trusts (REITs) are two proposed investment vehicles that have the potential to lower the high cost of capital for renewable energy assets—a critical factor in the U.S. Department of Energy’s goal for renewable energy to achieve grid-parity with traditional sources of electric generation. Due to current U.S. federal income tax laws, regulations, and administrative interpretations, REITs and MLPs cannot finance a significant portion of the cost of renewable energy assets. Efforts are underway to alter these rules by changing the definition of “real property” (REIT) and “qualified income” (MLP). However, even with rule changes, both investment vehicles have structural challenges to efficiently finance renewable energy assets. Among them are (1) effectively utilizing the U.S. federal income tax incentives; (2) administratively structuring the investments to not be overly onerous or complicated, given the potential for pooling a relatively large amount of small assets; and (3) attracting and retaining a large enough investment community to participate in the funding opportunities. This report summarizes these challenges so that if proposed federal changes are made, stakeholders have an understanding of the possible outcomes.

The first section of this report summarizes current MLP and REIT markets and proposed rule changes. The second and third sections detail challenges to financing renewable energy assets with REITs and MLPs, respectively. Finally, the fourth section discusses possible investor responses to a renewable energy REIT or MLP.

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# 1 Introduction to Master Limited Partnerships and Real Estate Investment Trusts

Master Limited Partnerships (MLPs) and Real Estate Investment Trusts (REITs) are investment vehicles organized under sections 7704 and 856 of the U.S. Internal Revenue Code (Code or IRC), respectively. These business structures combine advantages similar to those of a traditional publicly traded corporation with those of a private partnership. Public trading provides broad access to capital and liquidity, while a partnership-like model can avoid the double taxation that would otherwise occur at both the corporate and investor level in a public corporation.<sup>1</sup>

MLPs and REITs are in many ways like a mutual fund; in fact, REITs are modeled directly off of the mutual fund structure. Mutual funds are equity investments registered with the Securities and Exchange Commission (subject to various federal and state regulations) and publicly traded on market exchanges. Like mutual funds, MLPs and REITs are designed to allow a typical retail investor to make investments that the investor may not otherwise have the opportunity to make; namely, modest investments in assets (or pools of assets), such as real estate or natural gas pipelines. MLP and REIT assets have certain attractive qualities similar to debt, Treasuries, or high-quality bonds because they are designed to produce long-term, stable cash flow distributions for their passive investors.<sup>2</sup>

Key advantages of MLPs and REITs are highlighted as follows:

- Long-term, stable cash flows, typically through long-term, stable contracts<sup>3</sup>
- Little to no MLP or REIT level tax, resulting in lower overall taxes on investment
- Transferable ownership units, available to a wide pool of investors (accredited, institutional, retail, or otherwise)
- Liquidity of investment, providing for easier exit
- Public exposure, providing transparency in price
- Portfolio of assets, offering diversification benefits
- Historically higher yields to investors than the S&P 500
- Ability to raise capital for corporate needs, such as acquisitions, through public market sale of units.

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<sup>1</sup> While an MLP is literally a partnership for federal income tax purposes, a REIT is not. However, special rules applicable to REITs (discussed later) provide them with a tax effect similar, though not identical, to a partnership, while not actually being a partnership and not using partnership income tax law.

<sup>2</sup> See IRS Publication 925 for a definition of “passive.”

<sup>3</sup> Investor return from a REIT is, in large part, structured to come from dividends (like coupons on a bond). However, unlike debt, a REIT is not required to return the REIT owner’s original investment; the investor may effectively receive this through sale of the asset. In other words, debt issued at 6% must pay back principal in addition to the coupons; a REIT structure’s predictable cash flows provide a 6% yield, and the original investment is paid back when the investor sells their units.

These benefits have attracted considerable attention in the investor community, resulting in a lower cost of capital. Currently, approximately 172 REITs are listed on major exchanges and have a market cap of \$600 billion (NAREIT 2013a). There are also approximately 120 MLPs trading on major exchanges with a market cap of \$400 billion (NAPTP 2013).

However, although the two structures share many of the same benefits and are often paired together, they have different sets of governing rules.

## 1.1 REITs

### 1.1.1 Background and Current Status

REITs were established in 1960 under the *REIT Act* contained in the *Cigar Excise Tax Extension* (NAREIT 2013). The effective elimination of corporate-level income tax was designed to give the same tax treatment to investors as they would have received if they had directly invested in the underlying assets. There were two intended benefits of this action. “First, Congress believed that this method of investment would give small investors the opportunity to pool their resources in a way that would secure for them investment advantages normally available to those with larger resources. Second, Congress wanted to remove taxation as much as possible as a factor in determining the relative size of investments in stocks and securities on the one hand and real estate equities and mortgages on the other” (Kogan 2012). This was particularly important at the time because of the shortage of capital in real estate, which primarily relied on “government-guaranteed money, and investments by special groups, such as insurance companies and pension trusts” (Kogan 2012).<sup>4</sup>

The qualifications for being a REIT are specified in Section 856 of the Code (26 USC 856). In short, to be considered a REIT, an entity must pass two tests:

- Asset test: 75% of a REIT's assets must be real property, cash, and cash items (such as receivables).<sup>5</sup>
- Income test: 95% of a REIT's gross income must come from approved passive income sources (such as dividends, interest, and rent) and 75% of its gross income must come from real estate.

Most REIT managers structure their investments to be well over the income and asset threshold requirements so that any unforeseen fluctuation does not disqualify the entity.<sup>6</sup> Due to these tests, a REIT is limited in the types of assets in which it can invest. Over the past 50 years, the variety of assets in which REITs have invested has grown (e.g., buildings, railroads, mobile homes, LED billboards, cellular towers, and electric transmission assets). However, REITs are still limited, in large part, to what the IRS considers to be real property. Figure 1 shows a timeline of a limited selection of asset classes which the IRS has interpreted in a private letter

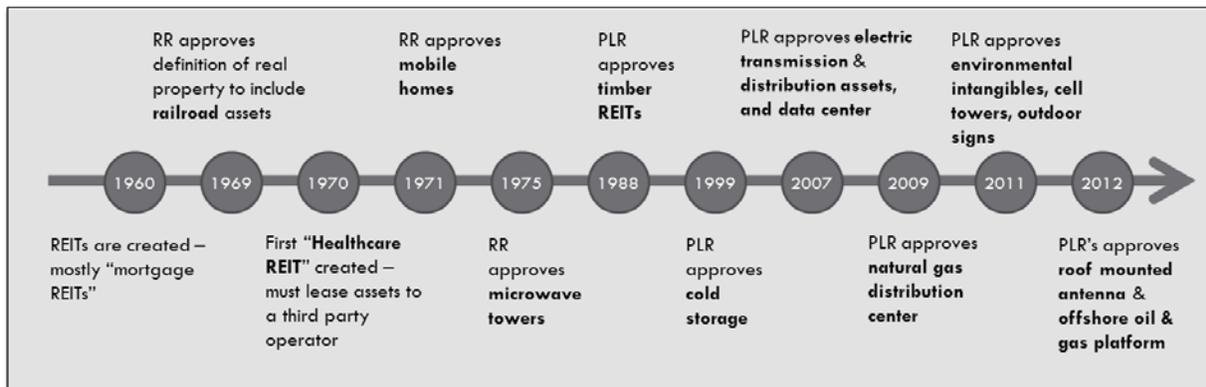
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<sup>4</sup> This is not dissimilar to current capital constraints in the renewable energy space, which rely on government tax credits and tax equity investors.

<sup>5</sup> The asset test must be met on a quarterly basis. Both parts of the income test must be met on an annual basis.

<sup>6</sup> Subject to certain limited exceptions, a REIT that fails to meet either test is disqualified from electing the REIT tax treatment for five years.

ruling (PLR) or revenue ruling (RR) to be real for purposes of REIT requirements, and the year in which the determination was made.



**Figure 1. Expansion of REIT asset classes**

Sources: Feldman et al. (2012), and NAREIT (2013)

However, land, buildings and certain improvements to such real estate are still the most common REIT assets, as well as other assets clearly related to *bona fide* real estate such as certain qualified real estate mortgages. Though the IRS has over the years substantially expanded the list of qualified REIT activity, the focus has nonetheless remained on traditional assets.

With respect to the portion of their assets (up to 25%) that do not need to be real property, cash, or cash items, many REITs own interests in Taxable REIT Subsidiaries (TRS). A TRS is a company, some or all of whose stock is owned directly or indirectly by a REIT, which has made a joint election with the REIT to be treated as a TRS. A TRS can engage in any business activity, including an activity that the REIT itself is prohibited from performing. In return, the TRS is required to pay corporate-level taxes, with only its after-tax profits available for distribution to its shareholders.<sup>7</sup>

A REIT computes its taxable income like any other corporation, except that it is also allowed to adjust its net taxable income by deducting the portion of its taxable income that it distributes to unit holders (i.e., REIT shareholders). Because REITs are required to distribute at least 90% of their taxable income to unit holders, they typically avoid paying most, if not all, taxes at the corporate level.

### 1.1.2 Proposed Broadening Definition of Qualifying Assets/Income

Due to asset and income limitations, REITs currently cannot own a meaningful amount of renewable energy assets. Efforts are underway to expand the definitions of qualifying assets and/or income to include renewable energy.

<sup>7</sup> Unlike REITs, TRSs do not have to distribute their profits.

A renewable energy asset would qualify for REIT purposes under federal income tax rules if it was considered real property for federal income tax purposes.<sup>8</sup> While renewable energy technology has been interpreted as equipment (personal property) under some provisions of the Code, some technologies, such as solar,<sup>9</sup> share the same traits as some assets that qualify as real property under the REIT provisions.<sup>10</sup> For more information on this topic, refer to NREL's report, "The Technical Qualifications for Treating Photovoltaic Assets as Real Property by Real Estate Investment Trusts" (Feldman et al. 2012). The definition of real property for REIT purposes is frequently interpreted by the IRS. A company can request that the IRS make a targeted determination by asking for a PLR, in which the IRS would determine whether the company's assets qualified as real property under the REIT rules. While a PLR would only apply to that individual company, the IRS is required to treat all taxpayers consistently, and a favorable ruling could encourage broader adoption of the underlying principles by other companies who believe they have the same type of assets as those covered in the ruling. The IRS could also issue a revenue ruling, preemptively, to address whether certain assets are real property.<sup>11</sup> Currently, several companies are preparing requests for a PLR, are in discussions with the IRS, or have submitted a formal request to try to get renewable energy assets to qualify as real property. As of publication, the authors are unaware of any ruling that has significantly altered the tax treatment of renewable energy assets, or the likelihood that one will be issued in the future.

If the efforts to make income from renewable energy assets qualify under REIT rules are successful, the implementation of investment by these vehicles will be dependent on the language in which rule changes are drafted. While altering the definitions of qualified income under IRC Section 856 are paramount to this endeavor, other sections of the Code and the market may dictate the success of using these proposed sources of capital for renewable energy assets.

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<sup>8</sup> See Treas. Reg. § 1.856-3(d), which defines "Real Property." Note, the definition of real property is *not* provided for in the tax code itself, but rather in the regulations.

<sup>9</sup> For purposes of this paper, "solar" refers to photovoltaic generation devices, as opposed to concentrated solar power, solar water heating, or solar energy component manufacturing.

<sup>10</sup> The sticking point of the current IRS position is that machinery cannot comprise more than 15% of the assets or income of a REIT unless the machinery serves only the building or other structure with which it is associated (thus, for example, solar panels that are able to deliver electricity into the grid at any point in time would not be REIT real property). The IRS holds to its position on machinery even where the machinery at issue is in and of itself an inherently permanent structure (such as a wind-driven generator or a utility-size solar facility). Many renewable energy facilities meet the requirement for inherent permanence: the facilities are attached to real property (e.g., land, buildings, parking canopies) and will ordinarily remain affixed indefinitely. The IRS has accepted the REIT-ability of many classes of non-building structures that conduct or store commodities such as electric and gas distribution assets because those assets are inherently permanent. At the same time the IRS has denied REIT treatment for similarly permanent assets that produce a commodity, such as renewable energy facilities. The distinction that the IRS draws between conduit/storage assets and productive assets is a distinction first imposed when the original REIT regulations were adopted in 1962. Since the distinction is not driven by the statute or by Congressional intent, the IRS can, by regulation alone, enable renewable energy REITs that invest in inherently permanent facilities.

<sup>11</sup> A Revenue Rulings represents the IRS's interpretation of how the law applies to a particular set of facts. Unlike a PLR, which technically applies only to the taxpayer that requested it, a revenue ruling applies to all taxpayers with the same facts.

## 1.2 Master Limited Partnerships

### 1.2.1 Background and Current Status

In 1980, the top tax rate on corporate income was 46% and the top tax rate on individual income was 70%. Private partnerships were taxed at the individual level only, while investors owning shares in a public corporation were double taxed—both corporate and individual taxation.<sup>12</sup>

Apache Oil Company launched the first publicly-traded partnership in 1981, and the tax-advantaged structure rapidly gained popularity. The partnership was not subject to U.S. federal income tax as a corporation, so partners were only taxed at the individual level. In addition, unlike previous partnerships, Apache began trading on the established securities market with broad, attractive access to public capital, as a wider range of investors could participate in an investment opportunity that was more affordable and more liquid than a private partnership (NAPTP 2013).

Restaurants, amusement parks, the Boston Celtics, hotels, and other businesses began shifting to operate as MLPs. Between 1981 and 1987 there were over 100 MLP initial public offerings (IPO) (Fenn 2011). Fearing corporate tax avoidance and expanding erosion of tax revenue, in 1987 Congress enacted IRC Section 7704 (26 USC 7704), which treats partnerships whose interests are traded on a securities market as corporations for U.S. federal income tax purposes.<sup>13</sup> Subsequently, many of the real estate owning entities became REITs,<sup>14</sup> while other MLPs went private, were acquired, or otherwise abandoned the MLP structure.

MLPs, referred to as publicly traded partnerships in the Code, are not required to pay corporate taxes, provided that 90% or more of income generated is derived from specific sources. The general categories of qualifying sources of income are:

- Interest, dividends, and capital gains
- Rental income and capital gains from real estate<sup>15</sup>
- Income and capital gains from **natural resources activities**
  - Natural resources include oil, gas, petroleum products, timber, etc.

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<sup>12</sup> In a “traditional corporate structure,” corporate profits are subject to corporate federal income taxes, and shareholders of the corporation are (usually) subject to personal federal income taxes when they receive dividends or distributions of those profits. Thus, there is a double layer of taxation, or double taxation.

<sup>13</sup> *Revenue Act of 1987 (P.L. 100-203)*, §10211(a). Congress made IRC Section 7704 prospective only and allowed master limited partnerships that were in existence prior to the effective date of this provision to retain partnership status as long as they do not substantially expand or terminate their business activities.

<sup>14</sup> The REIT structure is often viewed as more attractive to investors from a tax compliance perspective. Jeff Eckel, CEO of the REIT Hannon Armstrong states, “A REIT is friendlier to investors than an MLP. Investors get simple 1099 forms at year end with the amount of their dividends. They do not have to fuss with complicated K-1 forms reporting cash distributions, allocations of various kinds of income, capital accounts, outside bases and the like (Chadbourne, 2013).” In addition, investors in MLPs are considered engaged in business in the states where the MLP does business and have to file state tax returns.

<sup>15</sup> There is an interesting intersection between the REIT and MLP provisions of the Code: income from real property—rents, interest, and gains—are good income under the MLP provisions because the MLP provisions expressly adopt the REIT definitions of rent, income, and gains.

- Natural resource activities include gathering, processing, pipelines, etc.
- Income from commodity investments
- Capital gains from sale of assets used to generate the above types of income.

The above sources can generally be divided into two categories: various forms of passive income, such as rent, dividends, and interest; and exhaustible natural resources, such as mining or transporting minerals or timber. In the 1988 amendments to IRC Section 7704, Congress included language in the definition of qualifying income intended to clarify that it does not include income and gains from renewable energy sources.<sup>16</sup> “Congress said that 'fishing, farming . . . [and] hydroelectric, solar, wind, or nuclear power production' are not activities that deal in minerals or natural resources. Inexhaustible resources, even if natural resources, do not qualify. Examples of inexhaustible resources are soil, sod, turf, water, air and minerals from sea water. Thus, wind farms, solar power plants and hydroelectric projects are generally not suitable assets for MLPs" (Martin 2006).<sup>17</sup>

Currently, avoiding double taxation through reliance on the partnership provisions of the U.S. income tax code may still be attractive. As of the date of this publication, from a regulatory perspective, the U.S. corporate federal income tax rate is 35%, the tax rate on dividends is 15% to 20%, and individual tax rates range from 10% to 39.6%.

A prime example of an MLP in today’s public marketplace is an energy pipeline operator that moves crude oil, natural gas, and refined petroleum products through its network of pipelines. The MLP is paid fees based on pipe capacity and volumes transported, not on the price of the underlying commodity in the pipe. Pipeline building requires significant capital, resulting in a captive market for customers and a barrier to competition. More successful MLPs are often paired with a sister corporation, which builds and then sells the qualifying source assets to the MLP, taking on the commodity and construction risk to the benefit of the MLP. As commodity demand rises, the MLP’s earnings and dividends grow. The MLP can grow as well by acquiring the income from other pipelines or building new pipelines.

MLPs generally distribute their income to the unit holders on a quarterly basis<sup>18</sup> and are characterized as having relatively low risk with relatively high yields (5% to 10%). Distributions are usually treated as tax deferred return of owner capital, lowering the owner’s tax basis while taxing gains only upon the sale of units.

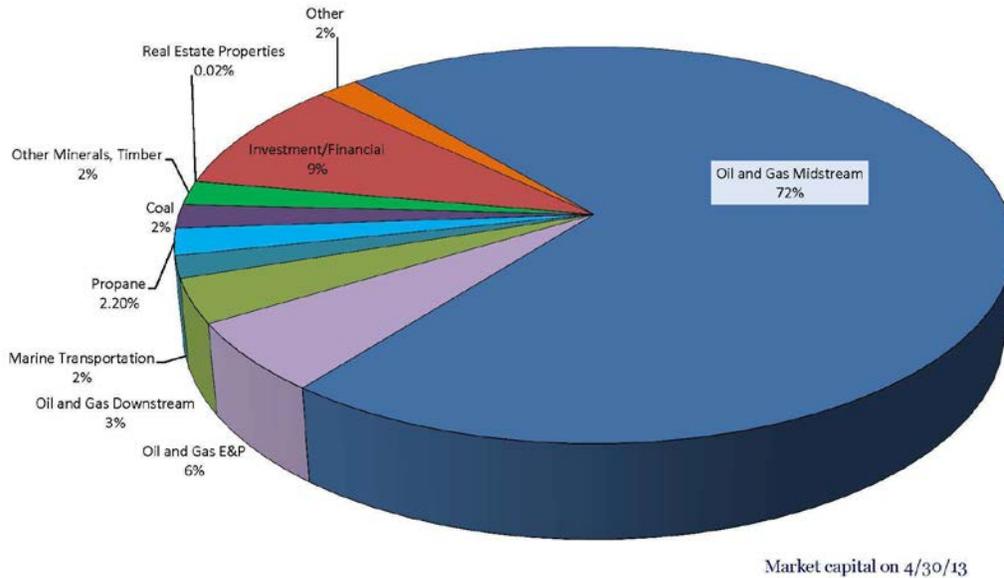
As illustrated in Figure 2, more than 90% of MLP investment is currently in “natural resource” activity. Oil and gas dominate the sector, and with the rise in shale gas, the total market cap, and the oil and gas industry’s share of it, should continue to grow.

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<sup>16</sup> Technical and Miscellaneous Revenue Act of 1988 (P.L. 100-647), § 2004(f)(4). See also House Report 100-795, at 400 (1988), Senate Report 100-445, at 424 (1988).

<sup>17</sup> Efforts have been made to structure MLPs that avoid qualified income issues by forming a series of partnerships which issue dividends from non-qualified sources of income, and that are partially owned by the MLP. Because the MLP receives the cash flow as a dividend, which is passive, instead of non-qualified income, it has changed the nature of the cash flow. These arrangements are very hard to structure and come with a series of complications. See Martin (2007) for more details.

<sup>18</sup> Two upstream MLPs, Linn and Vanguard, have adopted monthly distributions.



**Figure 2. MLP market cap by sector**

Source: NAPTP (2013)

In summary, the MLP structure, by avoiding double taxation via federal partnership tax rules, deferring taxes, and providing access to a broad investor base through reliance on the public securities markets, provides a lower cost of capital than a traditional public corporation structure or a private partnership, which is crucial for a capital intensive industry. Assets with relatively low returns can be built while still providing an adequate yield for investors. MLPs distribute all available cash, which is attractive to investors seeking income with little investment risk, such as pensioners.

### **1.2.2 Proposed Changes of “Qualifying Income” for MLPs**

The renewable energy industries, particularly businesses that own and operate residential- to utility-scale solar photovoltaic assets, share many of the characteristics of the oil and gas pipeline business. Income is steady per asset deployed and is based on a long-term contract in the form of a power purchase agreement or equipment lease agreement. Income is often based off of the regional regulated utility rates for electricity. Upfront capital expense is intensive and operations and maintenance expenses are relatively low, making the cost of capital particularly important to a project’s economics. The solar energy industry, like the shale gas industry, has been growing rapidly in recent years, with annual installations growing from 160 MW in 2007 to 3,341 MW in 2012 (Sherwood 2009, Sherwood 2013). Given the significant benefits associated with the MLP structure, many within the renewable energy industry are advocating for the ability to use the structure.

Presently, a limited amount of renewable energy assets are owned by publicly traded partnerships. In fact, solar energy systems can be found at most remote pipeline gathering locations, providing energy to the data and telemetry systems crucial to pipeline operations.

However, if 10% or more of the partnership's income is derived from renewable energy,<sup>19</sup> then it will not qualify as an MLP, and thus must pay corporate taxes.

A PLR by the Internal Revenue Service dated February 19, 2008, analyzes the issue of MLPs and renewable energy power production (IRS, PLR- 200821021). The petitioner was intending an initial public offering as an MLP based on power plants fueled by various renewable energy resources. The letter refers to the Senate Report accompanying the Technical and Miscellaneous Revenue Act of 1988 that clarified that "qualifying income does not include, for example, income from ... hydroelectric, solar, wind, or nuclear power production." The PLR made explicit that income derived from the sale of electrical energy generated using renewable resources not previously listed, such as geothermal energy and wood chips from timber, were not qualifying income.

An act of Congress is necessary to open up the MLP structure for broader inclusion of renewable energy assets.<sup>20</sup> Several proposals have been discussed (including removing MLPs from the Code altogether). However, the most prominent efforts include the bipartisan *MLP Parity Act*, first introduced in June 2012 by Senators Chris Coons (DE) and Jerry Moran (KS). The bill was later re-introduced on a bipartisan basis into the new congress in April 2013 by Senators Chris Coons (DE), Debbie Stabenow (MI), Jerry Moran (KS), and Lisa Murkowski (AK).

As written, the proposed bill changes the definition of qualified income to include income derived from energy technologies that qualify under Sections 45 and 48 of the Code (production tax credit and investment tax credit, respectively), which are primarily renewable energy technologies, such as wind, solar, and geothermal. The proposed bill also includes income from "green" investments such as energy efficiency; grid-connected electrical energy storage; carbon capture and sequestration; and production, transportation and storage of renewable fuels and chemicals (Coons 2013).

If the Code is revised to permit renewable energy to use the MLP structure, such arrangement should not carry the perceived or apparent difficulties in reinterpreting its different sections with regards to real property and personal property, as in the case of the REIT business model (discussed in further detail in section 2). The MLP change would merely add power generation from renewable resources to the list of qualifying income activities.

If the efforts to make income from renewable energy assets qualify under REIT and MLP rules are successful, the attractiveness of these investment vehicles will be dependent on the final language of the rule changes. While altering the definitions of qualified income under IRC Sections 7704 and 856 are paramount to this endeavor, other sections of the Code, and the private sector's comprehension and comfort with these changes, will ultimately determine the success (or not) of using these proposed sources of capital for renewable energy assets.

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<sup>19</sup> In other words, if 10% or more of the partnership's income is derived from renewable energy, then less than 90% would come from "qualifying sources."

<sup>20</sup> The exception to this is "rental income and capital gains from real estate," which would be qualifying income under the presumption that solar assets were to qualify as real property. Again, the likelihood of this happening is unknown.

## 2 Considerations If Changes Are Made to REITs

### 2.1 Joint Ownership

An important factor in any IRS ruling on whether solar property constitutes real property is how the asset is divided into real or personal property, if at all. It has been argued that a solar energy asset is a self-contained system which must work holistically to generate electricity. However, within this single system are many different components and materials, such as modules, inverters, conduit, and racking. In its real property PLRs, the IRS typically concludes that some, but not necessarily all, of a project's assets are real property. For example, Revenue Rule 75-424, 1975-2 C.B. 269 (IRS 1/27/12) concerns which components of a microwave transmission system are real estate assets. In the ruling, the IRS determined that the transmitting and receiving tower itself was real property. However, the transmitting, multiplex, and receiving equipment, which did not require external support to operate, were held to be assets accessory to the operation of a business and, therefore, were not real property.

If a portion of the solar property causes the REIT to fail either the gross income or asset test, then a REIT would likely not be able to solely own the solar property and maintain its REIT status. Instead, a joint ownership structure could be instituted in which the REIT owns the real property, and a non-REIT owns the personal property. While this complicates financing, potentially increasing costs that could make the process uneconomical, this approach is currently used in at least one instance.<sup>21</sup> For example, the company "PowerREIT" operates in the solar energy space under current IRS guidelines by owning the land underneath solar energy systems. The company, which has closed transactions in Massachusetts and California, is able to pay for a portion of the initial capital structure of a solar energy asset (thus lowering the initial outlay by the solar property owner), and generate revenue through lease payments from the land. If a larger portion of the solar energy asset were classified as real property, then it is conceivable that a REIT could contribute that additional portion of the original capital structure as well.

Certain complications may arise, particularly in the solar rooftop space, when connected assets are owned by different entities, for example, in the case of bankruptcy. This circumstance is common in the solar rooftop space due to third-party entities owning solar energy assets on other companies' or homeowners' roofs. There may be difficulties disentangling the solar asset and the roof in the event of default if they are both considered "permanent". This becomes particularly problematic for balance of plant equipment, which may serve both the solar system and the building. However, to a certain degree, this has been solved for REIT ownership by the company Hannon Armstrong. Hannon Armstrong, which raised \$167 million in an initial public offering in 2013, is a REIT which primarily finances energy efficiency assets in buildings. Like plumbing and electric, energy efficiency assets are typically assimilated into the underlying building. In some instances, these buildings are owned by other entities, yet Hannon Armstrong was still able to structure these transactions to finance the ownership of the energy efficiency assets. It is believed that solar assets may also be able to find solutions to joint ownership in the event that only a portion is deemed real property.

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<sup>21</sup> See, e.g., PLR 201323016 (holding land upon which a solar system was located was eligible for REIT ownership).

## 2.2 Complications with Existing Tax Code

Designating solar assets as real property may cause unintended consequences that could significantly reduce the desired benefits of this new classification. Solar properties enjoy two prominent tax-related benefits: the investment tax credit (ITC), covered in IRC Section 48, and the five-year Modified Accelerated Cost Recovery System (MACRS) depreciation schedule, covered in IRC Sections 167 and 168. The sections of Code that govern these benefits treat solar energy property primarily as tangible personal property.

However, IRC Section 48(a)(1) and Treasury Regulation 1.48-1(c), which concerns federal investment tax credits, allows property on which a tax credit is claimed to be either “tangible personal property” or “other tangible property.” If a solar asset is designated real property, then it cannot be tangible personal property, but it has been argued that it could be considered “other tangible property.” In IRC Section 48, only certain types of real property are prohibited from receiving an investment tax credit, including buildings and structural components of buildings. If property serves as a “building component,” then it is part of the building and cannot be used for an ITC. However, if the asset provides a “special service,” it is not considered to be part of the building, and can receive the ITC while being treated as realty because its primary purpose is not building related, but energy related. The IRS has addressed “building components” for solar equipment in two separate PLRs (one involving a solar roofing membrane [PLR-200947027 {August 11, 2009}], and one involving a solar collector for a window [PLR-201043023 {October 23, 2009}]). The IRS ruled in both instances that the property was not a building component, but rather performed a “special service,” meaning they could receive the ITC. Despite these rulings, there is still uncertainty over the matter, and solar owners and developers may be very concerned over the potential loss of such a large tax benefit.<sup>22</sup>

The depreciation schedule faces similar challenges. Real property is typically depreciated over a period of 27.5 or 39 years (or not depreciated at all, in the case of land). However, the relevant section of the Code<sup>23</sup> states that all property eligible for the ITC,<sup>24</sup> including solar “equipment” (i.e., personal property), is also eligible to use the five-year MACRS depreciation schedule. If solar equipment is reclassified as real property, it may cast doubt as to which depreciation schedule is now most appropriate.

Finally, the 1603 Treasury Program, which awards a cash grant in lieu of a 30% ITC, only gives grants on equipment, not real property. Businesses must have started construction of their asset before January 1, 2012; however, grants can be given to these projects placed in service before January 1, 2017. If a change in classification were made, this may affect projects which have not received a grant yet.

Because the Code is written to implement laws from the legislative branch, and these laws are not necessarily consistent, it also does not necessarily have to be internally consistent. It may be possible to conclude, based on legislative intent and judicial interpretations, that property that qualifies as real property for one purpose (e.g., REITs) may nonetheless qualify as personal

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<sup>22</sup> However, this issue will be diminished if the tax credit reverts from 30% to 10% as scheduled in 2017.

<sup>23</sup> 168(e)(3)(B)(vi)(I)

<sup>24</sup> Section 48(a)(3)

property for another purpose (e.g., depreciation). The way in which any change in classification is written will be important and may need further clarification by future rulings.

### 2.3 Structural Issues with Using Tax Benefits

Assuming that solar assets are eligible for using the five-year MACRS depreciation schedule and the investment tax credit, there are structural difficulties with REIT investors benefiting from such an arrangement. An advantage to forming a REIT is that the entity is only required to pay taxes on its undistributed taxable income, and because it is required to distribute at least 90% of its taxable income annually to its shareholders, and often distributes more, REITs pay little or no income taxes. Therefore, the ITC may be of little value to a REIT, particularly if solar assets are a relatively large portion of its total asset base. In addition, a REIT cannot pass along the ITC to its unit holders because it is not a pass-through entity like a partnership, whose partners are allocated shares of the partnership's income and losses (through a K-1 form); a REIT distributes dividends to its unit holders, and the unit holders receive form 1099-DIV from the REIT at the end of the year showing their individual dividend income, which they then report on their tax return. In addition, to the extent a REIT distributes its taxable income to its shareholders, a pro rata portion of any investment tax credit it would otherwise be eligible to claim is disallowed.<sup>25</sup>

Unit holders of a REIT *can* benefit from the depreciation of its assets. Cash distributions by REITs are taxed in different ways depending on the price one paid for ownership in the REIT and the amount that the REIT's assets have been depreciated. In fact, REITs are often thought of as tax-deferred investments because the cash distributions in initial years are not taxed due to depreciation expenses offsetting income at the REIT level, resulting in a non-taxable return of capital at the investor level. However, because the five-year depreciation schedule is so accelerated, the depreciation expense is often greater than a solar asset's income, which generates a tax loss. Unit holders of a REIT are unable to take advantage of this loss by sheltering other income; they can only shelter the distribution they receive. Therefore, because these losses must be used in future years, much of the time value of the depreciation is lost. If solar assets were a significant portion of a REIT's asset base, the REIT would either lose much of the benefit of the ITC and accelerated depreciation,<sup>26</sup> or need to structure a financial arrangement with an alternative equity source (tax equity provider), which would limit the amount of capital it could contribute.<sup>27</sup>

Another option which companies are currently exploring is purchasing portfolios of solar energy assets after their tax benefits are fully utilized (and the projects are allowed to be sold without

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<sup>25</sup> See IRC Section 50(d)(1), which applies rules "similar to" IRC Section 46(e) effective prior to the date of enactment of the Revenue Reconciliation Act of 1990. Prior IRC Section 46(e)(1)(B) and (2)(B) limited the REIT to claiming a share of the ITC equal to the same pro rata share of taxable income that the REIT retained. The remaining portion of the ITC was disallowed. Further, if the REIT pays taxes on a smaller share of its income in any of the next four years, then the ITC it claimed may be subject to partial recapture.

<sup>26</sup> REITs can carry unused losses forward to reduce REIT taxable income in later years, though would lose some of its "time value."

<sup>27</sup> Certain financial arrangements (such as a partnership, or inverted lease) with a tax equity provider may also face complications due to a REIT's tax classification. For example, if a tax equity provider entered a partnership with a REIT for the purpose of owning solar assets, the REIT may inhibit the tax equity provider from receiving the full ITC and benefits from the tax losses.

triggering the recapture rules in the Code). In doing this, a REIT would avoid the issue of how to use the tax benefits at the REIT level (since they were used by the prior owner), and thus have a portfolio of assets whose primary benefit is long-term stable cash flow (like other REIT asset classes). If REIT qualifications do change for solar, this may be one of the first strategies to be implemented. Conversely, because of the solar market's rapid growth, not many solar projects are five years or older. A REIT could purchase a solar asset that received a Treasury grant (as the same recapture rules do not apply); however, the REIT acquisition must not have been planned as a method of circumventing the issue.

## 2.4 Prohibited Transaction Tax on Electricity Sales

A REIT cannot be used to own an operating business, and therefore, if it sells inventory, it is subject to a 100% tax on profits from the sale. Electricity is typically classified as inventory for companies that own generating assets and use them to generate electricity for sale (as opposed to leasing them to someone else). If electricity were to qualify as inventory for purposes of a solar asset, then its sale by a REIT would attract a tax equal to 100% of the REIT's net income from those sales.<sup>28</sup> In order for a solar REIT to generate revenues through power purchase agreements without it being a prohibited transaction, there would need to be a determination by the IRS that electricity generated by the REIT is not inventory, or Congress would need to pass legislation incorporating an exception into the rules (Congress passed this exception for the sale of timber in *The Food Conservation and Energy Act of 2008*). An alternative would be to structure all transactions using a lease in lieu of a PPA. However, this practice is currently only used in the distributed solar space, and is likely to be problematic for a project contracted for a utility.

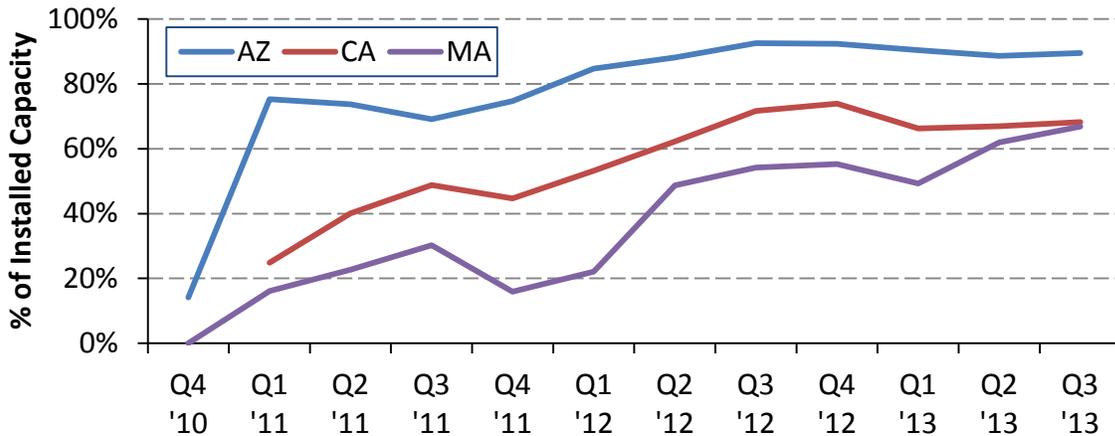
## 2.5 Complications with Third Party Ownership

If solar assets were confirmed to be real property by the IRS, this could create uncertainty for current financing structures that use either leases or power purchase agreements (PPAs). Third-party businesses have gained significant market share in the United States, driving a considerable amount of distributed PV demand. For example, as noted in Figure 3, approximately 90% of residential systems installed in Arizona during 2012, and through the first half of 2013, were third-party owned.

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<sup>28</sup> See section 857(b)(6)(A)

## Residential Systems



**Figure 3. Percentage of residential PV capacity installed as third-party systems in select states**

Source: Arizona Goes Solar (2013); CSI (2013); DOER (2013)

Tax treatment of a lease as a true lease and not a capital lease or financed sale of the asset must meet certain requirements established primarily through case law. In 2001, the IRS reiterated its views on the factors supporting treatment of a lease as a true lease.<sup>29</sup> Among these factors are issues relating to permanence: 1) the lease term cannot be more than 80% of the life of an asset; 2) the owner must have a claim for the residual value of the asset; and 3) the lessor must have the ability to offer the services of the asset to someone else other than the lessee at the end of the lease. If it does not pass these tests, the leasing of the asset could be treated as a sale of the asset to the lessee. A solar asset’s treatment as real property, and thus inherently permanent, might cause problems for a transaction passing the third, and possibly the second, test.

## 2.6 Other Complications

Solar assets currently receive property tax exemptions in many states. These laws often treat solar assets as personal property. This does not necessarily create a conflict with treating solar assets as real property for REIT purposes; federal and state laws often classify the same assets in different categories. Further, the REIT rules expressly state that local law definitions do not control for purposes of determining the definition of real property under the REIT rules.<sup>30</sup> For example, many local laws classify property, such as machinery, as fixtures while federal law defines it as personal property. However, it should be identified as a potential complication, particularly in states and localities whose laws follow federal laws.

Finally, if solar assets are classified as real property, an investor in solar energy projects may incur tax on gains from the sale of such property under the Foreign Investors Real Property Tax Act (“FIRPTA”), as codified in Sections 897 and 1445 of the Code. In general, foreign persons are taxed in the United States only on investment income from U.S. sources and income that is

<sup>29</sup> See Rev. Proc. 2001-28.

<sup>30</sup> See Treas. Reg. § 1.856-3(d).

connected with the conduct of a trade or business in the United States by the foreign person. In contrast, gain from the sale of property is not generally subject to tax in the United States. However, FIRPTA changes the latter rule in the case of gains from the sale of U.S. real property and treats such gains as if they had been derived by the foreign person from a U.S. trade or business. The foreign seller of such property is subject to U.S. tax on the net gain from the sale, and the buyer is required to withhold 10% of the purchase price of the property and remit it to the IRS as a “prepayment” of the seller’s U.S. tax liability.<sup>31</sup> Thus, if solar is classified as real property, foreign investment in projects will also be subject to these rules, which may dampen investment.

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<sup>31</sup> Exceptions from this rule are available for certain investors who own interests in publicly traded REITs, or REITs in which foreign investors own in the aggregate less than 50% of the interests. However, applying these rules in practice is often difficult.

## 3 Considerations if Changes are Made to MLPs

### 3.1 Loss limitations for Investors

Investments in partnerships are much more complicated to track than investments in corporations. A partner's investment in a partnership is tracked through two accounts. The first is the capital account, which represents the partner's share of the equity contributed to the partnership. The second account calculates a partner's outside basis, or the amount of a partner's investment in his or her interest in the partnership. This amount determines how much gain (or loss) the partner would incur upon a sale of that interest.

A partner's capital account begins as the sum of the cash and the market value of any property contributed by the partner to the partnership. A partner's outside basis begins as the sum of the cash and the partner's tax basis in property contributed by the partner to the partnership.<sup>32</sup> Both amounts then increase by the amount of partnership income allocated to the partner and decrease by the amount of cash distributed and losses allocated to the partner. If the partnership has nonrecourse debt, then the partner's share of this debt is added to his or her outside basis, and the partner's share of any repayment of that debt is subtracted from his or her outside basis.<sup>33</sup> These rules are particularly relevant to solar projects because the use of their accelerated depreciation schedule, and the potential use of debt, which can cause significant losses and low capital account and outside basis amounts in the first several years of a project.

If a partnership incurs an operating loss, partners who are *individuals* or *closely-held corporations* are subject to certain *loss limitation* rules in the Code that can prevent these investors from fully utilizing this loss.

- **Capital basis limitation:** a partner cannot claim a loss to the extent it exceeds the amount in the partner's capital account. When the capital account is reduced to zero, it means that for tax purposes, the partner has no capital invested in the partnership. The Code's partnership rules do not allow a partner to claim losses beyond the partner's equity investment in the partnership.<sup>34</sup>
- **At-risk limitation:** Assuming basis is greater than zero, the partner's capital must be at risk or the loss cannot be claimed. Capital may not be at risk if there are, for example, non-recourse loans, or loan guarantees that protect the investor's capital. Like the capital basis limitation, this rule is designed so that a partner cannot receive benefits without risk in its investment. If the only capital at risk, for tax purposes, is non-recourse debt (in

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<sup>32</sup> If a partner purchases his or her interest in the partnership from another person, outside basis starts as the amount paid by the partner for that interest.

<sup>33</sup> Partnership-level nonrecourse debt does not affect the partners' capital accounts.

<sup>34</sup> Note, however, that there is an exception to this rule to the extent the losses are funded with nonrecourse debt allocated to the partner. This rule allows a partner to take deductions for losses that are funded with the partner's share of nonrecourse debt (e.g., nonrecourse debt is used to purchase property that generates depreciation deductions) even if those losses exceed at some point the amount in the partner's capital account (this amount is referred to as minimum gain). In return, as that debt is repaid, the partner is required to recognize gain equal to his or her share of the repaid debt (this amount is referred to as minimum gains chargeback income). The minimum gains chargeback income partially offsets the advantage of taking the depreciation expense.

which the debt is secured only by the project, not by the partners), then the partners are not entitled to benefit from the losses.

- **Passive loss limitation:** Passive activity income can only be offset by passive activity losses. Passive activity is characterized as a partner who does not materially participate in the business. Other examples of passive income include rental income or investment income. Passive losses cannot be deducted from a partner's earned income, such as a salary. To the extent passive activity income exceeds passive activities losses in a particular year, the excess loss is carried forward to future years. For publicly traded partnerships, *a loss in one MLP cannot be used to offset income from a separate MLP, or any other investments generating passive income.*

The loss limitations are designed to prevent investors from using losses from investments, in which they are passive or in which they have no risk, to offset an investor's income from other activities. These rules also apply to tax credits as well, meaning a partner of an MLP is limited to using tax credits it receives from the MLP to offset taxes owed on income it receives from investment in the same MLP. Currently, two of the main benefits of solar energy generation ownership are the tax losses associated with the accelerated depreciation schedule and the 30% ITC. Due to these loss limitation rules, it would be difficult for an individual or closely held corporate partner in an MLP to benefit from the accelerated depreciation and ITC without significant loss of the time-value of these benefits.<sup>35</sup>

### 3.2 Mixed Portfolio Considerations

One method for avoiding the loss limitation rules to an MLP is to combine solar assets with other qualifying assets into one MLP. Losses and tax credits generated by a solar asset could be used to offset income and taxes owed from other assets, such as a natural gas pipeline, to the extent they are realized under the rules set forth above. Today's MLPs are ordinarily focused on a specific niche business, and business focus is often viewed by the investment community as a characteristic of a well-managed business. However, MLPs are constantly evaluating their ability to grow the asset base and cash distributions. This may include, for example, addition of businesses that are directly related to the core business going beyond mere pipeline operations and adding various assets for gathering, processing, and shipping natural gas, natural gas liquids, and refined oil and gas products. Occasionally, the partnership may expand into an indirectly related business, such as fuel ethanol storage tanks, an asset category which was added as an MLP qualifying income source in *The Energy Improvement and Extension Act of 2008*.

All else being equal, renewable energy businesses, such as third-party solar energy companies, may be attractive to those MLPs willing to evaluate them strictly as a growth opportunity that will add to the asset base, enhance depreciation charges, increase cash distributions to investors, and ultimately increase the distributions from the partnership. A diversified portfolio may achieve greater results through pairing certain types of assets (e.g., natural gas combined with hydroelectric power or solar combined with wind). A diversified portfolio may require more analysis of timing, tax avoidance, and cash flow benefits.

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<sup>35</sup> Another complication with a partner in an MLP using the ITC is that if it sells its interest in the MLP during the first five years after a project is put in service, it will have a partial recapture of the ITC claimed on the project.

Market research might be able to gauge on a hypothetical basis whether existing MLPs or their investors would be interested in diversifying into renewable energy investments. Likewise, additional market research could help understand whether investors would be willing to invest in an MLP that is solely focused on renewable energy. Such studies could be useful for structuring transactions and compiling the prospectus in advance of an IPO, but ultimately, until several renewable energy MLPs are available to the market, the depth of investor interest cannot reliably be predicted. With that said, a similar business model has recently been deployed in the public capital markets by NRG. In July 2013, NRG Yield successfully raised over \$400 million through an IPO, with a diversified portfolio of contracted renewable energy projects and conventional generation and thermal infrastructure assets in the United States.<sup>36</sup> NRG is in a unique position because it is one of the largest renewable energy and traditional energy asset owners in the United States. However, based on the IPO, public markets appear willing to invest in a mixed-generation portfolio of assets, including solar.

### 3.3 Partnership Tax Management Challenges

Financial reporting, tax accounting, corporate governance, and other compliance responsibilities of publicly traded entities can be quite complicated; even more so for MLPs. There are nuances that must be addressed differently from those entities taxed as corporations, beginning with the initial public offering and continuing into “normal operations.” Prior to an IPO, the various business structures and assets must be aligned for consistency in a pass-through environment. After the IPO, varying classes of equity such as common, preferred, and general partnership units must be tracked and managed. Continued growth and integration is also imperative to increase cash distributions to unit holders, demanding roll-ups, drop-downs, roll-outs, acquisitions, and divestitures.

Managing a solar MLP has the potential to be even more complicated. Depreciation charges are one of the very attractive features in an MLP, sheltering income from tax. A partnership owning a solar or wind project is usually in a net tax loss position due to depreciation until the fourth year after the project is placed in service. Any excess depreciation is passed through to partners. They can carry it forward for up to 20 years. The excess depreciation is usually enough to shelter the income from a project for the first nine years after the project is placed in service (assuming they do not use the excess depreciation in earlier years). Assets like buildings and pipelines do not truly wear out, according to the schedules set forth by the IRS, but nonetheless, those long depreciation time frames allow for a long, steady return of capital to unit holders. Similarly, high-quality solar energy property is guaranteed by manufacturers to produce at more than 80% of its nameplate capacity after 25 years, while MACRS depreciation on the property is only five years

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<sup>36</sup> A close review of the IPO prospectus for NRG Yield discloses that NRG Yield has developed a tax strategy to manage its taxable income in such a manner that, for a lengthy period of time, the bulk of its distributions to shareholders are treated as non-taxable returns of capital. Retaining the ability to distribute “return of dividend” non-taxable distributions will be difficult for NRG Yield given the manner in which accelerated depreciation and other beneficial tax attributes are effectively reversed in the “earnings and profits” account, an account which must be zeroed out (“cleansed”) in order to make return-of-capital distributions to shareholders. NRG Yield will have difficulty continuing to produce non-taxable distributions and it will be even tougher for others to replicate.

In the case of a third-party residential solar MLP, which manages and owns equipment on thousands of homes, each system would have a distinct tax fixed asset depreciation schedule, based on the date the equipment was placed in service. Managing all of these assets has the potential to complicate an already difficult accounting procedure. The responsibilities of a publicly traded partnership are well understood today by those active in the business, just as the responsibilities of managing a renewable energy company are well understood; the complexity will be in the marriage of these businesses.

### 3.4 Challenges to Attracting Investors to MLPs

Expanding the definition of “qualified income” to include income from solar assets would give the solar industry another vehicle in which to access public markets, thus potentially expanding the amount of capital able to be deployed in the industry, and ideally lowering the cost of this capital. However, current MLP laws also make it challenging for some investors as well, and their limitations would also apply for a solar MLP. First, unlike many forms of public investment, MLPs are partnerships, which have different accounting and reporting methods. Whereas a shareholder in a publicly-traded corporation might receive a 1099 stating either the gain or loss on shares for a given year, a unit holder in a partnership receives a K-1 form. The K-1 form shows the investor’s share of each item of partnership income, gain, loss, deductions, and credits, and must be reported on the investor’s tax return. Additionally, for income from MLPs operating in multiple states, the investor will receive a state K-1 and may be required to file a state income tax return in each of those states with reported income. Further, MLPs must complete the partnership tax returns before the K-1 forms can be completed and sent to investors. Finally, K-1 amendments are frequent, and require amendments to individual taxpayer returns. Thus, many MLP investors find it necessary to request an extension for income tax filing. These unique investment characteristics specific to partnerships may disincentivize investment by average retail investors.

Because income from MLPs is often tax deferred, there is likely to be less inducement for investment from non-taxed accounts such as IRAs, 401(k)s, and other qualified retirement accounts. Further, if a tax-exempt entity invests in an MLP, the Code requires that they be treated as engaged in an “unrelated” trade or business and must pay taxes on the income as “unrelated business taxable income” (UBTI).<sup>37</sup> All UBTI above \$1,000 is taxed at the highest rate for a trust, currently 39.6% (NAPTP, 2013). A significant portion of U.S. investment is from tax-exempt entities, such as IRAs, universities, and pension funds.

Foreign investors also have more complicated tax filing requirements when investing in an MLP. Foreign investors are required to file tax returns reporting their share of an MLP’s income and must withhold taxes at the highest applicable effective tax rate on MLP quarterly distributions. The foreign investors receive credit back on excess withholdings only after they have filed a U.S. federal tax return.

The tax consequences, filings, and withholdings of MLP investment may discourage investment from less sophisticated investors, foreign investors, and non-profit organizations. While this would not be unique to a solar MLP, it should be recognized that allowing solar to qualify as

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<sup>37</sup> Further complications may arise as tax exempt ownership typically inhibits a company from claiming an ITC.

“good income” for MLP purposes does not necessarily expand its potential investors to all U.S. public capital market participants.

### **3.5 Steady, Predictable Revenue**

MLPs distribute cash on a quarterly basis, and MLPs generally predict, without guarantee, the amount of the quarterly distribution. Investors choosing the MLP vehicle often anticipate a steady distribution of cash from their investment.

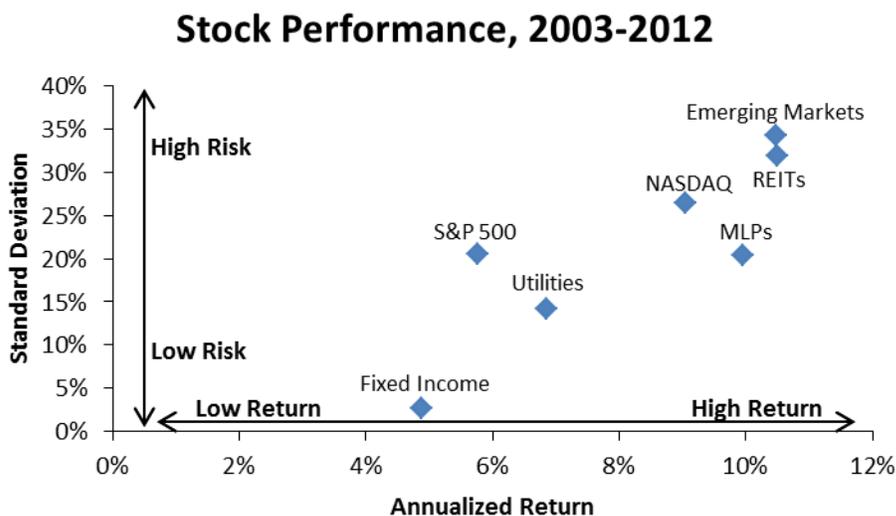
Production of electricity from solar assets is reasonably predictable and based on the equipment choice, angle, and positioning of the modules related to the path of the sun and other environmental and operational factors. However, production from solar is not steady throughout the year.<sup>38</sup> If the customer agreements are based on actual production during each quarter, as opposed to levelized production over the year, the cash available for distribution each quarter will vary considerably.

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<sup>38</sup> It should be noted that many businesses are seasonal, including natural gas pipelines. This may support the idea of bundling different asset classes into one MLP or REIT to potentially avoid peaks and troughs.

## 4 Comparison of Solar MLP/REIT Investment to Traditional MLP/REIT Investment

Investment decisions are traditionally determined by an individual investor's specific balance of desired risk and return. U.S. Treasury securities are globally liquid and considered riskless because they are backed by the full faith and credit of the U.S. government. The remainder of the risk spectrum generally involves a range from money market funds and high-quality bonds to high-risk equities. MLPs and REITs have returned relatively high yields for their volatility compared to other investment choices over the last decade. Risk and return are typically considered highly correlated. In other words, the riskier an investment, the higher its expected return must be to attract investors. As compared to other investment classes in Figure 4, MLPs and REITs have higher returns than other investments with similar volatility (i.e. standard deviation, or risk), and have lower volatility than investments with similar returns. These attractive qualities of MLP and REIT securities has caused demand from investors and produced a relatively large and stable investment industry.



**Figure 4. Returns and standard deviation across asset classes**

Source: *finance.yahoo.com*. Annual returns and standard deviation of annual returns based on adjusted close for stocks and indices with proxies of asset classes as follows: emerging markets (iShares MSCI Emerging Markets [pricing only available from 2004-12]); fixed income (iShares Core Total US Bond Market ETF); MLPs (Alerian MLP Index); REITs (iShares Dow Jones US Real Estate); utilities (PHLX Utility Sector [pricing only available from 2004-12]).

**Note: much of volatility in REIT return is due to the housing market crisis in 2007-08.**

One of the advantages to expanding the eligibility of REITs and MLPs to include solar equipment is that solar development would have access to an entire industry of lawyers, financiers, and investors with the understanding, and experience, to deploy billions of dollars in capital efficiently and effectively through REITs and MLPs. In theory, by tapping into this knowledge-base and infrastructure, the solar industry will be able to more easily and more cheaply deploy assets.

Certain characteristics of the solar industry differ from assets which have traditionally been financed in MLP or REIT vehicles. Most significantly, unfamiliarity with the asset class will require investors to be educated about the nuances of the industry. The U.S. solar industry has grown rapidly in recent years; 70% of total installed capacity came on-line in 2011-2012 alone (Sherwood 2013). Because it is a much newer asset class than the housing market, for example, there may be more perceived investment uncertainty, and thus riskiness, making solar REITs or MLPs more expensive than their more traditional counterparts. However, over the past 30 years, potential investors have been educated on the risk and return profiles of new asset classes, and as a result MLP and REIT securities have been issued in enterprises such as ethanol storage, cemeteries, fertilizer, and carbon dioxide, among others. Perceived riskiness of solar assets should decline over time through additional information provided to investors, such as the credit quality of PPA (or lease) countersigners, expected lifetime of asset, and the production and volatility of cash-flows from solar investments. Further, new production forecasting methods are in development to better estimate a solar asset's electricity production, which will also reduce uncertainty.

It can be argued that the underlying risk of owning a solar asset is equivalent to or lower than many traditional MLP and REIT asset classes. The revenue stream of a midstream oil and gas MLP has potential volatility due to the current and future price of natural gas. A certain portion of its income is derived from the volume of natural gas processed and transported; if there is an increase in natural gas price, demand can fall leading to a reduction in income for the midstream MLP. If natural gas prices rise in the future, this could also impact a midstream MLP's ability to renew or replace existing agreements. Furthermore, a midstream MLP faces the risk of government regulatory action, disaster (such as hazardous material spill or loss of life, man-made or otherwise), and higher than expected operations and maintenance costs. Finally, midstream MLPs have contracting risks due to the underlying creditworthiness of their customers and their ability to negotiate long-term contracts. As shown in Table 1, some natural gas pipeline contracts may be structured with durations longer than 10 years; however, other MLP sectors have much shorter average underlying contract lengths.

**Table 1. Midstream MLP Business Profiles**

Cash Flow Stability	Type of Business	Contract Length	Revenue Type	Type of Customers
<b>Very High</b>	Natural gas pipelines	<b>10+ years</b>	Rental fee/"Ship-or-pay"	Gas distributors, utilities, producers, marketers and others
	Crude oil pipelines	<b>5-10+ years</b>	Rental fee/Volume	Refiners, producers, financials
	Storage	<b>3-5 years</b>	Rental fee/Volume	Utilities, marketers, financials
	Refined prod. pipelines	<b>1-5 years</b>	Rental fee/Volume	Refiners, marketers
	NGL pipelines	<b>1-5 years</b>	Rental fee/Volume	Petrochemical plants, producers
	Gathering	<b>Ranging from month-to-month to life of lease dedications</b>	Rental fee/Volume	Producers
	Fractionation	<b>Typically short-term contracts but trending more long-term</b>	Fee-based/"Frac-or-pay"	Producers
	Rail	<b>1-5 years</b>	Fee-based/Distance	Refiners, producers
	Terminals	<b>1-3 years</b>	Volume/Ancillary services	Refiners, financials
	Processing	<b>Month-to-month to life of lease dedications</b>	Fee-per-car/Distance	Producers
	Marine Shipping	<b>1-3 years</b>	Fee-based/Indexed charter rates	Refiners, petrochemical companies, integrateds, marketers
<b>Very Low</b>	E&P	-	Market rates/Hedging	Midstream operators

Source: Maresca et al. (2013)

Appendix A highlights some of the risks given by the MLP Tallgrass Energy Partners in its recent initial public offering, as may be compared to those of a solar investment.

A REIT which owns commercial property also has inherent investment risk. The underlying value of commercial properties is subject to change due to changes in population, employment, or ownership trends. This has a direct effect on a REIT's ability to maintain and renew long-term leases and manage the creditworthiness of their customers. REITs are also subject to costs beyond their control, such as regulatory developments that affect their ability to dispossess or evict an occupant or increase rent. These costs can also include increases in real estate taxes, fees, insurance premiums, litigation costs, compliance costs, and any unforeseen environmental or structural issue with a building or property.

A solar MLP or REIT would have a similar, or perhaps lower, risk profile to their traditional counterparts. Like a natural gas pipeline, a solar energy asset has a degree of revenue volatility due to underlying annual and seasonal weather variability. The ability of a solar REIT to replace or renew existing agreements is similarly dependent on future competitive pricing. There is also

the risk of future regulatory action, though the chance of a disaster is far lower for a solar facility than a natural gas pipeline or other midstream operations. Increased operations and maintenance costs are also less, due to fewer moving parts in a solar asset compared to a building or pipeline. With an expected life exceeding 30 years, a solar energy system typically has a long contract length compared to other industries using MLPs or REITs, with power purchase agreements (or leases) ranging from ten to twenty-five years. Finally, the underlying revenue stream of an asset is dependent upon the creditworthiness of its customer. Large solar energy systems often have agreements with regulated utilities; 99% of the public utilities rated by Moody's and Fitch were investment grade (UWEB 2012). Transactions in the residential solar energy space are made with homeowners, with varying degrees of credit. However, most financing agreements, thus far, have required the homeowner to possess a minimum credit score of 680 to 700 (Marciano 2013).

In summary, while there are risks associated with solar energy systems, they are reasonably similar and, in several aspects, less risky than many industries currently financed through MLP and REIT structures. In addition, perceived investment risk within the solar industry should decrease over time with increased information available to investors on asset and investment performance.

## 5 Conclusion

MLPs and REITs have the potential to lower renewable energy assets' high cost of capital because of their ability to access public markets and the avoidance of double taxation. In order for MLPs and REITs to own a meaningful amount of solar energy assets, the IRS would have to change its definition of what qualifies as real property (for REITs) or legislation must be passed by Congress to change the definition of “qualifying sources of income” for MLPs.

The details of these changes, if they were to happen, could play an important part in determining the success with which MLPs and REITs are adopted to own solar energy assets, due to the current complexities within the Code and the investment profile of solar energy assets. Financing solar equipment under the REIT structure may face challenges in maximizing the benefits of the accelerated depreciation schedule and the investment tax credit (though this is expected to become less of an issue in the future as installed prices—per watt—fall, and the tax credits expire). There may also be conflicting dynamics with current leasing practices within the solar market, foreign investment, and state property tax laws, if solar equipment is determined to be real property. MLPs also face complications due to loss limitation rules; the accounting and legal complexities of structuring MLPs; and the added tax procedures for retail investors, non-profits, and foreign investors.

If these challenges are overcome, investors may be convinced to make investments in solar MLPs or REITs because the underlying risk of owning a solar asset is equivalent to or lower than many traditional MLP and REIT asset classes, while offering the same predictable cash flows. Expanding the eligibility of REITs and MLPs to include solar equipment would also give the solar industry access to an entire industry of lawyers, financiers, and investors with the understanding, and experience, to deploy billions of dollars in capital efficiently and effectively through REITs and MLPs. In theory, by tapping into this knowledge base and infrastructure, the solar industry will be able to more easily and more cheaply deploy assets, helping the U.S. Department of Energy's goal of solar achieving grid-parity with traditional sources of electric generation (DOE 2011).

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## Appendix A

The table below summarizes several risk factors recently published in an initial public offering prospectus for a natural gas transportation and storage services partnership, Tallgrass Energy Partners, LP. It indicates whether there may be a corollary risk factor for a hypothetical solar energy partnership.

**Table A-1. Comparison of Midstream Energy Partnership and Corollary Solar Energy Partnership Risk Factors**

<b>Midstream Energy Partnership Risk Factor</b>	<b>Corollary Solar Energy Partnership Risk Factor</b>
Level of firm transportation and storage capacity sold and the volume of natural gas we transport, store and process.	Solar energy sold to a subscribed customer would be based on sunshine, not market or consumer demand, once the initial contract is executed.
Level of production of oil and natural gas and the resultant market prices of natural gas and NGLs.	Depending on sunshine, the level of production is reasonably established at the initial contract. Market prices influence new contracts only.
Actual and anticipated future prices of natural gas impacting ability to renew and replace agreements.	Actual and anticipated future prices of electricity may impact the ability to extend the power purchase or lease agreement with a host.
Regulatory action affecting supply, demand, rates, operating costs, operating flexibility, or method of contracting.	Regulatory action could affect rates, operating costs, or method of contracting.
Effect of seasonal variations in temperature on the amount of natural gas transported, stored, processed, and treated.	Temperature effects would be minimal; however, the amount of sunshine each quarter may differ materially from the longer term average forecast.
Competition from other midstream energy companies.	Competition would be material for signing up new solar customers, but would not impact current sold properties and the underlying revenues.
Customer creditworthiness.	Customer creditworthiness.
Operating and maintenance costs.	Although the solar industry is less mature, the technology has far fewer moving parts and labor requirements than the natural gas industry.
Damages to equipment and properties from natural disasters and acts of terrorism.	Solar properties may face similar natural disaster risks, and vandalism in place of terrorism.
Outages at processing facilities, requiring extended and complex repairs.	Solar facilities may experience outages, with the inverter being a weaker link. Repair timing and complexity could be comparable to a home HVAC system or hot water heater.
Leaks or accidental releases of hazardous materials into the environment.	Not a risk factor for solar.
Cost of acquisitions affecting actual cash available for distributions, debt service requirements, etc.	Similar risk factor for solar.
Extent to which customers are willing to contract on a long-term basis.	Solar faces a similar risk as the technology matures, customer profiles change, competition continues to increase, and power prices fluctuate.
Poor acquisition choice and assumptions.	Similar but lower risk anticipated given low technology complexity, established records for operation, no environmental liability, etc.
Price and availability of other forms of energy.	Solar energy rates are approaching grid parity as the technology adoption expands rapidly. Should another technology accomplish a similar path, it could present a risk to solar energy.
Increased costs to explore for, develop, produce, gather, process, and transport natural gas.	Solar enjoys a relatively steady profile for energy

	production. After the first 25 years of operation, solar modules continue to produce at more than 80% of original capacity.
Nature and extent of, and changes in, governmental regulation such as greenhouse gas legislation.	Solar energy is likely to receive favorable treatment under greenhouse gas legislation.
Hazards that result in personal injury and loss of life.	Solar energy requires fewer employees and they are exposed to materially fewer risks than those employees working in the natural gas industry.