

## **MACRS Depreciation and Renewable Energy Finance**

***The US Partnership for Renewable Energy Finance (US PREF) has prepared the following issue brief on the importance of MACRS depreciation in facilitating renewable energy investment. An appreciation of MACRS' role will assist members of the policy community as they evaluate proposals to modify or eliminate MACRS as part of a fundamental reform of the U.S. tax code.***

### **I. Introduction.**

The Tax Code's current depreciation system – known as MACRS – is essential in driving private investment to renewable energy infrastructure. In turn, MACRS has served to immediately lower consumers' electricity costs, create high-paying American jobs, enhance energy independence, and reduce greenhouse gas emissions. But in today's tax reform discussions, some have suggested scaling-back MACRS – or even replacing it altogether with “economic depreciation.” But as this White Paper, as informed by our financial modeling, explains, an erosion of MACRS would have dramatically negative implications for renewable energy – curtailing project deployment and slowing job growth while significantly raising prices for consumers.

### **II. Background on MACRS.**

#### **A. MACRS generally.**

Generally speaking, the Tax Code subjects a business to income tax only on the business's net income, a concept that requires deducting from gross receipts costs that the business reasonably incurs in providing goods or services. Some costs can be deducted immediately, or “expensed.” But to the extent a business incurs costs for acquiring a tangible asset that will last more than one year, the business must deduct the cost over the asset's “useful life.”<sup>1</sup> This annual deduction, which is referred to as the business's “depreciation allowance” for the associated asset, ensures that the income tax is assessed on income, rather than receipts.<sup>2</sup>

Since its inception, the Tax Code has authorized depreciation deductions.<sup>3</sup> The Tax Reform Act of 1986<sup>4</sup> streamlined the system for claiming these deductions by creating MACRS (formally, the Modified

---

<sup>1</sup> For general background on MACRS depreciation, see Internal Revenue Service, *A Brief Overview of Depreciation*, available online at [www.irs.gov/Businesses/Small-Businesses-&Self-Employed/A-Brief-Overview-of-Depreciation](http://www.irs.gov/Businesses/Small-Businesses-&Self-Employed/A-Brief-Overview-of-Depreciation).

<sup>2</sup> As Treasury Department economists have explained: “An asset may depreciate for several reasons. One reason for depreciation is that as an asset ages, it has a progressively shorter future life over which it can earn income. Thus, the present value of the asset's future income stream, which determines its value, falls as the asset ages. A second reason is that as it ages, the asset may require more expensive maintenance or become less productive. Obsolescence sometimes also is considered to be a third reason for economic depreciation, but there appears to be some ambiguity on this point.” Donald W. Brazell & James B. Mackie III, *Depreciation Lives and Methods: Current Issues in the U.S. Capital Costs Recovery System*, 53 NAT'L TAX J., 531, 532 (2000).

<sup>3</sup> See generally David W. Brazell et al, *A History of Federal Tax Depreciation Policy*, United States Treasury Office of Tax Analysis, OTA Paper 64, May 1989, available online at [www.treasury.gov/resource-center/tax-policy/tax-analysis/documents/ota64.pdf](http://www.treasury.gov/resource-center/tax-policy/tax-analysis/documents/ota64.pdf) (reviewing the changes over time to the depreciation system, and noting that the “history was shaped, in part, by a gradual shift

Accelerated Cost Recovery System).<sup>5</sup> In enacting MACRS, Congress explained that a competitive “capital cost recovery system is essential to maintaining U.S. economic growth.”<sup>6</sup> MACRS assigns each asset:

- a “recovery period” – providing the number of years over which depreciation allowances are spread (which varies from three to 50 years);
- a “recovery method” – determining how depreciation allowances are allocated over the recovery period; and
- an “applicable convention” – establishing the time of year when the property is deemed placed in service.

Based on these variables, a business typically can write-off costs of acquiring an asset more rapidly under MACRS than under economic depreciation rules, which require write-offs on a “straight-line” method and over a longer recovery period.<sup>7</sup>

But it is important to emphasize that MACRS impacts only the *timing* of tax payments associated with an investment; as compared to economic depreciation, MACRS does not impact the total *amount* of taxes paid. That is because, relative to economic depreciation, MACRS reduces income tax liability in the years immediately after the asset is placed in service. But MACRS correspondingly increases tax liability in later years. In other words, MACRS’ benefit for business taxpayers stems solely from the time value of money, which makes depreciation deductions worth more to a business in net present value (NPV) terms than does economic depreciation.

#### **B. “Bonus” depreciation.**

In recent years, Congress on several occasions enacted legislation providing for “bonus depreciation,” which enables business taxpayers to write-off the cost of acquiring certain assets more rapidly than MACRS would ordinarily permit. (Some informally describe bonus depreciation as “MACRS on steroids”.) A bonus depreciation provision that President George W. Bush signed into law in 2002 allowed taxpayers to immediately deduct 30% of the cost of new assets acquired during the provision’s applicability; the remaining 70% would be deducted under otherwise applicable MACRS rules.<sup>8</sup> Both the Economic Stimulus Act of 2008,<sup>9</sup> signed by President Bush, and the American Recovery and Reinvestment Act of 2009,<sup>10</sup> signed by President Obama, instituted a 50% bonus depreciation allowance. Later, the Tax Relief, Unemployment Compensation Reauthorization and Job Creation Act of 2010

---

from a policy in which depreciation allowances were based on individual taxpayer circumstances to one in which uniform statutory rules are used to facilitate taxpayer compliance”).

<sup>4</sup> P.L. 99-514.

<sup>5</sup> I.R.C. §§ 167(a), 168.

<sup>6</sup> Joint Committee on Taxation, *General Explanation of the Tax Reform Act of 1986*, May 4, 1987.

<sup>7</sup> See generally Joint Committee on Taxation, *Present Law and Background Relating to the Interaction of Federal Income Tax Rules and Federal Accounting Rules*, JCX-13-12, Feb. 7, 2012.

<sup>8</sup> Job Creation and Worker Assistance Act of 2002, Pub. L. 107-147.

<sup>9</sup> Pub. L. 110-185.

<sup>10</sup> Pub. L. 111-5.

further increased the allowance to 100% – such that the asset would be fully depreciated in the year of acquisition.<sup>11</sup> In general, bonus depreciation has been supported by both Republicans and Democrats, who note the usefulness of accelerating write-offs as a catalyst for the very kinds of private investments that stimulate the economy.<sup>12</sup>

**C. Application of MACRS to renewable energy.**

Since its establishment in 1986, MACRS has assigned a five-year useful life to most renewable energy property – including solar, wind, geothermal, fuel cell, combined heat and power (CHP), and micro turbine property, as well as renewable energy generation property that is part of a “small electric power facility” and certain biomass property.<sup>13</sup> This property has been subject to the “200% declining balance” recovery method, which provides the greatest depreciation allowance in the first full year of use and declines over time.<sup>14</sup> Figure 1 demonstrates the application of these rules, both under current law (without any bonus depreciation) and when there is 50% bonus depreciation.

**Figure 1. MACRS depreciation for renewable energy projects (percentages)**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 <sup>15</sup>
MACRS	20.00	32.00	19.20	11.52	11.52	5.76
MACRS + 50% bonus depreciation	60.00	16.00	9.60	5.76	5.76	2.88

<sup>11</sup> Pub. L. 111-312.

<sup>12</sup> For instance, in announcing 2010 legislation to extend bonus depreciation, Senate Finance Committee Chairman Max Baucus (D-MT) argued on the Senate floor that “[b]onus depreciation is a cost-effective provision that provides real relief for businesses. Bonus depreciation creates jobs.” Statement of Sen. Max Baucus, *Bonus Depreciation Extension to Create Jobs Act*, U.S. Senate, June 21, 2010, 110 Cong. Rec. S5204. Similarly, Senator Orrin Hatch (R-UT), the senior Republican on the Finance Committee took to the floor in 2001 to argue: “Our recent recession was not one born of the lack of consumer spending, but the dearth of business investment. . . . Last year’s economic stimulus bill included a provision that has proven effective in increasing business investment -- a 30-percent bonus depreciation for the first year. . . . I have been a strong proponent of bonus depreciation....” Statement of Sen. Orrin Hatch, May 23, 2003, 108 Cong. Rec. 13,188.

<sup>13</sup> P.L. 99-514. The Emergency Economic Stabilization Act of 2008 shortened the depreciation recovery period for smart meter and smart electric grid systems to 10 years. P.L. 110-343.

<sup>14</sup> *I.R.C. § 168(e)(3)(B)(vi); see also* Molly F. Sherlock, *Energy Tax Policy: Historical Perspectives and Current Status of Energy Tax Expenditures*, Congressional Research Service, May 7, 2010.

<sup>15</sup> While MACRS generally assigns a five-year useful life to renewable energy, MACRS actually carries into year six of the project, since the half-year convention assumes that the property is placed in service at the mid-point of year one.

#### **D. Tax reform's threats to MACRS.**

Despite Congress's recent focus on liberalizing depreciation schedules (through bonus depreciation) to boost economic growth, some have called to move 180 degrees in the opposite direction, by eliminating the MACRS system altogether – and thus decelerating the depreciation allowances that have been in place since 1986. Generally, these proposals would replace MACRS with economic depreciation, which would more closely mirror the GAAP accounting treatment of capital assets (that is, write-offs taken on a straight-line basis over longer recovery periods). For instance:

- President Obama's tax reform "framework" expressly includes an option of moving from MACRS to economic depreciation;<sup>16</sup>
- Erskine Bowles and Alan Simpson, co-chairs of President Obama's Deficit Commission, released a "Chairmen's Mark" that would eliminate virtually all tax expenditures, including MACRS;<sup>17</sup>
- a October 2011 Joint Committee on Taxation revenue estimate observed that reaching a revenue-neutral rate of 28% for corporations – a rate that still is above the 25% that Ways and Means Committee Chairman Dave Camp (R-MI) publicly seeks – would require eliminating virtually all corporate tax expenditures, *including* MACRS; and<sup>18</sup>
- a recent release from the Senate Finance Committee outlining tax reform options in the areas of infrastructure, energy, and natural resources includes replacing depreciation with "other types of tax incentives, such as rate reductions or credits."<sup>19</sup>

But these calls fail to distinguish across types of assets – and therefore ignore the particularly important role that MACRS may play in certain industries, such as renewable energy. In fact, abandoning MACRS would disproportionately impact assets that currently qualify for among the shortest depreciation periods, such as renewable energy property. We presume that if MACRS were repealed, renewable property would be written-off using the straight-line depreciation method (which spreads deductions equally across the recovery period), and the recovery period would be lengthened from its current five years (perhaps to a significantly longer period).

---

<sup>16</sup> See *President's Framework for Business Tax Reform*, Feb. 22, 2012, at 10, available online at <http://www.treasury.gov/resource-center/tax-policy/Documents/The-Presidents-Framework-for-Business-Tax-Reform-02-22-2012.pdf> ("Current depreciation schedules generally overstate the true economic depreciation of assets. Although this provides an incentive to invest, it comes at the cost of higher tax rates for a given amount of revenue. In an increasingly global economy, accelerated depreciation may be a less effective way to increase investment and job creation than reinvesting the savings from moving towards economic depreciation into reducing tax rates.").

<sup>17</sup> See Co-Chairs' Proposal, Nov. 10, 2010, available online at [www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/CoChair\\_Draft.pdf](http://www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/CoChair_Draft.pdf).

<sup>18</sup> Memorandum from Thomas A. Barthold (Joint Committee on Taxation, United States Congress) to unknown recipient, dated October 27, 2011, available online at [http://www.novoco.com/hottopics/resource\\_files/jct-memo\\_tax-expenditure-repeal\\_102711.pdf](http://www.novoco.com/hottopics/resource_files/jct-memo_tax-expenditure-repeal_102711.pdf).

<sup>19</sup> Senate Finance Committee Staff, *Tax Reform Options for Discussion, Infrastructure, Energy, and Natural Resources*, Apr. 25, 2013, available online at [http://www.finance.senate.gov/imo/media/doc/04252013 Infrastructure, Energy, and Natural Resources OptionsPaper.pdf](http://www.finance.senate.gov/imo/media/doc/04252013%20Infrastructure,%20Energy,%20and%20Natural%20Resources%20OptionsPaper.pdf).

### III. MACRS’ role in facilitating renewable energy projects.

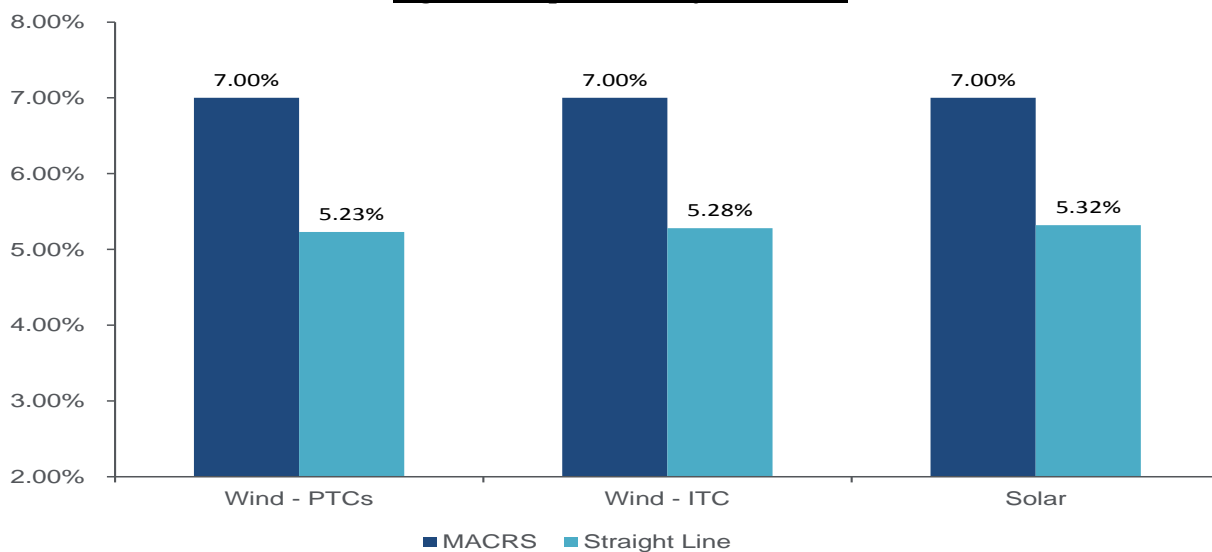
As is the case across industries, MACRS reduces the present value of corporate income tax liabilities for renewable project developers – thus enabling developers to place more renewable energy projects in service, and for those projects to deliver renewable energy at lower cost to consumers. But relative to most industries, MACRS takes on added importance in renewable energy.

#### A. Absent MACRS, fewer renewable projects would be deployed.

MACRS plays a key role in supporting marginal investments. A fundamental principle of corporate finance is that a firm’s decision to make a capital investment is based largely on its cost of capital, and the degree to which the return on an investment opportunity (such as a new factory or power plant) exceeds this cost. If depreciation were made less attractive, the after-tax return from a given investment would fall (all else being equal) – in turn reducing the attractiveness of the project and potentially reducing the number of opportunities that can be undertaken at the necessary internal rate of return.

Our model of typical renewable generation assets finds that replacing MACRS with economic depreciation would reduce the returns on new projects by about 25%. The model presumes that a 7% internal rate of return is required for an investor to put up capital for a project (which is roughly the rate that investors currently require). But holding all other factors constant, replacing MACRS with straight-line depreciation would drive down by about one-fourth the returns on a project currently yielding 7%, to around 5.25%.<sup>20</sup> We graphically illustrate this impact in [Figure 2](#), below.

**Figure 2. Impact on Project Returns**



In addition to reducing the return provided by these investment opportunities, MACRS’ acceleration of depreciation deductions substantially reduces the time period in which the capital expenditures are recovered. In an increasingly uncertain investment climate – in which market demand and production costs shift quickly – this faster return of capital may lower the risk premium, and thus reduce the returns required to make a new investment attractive. Eliminating MACRS would lower the

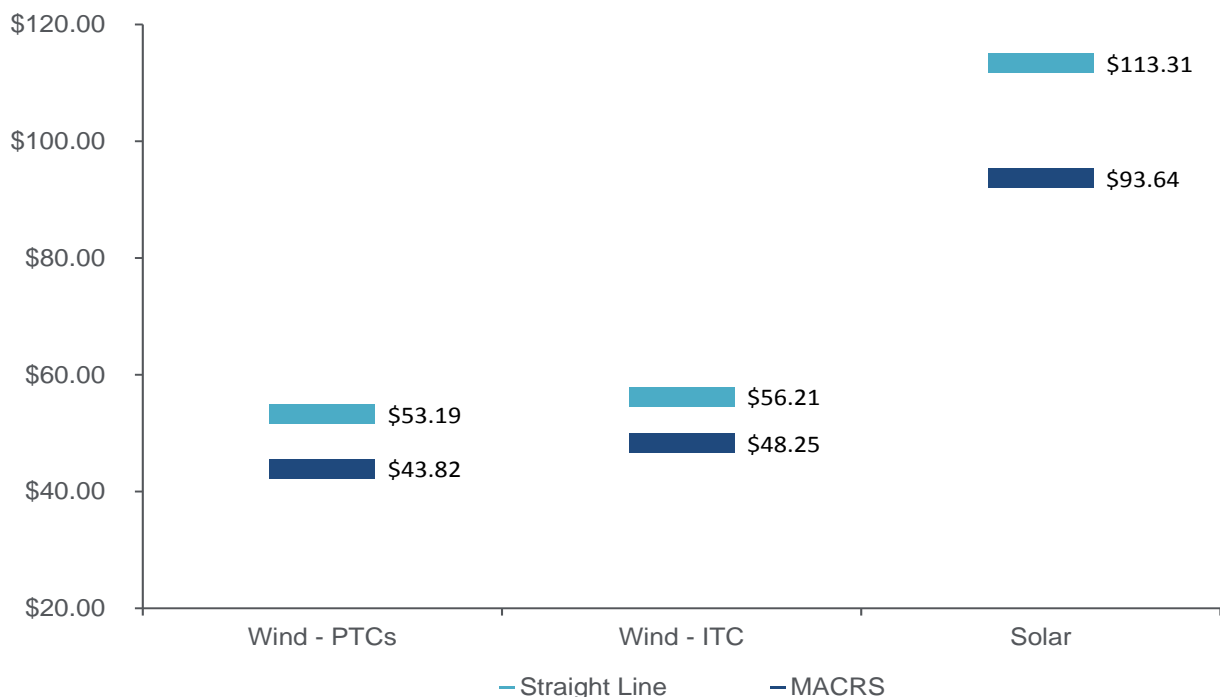
<sup>20</sup> The assumptions underpinning this finding are detailed in [Appendix A](#). Specifically, our financial model examined three scenarios: a wind project that elects the Section 45 production tax credit (PTC); a wind project that elects the Section 48 investment tax credit (ITC); and a solar project that qualifies for the ITC.

return potential for renewable energy projects and raise their risk premium, which means that fewer projects would ultimately get built.

**B. Absent MACRS, consumer prices would increase dramatically.**

Alternatively, the impact of replacing MACRS with straight-line depreciation can be conceptualized in terms of the amount that a project undertaken today would need to increase its revenues in order to satisfy return requirements. Holding all other assumptions constant, we find that switching from MACRS to straight-line depreciation would require projects to increase revenues by about a fifth (16.5-21.4%) to satisfy return requirements. Undoubtedly, this revenue would come from a corresponding increase in prices charged to electricity consumers. We illustrate the pricing impact on Figure 3.

**Figure 3. Impact on Levelized Revenue Requirement<sup>21</sup>**



**C. Eliminating MACRS to finance a tax-rate reduction relies on shaky premises.**

**1. Revenue estimates are likely overstated.**

Proposals to eliminate MACRS appear driven not by disputes over the system’s policy merits, but rather by a desire to recover the revenue foregone on account of MACRS, presumably to finance a reduction in tax rates. As mentioned earlier, however, the incremental revenue “recovered” is ultimately tax revenue taken today at the expense of future revenue, which would otherwise accrue to the government for the same assets as their depreciation period ends (i.e. in years seven and beyond in the

<sup>21</sup> As the U.S. Energy Information Administration explains: “Levelized cost is often cited as a convenient summary measure of the overall competitiveness of different generating technologies. It represents the per-kilowatt hour cost (in real dollars) of building and operating a generating plant over an assumed financial life and duty cycle. Key inputs to calculating levelized costs include overnight capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate for each plant type.” *Annual Energy Outlook 2013*, Jan. 28, 2013, available online at [http://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](http://www.eia.gov/forecasts/aeo/electricity_generation.cfm).

case of 5-year MACRS property). In fact, savings from a switch to economic depreciation are significantly illusory. Much of the revenue that Congressional “scorekeepers” estimate from switching from MACRS to straight-line depreciation would, in fact, never reach Treasury’s coffers. This results from Washington’s reliance on a 10-year budget window – meaning a snapshot of 10 years worth of tax payments that completely ignores revenue collected outside the window. Congruently, deductions are deemed to constitute tax expenditures only within that 10-year period – and to the extent that an asset’s useful life extends beyond the 10-year window, depreciation deductions taken more than 10 years in the future will not be counted. Economists with the Treasury’s Office of Tax Analysis recently explained:

Using slower depreciation to pay for corporate tax rate reduction ... raises concerns about the long-run fiscal sustainability of such a policy. While tax rate cuts permanently reduce tax revenue, the revenue gained from slowing depreciation can be larger immediately following the policy change than it is later, once the policy is fully phased in. Consequently, a tax reform plan that slows depreciation and cuts the corporate rate and is revenue neutral over the typically used 10-year budget window could lose substantial revenue in the long run.<sup>22</sup>

It would be particularly misguided to allow revenue considerations to drive such a dramatic policy decision, especially when the anticipated revenues are transitory.

## **2. Renewable energy developers are unable to trade MACRS for a lower tax rate.**

Proposals to switch from MACRS to straight-line depreciation have emerged in the context of tax reforms that would broaden the tax base to finance a reduction in tax rates. Acknowledging that elimination of MACRS could likely be paired with a tax rate reduction, we computed the tax rate that would be required to equalize returns. Our examination of a typical wind project relying on the wind production tax credit found that *even a zero corporate rate* would not offset the benefits of MACRS. And for wind and solar projects relying on the investment tax credit, the rate would need to drop from 35% to 2% in order to equalize returns. Meanwhile, the “holy grail” of corporate tax reform is to achieve a 25% tax rate. While some industries might be keen to trade MACRS for a lower tax rate, this is not a tradeoff that renewable energy firms are able to make.

### **D. Tax policy should favor new investments over existing ones.**

While reducing tax rates is a meaningful objective, maintaining MACRS is actually a more pro-growth policy than reduced rates. That is because MACRS rewards *new* investments – its core benefit is to allow companies to take more depreciation in the beginning of an asset’s life, to increase the net present value of capital purchases. In turn, MACRS makes a new investment more attractive and helps to stimulate spending that creates jobs. In contrast, a lower corporate tax rate rewards returns on previously made investments. In other words, eliminating MACRS merely in the name of reducing taxes would reward existing investments at the cost of new ones.

### **E. MACRS offers an important hedge against interest rate risk – leveraging the federal financing advantage to facilitate private investment.**

When it comes to cost of capital, the federal government has a significant comparative advantage relative to the private sector. Whereas the cost to the federal government is based on the risk-free borrowing rate, a renewable energy project’s benefit is based on its senior debt rate (that is, avoided borrowing), which typically is higher than the risk-free rate by at least 100 to 200 basis points. MACRS enables the government to leverage that advantage to stimulate private investment.

---

<sup>22</sup> James B. Mackie III & John Kitchen, *Slowing Depreciation in Corporate Tax Reform*, TAX NOTES, Apr. 29, 2013, at 511.

In today's low interest-rate environment, this aspect of MACRS' importance is more limited – that is, the fact that MACRS is a benefit only in terms of timing is less significant because borrowing costs are lower.<sup>23</sup> But interest rates may very well rise and, when they do, pre-tax values of future cash flows will correspondingly fall. MACRS will play a key role in addressing this risk. Because the income tax dynamics of the initial term of a renewable project are typically an initial term of tax benefit (followed by a longer term of tax expense), an increase in the risk-free rate actually increases the value of accelerated depreciation; in other words, MACRS is even more beneficial as interest rates increase. In fact, some US PREF members have found that MACRS can mute by almost *two-thirds* the reduction in after-tax net present value caused by increased interest rates. While any erosion of MACRS would have negative consequences for renewable energy, those consequences are magnified at a time when interest rates can be expected to rise.

#### **IV. Conclusion.**

Moving from MACRS to economic depreciation would dramatically impede the renewable energy industries' rapid expansion while producing little, if any, tangible budget impact over the long term. It is important to assess the impact of any depreciation reform on broader objectives of enhancing energy security, reducing emissions, and creating high-paying jobs across the value chain.

**Primary Author:** Derek Dorn, Davis & Harman LLP for SunRun

**Contributing Authors:** Lee Peterson, CohnReznick and Michael Dorenfeld, Citigroup

#### **ABOUT US PREF**

US PREF is a coalition of senior level financiers who invest in all sectors of the energy industry, including renewable energy. Members educate the public sector to assure renewable energy finance legislation impacts the market as efficiently and effectively as possible, with the goal of helping to unlock capital flows to renewable energy projects in the United States. US PREF is a program of the American Council On Renewable Energy (ACORE), a Washington, DC - based non-profit organization dedicated to building a secure and prosperous America with clean, renewable energy.

For any questions on this paper or if you would like more information about US PREF, please contact Todd Foley at [foley@acore.org](mailto:foley@acore.org) or Cindi Eck at [eck@acore.org](mailto:eck@acore.org).

---

<sup>23</sup> On the other hand, since equity returns are also reduced in a low interest-rate environment, even a less valuable MACRS benefit still can be essential in helping a project “pencil out” for private investors.