

**POLICY PAPER**

# **The Financing Effects of Addressing CCS Technical and Commercial Scale-Up Barriers: Remaining Challenges**

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**July 2022**



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## Abstract

Some *financial* barriers to CCS investment would be substantially addressed by solutions advocated in whitepapers #1-4 of this study series, yet some intractable barriers would remain. This paper discusses both types of barriers. Adoption of the recommendations of the first four whitepapers for removal of commercial, revenue and regulatory barriers would raise the economic prospects of carbon capture and storage (CCS) facilities enough to presumably attract institutional investors. Particularly, if the current tax credit-reliance regime were converted to cash-paid incentives at a higher dollar rate, vastly larger markets would be open to CCS projects. Even so, there would still remain significant structural financial barriers to these kinds of decarbonization projects. These residual, finance-specific barriers are broadly a function of how revenues and other benefits generated within project finance structures are defined, shared, consumed, or taxed. Institutional investors such as foreign and domestic pensions, sovereign wealth funds and tax-exempt entities such as charitable endowments—which together account for \$47 trillion USD in assets under management—are differentially affected by U.S. law and regulation. These rules increase the complexity, administration costs and/or taxable income which taken together reduce the attractiveness of decarbonization projects. This 5th whitepaper begins with a brief description of how the provision of project financing (debt and equity), or corporate on-balance-sheet capital may favorably respond to recommended changes articulated in the preceding four whitepaper and what that might mean for the viability for CCS scale-up. This paper then details key residual finance-specific barriers and how they are currently accommodated by financial actors. Given that these finance-specific challenges are cross-cutting irrespective of the kind of decarbonization projects, this exploratory paper highlights areas of further inquiry to explore and mitigate these residual barriers.



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# 1. Introduction

Decarbonization projects can be financed either in non-recourse/standalone project finance markets or on-balance sheet if owned by a large corporation. In either case, for a decarbonization project to achieve a successful closing (for project finance), or final investment decision (corporate capital allocation process), the proposed project has to meet similar quality standards. For project finance, owners who fail to meet the standard simply will fail to find lenders and investors. For on-balance sheet corporate finance, while a firm may have the financial means to undertake a risky/low-return project, corporate managements avoid such projects to prevent erosion of company-wide financial performance metrics.

One goal of policy for decarbonization projects such as CCS ought to support the creation of high-quality solutions with strong credit profiles and attractive risk-adjusted returns for equity owners. In the current U.S. environment, policy support is required because there is neither a compliance based GHG emission control regime, nor a carbon tax. Further, given the relative speed for which decarbonization solutions must be deployed at scale to meet U.S. federal climate reduction goals, let alone a net-zero 2050 ambition, such existing and expanded policy support is crucial. The intent of these policies would be to further attract private capital to decarbonization solutions.

Successfully attracting capital depends upon: (i) de-risking technical dimensions, (ii) demonstrating and contractually securing an adequate and predictable revenue/incentive cashflow stream, (iii) acquiring critical permit and any entitlements, as well as building a base-level social license to operate within the community where the facility will be located, and (iv) securing capital that ensures project economic feasibility, while meeting the terms of providers' return requirements. Complementary studies in this series of whitepapers have explored the technical and commercial (cashflow and non-cashflow) barriers to CCS scale-up and mechanisms to address such barriers (i.e. i-iii) through changes in policy and project developer approaches, amongst others.

- Whitepaper #1 explores how a successful commercial deployment track record can be fostered for CCS projects
- Whitepaper #2 explores the level of stable policy support, in addition to other market-based revenue streams that would enable de-risked projects to scale-up.
- Whitepapers #3 and #4 discuss regulatory design and infrastructure development issues that would eliminate “binary risks” that can otherwise present critical roadblocks to CCS projects.

This whitepaper explores point (iv), financing. This whitepaper asks, “To what extent will successful implementation of policies recommended in whitepapers #1-4 be sufficient to allow \$3-4 trillion a year of new ‘green/decarbonization assets’ to tap institutional investor/lender markets; and, if not, what are the remaining barriers?” In response, this work begins with a brief description of how the provision of project financing (debt and equity), or corporate on-balance-sheet capital may favorably respond to recommended changes articulated in the preceding four whitepapers and what that might mean for the viability for CCS scale-up. This paper then details key residual finance-specific barriers and how they are currently accommodated by financial actors. Given that these finance-specific challenges are cross-cutting irrespective of the kind of decarbonization projects, this exploratory paper highlights areas of further inquiry to mitigate these residual financial barriers.

## 2. Background: Passthrough Entities in Decarbonization Projects & the Effects of Tax Credits

Whether it be via project financing or corporate on-balance-sheet capital, most energy projects are organized as — and placed within — a limited liability company (LLC), which provides the limited liability offered by a corporation, combined with the passthrough taxation treatment of a partnership. Partnerships offer flexibility in how economic returns can be shared by the partners. This is of particular importance in the case of incentives which take the form of tax credits. Such tax benefits can only be claimed by a project owner. In the likely event that the energy project developer does not possess the “tax appetite” to fully monetize these credits, it seeks an investor to do so. The passthrough of the credits to the investor is achieved through joint ownership in the project through a partnership structure. The tax equity provider pool has historically been rather concentrated, currently with a market size of ~\$18 billion with 30-50 active providers and commanding a relatively high cost of equity compared with commercial debt.<sup>1</sup> The combination of tax credits forcing a partnership structure and the need for tax equity investors adds some cost and complexity to the development of an energy project, with two in particular: credit “trapping” and project back-levering.

Affecting all institutional investors is the concept of avoiding “trapping” carbon abatement tax benefits inside of a corporate form, necessitating the need for partnership and the attendant structuring complexity. This is because these carbon abatement tax credits are in addition to depreciation and interest deductions. Depreciation is deducted from taxable income, so is interest on any debt outstanding; a tax credit is simply subtracted from the taxes owing. However, all of these deductions and tax credits are only of financial value in the current year if—after taxing account of the deductions—enough pre-credit tax liability is generated to also utilize the credits fully.

Consider a firm that reports a tax loss. There will be no deductions eligible the year of the tax loss. The tax code does allow for carryforward and carryback. Typically, in a project and especially during construction, there are only losses as the project is not generating any cash and is consuming resources. These losses are carried forward to reduce the average tax burden of the project. However, with the combination of excess losses, and depreciation and interest tax shields, the tax credits may not be used for a long time, therefore they lose their time value of money. In fact, any type of carryforward represents an erosion of value because whatever losses are generated in a given year are added to the stock of carryforwards and the taxpayer waits to deduct the loss in future years.<sup>2</sup> Figure 1 provides a

numerical example of the trapped losses and tax credits and their effects within a “blue hydrogen” project organized within a corporate form, compared to a notional manufacturing corporation that does not face the same challenge.

To avoid trapped losses and tax credits, along with other amenable attributes, developers create energy projects within passthrough entities, such as an LLC which is treated as a partnership, to efficiently make use of any tax credits. Thus, energy entities that have this issue (and certainly CCS deals will to an exceptional degree because incentives are basically the only form of revenue) will adopt and the organizational form of an LLC.

Example of "Trapped Losses and Tax Credits for a CCS Project"			
Normal Manufacturing Corporation* w Tax Credit		Greenfield H2 Project with CCS (per 1 tonne Blue H2 w/ CCS) w/ Tax Credit	
Sales Revenues	\$1,250.0	Sales Revenues (@ \$1.25/kg)	\$1,250.0
Cost of Goods Sold	(\$625.0)	Cost of Goods Sold (incl fuel)	(\$1,241.0)
		Carbon Sequestration 9 kg/kg H2	(\$135.0)
Operating Revenues	\$625.0		\$9.0
Tax Depreciation @15 yrs	(\$41.7)	Tax Depreciation @ 5 yrs	(\$646.7)
Interest @ 5%	(\$31.3)	Interest @ 5%	(\$80.8)
Federally Taxable Net Income	\$552.1	Federally Taxable Net Income (Loss)	(\$718.5)
Pre-Credit Tax Owed @ 21%	(\$115.9)	Pre-Credit Tax Liability @ 21%	\$0.0
plus Tax Credit of \$100	\$100.0	Plus Tax Credit of \$85* 9T CO2/1TH2	\$765.0
Remaining Tax Liability	(\$15.9)	Trapped Tax Credit Amount	\$765.0
		Memo: Future Value @ 21% of Tax Losses	\$150.9
		<b>Total Value of Losses and Credits Trapped</b>	<b>\$915.9</b>

Figure 1: Numerical example of “trapped” losses and tax credits within a corporate form.<sup>3</sup> On the left is a simplified calculation of a notional manufacturing corporation with positive taxable net income (gain), which also is able to fully use a given tax credit.<sup>a</sup> On the right is a revenue and cost analysis of new build hydrogen production facility using CCS.<sup>b</sup> Excess losses (normalized by 21% tax rate) and tax credits remain in the corporate form until such time they can be consumed by owed taxes, presumably in future years. Data from National Energy Technology Laboratory.

Focusing on the structuring effects caused by the presence of tax credits, in part due to the relatively small number of tax equity investors that are active in the market, tax equity investors have been able to dictate the capital structure of projects in which they invest. This has allowed tax equity investors to require that any debt financing that is outstanding after the tax equity investment is made (i.e., during the project’s operating period) be structurally subordinated (or back-levered) to the tax equity investor. Back leverage typically refers to debt financing that is provided by lenders to a holding company that owns a controlling interest in a tax equity partnership, which in turn owns the project company that owns and

a Assumptions: Sale to asset ratio of 2 (i.e. assets = sales revenues/2); 50% debt ratio (i.e. interest payable = interest rate x assets x 50%).

b Hydrogen costs based upon recent National Energy Technology Laboratory study including hydrogen manufacture from autothermal reforming of methane with carbon capture

operates the asset.<sup>4</sup> As a result, the back-levered lenders make their loans to the holding company that owns the sponsor's interest in the tax equity partnership and do not have recourse to the tax equity partnership, the project company, or the project assets. Instead, the back-levered lenders receive a security interest in the sponsor's equity interests in the tax equity partnership and are dependent on the cash flows distributed by the tax equity partnership to service their debt. While historically not the case, recent competitive pressures have forced back-levered lenders to increasingly close the gap with senior debt at the project level.<sup>c,5</sup> Nevertheless, the tax equity partnership structure has increased the overall complexity and cost relative to projects that do not have such features.

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<sup>c</sup> Provided that CCS projects will have very low free cash flow, back leverage would not likely been used in such a project.

### 3. Financing Effects of Addressing Technical and Commercial Barriers to Decarbonization Projects

If the policy recommendations contained in whitepapers #1-4 in the study series were fully and successfully implemented, many of the current barriers to financial markets access would be mitigated for CCS projects. The financial implications would be (i) an increased access to investment grade debt market, (ii) extended loan tenor and lengthened amortization of principal for decarbonization projects, and (iii) reduced investment structure complexity. This is partially achieved through the increase in the value of the revenue support mechanism and making it easier to use (i.e. offering a cash “direct pay” option for projects that earn 26 U.S.C. §45Q credits). With respect to CCS projects, this means (for example) increasing the §45Q tax credit value from the current \$50/tonne sequestered in geologic storage to \$85/tonne and making it direct pay, both which are provisions currently within H.R. 5376 (“Build Back Better Act”).<sup>6</sup> The direct pay provision would alleviate much of the friction associated with tax equity investor partnerships and the relatively higher cost of capital vis-à-vis commercial debt.

Moreover, the basket of recommendations made in whitepapers #1-4 would have the aggregate effect of increasing the revenue available to decarbonization projects and matching this revenue availability with the operational lifetime of the asset, coupled with reducing the uncertainty of acquiring permits to build and operate a facility, thereby increasing risk-adjusted returns. Technical risks would be lowered, and the ability for projects to obtain bankable turnkey engineering, procure, construct (EPC) contracts would be relatively assured.

With lower technical/greenfield construction risk, combined with increased revenue and cashflows available to CCS projects, projects could achieve investment grade (Baa3/BBB-) ratings, thereby gaining access to the broad taxable debt capital markets, meaning gaining access to conventional fixed income portfolios. Put simply, the size of the capital pool available to fund these projects would expand materially. At the same time, an investment grade rating would have the effect of increasing the probability of obtaining longer term loan tenor and at more amenable rates, thereby decreasing the overall cost of the project in two ways: (i) because interest rates are typically lower on fixed rate project debt than on commercial bank loans, and (ii) because a lengthened loan repayment period allows more rapid returns to the high-cost equity layer in the project capitalization stack. Moreover, project debt service coverage ratios would be enhanced with greater revenue availability. Further, lower cost debt would be more widely available to such projects, given that the

projects currently relying on tax equity are often prohibited from using any debt in the project company capital structure.

## 4. Pools of Capital Potentially Available for Decarbonization Projects in the United States

Aside from commercial debt and equity markets, institutional investors represent a large pool of capital that ought to be accessed to support earlier stage decarbonization projects, given the relative risk of such projects and the investor desire for risk-adjusted returns. How these asset owners enter into decarbonization/project investments, and the structural barriers they face depending upon, among other things, their tax-exempt status and domesticity, is the focus of the remainder of this paper.

Taken together, institutional investors, including foreign and domestic sovereign wealth funds (SWF), charitable foundations and endowments, foreign and domestic public (PPF), and private pension funds and life insurance firms, control roughly \$47 trillion assets under management. The majority of these assets are controlled by foreign SWF and PPF, and domestic pensions funds; see Figure 2 below. Individual retirement accounts, which are not a source of capital for decarbonization projects (directly), are included as a reference.



Figure 2: Current estimate of total assets under management by type of institutional investor.<sup>7,8,9,10,11</sup> Not including individual retirement accounts, which typically are unable to participate directly in decarbonization projects, the

*aggregate of these pools of capital is approximately \$47 trillion USD. Of course, the vast majority of these assets would not be allocated to investments like CCS. However, when considering the quantity of incremental funds required to decarbonize the U.S. energy system – measured at \$200-300 billion/year – even an increased fraction of the asset pool controlled by these institutional investors devoted to decarbonization projects would be material. Data from Global SWF, Investment Company Institute, American Council of Life Insurers, The Hauser Center for Civil Society, and National Association of College and University Business Officers.*

## 5. Residual Financing Barriers to Scale-Up Decarbonization Projects

Thus far, we have explicated (i) the current use of partnership structures as the predominant form for developers and investors to build and operate decarbonization projects, (ii) the added complexity associated with the inclusion of tax equity investors to make efficient use of tax credits, (iii) how this complexity (and additional cost) may be alleviated in the presence of a direct pay alternative as a public policy support mechanism, and (iv) the type and aggregate size of institutional investors who control pools of capital that ought to be tapped to support decarbonization scale up.

Now, we consider the sets of barriers contained within the financial industry that act to reduce the availability and flows of capital from the investors identified in Figure 1 to decarbonization projects, *even if all recommendations from whitepapers #1-4 are implemented*. Most of these barriers are regulatory/statutory, while others relate to self-imposed limitations that arise as institutional investors respond to a rising call for a broader stakeholder engagement in order to – at minimum – maintain a social license to operate.

We classify these financing barriers along the lines of those (i) only affecting U.S.-based actors, (ii) only affecting non-U.S. actors and (iii) both kinds of entities.

- U.S.-based
  - Tax implications for U.S. tax-exempt entities such as charitable endowments and public pensions
  - Investment limitations caused by regulations governing U.S. private pension funds
  - Passive loss rules for family offices, wealthy individuals, and master limited partnerships (MLPs)
- Non-U.S.-based
  - Tax implications for non-U.S. entities such as sovereign wealth funds and foreign pension funds
- Both U.S. and non-U.S. based
  - Commercial banking regulations requiring capital reserves
  - Reputational effects: Emerging institutional investor norms and self-imposed limitations on specific kinds of projects (e.g. ESG screens, zero fossil fuel exposure, etc.)

In the following subsections, we describe the barriers, the current approaches that related entities use to address them, and the remaining hold-ups. We also provide high level recommendations on how some of these barriers may be mitigated through policy changes.

## 5.1 Finance Barriers for U.S.-Based Institutional Investors

Two first-order barriers to capital availability and flows to decarbonization projects for U.S.-based institutional investors are: (i) unrelated business taxable income (UBTI) implications for tax-exempt entities and, (ii) limitations placed upon private pensions caused by the Employee Retirement Income Securities Act (ERISA).

### 5.1.1 Tax Implications for U.S. Tax-Exempt Entities: Unrelated Business Taxable Income (UBTI)

U.S. tax-exempt/501(c) organizations such as public pensions, charitable endowments and foundations are subject to taxation on income that is unrelated to its core mission. Effectively, if a 501(c) organization is a partner in a typical clean energy/CCS partnership, its share of partnership income is treated as “unrelated to its core mission” and taxed, whereas income on stocks and bonds is not so taxed. Tying back to the earlier concept of tax credits, if the CCS project as not so reliant on non-cash tax credits and were a corporation paying dividends to the 501(c), this UBTI issue would not arise.

Unrelated business taxable income (UBTI) is defined as gross income from an unrelated trade or business minus the deductions directly connected with said trade or business.<sup>12</sup> As such, 501(c) organizations need to be careful with the kinds of investments that generate passive (non-core mission) income. To be clear, the U.S. Internal Revenue Code (I.R.C.) indicates two kinds of income that are not considered UBTI: (i) interest income, dividends, and annuities, as well as (ii) income from the sale of capital assets.<sup>13,14</sup> Aside from these exceptions, there are three characteristics of income that all need to be present for UBTI to be recognized; the income must be: (i) generated by a business which is (ii) regularly conducted, which is (iii) not substantially related to the entity’s exempt purpose.<sup>15</sup> If any U.S. tax-exempt organization incurs UBTI, not only is it required to pay taxes owing, but the entity must also file an income tax return with the IRS, which is an additional obligation. Most nonprofit organizations file an annual Form 990/EZ/N/PF with the IRS, but do not need to fill out other tax-related paperwork or pay federal income taxes.<sup>16</sup> Taken together, 501(c) organizations seek to avoid incurring UBTI to reduce taxes owing and eliminate administrative burdens.

Income from UBTI arises in two principal forms: (i) income from investments in limited liability companies and (ii) income derived from certain types of “acquisition indebtedness”. On the latter, UBTI applies to passive income to the extent that the investment in the income producing property is debt-financed.<sup>17</sup> UBTI is a concern to 501(c) organizations who would wish to participate in clean energy projects such as solar, wind and CCS, which typically make use of project finance structures organized by private equity investors to take advantage of supportive federal tax incentives (e.g. PTC, ITC, §45Q).

As a means to boost (risk-adjusted) return on invested capital, a clean energy private equity (PE) fund will typically employ financial leverage (debt). To avoid corporate income tax, such funds generally elect to be treated as pass-through entities for U.S. tax purposes.<sup>18</sup> As pass-through entities, funds themselves are not subject to tax, rather, limited partners (investors) pay taxes on their pro rata share of fund income. Structuring the fund as a pass-through entity thus prevents investors' returns from being taxed twice: first, when earned by the private equity fund, and then a second time, when distributed to the investor.<sup>19</sup> Yet, a 501(c) organization will incur debt-finance UBTI when it invests in pass-through entity and the pass-through entity acquires income producing property by means of debt financing, because such income would be considered received from an unrelated controlled company.<sup>20,21</sup> An example is a fund for which the 501(c) entity is an investor taking a back-levered equity position in a holding company that owns a controlling interest in a tax-equity partnership. Under the unrelated business income tax, tax-exempt entities are treated as if they had directly earned not only the income and losses of a pass-through entity in which they invest, but also any UBTI (including unrelated debt-financed income) earned by that pass-through entity.<sup>22</sup>

To avoid incurring UBTI, 501(c) organizations can be accommodated within private equity funds if a “blocker” structure is used, specifically a U.S. domiciled blocker “C” corporation (c-corp, separately taxable entity). Since debt incurred by a corporation is not treated as debt of its shareholders and therefore is an exclusion from UBTI for dividends received from a corporation (or an LLC with a “checked box”) as per I.R.C. §512(b)(1), an investment in or held through a corporation generally does not generate UBTI.<sup>23</sup> In essence, by virtue of the non-passthrough nature of a corporation, the debt-financed character of the underlying income is effectively blocked. Of course, any blocker corporation registered in the United States will still have to pay corporate-level taxes on its income at the going rate (i.e., currently 21%). Moreover, any losses get “trapped” within the blocker and could not get passed (refer to Section 2: Background, above), which would have implications on the ability to offset taxes passive income in certain circumstance (see Section 5.a.iii below).

Provided that a substantial portion of PE funds originate from foreign and tax-exempt investors, PE general partners are highly motivated to accommodate such investors and offer blocker corporation structures. In essence, blocker structures allow 501(c) organizations to avoid U.S. income tax; to effectively pay a 0% tax rate, a situation for which they are accustomed. Of course, there is an administrative burden to create and maintain such a fund structure and retain the capability to successfully avoid investor taxation upon liquidation. These encumbrances increase the complexity of PE, a tranche of funds already relatively illiquid compared to portfolio investments in common stocks or debt. This may have the effect of lowering the overall net available capital that could be deployed to fund decarbonization projects.

If the credits awarded for CCS projects were converted to direct pay, the projects would have no strong reason to use an LLC-flow-through entity form and could simply be

organized corporations taxed under subchapter “C” of the Code.<sup>d</sup> The CCS corporation would monetize tax credits directly as non-taxable cash receipts, pay corporate taxes, and be able remit non-taxable dividends to the 501(c) that would not be subject to UBTI (i.e., being just like a dividend received from a taxable publicly listed equity investment).

### **5.1.2 Investment Limitations Caused by Regulations Governing U.S. Private Pension Funds: Employee Retirement Income Securities Act (ERISA)**

The Employee Retirement Income Securities Act (ERISA) of 1974 is a federal law that sets minimum standards for most voluntarily established retirement (defined contribution and defined benefit) and health plans in *private industry* to provide protection for individuals in these plans.<sup>24</sup> ERISA has features that make investment in decarbonization projects (such as CCS) by employee benefit plans problematic by potentially turning managers of operating clean energy projects into ERISA fiduciaries.

The difficulty arises because private pension funds would typically invest in decarbonization projects indirectly, via a PE fund, whose managers in turn invest in a number of operating decarbonization projects. ERISA outlines a “look-through” procedure to determine whether each entity/investment includes plan assets subject to ERISA. If benefit plan investors hold at least 25% of any class of equity in any entity down the ownership chain, then the assets of that tier entity are deemed to be “plan assets” and the ERISA rules will apply, unless another exemption applies.<sup>25</sup> If all the various private pension fund investors together represent more than 25% of the PE fund, then the fund managers effectively become ERISA fiduciaries. ERISA then requires looking down to the next level (the actual projects) to calculate the aggregate indirect pension fund ownership of each project (See Box 1 for an illustration). In a simple example, if a private pension fund owns 30% of a PE fund, and the fund owns 100% of a CCS project, then the private pension fund has an indirect 30% stake in the CCS project itself. That would have the effect of turning the CCS project managers into ERISA-regulated pension fund fiduciaries. Refer to Appendix A for a deeper discussion on ERISA.

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<sup>d</sup> If the CCS corporation has significant interest expense, as well as likely having significant accelerated depreciation, some losses would be trapped for a short period and carried forward for a few years; but this is a minor issue compared to the same situation compounded to the present.

## Box 1

**Illustration of ERISA Plan Asset Test<sup>26</sup>**

If an upper-tier entity — for example, the upper-tier partnership between the developer and benefit plan — is deemed to hold plan assets under the 25% test, then the proportionate share of investment held by the benefit plan in the next lower entity is tested to determine whether the investment by the benefit plan is at least 25% in that next tier down. This is tested by multiplying the percentage interest of the benefit plan in the upper-tier partnership by the percentage interest of the upper-tier partnership in the tax equity partnership. If the interest of the benefit plan in the tax equity partnership is less than 25%, then there is no need to keep testing down the ownership chain. If the project is a plan asset, then the ERISA restrictions on transactions with affiliates, fiduciary responsibilities, duty to disclose fees and other obligations could fall on all three entities in the ownership chain. The project company, in turn, might have a harder time entering into contracts with affiliates of the sponsor.

There are three strategies that are commonly employed to ensure that an investment (such as a decarbonization project) is not deemed a plan asset subject to ERISA, all of which seek to structure the transaction with the benefit plan investor into one of three exemptions: (i) the 25% benefit plan investor exemption (already discussed, for more detail see Appendix A), (ii) a venture capital operating company exemption (VCOC) or (iii) a real estate operation company exemption (REOC).<sup>e</sup>

In the event that a benefit plan investor exceeds the 25% ownership threshold, the VCOC exemption is often used. The focus of this exemption is the upper-tier partnership between the pension plan subject to ERISA and the developer that holds the sponsor interest in the tax equity partnership.<sup>27</sup> Two tests – an asset test and a management rights test – must be met in order to qualify for this exemption. The asset test requires the benefit plan investor to hold at least 50% of its assets in operating companies, defined here as entities that directly or through majority-owned subsidiaries are actively engaged in the production of goods or services.<sup>f</sup> If a blocker is used, the asset test is applied at the blocker level if the blocker has multiple U.S. private pension plans as owners (in parallel construction to the 25% test including/excluding certain public and non-U.S. entities). The management test requires the pension plan to obtain direct contractual management rights in the underlying qualifying operating company and must actually exercise those rights in the ordinary course with respect to at least one qualifying operating company each year.<sup>28,g</sup> Indeed, there are additional complexities if a blocker corporation is used, and it is jointly owned. Importantly, said rights must be made on a bilateral basis between the benefit plan investor and the operating company, detailed in a separate “management rights side letter”; shared rights do not qualify.

<sup>e</sup> Given that the REOC are commonly used for real estate investments, coupled with a paucity of guidance about whether specific infrastructure investments such as power plants are considered real estate for purposes of the REOC exemption, this paper does not cover this strategy.

<sup>f</sup> Assets valued at cost. The 50% test must be met on the date the first investment is made.

<sup>g</sup> The right held by the benefit plan investor to appoint an operating company board member with full voting rights is generally sufficient to meet the management test.

While plan asset investors subject to ERISA constitute a substantial source of potential funds to PE general partners, there are material structuring complexities needed ensure the restrictions imposed by ERISA cascade to all fund assets. Careful planning (basically limiting the proportion of investors subject to ERISA in a fund) can avoid these results, this feature of ERISA ultimately makes the job of raising a decarbonization-oriented PE fund even harder than it would be otherwise. Indeed, findings from an in-depth survey of 20 financial actors across the capital landscape indicate that there is general reluctance to include investors subject to ERISA.<sup>h</sup> As one asset manager mentioned “...we don't want to take their money. Because it imposes all kinds of restrictions on us so they can't be more than 20% of the fund, which is fine. We still find ways to get them into our funds.”

If, analogously to our earlier discussion regarding UBTI, CCS tax credits were restructured to be “direct pay”, it might be attractive to use a corporate form for a CCS entity (rather than LLC/partnership). In such a case, it also might be attractive for investors subject to ERISA to invest in registered mutual funds that hold (private) CCS corporations of various types. The mutual fund would be registered, but there would be no “look-through” to the companies owned by the mutual fund.<sup>i</sup>

### 5.1.3 Passive Activity Losses and Implications for Family Offices, Wealthy Individuals & MLPs

In 1984 tax reform legislation, Congress attempted to crack down on the use of tax-motivated partnerships by individual taxpayers (i.e., “natural persons” vs. corporate taxpayers).<sup>29</sup> Prior to 1984, an individual could own a partnership stake in a tax loss-generating enterprise — *without any real personal participation in its day-to-day business*. The individual taxpayer could then use their pro-rata share of the tax losses to offset their taxable income from salary, interest, dividends, and capital gains. Congress therefore attacked this practice by distinguishing between “passive” losses (and credits) generated by partnerships in which the individual has virtually no real involvement vs. “active” losses (and credits) from an individual's share of losses in a business where the individual was truly, materially involved. Therefore, for tax purposes, activities are grouped as either passive or active activities.<sup>j,k</sup> The IRS promulgates seven tests to determine material participation, where if any criteria are met, then the resulting income would be deemed active.<sup>30</sup> While income from all passive and active activities are aggregated and treated the same, the same cannot be said for losses. Losses and tax credits tied to passive activities can be only used to offset passive income (i.e., passive losses cannot be used to shelter wage or portfolio income). Like any other loss, in the

<sup>h</sup> EFI sponsored research; in-depth, semi-structured interviews conducted January 31 – February 25 via phone/zoom; 46-minute average length

<sup>i</sup> Authors need to seek advice of tax counsel to confirm.

<sup>j</sup> 26 U.S. Code §469(c)(1): The term passive activity means any activity, (A) which involves conduct of any trade or business, and (B) in which the taxpayer does not materially participate.

<sup>k</sup> It is important to note that portfolio income, which is comprised of interest, dividends, and capital gains, are treated separately, and are expressly *not* considered passive income under 26 U.S. Code §469(e)(1)

event that passive losses exceed passive income for a given year, these losses would be carried forward. Similarly, if there is no tax owing (pre-credit), passive credits are also carried forward. The losses and credits carry forward until either there is passive income to offset, or the activity is disposed of (sold or otherwise no longer owned), in which case the suspended losses release in full in that year.<sup>31</sup> The implication for investors who do not have other passive income that could make use of the loss carryforwards, is that there is an accumulation of benefits that are discounted because of the time value of money as noted above, and thus makes such an investment overall less appealing compared to alternatives (e.g., portfolio as opposed to project income).

Since Congress primarily seeks to encourage clean energy through fast depreciation schemes and generous tax credits, decarbonization projects (such as CCS) are structured as pass-through entities (LLCs or partnerships). Many individual investors would otherwise be supportive of clean energy by taking modest stakes in such decarbonization businesses. However, it is unlikely that they wish to spend 25% of the year working on those projects. Absent such unlikely involvement, the individual's investment would be a passive stake, and the losses and credits flowing to the individual would be effectively useless from a financial point of view.

Passive activity loss rules also extend to investors in master limited partnerships (MLPs), which are organized as a publicly traded partnership. While most decarbonization projects are not eligible to be placed within an MLP, since to maintain its pass-through status, >90% of the MLP income must be deemed qualifying income. Qualifying income includes income realized from the exploration, development, production, processing, refining, transportation (including pipelines transporting oil and gas), and marketing of minerals or natural resources and the transportation and storage of certain fuels.<sup>32</sup> Passive losses can be used as a deduction against passive income and carried forward in the event of excess losses. However, such losses can only be used within a given MLP, that is, losses from an MLP can only be used to offset income from the same MLP.<sup>33</sup> In this sense, this is more restrictive treatment of losses and may have the effect of acting as a barrier to a wider set of potential pools of capital.

As a summary statement from the interviews, one asset manager mentioned “... *we've got to get rid of the passive [activity] loss rules, [and] open up it up to retail investors.*” In synthesis, decarbonization projects such as CCS accumulate substantial losses and tax credits during construction and, typically, the first decade of operation. The losses and credits would represent an investment motivation for individual investors if an exception to passive loss rules were made for decarbonization investments (subject to regulatory definition). There are already such exceptions in law, including an exception for “professional real estate investors” and for losses associated with working interests in oil and gas properties held by a general partner.

If an exception were made to the passive loss rules for energy projects that had successfully qualified for clean energy production-type tax credits (§45Q) or investment tax credits (§48), a vast market may be opened for individual direct investment in clean energy projects. The

size of that currently lost, untapped potential can be seen by the fact that individual investors directly own ~\$25 trillion of U.S. stocks (approximately 40% of the market) vs. virtually zero participation in clean energy partnerships.

## 5.2 Finance Barriers for Non-U.S.-Based Investors

Generally, non-U.S.-based institutional investors are considered tax-sensitive investors similar to U.S.-based tax-exempt entities. Examples of these types of investors are foreign public pensions funds, sovereign wealth funds (SWF) and other public and private asset owners (i.e., government and non-government entities). Specifically, they seek to mitigate and ideally avoid any type of U.S. taxes, thereby only being required to file (and potentially pay) taxes in the jurisdiction within which they are domiciled. In parallel to the UBTI identified earlier, foreign investors want to minimize or eliminate the realization of effectively connected income (ECI).<sup>34</sup> ECI is defined as income effectively connected with the conduct of a trade or business within the United States. A non-U.S. entity that is a partner in a partnership is considered as being engaged in a trade or business within the United States if the partnership is so engaged.<sup>35</sup>

Aside from U.S. real property interests, operating partnerships are principal sources of ECI. Conceptually, the barriers faced by foreign-based investors in avoiding ECI are similar to U.S.-based tax-exempt investors seeking to avoid UBTI. Specifically, if a fund invests in a flowthrough entity (a partnership, an LLC or a non-U.S. entity treated as a partnership for U.S. tax purposes) that is engaged in a trade or business within the United States, a non-U.S. partner's share of the fund's income from the entity would be ECI.<sup>36</sup> While typically the non-U.S. investor is taxed on income at the going rate applicable to U.S. corporations, a non-U.S. corporation may, in addition, be subject to the "branch profits tax" at the rate of 30% on its earnings attributable to ECI that is not reinvested in the U.S.<sup>1,37,38</sup> Moreover, all non-U.S. investors are subject to at 30% tax on the gross amount of interest, dividends, rents, royalties, and certain other income from U.S. sources subject to exemption or reduction by statute or treaty.<sup>39</sup> Finally, if any non-U.S. entity owns more than a 10% vote or value in any U.S. entity (e.g. corporation, partnership), interest income from such source would be subject to 30% withholding tax, again subject to a treaty benefit that would reduce this rate.<sup>40</sup>

With respect to taxation, an exemption exists for non-U.S. governments. Income received from investments in the U.S. through instruments such as interest, dividends and gains arising from stocks, bonds, securities, bank deposits and certain other income is generally exempt from tax on its ECI.<sup>41</sup> Specifically, the 30% withholding tax does not apply to non-U.S. government investors such as SWFs. However, there are exceptions to this blanket exemption. Any income derived by foreign governments from the conduct of a commercial activity (with the exception of trading or investment), income received directly or indirectly from a "commercial controlled entity" and any gain derived from the disposition of any

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<sup>1</sup> The purpose of the branch profits tax is to treat U.S. operations of foreign corporations in much the same manner as U.S. corporations owned by foreign persons

interest in a commercial controlled entity does not get exemption.<sup>42</sup> In this case, a commercially controlled entity is defined as a corporation or partnership engaged in the commercial activity in any part of the world in which the foreign government holds directly or indirectly greater than a 50% vote or value or any interest that would mean an effective control of such entity. Any income generated in the U.S. by such a commercially controlled entity would lose its exemption and would be subject to regular income tax rate.<sup>m</sup> It must be emphasized that the exemption exists at the level of a foreign government, not its (wholly owned) agents, or “controlled entities” such as SWFs. Herein lies a nuance; if, for example, a SWF engages in any commercial activities (with the exception of trading or investment), then by definition it would become a commercial controlled entity. In this case, the IRS applies an “all or nothing rule”, whereby the entire portfolio of the SWF would lose its exemption status, even on that income that was not related to commercial activity. Indeed, this is a material concern for foreign governments and SWFs as they make investments in the U.S.<sup>43</sup>

Setting aside the foreign government exemption, non-U.S. organizations – like U.S. tax-exempt organizations – are often included in private equity funds through a blocker structure, where the investment is made through the c-corp. Depending on the specific structure of the overall structure of the various investment vehicles, the blocker can be used to shield non-U.S. investors from ECI (and the resulting filing requirements) from operating partnerships and to shield non-U.S. governments from commercial activities.<sup>n44</sup>

## 5.3 Bank Capital Requirement

Financial regulators impose requirements on commercial banks headquartered within their jurisdictions to maintain capital adequacy; that is, to ensure that these institutions hold enough capital to operate with an acceptable risk of insolvency. The Basel Accords of the Bank for International Settlements (BIS) sets the framework for how banks and depository institutions calculate capital and capital ratios to assess the bank capital adequacy. Some form of this framework has existed since 2004 (Basel I). Following the financial crisis of 2007-2009, new standards were promulgated – commonly referred to as Basel III. Two new measures were developed as part of the standards to help measure and assess each financial institution’s liquidity requirements: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). The LCR evaluates how well a bank can withstand a liquidity shock scenario over a 30-day period based on the amount of its high-quality liquid assets. The NSFR is designed to measure the stability of the funding profile of certain large banking organizations and requires these banking organizations to maintain minimum amounts of stable funding to support their assets, commitments, and derivatives exposures over a one-year time horizon.<sup>45</sup> U.S. regulators finalized a rule in 2014 for LCR; 2021 for NSFR.<sup>46</sup>

<sup>m</sup> Unless there is a tax treaty between the U.S. and the government in question that would overrule this exemption. List and details of U.S. tax treaties found here: <https://www.irs.gov/businesses/international-businesses/united-states-income-tax-treaties-a-to-z>

<sup>n</sup> Presuming <50% single entity foreign ownership of the blocker.

Especially with the implementation of NSFR, these liquidity requirements are meant to limit unstable funding strategies by preventing banks from performing excessive amounts of maturity transformation by making too many illiquid long-term loans and investments funded by wholesale short-term money, as measured over a one-year time frame.<sup>47</sup> The NSFR is designed to measure the ratio of a bank's sources of stable funding ("available stable funding") relative to its on- and off-balance sheet assets ("required stable funding") through a granular factor-weight assignment system ranging from 0% to 100% in line with inherent liquidity characteristics of each type of asset or liability. Specifically, the factors are based on the funding tenor, funding type, and counterparty type.<sup>48</sup>

Generally speaking, the NSFR rule generally will require assets of lower credit quality to be supported by more stable funding to reduce the risk that a bank may have to monetize the lower credit quality asset at a discount.<sup>49</sup> The rule also requires a financial institution to maintain more stable funding to support assets that have a longer tenor (> 1 year) because of the greater time remaining before the bank will realize inflows associated with the asset. Further, more stable funding will be needed to support assets that trade in non-standard markets with few participants and high information asymmetry, all characteristics of an illiquid market.

In part because of the imposition of more stringent capital requirements on banks by government regulators and Basel III requirements, project sponsors seeking capital have increasingly turned to institutional investors for debt via Term Loan B (TLB) facilities. TLBs are syndicated loans typically made to companies that are below investment grade. TLBs are rated instruments that are bought and sold on the secondary market, although the TLB investor pool is a smaller and more restricted group of domestic and international investors than high-yield debtholders.<sup>50</sup> Most investors in the TLB market are institutional or non-bank lenders such as collateralized loan obligations, hedge funds and private equity funds. There is considerably more diversity among Term B Lenders some Term B Lenders (for example, business development companies such as Apollo and Ares) are willing to accept construction risk while others limit their investments to projects in operation.<sup>51</sup> The large number of institutional investors and banks operating in the TLB market has resulted in significant liquidity for US project financings which has not yet been fully absorbed.<sup>52</sup> Project finance TLBs generally have tenors in the six-to-eight-year range, with seven years being the most common.<sup>53</sup> Interest rates on TLBs are usually higher than on traditional bank term loans, although still lower than what would be typical on mezzanine debt.<sup>54</sup>

So described and taken together, these liquidity requirements of financial institutions generally disfavor emerging technology project finance, the domain of many current decarbonization projects outside of solar and wind. Given the highly complex nature of the projects (aside from technological complexity and focusing only on financial structure complexity), commercial banks would prefer to not participate in offering loans, especially long-term loans. In response, project sponsors could turn to TLB debt, however despite the increase in potential liquidity, TLB tenors are rather short. Indeed, Figure 3 below shows that the average loan tenor on

energy and industrial projects has reduced since the financial crisis and has yet to fully recover. This has the consequence of increasing the cost of debt and administrative costs. Therefore, while capital adequacy is critical to the functioning of an efficient, stable, and safe global financial system, it indirectly works against the purposes of decarbonization project development. Quantifying the extent of this financial barrier ought to be the remit of further research.

The difficulty of sub-investment rated CCS projects obtaining long-term amortizing bank loans would be less relevant if, following a conversion of CCS tax credits to direct pay, many more CCS entities were able to get investment grade ratings and tap the bond market. That is, perhaps the issue is less the bank loans term than that the lack of cash flow that forces CCS projects into bank borrowing as a market of last resort.

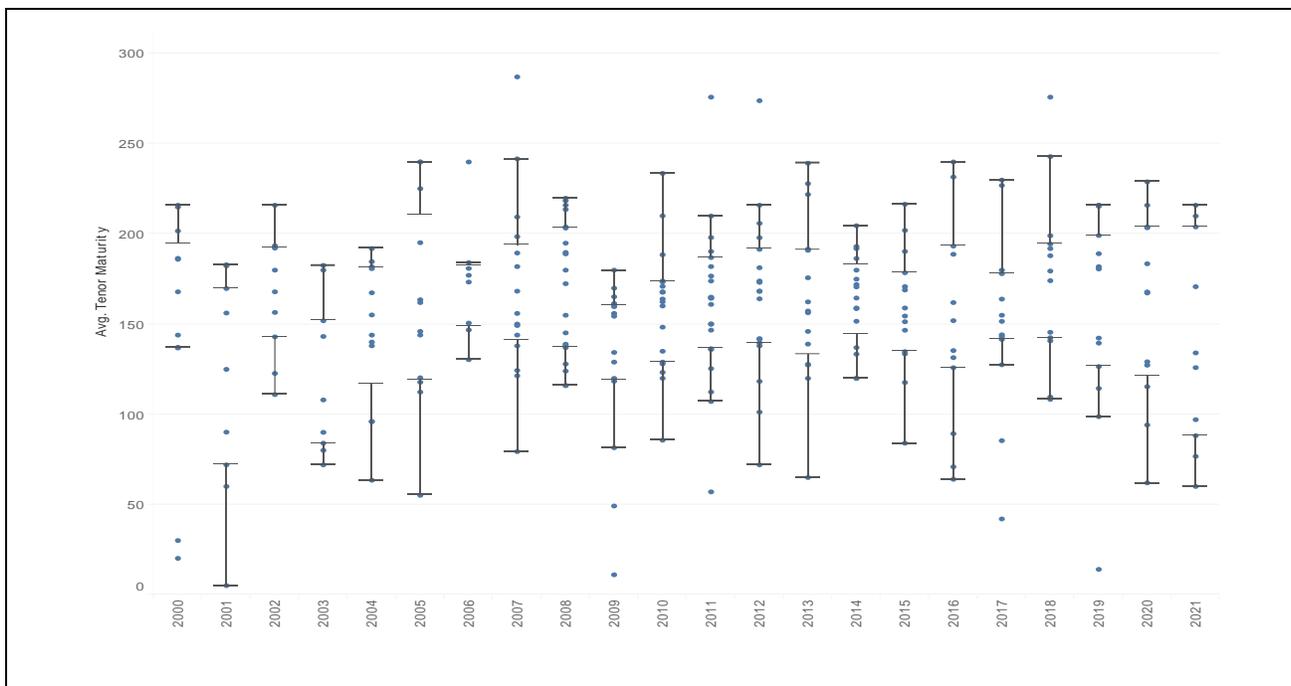


Figure 3: Average tenor maturity (all seniority forms) for project finance deals within the utility sector (generation and transmission), excluding bullet and revolving repayment types from 2000-2021.<sup>55</sup> Outside 2018 and 2019, 2008 represents the highwater mark for tenor maturity. Data from Wharton Research Data Services-Reuters' DealScan.

## 5.4 Reputation Considerations

Aside from risk adjusted returns, an increasing proportion of institutional investors and the firms to which they deploy capital have come under increasing stakeholder pressure to enable the energy transition that undergirds the global ambition of net-zero by 2050. BlackRock's Larry Fink's Letter to CEOs stating that *"every company and every industry will be transformed by the transition to a net zero world"* and imploring companies to develop and implement credible plans in response, provides a good example of this sentiment.<sup>56</sup> In short, a forward

posture is being asked of the financial community to bring about envisioned change. Indeed, climate-aligned investing represents a marked change in how financial institutions respond to the task at hand, from a reactive response to mitigating the risks of climate change toward a proactive approach to supporting the transition.<sup>57</sup> The growing consensus across public and private stakeholders is that for both firms and investors to maintain and enhance their ongoing social license to operate, clear and credible plans to drawdown carbon intensive practices and scale-up their green replacements is paramount.<sup>58</sup> In response, multiple financial institutions have promulgated net-zero or related pledges that outline how and when decarbonization through implemented strategies are to occur. However, several recent studies have questioned their credibility.<sup>59,60,61,62</sup>

Indeed, even the widely accepted frameworks such as the principles detailed in the Task Force on Climate-Related Financial Disclosures and the recently produced by the Science Based Targets Initiative (SBTi) Financial Sector Science-Based Targets Guidance - while helpful and progressive – offer only high-level direction.<sup>63,64</sup> It is up to the individual financial actor to develop their own detailed tools and approaches (as they should), though this is a nascent activity.

Findings from an in-depth survey of 20 financial actors across the capital landscape indicate that the implementation of energy transition investments remains a work in progress. Investors employ multiple definitions of “energy transition” projects to include/exclude within portfolios. For example, some have “hard” no coal/oil/gas screens for sustainable funds, some accept non pure play public equities, etc. There is a general difficulty quantifying any “green premium” or environmental attributes and how these measures may relate to investment risks and return assessments. Some investors co-mingle ESG attributes within portfolio selection, leading to potential underweighting of energy-related projects in part because it is less effort to negatively screen for social and governance attributes than invest in decarbonization projects. Given lack of clear definitions and measures, some leading asset owners impose differentiation restrictions on asset managers, who in turn struggle to satisfy requirements across sponsors/LPs. One overarching summary quote on this subject from the interviews was: *“probably my biggest challenge is because each client views it slightly different in their own world in their own vernacular.”*

While all decarbonization projects will face some level of scrutiny on the basis of their ability to mitigate GHG emissions while minimizing local community concerns surrounding – amongst others – environmental justice, land use, and economic impacts, CCS has and continues to be a relatively controversial solution across multiple stakeholders. While respected, detailed models (e.g. IEA’s Net Zero by 2050, Princeton University’s Net Zero America study, IPCC’s AR6WGIII Climate Change 2022: Mitigation of Climate Change)<sup>65,66,67</sup> calling for some necessary buildout of CCS to reach U.S. and global net-zero ambitions are seriously considered, this is far from a unanimous view, especially given a history of cost overruns and failed project completions.<sup>68</sup> Further, the environmental advocacy and justice communities offer a mixed view of CCS, with a variety of organizations for and against its development.<sup>69,70,71</sup> Finally, while there are some supporting regulatory actions occurring

within specific states (e.g. Texas, Louisiana, California), and support from certain parts within the federal government, there are equally influential opposing voices (e.g., WHEJAC).<sup>72,73,74,75,76</sup>

The mixed view of the need and desire for CCS, coupled with the technology's strong association with the oil and gas industry that has for decades struggled with its own social license to operate concerns, has rightfully made potential investors wary of funding a solution that could taint their own fragile net-zero goals.

Deep, strategic, and professional community engagement with all phases of project buildout, projects geared especially toward industrial applications and cost and emissions transparency in first-of-a-kind deployments will help reduce uncertainty surrounding CCS. Provisions within the IIJA, coupled with the mandates of the newly formed U.S. DOE Office of Clean Energy Demonstrations, and advances in environmental justice practices are supportive of increasing the social acceptance of CCS.<sup>77,78,79</sup> Developers and policymakers would be wise to take seriously the acceptance gap in CCS and use the potential tailwinds provided by recent supportive federal and state policies to create the basis for deployments in well informed, collaborative communities. Financing will follow if done correctly. It is also critical that the federal executive branch speaks with a single voice regarding CCS. The opposite is currently true, with US DOE seeking to support CCS hubs, while a Federal Advisory Commission calls CCS one of “The Types of Projects That Will Not Benefit a Community” (emphasis in original).<sup>80</sup>

## 6. Appendix A

### ERISA

Employee benefit plans subject to ERISA include private entity established pension plans, 401(k) plans and Taft-Hartley (multiemployer) plans, but not governmental plans and public retirement systems (i.e. public, tax-exempt plans; see above), non-U.S. plans and pension systems, or church plans (unless a special election has been made to be subject to ERISA).<sup>81</sup> In general, a plan sponsor or plan administrator of a qualified plan who acts in a fiduciary capacity is required in investing *plan assets*, to exercise the judgment that a prudent investor would use in investing for his or her own retirement.<sup>82</sup> In addition, certain rules apply to specific plan types. For example, there are different limits on the amount of employer stock and employer real property that a qualified plan can hold, depending on whether the plan is a defined benefit, a 401(k) or another kind of qualified plan.<sup>83</sup>

Focusing on decarbonization projects, if a benefit plan investor (e.g. private pension investor) invests in any pooled investment vehicle (e.g. private equity fund, mutual fund, special purpose acquisition corporation), then the underlying assets of the fund are deemed to be plan assets for purposes of ERISA.<sup>84,°</sup> To be clear, ERISA rules dictate that the investment in the fund be recognized as identical to the benefit plan investor holding undivided interests in each underlying asset. Therefore, given that the investor is subject to ERISA the *fund itself becomes subject to ERISA*, and the fund's manager (or, as applicable, its general partner, managing member, trustee, adviser, or similar entity) becomes an ERISA fiduciary with respect to the assets attributable to investors that are subject to ERISA.<sup>p</sup> As an example, if a clean energy PE fund invests in a holding company which in turn owns one (or many) solar projects, then a U.S. private pension LP – an entity subject to ERISA – would cause the fund and ultimately solar project(s) to be deemed plan assets, governed by ERISA.

If a project company, tax equity partnership or project becomes a plan asset, then strict ERISA requirements apply, including the need to comply with pension fiduciary duties, restrictions on certain transactions between related parties, fee disclosure, other reporting and disclosure, bonding and limits on fees paid to managers.<sup>85</sup> In certain cases, significant penalties may be imposed, and, in rare cases, the US Department of Labor may step in to unwind the transaction or investment.<sup>86</sup>

<sup>°</sup> To be clear, common stocks and bonds would not be considered planned assets and thus are an exception. Specifically, the exception is afforded to assets that are a “publicly offered security”—generally, a freely transferable security that is part of a class of securities that is widely held and registered under Section 12(b) or (g) of the Securities Exchange Act. This exception effectively requires a U.S. listing, so publicly listed companies outside of the United States cannot rely on this exception. (Ropes & Gray LLP 2019)

<sup>p</sup> The manager must act solely in the interest of the ERISA investor's participants and beneficiaries. For example, the manager cannot, acting in its fiduciary capacity, use plan assets to benefit its other clients, and cannot benefit its other clients at the expense of an ERISA investor or a fund holding plan assets.

A benefit plan investor will not be considered to hold plan assets subject to ERISA if it holds less than 25% of every class of equity in the entity. It is notable that in calculating the 25% limit, holdings by non-US pensions are included in the denominator only (i.e. excluded from the numerator); as such, this exemption is beneficial if co-investors include non-U.S. and U.S. public pension plans.<sup>9</sup> When calculating the 25% limit, interests held by the project developer and its affiliates must generally be excluded from both the numerator and denominator of the test.<sup>87</sup> In the event that a benefit plan investor owns at least 25% of the upper-tier partnership with the developer, then the benefit plan investor has a large enough interest in the upper-tier partnership potentially to bring ERISA into play. The 25% test would then be applied to the tax equity partnership that is the next tier down. If the benefit plan investor owns at least 25% of any class of equity in it, then the tax equity partnership will also be a plan asset. However, a tax equity partnership usually has a class B interest that is held entirely by the sponsor and a class A interest that is held by the tax equity investor. Thus, the upper-tier partnership between the sponsor and benefit plan is likely to own 100% of a class of equity interest: the class B interest.

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<sup>9</sup> This calculation must be reapplied each time interest positions change among the co-investors.

## Notes

<sup>1</sup> Norton Rose Fulbright, *Project Finance News Wire*, March 2022, [https://www.projectfinance.law/media/5726/pfn\\_0322.pdf](https://www.projectfinance.law/media/5726/pfn_0322.pdf), pg. 5

<sup>2</sup> Eric Zwick, “The Costs of Corporate Tax Complexity,” 2018, NBER Working Paper 24382, <http://www.nber.org/papers/w24382>.

<sup>3</sup> Eric Lewis et al., *Comparison of Commercial State-of-the-Art, Fossil-Based Hydrogen Production Technologies*, National Energy Technology Laboratory, April 14, 2022, <https://www.osti.gov/biblio/1862910>.

<sup>4</sup> Latham & Watkins, Key Considerations for Back-Leverage Financings of Renewable Energy Projects, January 8, 2020, Number 2576.

<sup>5</sup> Keith Martin, “Solar Tax Equity Structures,” Norton Rose Fulbright, December 14, 2021, <https://www.projectfinance.law/publications/2021/december/solar-tax-equity-structures/>.

<sup>6</sup> Library of Congress, “Text - H.R.5376 - 117th Congress (2021-2022): Build Back Better Act,” Congress.gov, 19 November 2021, <https://www.congress.gov/bill/117th-congress/house-bill/5376/text>.

<sup>7</sup> Global SWF, “Ranking,” <https://globalswf.com/ranking>.

<sup>8</sup> Investment Company Institute, “Quarterly Retirement Market Data, Fourth Quarter 2021,” [https://www.ici.org/statistical-report/ret\\_21\\_q4](https://www.ici.org/statistical-report/ret_21_q4)

<sup>9</sup> American Council of Life Insurers, *Life Insurers Fact Book 2021*, pg. 11

<sup>10</sup> Paula D. Johnson, *Global Philanthropy Report*, Harvard Kennedy School, 2018, [https://energyfuturesinitiative.org/wp-content/uploads/sites/2/2022/03/Green-Real-Deal\\_Report\\_-Aug-2019.pdf](https://energyfuturesinitiative.org/wp-content/uploads/sites/2/2022/03/Green-Real-Deal_Report_-Aug-2019.pdf), pg.17.

<sup>11</sup> National Association of College and University Business Officers, “2021 NACUBO-TIAA Study of Endowments (NTSE) Results,” January 18, 2023, <https://www.nacubo.org/Research/2021/Public-NTSE-Tables>.

<sup>12</sup> I.R.C. §512(a)(1)

<sup>13</sup> I.R.C. §512(b)(1)

<sup>14</sup> I.R.C. §512(b)(5)

<sup>15</sup> Robert A Wexler, “Unrelated Business Income Tax: A Primer,” Adler & Colvin, January 2012, <https://www.adlercolvin.com/unrelated-business-income-tax-a-primer/>.

<sup>16</sup> Norman I. Silber and John C. Wei, “The Use of Offshore Blocker Corporations by U.S. Nonprofits: Should Blockers Be Blocked? Nonprofit Policy Forum,” *Nonprofit Policy Forum* 6, no. 3 (2015): 353–370, <https://doi.org/10.1515/npf-2015-0010>.

<sup>17</sup> I.R.C. §512(b)(4)

<sup>18</sup> Samuel D. Brunson “Repatriating Tax-Exempt Investments: Tax Havens, Block Corporations, And Unrelated Debt-Financed Income” *Northwestern University Law Review Vol. 106*, no. 1 (2012): 225-272, <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1138&context=nulr>.

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