Clean Energy Trust

The 501vc® Journey

Evaluating Alternative Fund Structures to Unlock Capital for Cleantech Innovation

Introduction

There is growing international consensus that the climate and environmental imperative requires immediate and aggressive action. It is widely accepted that 2 degrees C is the maximum warming allowable to avoid widespread catastrophe. Yet, remaining under the 2 degrees C threshold will require dramatic emissions reductions and, possibly, aggressive measures to remove previous emissions from the atmosphere. Compounding the situation is that over the next 20 years, 2 billion people will join the global middle class and will demand access to reliable energy, high-quality food, clean water, and the kind of transportation most Americans take for granted. The convergence of these trends requires aggressive technological innovation coupled with interventions such as policy, regulation, and behavioral change.

Clean Energy Trust (CET) is a 501(c)(3) public charity founded in 2010 and supports entrepreneurs and startups working on solutions for clean energy, decarbonization, and

environmental sustainability. CET's theory of change is that entrepreneurship and technological innovation are powerful forces that can be harnessed to solve environmental challenges, create jobs, and generate attractive business and investment opportunities. However, this strategy faces challenges as there is a persistent, critical scarcity of capital in the cleantech sector, particularly for companies at the earliest stages of development.

In 2017, the U.S. Department of Energy (DOE) awarded CET a two-year grant to evaluate novel investment models to expand access to capital for early-stage cleantech ventures. This paper will describe the novel structures CET examined under the DOE grant as well the model that CET has utilized since 2014 to make catalytic seed investments. The paper will describe the opportunities and challenges encountered with each model.

After careful consideration, CET ultimately elected to focus its organizational resources on properly capitalizing its existing "evergreen" fund structure with philanthropic contributions (as opposed to risk capital). The paper will explain why this decision made sense for CET even though the other models may work for others. CET hopes that its journey, and the resulting decision to center its strategy on its existing model, will be beneficial and informative to others evaluating similar strategies.

The Early Stage Capital Gap

Recent research shows that traditional venture capital has largely stepped away from investing in early-stage cleantech companies, preferring to emphasize investment in capital-light software and social media companies. Analyzing Pitchbook data, there has been over $830 billion of venture capital investment in the U.S. from 2010 to date. Of these investments, only $45 billion, or approximately 5 percent of total venture capital investment, has been targeted towards the cleantech sector in this same period. More concerning is that only about $760 million, less than 0.1 percent, has gone towards seed stage cleantech investments. The implication is that promising cleantech innovations which have the potential of delivering significant impact risk dying on the vine.

A 2016 paper titled "Venture Capital and Cleantech: The Wrong Model for Energy Innovation," published by the MIT Energy Initiative, which analyzed venture capital funding in cleantech between 2006 and 2011, concluded that the traditional venture capital model

was broken for the cleantech sector.[1] Of the $25 billion invested in cleantech startups in that period, venture capitalists lost over half of their money. The reasons for such poor performance included significant capital requirements, long development timelines, difficulty competing in commoditized markets dominated by large incumbents, and a dearth of corporate acquirers that were willing to pay the premiums required for venture returns. Given that other sectors, such as software and medical technologies, didn't face similar handicaps, cleantech rapidly fell out of favor with venture capitalists.

In 10 years of supporting early-stage cleantech startups, CET has observed first-hand the scarcity of capital that hinders these ventures. CET's portfolio companies often struggle to bridge the gap between traditional research and development (R&D) funding provided by entities such as the federal government and the next level of private sector investment.

Encouragingly, CET has also begun to observe a new class of investors expressing interest in investing in early-stage cleantech businesses. These investors, which include family offices, high net worth individuals, and other mission-driven investors, expect to "do well while doing good." However, many of these investors cite a lack of sufficiently qualified deal-flow, vetted by a trusted third party, as a major barrier to investing. Embedded in these concerns is the desire for these opportunities to be further shaped and developed to become investor ready. As such, entities working with startups at the earliest stages to prepare them for commercialization and outside investment are critical. This need transcends capital and encompasses an array of venture development support, including hands-on coaching, mentorship, and fundraising assistance.

The Search for Novel Funding Models

CET anchored its analyses of alternative investment models on the thesis that philanthropic support can help bridge the "valley of death" between research and development funding and the emerging class of return-seeking investors willing to invest in early-stage cleantech startups. Philanthropic support is a tremendous untapped resource, evidenced by the fact that in 2014 less than 1/10 of 1 percent of the $84 billion in grants by U.S. foundations went

[1] Authors: Dr. Benjamin Gaddy, Director of Technology Development, Clean Energy Trust; Dr. Varun Sivaram, Douglas Dillon Fellow, Council on Foreign Relations; and Dr. Francis O'Sullivan, Director of Research and Analysis, MIT Energy Initiative.

towards energy innovation.[2] This percentage has not changed significantly since and only a modest increase in grant making towards cleantech innovation could provide patient capital for pre-seed and seed investments and also help underwrite the venture development and business building support these emerging startups require.

CET explored three strategies utilizing philanthropic support in varying degrees: (1) a hybrid fund capitalized with both philanthropic contributions and return-seeking investment capital; (2) a stand-alone, investment fund capitalized with return-seeking capital that benefits from close affiliation with CET; and (3) fully capitalizing its existing "evergreen" fund with philanthropic contributions so that it becomes self-sustaining, positioned to make investments into perpetuity given its revolving design.

CET evaluated each of the three structures based on attractiveness to financial supporters, complexity in meeting all relevant tax and securities regulations, and ability to deliver expected financial returns. It is important to recognize that "optics" and the court of public opinion are considerations that must be weighed when innovating around the tax code. As such, CET also weighed the overall operational, legal, and reputational risks to CET and its 501(c)(3) charter presented by each option.

CET conducted interviews with over 30 fiduciary investors, impact investors, and philanthropists to understand the challenges and concerns they face in deploying additional capital into the space and to solicit feedback about the attractiveness of these funding models. CET also engaged legal experts at Patterson Belknap Webb & Tyler and Morrison Foerster to evaluate options for structuring the funds and identifying areas where special care must be taken to avoid any real or perceived third-party inurement issues or jeopardy to the non-profit status of the 501(c)(3) organization. Finally, to estimate returns, CET built detailed financial models using Monte-Carlo simulations and sampling of historical and representative returns.

The Hybrid Fund

Given the emerging class of investors who wish to "do well while doing good" by investing in cleantech innovation, and the significant amounts of philanthropic capital that could be

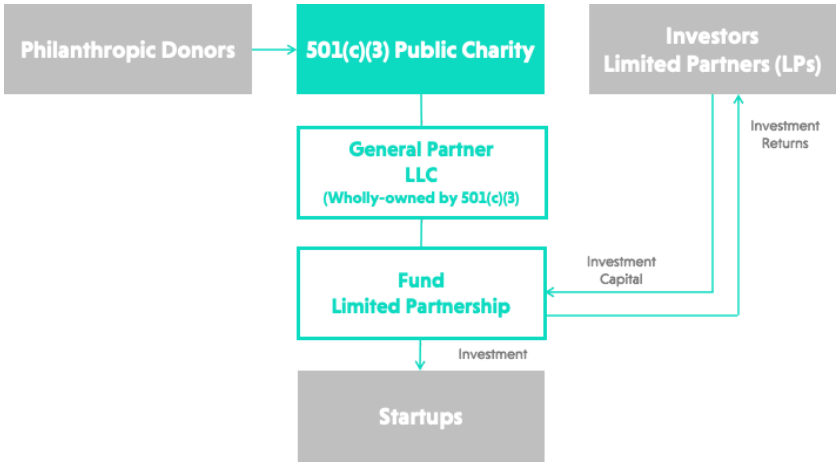
[2] Foundation Center data.

directed towards cleantech innovation, CET explored the creation of a hybrid fund that would blend capital from limited partners seeking returns with charitable support from philanthropic donors.

CET's thesis was (a) the philanthropic contributions enable a greater depth of deal sourcing, due diligence, and ongoing management and support of investments than would be possible with fees earned from a traditional structure; (b) philanthropic contributions eliminate management fees, resulting in more money put towards investments thereby enhancing overall fund returns; and (a) + (b) improves the traditionally poor risk/return profile of an early-stage cleantech fund such that investors who historically would not have considered such a fund now find it attractive. The goal was to demonstrate that this relatively simple twist on the traditional VC structure would attract capital that otherwise would be invested elsewhere.

The fund was envisioned as a limited partnership with the General Partner (GP) being an LLC, wholly-owned by the 501(c)(3) public charity, and the Limited Partners (LPs) being the third-party investors providing return-seeking capital. (Figure 1).

Figure 1

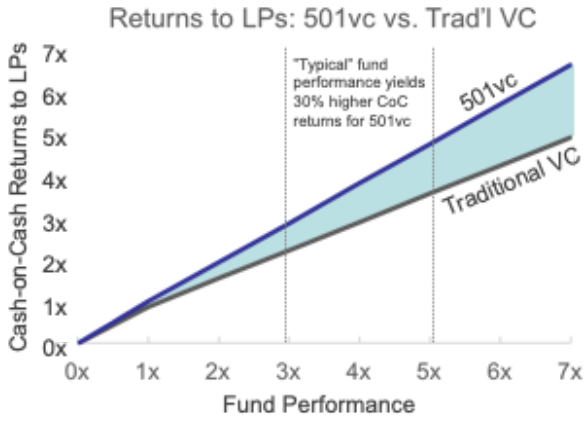


The vision was to bring together $35 million in investment capital and $5 million in philanthropic support. The philanthropic support would supplant the need for management fees and amplify deal sourcing, diligence, and venture development support to a level above what a similarly sized, traditional fund structure could offer. The $35 million would enable investments in 8 to 12 high-impact companies at the Seed and Series

A stage during the 10-year life of the fund. A portion of capital would be reserved for follow-on investment.[3]

CET's financial modeling indicated that by using philanthropic donors' support to enable more money being put towards making investments versus paying fees, this hybrid structure could overcome the bounded upsides that have driven VCs from cleantech. By shifting the risk/return profile, modeling suggested that the hybrid fund could offer investors 30% higher returns than a traditional VC structure (Figure 2). Such higher returns would be an incentive to attractive investors who, historically, would not have considered such a fund.[4]

Figure 2



The key issue was whether this novel structure would be allowable under IRS regulations that govern both appropriate activities for 501(c)(3) public charities and what constitute appropriate contributions by philanthropic donors and grantors. Two critical questions were (1) whether it is appropriate for a 501(c)(3) public charity to invest in for-profit enterprises; and (2) whether it is allowable for third party, for-profit investors to benefit from activities supported by philanthropic dollars.

Examining the first question, legal counsel advised that there have been precedents of organizations attracting capital to and investing in for-profit enterprises provided such

[3] Please refer to "Whitepaper 2: Blueprint for Replication" for a discussion of the modeling and assumptions supporting fund structure, fund size, and types of investment.
[4] The majority of investor respondents in CET's market research indicated that they expect returns that exceed 15% IRR when evaluating new funds in which to invest.

activities are designed to address intractable social problems. At a minimum, such investments must complement other charitable interventions and be consistent with the charitable purpose of the 501(c)(3) as set forth in its IRS Form 1023 filing.[5] Interestingly, it remains unclear whether the IRS views activities supporting clean energy and climate change mitigation as warranting tax exemption in and of themselves. Rather, allowable activities would need to support research and development, advancing science, education, or preserving the natural environment.[6] CET was also advised that charitable purpose and impact must clearly outweigh the opportunity for financial return in any investment decision. Investment returns may be allowable if they are by-products of investments driven by impact and mission-based rationales.

CET was also cautioned that conflicts of interest could arise for CET, as the General Partner, if it has fiduciary obligations to maximize returns for the fund's Limited Partners and legal obligations to exclusively serve its charitable purpose. One clear implication was that CET would need to avoid any discussion of financial returns when speaking with potential Limited Partners when marketing the fund to help mitigate fiduciary risk. This was problematic as potential investors identified financial returns as key criteria in deciding where to place investment capital. CET's interviews had revealed that any omission of financial returns in the fund prospectus would create an impression of concessionary returns and relegate the fund to non-investment grade status.

The second question of whether third party, for-profit investors can benefit from activities supported by philanthropic dollars was equally challenging. The safe guidance was that activities that benefit third-party investors generally are not considered charitable. However, there have been examples of philanthropic "subsidies" being used to attract non-philanthropic capital to activities designed to achieve charitable goals. Examples include foundation grants held in first-loss reserves, foundation low-interest loans that are subordinated to other senior loans from banks, and guarantees from foundations that can be drawn upon to make investors whole should portfolio investments suffer losses. Even with some existing precedents, the lack of guidance from the IRS creates enough ambiguity

[5] Application for Recognition of Exemption Under Section 501(c)(3) of the Internal Revenue Code.
[6] In CET's case, CET operates exclusively for charitable, scientific, literary and educational purposes. Its mission is to support the advancement of science and research and development of alternative energy technologies that positively contribute to the environment and economic development.

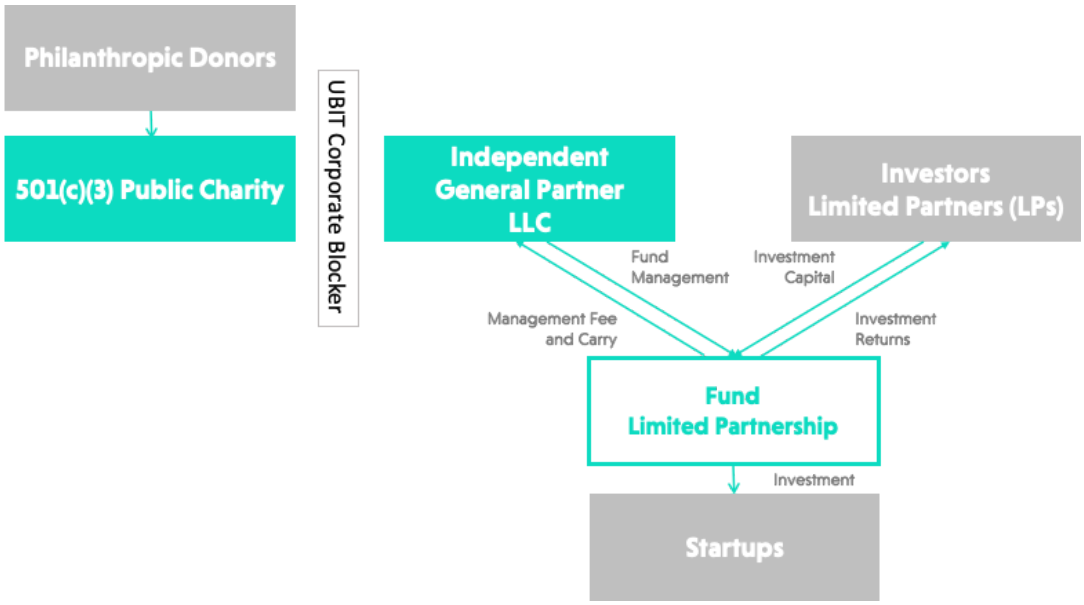
that many philanthropic donors are concerned that their charitable funds would be inappropriately subsidizing returns, creating unacceptable third-party inurement risk.

The suggested solution was to ensure that any support received by the fund from CET, such as personnel time and overhead costs, be compensated by the fund at fair market value. The notable exceptions were activities deemed to be charitable, such as impact measurement, technology research, and certain types of training and technical assistance. The implication, however, was that the fund would need to assess some level of management fees which, in turn, would jeopardize the original thesis. Other recommended safeguards included establishing an independent charitability committee to review investments strictly on the basis of charitable impacts, independent of financial performance. This committee would need to maintain approval rights so that the fund only makes investments that serve CET's charitable mission. Finally, it was recommended that CET establish a taxable corporate "blocker" between the 501(c)(3) and the fund to pay taxes on any unrelated business taxable income (UBTI).

The Stand-Alone, Affiliated Fund

Given the challenges and risks associated with blending philanthropic funds with risk capital in a fund wholly-owned by 501(c)(3), CET next considered the possibility of creating a stand-alone, affiliated fund (Figure 3). Such a fund would be structured like most other venture capital funds. It would be a Limited Partnership that sits outside of the 501(c)(3) public charity with a GP that is independent of the 501(c)(3) organization. The fund would be capitalized with return-seeking capital from LPs and assess management fees to cover the cost of fund operations. The fund would seek to maximize investment returns, the majority of which flow back to the LPs. An agreed upon portion of these proceeds would accrue to the GP based upon a "carry" percentage that is negotiated upfront in the investor agreements with the LPs. In this instance, if there is involvement by the 501(c)(3), then a UBTI corporate "blocker" would be required.

Figure 3



The nuance to this structure compared to a traditional fund structure would be the relationship between the fund and the 501(c)(3) public charity. The 501(c)(3) would be able to grant certain allowable support to the fund to help defray a portion of the costs related to fund operations. Such allowable support, however, would be limited to activities that are considered charitable. These activities might include measuring and tracking environmental impact, supporting technological research, and providing training and education to portfolio companies. As discussed above, it would not be allowable for the 501(c)(3) to contribute activities such as investment and fund management, rent, back office operations, and other overhead expenses. These would need to be reimbursed to the 501(c)(3) at fair market value. As such, the stand-alone, affiliated fund would need to assess management fees to effectively operate.

Management fees typically range from 1 percent to 2 percent of fund size and increasingly fall on the lower-end of that spectrum. Given CET's assessment that $35 million is an appropriate fund size for Seed and smaller Series-A rounds, the fund could expect to draw $350,000 to $700,000 in fees annually to support management and operations. This modest amount of fees would make it difficult to support the level of staffing, overhead, deal sourcing, diligence, and venture development support the fund would require to be successful. Raising a larger fund could be one strategy for overcoming this constraint but then the fund would be challenged in quickly deploying such capital in quality Seed and

smaller Series-A rounds. A larger fund could be deployed by increasing the fund's participation in later stage or follow-on rounds but this would not be in-keeping with CET's original vision of catalyzing investment to overcome the early-stage capital gap.

Management fees also decrease the amount of capital that can be put to work towards investment. As CET discovered in its modeling for the hybrid fund, investing funds that otherwise would go towards management fees can increase fund returns 30% over the returns of funds charging management fees, all else being equal. With investor return expectations more difficult to achieve, the fund would be compelled to invest in later stage opportunities to mitigate risk and to meet investor return expectations. This approach would do little to address the early stage capital gap that CET endeavored to solve.

Evergreen Self-Sustaining Seed Fund

Beginning in 2014, in recognition of the early stage capital gap confronting early stage startups, particularly those in the mid-continent region of the United States, CET began making seed investments in promising cleantech startups. To date, CET has invested $5.5 million in 33 companies, with check sizes that typically range from $50 thousand to $250 thousand. CET pursues this strategy using its 501vc® platform, so named to recognize the combination of CET's 501(c)(3) structure and its activities that are analogous in many respects to those of the venture capital industry.

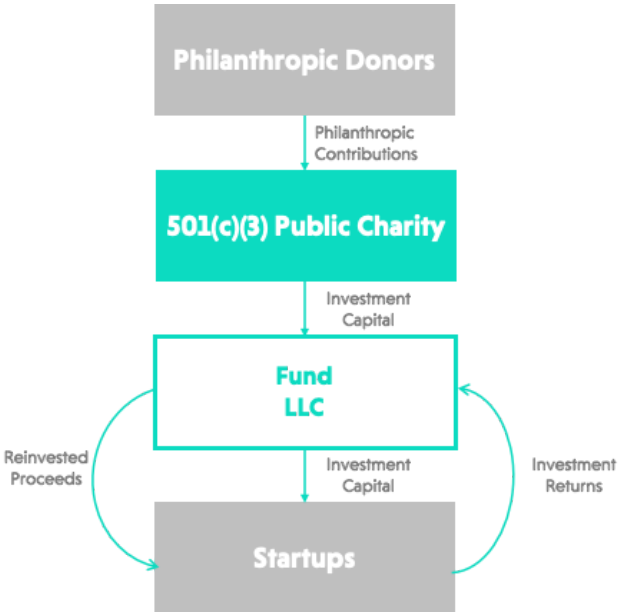
There are three key components to the 501vc® platform, all enabled by philanthropic support: (1) deep engagement with the innovation ecosystem in the mid-continent region of the United States to identify the most promising startups and entrepreneurs working on clean energy, decarbonization, and environmental sustainability solutions; (2) seed investments in such startups; and (3) deep engagement with its portfolio companies with programming, mentorship, business development, and fundraising support. Unlike many cohort based incubator and accelerator programs, CET remains engaged with its portfolio companies across their lifetimes and doesn't "graduate" companies.

This model has proven successful as CET has helped these companies go forward to raise over $140 million of follow-on investment, representing 26x leverage on each dollar that CET has invested. CET's portfolio has demonstrated a 90 percent "survival rate" thus far and 67 percent of its companies are revenue generating. CET's portfolio companies employ over

520 people and 58 percent have female and minority founders. The 501vc® platform has realized 4 “exits” to date. The original investments in these startups were funded with $300 thousand in grants and contributions, and translated to over $413 thousand in gains returned back to the fund. Demonstrating the revolving design of the fund, over $713 thousand of funds were thus made available for reinvestment, a 2.4x amplification of the original grants and contributions.

The evergreen, self-sustaining fund is structured as a limited liability corporation (LLC) with CET, a 501(c)(3) public charity, as its sole managing member (Figure 4). The fund is capitalized with charitable, tax deductible contributions and, as such, must invest in companies that are consistent with and further the charitable purpose and mission of the 501(c)(3) as defined in its IRS Form 1023 filing. Investment returns are reinvested by the fund into new startups as opposed to being returned to the capital providers. Given that the source of investment capital is philanthropic, with no expectation of financial returns flowing back to the capital providers, the fund is better positioned to invest in early-stage companies that have longer development timelines and higher risk profiles than traditional return-seeking investment funds. This attribute makes it well suited to address the early-stage capital gap and its self-sustaining design ensures that it is positioned to address the early-stage capital gap well into the future.

Figure 4



The challenge CET has encountered with this model is sourcing a large enough pool of philanthropic capital to afford consistent investment capacity. The total amount of CET's annual investments have ranged from $400 thousand to more than $1.5 million. CET's check sizes have ranged from $25 thousand to over $400 thousand. There have been numerous instances where CET identified promising startups needing support but lacked available capital to engage at that particular point in time. CET has also not had the capital to make follow-on investments in select portfolio companies. As a result, CET has not had the luxury to strategically architect and manage its investment portfolio to optimize returns for future investment.

This challenge is rooted in part to CET originally approaching its early investment activities as a pilot test to better understand the feasibility of investing in very early stage cleantech companies and to refine its investment processes. As such, CET approached its fundraising incrementally, raising variable sums of money at the beginning of each year to support its upcoming investment activities versus mounting a large fundraising campaign to secure a large, reliable pool of investment capital.

Charting A Path Forward

CET's internal deliberations on which fund structures to pursue balanced assessments of what may be possible with what is practical and achievable. It was important to CET's board of directors that the chosen path forward did not jeopardize CET's tax-exempt status, damage its reputation, nor limit its ability to support a wide-range of innovative startups in the mid-continent ecosystem.

CET's internal deliberations also were informed by the difficulty CET encountered in recruiting an experienced venture investor to serve as the managing partner of the fund. CET's market research identified that return-seeking investors would require such an individual to be in place prior to placing investment capital with the fund. CET reviewed many resumes, interviewed 10 candidates, and advanced one finalist to meet with the search committee. However, it was clear throughout this process that the experienced candidates held serious concerns about whether the fund was possible given the unique structuring that would be required. Similar to what CET heard in its market research,

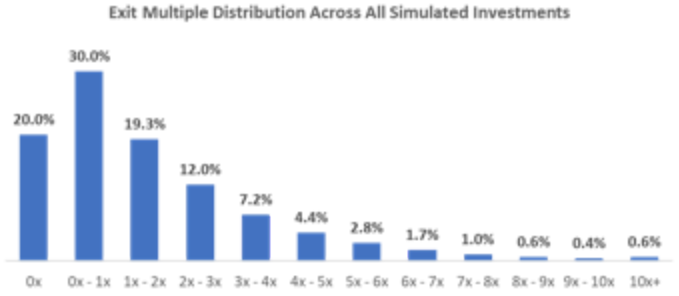
candidates expressed concern that complexity, particularly for a first-time fund, would make fundraising exceedingly difficult.

It was clear that the evergreen, self-sustaining fund was proven and effective and the logical choice if it could be properly capitalized with philanthropic support. Given this, CET set out to determine whether it would be possible to endow the 501vc® Seed Fund so that it could revolve into perpetuity and become a self-sustaining investment vehicle enduring for generations. It was critical to right-size the endowment to position CET to be a consistent and nimble source of seed funding and venture development support, yet not be so large that CET would struggle to deploy capital in a timely and efficient manner. Assumptions CET incorporated into its modeling included:

- Average of 6 investments made per year
- Average $250 thousand check sizes for seed investments; no follow-on investments
- $1 million per year allocated to operating expenses for years 1 - 5
- $400 thousand per year allocated to operating expenses for years beyond year 5
- Average of 8 years to exit
- 100 percent reinvestment of investment returns
- 3 percent interest on uninvested capital

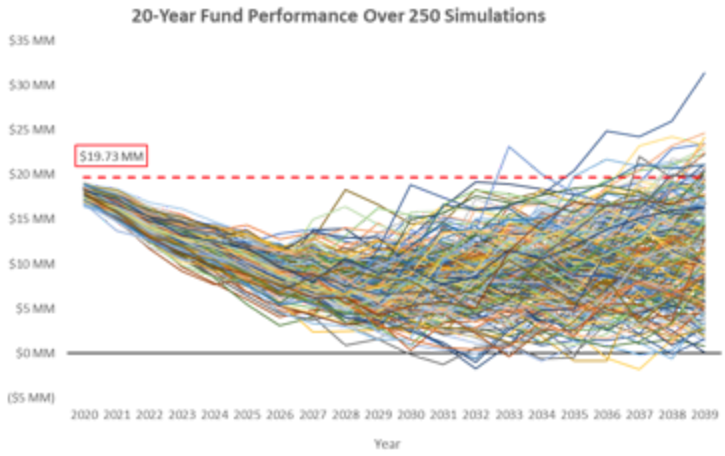
Whether the fund can revolve into perpetuity hinges on investment outcomes and the repatriation of capital and returns. CET analyzed a variety of information sources with historical data on investment returns to determine the appropriate exit multiple assumptions to incorporate into its modeling. CET's modeling incorporated the conservative exit multiple distribution in Figure 5, with 30 percent of investments returning less than 1x and 20 percent representing outright losses.

Figure 5



Based on the aforementioned assumptions, CET performed Monte Carlo fund simulations to determine appropriate fund size. These analyses identified that a $20 million endowment would allow the 501vc® Seed Fund to revolve into perpetuity with a 95 percent confidence interval (Figure 6).

Figure 6

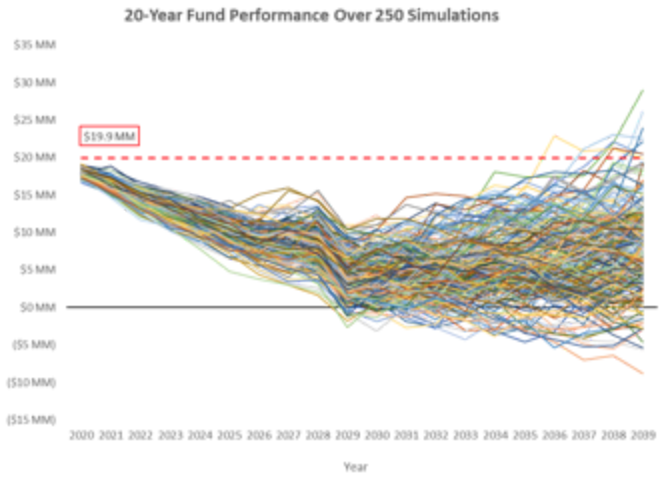


Recognizing that many foundations may wish to deploy Program Related Investment (PRI) capital, CET analyzed whether the 501vc® Seed Fund can accept such capital without sacrificing the funds ability to revolve into perpetuity. CET found that the 501vc® Seed Fund can accept some PRI capital but with certain trade-offs, such as:

- Lowering the confidence interval that the fund can revolve into perpetuity;
- Reducing the amount of fees that be used to support operating expenses; or
- Requiring that the PRI capital be incremental to the $20 million revolving fund

Demonstrating one such trade-off, CET modelled the $20 million fund endowed with $17 million in grants and $3 million in PRI capital. The modeling assumed that the PRI carried a 2% interest rate and a 10-year term. As Figure 7 illustrates, the fund has the potential to revolve into perpetuity albeit at a lower 75 percent confidence interval. The question then becomes what level of risk CET is willing to assume while ensuring the fund remains self-sustaining.

Figure 7



Conclusion

CET ultimately concluded that its best path forward is to pursue a formal campaign to endow the 501vc® Seed Fund with $20 million of philanthropic support. As outlined above, this level of funding would enable the fund to revolve into perpetuity and establish a persistent vehicle for providing early-stage seed funding to high-potential cleantech startups.

CET's journey did highlight the vexing legal complexities and ambiguities when innovating around the tax code. Although legal counsel advised that there may be creative pathways for pursuing options such as the hybrid fund, and some precedents that may be relevant, it was clear that there was no clear and definitive legal or regulatory guidance on what is allowable.

Successful execution of innovative structures would require an appetite for risk to test allowability by both the organization creating the fund and the organizations providing both philanthropic contributions and investment capital. This ambiguity significantly lessens the probability of success and creates operational and reputational risk for the organization seeking the capital should it not succeed. It should be noted that if the organization does succeed in raising capital using innovative structures, the possibility

remains that all parties involved may fall under future legal and regulatory scrutiny with the potential of needing to revise fund structure once operational.

To truly unlock philanthropic support and capital to best serve cleantech innovation, there is clear need for definitive IRS guidance on what is allowable and not allowable. Both public and private stakeholders endeavoring to remove barriers to cleantech innovation would be well-served to undertake an advocacy campaign to achieve IRS guidance. This would include advocating the IRS to recognize activities addressing clean energy and climate change mitigation as being tax exempt.