Practice Briefing

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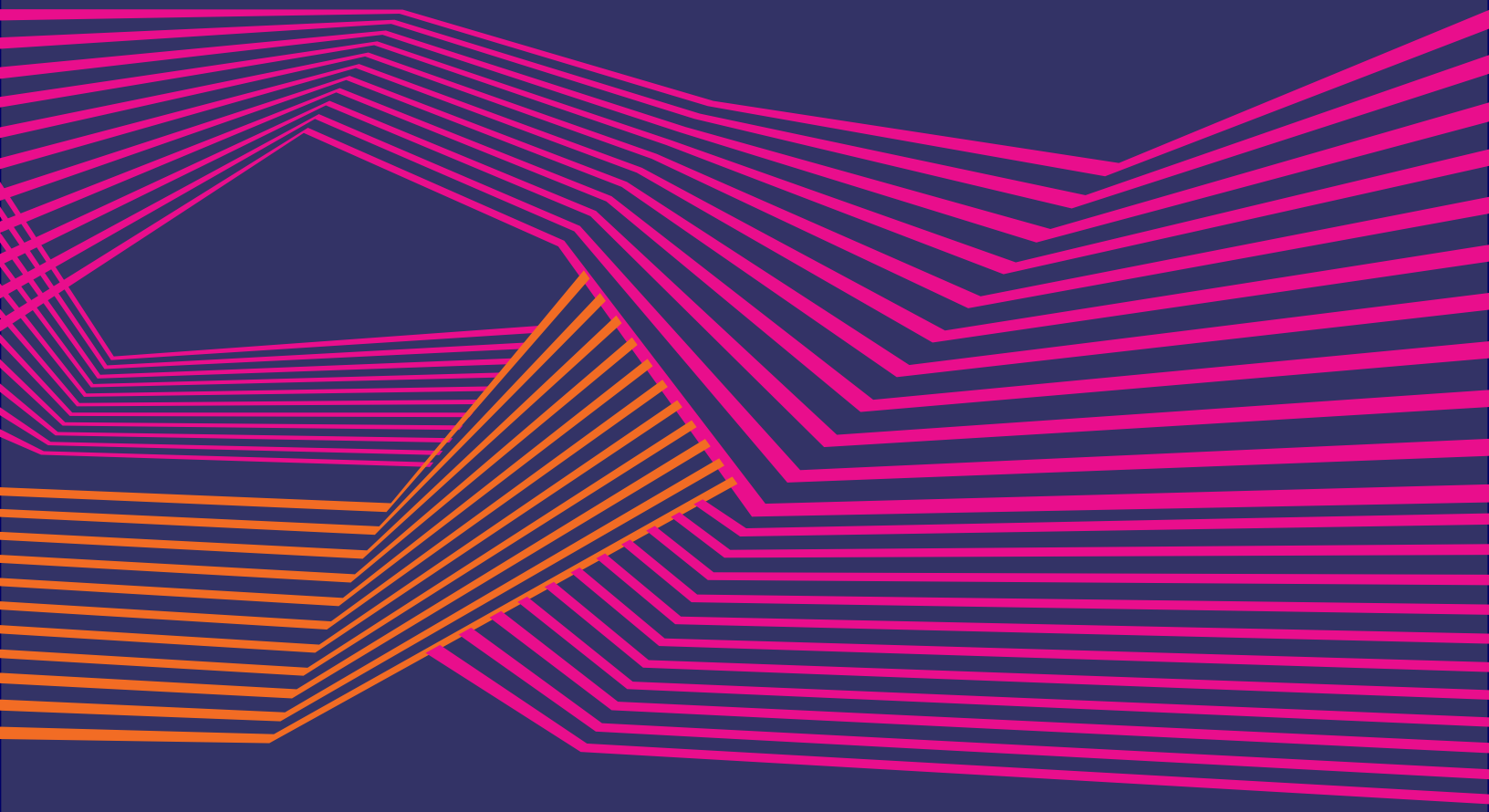
Foundations:

exploring the emerging practice of philanthropic investing to support innovation in science and engineering



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This practice brief is intended to serve as a guide for investors, philanthropists, institutions, and entrepreneurs interested in **ways to use charitable capital to support early stage, science-based innovation in for-profit enterprises.** Charitable capital can be granted or invested from several different philanthropic structures; this brief covers five options available to those utilizing a private foundation to support innovation, while its companion brief, covers options for those wishing to utilize a Donor Advised Fund.

Problem Statement

The translation of scientific breakthroughs from the earliest stages of idea generation into impactful, real-world solutions has long served as a vital process for a prosperous society. This is true of many areas of scientific inquiry: advances in biology, physics, chemistry, and materials science have led to new solutions in fields as varied as medicine, transportation, food security, and energy.

However, for many of these breakthroughs the innovation process – from idea to impact – requires years of effort and significant financial support. Unfortunately, gaps in financing along the idea-to-impact pathway are widening as government funding for research declines, and commercial funding for scale-up, manufacturing and distribution of products is narrowing in its scope.

For science and engineering innovators, the early-stage funding "valley of death" comes at a critical moment, when ideas are ripe to leave the confines of the research laboratory and teams must focus on reducing technology, regulatory, and market risks. Nowhere is the capital gap more acute than for innovations that promise science-based hardware solutions that enable the sustainable production and consumption of water, food, and energy. It is challenging to quantify this capital gap, but a single data point provides some hint as to the challenge for impact entrepreneurs: Price Waterhouse Cooper reported $0 of initial investment – first money into new ventures – into any companies flagged as "clean tech" during Q2, Q3 and Q4 of 2016.[1] Indeed, entrepreneurs in capital-intensive contexts spend significant time pursuing dwindling capital.

Philanthropy as One Solution

Philanthropists have the potential to play a critical role in bridging the early-stage financing gap for science and engineering innovation.[2] As traditional venture capital – often relied upon as the primary source of early-stage risk capital – has proven a poor fit for many nascent hardware solutions, entrepreneurs are increasingly turning to philanthropists to create new financial instruments to fill the capital gap.

The natural match between philanthropists and impact-oriented entrepreneurs centers on the emerging set of start-ups based on deep science, technology and business models that require significant early-stage capital to de-risk products with the potential to provide cleaner water, secure food supplies, and sustainable energy.

Philanthropists could help move lab-scale ideas along the early-stages of the path, by deploying early, catalytic investments of charitable dollars. When technical risk is sufficiently reduced, mainstream financiers (e.g. venture capital funds, corporate investors, etc.) will then be more willing to step in to take companies to scale. The case study at the end of this brief provides an illustration of how early stage philanthropic financing enabled a science-based for-profit enterprise with a clear social (as well as economic) impact to reduce enough technical risk to attract commercial capital in follow-on rounds.

Foundations as an Organizational Form for Philanthropists

Philanthropists wishing to invest in entrepreneurs working on science-based innovation are likely to use private foundations to do so. This is because private foundations emerged as the most common vehicle for charitable giving starting at the turn of the 20th century in the United States.[3] And so, before we provide more guidance on how to use private foundations to support innovation-driven entrepreneurship, we outline the emergence of such foundations.

A private foundation is a legal entity formed for the purpose of charitable giving. It is a 501(c)(3) tax-exempt organization, and is described as a charitable organization in Internal Revenue Code by section 509. It can be set up by one or more individuals through an initial endowment of cash and/or investments (for which the donor or donors receive a one-time tax benefit up front). The foundation's endowment forms the principal for gifts and investments over time. In 2016, 86,192 U.S. private foundations controlled over $715 billion in assets, and made $52 billion in annual charitable contributions.[4]

Private foundations organize their activities into two sides: a program side and an endowment side, with the endowment side responsible for "making the money" and the program side responsible for "giving it away."

- **Program Side.** The program side of a foundation is responsible for disbursing a minimum of 5% of the foundation's assets each year to achieve the philanthropic mission of the organization. It is often staffed by officers with cause-specific expertise relevant to the foundation's charitable purpose. Exempt (i.e. charitable) purposes listed in section 501(c)(3) of the Internal Revenue Code include "economic development," "poverty alleviation," "advancement of human health," "environmental conservation and preservation," as well as "advancement of education or science," which provide direct and indirect rationale for grants to explore science in both the public and private sector.

- **Endowment Side.** The endowment side of the foundation is responsible for preserving the foundation's assets over time. While the foundation's board of directors has the fiduciary responsibility to safeguard the foundation's assets to achieve its long-term charitable mission, it is common to outsource day-to-day management of the endowment to external asset managers. The financial tools of these external asset managers include investment in venture capital funds. But IRS guidelines do not allow foundation endowments to be allocated to "jeopardizing" (e.g. excessively risky) investments. Examples of jeopardizing investments include things like trading on margin, selling short, and distressed real estate.[5]

From 1900 through to the late 1950s, private foundations were not subject to strict regulations or disclosure requirements. However, in the early 1960s, the formation rate for private foundations jumped to 2,000 new organizations per year and public skepticism of foundation operations rose precipitously. The American public became concerned that private foundations were being set up by wealthy families simply to avoid paying taxes and began to view private foundations as "symbols of secret wealth which mysteriously used the levers of power to promote obscure, devious, and even sinister purposes."[6]

These suspicions inspired in the Tax Reform Act of 1969, which imposed a battery of constraints on foundation activities and empowered the IRS to enforce regulations through the imposition of excise taxes. Limits include:

- No self-dealing;
- No investment in speculative ventures that jeopardize a foundation's charitable purpose;
- Minimum payout to charitable purposes (today the minimum payout is 5% of a foundation's assets on an annual basis);
- No expenditures to influence elections; no payments to government officials; and no expenditures for non-charitable purposes.[7]

While these regulations seem reasonable to ensure that private foundations are used only as vehicles for the public good, we outline them because in our experience, the conservative interpretation of these rules has likely stifled the evolution of philanthropic practices. Many foundations only make "safe" grants to public charities, rather than utilizing all the financial tools at their disposal to achieve their charitable purpose.

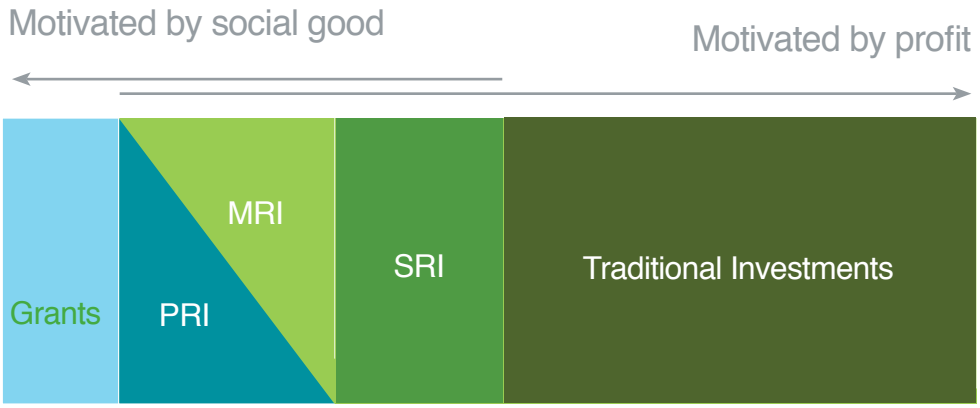
How Can Foundations Support Innovation?

When it comes to supporting innovation, by far the most popular option for foundations has been traditional grants with no expectation of financial return to existing non-profit organizations like universities, often focused on early-stage basic research. The practice of grant-making for scientific research has long-standing origins in the contributions of philanthropists such as Smithson (whose funds supported the creation of the Smithsonian Institute), wealthy Bostonians who funded Professor Agassi at Harvard, Rockefeller's support of many research activities around the U.S., and Carnegie's contributions to research labs across the country. This tradition has continued to the present day, with ultra high net worth individuals endowing research institutes focused on specific areas. One example is the Allen Institute, funded by Microsoft co-founder Paul G. Allen, to focus on addressable problems in bioscience.

Prize philanthropy is another time-honored mechanism to support science and engineering. The Nobel Foundation was famously established in 1900 to award prizes for achievement in chemistry, physics, medicine, and literature. In the modern day, prize philanthropy has focused more strongly on incentivizing commercial innovation: consider the XPrize, a 501(c)(3) public charity that solicits and aggregates donations to run competitions with multi-million dollar prize purses, to incentivize entrepreneurs to work on moonshot solutions to challenging societal problems.

Nonetheless, supporting science and innovation through grant-making to non-profits is not the only way in which start-ups that build on early research might be supported through the valley of death by philanthropic foundations. Other, under-utilized tools are available, from traditional grants into for-profit start-ups on the one end, to program- or mission-related investments, through to traditional (fiduciary) investment vehicles on the other.

Spectrum of Tools Available to U.S. Private Foundations [8]



Grant: a gift made to achieve the foundation's charitable purpose, with no expectation of financial return, counting towards the charitable distribution requirement

PRI or Program Related Investment: an investment made expressly to achieve the foundation's charitable mission, counting towards the charitable distribution requirement

MRI or Mission Related Investment: an investment aligned with the foundation's charitable mission, made from the foundation's endowment

SRI or Socially Responsible Investments: an investment strategy for endowment assets that considers both financial return and social or environmental benefits

Traditional Investments: a strategy for endowment assets considering financial return only

Specifically, a foundation can also make investments in for-profit companies and projects to advance their charitable goals, using both charitable and endowment (fiduciary) funds. While there is growing momentum in the foundation community to explore new financial methods for achieving charitable mission, including the investment of foundation moneys in for-profit entities, few foundations have done so, and even fewer have used these methods to support science innovation. Of the 5,861 program-related investments on record since 1998, less than 3% pertain to science and engineering innovation. (A notable leader in the use of Program-Related Investments or PRIs is the Bill and Melinda Gates Foundation, which has made over 45 PRIs into non-profit and for-profit organizations aligned with the foundation's charitable purpose.)[9]

Our hypothesis is educational barriers in the foundation community about the shortcomings of our traditional financial sector, operational challenges associated with making for-profit, science-oriented investments, and perceived regulatory barriers for blended capital approaches, may be limiting the use of these other mechanisms. In our recent experience working with a large number of philanthropists and foundations, common questions about the usage of foundation assets include:

- How should market-based approaches complement an existing grant portfolio? What social problems are best suited to be solved by market-based solutions. Why aren't they already being supported by the traditional financial sector?
- Under what conditions may a foundation legally use charitable dollars to make an investment to achieve its charitable purpose (with some expectation of financial return)?
- Conversely, under what conditions may a foundation legally make an investment from its endowment to achieve its charitable mission? What mechanisms exist today to support such investments?

Uncertainty about these questions prevents many "would-be" charitable investors from using all the tools their private foundations can offer. In an attempt to provide some answers, we briefly outline the private foundation's mechanisms for supporting science and engineering innovation.

Private Foundation Support for Science and Engineering Innovation

Our theory of change is that foundations could increase their impact on science and engineering innovation by activating all aspects of their human and financial capital to harness the power of science to address critical global challenges.

To be more concrete, in the middle ground between endowment and program expenditures, foundations have a variety of tools at their disposal for supporting early-stage, innovation-driven ventures focused on solving key charitable issues.

Below we outline five different ways any private foundation might support a start-up whose activities are grounded in science and engineering.

Option A—Issue a grant to a for-profit S&E entity that qualifies as charitable.

The first option available to foundations is to issue a grant (with no expectation of financial return) to a for-profit company. Grants qualify as charitable when they serve an exempt (i.e. charitable) purpose, and are not for the private benefit of any individual. Foundations need to exercise expenditure responsibility and document the charitability of the grant in order to protect against negative tax penalties. One example of a private foundation using this method includes the DC-based Hitachi Foundation, which was active from 1985 through 2016, and made grants to early-stage companies through its Yoshiyama Young Entrepreneurs Program from 2010-2013.[10]

Option B—Issue a grant that qualifies as charitable to a non-profit intermediary that supports market-based solutions.

Instead of issuing a grant directly to a for-profit innovation-driven enterprise, a foundation can instead issue a grant to a 501(c)(3) intermediary that supports market-based solutions to achieve the intermediary and foundation's shared charitable goals. In this case, the non-profit intermediary would use the grant moneys to finance an early-stage start-up, and financial return could accrue to the intermediary to be re-invested to achieve the intermediary's charitable purpose, depending on the terms between the intermediary and the company or project being supported. One potential advantage of this option for foundations over issuing a grant directly to a for-profit company is that any liability for non-compliance with Internal Revenue code rests with the intermediary, and not the foundation.

Option C—Issue a recoverable grant or loan that qualifies as charitable to a non-profit intermediary that supports market-based solutions.

Foundations also have the option to make a recoverable grant or loan to a 501(c)(3) intermediary that supports market-based solutions to achieve the intermediary's charitable purpose. After receiving the recoverable grant or loan from a foundation, the intermediary would extend a back-to-back recoverable grant to an early stage innovation-driven company. Any proceeds from the recoverable grant would be passed back through intermediary to the foundation, to be reinvested or granted out by the foundation toward its charitable mission.

Option D—Issue a program related investment (PRI) to a for-profit S&E entity that qualifies as charitable.

Instead of using a grant mechanism, foundations can instead make a program related investment (PRI) to a for-profit innovation-driven enterprise, which counts towards the foundation's annual 5% distribution requirement. PRIs must meet the following criteria:

> (1) The primary purpose of the investment is to accomplish one or more of the charitable purposes outlined in the Internal Revenue Code. (i.e. the investment must significantly further the foundation's charitable goals, and would not have been made but for the investment's alignment with the foundation's charitable purpose);
>
> (2) No significant purpose of the investment is the production of income or the appreciation of property;
>
> (3) No purpose of the investment is to lobby, support, or oppose candidates for public office or to accomplish any of the other political purposes forbidden to private foundations by the Internal Revenue Code.

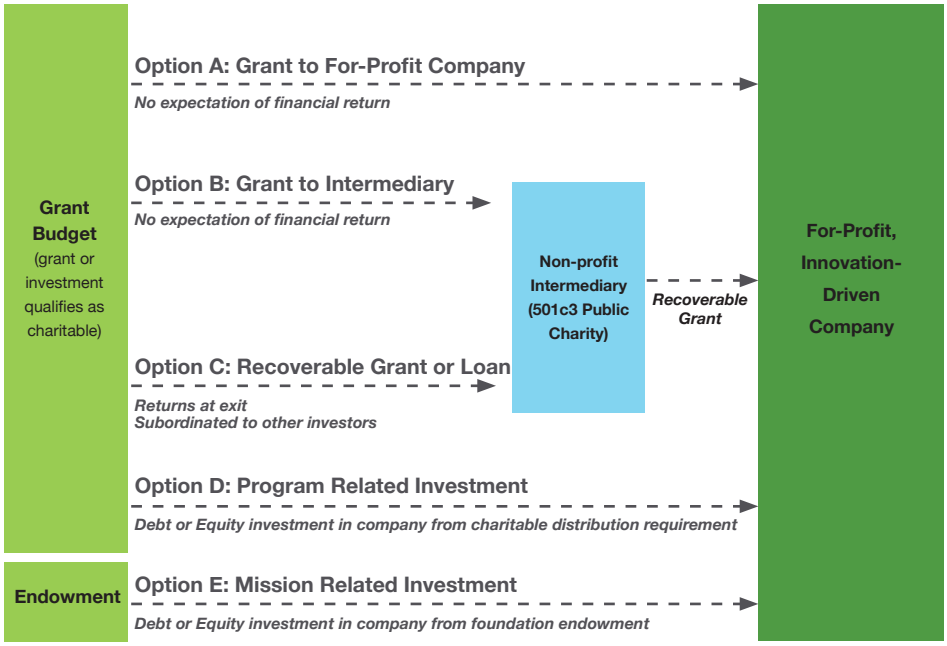
If a foundation chooses to make a PRI, it should carefully document the circumstances surrounding the investment at the time it was made. In order to satisfy the first requirement, foundations should record their charitable motivations for making the investment. In order to meet the second criterion, foundations can document that the expected financial return at the time of the investment is insufficient to compensate for the risk. In both of these cases, it should be noted that the foundation's motivations and beliefs at the time of investment are what matters—not whether an investment becomes profitable later. Without documentation, a foundation risks excise taxes on investments that are later deemed to be non-compliant.

Option E—Issue an equity or debt investment to a for-profit S&E entity from the foundation endowment.

Investments from a foundation's endowment – but aligned to a foundation's mission – are often called mission related investments (MRIs). Investing in a for-profit start-up with an expectation of market or above-market return from the endowment would count as an MRI.

However, foundations wishing to make to direct investments from their endowment in early stage companies must ensure that these investments do not jeopardize the foundation's ability to carry out its charitable purpose; that is to say, investments must not be excessively risky. In general, investments in innovation-driven enterprises in science-related areas such as energy, agriculture, or global health are unlikely to fall into this category.

Five Options Available to Private Foundations to Support For-Profit Innovation[11]



For foundations looking to mobilize both the grant-side and the endowment-side of impact investing for important science-based ventures, one benefit of partnership with a nonprofit intermediary is that the same foundation can support companies in their earliest stages of formation with grants to the intermediary, while leaving room for the foundation endowment to follow on into the most promising investments later. Intermediaries make independent investment decisions that can alleviate the foundation of self-dealing concerns later while doubling down on the most potentially impactful ventures.

The five approaches laid out above provide a rich set of mechanisms for philanthropists to consider and can be used in parallel, by multiple foundations to support the same start-up. The case of Quidnet Energy is illustrative.

CASE STUDY: Quidnet Energy / PRIME Coalition

Quidnet Energy, founded in 2015, is a new venture developing a radical approach to grid-scale energy storage by repurposing oil and gas infrastructure for clean energy. Its goal is to outcompete incumbent natural gas generation and pumped hydroelectric storage – without subsidy. Its underlying solution is simple: Quidnet will store energy via pressurized water in underground geologic formations. In the "charge" event, a pressure pumping-rig pumps water at high pressure into the reservoir. That water elastically deforms the reservoir, like a spring, storing energy. In the "discharge" event, a valve opens at the surface to drive a pressure turbine.

Following in the frustrating footsteps of many "clean tech" entrepreneurs, Quidnet's founders discovered that, while they were able to computationally model their solution and theoretically demonstrate the large potential impact of their approach, their likely time to market was long, and the technical risks were high. After self-financing their modeling work, they experienced significant difficulty in raising capital to fund initial field testing.

In line with its mission to spread awareness of the range of philanthropic approaches to funding startups such as Quidnet, the PRIME Coalition – a nonprofit intermediary – began to work with Quidnet Energy to put together a syndicate of philanthropic and commercial seed investors.

Over the course of the following months, the seed round took shape using two of the mechanisms outlined above:

1. Using Option D, the Sorenson Impact Foundation made a Program-Related Investment (PRI) directly into Quidnet; and

2. Using Option C, the Will and Jada Smith Family Foundation made a recoverable grant to Quidnet, using PRIME as the non-profit intermediary.

The philanthropic capital provided by the Sorenson Impact Foundation and the Will and Jada Smith Family Foundation was catalytic in Quidnet's ability to close additional seed financing from commercial seed investors. Thus, with the assistance of a focused, and expert intermediary, Quidnet was able to raise $1 million and execute its pilot demonstration at a site in Erath County, Texas, working with a large corporate strategic partner.

Field-testing of the technology began in June 2015. Since that time, Quidnet has achieved all of its field targets and is progressing to a full, grid-connected demonstration turbine. Having significantly reduced technical risk, the company closed a seed extension round from commercial funders in early 2016—providing strong evidence of the catalytic role philanthropy can play in helping companies retire enough risk to attract purely commercial investment.

Conclusion

Foundations interested in supporting science-based innovation can play a catalytic role in helping fill a critical financing gap for early stage companies across medicine, transportation, food security, and energy. In taking the first steps from a lab breakthrough to a prototype, these companies often have too much technical, regulatory, or market risk to be attractive to commercial venture capital or other sources of early stage financing. This is especially true of new hardware technologies, new therapeutic techniques, new methods of electricity generation, and new approaches to water treatment or agriculture. Yet, if these start-ups can get to scale, market forces can be a powerful aid in achieving impact — driving the deployment of technology and corresponding benefits for society and the environment in a virtuous cycle.

Foundations have a variety of tools at their disposal to support innovation-driven enterprises. If the primary purpose of the "investment" is charitable and a foundation's officers are comfortable with transferring moneys to a for-profit entity directly, then foundations can make grants or program-related investments directly to the for-profit entity, documenting the charitable intentions of the grant or investment. Alternatively, foundations can write a grant or recoverable grant/loan to a non-profit financial intermediary, which can help to document the charitability of the gift and protect the foundation from any liability. Finally, foundations can utilize their endowment capital to make a direct, mission related investment, with full expectation of financial return.

Philanthropy and science have long been intertwined: whether through support of academic institutions, healthcare facilities, advocacy groups, or direct services, foundations fund science and technology to achieve their missions. But a critical link between science and the market is missing — without ensuring that innovators have a chance to get to market, the benefits of an enabling policy environment or basic research breakthrough will never be realized. Building on deep issue expertise, foundations can and should take the next step, drawing on all their resources to help science-based innovation bear fruit.

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