

EVAN S. MICHELSON AND ISABELLA M. GEE

Lessons from a Decade of Philanthropy for Interdisciplinary Energy Research

What we learned in reviewing 10 years of grantmaking for research aimed at decarbonizing energy systems.

In 2016, we at the Alfred P. Sloan Foundation put out a request for proposals to advance research on the economics of energy efficiency. In response, a group of researchers from Western Washington University proposed to investigate how such investments affected housing prices. By performing energy-efficiency audits on home sales across Washington State, they intended to determine whether sharing this information had a detectable impact on final sale price. As funders, we felt the project addressed a unique set of questions and would provide practical, actionable insights into how consumer preferences are reflected in housing prices, so we supported the study.

However, within the first year, the team encountered complicated disclosure rules that delayed their research. To try to speed things up, they redesigned the energy scorecard used to present audit results to would-be homebuyers. When faced with low recruitment rates, the team opened their study to include homes currently on the market along with homes that had recently been sold. Even so, by 2020, two years after the project's planned end date, the research team had been able to secure data on only a fraction of the homes they had originally intended to include in the study.

Instead of abandoning this focused research effort, the team shifted to a much wider array of research methodologies—including surveys, interviews, and modeling—to study a more complex set of issues surrounding energy-efficiency interventions: motives behind consumer adoption of energy-efficient technologies, the impact of home

energy-efficiency labels, and policymaker perspectives on electrification. The researchers even explored how data from test homes can be used to understand real-world behavior patterns. Though the original approach would have provided an informative and robust analysis of the relationship between energy efficiency and housing prices, the results would have been very specific to the study region. With their expanded approach, the team is producing a more varied set of insights on the opportunities and barriers policymakers might encounter when trying to craft decarbonization policies.

As funders, we followed along as these researchers pivoted and adapted their aims to study home energy use through a wider lens. In these shifts, we see important lessons about how philanthropic funders assess the impacts of the programs they support. There is often a tension between measuring the progress of grantees toward project-specific milestones and measuring the overall progress of a funding program toward its stated mission.

Grants such as this show that one consideration informs the other: program goals inform project selection, and tracking a grant's path to impact contributes to a funding program's influence and strategic direction. Understanding this feedback loop can provide funders valuable insight into their grantmaking strategies.

As energy and environmental philanthropy grows, it is vital for grantmakers to look inward. Funders need to assess both how their grantmaking efforts fit within their stated program goals and how they can best leverage their resources

toward their mission moving forward. Taking time to reflect and evaluate can increase the impact of philanthropic investments in knowledge generation, enabling funders to direct resources more swiftly in support of decarbonizing energy systems and addressing climate change. To accelerate progress, we believe it is necessary for foundations to enable collective learning by being transparent about their findings; in doing so, they can contribute additional guidance for new and legacy funders alike on how to better allocate their resources or define programmatic impact.

A growing and evolving area for philanthropy

According to a 2023 report by the ClimateWorks Foundation, philanthropic funding directed at climate change mitigation efforts tripled between 2015 and 2021, but has since plateaued. As philanthropies experiment with novel forms of grantmaking, these practices open the field to new opportunities and can direct resources to critically important topics in new ways. However, overall philanthropic giving on these topics remains surprisingly small, representing less than 2% of philanthropic funding globally. And although interdisciplinary academic research on energy,

programmatic goals and to refine how we do grantmaking in the future? What have we learned that could be useful to other funders in this area?

To answer these questions, we reviewed our full catalogue of annual grantee reports and tracked all the outputs supported by our program, including publications, conferences and workshops, students and early-career scholars supported, and additional funding raised by grantees as a direct result of our initial grantmaking. This multiyear impact assessment enabled us to see the full reach of our program, providing a basis to ask a wide range of questions while revealing important stories, like that of the team at Western Washington University. Here we have distilled some of the most important lessons learned from this undertaking.

Providing qualitative context for quantitative metrics

To make sense of our program's overall impact, we need both specific measures of grantee progress—publications produced and workshops organized—as well as contextual descriptions of how the research fits into the overall academic and policy landscapes. It is only by reading our grantees' narratives that we learn what a grant can actually accomplish—which is

Funders need to assess both how their grantmaking efforts fit within their stated program goals and how they can best leverage their resources toward their mission moving forward.

environment, and climate issues is key to developing socially engaged responses to climate change, energy and climate philanthropies in the United States direct a small fraction of their resources toward this end. Support for interdisciplinary social science research remains even scarcer, both among philanthropic and government funders, with one study showing that scholarship on energy systems decarbonization and climate change mitigation received only 0.12% of research dollars globally.

Formalized in 2014, the goal of the Alfred P. Sloan Foundation's Energy and Environment Program is to support academic research, education, networking, and dissemination efforts to inform the societal transition toward low-carbon energy systems in the United States. Of the top 50 energy and climate funders in the country, we are the only one fully dedicated to supporting academic scholarship. To date, the Energy and Environment Program has awarded just over \$107 million across more than 300 grants, including some initial exploratory grantmaking before 2014.

As the program reaches its 10-year anniversary, it is a natural time to reflect on our first decade of grantmaking and take stock of our efforts thus far. How have we improved the world? How can we use evaluation to achieve our

sometimes well beyond the scope of the initial application.

This process of learning must start even before the grant itself begins. Many funders, including the Sloan Foundation, work with their grantees to identify a set of goals and metrics to gauge progress and measure output. Though establishing such goals might seem somewhat perfunctory, this list of metrics sends a powerful signal about funder priorities—through both what is included and what is left out.

This signal-setting is particularly relevant for academic research, as it is easy to overemphasize conventional indicators of productivity such as publication counts or citations. However, more salient measures include collaboration with external partners, interdisciplinary engagement, and dissemination of findings to decisionmakers. Incorporating qualitative goals and metrics broadens our view of success for each grant.

The narrative descriptions in grantee reports also help funders contextualize research impact and see past the completion of specific grant goals to appreciate how scientific research findings might influence real-world decisionmaking. For example, grantee narratives showed us that Sloan-supported research on how utility disconnections disproportionately impacted vulnerable households helped

influence policymaking during the height of the COVID-19 pandemic. One study even prompted the governor of Illinois to announce an \$80 million financial aid program to prevent electricity disconnections.

Sometimes these impacts reach well beyond what we anticipated when we set the goals of the grant. We learned that our support to the environmental think tank Resources for the Future to update the framework for estimating the social cost of carbon went beyond simply accomplishing technical improvements for modeling. Since 2017, this project has helped catalyze a wide-ranging, highly influential initiative featuring a publicly available, open-source modeling framework and data explorer tool. Once launched, the initiative drew additional funding from multiple sources, and some of its insights have been incorporated into federal and state decisionmaking processes.

Goals and metrics that encourage grantees to think broadly about the reach of their work have provided us a more holistic vision of impact and a better understanding of the ripple effects of our funding. We would have missed these insights if we had assessed grants solely through quantitative metrics.

Letting grantees adapt

Though grantmaking and grant reporting tend to follow a regular schedule, the research process is nonlinear: projects change, collaborations develop, and results point in unexpected directions. Investigators need autonomy over how best to adapt their projects. Unlike larger federal funders, philanthropic funding can allow for much more flexibility in how research is conducted. We know that research impact is not predetermined, and funders should encourage adaptation when necessary. Leaving room for grantees to make these changes also requires funders to adjust how they evaluate progress.

Our grantee portfolio has many examples of projects that pivoted productively midway. There may be no more salient example of the need for flexibility than the COVID-19 pandemic, which put innumerable research and dissemination efforts on pause. When original plans became infeasible, many grantees modified their work to take full advantage of online platforms. For instance, in 2020 and 2021, the annual Environmental and Energy Policy and the Economy Conference organized by the National Bureau of Economic Research occurred virtually and attracted more participants than the usual in-person gathering. The subsequent 2022 and 2023 meetings were then held in a hybrid format that allowed virtual participation along with in-person attendance. This change had unexpected benefits, allowing researchers and decisionmakers from a broader range of locations to participate. Although pandemic disruptions are a magnified example, deviations from initial

workplans can provide openings for grantees to pursue important research questions and innovate in how their findings are shared.

In fact, ambitious research that could drive social adaptation toward clean energy systems requires the type of flexibility that philanthropies are well suited to provide. Cutting-edge inquiries that involve multiple disciplines, methods, and institutions require a high degree of flexibility integrated into researchers' workplans from the start.

In particular, we support many studies incorporating participatory research, and these efforts need time to develop trusting relationships between the research team and the communities with which they intend to collaborate. Clinging to an overly rigid set of goals and metrics with minimal flexibility might preclude such projects from advancing, potentially leading to imbalances in the research design that perpetuate the same cycles of inequity these projects are meant to interrogate and disrupt. Such interdisciplinary programs also tend to be neglected by federal funding, which is often siloed by discipline. Philanthropy can capitalize on its inherent flexibility to support projects like these, and it also can work to ameliorate obstacles that arise with traditional peer review evaluation that may discourage interdisciplinary scholarship.

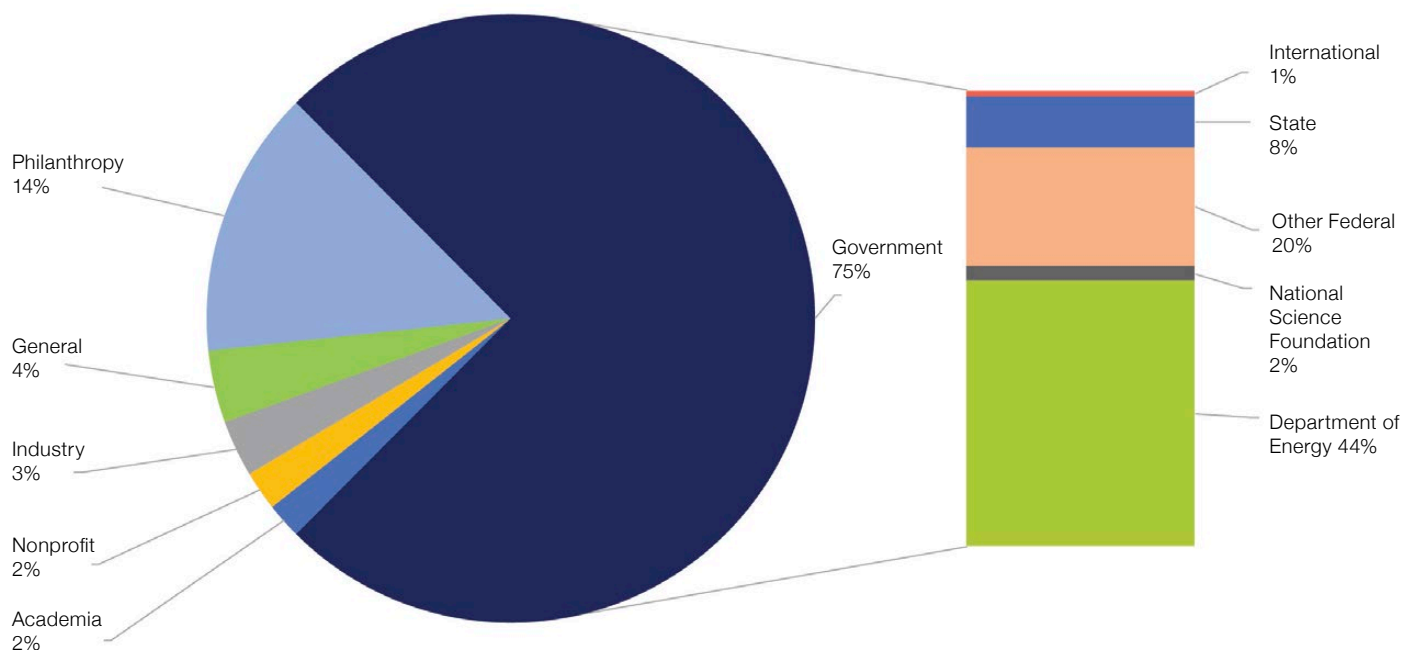
Finally, funder self-evaluation also requires a degree of flexibility and reflection. As projects evolve and programmatic priorities get codified, existing evaluation tools and techniques might become unsuitable for the task at hand. We went through multiple iterations of our own internal assessment process to find the right amount of time required of our grantees to provide an appropriate level of information without placing an unnecessary burden on them.

Taking a long-term view

As we've looked back over the past 10 years, we've seen ever more clearly that impact assessment is a dynamic process, cutting across many timescales and requiring a long-term view to appreciate it fully. Impact can be seen almost immediately at the granular level of an individual scholar publishing novel results or a graduate student learning a new research method and is evident over the medium term as forums that bring together multiple communities begin to forge new connections. But over the years, some projects continue to develop in surprising directions that funders need to pay attention to when conducting impact assessments. Many times, the most significant impacts might be difficult for funders to appreciate because they take place well after the grant reporting period has ended.

To get a handle on the longer-term influence of our program, we have begun to follow two factors over time: whether the research is used by other scholars and decisionmakers and whether the grantees secure further

Figure 1: ADDITIONAL FUNDING RAISED BY SLOAN ENERGY AND ENVIRONMENT PROGRAM GRANTEES



From 2014 to the present, Energy and Environment Program grantees have raised an additional \$75.2 million dollars from a variety of funding sources to support the development of their research. All data were collected and analyzed from internal Sloan Foundation grantee reporting.

funding to expand or continue the research. These are direct indicators of impact that extend after the lifetime of a grant that help us measure progress against our own programmatic objectives of linking research with practice and disseminating information for decisionmaking. These factors are also useful for their tractability: both uptake by decisionmakers and the securing of additional funding can be easily gleaned from grantee reports, and neither requires much effort by grantees to summarize.

This first indicator of impact we track is how research results are incorporated and used by decisionmakers, indicating that a project fills a knowledge gap. For example, in 2021 we made a grant to a scholar at The George Washington University to study the timing of electric vehicle (EV) rebate provisions. This research found that lower-income EV buyers strongly preferred upfront rebates instead of waiting to receive a credit on their annual tax filing. These findings were incorporated into provisions in the Inflation Reduction Act that allow EV dealers to provide rebates at the time of purchase. Though we had not anticipated this rapid application of research results, the project's real-world relevance was obvious

from the start, which was why we chose to support it.

Another way for research projects to be applicable is when they establish foundational research methodologies that can be applied in other contexts. An example is a 2013 grant we made for a coordinated field research campaign led by Environmental Defense Fund to investigate methane emissions from oil and gas infrastructure in the Barnett Shale region of Texas. The aim of the original grant was to test and compare different approaches for monitoring methane emissions in the United States. But over the past decade, amid declining costs for remote-sensing capabilities, the analytical tools tested in this effort led to development of a high-precision satellite capable of monitoring methane emissions from space that is expected to launch soon. In this way, a more narrowly focused domestic project paved the way for a global remote-sensing effort that goes well beyond both the initial grant scope and the reporting period. Having a better gauge of factors that contribute to the success of projects such as these can help us to identify such qualities in future projects.

The second indicator of impact we track is the ability of grantees to secure subsequent follow-on funding.

Positioning early-career scholars to be successful in securing additional funding is a particularly important catalytic role for our program, as faculty at this stage are just beginning to formulate their research agendas and gain leadership experience in managing complex teams. Securing seed funding for their initial ideas is crucial, especially for scholars pursuing interdisciplinary research or working at less-well-resourced institutions. Initial support from a foundation can accelerate the launch of a project, produce preliminary results that boost confidence in the work, and eventually attract other funders to help the work grow.

To that end, collectively, our grantees report leveraging our initial support to raise at least \$75.2 million in additional funding to advance their scholarship, compared to approximately \$107 million granted from our program. This greatly exceeded our expectations and was an impact of which we were only partially aware before we began collecting information systematically.

This experience also helped us recognize the ways that philanthropy can help position early-career scholars for future success by providing continued guidance throughout the grantmaking process. Early-career researchers often

That knowledge is poised to come from early-career scholars conducting interdisciplinary, policy-relevant research, a group that is systematically overlooked and disincentivized within academic institutions. As the average age of principal investigators receiving their first large-scale grant has increased across fields of science, the scientific enterprise is missing out on years of potential innovation from promising scholars.

Philanthropy has a unique opportunity to leverage its funding flexibility to support early-career scholars. Expanding diverse ideas and perspectives associated with energy system decarbonization can enable progress on one of society's most pressing, complex problems. Supporting these scholars is a primary way for philanthropy to have a lasting, positive impact on the field. More foundations need to devote resources to learn how best to fill this gap. We expect that the findings presented here can help provide a roadmap for others who are developing similar programs.

Additionally, integrating holistic evaluation has better prepared us to analyze our impact over time and assess our program's place as we approach our next strategic program review. This assessment exercise made us think about

Ambitious research that could drive social adaptation toward clean energy systems requires the type of flexibility that philanthropies are well suited to provide.

find working with foundations to be opaque, and greater candor and collaboration between funders and grantees can provide invaluable experience that they can apply to future opportunities. At the Sloan Foundation, we often iterate on proposals with prospective grantees, providing feedback and comments on drafts to help set up their projects for the best chance of eventual success. Offering substantive feedback early in proposal preparation helps proposers clarify their arguments and deepen their thinking about how to approach their research project.

Advancing catalytic, interdisciplinary research

After a decade of formal grantmaking on energy and the environment, we are just now beginning to see the durable effects of our program. A major takeaway from our assessment is the unique role that philanthropy can play by supporting interdisciplinary, early-career scholars working on energy and climate research. We need as many perspectives as possible conducting research within and across the social sciences, engineering, and basic science to produce the integrated knowledge necessary to solve the complex energy and environmental problems we face today.

what we signal to grantees in our goals and metrics, how to identify illustrative indicators of influence and impact, and how to contextualize tangible grant outputs within broader programmatic efforts aimed at energy system decarbonization.

Developing a habit of conducting routine self-evaluations and, most importantly, sharing these insights publicly supports successful, sustained growth in energy and environmental philanthropy. Sharing learning from these assessments can help inform practices by other funders, prompting continual reflection and refinement within the field that can support more effective and strategic grantmaking overall. As the role of science philanthropy grows, it is important to develop a culture of transparency and engage in ongoing, meaningful self-reflection with the scientific and public communities around us.

*Evan S. Michelson is a program director at the Alfred P. Sloan Foundation and author of *Philanthropy and the Future of Science and Technology*. **Isabella M. Gee** is a program associate at the Alfred P. Sloan Foundation.*