



HARVARD
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JOHN F. KENNEDY SCHOOL OF GOVERNMENT

November 20, 2020

Dear Advisory Committee,

Thank you for undertaking a financial review process for SCoPEX. We are happy to answer the follow up questions you have proposed. See enclosed document.

Please don't hesitate to reach out with questions. We can always setup a call to discuss further.

Yours,

David Keith
Gordon McKay Professor of Applied Physics, School of Engineering and Applied Sciences (SEAS); and,
Professor of Public Policy, Kennedy School of Government,
Harvard University

Question 1: In your memorandum to the Committee dated June 10, 2020 it was stated inter alia that “We do not accept donations from corporations, foundations or individuals if the majority of their current profits or wealth come from the fossil fuel industry, unless they can clearly demonstrate that they do not have a conflict of interest and present a strong track record of supporting efforts to address climate change.” In addition, you provided two examples as to why funding from fossil fuel derived wealth would be unacceptable (in the case of Exxon) but acceptable (in the case of Tom Steyer or Rockefeller Foundation), based on what the Committee considers to be a relatively subjective rating scale. In light of these criteria, can you clarify (a) how the contribution from Laura and John Arnold is consistent with your policy?

Response: John and Laura Arnold’s donation is consistent with our policy because we believe their contribution does not present a conflict of interest. Between their strong record of supporting efforts to address climate change and their investment in renewables (amongst oil and gas investments), we feel the Arnolds are not seeking to support and exploit solar geoengineering as a pretext for delaying reductions in greenhouse gas emissions—our (and others’) main concern.

Yet, their contribution does provide a useful, concrete example of how complicated it is to determine a potential conflict of interest in the real world, since it is not uncommon for individuals, foundations, or corporations to have some fraction of wealth or profits connected to the fossil fuel industry. Indeed, in a world that depends on fossil fuels for energy, arguably any entity is so tied (including Harvard). We therefore provide more information below.

John and Laura Arnold are contributing to the climate effort in many important ways. John is the lead director at Breakthrough Energy and the Environmental Defense Fund’s methane satellite detection project, and he and Laura have made significant philanthropic gifts to several climate organizations and initiatives, including Citizens Climate Education Corp, Clean Air Task Force Inc., Climate Leadership Council Inc., Energy Innovation Reform Project, and the Environmental Defense Action Fund. Therefore, if we were to use our rough weighting system¹ as a guide, our view is that John and Laura’s rating on climate action is a 2 or 3. The main reason we did not assign a 1 is because climate change is not the sole focus of John and Laura’s philanthropic efforts (they are also involved in other issues such as education, health, and criminal justice).

John and Laura also have current investments in the energy sector. Our funding policy focuses on funders’ current portfolio rather than past since we believe that is the best indicator as to whether there could be a potential conflict of interest (hence why we would accept funds from Tom Steyer, as you noted above). John and Laura’s current portfolio includes a mixture of oil and gas as well as clean energy investments. We could therefore understand if one assigned a rating on his current investments as a 3 or 4.

These initial estimates suggest that John and Laura’s product would fall somewhere between a 6 and 12. Clearly, it is complicated. In such cases, we return to the heart of our conflict of interest question: is the donor seeking to support and exploit solar geoengineering as a pretext for delaying reductions in greenhouse gas emissions? From our point of view, John and Laura’s leadership roles in climate initiatives, significant donations to climate organizations, and investments in renewable energy demonstrate a real interest in and commitment to reducing greenhouse gas emissions despite their investments in oil and gas. We recognize, however, that our final judgment is subjective and could

¹ We rate the donor’s ties to fossil fuels on a 1 to 5 scale, where 1 has no connection with fossil fuels and 5 has nearly all of their current wealth and social connections tied to coal. Then, we rate the donor’s commitment to climate from 1 for a donor who has long devoted a majority of their time and resources to climate action to 5 for a donor who has no visible interest in climate. We then take the product of the two ratings, rejecting donors with a multiplicative combined rating that is larger than 10.

certainly be critiqued. We mainly hope this process sheds light on the nuances and complexities of this process in the real world and is useful to others in the future if they choose to adopt such a model.

Question 2: The Committee notes that at least one donor (Bill Gates) has funded other experiments and research on large scale SRM. Do any project funders, whether individuals, foundations, institutions, corporations, affiliates or collaborators stand to benefit financially or politically from the results of this work? The Committee would also be grateful to be informed of the actions that you have taken (or intend to take) to mitigate such potential conflicts of interest.

Response: To our knowledge, no project funders stand to benefit financially or politically from the results of this work.

First, all donations to SGRP are philanthropic, meaning that funders cannot have any *direct* financial return on investment from any gift they give to our program. Their donation is simply that—a charitable gift. And given Harvard’s very high level of public visibility, the university is very strict about applying these standards. In fact, this control is at the level of Harvard senior management, so the teams from Harvard’s Solar Geoengineering Research Program (SGRP) and/or SCoPEX could not overrule these policies even if we wanted to (which we don’t).

Second, funders cannot have any claim over the intellectual property of the program’s work. Harvard owns the intellectual property arising from research conducted using university resources (more on this below). This further reinforces the fact that funders cannot have a *direct* financial benefit from the results of our research.

Third, to address *indirect* concerns, we do not accept donations from funders who are seeking to exploit solar geoengineering for personal financial gain in the fossil fuel industry, as noted above. This is why we do not accept donations from corporations, foundations, or individuals if the majority of their current profits or wealth come from the fossil fuel industry unless they can clearly demonstrate that they do not have a conflict of interest and present a strong track record of supporting efforts to address climate change. To mitigate such conflicts of interest, we have implemented the weighting system we outlined in our financial statement.

Question 3. The Committee is advised that there are different kinds of intellectual property that could be generated from SCoPEX, including copyright, patent, trademark, industrial design and geographical indicators. We would welcome a clear statement of the specific principles governing intellectual property generated by the project, and how these principles will apply to members of the SCoPEX project team, its contractors, collaborators and other third parties. As you have stated that all intellectual property from the project will be in the public domain would you consider publishing it under the relevant Creative Commons license structure?

Response: One of SGRP’s core principles is to operate in a way that is open access across all activities. As we list publicly on [our website](#), we aim to provide “full transparency with open-access publications and liberal data sharing,” and we “discourage patents and any form of IP protection.”

If it were possible, SGRP would forbid patenting for any solar geoengineering related technologies it supported. But there is not a legal way to do so. Harvard owns the intellectual property arising from research conducted using university resources, based on [Harvard’s IP Policy](#) and the individual Participation Agreements faculty and researchers sign. We therefore cannot, for example, force a graduate student working on SCoPEX to not file for a patent. In practice, key SCoPEX personnel have personally committed to not file for patents associated with SCoPEX, including Frank Keutsch, David Keith, Norton Allen, Martin Breitenlechner, John Dykema, Mike Greenberg, Michael Litchfield, Terry Martin, Marco

Rivero, and Yomay Shyur. And Harvard would not practically file to protect or enforce intellectual property against the wishes of the contributing faculty member. Yet, legally, SGRP's hands are tied.

We therefore seek the Advisory Committee's advice as to how we best manage the intellectual property question within the constraints of Harvard's policies, as this will likely be relevant to programs and researchers at other universities.

Similarly, we cannot prevent a third-party contractor from filing for patents since they (not we) own the technology that they create. Importantly, however, we have not and do not expect to contract with a third-party vendor for work that could result in a patent of a core piece of solar geoengineering technology.

Right now, this is easy because nothing on our research radar would have us involved with subcontractors on technologies that would be core to solar geoengineering deployment. For example, in the case of SCoPEX specifically, this is not an issue because any hardware that the balloon vendor develops will not be core to solar geoengineering. It may, for example, be useful to a range of stratospheric balloon flights, including those unrelated to solar geoengineering experiments (if, of course, any new technology is developed at all), but it will not be specific or central to solar geoengineering. This is largely because stratospheric solar geoengineering would most likely be deployed by aircraft, not balloons, if deployed at all.

Hard questions will arise if future research involves a contract with a third-party vendor for work that could result in a patent of a core piece of solar geoengineering technology. We don't know the best path. Perhaps the contract might legally commit the firm to allow for any such technology to undergo rigorous, independent, third party evaluation by multiple entities, including governments and intergovernmental organizations.

Overall, the question of commercial sector engagement is complicated, and we are still forming our own views as we continue to learn more. We certainly welcome critiques and encourage people to read many great publications in this space, including [*Intellectual Property Policies for Solar Geoengineering*](#) (Reynolds, Contreras, and Sarnoff, 2018), which provides useful background information on the issues and challenges confronting the use of patents and trade secrets in solar geoengineering technologies.

To us, the central issue with commercial involvement in solar geoengineering is that commercial entities could have divergent interests from the public good. They would, for example, have some interest in hiding risks and presenting benefits that make a technology look better than it might actually be, have the resources to market a technology so that it appears better than another, and have an incentive to accelerate the deployment of solar geoengineering so their technology is used, amongst many other serious concerns.

This is not to say that the commercial sector will not or should not ever be involved in solar geoengineering. Indeed, likely through a procurement structure, there may be areas where private sector innovation can meaningfully contribute, as it has in other areas related to the public good, such as COVID vaccine development. Yet, in the case of vaccines, there is currently a rigorous process in place that allows for independent, third-party testing of the commercial entities' results. The FDA, for example, is overseeing the efficacy and safety of any potential vaccine that could be distributed in the US so that the public can be meaningfully informed of the potential benefits and risks of any particular immunization. There needs to be this level of transparent, independent, rigorous oversight of any private sector technological developments that are patented and are core to solar geoengineering so that governments, scientists, and people around the world can seriously evaluate and understand their risks.

Additional Information: In addition to our above responses, you have sought our assurances that:

1. The Advisory committee will be kept updated on any changes to current Harvard and SCoPEX policy governing the acceptance of philanthropic donations.
2. The Advisory Committee will be informed of the identity of all additional sources and amount of monetary and in-kind support accepted for the SCoPEX experiment.
3. All funding sources will be clearly identified and publicly listed.
4. SCoPEX does not accept resources from anonymous donors.
5. Donations are accepted to provide broad project support, and are without conditionalities that direct the use of such funding to specific project activities.

We can commit to requests numbered 1, 2, 3, and 4, but we cannot commit to number 5.

First, experiments proposed by researchers outside of Harvard may not be housed within a program such as ours (SGRP) and may therefore need to raise funds for the specific project. Researchers at the University of Washington, for example, do not have a formal Solar Geoengineering Research Program at their institution, yet they are raising funds for a proposed, small-scale marine cloud brightening experiment. Why would it be problematic for a research team to raise funds for a specific experiment, assuming they do so in a manner that is transparent, avoids conflict of interest, and follows other principles and guidelines that you recommend?

Second, based on the societal engagement process you have proposed, we may need to work (perhaps in concert with you) to raise funds to support the experiment's engagement process. Hopefully the initial amount of funds SGRP awarded to the Advisory Committee to carry out its work, totaling \$335,000, can fund portions of this societal engagement process. But if some of the activities proposed require additional funds, we may need to raise separate funds to specifically support the societal engagement process since SGRP has a limited budget (given its mission to support a range of interdisciplinary research across Harvard's campus). On a positive note, this may not necessarily be a terrible outcome so long as the funds needed are not exorbitant and out of reach of others. In fact, if we can generate philanthropic interest and establish a sustainable funding model for societal engagement activities, it may be useful for future small-scale outdoor experiments looking to adopt such an engagement model.