R E S P O N S E

A Response to Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization

by Larry P. Cooper

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Introduction

Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization,¹ explores the use of inducement prizes as a means to develop technology to stabilize green house gas contributions to global climate change. The author, Jonathan H. Adler, presents the current state of the policy debate concerning greenhouse gases (GHG) and global climate change. The premise of the paper is that the level of technological innovation necessary to make atmospheric stabilization affordable—and therefore a politically viable proposition—is unlikely to happen without government intervention. Because GHG's are emitted into the atmospheric commons, there is no direct economic incentive to reduce such emissions and little market for GHG limiting innovations. The author states: "This is the problem technology inducement prizes could solve."²

This problem might also be solved by traditional approaches such as grants, contracts, or regulation and the author presents the case of grants versus prizes and government funded research versus regulation. The paper presents arguments as to deficiencies, merits, and drawbacks of the approaches. The author concludes that prizes are the superior approach to address GHG and presents a proposal for significant federal funding of innovation prizes to address the global climate change problem.

I. Government Prize Authority

Recognition of the power and benefits of incentive prizes has led to several significant developments in recent years. In his September 2009 *Strategy for American Innovation*,³ President Barack Obama called on all agencies to increase their use of prizes and challenges in order to mobilize America's ingenuity to solve some of its most pressing challenges. In March 2010, the Office of Management and Budget issued a formal policy framework to guide agency leadership in using prizes to advance their core mission. In September 2010, the Administration launched Challenge. gov, a one-stop shop where entrepreneurs and citizen solvers can find public-sector prizes. Throughout, the Administration built a community of practice for agencies to share best practices and lessons learned. To date, there have been more than 150 competitions from 40 agencies generating novel solutions for childhood obesity, advanced vehicle technologies, financing for small businesses, Type 1 Diabetes, and many other national priorities.⁴ On December 21, the U.S. Congress passed the America COMPETES Reauthorization Act of 2010, providing broad prize authority to all federal agencies. By giving agencies a simple and clear legal path, the Act makes it dramatically easier for agencies to use prizes and challenges. Prize competitions mark a dramatic departure from business as usual and are quickly becoming a standard tool in every federal agency's toolbox.

II. Prizes for Greenhouse Gases Innovation

While the focus of the paper is on government funding for prizes, there is a considerable body of evidence that prizes can work for most organizations. I am in overall agreement with the statements concerning prizes regardless of the source of the prize funds. The author points out that unlike grants, the funder is only required to pay funds to competitors that achieve the funder's goals. Wellconstructed prize competitions can also result in multiple competitors with the potential for multiple viable solutions to the problem posed. These competitors may have valuable insights not found in the traditional pool of sup-

Jonathan H. Adler, Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization, 42 ELR 10713 (Aug. 2012).

^{2.} *Id.*

Executive Office of the President, National Economic Council Office of Science and Technology Policy, A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Jobs (Sept. 2009).

^{4.} See Challenge.gov at http://challenge.gov/, for more examples.

pliers and can be parties that would never otherwise do business with the government.

One major issue in using prizes in this area is the apparent lack of economic return for most GHG technologies. As the author points out, there is no price on GHG emissions, no direct economic incentive to reduce such emissions, and consequently no meaningful market for GHG emission-reducing technologies. One of the major drawbacks of prizes is that prize systems require researchers to obtain funding for their research "up front." This is particularly difficult when there is little prospect of future economic payoff. Later the author states, there is a need for practical innovations that are commercially viable. This would seem to be a significant disconnect that indicates prizes may not be the appropriate policy choice. Alternately, if one acknowledges that GHG emission technologies are unlikely to be driven by commercial viability, but will instead make GHG mitigation affordable and the use of policy tools such as regulation politically palatable, then prizes are indeed a viable tool.

Fortunately, there are many GHG areas that appear to hold promise of economic returns. For example, more efficient and longer-life light bulbs can provide consumers with an economic rationale for adopting new technologies. These potential benefits supported creation of the L Prize,⁵ sponsored by the U.S. Department of Energy to spur lighting manufacturers to develop high-quality, high-efficiency solid-state lighting products to replace the common light bulb. In September 2009, the L Prize competition received its first entry, a 60-watt replacement product from Philips Lighting North America. After a rigorous evaluation process, Philips Lighting North America was officially awarded the first L Prize of \$10 million in August 2011.

Also, as shown by the 11 finalists for the Virgin Earth Prize,⁶ many entrepreneurs are not deterred by general perceptions of lack of markets but look to create commercially viable ventures by changing the marketplace. Of particular note are those that are trying to extract carbon dioxide from the atmosphere and sell it to other industrial users. With commercial potential, funding from private sources may be much more readily available and prize purses may not need to be nearly as large as the author may believe. Indeed, where visionaries see significant realizable returns, they can invest considerably more that the value of the prize. This was true for the *Ansari X PRIZE*⁷ where the winning team spent about twice the \$10 million purse and collectively the teams invested about \$100 million. Similarly, in the NASA-funded *Green Flight Challenge*, sponsored by Google,⁸ the teams collectively invested nearly four times the prize purse, and both second place teams spent more than the prize purse.

Other arguments advanced by the author in favor of prizes such as "grant making" being more subject to political pressure and creating negative incentives among researchers are less compelling. Both grant seekers and those seeking prize funding for particular causes can have incentives to exaggerate the potential of their projects. Similarly, any program, public or private, can be subject to external pressures, political or otherwise. In either case, there can be pressure to create prizes for favored industries as easily as for a grant to a "favored recipient."

III. The Prize Proposal

In regard to the author's prize proposal, there is no doubt that billions for prizes would get attention. But what amount is really needed to achieve the sufficient innovation? Relatively small prizes can produce outsized results. The Virgin Earth Challenge attracted over 2,600 applications and 11 finalists have been selected for the \$25 million prize. Would offering billions for prizes lead to overinvestment and potentially wasteful spending?

The author states the "same political pressure that can distort traditional R&D funding are likely to discourage the diversion of funds from R&D grant programs to prizes."⁹ He argues for direct statutory mandates for development of prizes and specification of minimum degree of funding from agency appropriations. He argues that those parties who could benefit from political influence in grant awards should forgo them, instead requiring a system over which they would have diminished influence. It is unlikely that this would happen on a large scale without very strong support for prizes.

Rather than arguing for a particular amount of funding, the first steps should be identification of those areas most suited to the use of prizes, detailed work to define the prize competitions and the appropriate prize amounts, and proposals for the overall funding for the program. Congress could readily direct the undertaking of such studies as it has previously done for other national issues. The studies would lay the groundwork for debate and justification for future appropriations based on thoughtful reflection rather than the size of either the current federal R&D investment or the speculative size of social benefit from a successful innovation.

It has been my experience that prizes are not widely used because potential users are unfamiliar with them. For similar reasons, other tools such as Cooperative Research and Development Agreements are not widely used. Most

^{5.} U.S. Dep't of Energy, *L Prize*, http://www.lightingprize.org/ (last visited June 16, 2012).

Helen Craig, Virgin Earth Challenge Announces Leading Organisations, http://www.virgin.com/people-and-planet/blog/virgin-earth-challenge-announces-leading-organisations (last visited June 16, 2012).

X PRIZE Foundation, Ansari X PRIZE, http://space.xprize.org/ansari-xprize (last visited June 16, 2012).

Challenge.gov, Green Flight Challenge, http://challenge.gov/NASA/47green-flight-challenge (last visited June 16, 2012).

^{9.} Adler, *supra* note 1, at 10717.

program officers do have extensive experience with grants and contracts. There is nothing sinister in this, such as preference for political influence and rewarding favored parties, just a basic lack of understanding of the merits of prizes. When presented with the evidence, most experience an "aha" moment. Expanding the use of prizes in government is a diffusion of innovation problem. The early adopters are leading development of a community of practice and direction to agencies to identify candidate problems would likely accelerate adoption if subsequent funding were made available.

Conclusion

While it is undoubtedly true that prizes can be a means to induce technological achievement, the author notes, "Prizes are no panacea."¹⁰ I wholeheartedly agree. Grants, contracts, and prizes can all produce technological innovation. The choice of the tool is dependent upon the circumstances. At this time, it is unknown if prizes will create a breakthrough technology but the outlook is hopeful and using all the tools at our disposal would appear to be a prudent course of action.