



Climate Technology Innovation

PICKING WINNERS: SOME THOUGHTS TO CONSIDER

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When a technology based policy is discussed for long term climate stabilization, typically a contrary argument will be made that governments and other donors should not be in the business of “picking winners.” We would like to set out some countervailing arguments for consideration.

In the late 1990s, two Harvard professors addressed the argument that government should not be in the business of “picking winners.” And they came up with some surprising conclusions about the role of government in technology innovation.

Branscomb and Keller describe how this bias against a government technology role can lead to two incorrect conclusions:

...First, that markets do that most effectively; and second, that pork barrel politics is more likely to support the losers anyway. This neat two-step eliminates from the role of technology policy everything for which government is institutionally well-suited, from infrastructure building and investment incentives to support of skills training. It then notes that what is left is, of course, institutionally more appropriate for the market. The argument is legitimated simultaneously by our ancient faith in markets and our recent cynicism about politics.¹

They admitted that the “picking winners and losers argument” might apply to *some* government efforts but *not* to the development of new technologies.

- Private markets often under-invest in new technologies; “empirical evidence suggests that as a result of spillovers of all kinds, the social returns to R&D spending on new technologies far exceed the private returns, perhaps by as much as 50 to 100 percent.” Private rates of return may not equal social rates of return—companies often cannot appropriate all the social benefits of an innovation and so fail to invest in what could be socially optimal technology.²
- Because innovation is highly contingent—the actions of developers, governments and users are highly uncertain, making good information hard to come by, leading to great risks for investment—there is an inevitable misallocation of resources. “Some bets will pay off; some not at all. Winners and losers can only be positively identified in the revealing gaze of hindsight.”

- This misallocation is true in both private and public investment. “For every winner in a venture portfolio, there are untold losers that get nowhere near the publicity.”
- And finally, “...there is absolutely no evidence, beyond the economist’s leap of faith, that private investment is any more capable than public investment of separating the winners from the losers before the fact. The major difference is that private losers exit the market, while publicly backed losers are held to the higher standard of wasting taxpayers’ money.”³

They flatly reject the argument in the way that it is framed, as if this is really all about whether or not the government should “pick winners.”

In short, picking winners and losers is the wrong metaphor to characterize the government’s socially useful and necessary activity of supporting the process of innovation. Government is placing bets on our collective future. From the public standpoint, the magnitude of the potential social gains is sufficiently large to provide a comfortable margin of error in choosing among technologies to back.⁴

Further, they confront another myth about government technology policy—that the federal government has in the past and in the future should only focus on R&D rather than commercial diffusion and use. Instead, they point out, in those areas where success has occurred, government has in fact played a much more expansive role than simply R&D.

Referring to the post-World War Two period in the U.S. regarding defense industry support as the most obvious time when many government policy tools were used, they note:

Public spending supported the enormous development costs of relevant new technologies...In these cases, government underwrote the basic science research at universities and labs; direct R&D contracts accelerated the development of the technology; and defense procurement at premium prices constituted a highly effective initial launch market...A variety of mechanisms, ranging from patent pooling and hardware leasing (such as machine tool pools) to loan guarantees for building production facilities, helped to lower entry costs, diffused technology

widely among competitors and set the stage for commercial market penetration. Aspects of this support model were adapted for government investment in other sectors, notably for public health, and produced similarly beneficial results...⁵

In the defense area, the U.S. government did not limit its role to only R&D, the typical critic's myth, but "to the successful launch and diffusion of a technology development path—a trajectory—whose characteristics corresponded to the requirements of the commercial marketplace."

The historical experience strongly suggests that the U.S. government's direct R&D sponsorship has often been far less important for commercial success than has its support for diffusion and use. Its procurement of new technologies and other indirect supports for application launched fledgling technologies and helped diffuse them into widespread use.⁶

When it comes to other crises, governments have clearly picked technology "winners" to meet unprecedented challenges. Of course, it is also the case that governments have picked failures, but that does not undermine the basic theory of the proper role of government.

In the end, it might be that government has done such a poor job of technology innovation so far because policies have not yet directed that innovation take place.

Perhaps the root of regulators' and regulations' lack of sympathy for innovation is the fact that they have never been directed to encourage it. Until a new...mandate emerges, reforms to encourage innovation will be difficult to craft."⁷

Climate is an unprecedented challenge that calls for such a new innovation mandate, a new approach to climate technology policy that governments and others should adopt.

ENDNOTES

- 1 Lewis M. Branscomb and James H. Keller, Eds., *Investing in Innovation: Creating a Research and Innovation Policy that Works* (MIT Press 1999) at 45.
- 2 Edwin Mansfield, *The Production and Application of New Industrial Technology*, (Norton 1977), at 192. "Socially worthwhile innovations...will not be carried out if the perceived rate of return is so low that that potential innovator rejects the project. An important question facing policy makers is: how frequently does this situation arise, and in what areas is it most prevalent?... Economists have long recognized that this question lies at the heart of any discussion of public policy toward civilian technology..."
- 3 Branscomb and Keller at 46.
- 4 Ibid.
- 5 Ibid at 50.
- 6 Ibid at 51.
- 7 Ibid at 279.

ABOUT THE AUTHORS

Lewis Milford is the President and founder of Clean Energy Group (CEG) and Executive Director and founder of the Clean Energy States Alliance (CESA), two nonprofit organizations that work with state, federal, and international organizations to promote clean energy technologies. He also works with many public agencies in the U.S. and Europe that invest in clean energy, including public pension funds. He is frequently asked to appear as an expert panelist at energy conferences throughout the U.S. and Europe. His articles promoting clean energy have appeared in *The New York Times*, *Boston Globe*, *Electricity Journal* and *Solar Today*.

Prior to founding CEG in 1998, Mr. Milford was a Vice President of the Conservation Law Foundation where he worked on a variety of energy and environmental issues, including litigation, advocacy and testifying before numerous legislative and regulatory agencies. Also, Mr. Milford was a New York Assistant Attorney General representing the State of New York in the Love Canal hazardous waste case, and a law professor and director of the Public Interest Law Clinic at American University in Washington, D.C., where in federal court and before Congress he represented Vietnam War veterans harmed by Agent Orange. Mr. Milford also is the co-author of *Wages of War*, a social history of American war veterans, published by Simon and Schuster in 1989. He has a J.D. from Georgetown University Law Center and is a Phi Beta Kappa graduate of Rutgers College.

Daniel Dutcher is a Project Director with Clean Energy Group. He brings his expertise in integrating the law, the natural sciences, and the social sciences to the development and deployment of clean energy technology in the United States and internationally. Dan works on international and domestic technology policy projects and also provides assistance to CESA projects as needed. In addition, Dan serves as CEG's liaison to the Sustainable Energy Finance Initiative (SEFI) of the United Nations Environment Programme (UNEP). Dan works with the Basel Agency for Sustainable Energy (BASE) on managing the UNEP-SEFI Public Finance Alliance, a new international consortium of publicly backed funding agencies dedicated to building sustainable energy markets. Dan received his B.A. from Ithaca College in 1981 and his J.D. from Cornell Law School in 1985. In 2000, Dan received his Ph.D. in forest resources from Penn State University. Dan has previously practiced civil and environmental law in Maryland, Pennsylvania, and Vermont.

Clean Energy Group (CEG) is a nonprofit organization established in January 1998 to increase the use of cleaner energy technologies in the U.S. and abroad through creative financing, business partnerships, public policy and advocacy.

CEG works with state and nonprofit officials from around the U.S. that are responsible for over \$4 billion in new clean energy funds. CEG manages the Clean Energy States Alliance (CESA), a new nonprofit organization assisting these funds in multi-state strategies. A key project of CESA is the Public Fuel Cell Alliance, a state and federal fuel cell and hydrogen infrastructure collaboration. CEG also works with public officials in Europe interested in trans-Atlantic efforts to build clean energy markets.

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