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CATALYSIS

Reaction: Public Policy Challenges to Scientific Innovation on Solar Energy

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Professor Hammarström makes a compelling case for coordinated efforts to transform the ways in which energy is produced and consumed. His hope is to spur investment and development in technologies that more efficiently harness solar irradiation, which is now commonly used to generate electricity and in the future could be used to generate renewable fuels. He highlights several technical challenges that lie ahead. One additional hurdle concerns how politics affects the emergence of new energy technologies.

Investment in and the adoption and expansion of any energy technology require action on the part of elected public officials. Officials will not often enact change unless there is widespread public support.¹ At first glance, it seems there is such support for the usage of solar energy and the development of related technologies in the US. In 2010, we investigated support for and opposition to the usage of and investments into the development of various energy sources and technologies. We did so by implementing three simultaneous surveys on a nationally representative sample of the

US public, scientists who are actively publishing research on energy technologies in the US, and congressional staffers (the survey is available by request from the authors). We found that overwhelming majorities across each of the three samples favor investments to increase the use of solar energy. When asked to rate how positively or negatively each of nine distinct energy sources listed on the Department of Energy's website would affect the environment, respondents awarded solar energy the highest score across all three samples. Additionally, we asked respondents to rate the extent to which government should invest in nine distinct energy technologies. The public and energy scientists expressed the strongest support for technologies that “convert sunlight to electricity,” and policy-makers rated this technology second highest among those included in our survey—just below “batteries with increased storage capacity.” Thus, there is strong support among all three samples for the development of solar energy and investments into solar-related technologies.

This paints a promising picture because not only does public support seem to be strong for the development of solar energy, but also three critical actors—citizens, scientists, and policy makers—share high levels of enthusiasm for the expansion of its use. However, there is also a notable disjuncture.² The public views the development of solar energy as leading to *positive economic effects* (i.e., cost savings)—they rated it the second most economically advantageous energy source (of the nine sources). In contrast, energy scientists are less sanguine about the impact of solar energy on energy costs—they rated it second to last in terms of its economic effects (i.e., they perceive solar energy as being more expensive than traditional energy sources). Congressional staffers fall in between the public and scientists regarding the impact that an increased

reliance on solar energy could have on costs—they rated it fifth on the list of nine energy sources. This discordance has the potential to stunt solar energy applications for at least two reasons. First, if the economic effects are indeed more in line with what the “expert” scientists believe, the public and policymakers could become less supportive of solar energy over time. In general, any stark division in beliefs across key actors has the potential to curtail the support for an emergent technology, given that key actors could envision conflicting developmental paths. Second, scientists’, and to a lesser degree policymakers’, beliefs about relatively high economic costs provide opponents of solar energy (e.g., organizations and individuals who favor using other sources of energy) with a critical rhetorical weapon. Citizens’ opinions depend in part on how advocates, politicians, and other actors *frame* the policies or technologies being debated.^{3,4} Environmental activists might discuss solar energy in terms of the long-term ecological payoffs,

making such concerns salient in people’s mind and leading them to support the development of solar technologies.⁵ However, opponents can emphasize the potential economic costs and even cite expert energy scientists’ beliefs, leading citizens to consider such costs and possibly oppose the technology’s adoption.⁶

Without public support, solar energy technologies are unlikely to succeed in the political and economic marketplace. As debates about solar energy enliven, which frames will emerge and shape public discourse and opinions is not yet clear. Our point, however, is that overcoming the technological hurdles identified by Professor Hammarström is only part of the battle. It is also critical to consider challenges to effective public policy, which in turn, depends on citizens’ opinions as well as those of other actors. Progress requires that physical scientists and social scientists work together to develop strategies that ensure that approaches to battling climate change through transforming energy systems

are not only developed but also utilized by societies.

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