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Historians of Technology in the Real World

Reflections on the Pursuit of Policy-Oriented History

RICHARD F. HIRSH

Nearly all historians writing about their craft begin by explaining the value of studying the past. According to the authors of a popular primer, history represents a collective memory that provides an awareness of past events, helping us shape our present and future.¹ History has great practical significance, notes another academic, because “intelligent action” draws on past experience.² As a consequence of the way pedagogues extol the relevance of their work, many high-school students can paraphrase Santayana’s dictum that “[t]hose who cannot remember the past are condemned to repeat it.”³

Despite widespread acceptance of the notion that history provides tangible benefits, historians usually remain reluctant to apply “lessons” to real-world situations, especially in the realms of public and business policy. Eager to be viewed as unbiased, dispassionate observers of events, most academic historians seem happy to write primarily for their peers. Others argue appropriately that specific advice drawn from historical analogies cannot translate perfectly to contemporary situations and therefore has only limited relevance. More practically, many historians realize that universities rarely provide rewards for work that has direct application outside the ivory tower.

In this essay, which draws on the work of policy historians and historians of technology, I acknowledge the reasons why few academics engage in

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1. John Tosh and Sean Lang, *The Pursuit of History: Aims, Methods, and New Directions in the Study of Modern History*, 4th ed. (New York, 2006), 1-2.

2. Robert V. Daniels, *Studying History: How and Why*, 2nd ed. (Englewood Cliffs, N.J., 1972), 6.

3. George Santayana, *The Life of Reason: The Phases of Human Progress*, vol. 1: *Reason in Common Sense* (New York, 1905), 284.

policy issues.⁴ Nevertheless, I also suggest that some historians—at least those who enjoy secure positions in universities—should pursue such work, largely because they have much to offer policymakers. To pursue that argument, I will provide accounts of the use of history in the area of energy policy. Moreover, I maintain that because the profession of the history of technology emphasizes the importance of the social construction of technology, its practitioners may have special qualifications to help people who shape technically oriented policy.

The Value of Policy History

Generally, historians of government and business policy believe that their studies can help decision makers become better aware of the context of their work and of the outcomes that may arise from their actions.⁵ They typically offer analogies between earlier events and those occurring recently and help policymakers understand common causes, likely consequences, or significant factors worthy of consideration. In a 2002 paper on the “Origins and Practice of Emissions Trading,” for example, Hugh Gorman and Barry Solomon note that “an examination of how such [emissions trading] programs have evolved up to this point provides insight into the strengths and limits of emissions trading as a policy tool.” The authors observe that market-based mechanisms to reduce pollution constitute frequently discussed options in today’s policy community. Legislators can learn from history, the academics argue, by becoming acutely aware of assumptions held by Americans in a way that may impede creation of international trading agreements.⁶

As illustrated by Gorman and Solomon, the practical value of history often comes from an emphasis on important yet overlooked factors that policymakers ought to recognize. In a similar vein, Otis Graham observed that history can help sensitize policymakers so they can circumvent mistakes and surprises “from some impinging factor or factors whose bearing upon one’s own narrower plans, indeed whose very existence, was often

4. This essay deals primarily with historians employed in universities, not necessarily those who work in the private sector or for government organizations.

5. Pat Thane, “History and Policy,” *History Workshop Journal* 67 (2009): 140–45. This section draws on essays dealing with the value of historical research in the policy realm (and critiques) written by Peter N. Stearns, “History and Policy Analysis: Toward Maturity,” *The Public Historian* 4 (1982): 4–29; Stearns, “Applied History and Social Science,” *Social Science History* 6 (1982): 219–26; Otis L. Graham Jr., “The Uses and Misuses of History: Roles in Policymaking,” *The Public Historian* 5 (1983): 5–19; and Hugh Davis Graham, “The Stunted Career of Policy History: A Critique and an Agenda,” *The Policy Historian* 15 (1993): 15–37.

6. Hugh S. Gorman and Barry D. Solomon, “The Origins and Practice of Emissions Trading,” *Journal of Policy History* 14 (2002): 293–320.

screened out of the analysis.”⁷ Put differently, historical analysis may sometimes broaden the boundaries of a policy discussion by identifying heretofore neglected considerations and by usefully clarifying the functions of stakeholders and institutions.⁸

To be sure, professional historians realize that analogies remain fraught with difficulties, since no two situations exactly match each other.⁹ Perhaps because historians so carefully qualify the use of analogies, their work becomes less useful to decision makers. Nevertheless, scholars’ analysis of policy creation in the past can help decision makers by highlighting concerns that may otherwise be overlooked. This type of work may constitute a major contribution that historians can make without fearing that they reach beyond their competencies.

Categorizing Policy History

Besides promoting the relevance of historical analogies, a few scholars have gone further to write specifically about how academics can employ their skills to influence the policy process. Julian Zelizer, formerly at the State University of New York at Albany (with a joint appointment in the Department of Public Administration and Policy), enumerated in 2000 “five central categories of historical research” that have evolved in the field of policy studies.¹⁰ Although others have created similar classification schemes, I briefly describe Zelizer’s, which consist of: institutional and cultural persistence; historical correctives; political culture; process evolution; and lost alternatives.¹¹ To add meaning to these categories, I offer a few examples, including some from my own experiences.

INSTITUTIONAL AND CULTURAL PERSISTENCE

Historians have shown that institutional structures and cultural attitudes persist for long periods of time and often exert influence among pol-

7. Otis Graham, 11–12.

8. I like to think I expanded the dimensions of a public debate when I wrote an op-ed piece critical of legislators’ attacks on Virginia’s regulatory body for permitting an electric utility company to increase the price of power. The essay reminded readers of the historical roles played by regulatory commissions and urged consideration of hitherto neglected measures that could lessen pressure for future price hikes. See Richard F. Hirsh, “Legislators Could Do More About Rates, Efficiency,” *Roanoke Times*, 4 March 2010, available at <http://www.roanoke.com/editorials/commentary/wb/238596>.

9. Thane cleverly observed that “[h]istory doesn’t exactly repeat itself. But it can inform thinking about current issues” (141).

10. Julian E. Zelizer, “Clio’s Lost Tribe: Public Policy History since 1978,” *Journal of Policy History* 12 (2000): 369–94.

11. For example, Peter N. Stearns earlier identified the useful categories of analogy, trend assessment, and perspective; see Stearns, “Applied History and Social History,” *Journal of Social History* 14 (1981): 533–37.

icymakers in both subtle and explicit ways.¹² David Nye's work on the energy culture of the United States exemplifies this category.¹³ Nye observed that U.S. citizens, business managers, and politicians have historically thought of their energy resources as virtually infinite, and they waste energy at alarming rates. Such a predominant belief system suggests that efforts to change it (outside of a "hot" war, such as World War II) would not receive a warm welcome; indeed, when President Jimmy Carter asked Americans in 1977 to reduce their use of cars, dial down their thermostats in the winter, and turn off unused lights, he effectively sought to change the nation's energy culture. Perhaps aware of the formidable nature of his effort, Carter used language like the "moral equivalent of war" to motivate his countrymen and their congressional representatives.¹⁴ But the president's failure to craft meaningful, long-term energy policy can be attributed, in part, to the endurance of a cultural attitude that could not be easily altered, one based on the notion of almost limitless, cheap energy and the convenient lifestyle made possible by it.

We can also examine the culture of a more specific group of people—engineers, for example—who evolved a specific way of dealing with problems. As I have described elsewhere, engineers (and policymakers in business and government who have engineering training) often seek hardware solutions to problems they perceive as exclusively technical.¹⁵ Thus, when energy problems loomed large after the 1973 oil embargo, some engineer-managers sought to build nuclear power plants to displace the use of oil in producing electric power. (In 1973, utilities burned petroleum to generate almost 18 percent of the nation's electricity.)¹⁶ As it turned out, the country did not go on a nuclear power plant-building binge; rather, the nation avoided greater energy problems not by exclusively adding new supply, but by performing the same work with less energy and by deregulating markets for oil and natural gas in a way that made these fuels more widely available in the 1980s. The hardware approach, I argue, proved to be the wrong approach.¹⁷

12. Zelizer, 383.

13. David E. Nye has creatively explored the importance of culture in the construction of energy choices in *Consuming Power: A Social History of American Energies* (Cambridge, Mass., 1998).

14. Jimmy Carter, "The President's Proposed Energy Policy," *Vital Speeches of the Day* 43 (1 May 1977): 418–20. Carter gave his speech on 18 April 1977.

15. Richard F. Hirsh, *Technology and Transformation in the American Electric Utility Industry* (Cambridge, 1989), chap. 2, "Establishment of a Management Culture."

16. By contrast, less than 2 percent of the nation's electricity in 2007 stemmed from combustion of oil; see U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2007*, Report no. DOE/EIA-0384 (2007), available at <http://www.eia.doe.gov/emeu/aer/elect.html> (accessed 1 August 2008).

17. Perhaps more correctly, I should say the "big" hardware approach proved wrong. The widespread development of small-scale, end-use hardware that contributed to greater efficiency—in motor vehicles, homes, and businesses—appeared more suitable for meeting energy challenges.

HISTORICAL CORRECTIVES

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Scholars can perform a valuable service by evaluating “the historical assumptions and analogies used by policymakers.”¹⁸ As observed by several academics, policymakers frequently use history, often to reinforce an existing bias or to strengthen a position they have already staked out.¹⁹ Unfortunately, they sometimes employ history poorly by making bad parallels or by basing arguments on faulty premises. Historians can aid the policymaking process by playing the role of “fixers” who challenge shoddily crafted analogies and expose unexamined fundamental contentions, as I suggest with the following example.

Representatives of industrial companies sometimes predicate their calls for the need to increase the supply of energy on the assumption that economic growth requires greatly increased energy consumption;²⁰ they argue that the heightened demand for power means that electric utilities need to build large, new generation plants. Often seeking to advance self-serving interests, they conclude that only rapidly increasing supply can satisfy projected demand.

Although compelling, this argument employs a bad assumption, I argue, one consisting of the notion that U.S. consumers and businesses will continue to increase their use of energy at the same rate as they have in the past. To refute the point, I simply note that Americans’ growth rate of energy consumption has already declined dramatically since the mid-1970s, a point conveniently neglected by advocates of big-technology projects. For the last decade (through the end of 2009), the annual growth rate of electricity consumption has dropped to about seven-tenths of 1 percent—down from more than 7 percent annually during the 1960s.²¹ And while energy usage may still be growing, the economy has become much more efficient, requiring less than half as much energy in 2008 to produce a constant dollar of gross domestic product (GDP) as it did in 1973, leading to huge energy and financial savings (equivalent to about \$700 billion per year in 2005).²² This declining amount of energy needed to create a dollar of GDP occurred as a result of increasingly efficient appliances and factory equipment, stricter building codes, newly imposed government standards,

18. Zelizer (n. 10 above), 386.

19. See Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decision Makers* (New York, 1986).

20. A recent example of such an argument can be found in Aris Candris, “Why the U.S. Needs Nuclear Power: Other Clean Energy Sources Can’t Meet the Needs of a Growing Economy,” *Wall Street Journal*, 8 November 2009, A19. Candris is president and CEO of Westinghouse Electric.

21. Calculations made using data (through December 2009) from U.S. Department of Energy, “Monthly Energy Review,” table 7.1, available at <http://www.eia.doe.gov/emeu/mer/elect.html> (accessed 7 April 2010).

22. Arthur Rosenfeld, “Less Is More: California’s Energy Legacy,” introduction to Peter Asmus, *Introduction to Energy in California* (Berkeley, Calif., 2009), xii.

less manufacturing in a service-oriented economy, and market-induced consumer behavior. Moreover, most energy-efficiency advocates, as well as some utility-industry analysts, think that Americans can make further gains, thus keeping the growth rate of demand low and declining.²³ In talks to utility officials, regulators, and legislators considering energy-related bills, I highlight the fact that the growth rate of demand has decreased in recent decades, and I suggest that making plans based on an assumption of stable or increasing growth rates of demand may constitute bad policy. Moreover, I explain that a significant change in thinking about energy futures—the widespread acceptance of focusing on energy *demand* rather than simply energy *supply*—has become mainstream among many modern planners. Under the circumstances of slowing growth rates and a greater understanding of the value of efficiency measures, energy companies may be able to meet new demand by constructing power generators in tiny increments, such as small-scale renewable facilities rather than large fossil-fueled or nuclear power plants.

POLITICAL CULTURE

Historians demonstrate that political culture influences policymaking by dispelling the notion that people always act rationally; instead, historical research shows that actors maintain cultural and historical attitudes that help explain their sometimes unexpected behavior.

In Virginia and other southeastern states, I have observed a persistent reluctance by governments to pursue policies that would reduce the demand for electricity, in stark contrast to approaches advanced elsewhere, such as in California, Oregon, and Vermont. Consequently, the southeastern states exhibit the highest per capita use of electricity in the country and the lowest investment in energy-efficiency measures by utility companies.²⁴ My preliminary research suggests that this ambivalence to employ novel

23. See publications of the American Council for an Energy-Efficiency Economy (ACEEE), such as John A. “Skip” Laitner, “The Positive Economics of Climate Change Policies: What the Historical Evidence Can Tell Us,” ACEEE Report E095 (July 2009); several publications from the Rocky Mountain Institute, run by Amory Lovins, such as Natalie Mims, Mathias Bell, and Stephen Doig, “Assessing the Electric Productivity Gap and U.S. Efficiency Opportunity,” Publication 2009-08 (2009), available at <http://www.rmi.org/rmi/pid113>; and the work of Arthur Rosenfeld, a UC-Berkeley physicist and member of the California Energy Commission, whose publications are listed at http://www.energy.ca.gov/commissioners/rosenfeld_docs/2010-01-04_Art_Bibliography.pdf. See also Electric Power Research Institute, “Energy Efficiency Programs Can Realistically Reduce Growth in Electricity Consumption by 22 percent, According to EPRI,” Power Delivery and Utilization Update (April 2009), available at www.epri.com. All websites accessed 11 January 2010.

24. Southeast Energy Efficiency Alliance, “Energy Efficiency: Why Energy Efficiency in the Southeast,” available at <http://www.seealliance.org/energy/energySE.php> (accessed 15 January 2010).

methods (such as the use “public-benefit funds” collected by utilities to finance efficiency) has a subtle, historical origin engendered during the Depression and the years after World War II: southerners view increased electrical usage as an indicator of material and social progress. An attitude promoted by the Tennessee Valley Authority, the view persists today in the culture of utility managers, the public, and legislators. Moreover, these states have traditions of close ties between government bodies and energy companies, such that the advocacy of self-interested policy by corporate lobbyists does not spur the outcry it might elsewhere.²⁵ Finally, it appears that southern states’ disdain for policy pushed from other states or the federal government may originate in distasteful memories of the Civil War and Reconstruction; southerners simply do not like outsiders telling them (or suggesting to them) what to do.

PROCESS EVOLUTION

Academics often write about the sometimes strange manner by which stakeholders craft policy and its occasionally unintended consequences. For example, Zelizer notes that studies of the rise of nuclear power in the United States demonstrate that members of the Atomic Energy Commission (AEC) promoted construction of commercial nuclear plants. They did so even though electric utility company leaders, who might have been viewed as having the most to benefit from the AEC efforts, at first remained skeptical about the prospect.²⁶ Not until passage of the 1957 Price-Anderson Act, which removed much of the risk in using a largely untested technology, did utility managers gain much enthusiasm for nuclear power. This example should give pause to legislators who offer too much latitude to unelected government administrators.²⁷

LOST ALTERNATIVES

In this category, historians employ studies of the past to illuminate policy approaches that once succeeded and perhaps could do so again if em-

25. In 2007, for example, the Virginia legislature passed a bill (SB 1416) to restore regulation of electric utilities after a supposedly failed eight-year experiment with deregulation. Originally drafted by the state’s largest utility company, the bill appeared to restore oversight power to Virginia’s regulatory commission; however, as even the head of the commission pointed out, it actually took latitude away from the regulators (Michael Sluss, “House, Senate Panels Approve Electric Utilities Regulation Bills,” *Roanoke Times and World News*, 20 February 2007, B1). I also spoke at this hearing at the invitation of a House of Delegates member who opposed the bill.

26. Zelizer (n. 10 above), 387–88.

27. In a similar analysis of the policy process, I traced the origins of the Public Utility Regulatory Policies Act (PURPA) of 1978 and explained how it unexpectedly gave rise to the end of traditional regulation in the electric power sector; see Richard F. Hirsh, *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (Cambridge, Mass., 1999), sec. 2, “PURPA and the Threat to Utility Elites.”

ployed appropriately.²⁸ I have found that my work on novel approaches to energy efficiency in California, for example, has helped me to elaborate on what appear to be unusual ideas in Virginia. (They really are not new ideas—just new to Virginians.) In the early 1980s California’s electric utilities, spurred by criticism from politically effective environmental organizations, agreed to an original way of obtaining revenues: instead of earning money for each unit of energy they sold—the traditional approach that spurred sales of power and discouraged efficiency efforts—they won guarantees to receive enough income to pay all their costs and produce a fair profit regardless of how much power they generated. At the end of each year, the state regulatory body determined if utility companies received too much or too little revenue; it then balanced the accounts for the following year, allowing for financial security without the incentive to sell more power.²⁹ This approach to decouple sales and revenues has been proposed in Virginia, and because I studied the subject in California, local advocates consulted me since I appeared to possess special expertise. Likewise, I have used examples of innovative mechanisms for encouraging small-scale generation technologies in other parts of the country to suggest the application of similar approaches in Virginia.

The historical study of policies in other states may constitute the most productive element of my academic work as I have become involved in policymaking. Instead of employing analogies or historical correctives, I simply use knowledge from a broad set of past experiences elsewhere that help me address concerns at home. My study of long-term strategic planning by utilities and regulatory bodies (a process known as “integrated resource planning”) in Wisconsin in the late 1970s and 1980s, for example, made me aware of specific problems encountered by power-company managers and nongovernmental opponents of utility plans. Decades later, this knowledge guided my suggestions for implementation of a similar planning process in Virginia. In other words, my historical work helped me understand the major issues and controversies that arose elsewhere and at different times; by examining them, I collected practical information that could assist policymakers as the issues arose again.

Special Contributions That Historians of Technology Can Make

Zelizer has admirably highlighted specific categories in which historians can make significant contributions to policy. But perhaps surprisingly, much of policy historians’ work goes unappreciated—and not just by the policy world, but by the history profession itself. According to those who have studied the subject seriously, policy history remains viewed as a step-

28. Zelizer, 385.

29. Hirsh, *Power Loss*, 181–83.

child of applied history, incorporating a top-down model of history in which politicians and government officials play the most essential roles in society.³⁰ Beginning in the 1970s, the history profession underwent a significant shift, such that academics have shunned government as a focal point and have instead looked more closely at the importance of culture and social groups. Analyses of laborers, gender, social movements, minority groups, and popular culture have taken center stage, displacing traditional political history—which indeed, seemed to focus on dead, white, elite males. Moreover, this move away from traditional history became institutionalized; as social and cultural historians assumed leadership of academic history departments, they felt disinclined to hire policy historians, especially if doing so meant they could not employ members of the new breed.³¹

Within this context of trends in academic history, I suggest—somewhat playfully though not totally—that historians of technology can resurrect the status of policy studies within the history profession while offering great value to policymakers. This value stems from two characteristics of our specialty:

- We deal with technology, which has become eminently important in society. In everyday life and for government and business activities, technology plays important roles, and people want to understand technology better so that they can manage it more effectively. And as Mel Kranzberg, one of our profession's founding fathers, frequently proclaimed, who can better educate about the nature of technology (and its relationship to science, business, and society) than historians of technology?³²
- Historians of technology have developed a useful set of tools to analyze technology within society. These tools include contextual methodologies such as Thomas Hughes's systems approach. By highlighting the social nature of technological change, Hughes emphasizes the nontechnical circumstances that contribute to the evolution of large technological enterprises. Identifying these circumstances can help policymakers develop a deeper (and practically oriented) understanding of why certain technologies may succeed or fail.³³

30. Hugh Graham (n. 5 above), 26–33; Zelizer, 370.

31. Hugh Graham, 26–33; Zelizer, 370. See also Gordon S. Wood, *The Purpose of the Past: Reflections on the Uses of History* (New York, 2008). Wood notes that “[h]istory departments appear to have stopped hiring anyone but cultural historians, the assumption being that cultural history is the only kind of history worth doing” (4).

32. Mel Kranzberg pointed out that technology has become so important that even its history is important. His fifth “law” states that “[a]ll history is relevant, but the history of technology is most relevant” (Kranzberg, “Technology and History: ‘Kranzberg’s Laws,’” *Technology and Culture* 27 [1986]: 553).

33. This argument has also been made by Kranzberg, who pointed out in his fourth

Let me offer a few examples, first by suggesting the relevance of our field's emphasis on the social construction of technology. The work of David Kirsch on early-twentieth-century electric cars suggests that the reason for their poor reception goes beyond the easy (and well-accepted) explanation that battery hardware could not propel vehicles for long distances;³⁴ instead, he points to several conditions that slowed the cars' acceptance, including the lack of support from electric utility companies and intense market competition that discouraged the adoption of standards. With my colleague Benjamin Sovacool, I have drawn on Kirsch's study to argue that analysts should take care when they make overly optimistic projections for today's electrically powered automobiles; like the situation a hundred years ago, people point to batteries as the limiting factor in the widespread production and use of fully (or hybrid) electric vehicles. But we observe that several impediments exist besides the technical problem of inadequate batteries: we offer historical examples implying that consumers may remain reluctant to embrace "revolutionary" technologies that require learning new skills to achieve promised benefits; moreover, we suggest that the need to develop a new infrastructure (one that would replace an existing one that has billions of dollars invested in it) will make acceptance of electric cars slower than anticipated, even if manufacturers resolve the battery problems.³⁵

Likewise, historical work on renewable-energy technologies suggests that advocates should pay attention to Hughes's notion of radical and conservative inventions, which constitute important elements in the development or retardation of "momentum" in technological systems.³⁶ During the 1970s, as Frank Laird has pointed out, promoters pushed wind- and solar-electric generators as devices fitting into their vision of a utopian society that shunned conventional-energy technologies and the existing social infrastructure—along with the traditional way of life enjoyed by most Americans.³⁷ Not surprisingly, renewable-energy technologies became associated with commune-living, dope-smoking hippies. Such technologies, in

law that "[a]lthough technology might be a prime element in many public issues, non-technical factors take precedence in technology-policy decisions" (ibid., 550). Kranzberg makes it difficult to be original, since he anticipated everything I have written!

34. David A. Kirsch, *The Electric Vehicle and the Burden of History* (New Brunswick, N.J., 2000).

35. Benjamin K. Sovacool and Richard F. Hirsh, "Beyond Batteries: An Examination of the Benefits and Barriers to Plug-in Hybrid Electric Vehicles (PHEVs) and a Vehicle-to-Grid (V2G) Transition," *Energy Policy* 37 (2009): 1095–1103.

36. Thomas P. Hughes, "The Evolution of Large Technological Systems," in Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch, eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (Cambridge, Mass., 1987), 57.

37. Frank N. Laird, "Constructing the Future: Advocating Energy Technologies in the Cold War," *Technology and Culture* 44 (2003): 27–49.

other words, could be viewed as radical, making them difficult to accept by most people and institutions. During the 1980s, however, wind-turbine technology became integrated into the existing utility-owned power grid.³⁸ The turbines, therefore, could be considered conservative innovations, even if the hardware itself differed from the traditional large-scale turbine generators powered by fossil and nuclear fuels; indeed, today's planners generally view wind-turbine technology as a conservative, mature, and reliable component of the nation's electricity-supply portfolio.³⁹ Policymakers can draw a practical lesson from this history: they should not advocate renewable-energy (or any energy) technology as radical; rather, they should peddle it as something that fits well into the existing framework of everyday society, especially if it looks unusual and operates in a novel fashion.

A focus on the social nature of technology also played a central role in my analysis (as a consultant, working with the Winthrop Group's Bettye Pruitt) of an energy-efficiency experiment pursued by a utility company in the 1990s. Of course, our report highlighted technical results; namely, that designers could cost-effectively reduce energy consumption in homes and businesses by greater than 50 percent without reducing the comfort of the inhabitants. But we also observed that the widespread acceptance of such energy-efficiency approaches would require huge changes in the education of engineers and architects. Until these professionals learned to integrate energy-efficiency measures into every aspect of their planning and construction—which often meant eliminating easy-to-use rules of thumb—much of the technical success seen in the experiment would never be achieved in the real world.⁴⁰ Designing the hardware, in other words, was the easy step; getting people to embrace new approaches in their business models, building codes, regulatory procedures, and educational institutions

38. Richard F. Hirsh and Adam H. Serchuk, "Momentum Shifts in the American Electric Utility System: Catastrophic Change or No Change at All?" *Technology and Culture* 37 (1996): 280–311.

39. The conservative nature of wind-turbine technology can be evidenced by its widespread acceptance. In 2007, 2008, and 2009 wind-turbine generation constituted 35 percent or more of the newly installed electrical-generation capacity in the United States—greater than that of coal-burning power plants. See Ryan Wiser and Mark Bolinger, *Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2007*, Report DOE/GO-102008-2590 (Washington, D.C., 2008), 4; American Wind Energy Association (AWEA), *Annual Wind Industry Report: Year Ending 2008* (Washington, D.C., 2009), 2, available at <http://www.awea.org/documents/reports/AWEA-Annual-Wind-Report-2009.pdf>; and AWEA, *AWEA U.S. Wind Industry Annual Market Report: Year Ending 2009* (Washington, D.C., 2010), available at http://www.awea.org/documents/reports/Annual_Market_Report_Press_Release_Teaser.pdf (accessed 7 April 2010).

40. Richard F. Hirsh and Bettye H. Pruitt, "The Background, Origins, and Formative Phase of the Advanced Customer Technology Test (ACT2) for Maximum Energy Efficiency," prepared for Pacific Gas and Electric Company, Research and Development Department, by the Winthrop Group, Inc. (1993).

remained the challenge. The company's energy project "was as much a social experiment as it was a hardware experiment," we wrote. "It required careful management of human components that were unfamiliar to the R&D managers, who were more accustomed to dealing with material artifacts."⁴¹ That lesson resonates today, and the people involved in that project years ago invited me to participate in a new effort to remind people that achieving energy efficiency consists of more than just designing newfangled hardware.

So, What's the Problem?

Despite the relevance of our work in history (and especially in the history of technology), something that has been noted by others in our profession like Joel Tarr and Wiebe Bijker, few policymakers draw directly from this work or seek our assistance.⁴² Or put differently (by paraphrasing historian Kenneth Lipartito), our work does not necessarily penetrate deeply in the real world. Although Lipartito notes that wisdom-laden academic studies "may charm a handful of high-level decision makers" who may occasionally affect lower levels of management, rarely do these treatises have a lasting impact.⁴³

Our influence remains limited perhaps because historians (and other academics) generally do not make their work highly accessible to policymakers. As Lipartito observes, scholars rarely provide material in a format policymakers find useful—namely, "bullet items, decision trees, [and] two-by-two matrices";⁴⁴ instead, we write in academic prose that seeks to highlight broad generalities and grand themes—useful to us practitioners, but not to policymakers, especially the majority of them who have little time to read our work. An elected member of a county board of supervisors told me that, in a typical meeting, she must vote on scores of measures without the intense study that professional academics appreciate and expect of one another. During one meeting in 2009, for example, she considered land-use revisions, recycling-center permits, bicycle-crossing locations, commendations of Boy Scouts, and options to protect the county's water quality; at the same meeting, she voted on an application from utility companies that

41. *Ibid.*, 78.

42. Wiebe E. Bijker, for example, called for more scholars to be involved in the policy world; see Bijker, "The Need for Public Intellectuals: A Space for STS," *Science, Technology, & Human Values* 28 (2003): 443–50. Earlier, historian Joel A. Tarr, whose work has inspired many involved in this enterprise, made a strong case for the value of history to inform policy; see Bruce M. Stave, "A Conversation with Joel A. Tarr," *Journal of Urban History* 9 (1983): 195–232, and Elizabeth M. Fowler, "Applying the Past to the Present," *New York Times*, 20 August 1980, D17.

43. Kenneth Lipartito, "The Historian in the Rose Garden?" *Technology and Culture* 41 (2000): 547–48.

44. *Ibid.*, 546.

sought to construct a high-voltage transmission line through populated neighborhoods—a subject of interest to me and other energy scholars.⁴⁵ Clearly, she could not prepare to make decisions by reading tomes of scholarly research; on the other hand, she may have benefited from a few well-written, concise op-ed pieces or executive summaries in which academics crystallized core elements and expanded the terms of the debate.⁴⁶

Our reluctance to communicate in a manner that caters to policymakers may result from the nature of the reward system in which we operate. To gain status and promotion within universities, we must author books and articles that address issues that our peers find intellectually exciting while offering insights into the practice of history. We do not get ahead in the ivory tower by being viewed as servants to politicians and corporate bureaucrats and by writing in management publications or on op-ed pages of local newspapers. Likewise, academic work focused on practical policy issues may be viewed by colleagues as not “theoretical” enough for reward. One professional academic (a political scientist, not a historian) confided that she thought she would not earn tenure at a major university because of her focus on immediate environmental issues while serving on a state policymaking board.

What We Can Do

Given the difficulties and disincentives to pursue scholarship that can have a direct impact on policy, how can we academics make a difference? At the moment, I see three avenues of action. First, we can emphasize the real-world impact of our work in our everyday teaching, hoping that we enable students to think broadly about ways historical analysis can help them in making policy-based decisions as citizens and—better yet—as policymakers themselves. At Virginia Tech’s northern Virginia campus, my colleagues in the Science and Technology Studies program typically work with students who already hold positions at the Nuclear Regulatory Commission, National Aeronautics and Space Administration, Department of Defense, Environmental Protection Agency, and other government organizations. Students in the program (along with some at the Blacksburg campus) often

45. “Board Opposes Potomac-Appalachian Transmission Highline,” Loudoun County, Virginia News Release, 17 February 2009, available at <http://www.loudoun.gov/Default.aspx?tabid=2543>; see also Loudoun County Board of Supervisors “Minutes,” 17 February 2009, available at <http://www.loudoun.gov/controls/speerio/resources/RenderContent.aspx?data=5e1c968149a94347b3b7de4d61dc1714&optimize=100&tabid=312&fmpath=%2fBOS+Minutes> (accessed 5 November 2009).

46. Lipartito notes that we historians would do better in the real world if we learned more about the politics of bureaucracy. Based on his own experiences in trying to influence policy dealing with the restoration of Florida’s Everglades wilderness ecosystem, he wrote that “affecting decisions and behavior at the operational level is a much more difficult task than writing high-level position papers” (548).

pursue careers in the policy and business world. One of my most productive former students, for example, worked for a nonprofit think tank dealing with renewable power after writing a dissertation on the history of wind-energy policy in the United States; he went on to manage the strategic-business-development unit of an international wind-energy company. Clearly, our teaching of the relevance of history can have a bearing in government and business, though indirectly.

More straightforwardly, we can occasionally serve as consultants to corporations, speakers at meetings held by policymakers, and expert witnesses in court cases that deal with technical issues. In such capacities, we can offer insight into specific events and an understanding of situations that go beyond the previously staked-out boundaries of public discourse. Appearing as an expert witness in a landmark 2006 court case involving cigarette companies, for example, historian Allan Brandt made substantive contributions by explaining how the tobacco industry controlled the nature of scientific controversy over the health impacts of smoking since the 1950s.⁴⁷ In a similar fashion, we can apply our knowledge about specific issues; however, we need to make that information accessible to appropriate audiences, and not just to our academic peers. Hence we should not fear writing op-ed pieces and policy statements for politicians, regulators, and business managers, dispensing with the discussions of theory and methodology that we cherish in scholarly circles.

Finally, and most directly, we can win election or appointment to policymaking positions ourselves. As our work on policy issues becomes better known within various communities, we may become more visible to those who nominate people for positions on technically based or elected bodies. Surprisingly, I found myself involved in this approach to influence policy when a coalition of Virginia environmental groups nominated me to serve on the state Air Pollution Control Board. Although I realized I would need to learn much about other matters besides my research areas of electric utilities and regulatory policy, I gladly accepted the nomination, thinking that it would enable me (if appointed by the governor) to apply knowledge gained from academia to real-world situations. Alas, I did not win the appointment, but the experience helped me think more seriously about the viability of this approach for academics to influence the policy world. As I discussed my nomination with colleagues, however, I realized that I faced the same professional disincentives as others who try to move away from

47. Brandt reluctantly participated in this case because he did not want to be branded as an advocate and “combatant” for the anti-tobacco cause. He explains his concerns about serving as an expert witness in the epilogue of his *The Cigarette Century: The Rise, Fall, and Deadly Persistence of the Product that Defined America* (New York, 2009). I also prepared to serve as an expert witness in a case dealing with electric utilities, though without much impact: in opening motions, the judge ruled that historical testimony would not be permitted.

the ivory tower. While some colleagues encouraged me to seek the appointment, others showed disdain, with some noting that such work would take time away from activities viewed as more important, such as performing traditional academic research and writing. In the process, I learned that academics pursuing such work should have thick skins so they can endure their associates' scorn.

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To summarize, history (and especially the history of technology) has much to offer policymakers. Of course, policymakers already employ history, though often to make poor analogies that support positions they have adopted for a host of reasons. In particular, history can serve as a corrective to help focus scrutiny on badly made assumptions or improperly used examples of past events employed to buttress policymakers' agendas. At the same time, historians may have studied solutions to problems in the past that have applicability in similar situations today. Moreover, historians of technology can make especially valuable contributions by highlighting the contexts and belief systems in which technical people often make decisions. Because of our focus on the cultural nature of technological change, we can also draw attention to potential social impediments to the success of new technologies, even when these technologies exhibit excellent technical and economic attributes. And while some of us look at political actors, we also know that these actors operate in an environment suffused with culture, history, and institutional momentum. By comprehending these social elements that play into the acceptance or rejection of technologies, historians of technology can help policymakers avoid committing resources to problems that seem purely hardware-oriented; we can point out that they also need to overcome non-technical barriers by using methods that specifically address social impediments to acceptance of novel technologies.⁴⁸

Making historical work truly useful to people in the policy world will require reshaping the values of our own profession. Despite the wisdom of Mel Kranzberg, Joel Tarr, and others, we remain caught up in an academic culture that generally shuns practically oriented work; instead of only trying to change our traditional culture—a process that may take decades—those of us interested in policy may need to work indirectly by influencing students and by taking on work outside our academic positions. But because of institutional disincentives, we may need to wait to pursue these activities until we have earned secure, tenured positions so that our participation in the real world does not cost us our day jobs!

48. As an example of this approach, see Benjamin K. Sovacool and Richard F. Hirsh, "Energy Myth Seven—the Impediments to Novel Energy Technologies Are Primarily Technical: The Case of Distributed Generation," in *Energy and American Society—Thirteen Myths*, ed. B. K. Sovacool and M. A. Brown (New York, 2007), 145–69.