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SOFT ENERGY CONTROVERSY

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In October 1976, Amory Lovins, a consultant physicist and British representative of Friends of the Earth, published the article "Soft Energy Paths: The Road Not Taken." Lovins' paper outlined an alternative "soft path" to conventional energy policy,[1] announcing that sustaining energy growth was not the answer. The hard path technologies—high-energy nuclear and centralized electric energy—resulted in excessive waste of resources, which could not continue given rising costs, adverse environmental impacts, safety concerns, and the proliferation of weapons. A significant social change, Lovins reasoned, was necessary to transition from the hard to soft energy path. The goal was to shift industrial societies to lower-energy, fission-free, and decentralized sources that would match energy supply and quality to user demands.

The "Soft Energy Paths" article brought a storm of controversy that culminated with a congressional hearing of Lovins and his critics in December 1976.[2] Beyond its historical significance in contemporary policy circles, the debate on the hard and soft paths has had an important legacy in the discourse on renewables and social change. This essay traces some of the contributions and limitations of Lovins' argument to frame a critical discourse on energy. On one hand, it acknowledges the significance of Lovins' position in highlighting how our energy choices are socially and politically grounded, particularly when bringing their costs, benefits and risks into public discussion. On the other hand, it questions the appropriateness of the hard-soft binary which abstracts the social relations it proposes to anchor itself in, and what alternative worlds it promises to deliver.

The Soft as a Critique of the Fossil Fuel Energy System

In the words of Dr. Pickering, one of Lovins' critics and a professor of social ethics, Lovins deserves "our critical attention because he is trying to generate a sense of alternatives, and because he does pose, however backhandedly, the problems of social change which are necessarily entailed in any serious discussion of the future of our energy needs or the future of democratic institutions."[3] On a basic level, Lovins proposes to expand the narrow disciplinary framing of Energy, and by extension the grounds from which to engage choice. In his response to a memorandum from the Energy Research and Development Administration, which framed "energy supply as primarily the domain of the engineering disciplines and demand as in the domain of the economics," he states that a tendency to narrow the energy debate into the exclusive domain of economics and engineering ignores other and perhaps more important perspectives.[4] In contrast to energy modelers who view energy decisions as governed by the number of kilowatt hours delivered per dollar invested, Lovins views energy choices as fundamentally social, political, and institutional in nature.

In the gestalt of the early 1970s, Lovins proposes to dissociate energy consumption and economic development, which typically centered on growth and cost. In his view, the energy problem was closely tied to the society that used it, and in particular to the underlying assumption that "the more energy we use the better off we are."[5] Indeed, environmental historians have elaborated how the carbon regime was propelled by the belief that energy consumption is an essential facet of social progress, or development *tout cours*.[6] By equating the rate of energy consumption with progress, development indicators have contributed to the exponential increase in oil sales. Lovins instead shifts the discussion towards an examination of the different energy uses. If the hard path rests on the belief that the more energy we use, the better off we are; in the soft path, how much energy we use is considered a measure our failure. Wilhelm Ostwald, a chemist and Nobel-prize laureate, had already preached as early as 1900 that the stature of a civilization should not be measured by its level of coal consumption but by the quality of its exploitation of energy. The soft path espouses end-use orientation to determine how the volume and kind of energy needed for a given task, and then supplying the required kind of energy.

Along with a critique of growth, the convergence of the environmental movement and the energy crisis suggested an alternative worldview that took into account the finite nature of the world's resources and of its geographic space to critique the historically cheap price of energy. "'Cheap' energy," Lovins argued, "is actually very expensive; we pay for it by structural distortions everywhere else in the economy."[7] In the United States, the "tacit identification of the rate of growth of primary energy use with the level of well-being," has lead to the subsidization of energy supply.[8] Myriad direct and indirect public subsidies have kept the price of oil artificially cheap and not indicative of its full economic cost to society. In particular, the historic

1. Amory Lovins, "Soft Energy Paths: The Road Not Taken," *Foreign Affairs* 55 (1976), 65-96.
2. U.S. Senate, Select Committee on Small Business and Committee on Interior and Insular Affairs, *Alternative Long-Range Energy Strategies* (Washington D.C.: GPO, 1977). A selection of Lovins' critics and his responses are published in Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979).
3. Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979), 237.
4. Ibid., 36.
5. Amory Lovins, *Soft Energy Paths: Towards a Durable Peace* (Cambridge: Friends of the Earth, 1977), 4.
6. Martin Melosi, "Energy and Environment in the United States: The Era of Fossil Fuels," *Environmental Review* 11.3 (1987): 167-188.
7. Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979), 60.
8. Amory Lovins, "Soft Energy Technologies," in *Annual Review of Energy* (1978): 477-517, 477.

^ **Yellow Brick Road. (Rania Ghosn and Khaled Malas. Photomontage, 2005)**

price of the "hard path" has not accounted for pollution, health hazards and damages to the environment and communities, which have been treated as "external" to the economics of energy. Furthermore, the centralized organization of the hard system has "allocated benefits to suburbanites and social costs to politically weaker rural agrarians... in an increasingly divisive and wasteful form of centrifugal politics."[9] The hard path, Lovins adds, entails serious environmental risks, "many of which are poorly understood and some of which have probably not yet been thought of."[10] He advocates that the market prices of all forms of energy—"hard" or "soft"—should not be distorted by subsidies or regulation and should include environmental and other external costs, without however addressing the challenge of whether and how to quantify them.[11]

The Soft is not an Alternative Energy System

Although Lovins sets out to convince us of the soft, the compelling aspect of his argument is inherently limited by its binary structure. Dr. Pickering shares that it required an effort on his part to "divest [his] mind of the sexual imagery suggested by such terms as 'hard,' and 'soft,'" and to understand why one is better than the other.[12] Lovins' reply does not defend the choice of the term soft. His response is at best apologetic; that he was unable to find a more satisfactory term, "that any term is bound to have unsatisfactory connotations, and that in retrospect he should have perhaps have made up a nonsense word—if he could find one with no affective content."[13] Whatever the second arm of the binary is, "soft" or another congenial term for that matter, the asymmetrical structure is essential to the construction of the argument.

The hard-soft duality rests on a set of associations that dismisses the former in favor of the latter. On one hand, the hard path is one whose polity is dominated by such structural problems as centrism, autarchy, and technocracy. In particular, Lovins hones the "vulnerability" of the hard path to promote decentralized energy technologies. He argues that the XL scale increases incentive for "sabotage and disruption, including war, and so reducing national security."[14] In a later book, *Brittle Power: Energy Strategy for National Security*, he documents a wide array of accidents, malicious attacks, and near misses on U.S. energy systems, identifying the infrastructures for electricity, natural gas, oil, and nuclear power as "disasters waiting to happen."[15] Throughout, his discourse is neither critical of the concepts of "energy risk" and "energy security" nor of their historical deployment to legitimatize choices of war

9. Amory Lovins, *Soft Energy Paths: Towards a Durable Peace* (Cambridge: Friends of the Earth, 1977), 92.
10. Ibid., 88.
11. Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979), 48.
12. Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979), 236.
13. Ibid.
14. Amory Lovins, "Soft Energy Technologies," in *Annual Review of Energy* (1978): 488.
15. Amory Lovins and Hunter Lovins, *Brittle Power: Energy Strategy for National Security* (Andover: Brick House, 1982), 10.

and federal budgeting in domestic and foreign policies. He overlooks that discussions of energy are ineluctably part of the larger constructions of geopolitics, and as such need to engage with the deconstruction of particular geographies of "vulnerability," "threat," and "insecurity."

On the other hand, the soft alternative is supported by a set of "universal" values—such as freedom, a high quality of life, and increased equity. It promises to be more democratic, less militarized, less hazardous, more flexible, and more efficient in its uses of energy and capital. Such ideological embrace of the soft rests on other supporting binaries—such as the local/global, populist/elite, small/big. In particular, Schumacher's *Small is Beautiful*[16] haunts the soft path, although Lovins at moments distances himself from the soft-small associations. In a response to his critics, Lovins emphasizes that he did not begin "with a preconceived attachment to a particular ideology about energy or technology, such as the "small is beautiful philosophy that some have tried to read into my results." He reaffirms, "I do not think Schumacher makes sense."[17] At the end of the day however, the soft path favors decentralized neighborhood-scale technologies. Whereas hard technology is "an alien, remote, and perhaps humiliatingly uncontrollable technology run by a faraway, bureaucratized, technical elite," soft technology Lovins argues, is an "understandable neighborhood technology."[18] Soft technologies "can often be made locally from local materials and do not require a technical elite to maintain them; they resist technological dependence and commercial monopoly."[19] In support of soft technologies, Lovins associates positive values to the neighborhood—less coercive, more participatory, and equitable.

His argument however, abstracts political relations at the scale of the locality while simultaneously isolating individual technologies from the larger technological systems in which they are embedded. As opponents of "community-participation" and "new urbanism" have well observed, the neighborhood or locality is enmeshed in political and economic relations that are operative over broader spatial scales. If soft technologies are commercially viable—and hence mass-produced, they will become absorbed in a web of commercial corporations competing in the manufacture, distribution, marketing, and servicing of them. Furthermore, the scale of an individual technology does not determine the sociopolitical structure of the energy system. An important aspect of Thomas Hughes's seminal *Networks of Power*[20] is to overcome the customary focus on the light bulb as harbinger of social change and argue that such artifact was just one among many interrelated elements within a geographically extended system for the supply and transport of electricity.[21] It is not only the fixity, the durability, and the enormous capital? costs of energy infrastructures that make them highly path dependent, but as well the interests of, and interactions among various social groups which have invested financial, labor, and research resources in the planning and functioning of a specific system. By linking many interests, the large technological system develops a considerable momentum towards inertia, resisting the flexibility suggested by soft systems.

Lovins briefly mentions that a hard energy path is consistent with the interests of a few powerful American institutions, and that it is important to remove subsidies to conventional fuels and vigorously enforce anti-trust laws.[22] He compellingly argues that the mismatch between the scale of centralized energy system components (large) and the scale of most power consumption (small) is at the core of the energy predicament. The massive technological fixes that have historically been the response to previous energy crises will further exacerbate the problem. However, his argument omits that the mismatch is, in fact, *by design*. Instead, his proposal to rectify the vulnerabilities of the hard path by increasing energy efficiency overlooks the reality that the "energy problem" of the twentieth century has been how to design for abundance rather than to procure for shortage. Energy abundance was essential for the economy of incessant growth. Through a series of tax breaks, including the oil depletion allowance, as well as easy access to public lands and international concessions, government promotion has allowed for fossil fuels to be artificially cheap. Organized around a regulatory regime favorable to a state-backed, debt-financed consumption order, the "American way of life" was predicated upon cheap and abundant petroleum. The postwar urban process was supported by generous government-financing programs, including federal funds for national interstate highways, the financing of millions of suburban homes by the Federal Housing Authority, and large government subsidies for agribusiness. In such a political and economic context, the challenge of the oil industry was to deliver fossil fuels in ever-increasing quantities while ensuring that abundance does not drive price down. To eliminate competition and stabilize prices, major oil companies deployed a spatial and legal infrastructure, which strove to achieve monopolies on supply by instituting concession areas, exclusive transport channels, and a vertically integrated oil industry.

16. E.F. Schumacher, *Small is Beautiful: Economics as if People Mattered* (New York: Harper & Row, 1975, c1973). First published during the 1973 energy crisis, *Small is Beautiful* critiques growth and advances that the modern economy is unsustainable. Coinciding with the rise of ecological awareness, the book is often used to champion small, appropriate technologies that are believed to empower people more.

17. Amory Lovins, *Soft Energy Paths: Towards a Durable Peace* (Cambridge: Friends of the Earth, 1977), 12.

18. Ibid., 92.

19. Ibid., 89.

20. Thomas Hughes, *Networks of Power: Electrification in Western Society, 1880–1930* (Baltimore: Johns Hopkins University Press, 1983). Hughes' most significant contribution to the history of technology, the book locates electrical technologies in context analyzing how both human and technological elements were bound together in large scale "systems." Hughes characterizes systems as fundamentally constituted not only of interconnected technological artifacts (such as generators, couplers, relays, lamps) but also local, regional, and national political structures, perceived (and constructed) societal need, geographical features, etc.

21. Thomas Hughes, *Networks of Power: Electrification in Western Society, 1880–1930* (Baltimore: Johns Hopkins University Press, 1983).

22. Hugh Nash, ed. *The Energy Controversy: Soft Path Questions & Answers* (San Francisco: Friends of the Earth, 1979), 29-30.

The expansion of the industrial corporation and of its infrastructure to the scale of the globe was thus central to the carbon regime. Lovins does briefly mention the prohibitive actual and environmental costs of offshore and arctic operations, coal stripping, and the plutonium economy. The crux of his argument rests however on the fact that the hard path is economically unworkable, as it relies on capital-intensive and vulnerable systems. The soft path on the contrary is more flexible; it distributes and minimizes the economic risks to capital. His later books, *Small is Profitable* and *Natural Capitalism*, make evident how the accounting for human and environmental costs serves to power a new industrial revolution through the invisible green hand of the market. *Small is Profitable* proposes that the global economy can serve a sustainability interest if the 'raison de market' wins the energy policy debate. Thus, it suggests that society can turn "more profit with less carbon," by "harnessing corporate power to heal the planet."[23]

Lovins' initial promise to move beyond the narrow grounds of engineering and economics eventually confines the energy question to market-initiated techno-centric solutions. The soft path espouses the rhetoric of autonomous progress, comparing the coming industrial revolution to a train about to depart the station, leaving behind all those who fail to board.[24] Such technological fetishism ignores the geometries of power, the long history of governmental subsidies, and the underlying questions of social justice associated to alternative paths. More importantly, the soft path does not recognize Energy as a situated historical concept of human existence over the last two centuries. The critique he advances operates *from within* the nineteenth century thermodynamic concept of Energy as the ability "to make nature do work."[25] As such, it perpetuates many modern industrial practices of controlling nature and favors the appearance of the ecocrat, whose analogies and management tools fit nature into his domain.[26] It borrows key concepts from ecology such as "resilience" which are then designed into energy systems to include a modular structure, redundancy and adaptability, diversity, and the possibility of decoupling, and dispersion.[27] The ecological caché leaves the costs and risks of the soft path itself unaddressed. Lovins trusts that "soft technologies give everyone the costs and benefits of the energy system he chooses,"[28] and that by minimizing all fossil-fuel combustion, their "environmental impacts are relatively small, tractable and reversible."[29] The Soft somehow shies away from a critical engagement with its premises and promises.

Deessentializing the Hard-Soft Binary

Four decades later, the controversy over the strategies addressed by Lovins and his critics carries the significant legacy of critically examining Energy. The Soft initiates the crucial task of deconstructing Energy into its constitutive end-use elements and questions the necessity of expanding supplies to meet the extrapolated demands of the economy. In a more modest way, it hints as well to the costs of our energy choices, the social relations underlying both paths, while keeping open opportunities to engage the structures, worldviews, and costs of different energy alternatives. To the architecture of energy, one of Soft Energy's most significant contributions is that it highlights the scales of energy production which spur a broad range of design responses, from the detail to the megaregional. In recent years, the Soft Energy project has opened up opportunities to design material and shape their properties and appearance, a potential mobilized by designers such as Sheila Kennedy and Sean Lally amongst others. Furthermore, by identifying the reliance of urbanization on resources often far from sites of consumption, the Soft has also drawn attention to the systemic and territorial attributes of the distribution and transportation of energy, whether the spatio-political adequacy between the ordering of space and forms of political regulation, or the forms of territorialities produced by such systems. Rather than obliterating the significance of infrastructure in favor of decentralized off-grid movements, the Soft path has highlighted the significance of the network and the large-scale as sites for energy imaginaries. Informed by the critiques advances by the soft path, contemporary energy proposal such as AMO's Roadmap 2050 have sought to recuperate the promises of the network by dissociating the form from associated negative ecological connotations all while reaffirming its political potential to integrate geographies. Drawing on Fuller's World Grid, AMO's proposal capitalizes on Europe's geographic diversity through an E.U. network of hydropower, geothermal, biomass, and solar power, which helps to unify the territory it serves and reinforce its economic position. The technology (solar for example) is thus expanded beyond the locality through the grid distribution system. Such hybridization of technologies and scales deessentializes the hard-soft binary leaving the door wide open to questions concerning the broader political significance of "renewable" forms of energy.

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23. Amory Lovins, "More Profit with Less Carbon," *Scientific American* (September 2005): 74-83; Amory Lovins and Hunter Lovins, "Harnessing Corporate Power to Heal the Planet," *The World and I* (Washington: Washington Times Corporation, 2000).
24. Paul Hawken, Amory Lovins, and Hunter Lovins, *Natural Capitalism: Creating the Next Industrial Revolution* (Boston: Little, Brown and Company, 1999), xiii.
25. Ivan Illich, "The Social Construction of Energy," in *New Geographies #2: Landscapes of Energy*, Rania Ghosn ed. (Cambridge: Harvard GSD, 2010), 11-19; 13.
26. Ibid., 18.
27. Amory Lovins and Hunter Lovins, *Brittle Power: Energy Strategy for National Security* (Andover: Brick House, 1982), 23, 179-82.
28. Amory Lovins, *Soft Energy Paths: Towards a Durable Peace* (Cambridge: Friends of the Earth, 1977), 92.
29. Ibid., 88.