

---

# Technology Meteors

by Larry Lohmann and Nicholas Hildyard

*Can technology alone solve the climate crisis? The Corner House, a British organization dedicated to democratic and community movements for environmental and social justice, looks at the interplay between technology, politics and society in this excerpt from their report, "Energy Alternatives: Surveying the Territory."—Editors.*

In industrialized societies, the idea that machines have a life of their own is visible everywhere in everyday life, having perhaps reached a sort of apotheosis in mid-20th century US visions of salvation through technological advance. [1] In the 1960s, visitors to GM's Futurama 2 Pavilion at the New York World's Fair left an exhibition filled with visions of six-wheeled moon buggies, undersea hotels and tree-devouring machinery carving highways through jungles with a badge proclaiming, "I have seen the future." [2] The future they had seen—and it is one that continues to be portrayed in humbler forms in dioramas constructed for provincial fairs in India and engravings on Lao banknotes—was one that seemed almost to have been created by technological objects themselves. Technology was portrayed as being largely autonomous from society, with new inventions appearing out of the blue to usher in inevitable, irresistible change in a pre-determined direction.

This vision has become particularly entrenched among economists, government officials and other intellectuals. Most economic models of possible policy responses to climate change, for example, assume that technical change is an "exogenous variable": that is, it "just happens" in ways that do not depend on

other factors. [3] Technologies "emerge." The problem of nuclear waste "will" be solved. Ways "will" be found to sequester and store the carbon dioxide emitted from coal and oil-fired power plants. The use of energy "will" become progressively more efficient.

All that is needed to bring the technologies into being is a bit of human ingenuity and volition. [4]

But, as social historian David Nye observes, “Machines are not like meteors that come unbidden from the outside and have impacts.” [5] They are adopted and used in a matrix of social, economic and political relations that, while binding and dividing people, erode any hard distinction between technology, on the one hand, and society on the other. Every machine is “an extension of human lives: someone markets it, someone opposes it, many use it and all interpret it.” [6] No technological system should therefore be viewed as an independent, implacable force moving through history: “each is a part of a social process that varies from one time period to another and from one culture to another.” [7]

The deployment of wind power, for example, varies enormously from country to country and even within countries—a variation that cannot be explained by differences in the type of wind turbines used. In Germany, for example, resistance to wind farms has been muted, while in the US and UK it has often been

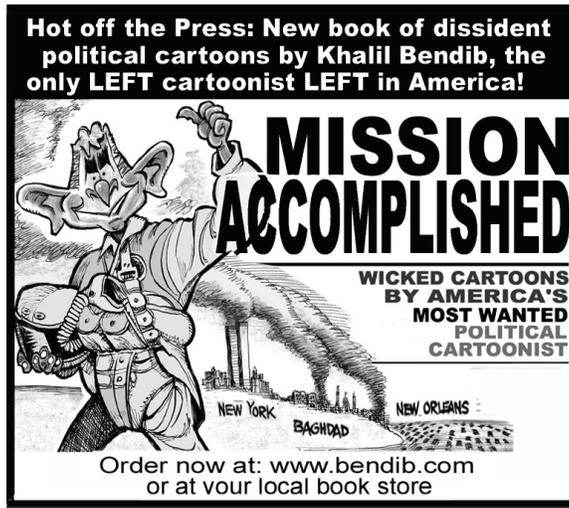
---

### **In Germany, half of all wind projects are community-owned and -financed.**

---

fierce. The likely explanation may lie in ownership patterns: in Germany, half of all wind projects are community-owned and -financed, whereas in the US (where only 2% of wind projects are community-owned), wind farms are largely funded by “banks, corporations and hedge funds—outside investors that find ideal locations for wind or solar, try to convince the local community and end up with a NIMBY problem.” [8] Similarly, it was politics, not a magically-independent “technology,” that determined the different histories of transportation systems in the US, where public subsidies were captured to promote private car use, and Europe, where public investment has (until recently) been directed more toward the development of public transport... [9]

Especially when driven by what technology scholar Langdon Winner calls “the desire of some to have dominion over others,” technology also often develops in strikingly inefficient directions. [10] Winner cites research by historian Robert Ozanne into the adoption of expensive and untested pneumatic molding machines by Cyrus McCormick’s reaper manufacturing plant in Chicago in the mid-1880s. [11] The standard economic interpretation, Winner says, “would lead us to expect that this step was taken to modernize the plant and achieve the kind of efficiencies that mechanization brings.” But a



broader view reveals that McCormick was engaged in a battle with the National Union of Iron Molders. “He saw the addition of the new machines as a way to ‘weed out the bad element among the men.’” namely, the skilled workers who had organized the union local in Chicago. The new machines produced inferior castings at a higher cost than the machine they replaced—but could be handled by unskilled laborers. “After three years of use the machines were, in fact, abandoned, but by that time they had served their purpose—the destruction

of the union.” [12]

A 20th-century automated machine tool system, historian David Noble found, was also rejected mainly because it “left control of production in the hands of skilled workers, rather than in those of managers or programmers.” [13] Treating technology as “self-defining and independent of social power,” rather than as being shaped by “institutions, ideas and social groups, operating in a context of class conflict,” Noble warns, threatens to “derail” the potentially liberating use of alternative technologies. It may even help transform them into “further, perhaps more subtle, means of domination.” [14]

Whether it increases efficiency or not, the development of any given technological object may well appear in retrospect to have been “inevitable.” But as Joseph Kaselow, the advertising columnist for the *New York Herald Tribune*, once remarked of robotics in manufacturing, “it takes a lot of hard work by a lot of dedicated people to make the inevitable happen.” [15] There was nothing inevitable, either, about the emergence of the internal combustion engine as the prime means of powering cars today. In the early 1900s, the majority of cars were either steam-driven or electric: petrol-driven cars were the least popular, not least because there were few petrol stations or mechanics to service them. [16] It took Henry Ford’s mass production of low-priced, petrol-fuelled cars to

---

### **By 1920, an extensive service system existed only for one kind of automobile.**

---

spur the development of the service industries needed. And, as that service infrastructure grew, it edged out others: “By 1920, an extensive service system existed only for one kind of automobile, and the others soon disappeared.” [17] Similar stories could be told of other technologies, such as pesticides and other oil-based agrichemicals, whose dominance was achieved in large part through dispossession of “backward” farmers, the capture of agricultural extension services by agribusiness companies, and the use of fiscal and

other measures to push farmers into adopting “modern” chemical agriculture. [18]

The fetishizing, “meteor” view of technology, in short, writes out of the story nearly everything that matters in shaping struggles over what objects are used for what purposes. Missing is the story of the construction of the political relationships necessary to

---

### **Missing is the story of the advertising strategies that have to be brought into play to create or nurture a “need.”**

---

secure research and development subsidies and other forms of government support for a particular technology (witness the vital role that securing taxpayer dollars for building the US. The fetishizing, “meteor” view of technology, in short, writes out of the story nearly everything that matters in highway system played in the development of private automobile travel and the squeezing out of public transport in the US). [19] Missing is the story of the advertising and other strategies that have to be brought into play to create or nurture a “need” for a specific product. Missing is the story of the physical infrastructure that must be lobbied for and built before a technology can “take off,” as well as the story of the bribes, pork-barrel legislation and regulatory exemptions that have to be arranged before permits are issued or finances are forthcoming. Missing, too, is the story of the complex negotiations between companies, bureaucrats and ordinary people that ultimately shape the use of a given set of mechanical contraptions, and of the public relations campaigns that have to be designed and rolled out to manage public debate around them.

### **Technology as unmoved mover**

Editing technological stories in this way encourages the idea that isolated technological objects are the unmoved movers of history. Technological objects are often said to “impact” on “society” and “have implications” for everyone’s lives, but, mysteriously, are somehow never themselves “impacted upon” or treated as “implications” of anything else. Instead of technological society resulting from a complex set of unequal negotiations among varied groups of humans and nonhumans, particular social formations come to seem the outcome of the presence or absence of given machines, which are credited with the power to bring about even more changes all by themselves.

In the 1940s, for example, proponents of nuclear reactors advertised them as ushering in an age of “unparalleled richness and opportunities for all,” where “privilege and class distinctions and other sources of social uneasiness and bitterness will become relics because things that make up the good life will become so abundant and inexpensive.” [20] Modern-day genetic engineering companies likewise claim

that certain laboratory processes will end hunger, ignoring the broader political causes of famine and malnutrition. Similarly for discussions of alternative energy. Until recently, windmills and solar panels were often described as if they would inevitably lead to decentralization of power generation, which in turn would blaze a path toward the rebuilding of local economies.

Along similar lines, bringing “modern energy” to 3.5 billion people who currently live without it is still sometimes portrayed as a magic bullet for ending poverty. The International Energy Authority, for example, talks of universal access to energy “heralding” poverty eradication through “reducing infant mortality, improving education, ameliorating gender inequality, attaining environmental sustainability, and accelerating global economic growth and prosperity.” [21] Others (apparently ignoring a history of millennia of resistance to exploitation) have even suggested that access to “modern energy” is a pre-requisite for politics itself: without it, claims Practical Action, a UK-based non-governmental organization, “billions of women, men and children will be denied the power to challenge their poverty.” [22]

Missing from such simplistic pictures are the complex ways that machines, embedded in a plethora of relationships with living and nonliving things, help open up some possibilities only by closing others; and the ways they can help push the rest of society into a particular elite-influenced trajectory. When energy is

produced as a commodity for sale and as a raw material for fuelling the production and exchange of other commodities, its impacts on poverty are multiple and often negative. [23] Indeed, “increasing access to energy” in

the context of an unchanged approach to its control, generation, distribution and use can greatly exacerbate poverty. As South African scholar Donald A. McDonald observes in *Electric Capitalism: Recolonizing Africa on the Power Grid*:

“Business as usual” in the electricity sector will be an environmental catastrophe in much of Africa. From the dirty coal-fired electricity generation stations of South Africa to nuclear waste, to the flooding, siltation and loss of biodiversity associated with hydro-electric dam developments, an unaltered electricity growth path would counter many potential gains. ‘Business as usual’ would also mean social oppression and forced relocation for hundreds of thousands of people who find themselves in the wake of these infrastructure developments. [24]

Even if such power generating plants were built in ways that minimized their environmental and social impacts, other inequalities would remain embedded in the way the energy is distributed (does it go to large industrial conglomerates or to ordinary people? are some regions favored over others? do user fees make the energy unaffordable for poorer people?) and consumed (is it primarily used to meet everyday needs? or to promote ever increasing consumption that serves primarily to enrich the few at the expense

---

### **“Increasing access to energy” can greatly exacerbate poverty.**

---

of the manv?). Indeed, to expect “alternative machines” to usher in wider structural change without social movements working to change the political and economic matrix in which they are designed and operated is to ignore the reality that energy embodies a whole political order that, at present, is organized around a process of accumulation that can only produce and reproduce poverty...

### Politics hollowed out

The fetishistic attempt to dissociate technology from politics, and machines from the social relations of exchange through which their raw materials are extracted, appropriated, transformed and redistributed, has two mirror-image effects. On the one hand, it empowers mainstream technocrats or politicians to claim that questions regarding (say) petroleum reserves and wind capacity can be answered in detail separately from questions regarding health, community conflict, the resistance of geological structures or the political acceptability of energy plans—which are often assigned the role almost of an afterthought or perhaps an “obstacle” to be cleared away. Research programs in geoengineering or genetically modified energy crops can accordingly be excused, no matter how much momentum they impart to the drive to adopt the technologies, on the ground that they are “apolitical” and that the “political” decisions about whether to implement them have somehow not yet been initiated.

On the other hand, disembedding politics and technology from each other also empowers certain strains of leftist visionary to play the flip side of this record: that is, to insist that technological questions can be settled “after” issues of exploitation or social injustice are negotiated. To more than a few on the left, nuclear energy (for example) is not racist, colonialist or oppressive “in itself;” it is merely an innocent object like a small “hammer” that fits the hand and can be used or misused. The only question is who “controls” it; and, since all technologies are nothing more than manageable physical objects, that can be decided without taking into consideration any special or unique features each may have. The idea, in other words,

is that “material objects are politically innocent and immune to moral critique.” [25] Similarly, the assumption of EcoEquity, echoing that of almost all delegates to United Nations conferences, is that

“technology transfer” is a relatively unproblematic currency for implementing the abstract redistributive international agreements that constitute the prior, substantive condition for a just energy transition. Here it is a technology somehow stripped of politics that becomes the afterthought, to be tacked onto whatever negotiations went before.

All such positions, whether associated with the right or the left, tend to render invisible crucial networks and exchanges: in the case of nuclear energy, for example, the political economy of uranium mining

Daily Affirmations for the Revolutionary Proletarian Militant  
 THE ENEMY NEVER STOPS EXPLOITING AND COMMITTING ECOCIDE. WE MUST BE EVEN MORE RELENTLESS IN DESTROYING it.



and processing in indigenous territories in Australia, the southwestern US or various African countries. In general, they occlude the politics that inheres in the coevolution of humans and nonhuman things, reflecting an ideology separating “society” and “nature” that science scholar Bruno Latour identifies as a mark of modernity. [26] The degraded vision of politics that results becomes itself a tool of the politically powerful. Lacking a comprehensive picture of the many points of possible political intervention throughout the complex web linking machines, energy flows, money, science, and the obduracy of particular geographies and peoples, movements partly or wholly

taken in by this vision often reduce science and technology to apolitical black boxes gifted to the world by experts. As part of the same process, agency is reduced to a contentless “political will” to be exercised by recognized “political

leaders” who, it is hoped, will eventually be forced to respond to decontextualized yet mysteriously potent “nonpolitical” information about molecule flows, machines and the risk of flooded cities provided by scientists and technologists.

Hence climate activists such as US writer Bill McKibben claim that in the field of climate change politics, “physics and chemistry call the tune” [27]—implying that an abstract, human-independent “nature” is now at last poised to force politicians to act (with, of course, the assistance of expert and pressure-group mediators). Such a partial vision ultimately

---

**To more than a few on the left,  
 nuclear energy is not racist,  
 colonialist or oppressive “in itself.”**

---

helps reinforce the positions of many mainstream political leaders, who are relieved not to have to face any more severe political tests on the global warming battlefield than to have to find ways of ignoring or

---

## The degraded vision of politics that results becomes itself a tool of the politically powerful.

---

downplaying warnings of catastrophe voiced by climatologists or by street demonstrators hoisting the banner of “peer-reviewed science.”

“Energy Alternatives: Surveying the Territory” was written by Larry Lohmann and Nicholas Hildyard with research by Sarah Sexton. It is available at [www.thecornerhouse.org.uk](http://www.thecornerhouse.org.uk)

### Notes

1. Nicholas Hildyard and Larry Lohmann, *The Museum of Fetishes*, The Corner House, Dorset, [http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/The per cent20Museum per cent20of per cent20Fetishes.pdf](http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/The%20Museum%20of%20Fetishes.pdf).
2. The Original Futurama, *Wired*, Issue 15.12, 27 November 2007, [http://www.wired.com/entertainment/hollywood/magazine/15-12/ff\\_futurama\\_original](http://www.wired.com/entertainment/hollywood/magazine/15-12/ff_futurama_original).
3. Michael Grubb, Jonathan Kohler and Dennis Anderson, “Induced Technical Change in Energy and Environmental Modeling: Analytical Approaches and Policy Implications,” *Annual Review of Energy and Environment*, 2002, <http://www.econ.cam.ac.uk/rstaff/grubb/publications/J34.pdf>.
4. David Goodstein’s analogy between the challenge of “kicking the fossil fuel habit altogether” and the challenge of putting a person on the moon is an example of such thinking. Goodstein writes: “In 1960, John F. Kennedy challenged us to put a human being on the moon within that decade. And we did it! That was possible because we already knew the basic principles of how it could be done. There were formidable technological obstacles to overcome, but we are very, very good at overcoming that kind of obstacle when we put our minds to it. The energy problem is of exactly that nature.”
5. David E. Nye, *Consuming Power: A Social History of American Energies*, MIT Press, Cambridge, 2001, pp.5–6.
6. Ibid.
7. Ibid.
8. Germany’s Energiewende, *Momentum*, Institute on the Environment, University of Minnesota, Fall 2012, p.13, [http://www.environment.umn.edu/momentum/issue/4.2\\_f12/momentum\\_fall12.pdf](http://www.environment.umn.edu/momentum/issue/4.2_f12/momentum_fall12.pdf). For discussions of community ownership of solar and wind projects, see David Elliott, *A Solar World: Climate Change and the Green Energy Revolution*, Schumacher Briefings 10, Totnes, Devon, pp.40–41; Dave Toke, “Supporting Renewables: Local Ownership, Wind Power and Sustainable Finance” in David Elliott (ed), *Sustainable Energy: Opportunities and Limitations*, Palgrave Macmillan, London, 2007.
9. David E. Nye, *Consuming Power: A Social History of American Energies*, MIT Press, Cambridge, 2001, p.175.
10. Langdon Winner, “Do Artifacts Have Politics?,” *Daedalus*, Vol. 109, No. 1, Winter 1980, available at <http://zaphod.mindlab.umd.edu/docSeminar/pdfs/Winner.pdf>.
11. Robert Ozanne, *A Century of Labor-Management Relations at McCormick and International Harvester*, University of Wisconsin Press, Madison, 1967.
12. Langdon Winner, “Do Artifacts Have Politics?,” *Daedalus*, Vol. 109, No. 1, Winter 1980, available at <http://zaphod.mindlab.umd.edu/docSeminar/pdfs/Winner.pdf>.
13. David F. Noble, *Forces of Production: A Social History of Industrial Automation*, Transaction Publishers, New Brunswick, New Jersey, 2011.
14. Ibid.
15. Quoted in the *New York Herald Tribune*, 1970.
16. David E. Nye, *Consuming Power: A Social History of American Energies*, MIT Press, Cambridge, 2001, p.176.
17. Ibid.
18. Tracey Clunies-Ross and Nicholas Hildyard, *The Politics of Industrial Agriculture*, Earthscan, London, 1992.
19. See for example. Robert Caro. *The Power Broker: Robert Moses and the Fall of New York*, Nintage, New York, 1975.
20. Scientist writing in *Collier’s Magazine*, 1940, quoted in David E Nye, *Narratives and Spaces: Technology and the Construction of American Culture*, University of Exeter Press, 1997, p.81.
21. “Universal access to energy would herald enormous economic and social benefits,” International Energy Agency, 14 June 2012, <http://www.iea.org/newsroomandevents/news/2012/june/name,27722,en.html>. The IEA’s obligatory disclaimer (“Electrification and access to modern energy services do not *per se* guarantee poverty alleviation”), is belied by its technocratic approach. See International Energy Agency, *World Energy Outlook 2002*, Chapter 13: “Energy and Poverty,” p.365, <http://www.worldenergyoutlook.org/media/weowebiste/energydevelopment/WEO2002Chapter13.pdf>.
22. Practical Action, “Energy for All 2030,” <http://practicalaction.org/energy-for-all-2030-project>.
23. Kolya Abramsky (ed.), *Sparking a Worldwide Energy Revolution: Social Struggles in the Transition to a Post-Petrol World*, AK Press, Oakland, 2010, p.8.
24. Donald McDonald (ed.), *Electric Capitalism: Recolonizing Africa on the Power Grid*, Earthscan, London, 2009, free download from [www.hscrepress.ac.za](http://www.hscrepress.ac.za).
25. Alf Hornborg, *Global Ecology and Unequal Exchange: Fetishism in a Zero-Sum World*, Routledge, London, 2011, p.43.
26. Bruno Latour, *We Have Never Been Modern*, Harvard University Press, Cambridge, MA, 1994.
27. Joe Romm, “Bill McKibben and Betsy Taylor on the Merger of 350.org and 1Sky,” Climate Progress website, 7 April 2011, <http://thinkprogress.org/climate/2011/04/07/207849/bill-mckibben-betsy-taylor-merger-350-org-1sky/?mobile=nc>.