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What Time Is It?

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TIME TO ORGANIZE

New Tech as a Force Multiplier and Equalizer:
Bootstrapping the Alternative Economy

KAT
Kevin Carson

"New Tech as a Force Multiplier and Equalizer: Bootstrapping the Alternative Economy"

Introduction

The generation of energy, whether it be the gas you pump into your tank or the coal burned to produce electricity to power your computer, is estimated to contribute upwards of 82% of all greenhouse gas emission. To add insult to injury, many of these firms have long been associated with the more deleterious impacts of neoliberal development. Of course we all know about BP's destruction of the entire Gulf region, but there is a lot of destruction that flies under the radar.

Right now in the United States there are *billions* of gallons of liquid coal ash sitting in retention lakes within range of sensitive ecosystems and major drinking water reservoir; one such coal¹ ash lake burst, sending millions of gallons of toxic waste down a major river system. As if that isn't bad enough, there is a major natural gas pipeline system² that is in need of critical infrastructural enhancements, but since it's not in the best interest of the bottom line, don't look for that problem to be solved anytime soon either.

An oft-reference source of clean energy is wind. The beauty of wind power is that the turbine consumes an endless supply of a free common pool resource that is virtually inexhaustible. Wind power, despite its hefty upfront costs of roughly \$2 million per turbine, has some serious profit margins, especially when factoring in subsidies and tax breaks; it is not uncommon for large-scale wind farms to pay off their initial capital outlay within 2 – 7 years time. Considering that wind power is heavily subsidized, and uses common pool resources (wind, land, and the heavily subsidized electric grid), one would think wind power development could be used for community-economic development by sidestepping the destructive energy cartels through the creation of local, community-based enterprise. Common sense would dictate that those who got us into an unprecedented mess that involves toxic waste sitting in our backyards and emissions destroying our global ecosystem should be denied a second chance. But too bad common sense doesn't win in energy policy.

Billionaire T. Boone Pickens, a Texas oilman with major investments in natural gas and drinking water reservoirs across the dessert West, has been plunking down wind turbines all across Oklahoma and the Texas panhandle. That free market loving governor of Texas, Rick Perry, has made sure to cut a blank check to T. Boone on behalf of taxpaying Texans to extend the electric grid in the direction of Picken's panhandle development. General Electric, notorious for polluting the Hudson in New York, is getting sweetheart deals to manufacture, construct, and manage wind farms all over the United States, ensuring capital flight from resource-constrained rural communities. And you can't forget the Missouri Carnahan political dynasty, reaping subsidies comprising upward of 30% of the total cost to build wind farms costing hundreds of millions of dollars.

- ⁶ Douglas Rushkoff, "How the Tech Boom Terminated California's Economy," *Fast Company*, July 10, 2009 <<http://www.fastcompany.com/node/1307504/print>>.
- ⁷ See Kevin Carson, *The Homebrew Industrial Revolution: A Low-Overhead Manifesto* (Book-Surge, 2010), Chapter Five: "The Small Workshop, Desktop Manufacturing, and Household Production."
- ⁸ Mark Elliott, "Stigmatic Collaboration: The Evolution of Group Work," *M/C Journal*, May 2006 <<http://journal.media-culture.org.au/0605/03-elliott.php>>.
- ⁹ *Ibid.*
- ¹⁰ Mark Elliott, "Some General Off-the-Cuff Reflections on Stigmergy," *Stigmatic Collaboration*, May 21, 2006 <<http://stigmergiccollaboration.blogspot.com/2006/05/some-general-off-cuff-reflections-on.html>>.
- ¹¹ Eric S. Raymond, *The Cathedral and the Bazaar* <<http://catb.org/~esr/writings/homesteading>>.
- ¹² John Robb, "THE BAZAAR'S OPEN SOURCE PLATFORM." *Global Guerrillas*, September 24, 2004 <http://globalguerrillas.typepad.com/globalguerrillas/2004/09/bazaar_dynamics.html>.
- ¹³ Doctorow, "Microsoft DRM Research Talk," in *Content: Selected Essays on Technology, Creativity, Copyright, and the Future of the Future* (San Francisco: Tachyon Publications, 2008), pp. 7-8.
- ¹⁴ Doctorow, "It's the Information Economy, Stupid," *Ibid.*, p. 60.
- ¹⁵ Eric Hunting comment under Michel Bauwens, "Phases for implementing peer production: Towards a Manifesto for Mutually Assured Production," P2P Foundation *Forum*, August 30, 2008 <<http://p2pfoundation.ning.com/forum/topics/2003008:topic:6275>>.
- ¹⁶ *Ibid.*, p. 77.
- ¹⁷ Paul Goodman. *People or Personnel*, in *People or Personnel and Like a Conquered Province* (New York: Vintage Books, 1965, 1967, 1968), p. 70.
- ¹⁸ Goodman, *Like a Conquered Province*, p. 357.
- ¹⁹ Goodman, *People or Personnel*, pp. 114-15.
- ²⁰ *Ibid.*, p. 113.
- ²¹ *Ibid.*, pp. 241-242.
- ²² *Ibid.*, p. 115.
- ²³ *Ibid.*, p. 120.
- ²⁴ One individual can have endless cooperative memberships (grocery, utility, grain elevator, etc.). So while there are roughly 350 million cooperative memberships nationally, the real number of individuals with at least one membership are lower than the 350 million mark, yet still substantial. <http://reic.uwcc.wisc.edu/issues/>
- ²⁵ Jim Cooper. *Electric Co-Operatives: From New Deal to Bad Deal*. Harvard Journal on Legislation, 2008 (45), p. 335 – 42.

By KAT and Kevin Carson

ALLiance writer KAT is a researcher.

ALLiance writer Kevin Carson is Research Associate for CASS.org, a contemporary mutualist author and individualist anarchist whose written work includes *Studies in Mutualist Political Economy*, *Organization Theory: An Individualist Anarchist Perspective*, and *The Homebrew Industrial Revolution: A Low-Overhead Manifesto*, all of which are freely available online. Carson has also written for such print publications as *The Freeman: Ideas on Liberty* and a variety of internet-based journals and blogs, including *Just Things*, *The Art of the Possible*, the P2P Foundation and his own Mutualist Blog @ mutualist.blogspot.com.

principles. That means educating member-owners about the services the cooperative provides and, most critically, about the complexities of the industrial sector that the cooperative is embedded within. Such a practice provides the member-owners with the tools needed for them to become enlightened participants, cooperative entrepreneurs, and act as non-state regulators.

Second, an active member-ownership can also work with cooperative associations to ensure that at the larger-scale levels (state and national), the sector persistently reminds the individual institutions of their foundations in the cooperative principles. Indeed, the one legislative action that the cooperative sector could undertake is a comprehensive “cooperative bill of rights.” The purpose would be to codify into law the definition of what a cooperative is as defined by the International Cooperative, not by disconnected technocrats. This would not solve the problems of cooperatives that act like corporations, but no doubt would help to reinvigorate cooperatives by freeing them of the corporate legal structure and placing them in a legal structure of their own making.

Engaging cooperative membership for a broader vision would breathe renewed life into the cooperative sector. We begin to remind cooperative members, as well as the boards and executive staffs, why it is they exist in the first place. These densely connected networks are readymade to distribute vast amounts of knowledge and information swiftly. If we can free the cooperative sector from unnecessary regulation designed to privilege the corporation, we can lay bare the system of artificial privilege that has hindered community capacity to not only provide for themselves, but also to create a world of work with actual meaning.

Get involved in your local cooperative. Understand the existing cooperative culture, and work to reengage your individual cooperative with other cooperatives regionally. Read over those bylaws and understand your institutional rights as a member-owner. If the board or execs don’t budge, run for a board spot and take direct control.

Cooperatives represent one of the best examples of latent capacity ready to be engaged for true social change. Remember, there are over 700 grocery coops (300+ are looking to come online), 900+ electric utility coops, 400+ telecom coops, and 7000+ credit union coops; there is a lot of opportunity to make these individual shops into a tangible movement and create a real counter economy. Can we make it happen?

References

¹ <http://www.sierraclub.org/coal/factsheets.aspx>

² http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/index.html

³ John Curl, *For All the People: Uncovering the Hidden History of Cooperation, Cooperative Movements, and Communalism in America* (Oakland, CA: PM Press, 2009), pp. 4, 33-34.

⁴ *Ibid.*, p. 107.

⁵ Tom Coates, “(Weblogs and) The Mass Amateurization of (Nearly) Everything,” http://www.plasticbag.org/archives/2003/09/weblogs_and_the_mass_amateurization_of_nearly_everything.

A public policy geared toward the public good whether it comes from the government, business or local level communities, would seek to mitigate neoliberal development models which act more like leeches than community symbiots. Public policy should not be used to privilege the existent destructive corporate order, but instead provide for the space necessary for alternative polycentric solutions. The demand for and growth in alternative energy, particularly wind energy, provides a substantial opportunity for community entrepreneurs. Groups in Oregon, Minnesota, and Maine are working together to pool their resources and own wind capital outright. Yet these models are in their infancy, and

current national policy continues to privilege the corporate firm above all others. The proposed solutions for freeing the market for alternative energy innovation must not only be critical of the impediments to innovation, but also must stress the potential benefits from such development.

Sustainable energy generation, transmission and distribution are socio-ecological in nature. Engineering expertise must be combined with evidence of social outcomes as well to optimize solutions and combat neoliberal economic tendencies of ecological destruction. What is needed is a diverse partnership of major institutions to free market actors to participate in this next generation of clean energy development. There may be no better institution equipped to participate in this initiative than the electric power cooperative.

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The Cooperative Advantage: Taking Innovation To The Next Level

A common critique of the cooperative movement is that if the business model is truly ideal, then why is it not the predominant business model? First, there is the obvious: when public policy privileges capitalist business models, the system perpetuates itself (albeit in an unsustainable, downward spiral). Second, the cooperative business model is really only just beginning

to flourish in the U.S. The American cooperative sector has a relatively solid foundation arising from the New Deal era that only recently is being recognized as a potential force for true change.

The electric cooperative industry in the United States has the human, political, social, built and financial capital to not only compete with transnational energy conglomerate, but to pool its vast array of social and material resources to innovative the energy sector and democratize it. The United States has over 930 electric cooperatives, 864 of them providing distribution of power to regional and local communities. The remaining cooperatives (generation and transmission coops or G & T) generate energy, mostly through coal, and sold as a commodity to public and private market actors. These cooperatives are represented by the National Rural Electric Cooperative Association, providing invaluable information and resource pooling, which is critical for small-scale firms, like cooperatives, to survive (Ostrom, 2005).

Taken together, the cooperative sector has enormous potential to not only proliferate growth in renewable energy, but to also foster deep, meaningful community development. This is especially true given the technological developments of recent years, which amount to an enormous force multiplier for the resources available to the alternative economy and go a long way toward nullifying the conventional capitalist economy's advantage in resources.

Historically, capitalist ownership and wage labor were associated with the high cost of production machinery. The shift from production primarily involving individually affordable workman's *tools*, to production with costly *machinery in factories*, meant that the expensive machinery required for factory production could only be purchased by very rich people who in turn hired wage labor to work the machinery.

According to John Curl, successful worker co-ops, like the Owenite unions' cooperatives in Britain and the National Trades' Union in the U.S., were mostly created before the mid-19th century, and were undertaken mainly by striking workers in craft employments where the tools of the trade were fairly inexpensive and "factories" were just large agglomerations of craft workers all using their hand tools in the same place. In this period cooperative shops were frequently organized by artisan laborers on strike, and were sometimes organized as an alternative to wage labor altogether.³ The balance between human capital and physical capital was such that workers could often walk out and take "the factory" with them, leaving behind a "company" consisting of nothing but a name and four walls.

Such possibilities largely came to an end with the advent of factory production using expensive machinery. The main reason the labor movement failed to build a counter-economy based on worker cooperatives after the mid-19th century (e.g. the failure of the Knights of Labor's network of worker co-ops) was the size of the capital outlays required.⁴

We are now experiencing a reversal of the previous shift: a transition back

economy, and isolate the cooperative business from the cut-throat, subsidy seeking world of the corporation.

The Cooperative As Its Own Worst Enemy: A Call To Action

Cooperatives offer immense potential to influence social change. But the cooperative model is not without its inherent complexities, and those engaging the cooperative sector must not be naïve; the cooperative can be gamed for the benefit of a select few at the expense of larger member-owners.

The board governance model of the cooperative is a mixed blessing. The board can insure the cooperative maintains its adherence to the cooperative principles, or the board can become captured by manipulative, ineffective board members. This is not to say that cooperatives are particularly prone to such disruption (remember, corporation, nonprofits, and city governments all utilize board governance structures), but to reinforce the point that with all institutions, they can become corrupted and ineffective. The cooperative, theoretically, serves as the ideal business model, bridging social connections and providing access to human capital and community resources. However, a scathing policy essay²⁵ from Congressman Jim Cooper (D-Tennessee) damning the cooperative electric utility sector demonstrates what might be facing social activists.

The New Deal policies that created what we now know as the modern day electric power cooperative, tasking the individual co-op to provide high quality services at the lowest possible prices; legally this is the only way in which cooperative electric utilities differ from their corporate counterparts. This means that regulation, not the cooperative principles, takes precedence in the day-to-day activities of the cooperative. The member-owners are then oftentimes excluded from open board meetings, which have led to evidence of rampant corruption.

The closed nature of many electric cooperatives prevents the member-owners from regulating the business. It is estimated for example that instead of returning dividends to the member-owners that electric cooperatives are hoarding cash. Congressman Cooper estimates that some \$31 billion in dividends (profits) are being held in reserves, allowing cooperatives to pay exorbitant executive pay, and lavish board member compensation.

While Congressman Cooper is attempting to draw attention to the abuses of the cooperative sector, those of us who see the cooperative model as empowerment have a real opportunity to shift these abuses into positive community development. More to the point, why can't the member-owner base mobilize to open up those opportunity structures necessary for cooperatives to be responsive to the member-owners and flourish?

First, member-owners should mobilize amongst themselves to make their cooperative act in a truly democratic manner, in sync with the cooperative

**Get involved in
your local
cooperative.**

on the buildings, and found that actual tuition charges were “four times as much as is needed to directly pay the teachers and the rent! This seems to be an extraordinary mark-up for administration and overhead.”²¹

Far from the system of “countervailing power” hypothesized by Galbraith, the large for-profit corporation, large government agency, and large non-profit in fact cluster together into coalitions: “the industrial-military complex, the alliance of promoters, contractors, and government in Urban Renewal; the alliance of universities, corporations, and government in research and development. This is the great domain of cost-plus.”²²

We seem to put an inordinate expense into maintaining the structure. Everywhere one turns... there seems to be a markup of 300 and 400 per cent, to do anything or make anything....²³

The ideal arrangement for the cooperative sector is to continue along the federated model to set out those aforementioned principles, objectives and ends, and then to set the federated members loose to stigmatically organize, innovate, and share the newly created knowledge.

Lastly, when we ponder the cooperative model as David taking on Goliath (the corporate-state industrial complex) we must remember we have the biggest rock available with which to toss at Goliath’s forehead: the cooperative membership. Cooperatives are estimated to serve roughly 350 millions memberships²⁴ in the United States alone. These members can be engaged to not only raise capital for cooperative expansion, but to free the opportunity structures blocked by Goliath - let me give you but one example of how Goliath is trying to pin David.

I am sure folks who know anything about cooperatives think they procure all their financing through credit unions (cooperative banks). Too bad they’re mostly wrong. Federal and state regulations limit the capacity with which credit unions are allowed to provide loans for businesses such as cooperatives, leaving the megabanks as the only viable option for loans needed by cooperative businesses. This then hinders daily interaction amongst cooperatives and encourages them to keep doing business with the corporate crooks so many of us loath. In this sense, regulation hurts our capacity to create this robust parallel cooperative economy, and shifts resources to the corporate sector.

But we have more resources than the corporate business sector: we have the people. We have tens to hundreds of millions of folks who are part of the cooperative movement. Taken as a whole, cooperative business member-owners have immense capacity to pool their resources for critical investments. Grocery store cooperatives have been innovating mechanisms to raise capital from their member-owners through member loans programs, bypassing the banks. Why can’t cooperatives mimic this model further, and source the servicing for the loans through their credit unions that are more adept at managing complex financial schemes, thereby alleviating the burden of non-financial cooperatives? If cooperatives were to work together to shape what the rules *should* be, across sectors, we get cooperatives to think in terms of self-governance to create interdependency, build a true parallel

from expensive *machinery* to affordable, general-purpose artisans’ *tools*, accessible through cheap communications technology (the internet) and the open source movement that is essentially the world’s biggest coordinated DIY effort.

Technological innovation is in the process of making capital constraints irrelevant, and thereby nullifying the capitalists’ former privileged access to enormous amounts of investment funds (indeed, websites like www.kickstarter.com allows for small-scale projects to crowd-source financing and subvert the banking cartels). Thanks to the desktop revolution, as Tom Coates put it, “the gap between what can be accomplished at home and what can be accomplished in a work environment has narrowed dramatically over the last ten to fifteen years.”⁵

Douglas Rushkoff commented on the superfluity of investment capital resulting from this:

The fact is, most Internet businesses don’t require venture capital. The beauty of these technologies is that they decentralize value creation. Anyone with a PC and bandwidth can program the next Twitter or Facebook plug-in, the next iPhone app, or even the next social network. While a few thousand dollars might be nice, the hundreds of millions that venture capitalists want to — need to — invest, simply aren’t required....

The banking crisis began with the dot.com industry, because here was a business sector that did not require massive investments of capital in order to grow. (I spent an entire night on the phone with one young entrepreneur who secured \$20 million of capital from a venture firm, trying to figure out how to possibly spend it. We could only come up with \$2 million of possible expenditures.) What’s a bank to do when its money is no longer needed?⁶

The same thing is happening in physical production. Over the past twenty years or so, the minimum cost of machinery required for producing goods of “factory” quality has fallen by two orders of magnitude. Using assorted homebrew versions of CNC 3-axis cutting tables, milling machines, lathes and 3-D printers developed by hardware hackers, it’s possible for a garage shop with \$10,000 worth of machinery capable of manufacturing goods that once required a factory costing hundreds of thousands of dollars.⁷

So the basis of the capitalist’s authority—the high cost of production machinery, and his ability to control labor’s access to it—has disappeared. And the balance between human capital and physical capital has shifted

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back to that prevailing in the days of artisan labor. An increasing share of production is carried out by independent job shops using small-scale, general-purpose machinery, producing on contract for corporate clients. Corporate control of production depends almost entirely on their ownership of “intellectual property” and their control of branding and marketing. The affordability of the actual machinery of production, and the growing importance of human capital as the primary source of value-added, mean that the corporate headquarters is becoming a redundant node increasingly vulnerable to being bypassed.

Under the cooperative model, there is no cooperative headquarters, but instead a central federation in which each individual cooperative chooses whether or not to join. The beauty of the cooperative federation scheme is that the model pushes the federation to innovate, lest the cooperatives split off and form a competing federation.

The current federation, NRECA, is a DC metro-area based association that provides valuable market research information, forecasting, and resource pooling amongst the membership. NRECA could go a step further to use its relatively positive social and political capital to leverage new partnerships amongst its cooperative base, university researchers, and engineering “hobbyists” to build a new open source model of energy generation. In this sense, development could be decentralized, though adhering to core principles, objectives, and ends. What the implosion of physical capital outlay costs has done for material production, networked, stigmergic organization has done for the transaction costs of coordinating effort that could be strung together through cooperative federations like NRECA.

“Stigmergy” is a term coined by biologist Pierre-Paul Grasse in the 1950s to describe the process by which termites coordinated their activity. Social insects like termites and ants coordinate their efforts through the independent responses of individuals to environmental triggers like chemical trails, without any need for a central coordinating authority.⁸ Matthew Elliott contrasts stigmergic coordination with social negotiation. Social negotiation is the traditional method of organizing collaborative group efforts, through agreements and compromise mediated by discussions between individuals. The exponential growth in the number of communications with the size of the group, obviously, imposes constraints on the feasible size of a collaborative group, before coordination must be achieved by hierarchy and top-down authority. Stigmergy, on the other hand, permits collaboration on an unlimited scale by individuals acting independently. This distinction between social negotiation and stigmergy is illustrated, in particular, by the contrast between traditional models of co-authoring and collaboration in a wiki.⁹ Individuals communicate indirectly, “via the stigmergic medium.”¹⁰

The adoption of innovations is not hindered by administrative procedures to determine “best practices,” or by long and imperfect processing of information through numerous levels of hierarchy, after which they are mandated by the pointy-haired bosses as Weberian/Taylorist work rules for

rest of the counter-economy is the contamination of cooperatives and non-profits by corporate organizational culture.

The large corporation and centralized government agency do not exist just as discrete individual organizations. Beyond a certain level of proliferation, such large organizations crystallize into an interlocking and mutually supporting system. Even the small and medium-sized firm, the cooperative, the non-profit, must function within an overall structure defined by large organizations. As Paul Goodman put it,

A system destroys its competitors by pre-empting the means and channels, and then proves that it is the only conceivable mode of operating.¹⁷

...[T]he genius of our centralized bureaucracies has been, as they interlock, to form a mutually accrediting establishment of decision-makers, with common interests and a common style that nullify the diversity of pluralism.¹⁸

The interlocking network of giant organizations includes not only the oligopoly corporation and government agency, but as Goodman pointed out, the large institutional non-profit: large universities, think tanks, and charities like the Red Cross and United Way. Goodman’s typology of organizations “cuts across the usual division of profit and non-profit,” as shown by the prevalence in the latter of “status salaries and expense accounts..., [and] excessive administration and overhead...”¹⁹ Indeed, Goodman defines the typical culture of the large organization largely in terms of those qualities, which stem largely from the nature of hierarchy, with work being divorced from responsibility, power or intrinsic motivation (as suggested by the contrasting spontaneous and frugal style of bottom-up organizations):

To sum up: what swells the costs in enterprises carried on in the interlocking centralized systems of society, whether commercial, official, or non-profit institutional, are all the factors of organization, procedure, and motivation that are not directly determined to the function and the desire to perform it. Their patents and rents, fixed prices, union scales, featherbedding, fringe benefits, status salaries, expense accounts, proliferating administration, paper work, permanent overhead, public relations and promotions, waste of time and skill by departmentalizing task-roles, bureaucratic thinking that is penny-wise pound-foolish, inflexible procedure and tight scheduling that exaggerate contingencies and overtime.

But when enterprises can be carried on autonomously by professionals, artists, and workmen intrinsically committed to the job, there are economies all along the line. People make do on means. They spend on value, not convention. They flexibly improvise procedures as opportunity presents and they step in during emergencies. They do not watch the clock. The available skills of each person are put to use. They eschew status and in a pinch accept subsistence wages. Administration and overhead are *ad hoc*. The task is likely to be seen in its essence rather than abstractly.²⁰

Goodman, taking the example of Columbia University, estimated the cost per capita if students hired instructors directly and paid market rents

Anything which artificially increases the initial capital outlay for entering the market, or increasing the ongoing cost of production, also increases the size of the minimum revenue stream required to service those costs at all times. The effect is to mandate large-batch production to fully utilize capacity and amortize costs, which in turn requires the social power to organize a guaranteed market for one's full output. In other words, "get big or get out"—or rather, start out big or don't start at all.

A wide variety of government-enforced artificial scarcities and artificial property rights have this effect. "Intellectual property" law, as we already saw above in connection with Tom Peters, is the reason the price of manufactured goods consists mainly of embedded rents rather than actual production costs. Patents serve as a restraint on the competing design and production of modular, open-source spare parts and accessories for proprietary platforms. "Intellectual property" is also the central structural support for the Nike "outsource everything" model of production, in which corporate headquarters contract out actual production to independent shops but retain control over them through ownership of IP, branding and marketing.

Yet another barrier to effective competition from cooperatives and the rest of the counter-economy is the contamination of cooperatives and non-profits by corporate organizational culture.

The same is true of "health" and "safety" regulations and business licensing which mandate unnecessary capital outlays, and zoning laws which prohibit mixed-use neighborhoods and criminalize operating a business out of one's own house. The cumulative effect of such legislation is to prohibit the home-based microenterprise, using spare capacity of ordinary household capital goods which most people already own. For example, consider a household micro-bakery using an ordinary kitchen oven. Local "health" and "safety" codes may require it to purchase an industrial-sized oven, dishwasher, and refrigerator. Worse yet, local zoning laws may require the rental of stand-alone commercial real estate. The home-based micro-bakery, using ordinary household capital goods, has virtually no overhead cost and consequently can ride out long periods of slow business at no cost. The bakery organized in compliance with the regulations, on the other hand, has large rent payments and payments on the loans required to purchase the equipment; a period of slow business, consequently, means Chapter Eleven.

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the organization. There is no need to wait for permission, or to laboriously get everyone on the same page, before anyone can take a single step. Innovations are developed by the self-selected individuals best suited to the work, and immediately adopted wherever they're useful, without bureaucratic mediation or transaction costs. This is the way open-source software development works, as described by Eric Raymond in "The Cathedral and the Bazaar."¹¹ It's also the standard operating procedure of "open source insurgencies," as described in a wide body of literature on networked resistance movements and Fourth Generation Warfare.¹² A cell of Al Qaeda Iraq develops an improved type of IED this week, and next week it's taken up by every Al Qaeda cell in the country. The same principle governs file-sharing, according to Cory Doctorow.

Raise your hand if you're thinking something like, "But DRM doesn't have to be proof against smart attackers, only average individuals!..."

...I don't have to be a cracker to break your DRM. I only need to know how to search Google, or Kazaa, or any of the other general-purpose search tools for the clear text that someone smarter than me has extracted.¹³

It used to be that copy-prevention companies' strategies went like this: "We'll make it easier to buy a copy of this data than to make an unauthorized copy of it. That way, only the *uber*-nerds and the cash-poor/time rich classes will bother to copy instead of buy." But every time a PC is connected to the Internet and its owner is taught to use search tools like Google (or The Pirate Bay), a third option appears: you can just download a copy from the Internet....¹⁴

Stigmergy is the highest development, simultaneously, of collectivism and individualism, without either being compromised or impaired by the other. As in *Star Trek's* Borg Collective, the innovation or discovery of any member quickly becomes the common knowledge of all—but unlike the Borg collective, the individual is not subordinated to the group. This is why stigmergic organization, while exponentially increasing the possibilities of collective action, is also the highest development of individualism. All decisions are decisions of individuals, acting for themselves alone. The individual's work is coordinated with a larger project (as for example in wikis) by the individual, with the individual designing a component to fit a selected interface in a preexisting project or platform.

Modular design is simply the stigmergic development of physical goods.

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It is a massive force multiplier because it spreads capital outlays for R&D out over as large of a product ecology as possible. Common platforms can be customized among the widest possible variety of products, and modular components to be used over an entire product ecology.¹⁵

The combination of drastically reduced capital outlays and drastically reduced overhead costs of organization, together, operate as an enormous force multiplier.

The revenue stream required to service ongoing costs is reduced, so there is reduced pressure for large-batch production and an increased ability to ride out long periods of slow business with no sunk costs to amortize. As a result, small manufacturers can produce on a lean, just-in-time basis, with output geared to orders and no need to maximize the utilization of capacity.

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It follows that there's an eroding distinction between economic "winners" and "losers," between being "in business" and "out of business." The upshot is that small producers can incrementally increase production with virtually no risk and no significant loss when business slows down, and with virtually all revenues being free and clear when business is good.

The cooperative movement – here our focus is only on the energy sector, but the applicability extends to virtually all cooperatives - and the alternative energy movement should take advantage of these new potentials. The drastically reduced capital outlay costs for micro-manufacturing mean that capitalist corporations' previous advantage of having preferential access to large sums of investment capital can be completely nullified.

Federations of cooperatives like the electric co-ops, rather than purchasing wind and solar generating equipment—with expensive proprietary designs and oligopoly markups—from conventional high-overhead capitalist industry, can get more bang for the buck by financing their own open-source designs and producing them in partnership with garage factories like those participating in the 100k garages project. The open-source designs, financed with capital pooled from the small contributions of many federated cooperatives, become a free library available to all.

An example from the 19th century is instructive in this regard. When manufacturers refused to sell farm machinery to the Grangers at wholesale prices, the Nebraska Grange undertook its own design and manufacturing

of machinery. (How's that for a parallel to modern P2P ideas?) Its first attempt, a wheat head reaper, sold at half the price of comparable models and drove down prices on farm machinery in Nebraska. The National Grange planned a complete line of farm machinery, but most Grange manufacturing enterprises failed to raise the large sums of capital needed.¹⁶

As we saw above, the capital outlays on which the Nebraska Grange experiment foundered are rapidly ceasing to be a constraint. But the chief advantage of the Granger program—the availability of state-of-the-art alternatives to products of capitalist technology at a fraction of the price—is more relevant than ever. Tom Peters once gushed that 10% of the price of his new Minolta camera was parts and labor, and the rest was "intellect." He celebrated an economy in which most of the price of manufactured goods resulted, not from the actual costs of production, but from embedded rents on artificial property rights—and in which we work several times as long as necessary to pay tribute to the rentiers who "own" those artificial property rights. Competition from open-source manufacturing will have the same effect on that portion of price as salt on a garden slug.

Unlike capitalist industry, open-source design networks in cooperation with low-overhead micro-manufacturers have no perverse incentives to maximize utilization of capacity through planned obsolescence and other push-distribution techniques. So generator designs can be modular, with a view to durability and cheap, easy repair.

In short, cheap micro-manufacturing technology and stigmergic organization offer the cooperative movement and the entire alternative economy the potential to act as an "army of Davids," or a swarm of piranha. This piranha swarm however reinvigorates free market competition, works to drive down *total* costs of day-to-day needs, and thereby frees people from the shackles of dehumanizing, non-subsistence, low-wage labor, and puts individuals and communities back in the driver's seat of their personal and collective livelihoods.

Barriers To Cooperative Innovation

Cooperative enterprise in the United States do not have a history of, for lack of a better word, cooperating. Cooperative businesses have for a long time worked together through their national associations to seek changes in public policy, and pool resources for capital investment endeavors. However, true coordinated, cooperative endeavors are somewhat foreign to the various sectors of US cooperatives.

One of the simplest policy innovations that would allow cooperatives to compete more effectively in a market economy is a removal of subsidies and tax incentives which privileges corporate energy models to the detriments of cooperative energy models.

Another barrier is the imposition of artificial capital outlay costs and overhead costs on production, in order to protect large, bureaucratic corporate dinosaurs from competition by small, networked, low-overhead producers.