

# ANARCHY AND THE STONE EDGE MICRO-GRID

Mac McQuown battles assumptions, false premises, and obsolete rules to create the future of home energy.

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John “Mac” McQuown doesn’t much look like an anarchist, whatever an anarchist is supposed to look like. Photos from the turn of the 20th century—when anarchism was a vocal and violent movement in America confronting the captains of finance and industry, when there were assassination attempts against millionaires and a bomb blast killed 39 people on Wall Street—often show people dressed in black, some bearded, angry fists raised.

Mac (which is what everyone calls him) looks like a distinguished college professor, perhaps a Wall Street banker or a high-ranking military officer. On the far side of 80, he is still trim, square-jawed, energetic, with neatly trimmed silver hair, penetrating eyes, and a thoughtful, even voice with traces

of his Illinois roots. He does not even remotely resemble anyone’s idea of an anarchist. He doesn’t care.

“You don’t need a government,” he insists. “Governments are enemies of the people. And by the way, that’s been the case for 2,000 years. But people haven’t been willing to notice that because it’s baked into the culture that we need a government, and it’s predicated on unverifiable assumptions. And until the human condition gets clear about the reality of some of these institutions that they’ve created for themselves, they’re going to continue to be exploited by those institutions.”

Wait. What?

Mac McQuown, has an MBA from Harvard, he spent two years as an officer in the U.S. Navy and, more to the point, he is a legendary capitalist who



helped shape, and then drove, perhaps the greatest revolution in investing, through creation of equity index funds, based on the use of thorough data analysis. Bloomberg Markets magazine called him, "one of the architects of the modern investing system." He pioneered the use of data analysis at Wells Fargo Bank, co-founded Wells Fargo Investment Advisors (now part of the giant New York global investment firm Blackrock, which has more assets under management than the GDP of Japan), started or co-started at least a dozen other companies in financial services, technology, and wine - including Sonoma Valley's Chalone Wine Group—and now has settled on his 16-acre Stone Edge Farm, bordering Carriger Road.

There, his wife, Leslie—an interior and exterior designer—has sculpted and orchestrated an eclectic set of motifs into an elegant, organic, and somewhat exotic landscape encompassing a vineyard, flower and vegetable gardens, a veritable campus of offices, meeting rooms, research space, workshops, sculptures, a family home, a lap pool fronting a fully functional celestial observatory remotely controlled by two or three universities, and a stunning stone pyramid constructed with rocks cleared from the fields and vineyard, all punctuated by an extraordinary array of enormous, sprawling, heritage oak trees, some up to 600 years old and so big they create their own ecosystems and stop visitors in their tracks.

Mac credits Leslie with the Stone Edge aesthetic vision. "Mind you, she would tell you that she's a design whore. She takes anybody's ideas she can possibly make use of. She hires various designers, consultants, architects, engineers, and she uses them. But she's the one who has the aesthetic sense. She's just extraordinarily creative, and she's very humble about it."

But the aesthetic sense is only part of the picture. Every element of Stone Edge Farm—the buildings, the gardens, the vineyards, the water system, the pavement, the paths, the use of native stone—is designed and engineered for maximum efficiency and minimum impact on the environment. Every thing that grows is organic. Water systems are completely engineered with soil mois-



gas fuel cell, largely as an experiment, and he hired Craig Wooster, CEO of Wooster Energy Engineering, to install it. Wooster turned out to be heaven-sent, a brilliant, ebullient, force of nature, totally committed to creating energy systems for a more sustainable world. Craig and Mac were an ideal match, combining a shared and evolving vision to take existing technology as far as they could stretch it to the outer edge of energy efficiency, in an ideal location with enough financial heft to do whatever heavy lifting the goal required. They had, in effect, a giant adult sandbox in which to play and in which they came to the conclusion that, despite the current cost benefit of solar energy, hydrogen is the wave of the future.

So now there is a giant electrolyzer, powered by solar cells, filling a shipping container, that could, if he needed it, give Mac 200 kilograms of hydrogen gas a day by splitting the hydrogen from water. He now has hydrogen "gas" pumps to fuel three hydrogen cars and expects to have more as soon as the big electrolyzer is online. "We can make hydrogen when we have a super abundance of solar," says Mac, "which is in the summer, and use it in the winter. We just store it at low pressure."

The clear focus of all this technology did not take final shape until, as Mac explains it, "One day Craig said to me, 'You know what? This place would lend itself for creating a micro-grid.' And I said, 'So, what is that?' So, he gave me his rendition of a micro-grid and that really quite appealed to me from a number of points of view."

Just like that, Stone Edge Farm became a living laboratory for refining and adapting existing technology into an interconnected, networked and, ultimately, autonomous electric grid no longer dependent on the enduring but increasingly precarious power paradigm—the giant utility, in this case PG&E.

It is in this contrary context that Mac McQuown still insists on the persuasive logic of anarchy, which has been claimed, it must be said, by such a wide swath of social and political activists it's hard to pin down a precise meaning for the term, although it is almost always focused against centralized government and concentrated wealth. Caught up







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at least descriptively in the web of anarchy are such disparate historic figures as Che Guevara, Vladimir Lenin, Emma Goldman, Jean-Paul Sartre, Karl Marx, Noam Chomsky, Mahatma Gandhi, Ursula Le Guin, Leo Tolstoy, Howard Zinn, the Unibomber Ted Kaczynski and the singer Bjork. A rather eclectic group.

McQuown routinely hosts prominent people, recently including former California governor Jerry Brown, who was contemplating a micro-grid for his 2,500-acre Colusa ranch. The casual conversation had the inevitable political content, which always includes what Mac considers “unverified assumptions.”

Following the meeting, one of Mac’s team members told him, “I noticed that you did not tell Jerry that you were an anarchist.” To which Mac replied, “That’s true, but I can tell you right now, after that discussion I’m more of an anarchist than ever. And you think I’m kidding. I am not kidding.”

Assumptions, argues McQuown, are the root of much evil. “You only make assumptions when you’re forced to do that, right? And we operate on a whole ton of implicit assumptions that we’re not cognizant of. Some of those were handed down innocently from our parents, some from our teachers, some from our neighbors, some from our politicians and some from our leading lights. They came from all kinds of places. But the analytical way of looking at the world is to get rid of assumptions. And you

get rid of the assumptions with data. You actually figure out what’s going on. The environment is just a problem of figuring out what’s going on. And then when you figure it out, solving it. And you know damn well the government’s not going to solve it. You don’t have to be an anarchist to come to that conclusion.”

The environment is very much on McQuown’s mind, he’s profoundly concerned about climate change, and he’s been on the advisory council for the Scripps Institute of Oceanography for nearly 18 years, a relationship that has helped shape his ecological awareness.

“From that exposure,” he says, “I’ve gotten a big dose of sustainability. Oceans and atmosphere primarily, but also some geo stuff as well, mostly having to do with waste in all three of those instances. And I was increasingly conscious of the problem of energy.”

That problem is, of course, sobering. “Now that we have 400 parts per million of CO<sub>2</sub> in the atmosphere, 100 ppm put there in the last century—and the half-life of that stuff is measured in hundreds of years—what we have in the atmosphere today is more than sufficient to absolutely guarantee global warming whether we never put another kilo in the air or not. The only question is how much damage is global warming going to do and when? That we don’t know. There’s a lot of uncertainty in estimating that kind of impact.”

The hub of Stone Edge research that problem inspired also has a major educational component, born from a suggestion made by an MIT friend of Mac’s who was then dean of the university’s nuclear engineering school. “I told him what I was doing, working on this micro-grid idea, and he said, ‘Boy, this would be a great place for an intern.’ I said, can you get me an intern, and he said, ‘Are you kidding? Of course I can get you an intern.’ And that intern turned out to be Jorge.”

Jorge Elizondo, an MIT-schooled electrical engineer who became the first Stone Edge intern, has been one of its greatest assets, especially since the sudden, tragic death of Craig Wooster in October of 2018. Elizondo designed the controller technology that determines what power source is most economical





to use at any given point in time, the point being that solar is usually the best value during peak power periods when PG&E charges its highest rates, battery storage fills in the gaps at night, and hydrogen will be on hand as another alternative, as soon as the latest hydrogen hydrolyzer is fully online. The controller supports synergy between the various power sources, which adds resilience to the system in case of a malfunction.

Since that first internship, Stone Edge has now hosted, Mac thinks, "60-some interns, from 14 or 15 universities. They come for three or more months, mostly master's students, a few undergrads, and a few Ph.D.s.

They come, in part, as a result of Mac's anarchist inclinations, which support the absence of central control of anything and the premise of radically distributed power. As a result, everything developed at Stone Edge is open source, anyone can have access to the intellectual product, there are no patents, copyrights, or other forms of ownership. Mac McQuown is investing millions to shape an energy future that will provide him with no financial benefit, other than savings on his own enormous PG&E bill.

When you point this out, he answers with a quip attributed to Texas oil magnate H.L. Hunt. "What's capital for?" he says. "Hunt said capital is exactly like manure. If you let it pile up it stinks. If you spread it around a little, it makes things grow. Look, I've done very well

financially and I don't need to hoard dollars. I think it's more important that I demonstrate ideas with capital. Who is going to get the capital anyway? Universities? OK. That part's good. But I'm having fun doing things with capital that universities would have a difficult time doing because they would have to go to the provost for permission."

So what's the bottom line here? Where is the Stone Edge micro-grid leading?

By way of answer, Mac says, "What's interesting about micro-grids is they're both positively and negatively scalable. Now, let me give you an example of what I mean by "negatively." Jorge and I have a model for a 2,000-square-foot, single-family home built from scratch, the size dictated by how many solar panels we need. It has two cars in the garage that could be either electric or hydrogen, it doesn't matter. We capture rainwater that falls on the roof, and we store it in a cistern under the driveway. We have an electrolyzer in front of the garage.

"We have three batteries, two for the controller and one for bulk storage. We also have a tank with hydrogen. But we also have automobiles, and let's say they both have tanks with hydrogen, and we can put hydrogen in and we can take hydrogen out, by the way, in both directions. You can't do that with existing cars, but it would be easy as hell to do.

"What do we save by doing that? We don't buy any gasoline. And we don't

pay PG&E anything. That savings is enough to finance the marginal capital investment of the energy infrastructure. And the return on investment is 4 or 5 percent, which is perfectly reasonable for a virtually no-risk investment."

For this groundbreaking work, the Stone Edge micro-grid was named one of 13 winners of California's highest environmental honor, the Governor's Environmental and Economic Leadership Award, honoring individual, organizations, and businesses that have demonstrated exceptional leadership and have made notable contributions in conserving California's resources. Stone Edge Farm was one of five awardees in the Sustainable Practices category for its "advanced technology to generate, store, and distribute clean energy to its property and beyond."

So, from what Mac and Jorge know now, how far away are they from building that model house in Sonoma?

"Very close," says Mac. "Jorge and I are talking about building that house in 2020. We don't need any new technology at all. We just have to descale a few things, but there are no scale economies. That's another false premise of where there are scale economies and where there are not. Here's another one of my favorite expressions, 'The human condition is awash in noise, false premises and obsolete rules.'"

During the catastrophic wildfires of October, 2017, when virtually all of Sonoma Valley lost power for a day or more, Stone Edge Farm was still operational, an island of electric tranquility, fully functioning off the grid.

But an "obsolete" rule of the California Public Utility code may make it harder to do that again. CPUC Rule 21 imposes restrictions against both unplugging from the grid and supplying power to the grid, without specified smart inverter requirements, and because critics charge the state's utilities are worried about the prospect of mass departure of ratepayers.

To which the anarchist Mac McQuown responds, "My bottom line is, micro-grids are gonna displace all the utilities. There aren't going to be any utilities by the time your grandkids are full-grown. There will be no utility grids." 🌱