Nearly everyone complains from time to time that our tools have become Sorcerer’s Apprentices; that we have come to serve our machines instead of the other way around; and that, increasingly, our lives are regimented as if we ourselves were mere gears in a vast mechanism utterly beyond our control.

Strangely, few of the critics have discussed at any length the role of fossil fuels in the industrial revolution. That is, they have consistently focused their attention on tools’ impacts on society and nature, and on the political conditions and ideologies that enabled their adoption, rather than on the fact that most of the new tools that have appeared during the past two centuries are of a kind previously rare—ones that derived the energy for their operation not from muscle power, but from the burning of fuels.

And yet it appears to me now that, in assessing technology and understand-
Fantasy, Choices, and Action

The Perfect Storm

Looking at the horizon for signs of what’s in store for Vermont’s energy future, informed Vermonters are spotting the signs of trouble brewing — the convergence of conditions that form “a perfect storm.” Peak oil, climate change and GM’s recent announcement to cut 30,000 jobs spell disaster. Meanwhile, Commander-in-Chief Bush and the Cheney energy task force have ordered more drilling for oil, more subsidies for energy giants, more trust-us-we-know-best sloganeering.

Perfect storm is no exaggeration. The evidence is obvious. We Vermonters will pay double this year for our heat compared to the last two years. For those of us lucky enough to have natural gas, we’re feeling lucky to get the stuff at any price. Gasoline prices soared beyond $3/gallon, and we’re all praying for low $2’s when only a year ago the $2/gallon mark. And the “juice” itself? Utility watchdogs are spotting the signs of trouble brewing.

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Choosing Responsibility Over Learned Helplessness

America’s corporate media cleverly minimizes, distorts and/or avoids any challenge to the current cultural reality and our addiction to fossil fuels. Given the constant barrage of multi-million dollar marketing campaigns, thousands of local, state and federal laws, mountains of regulations and policies, endless streams of academic and think-tank studies, the netherworld of hidden subsidies, and the “juice” itself? Utility watchdogs are spotting the signs of trouble brewing.

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I love flying. I always have. The magic of seeing the world from so high up never ceases to enthrall me. I always insist on having a window seat. I have watched the landscape of America uninterrupted from coast to coast, the ocean lit by the lights of shipping lanes at sea and Ireland’s Burren, with its stepped limestone hills awash in the morning’s sun. Last Spring I traveled to Germany and observed Europe proper for the first time.

We flew into Leipzig, surrounded by a broad, flat landscape divided into an ancient agricultural patchwork. Much like America’s Midwest but lacking the rigid squares and circles. As we began our descent, the structures of man slowly materialized. To my surprise, the first things I spied were windmills. At such a height, I thought, they must be enormous! I could even observe them spinning slowly, in groups of three or four, scattered here and there. The very next identifiable buildings, I noted with interest, emerged as the unmistakable shapes of the immense round cooling towers of a nuclear power plant.

As I consider Vermont’s future, the energy question soon follows. Oil is becoming a more precious commodity day by day. Oil is the common denominator of the war on terror in Iraq and Afghanistan, including America’s threats to expand the conflict into Syria and Iran. The trade of oil in U.S. dollars largely props up the American economy. Saddam’s last “great offense” was selling his oil in Euros; the current Administration now threatens Iran with war for daring the same. While Americans have been paying over double last year’s price for gasoline, the oil companies have enjoyed two quarters of record-breaking profits. Echoing the shadows of the Enron scandal, a memo from Texaco discussed shutting down refineries in order to drive up prices — prior to 2005’s violent hurricane season. America’s dependence on oil is inextricably linked to Vermont’s desire to free itself from the shackles of Corporate Empire.

I’ve been blessed to have flown down Vermont’s Champlain Valley a couple times, taking in my homeland from its autumn riot of color to its winter starkness. The beauty of that landscape reminds me why I tolerate the various hardships I endure here, many of which are rooted in energy issues. During the height of Enron’s crimes in California, Howard Dean reminded us that our electric bills were still the most expensive in the country. I must subsidize my propane heat with the hard labor of cutting and chopping firewood. I am able to work at home, but still dependent on my automobile to procure the basic necessities of life. It’s often a struggle to pay my energy bills.

Yet despite these hardships, my feet remain steadfastly rooted in the soil of Vermont. It is the natural beauty, the abundance of space and the cultivated wildness that keep me here. What will happen to Vermont as the harsh harbingers of climate change, corporate malfeasance and oil wars disrupt the flow of oil and economy stability? As oil and natural gas become more expensive, solar, biomass and wind power will become complementary necessities. There’s no doubt about it.

I’m personally surprised that members of the environmental community often oppose wind power. After all, it’s a clean, renewable energy. It’s also reversible, unlike hydro with its immense civil works or nuclear power with tons of highly radioactive waste. If we decide we don’t like the wind turbines, we can simply dismantle and move them. I suspect that a lot of the arguments against wind power get cooked up in some non-renewable energy industry think-tank. “wind turbines kill birds,” or “wind generators are noisy,” and insidiously, “wind power will destroy the landscape.” I find these arguments ill informed or cleverly disingenuous. The wind turbines I saw in Germany offer another story.

As we drove through the countryside, crossing what used to be the boundary between Eastern and Western Germany, I noticed that much like Vermont, this agricultural region had managed to avoid many of the scourges of modern development. The industrial structures of communism were already in decay; the buildings that anchored the landscape were the small farmhouses and villages solidly built long ago. When we passed near some of the windmills I’d seen from the plane, I was amazed at their height: easily 200-300 feet tall, with blades around 100 feet long. Entancing, silent, spinning slowly and elegantly on a blustery day. Their clean white design accented the landscape, contrasting with the rustic farmland. Here, I thought, simple rural beauty and sleek modern shapes work together to bring us back and forth in time.

We took a train from Heldrungen, a little village with a lovely castle to Halle, an empty old industrial city just Southwest of Berlin. Along the ride I chanced to talk with a German fellow named David. He pleasantly rattled off a wealth of local history, answering more than a few questions as we passed through the countryside. I asked him about what appeared to be man-made mountains looming quiteominously in the distance. These, as it turned out, were monuments to the Soviet nuclear endeavors of the Cold War: absurdly huge anthills from old uranium mines. They were still considered to be low-level radiation risks, especially the water runoff. I remembered that Chernobyl, from thousand miles east of Germany, actually managed to dump a significant amount of radiation on Montpelier of all places, when a severe thunderstorm grew high enough to tap into the contaminated upper atmosphere. David admitted that he’d rather see the windmills than deal with the environmental damages of nuclear power.

The landscape of Vermont is precious, there’s no doubt about it. Some say that it should be protected because it brings tourism and money to the state. I could care less about the money. Vermont’s beauty has a value far beyond any tourist dollars it might bring. Yet for all its natural beauty, there is the unmistakable mark of the human hand upon the hills. Farms with old tractors and enormous silos, unkempt houses and yards with rusting autos, a roadside cliff bearing the marks of high school pride from as far back as 1969. These things conspire with nature to create an aesthetic that still somehow satisfies. I used to hate the vertical clear-cuts of the ski resorts. I have hiked many sections of the Long Trail, and walked right past ski lifts in the seeming solitude of the mountains. I stopped one day and had lunch on a huge ski lift platform. It occurred to me that it wasn’t so bad after all. The empty trail in the bloom of summer gave me a sweeping view of the Mad River Valley and reminded me that skiing, for better or worse, is intrinsically part of Vermont.

I wonder what else will become intrinsic to the concept of Vermont as, inevitably, new trends fuse with old ways. As Vermont grows with or without the United States, I hope we can employ our collective foresight to make difficult decisions about our energy use. I hope we can find a way to scale down and yet live comfortably. I hope we can find a way to do this while maintaining the beauty of Vermont.

Like my German guide David, I, too, would...

Liability: the Price-Anderson Exemption
In his book The Corporation, The Pathological Pursuit of Profit and Power, Joel Bakan explains that a psychopath is a person who has no remorse, and takes no responsibility for their actions. By creating corporations, people who work for them have no personal liability for the actions of the company. This is recipe for creating irresponsible people, perhaps even psychopaths. But the corporation itself, a fictitious person created by the state, is still liable for its actions. But getting a settlement against a multi-billion dollar corporation like Entergy, Vermont Yankee’s owners, would be another story.

But Price-Anderson even removes the litigation option. “Liability laws in the United States provide for actual damages as well as punitive damages to punish irresponsible behavior; as a consequence, businesses are motivated to act responsibly or face devastating losses in court.” But we learn that learn that Price-Anderson “suspends U.S. liability laws for nuclear power plants.” (http://en.wikipedia.org/wiki/Price-Anderson_Nuclear_Indemnity_Act). More precisely: “The law provides no fault liability for reactor operators, and injured victims are precluded from directly suing vendors or manufacturers responsible for the accident. Its critics argue that it poses legal hurdles to victims seeking compensation by removing state jurisdiction and restricts plaintiffs ability to utilize any state laws which go above and beyond federal protections.”

Price-Anderson takes corporate limited liability one-step further into the twilight zone of unaccountability. Not only are the people who work for the company shielded by the corporate veil, but the company itself is off the hook in case of an accident. Congress has them covered. Try getting that deal for your auto shop from Uncle Sam!

Safety: the Nuclear Regulatory Commission Guaranteed Seal of Approval
Another point about nuclear power plants: States have no jurisdiction over safety issues. Safely concerns fall entirely under the jurisdiction of the federal Nuclear Regulatory Commission (NRC). That’s the agency that replaced the Atomic Energy Agency (AEC) in 1974. The AEC was given the job to “promote AND regulate” nuclear power in the US. Talk about a conflict of interest. Put a bunch of industry nuclear engineers into an agency to oversee nuclear power, and surprise! New name, same agency. Let’s more promotin’ than regulatin’ goin’ on. Lest we forget, Three Mile Island still happened in 1979. For three days, the plant’s operators, with virtually no backup from a clueless NRC, barely avoided a complete meltdown. A real disaster that narrowly missed being the “big one.”

Trust us now,” the NRC intoned! Just like we should have trusted the SEC to regulate Enron and other corporate scammers.

So when the current operators of Vermont Yankee (Entergy of Louisiana) recently discovered faulty welds, wrestled with a transformer fire, photographed cracks in the reactor steam-drier and lost several spent fuel rods in their storage pool, no one in Vermont was allowed to decide if the plant was safe or not. Only the NRC can decide. At this very moment Entergy is pushing for a 20% increase in power and behaving as if this “upgrade” is already a done-deal. Here’s a plant built in 1971 that is nearing the end of its 40-year design life and the owners want to experiment with running it hotter — higher temperatures, greater steam flow and radioactivity.

Would you take a 1972 muscle car with high mileage and hop-up the horsepower by 20%? You’d be asking to blow a head gasket, turn a crank bearing, or throw a rod. It might work, but you’d probably have to rebuild the block first with new pistons, rings, and bearings. If it breaks, you might blow a little smoke after emptying your bank account, but no harm done. Entergy’s not even rebuilding the plant’s “lower end.” They’re going to “turbo-charge” Vermont Yankee and put the pedal-to-the-metal. If Vermont Yankee fails, there’s gonna’ be more than a little smoke in the neighborhood.

But not to worry, the NRC is on the job! States have no right to regulate the most dangerous industry in their neighborhood. If it fails, Vermont will be like the freshman “Flounder” in Animal House after his fraternity brothers wrecked his car. Belushi tells this chump, “Hey, you f***ed up. You trusted us.”

Chernobyl-level Disasters: Price-Anderson in Action
Let’s see how the combination of limited insurance, lack of accountability and self-regulation stacks up with a severe nuclear accident. The 1986 Chernobyl nuclear accident has cost Ukraine, Belarus and southern Russia an estimated $350 billion. Getting an accurate death toll from Chernobyl is difficult, but the World Health Organization seems the least biased source, and they claim approximately 4000 people will eventually die from effects of the accident. (http://www.who.int/mort/diabetes/en/) The WHO report also states that “five million people currently live in areas of Belarus, Russia and Ukraine that are contaminated with radionuclides due to the accident; about 100 000 of them live in areas classified in the past by government authorities as areas of “strict control”. Relocation proved a “deeply traumatic experience” for some 350,000 people moved out of the affected areas.

Persistent myths and misperceptions about the threat of radiation have resulted in “paralyzing fatalism” among residents of affected areas.”
If I want to start a business, and one single person might be harmed, I need a million dollar policy because injury or death to one person is going to cost someone a million bucks in damages. I’ve been operating autos and boats for 35 years and have never caused injury to anyone. No one subsidizes my insurance.

The global nuclear industry has already killed thousands of people, yet they get a free ride. If 5 million Americans were affected by a Chernobyl-level nuclear accident and sued for $1 million bucks each, the total would be 5 Trillion dollars. Compare that to their coverage of $10 Billion. Would this fly in the Republic of Vermont?

Why do we put up with Vermont Yankee? Because they sell us power for 4 cents a kilowatt-hour. But this is a Faustian bargain, a false economy where the true costs and risks are hidden by insurance limits and federal assurances.

Chernobyl Could Never Happen Here: The NRC and Homeland Security

Chernobyl couldn’t happen here! If one of the 9-11 hijackers really wanted to damage the United States, he would have flown an aircraft into any number of commercial nuclear plants. Vermont Yankee would be an especially attractive target due to its elevated and exposed spent fuel storage pool. One airplane, a fire in the spent fuel pool, a plume of radioactivity and a 75-mile radius of contamination. New Hampshire, Massachusetts and New York would be uninhabitable for hundreds of years.

But Vermont has no authority to decide if Yankee could survive such a hit, or any other form of terrorism or sabotage. Federal jurisdiction. Let the NRC and Homeland Security watch our backs.

Here’s a secessionist idea for you. The federal government doesn’t recognize medical marijuana legislation passed in Vermont and many other states. Fine, you boozing, pill-popping hypocrites. Vermont doesn’t recognize Price-Anderson passed in Washington, DC. Energy go buy insurance. Try to survive in the “free” market.

Or how about this one. Washington doesn’t want to recognize civil unions formed in Vermont. Fine, you solo inhabitants of the higher moral ground. Vermont retains the right to grant charters of incorporation based on the corporation’s responsibility to meet the public good. The Republic of Vermont hereby revokes Energy’s charter to conduct business in Vermont.

Burlington’s Clean Power Mix

Editor’s interview with BED’s Patty Richards

Burlington Electric Department (BED) has joined its sixteen sister municipal and cooperative utilities in leading the electric utility industry in Vermont towards a greater degree of energy independence and commitment to renewable sources. Here’s Director of Resource Planning Patty Richard’s introduction to BED’s energy future.

Q. From your perspective, what is the current percentage of BED’s contribution to Vermont’s electrical supply?

BED is a municipal utility that serves electricity to the City of Burlington and the Burlington International Airport. Hence I’ll answer this question related Burlington’s power supply mix and power use in the City. Burlington’s peak load is approximately 60/69 MW’s and retail sales are approximately 353,000 MWH’s or 6% of the state of Vermont electricity sales. The City of Burlington’s power supply is comprised of commercial and industrial sources, and is made up of approximately 46% renewables of which only 4% is large hydro from the Niagara Falls region in New York. BED has no Hydro Quebec power in its mix. See chart below for more details.

Q. What is the potential contribution of renewable sources, considering fuel source, technological improvements, investment appeal, etc.?

BED plans to continue seeking additional renewable sources of power and doing so on a long-term basis managed with fiscal prudence and balance. In 1998 BED only had 30% renewables. In 7 years BED has increased its sources of renewables by 16% which is a growth rate of 2.3% per year. If BED is able to continue this trend, within a decade it conceivably could obtain over 60% of its power from renewable sources. While this is a future “what if” scenario we must also balance additional renewable supplies with BED’s overall financial outlook. Good fiscal management is imperative as we continue to do the right thing for consumers in our resource decisions. This speaks to having a balanced power supply portfolio and many differing sources of power available to meet Burlington’s energy needs.

Q. What are the barriers to improving on the future level of contribution? Local resistance (NIMBY responses, ordinances), State hurdles (regs, political will/idéology, corporate agendas) and/or Federal-level barriers and others like “not-so-free” market economies.

For renewable power to grow in the state of Vermont, education of the general public is a key determinant. Local resistance has plagued the advancement of not only renewable power efforts like wind development but it has also stalled and increased the cost for development of infrastructure improvements like transmission lines. As long as people use electricity it has to come from somewhere and that somewhere must balance cost, environmental impacts, and reliability. Today the state of Vermont is over dependent on out-of-state supplied power, and we have largely impacted others for our state’s energy consumption. The future will not hold the same conditions as out-of-state development gets more difficult and expensive, and we rely on transmission line expansion to get power to Vermont. Vermonters will be forced to accept generation development at some point, and the question is what do we build here. If we don’t grow the system, then reliability and power will not be as freely and cheaply accessible as it is today.

Hence the barriers include NIMBYism, ordinance restrictions, regulatory delays, perceived lack of development environment, etc. Property tax law is also a problem with the advent of Act 60/69. In the past, communities were willing to accept development as it contributed to local property tax base to fund schools and municipal services. With property taxes going to the State fund, most towns no longer accept the developer’s claims that the project will lower the town’s tax burden. This is a real problem that creates a disincentive for communities to support development!

Q. Any sense of how close Vermont can come to “Energy Independence” and how that might happen.

Energy Independence can mean a number of things to a number of people. If you mean independence within our State and being self-sufficient by not importing power from out-of-state sources, then we’ve got a lot of work to do. Vermont can become energy independent, but that means a balance of renewables, base-loaded plants like Vermont Yankee, and intermediate resources like the McNeil generating station. With a diverse power supply we can be independent but we must recognize that goal will require all sorts of power including renewables. Today we import the majority of our electricity from out-of-state supplies. To cut the cord to other states will require large amounts of development that many Vermonters would likely resist.

If you mean energy independency from fossil fuel sources that are not US-based then the challenge is even greater. Does this mean we should stop trying? Absolutely not. If we take small steps each year over time you’ll find our energy independence will grow. Just like BED has done over the past 7 years, Vermont should gradually get used to new technologies like wind development and over time consumers become supporters instead of opponents.
Vermonter Transportation, Energy, and Sovereignty

By Gary Flomenhoff and Rick Foley

Obvious problems, Obvious solutions

What federal energy policy would result in the greatest reduction in fossil fuel use and dependence on imported oil from countries that hate the United States? Since transportation is 99% dependent on petroleum and accounts for 2/3 of US oil consumption, the obvious policy would be to increase vehicle fuel mileage. There are two ways to accomplish this: increase gas mileage standards (CAFE standards) for manufacturers, or increase the price of gas to consumers through a gasoline or energy tax. Supply side or demand side, either would work. What two policies have been impossible to obtain at the federal level for 20 years? Higher CAFE standards or higher gas taxes. Furthermore, federal law pre-empts state law in the area of fuel mileage; states have no jurisdiction over vehicle mileage standards, just as states may not regulate nuclear power plant safety. Gasoline and other energy taxes, however, can be implemented at the state level.

Here’s an instructive example of “let the feds take care of it.” In 1992 the federal government undertook to create a national energy plan. The 1992 Federal Energy Policy Act was developed by a commission headed by Admiral James Watkins and was formulated by a very inclusive process including months of deliberation, public hearings, collaboration and input from many federal agencies. (Compare this to Vice-President Cheney’s process of secret, back-door meetings with oil companies). When the proposal got close to implementation it became apparent that two policies, were off the table: Higher gas taxes and higher CAFE standards. Since then higher CAFE standards for both cars and trucks have been shot down by Congress on every attempt to bring a bill forward. Results of this policy are apparent in the graph below from EPA. Average automobile gas mileage peaked in 1987 and has been declining ever since.

The primary reason for this is not that CAFE standards have been lowered. Cleverly automotive companies have exploited a loophole to bypass the higher CAFE requirement for passenger vehicles. How’s that? SUVs are considered trucks! When the original law created two categories of vehicles: cars and light trucks, the intent was not to penalize the small business that might use a pickup for a landscape or other business. 90% of vehicles were cars and 10% were trucks. The standard is currently 27.5 mpg for new cars and 21 for new trucks. In the past fifteen years the automotive industry has brilliantly marketed SUVs as the urban/suburban vehicle-of-choice. There are now more SUV/trucks than cars on America’s roads, and the “average” for total vehicle mileage has been dragged down toward the lower SUV/truck standard.

Q) What is the logic of reducing gas mileage in a country that had its oil extraction peak in 1970, currently imports 56% of its oil, and spends billions protecting its supply of oil from unstable countries in the middle east, including over $200 billion so far on the ruinous war in Iraq?

A) It’s very logical if you are a US automaker or oil company. Car companies have a higher profit margin on big cars, and oil companies don’t make money selling less gasoline and diesel.

Q) What does this have to do with federal energy policy?

A) Everything in “Corporate America.”

It’s no longer “What’s good for General Motors, is good for America”, as we heard in the 50’s. Now General Motors, ESSO et al are America. The federal government has become a wholly-owned subsidiary of “Corporate America,” especially the car and oil companies.

Sovereignty requires bold steps I: Vermont CAVV Standards

What could Vermont do as an independent, sovereign state? Although Vermont is an insignificant automobile market, we could pass our own “CAFE-like” standards for cars and avoid the blackball of federal pre-emption. We could fashion our increased gas mileage standards as emission regulations or a form of carbon tax much as California has developed its California-only emission regulations. We could call them “Carbon Assessments for Vermont Vehicles” (CAVV), pronounce the acronym as in the verb to ‘calve’ (with a nod to Vermont dairy farmers) and understand that we’re really referring to the expression to “calve off” because we intend to use the new source of funds to promote Vermont’s agenda, not the federal government’s black hole.

The argument that the fuel efficiency technology is not available is ancient history. New “plug-in hybrids” made from modified Toyota Prius vehicles get from 80-250 miles per gallon. Several aftermarket companies are modifying these vehicles into plug-in hybrids that allow for up to 60 miles range on electric-drive only using extra lithium batteries. A high-tech cottage industry could emerge to modify hybrid vehicles into plug-ins if the car companies won’t do it. Indications are that they (the Japanese) will do it anyway. The saying in the auto business is that when a new regulation is passed, Detroit hires lawyers and Japan hires engineers. Michael E. Porter from Harvard’s Competitiveness Institute has made a strong case that far from wrecking the economy, environmental regulations spur innovation and technology, and create whole new industries.

Result: More local innovation, less money leaving the state for fuel, cleaner air and fewer greenhouse gas emission.

Sovereignty requires bold steps II: Vermont Sustainable Energy Investments

Another approach is higher gas or energy taxes — either can be rationalized as forms of carbon tax. Although less popular, it is something Vermont could do now without federal restriction or pre-emption. In the past people have complained about the higher prices that would be induced by more gas taxes. During the recent Katrina disaster we saw the price of gas increase 75 cents in two days. The economy barely noticed. A 2000 study by the Vermont Fair Tax Coalition (Taxing Pollution) and updated in 2004 by UVM indicates that a $100/ton carbon tax will increase the price of gas only 10 cents. Revenue of approximately $175 million would be generated compared to the current total from energy taxes of $116 Million providing $59 million in extra revenue. Nine European countries (several more are considering this strategy) currently use carbon taxes based not only fuel consumption, but also all fossil fuel use. Vermonters...
could learn from the European experience, but we could call the additional tax revenues as the Vermont Sustainable Energy Investments (VSEI pronounced v-say).

Let’s round off the $59 million to $60 million-a-year and project some wise investments for VSEI. First, we could use $20 million/year to provide rebates to low-income households to avoid SVEI from acting as a flat tax, and putting the burden on those lease able to afford it. Sustainability starts with economically viable households.

Secondly, VSEI could allocate $15 million/year to increase investments in the currently very successful energy efficiency and renewable energy programs such as Efficiency Vermont and the Weatherization Assistance program. The Vermont DPS has estimated that given a modest 1% increase in fuel taxes dedicated to home weatherization, 6,550 additional homes could be served, reducing CO2 emissions by 34,000 tons and trimming 968 KWH from electricity bills. Another $5 million/year could fund the proposed Clean Energy Fund. As currently configured under the recent ACT 74, the Clean Energy Fund will come from Entergy, the corporate owner of the Vermont Yankee nuclear power plant, as a condition of the State’s approval of the plant’s proposed 20% power uprate. A complicated deal, which overlaps into Entergy’s plans to seek approval of dry cask storage and a 20-year operating license extension. Many have termed this a “deal with the devil.” There’s a real moral question trading support for the expansion of a non-renewable, highly polluting industry, on one hand, to underwrite clean energy initiatives, on the other hand.

Some folks dismiss such “alternative” efforts as little more than window dressing. But it is a little known fact that all of the increased electricity demands in Vermont since 1984 have been met by instate renewables and efficiency:

- 40 MW - small hydro, IPP, WEC, GMP
- 88 MW - McNeil and Ryegate wood chip plants
- 6 MW - Searsburg wind project
- small landfill gas projects – Brattleboro and Burlington
- 80MW met by Efficiency Vermont programs

Finally, what to do with that outstanding $20 million/year? We could use these funds to help underwrite the mortgage that would enable Vermont to finally purchase the hydroelectric dams on the Connecticut and Deerfield rivers. These dams represent one of the most productive properties that comprise our Vermont “commons.” They would produce 18-20% of our current electrical demand and replace in fell swoop more than 60% of Vermont Yankee’s contribution. Let the negotiations with TransCanada begin.

In short, further exploration of concepts like the Vermont CAVV standards and VSEI will take courage, an upfront admission of our shared addiction to unsustainable fuel sources and a commitment to a higher moral ground. Are Vermonters willing to pay their own way — carbon-taxing themselves — towards a more energy independent future? What better way to announce our sovereignty? •
work supporting economy; today the percentage is negligible: virtually all work is done by fuel-fed machines. Slavery was a strategy for capturing human muscle power, and the end of most overt slavery during the 19th century was more or less inevitable when Class D tools became cheaper to own and keep than human slaves—or domesticated animals, for that matter.

In early civilizations, agricultural workers sought to capture a surplus of solar energy on a yearly basis by plowing and reaping. It always takes energy to get energy (it takes effort to sow seeds, build a windmill, or drill an oil well). For agricultural societies, the net-energy profit was always moderate and sometimes nonexistent (hence recurrent famines): in most cases about 90 percent of the population had to work at farming in order to provide enough of a surplus so as to support the rest of the social edifice—including the warrior, priestly, and administrative classes. The extraction of coal, and especially of oil and natural gas—substances representing millions of years of accumulated past biotic energy—that have provided a spectacular net-energy profit, sometimes on the order of 50 to 100 units obtained for every one invested. As a result, with fossil fuels and modern machinery, only two percent of the population need to farm in order to support the rest of society, enabling the flourishing of a growing middle class composed of a dizzying array of specialists.

Increasing specialization was also enabled by a flourishing of differing types of machines, and that differentiation itself was fueled (quite literally) by the availability of cheap energy to make them go. Labor productivity increased relentlessly, not because people worked longer or harder, but because they had access to an increasing array of powerful, extrusomatically powered tools.

Hungry Tools

The availability of Class D tools produced excitement and wonder—initially among the few people who owned them, and also among the crafty and highly motivated inventors available for hire. These were tools that were, in a sense, alive: they consumed a kind of food, in the form of coal or oil (indirectly so in the case of electrical power), and had their own internal metabolism. Gradually, as mechanized production showed itself capable of producing more goods and gadgets than could possibly be soaked up by the wealthy elites, the latter devised the strategy of creating a consumer society in which anyone could own labor-saving machinery. The rank and file was soon persuaded of the dream of eliminating drudgery. And, due to the scale of the energies being unleashed, the fulfillment of that dream seemed well within reach.

That scale is difficult to comprehend without using familiar examples. Think for a moment of the effort required to push—for only a few feet—an automobile that has run out of gas. Now imagine pushing it twenty miles. This is, of course, the service provided by a single gallon of gasoline, and it represents the energy equivalent of at least a month of human labor (much more than this by some accounts). The amount of gasoline, diesel, and kerosene fuels used in the US in one day has roughly the energy equivalence of 20,000,000 person-years of work. If the building of the Great Pyramid required 10,000 people working for 20 years, then the petroleum-based energy used in the US on an average day could—in principle, given the available stone and machinery—build 100 Great Pyramids. Of course, we don’t use our oil for this purpose: instead we use it mostly to push millions of heavy metal cars along roadways so that we can get to and from jobs, restaurants, and video rental stores.

What does it take to do all of this? It takes 84 million barrels of oil per day globally, as well as millions of tons of coal and billions of cubic feet of natural gas. The supply network for these fuels is globe-spanning and awesome. Yet, from the standpoint of the end user, this network is practically invisible and easily taken for granted. We flip the switch, pump the gas, or turn up the thermostat with hardly a thought to the processes of extraction we draw upon, or the environmental horrors entailed.

The machines themselves have become so sophisticated, their services so seductive, that they are equivalent to magic. But what is more important, in the process of becoming dependent upon them, we have become almost a different species from our recent ancestors.

Infrastructure Matters

To understand how we have become so different, how different we have become, and also how the end of cheap extrasomatic energy is likely to impact us, and the society in which we are embedded, it is helpful to draw another lesson from cultural anthropology.

Comparative studies of human societies have consistently shown that the latter are best classified on the basis of their members’ means of obtaining food. Thus we commonly speak of hunting-and-gathering societies, horticultural societies, agricultural societies, fishing societies, herding societies, and industrial societies. The point is, if you know how people get their food, you can predict most of the rest of their social forms—their decision-making and child-rearing customs, spiritual practices, and so on. Of course, from a biological point of view, food is energy. And so what we are saying is that understanding energy sources is essential to understanding human societies. Anthropologist Marvin Harris identified three basic elements present in every human society:

- **infrastructure** (which consists of the means of obtaining and processing necessary energy and materials from nature—i.e., the means of production);
- **structure** (which consists of human-to-human decision-making and resource-allocating activities), and
- **superstructure** (consisting of the ideas, rituals, ethics, and myths that serve to explain the universe and coordinate human behavior).

Change at any of these levels can affect the others: the emergence of a new religion or a political revolution, for example, can change people’s lives in real, significant ways. However, the fact that so many cultural forms seem consistently to cluster around ways of obtaining food suggests that fundamental cultural change occurs at the infrastructural level: if people switch, for example, from hunting to plantings, or from planting to herding, their politics and spirituality are bound to shift as well, and probably in profound ways.

The industrial revolution represented one of history’s basic infrastructural shifts; everything about human society changed as a result. This revolution did not come about primarily because of religious or political developments, but because a few prior inventions (steel, gears, and a primitive steam engine—i.e., Class B and C and simple Class D tools) came together in the presence of an abundant new energy source: fossil fuels—first coal, then oil and natural gas.

**What Hath Hydrocarbon Wrought?**

What have been the structural and superstructural impacts of industrialism?

Because only a reduced portion of the populace is required to work the land (now with tractors and harvesters rather than oxen) in order to produce food-energy, a large majority of the populace has lost direct connection with the land and with the cycles of nature. If hunters get their food-energy from hunting, we get ours from shopping at the supermarket.

The ensuing proliferation, at first of factory work, and later of specialized occupations, has led to the development of universal compulsory public education and the idea of the “job”—a notion that most people today take for granted, but that seems strange, demeaning, and confining to people in non-industrial cultures.

With the expansion of the educated middle class, simple monarchal forms of government soon ceased to be defensible. By the latter part of the 18th century, a trend was well established, within industrial nations, of revolution and the widespread and growing expectation of democratic participation in governance—though of course that expectation was quickly hijacked by the new industrial ruling classes. Somewhat later, the economic exploitation of labor that typified both previous agricultural civilizations and the new industrial states also became the target of revolution; once again, the effect of revolution was primarily merely to rearrange deck chairs: people’s actual daily work and psychic life were still being shaped by machines, and, at a deeper level, the energy sources that propelled them.

We must remember that industrialism followed on the heels of the European takeover of the resources and labor of most of the rest of the world during centuries of conquest and colonialism. Thus the experience and expectation of economic growth had already insinuated themselves into the minds of members of the European merchant class before industrialism took hold. After the commencement of the fuel revolution, with vastly more energy available per capita, economic activity achieved seemingly perpetual logarithmic growth, and economic theories emerged not only to explain this growth in terms of “markets” but to affirm that now, because of markets, growth was necessary, inevitable, and unending; world without end, amen. Fractional-reserve banking,
based on the wonder of compound interest, served as the practical embodiment of these new expectations. In effect, within the minds of society’s managers and policy makers, faith in technology and markets supplanted previous religious faith in the hallucinated agricultural and herding deities that had presided over Western civilization for the previous couple of millennia.

In the early 20th century, as mechanized production mushroomed to swamp existing demand (among people who mostly still lived rurally and fairly self-sufficiently) for manufactured products, elites began experimenting with mass propaganda in the form of advertising and public relations. Later, television would dramatically increase the effectiveness of these efforts, which amounted to nothing less than the regimentation of the human imagination according to the demands of the capitalist-industrial system.

Since women were now needed both as consumers and workers in order to continue the perpetual expansion of that system, feminism (via the destruction of old domestic roles and the promotion of new ambitions and consumer tastes) became an inevitable byproduct.

Of course, many—though not all—of these changes were destructive both of people and nature. And so, while most of the political struggles of the 20th century centered on questions of the distribution of power and wealth (as had been the case since the first agricultural surpluses were laid aside ten thousand years ago), many of those struggles also grew from efforts to control technology’s caustic impacts, which were linked by the social critics both to tools themselves and to people’s attitudes toward them. Technological politics focused on a range of issues: nuclear weapons and nuclear power, polluting chemicals, ozone-destroying chlorofluorocarbons, greenhouse gases, and the genetic engineering of food, to name only a few familiar examples.

**Peak Oil and the Limits of Technology**

With the discourse on Peak Oil that has commenced mostly since the beginning of the new millennium has come a focus on energy as a determining factor in social evolution, at least as important as technology per se, or ideas, or political struggles. And with that shift has also come the sense that it is resource limits that will probably eventually drive basic cultural change, rather than moral persuasion, mass enlightenment, or some new invention.

As oil and gas prices rise, signaling the commencement of the peak oil period, we continue to see the rollout of new inventions in the form of the latest iPod, the next generation of nuclear bombs, improved surveillance tools, and so on. However, there is also evidence that this stream of new inventions, like the global stream of oil, is starting to dry up.

Peak Oil will be a fundamental cultural watershed, at least as important as the industrial revolution or the development of agriculture. Yet few mainstream commentators see it that way. They discuss the likelihood of energy price spikes and try to calculate how much economic havoc will result from them. Always the solution is technology: solar or wind and maybe a bit of hydrogen for greenhouse-gas ideologues; nuclear weapons for hard-nosed, anti-environmentalists; tar sands, methane hydrates, and coal-to-liquids for hard-headed, pro-growth economists and engineers; Tesla free-energy magnetic generators for the gullible fringe dwellers.

But technology cannot solve the underlying dilemma we face as a result of our application of fossil fuels to every human problem or desire: we are growing our population, destroying habitat (and undermining global climatic stability), and depleting resources in ways and at rates that are incapable of being mitigated by any new tool or energy source. The only way forward that does not end with the extinction of humanity and millions of other species is a scaling back of the entire human project—in terms both of human numbers and per-capita rates of consumption. And that is exactly what Peak Oil implies.

How dramatic a pull-back are we talking about? No one knows. It depends to a large degree on how we manage the inevitable collapse in financial and governance systems, and whether the countries of the world can be persuaded to adopt a global Oil Depletion Protocol; or whether instead nations merely fight mercilessly over the last petroleum reserves until even the “winners” are utterly spent and the resources in dispute have been used up or destroyed in the conflict itself.

**Staring at Techno-Collapse**

In the meantime, what should we expect, and what should we do? Realistically, I think we can expect to see some of the worst excesses of human history, but perhaps only briefly and in certain places. Within a few decades the governmental and corporate structures capable of perpetrating such outrages will have crumbled for lack of fuel. We can also anticipate—and participate in—localized cooperative attempts to reorganize society at a smaller scale.

Under the circumstances, efforts to bring industrialism to ruin prematurely seem to me to be pointless and wrongheaded: ruin will come soon enough on its own. Better to invest time and effort in personal and community preparedness. Enhance your survival prospects. Learn practical skills, including the manufacture and use of Paleolithic tools. Learn to understand and repair (as much as is possible) existing Class B and C tools that are likely still to be useful when there is no gasoline or electricity.

Preserve whatever is beautiful, sane, and intelligent. That includes scientific and cultural knowledge, and examples of human achievement in the arts. Nobody can preserve it all, or even a substantial portion; choose what appeals to you. A great deal of this knowledge is currently captured on media with dubious survival prospects—magnetic disc or tape, compact laser disc, or acid-soaked paper. If someone doesn’t make the effort, the best of what we have achieved over the past centuries and decades will disappear along with the worst.

In the best instance, the next generations will find themselves in a low-energy regime in which moral lessons from the fossil-fuel era and its demise have been seared into cultural memory. Maybe they will be able to maintain local, renewables-based electrical grids, and maybe also some powered transportation, so that they will still have access to a few tools with lives of their own. Perhaps not. In either case, we can hope that, like the Native Americans, who learned from the Pleistocene extinctions that over-hunting results in famine, they will have discovered that growth is not always good, that modest material goals are usually better for everyone in the long run than extravagant ones, and that every technology has a hidden cost. One hopes that, like the Haudenosaunee, who long ago concluded that fighting over scarce land and resources only means the endless perpetuation of violence, they will also have learned the methods and culture of peacemaking. •

**EDITOR’S NOTE:** This essay appears in unabridged form as MuscleLetter #163 / November 2005 at the author’s website www.muselletter.com.

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rather see windmills dotting the landscape than breathe polluted air or suffer the effects of a nuclear accident. I’ve seen some ugly pictures of wind farms on mountaintopsides in California. Their builders obviously neglected to even consider the issue of visual impact. Instead of a committing to a strictly utilitarian approach, what if we were to think about the opportunity to add wind machines to the visual landscape? What if we chose an intentionally aesthetic approach? Could we transform wind turbines into silent, clean and majestic symbols of Vermont’s energy independence? Could we superimpose wind power on the landscape and trust that this rotating sculpture, like the ski trails, will impress its image into our daily lives and emerge from our collective consciousness as another man-made enterprise that we salute as intrinsically Vermont?

Considering the alternatives of mercury poisoning and acid rain from burning coal, environmental damage from large hydro dams, and the risks of nuclear power, I, for one, certainly hope so. I’d be proud one day to fly over Vermont, look down, and see windmills turning, slowly, majestically, in groups of three or four, scattered here and there like the ones I saw in Germany. •
When the fact of my “off-grid” existence becomes known to others, two questions generally arise: how much did it cost and what’s it like? In fact, just as I wrote this, the guy delivering a load of material for my driveway stopped to ask me just these same questions!

Cost of course will vary depending upon the choice of off-grid system and the size of its charging capability. My system is a “hybrid”; two 75 watt solar panels and a small wind generator. In addition there is a charge controller for the solar panels, modified sine wave inverter with charging capability via generator, volt meter for the batteries, and the battery bank itself. Total cost for all of this in 1996; under $2,500. Most articles written about off-grid systems tend to focus on large costly systems. The only difference between those and mine is how much power can be generated and thus consumed. In my case, I decided to go with a system I could afford and adjust my electricity consumption to fit it. Others, perhaps not as limited financially, size the system to fit their current consumption. Ultimately, it depends on your own circumstances.

In any event, my system has been adequate to meet the needs of my family. We are able to power lighting (all compact fluorescent), a computer, printer, stereo, and miscellaneous appliances such as a coffee grinder, blender, mixer, etc. I can even do small jobs with a skill saw, electric screw gun, etc, but prefer to use a generator for large power tool projects. The refrigerator is powered by propane as is the on-demand tank-less water heater and gas stove. Heating is a combination of wood, solar and propane (with thermostat control). Water is provided by a gravity fed spring drawn up into the house and pressure tank with a 12 volt water pump.

What’s it like? Well, if you came to my house, you probably wouldn’t notice any major difference at first, other than the presence of the solar panels and the wind generator of course. The house is wired for standard AC current, and has conventional light switches, lamps, etc. When I first installed the system I was determined that guests in my house wouldn’t need a user’s manual to turn on a light or use the bathroom and indeed they don’t. Living with the system on a daily basis however requires minor maintainence and a general awareness of power supply.

In our house, we don’t leave lights or appliances on when they are not actively being used. I’m always amazed to go to friend’s houses where they are using more electricity with nobody home than I could even generate at home. With a solar/wind system, there is a good chance that either the sun is shining or the wind is blowing, thus producing power. There are a few times in the year however when power generation is minimal and we have to watch our electric consumption more than usual. So, I guess I’d say that the biggest difference is the willingness to be mindful of one’s energy consumption coupled with the recognition that use can’t outstrip the supply. Otherwise, maintainence of the batteries consists of checking their fluid levels every few months and adding distilled water as needed.

Would an off-grid system work for you? That depends on your willingness to adjust your usage of course. Living within your means doesn’t just apply to finances! Your location will dictate the source of power generation. I’ve got both a full southern exposure and a spot at a windy 1600 feet. What would work for you depends on your location, but it would be rare to have land where neither would work. What if you’re already tied into the grid? Well, that’s a whole other subject, an article in itself. But a grid-tied system is also feasible.

As for me, I can’t imagine going back to living hooked into the grid. I like knowing that I’m not adding to the production of greenhouse gases or air pollution with my electric use. The lack of utility bills is also a plus. And when the power goes down which it does quite frequently it seems in this area, well, I’m the house with the lights! •
First Vermont Independence Convention a Huge Success

By Jane Dwinell

On October 28th, the Chambers of the House of Representatives at the Statehouse in Montpelier was nearly filled with people of all ages—high school and college students, gray-haired grandparents, twenty-somethings, and everyone in between. We were all looking for answers to our questions, and a day filled with provocative and, at times, moving speeches. We found what we were looking for.

From J. Kevin Graffagnino’s portrait of Ethan Allen (and his quick and succinct answers to many questions) to Frank Bryan’s deeply personal talk, to James Howard Kunstler’s speech on the Cheap Oil End game, we were treated to the vast and the varied. The afternoon brought another collection of thoughts, from multi-generation Vermonters, scholars, and Canadians. When the day was over we were exhilarated, and ready for the next step.

Below are a collection of thoughts from various attendees as posted on the Vermont Commons website.

It should be abundantly obvious to anyone attending the Vermont Convention what a special place Vermont is as opposed to the horrors that has enveloped the Federal Government. Consider only this from the very beginning of the day—walked right into the State House without screening of any kind and were graciously treated to the use of its Legislative chamber. Compare that to the absurd security measures at any facility of the Feds—the metal detectors, the body searches, etc. There, fear is so pervasive that one has to ask “What guilt do they harbor, what do they have to hide?” By contrast, welcoming Vermont in its everyday life has nothing to fear and nothing to hide. It underscores the question “What type of society do you want to live in?” and resoundingly answers it at the same time. Long live the Second Vermont Republic.

Peter Jensen

The thing that impressed me the most from all the speakers was the small glimmer of hope that maybe—just maybe—the impossible of uniting the anti-authoritarian left and anti-authoritarian right is potentially do-able underneath Vermont’s state motto of “Freedom and Unity”!

Bill Grennon

The thing that struck and inspired me on Friday was seeing a number of young SVR supporters in the audience, especially after hearing Frank Bryan emphasize how this is a long-term effort which will take years of continued grassroots work. High school students from Montpelier and other local towns—what a great lesson in civics in action!

Kate Stephenson

I heard about the convention and wanted to check it out. I didn’t think it would be as informative as it was. I had all these issues/questions in my head: We’re so small! Is it legal? Is it unpatriotic? All my questions were answered there, and I’ve been telling everyone I know about the movement.

Amy

I agree that it was a remarkably decorous, calm, and articulate event, unimaginable in most places I’ve been to. Even the state troopers looked surprised at the behavior of the “rabble” assembled at the Statehouse, as we browsed the books on display and sipped our cups of organic Green Mountain Coffee Roasters coffee from upstairs... As someone who originally hails from Maryland, the civility and tolerance of Vermont is beyond anything I ever imagined. But there were moments during the Convention when harder, darker prospects appeared as well. It wasn’t all pleasant chitchat. An issue that has been bothering me all along, and was on my mind at the Convention, is: Isn’t it disrespectful and irresponsible to consider abandoning a polity for which so many people have died defending its freedom, from the Revolution through various wars? For example, I have an ancestor who fought for a Michigan regiment (and lived, luckily). My father went off to WW II. Do thoughts of secession defile the graves and memories of those who stood up for America and its values, especially those who gave their lives... These were only a few of the thoughts that crossed my mind during and since last Friday’s remarkable meeting in Montpelier.

Ralph Meima

These are just a few of the thoughts that attendees had after the Convention. Were you there? What did you think? What questions to you have? Are you willing to help to make independence a reality?

A straw vote taken at the end of the day was in favor of secession. Now the work has truly begun. We at SVR are taking this as a mandate to move forward. Stay tuned to future issues of Vermont Commons as we lay out our plan for you. In the meantime, please encourage your friends to join the Second Vermont Republic (yearly membership of $35 is money well spent), and to donate more to the cause if they are able. Let’s fund the dream! •
**DISPERSIONS**

**At What Size Secession?**

Could there be such a thing as an appropriate scale, an ideal size, for a nation?

Obviously through history there have been nations of all sizes, of territory, population, density. Surely some very big nations such as France or Australia have been generally successful, as have such small ones as Malta and Liechtenstein. Is there any way to determine what might be the optimum population and area for a state, the level at which a true and effective democracy could operate, at which internal harmony could be most thorough and efficient, and at which an economy could be successfully self-sufficient?

Aristotle certainly thought so. “To the size of states there is a limit, as there is to other things, plants, animals, implements, for none of these retain their natural power when they are too large or too small.” And that limit was set by human capacity: “If citizens of a state are to judge and to distribute offices according to merit, then they must know each other’s characters; where they do not possess this knowledge, both the election of offices and their decisions of lawsuits will go wrong.” Montesquieu, similarly: “It is in the nature of a republic that it should have a small territory.”

In my examination of this subject in Human Scale, coming at this from all angles, I concluded that the optimum size of a political unit would be between 5- and 15,000 souls—about the same figure that Rousseau, Plato, and Aristotle found ideal. (The findings of the latter two are not surprising; in the words of the Encyclopedia Britannica, Hellenic democracy operated in areas that were “generally confined to a city and its rural surroundings, and seldom had more than 10,000 citizens.”) This I found to be the right size for face-to-face democracy, for the managing of tensions and keeping of harmony, and for providing economic means. Cities for centuries did not grow much over 5,000 people and even in medieval times seldom over 10,000 (and when they did, they were composed of parishes, or quarters, of about 5,000 people each).

Now that is a size for a city state, and some settlements in the modern world have managed to extend that a bit and establish effective polities (San Marino at 28,000, Monaco at 32,000). But that is not likely to be a viable size for a true modern nation, and one would imagine that it would have to be a combination of a number of city-states of such sizes or smaller, plus intervening agricultural populations, that would be necessary for success in our age.

But what might the numbers be for such combinations?

Perhaps we should look at real-world figures of modern-day nations to give us some clue as to population sizes that work. First, let’s start by seeing how many are smaller than, let us arbitrarily say, Vermont, at 620,000. There happen to be no fewer than 35 nations with populations smaller than that, many fairly new (or newly independent) island nations (Antigua and Barbuda, Bahamas, Barbados, Cape Verde, Dominica, Grenada, Kiribati, Maldives, Marshall Islands, Micronesia, Nauru, Palau, Samoa, Seychelles, Solomon Islands, Tonga, Tuvalu, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Vanuatu), some others of more or less stability (Belize, Brunei, Equatorial Guinea, Kiribati, Qatar, Surinam), but a number that are long-established models of statecraft (Andorra, Iceland, Liechtenstein, Luxembourg, Malta, Monaco, San Marino, Vatican City). That leaves no question but that a population of 600,000 or fewer is sufficient for a successful nation—and the example of Iceland, with the world’s oldest surviving parliament and an unquestioned beacon of democracy, suggests that 290,000 is quite enough.

Other figures show that there are another seven nations under 1 million in population (Bahrein, Comoros, Cyprus, East Timor, Djibouti, Fiji, Guyana) and a further 41 between 1 and 5 million—some of them not particular models of stability and success (Armenia, Bhutan, Gabon, Gambia, Guinea-Bissau, Jordan, Kuwait, Lebanon, Lesotho, Lithuania, Macedonia, Mauritania, Mauritius, Moldova, Namibia, Oman, Slovenia, Swaziland, Togo, Trinidad and Tobago, United Arab Emirates) and some of them fine examples of national sovereignty (Botswana, Costa Rica, Estonia, Ireland, Jamaica, Latvia, New Zealand, Norway, Panama, Singapore, Uruguay).

So taken all in all, there are 83 functioning, or at least recognized, nations of under 5 million people, out of 193 nations at the United Nations (including Taiwan and Vatican City). If 43 per cent of the nations of the world work with less than the population of Minnesota, that would seem to be proof that there are no significant obstacles to governance by small populations.

And as to geographic size, the first thing to know is that the 10 smallest nations are all under 122 square miles in area, and that includes Monaco, Liechtenstein, Vatican City, and San Marino, as well as the island nations (Nauru, Tuvalu, Marshall Islands, St. Kitts and Nevis, Maldives, Malta). There are 25 nations of the world of the size of Vermont or smaller—that’s 9,610 square miles—and they include Andorra, Bahrein, Brunei, Cyprus, Israel, Jamaica, Kuwait, Luxembourg, Qatar, Singapore, and Slovenia, as well as many island nations in the Caribbean and Pacific.

And to further prove that small areas are no necessary obstacles to economic strength, one can look at the nations with the greatest Gross Domestic Product per capita. Eight of the top 20 are smaller than Iceland at 39,700 square miles (Luxembourg, San Marino, Switzerland, Ireland, Denmark, Monaco, Netherlands, Iceland, in order), and three more in the top 20 are effectively of the same geographic area, if you don’t count uninhabitable and unproductive areas of ice and snow (Norway, Finland, and Sweden).

Rounding out the top 40 nations are another 13 small states (Liechtenstein, Singapore, U.A.E., Qatar, Andorra, Israel, Brunei, Slovenia, Taiwan, Bahamas, Malta, Cyprus, Kuwait, in order), giving small states a majority of 24 of the richest 40 states.

Obviously there are countless variables beyond suchlike figures of population and area that matter in the success of a nation state. But none of them are arcane—they all have to do with measurable elements like the number and size of resources, the productivity of economic sectors from farm to factory to college, the education and skills of the populace, the extent of trade and self-sufficiency, the cultural cohesion of the citizens, and the political sophistication and participation at community, city, and regional levels. Therefore any body can reasonably assess the chances for the viability of any future polity.

Reckon with those variables, and keep the population size within the limits suggested by the real-world examples and experiences, and any population can calculate the viability of its secession. Then, if there is the will, the drive, the passion, and the dedication, that secession can be won—and the resulting nation can be an effective and proud player in the affairs of the world.