

CHAPTER 16

Implications and Possibilities

In fact, the artist's design seemed this: a final theory of my own, partly based upon the aggregated opinions of many aged persons with whom I conversed upon the subject. The picture represents a Cape-Horner in a great hurricane; the half-foundered ship weltering there with its three dismantled masts alone visible; and an exasperated whale, purposing to spring clean over the craft, is in the enormous act of impaling himself upon the three mast-heads.

—HERMAN MELVILLE, *Moby Dick*

CIVILIZATION IS IN CRISIS, though the effects are not yet fully felt. The metabolism of the world economy is fundamentally out of sync with that of nature. And that is a mortal threat to both. In the preceding pages, I have shown how the social impacts of climate change are already upon us, articulating themselves through the preexisting crises of poverty and violence, which are the legacies of Cold War militarism and neoliberal economics. The combination of these factors, their imbrications and mutual acceleration, is the catastrophic convergence. As part of the catastrophic convergence, we see forms of violent adaptation emerging.

In the Global South these take the form of: ethnic irredentism, religious fanaticism, rebellion, banditry, narcotics trafficking, and the small-scale resource wars like the desperate skirmishing over water and cattle in which the Turkana herder Ekaru Loruman was killed. In the North,

the multilayered crisis appears as the politics of the armed lifeboat: the preparations for open-ended counterinsurgency, militarized borders, aggressive anti-immigrant policing, and a mainstream proliferation of rightwing xenophobia.

And keep in mind this key fact: even if all greenhouse gas emissions stopped immediately—that is, if the world economy collapsed today, and not a single light bulb was switched on nor a single gasoline-powered motor started ever again—there is already enough carbon dioxide in the atmosphere to cause *significant* warming and disruptive climate change, and with that considerably more poverty, violence, social dislocation, forced migration, and political upheaval. Thus we must find humane and just means of adaptation, or we face barbaric prospects.

I will not offer a program of green development, nor one of grassroots peace building and disarmament, nor a list of NGOs that point the way forward with their good deeds. Such efforts must be generated in their appropriate contexts by the protagonists of specific local dramas. Our crisis is not a matter of the reading public lacking the names and addresses of groups to work with. Likewise, there are almost endless examples of small-scale, grassroots forms of socially just adaptation that use appropriate technology and are embedded in participatory democracy. But these will remain Lilliputian until they become central to *state policies* and a formal agenda of economic redistribution on an international scale.

Furthermore, to dwell on noble grassroots groups and ingenious new, appropriate technologies can easily miss the point. The climate crisis is not a *technical* problem, nor even an *economic* problem: it is, fundamentally, a *political* problem.

Consider these factors in tandem.

Technology

Is there enough technology for mitigation or making the transition to a carbon-neutral economy? Yes, technologies to create large amounts of carbon-neutral energy already exist. You know what they are: wind, solar, geothermal, and tidal kinetic power all feeding an efficient smart grid that,

in turn, feeds electric vehicles and radically more energy-efficient buildings. Clean tech is not without its problems, but it is here now, already available, and it works at an industrial scale. Can citizens of the Global North, particularly Americans, be as wasteful as they are currently? No. We will have to use energy and resources carefully.

Some see mitigation as hinging on a high-technology breakthrough. Billionaire software mogul Bill Gates, environmental scientist James Lovelock, and even NASA's James Hansen pin their hopes on pie-in-the-sky fourth-generation nukes (known as IV Gen in the industry). Such technology would surely be safer than today's rickety old plants and could be feasible given several decades and hundreds of billions of dollars of investment. But industrial-scale application of IV Gen nukes would arrive too late to stave off climate tipping points. The US Department of Energy, a major booster of all things atomic, gives 2021 as the earliest possible date for a IV Gen nuclear plant to open.¹ And keep in mind no atomic plant has yet been built on time or within budget, so the DOE's forecast is very optimistic.

Science tells us that aggressive emissions reductions need to start *immediately*. Emissions need to peak by 2015, then decline precipitously, if we are to avoid dangerous climate change. Such a time frame means we must scale up actually existing clean technology. That will take massive investments and serious planning—but that project has already begun. The United States remains as a laggard, but other leading economies are beginning the transformation.

What about the technological aspects of adaptation? All over the world, one can find small-scale, often grassroots projects that point the way forward. My colleague, environmental journalist Mark Hertsgaard, has reported on the "quiet green miracle" of a tree-based approach to farming that is transforming the western Sahel. The farm communities he visited in Burkina Faso had been in slow-motion crisis since "the terrible drought of 1972–84, when a 20 percent decline in average annual rainfall slashed food production throughout the Sahel, turned vast stretches of savanna into desert and caused hundreds of thousands of deaths from hunger." But widespread adaptation of the new "agroforestry" or "farmer-managed natural regeneration" (FMNR)—essentially the same sort of methods we saw in Brazil's

Nordeste but developed for an African context—have led to the mass regeneration of tree coverage across parts of Mali, Niger, and Burkina Faso. And with that, despite a locally growing population, water tables have actually risen between five and seventeen meters.² That is truly amazing.

Other examples of positive change are found in the portfolio of the UN Development Program's Global Environmental Facility, which distributes small grants to community-proposed adaptation and mitigation projects. The UNDP GEF has work going in 29 countries. Its projects include community-based forestry projects and energy-efficiency projects in Kenya; wind- and solar-based electrification and solar-power electricity generation to displace charcoal and diesel; improved watershed management, fighting desertification, protecting biodiversity. In Bolivia this UN program is establishing 22 rural clean-tech electrification projects, providing power to 200,000 rural households and, in so doing, it will prevent 21,000 million tons of CO₂ emissions over the next 25 years.³

But, as with the agroforestry projects we saw in Brazil, all these remain small scale, operating at the periphery of state policy. That needs to change. Brazil under Lula made great strides in addressing poverty, in large part by repudiating the moralistic, planning-phobic nostrums of new classical economic orthodoxy.⁴ But the light pink, semisocialist reforms in the style of Brazil will only work as socially just adaptation if reconciliation with nature is at the center of the agenda.

Economics

Is there enough money for mitigation and adaptation? Actually, yes: there are enormous pools of capital sloshing around the international financial system looking for profitable outlets and in the process creating dangerous destabilizing speculative bubbles.

In May 2010, the *Washington Post* reported that "Nonfinancial companies are sitting on \$1.8 trillion in cash, roughly one-quarter more than at the beginning of the recession."⁵ But, as the article went on to point out, they were not investing in creating new jobs. According to Federal Reserve data from late 2010, American companies had not sat on so much

uninvested cash since 1956.⁶ Many of the large banks spent the first years of the great recession engaged in an international “carry trade,” borrowing money from the US Federal Reserve at very low interest rates, then lending it back to the US government—that is, buying Treasury Bonds. This largely passive and parasitic style of speculation, rather than investment in real capital stock, was the basis for two years of record bonuses on Wall Street. In 2010, the top twenty-five Wall Street firms paid out \$135 billion in compensation to their traders and analysts.⁷ Meanwhile, the real economy stagnated. Coal and natural gas remain the dominant fuel sources, and there was no government policy in place to help structure, guide, encourage, mandate, or in anyway bring about a new wave of private investment in clean-technology-based industrialization.

As I write, those pools of liquidity are bidding up a speculative bubble in primary commodities like grains and metal ores. “Between 2003 and 2008, the amount of speculative money in commodities grew from \$13 billion to \$317 billion, an increase of 2,300 percent.”⁸ The Commodity Food Price Index rose by almost 75 percent between 2006 and the end of 2010.⁹ Wheat prices surged 56 percent in just the second half of 2010. This was also due in part to climate crises—floods in Pakistan and Australia and forest fires in Russia—led to a decrease in supply and a spike in demand. Once the price was moving up, speculators awash in cash and cheap credit started driving it up further.¹⁰

Not only is government failing to push private capital to invest in clean technology, but it is itself failing to invest. We suffer an appalling dearth of public money being directly invested in clean technology; nor is there a robust program of subsidies. At the same time, federal tax policy did almost *nothing* to penalize or prohibit speculation. The US government has resources available for the transition, even without raising taxes on speculators. Consider the military budget. When the 2010 federal budget was signed into law on October 28, 2009, the final size of the Department of Defense’s budget was \$680 billion. Defense-related expenditures by other parts of the federal government—such as weapons testing and storage by the DOE, security for the State Department in combat zones, health care for wounded veterans, the antiterrorism functions of the Department of

Homeland Security, military aspects of NASA's work, etc.—constitute between \$300 and \$600 billion more, according to various estimates, which would bring the total for defense spending to between \$1 and \$1.3 trillion in fiscal year 2010. To play it safe, we can say that direct military spending, plus supplemental war-fighting costs, plus the DOE's atomic weapons program totaled \$722 billion in 2010.¹¹ In short, there's money to be found—if we want to find it.

Nor should we allow the issue of government debt to trick us into thinking the economy lacks the wealth to invest in both mitigation and adaptation. For most of the twentieth century, the top marginal tax rate in the United States was above 50 percent and frequently as high as 90 percent. From 1933, at the start of the New Deal, until 1980, the top rate never dipped below 70 percent. In 1993, Clinton raised the top marginal tax rate from 31 to 39.6 percent; in so doing, he paid down the debt, and by 1998 the federal government was *running a surplus*.¹² If taxes on the superrich were increased, the US government could lower the national debt and have money to invest in clean tech.

Politics

Is there political will to make the transition? Alas, no.

Established corporate interests—the fossil fuel companies and the pampered large banks, for example—do not wish to see downward redistribution of wealth and power, nor the economic annihilation of all the sunk capital that is the fossil fuel economy. Few issues encapsulate this political problem better than the story of the fossil fuel industry's promotion of climate denialism.

For twenty years the fossil fuel lobby has funded and organized attacks on climate science. Most prominently, between 1998 and 2008, Exxon donated \$23 million in support of the climate denial movement.¹³ In 2006, the Royal Society, the United Kingdom's most prestigious scientific body, demanded that Exxon stop funding misinformation. The company promised it would, but it continues to do so anyway. In 2009, Greenpeace reported that Exxon gave \$1.3 million to organizations with histories of

climate change denial, including the Heritage Foundation, the American Enterprise Institute, and the Washington Legal Foundation.¹⁴

Another source of climate skepticism is the wealth of the Koch brothers, owners of a huge, privately held conglomerate involved in manufacturing, refining, and distributing petroleum and chemicals, as well as energy, plastics, minerals, and fertilizers. Koch Industries is ranked as the second-largest privately held company in the United States after Cargill, and, not surprisingly, it is ranked among the top ten air polluters in the United States.¹⁵ In keeping with the pattern of their investments, the Koch brothers are philanthropists of a hard-right variety, followers of Hayek, and they fund groups that push climate change denial.¹⁶ A Greenpeace report found that between 2005 and 2008, Koch-controlled foundations contributed \$24.9 million to organizations promoting climate denial. This campaign seems to have borne fruit. Pew research polls have found that in 2006, 77 percent of those questioned agreed that there was evidence that the Earth was warming; by 2009, that number had dropped to 57 percent.¹⁷

Resistance North

Where is the countervailing force? Climate-justice movements in the United States are largely moribund and under attack. In Europe, they are somewhat stronger, though they are under pressure there and have been infiltrated by the police. A recent scandal in Britain revealed that at least fifteen police officers had infiltrated and sabotaged that country's green movement.¹⁸ Nonetheless, grassroots greens in the United Kingdom and Europe have a relatively robust climate-justice movement.

In the United States, there is also a movement for climate justice, though it is small, and after an upsurge, has suffered setbacks. As Brian Tokar points out, "[a] marked shift in perception began in 2005–6 when Hurricane Katrina flooded New Orleans." Then came Al Gore's widely viewed documentary *An Inconvenient Truth* that was followed in 2007 by the IPCC's dire and authoritative fourth assessment report "on climate science and its consequences." The combination of all this momentarily forced climate change to the center of our national discussion.¹⁹

In this context, efforts to create a successor agreement to the Kyoto Protocol were gaining momentum. Barack Obama was elected, in part, by promising to invest \$150 billion over ten years to jump-start a clean-technology industrial revival. And by 2009, a comprehensive international treaty looked possible. Domestically, Democrats began pushing national climate legislation, so-called cap and trade, but these efforts were badly flawed and compromised by corporate lobbies. Beltway-oriented "Big Green" groups tended to see the legislative language as a glass half full, while the more left-leaning "Little Green" groups saw the bills as dangerously inadequate.

Much of big business—embodied in the Chamber of Commerce, the National Association of Manufacturers, the Western Fuels Association, the International Petroleum Institute—pushes back hard against climate legislation. As London's *Guardian* reported, by the summer of 2009 America's oil, gas, and coal industries had increased their antigreen lobbying budgets by 50 percent, "with key players spending \$44.5m in the first three months" of that year.²⁰ Comprehensive climate legislation in the United States indeed failed. And that helped undermine the UNFCCC talks in Copenhagen in 2009 and in Cancún the following year.

In the face of these setbacks some US greens refocused on more local and confrontational strategies. Exemplary in this was the fight against coal during the first decade of this century led by the Sierra Club, Rainforest Action Network, numerous local outfits, and, more recently, Greenpeace. These antioil campaigns have used mass protest and direct action, like mountaintop occupations, as well as financial and political pressure to halt construction of 130 proposed new coal plants.²¹

Other, more media-oriented organizations also exist, like 350.org—the name refers to 350 ppm of CO₂ in the atmosphere, beyond which dangerous climate change is likely. That group, started by environmental writer Bill McKibben and some of his students at Middlebury College, has done amazing work in educating the global public about the scientific realities of climate change and the idea of thresholds and tipping points. But as Henry Miller says toward the end of *Tropic of Capricorn*, "It is the essence of symbols to be symbolic."²² Political power, like economic power, is ulti-

mately made of thicker stuff—bodies, labor, nature, the things and places that bodies have built, and the physical violence that controls bodies.

Resistance South

Act One

It was late May 2005, and Bolivia was in the grip of massive multi-week-long protests—the people, most of them Quechan and Aymaran Indians, wanted Bolivia's natural gas industry to be nationalized. A general strike had been called. And now, a huge march was descending from El Alto to La Paz. The protesters were trade unionists, miners, teachers, and landless peasants. Their destination was the Congress and Presidential Palace, in front of which stood serried ranks of riot police.

As they approached, the marchers smashed out the windows of the few minibuses that had ignored the movement's strike order. When they met the police lines, some miners tossed small charges of dynamite. Windows shattered up and down the block; police fell back and blocked the blasts with their Plexiglas shields, then answered with volleys of tear gas and rubber bullets. Back and forth the battle went continued for three weeks. With La Paz and most of Bolivia's other major cities blockaded, food and fuel ran low; buses and taxis sat stranded. Protesters occupied several gas fields and a pipeline station. It had been five hundred years of theft and abuse, the indigenous people of Bolivia wanted justice.

Act Two

Six months later I was back in Bolivia. Awakening in a shabby La Paz hotel after a long night flight, I turned on the TV. To my surprise, onscreen sat Raul Prada, a short, thickset Marxist intellectual with permanently bent eyeglasses. The last time I'd seen Prada he was in the streets dodging tear gas with the masses. Now an adviser to President Evo Morales—yes, president, what a difference a year makes—Prada was explaining why the government had nationalized a big part of Bolivia's natural gas industry.

There were other changes as well. Morales had promised to go beyond gas, announcing plans to renationalize mining and forestry and to confiscate

and redistribute unused ranch lands, boost the minimum wage, and increase spending on health care. And after decades of IMF-imposed austerity, one of the new government's earliest acts was to allow the expiration of a three-year financing deal with the Fund—effectively kicking it out of Bolivia.

In a chilly drawing room of the presidential palace, I met with Vice President Álvaro García Linera. Only forty-two years old, he had a résumé that included stints as a guerrilla fighter, prisoner, powerhouse author, and intellectual. “Transnational corporations are welcome in Bolivia,” explained the boyish VP. “But they will not dominate the economy. They should expect to pay taxes and submit to reasonable environmental and social regulations. But they will still make profits.” As García Linera explained, all that the state could do was impose equilibrium and a minimal humanity on the savageness and chaos of Bolivian capitalism and grow the economy with a progressive and greenish version of Keynesianism. Many industrialists in La Paz—the owners of construction-supply companies, potato chip factories, and small foundries, the “national bourgeoisie,” if you will—came to see the virtues of this strategy. And within the confines of this realism, Bolivia gropes toward a new model of a mixed economy.²³

Act Three

By 2010 Bolivia was again in the news, this time because it was hosting the World People's Conference on Climate Change in anticipation of the COP 16 meeting to be held in Cancún that December. The year before, Bolivia's delegation had worked tirelessly with the G77—the main group of seventy-seven poor and developing countries from the Global South—to achieve deep emissions reductions and a robust transfer of capital and technology to the Global South as part of a binding treaty. Instead, COP 15 was marked by what John Vidal called “fantastically pompous speeches about being green” and produced a merely nonbinding, elite-negotiated “accord.” The accord recognized, as one report put it, “the scientific case for keeping temperature rises to no more than 2°C” but did not mandate emissions reductions or North-to-South aid to assist with adaptation.²⁴

As COP 16 wrapped up in Cancún, the quest for a binding agreement had collapsed. Instead, the world was now wrangling over the voluntary

“accord” rather than a binding treaty. When added up, all the voluntary (thus unlikely) emissions reductions pledged by the largest economies still allowed the average global temperature to rise by 3.2°C, even though the IPCC sees a 2°C increase as the outer limit of safety. Even a 2°C increase could be too much and cause runaway climate change.

The only country that refused to go along with this charade was Bolivia. Their lead negotiator—the stern and intense Bolivian ambassador to the United Nations, Pablo Solon—laid out his country’s position in the *Guardian*. In explaining his “obligation to set aside diplomacy and tell the truth,” Solon wrote:

Many commentators have called the Cancún accord a “step in the right direction.” We disagree: it is a giant step backward. The text replaces binding mechanisms for reducing greenhouse gas emissions with voluntary pledges that are wholly insufficient. These pledges contradict the stated goal of capping the rise in temperature at 2°C, instead guiding us to 4°C or more. The text is full of loopholes for polluters, opportunities for expanding carbon markets and similar mechanisms. . . . We feel a deep responsibility not to sign off on any paper that threatens millions of lives.²⁵

And so it was that in five years, protest on the streets of La Paz had become protest on the world stage. Had the democratic revolution in Bolivia translated into substantial forward movement in the international arena? No. But Bolivia’s commitment to a progressive politics of climate mitigation provides bold and vital leadership that would otherwise be lacking. Even the once plucky Maldives, having entered into secret negotiations with the United States for aid money, essentially retired from the field and endorsed the lame Cancún agreement. At the same time, the United States cut \$3 million in aid to Bolivia because of the Andean nation’s efforts to oppose the voluntary and inadequate accord. The US government pressured European countries to do the same.²⁶

In essence, Bolivia is attempting to confront the catastrophic convergence by addressing the problems through which climate change articulates itself.

If there is to be more progress on an international agreement that mitigates emissions and funds adaptation, it will be in large part by thanks to the brave example of impoverished and landlocked little Bolivia. That a country so poor, so underdeveloped, economically marginalized, fettered by widespread illiteracy, disease, and hunger, its politics for so long stunted by racism, exploitation, and dictatorship, could organize itself, avoid civil war, proceed toward a new path of mixed economic development, begin to take environmental issues seriously, and then to bring all of this to the international stage with dignity, is a feat of absolutely heroic and epic proportions.

Mitigation Now

A burdensome, if obvious, realization hit me while writing this book. Peaceful, progressive adaptation versus bad, violent adaptation is a difficult choice, but it is a struggle that is itself predicated on *robust mitigation*. Without mitigation, we run the very real risk of unleashing a process of self-fueling, runaway climate change to which there can be little successful adaptation.

As discussed earlier, scientists believe that stabilizing the climate system requires that we return to an atmospheric carbon dioxide concentration of less than 350 parts per million. The extremely bad news—we are now at 390 parts per million. The World Meteorological Organization has determined 2010 to have been one of the hottest ever recorded. And all year, extreme weather battered the Northern Hemisphere. Add to this the steady drip of new scientific reports on the degraded state of the world's oceans, ice packs, and forests. The IPCC says rich countries like the United States must cut emissions 25 to 40 percent below 1990 levels by 2020 and thereafter make precipitous cuts to almost zero emissions.

If we don't act now, average global temperatures will likely increase by much more than 2 degrees Celsius and that will likely trigger a set of dangerous positive-feedback loops that will unleash self-compounding, runaway climate change. For example, if the permafrost of the arctic keeps melting, and the massive stores of methane (CH₄) contained beneath it are released, global warming will accelerate radically because methane "is over 20 times more effective in trapping heat in the atmosphere than carbon

dioxide.”²⁷ At the moment, these vast stores of methane remain locked up under ice, beneath the tundra and ocean floor. But this frozen lid of mud is melting, threatening a rapid warming with attendant rises in sea levels, devastated agriculture, and social chaos.

As this book goes to press in 2011, very little mitigation is under way. The core problem in the international effort to cut emissions is fundamentally the intransigence of the United States: it failed to ratify the Kyoto Protocol and has played an obstructionist role at subsequent negotiations. Domestically, progress has been just as frustratingly slow despite wide public support for environmental protections. As of this writing, no climate legislation has been passed in the United States. We have no price on carbon, nor any program of robust investment in clean technology. Even the minimal production tax credit for clean energy generated by solar, wind, and hydro power has not been locked in as a long-term commitment. As a result, private investment in clean tech moves forward only in fits and starts.

China, on the other hand, now the world’s second-largest economy and largest greenhouse gas polluter, is moving ahead with a robust and fast-growing clean-tech industry—that is to say, with mitigation. The Chinese wind sector has grown steadily since 2001. In 2009, the sector grew by 113 percent, according to the World Wind Energy Report. This growth is the result, in part, of robust government support: China has invested \$200.8 billion in stimulus funding for clean tech. Estimates of US stimulus funding for clean technology range from \$50 to \$80 billion.²⁸

The EU is also moving forward to create a regional supergrid and plans to spend 1 trillion euros in doing so.²⁹ Germany and Portugal, in particular, are moving aggressively to expand their already quite large clean-tech sectors. Action in the core industrial economies is essential because only they have the infrastructure that can propel the clean-tech revolution and transform the world economy.

Pathways Forward

Despite US political sclerosis and fossil fuel fundamentalism, there are paths forward. First and foremost, there is the Environmental Protection

Agency. Thanks to the pressure and lawsuits of green activists, the EPA is now obliged to regulate greenhouse gas emissions. If the EPA were to act robustly, it could achieve significant and immediate emissions reductions using nothing more than existing laws and current technologies.

According to Kassie Siegel at the Center for Biological Diversity, "The Clean Air Act can achieve everything we need: a 40 percent reduction of greenhouse gas emissions over 1990 levels by 2020."³⁰ The two most important things the EPA could do are to halt any permitting of new coal-fired power plants—about fifty new plants are seeking approval as this book goes to press—and to force all existing coal-fired facilities to switch to natural gas. This "fuel switching" requires little to no retrofitting of most existing power plants. If that happened, total non-vehicle US emissions would be reduced by 13 percent or more in a matter of a year or two, say various experts. As a fuel, natural gas is generally half as polluting as coal. But in the case of old, inefficient coal-fired plants, switching to gas can reduce emissions by as much as two-thirds.

Though natural gas drilling is highly problematic, with regulation it could become less polluting. And there is plenty of natural gas: discoveries have glutted the market, and prices are down more than 60 percent from their peak. Gas is not a solution; it is not clean. Gas merely offers a cleaner, realistic "bridging fuel" as we move toward power generated from wind, solar, geothermal, and hydro sources.

Big Green Buy

Another tool of transformation readily at hand is direct government procurement of clean technology. Currently, leading clean technology remains slightly more expensive than the old dirty-tech alternatives. This so-called "price gap" is holding back clean technology's mass application. The simple fact is that capitalist economies will not switch to clean energy until it is cheaper than fossil fuels.

The price gap results partly from dirty tech's history of subsidies (\$72.5 billion between 2002 and 2008) and partly from the massive economies of scale that the fossil fuel industry enjoys. The fastest way to close the price gap

is to build large clean-tech markets that allow for similar economies of scale. And the fastest way to do that is to reorient government procurement away from fossil fuel energy toward clean energy and technology—to use the government's vast spending power to create a market for clean energy.

After all, the government didn't just fund the invention of the microprocessor, it was also the first major consumer of the device. It not only created the technology, it created its market. Throughout the 1950s, *more than half* of IBM's revenue came from government contracts. Along with money, these contracts provided a guaranteed market, as well as stability for IBM and its suppliers, and thus helped coax in private investment—all of which helped make IBM the market leader.³¹

Now consider the scale of the problem: our asphalt transportation arteries are clogged with 250 million gasoline-powered vehicles sucking down an annual \$200 to \$300 billion worth of fuel from more than 121,000 filling stations. Add to that the cost of heating and cooling buildings, jet travel, shipping, powering industry, and the energy-gobbling servers and mainframes that are the Internet, and the US energy economy reaches a spectacular annual tab of \$2 to \$3 trillion.

Those are enormous sums, but federal, state, and local government constitutes more than 38 percent of our GDP. The federal government spent about \$3.6 trillion in 2010. In more concrete terms, the federal government is the world's largest consumer of energy and vehicles—it owns or leases more than 430,000 buildings, mostly large office buildings, and 650,000 vehicles. As a result, it is the nation's largest greenhouse gas emitter. Add in state and local government activity, and those numbers grow again by about a third.

A redirection of government purchasing would create massive markets for clean power, electric vehicles, and efficient buildings, as well as for more sustainably produced furniture, paper, cleaning supplies, uniforms, food, and services. If government bought green, that would drive down the price of clean technology, and then the momentum toward green tech would become self-reinforcing and spread to the private sector.

Government has tremendous latitude to leverage green procurement because it requires no new taxes, programs, or spending, nor is it hostage to

the holy grail of sixty votes in the Senate. It is simply a matter of changing how the government buys its energy, vehicles, and services

Capitalism versus Nature?

There is one last imperative question. Several strands of green thinking maintain that capitalism is incapable of arriving at a sustainable relationship with nature because, as an economic system, capitalism must grow exponentially, while the earth is finite.³² You will find this argument in the literature of ecosocialism, deep ecology, and ecoanarchism. The same argument is often cast by liberal greens in deeply ahistorical and antitheoretical terms that, while critical of the economic system, often decline to name it. Back in the early 1970s, the Club of Rome's book *Limits to Growth* fixated on the dangers of "growth" but largely avoided explaining why capitalism needs growth or how growth is linked to private ownership, profits, and interfirm competition. Whether these literatures describe the problem as "modern industrial society," "the growth cult," or the profit system, they often have a similar takeaway: we need a totally different economic system if we are to live in balance with nature.

Some of the first to make such an argument were Marx and Engels. They came to their ecology through examining the local problem of relations between town and country—which was expressed simultaneously as urban pollution and rural soil depletion. In exploring this question they relied on the pioneering work of soil chemist Justus von Liebig. And from this small-scale problem, they developed the idea of capitalism's overall "metabolic rift" with nature.³³ Here is how Marx explained the dilemma:

Capitalist production collects the population together in great centres, and causes the urban population to achieve an ever-growing preponderance. This has two results. On the one hand it concentrates the historical motive force of society; on the other hand, it disturbs the metabolic interaction between man and the earth, i.e. it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the last-

ing fertility of the soil. . . . All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil.³⁴

From that grew the Marxist belief that capitalism, as a whole, is irreconcilably in contradiction with nature; that the economic system creates a rift in the balance of exchanges, or metabolism, connecting human society and natural systems. As with "soil robbing," so too with forests, fish stocks, water supplies, genetic inheritance, biodiversity, and atmospheric CO₂ concentrations. The natural systems are out of sync; their elements are being rearranged and redistributed, ending up as garbage and pollution.

As Mary Douglas, paraphrasing William James, put it, "Uncleanliness is matter out of place."³⁵ At a large enough scale, that disruption of elements threatens environmental catastrophe.

It may be true: capitalism may be, ultimately, incapable of accommodating itself to the limits of the natural world.

However, that is *not* the same question as whether capitalism can solve the climate crisis. Because of its magnitude, the climate crisis can appear as if it is the combination of all environmental crises—overexploitation of the seas, deforestation, overexploitation of freshwater, soil erosion, species and habitat loss, chemical contamination, and genetic contamination due to transgenic bioengineering. But halting greenhouse gas emissions is a much more specific problem; it is only one piece of the apocalyptic panorama. Though all these problems are connected, the most urgent and all encompassing of them is anthropogenic climate change.

The fact of the matter is time has run out on the climate issue. Either capitalism solves the crisis, or it destroys civilization. Capitalism begins to deal with the crisis now, or we face civilizational collapse beginning this century. We cannot wait for a socialist, or communist, or anarchist, or deep-ecology, neoprimitive revolution; nor for a nostalgia-based *localista* conversion back to the mythical small-town economy of preindustrial America as some advocate.

In short, we cannot wait to transform *everything*—including how we create energy. Instead, we must begin immediately transforming the energy economy. Other necessary changes can and will flow from that.

Hopeless? No. If we put aside the question of capitalism's limits and deal only with greenhouse gas emissions, the problem looks less daunting. While capitalism has not solved *the* environmental crisis—meaning the fundamental conflict between the infinite growth potential of the market and the finite parameters of the planet—it has, in the past, solved *specific* environmental crises. The sanitation movement of the Progressive Era is an example.

By the 1830s, industrial cities had become perfect incubators of epidemic disease, particularly cholera and yellow fever. Like climate change today, these diseases hit the poor hardest, but they also sickened and killed the wealthy. Class privilege offered some protection, but it was not a guarantee of safety. And so it was that middle-class do-gooder goo-goos and mugwumps began a series of reforms that contained and eventually defeated the urban epidemics.

First, the filthy garbage-eating hogs were banned from city streets, then public sanitation programs of refuse collection began, sewers were built, safe public water provided, housing codes were developed and enforced. And, eventually, the epidemics of cholera stopped. So, too, were other infectious diseases, like pulmonary tuberculosis, typhus, and typhoid, largely eliminated.³⁶

Thus, at the scale of the urban, capitalist society solved an environmental crisis through planning and public investment. Climate change is a problem on an entirely different order of magnitude, but past solutions to smaller environmental crises offer lessons.

Ultimately, solving the climate crisis—like the nineteenth-century victory over urban squalor and epidemic contagions—will require a relegitimation of the state's role in the economy. We will need planning and downward redistribution of wealth. And, as I have sketched out above, there are readily available ways to address the crisis immediately—if we make the effort to force our political leaders to act. We owe such an effort to people like Ekaru Lorman, who are already suffering and dying on the front lines of the catastrophic convergence, and to the next generation, who will inherit the mess. And, we owe it to ourselves.