State of the World 2013

IS SUSTAINABILITY Still Possible?

THE WORLDWATCH INSTITUTE
Coal, oil, and gas—fossil fuels: we can’t do without them. They are the life-blood of modern industrial civilization. These highly concentrated, widely available stores of energy have unleashed modern civilization’s astonishing productivity, liberating billions of people from drudgery and insecurity. Finding more fossil fuels and getting them to markets around the world is the challenge of our times.

Fossil fuels: we must do without them. They feed the fire in the oven destined to bake civilization beyond recognition. When these hydrocarbons from the concentrated, pressurized remains of ancient organisms are burned, they overwhelm the Earth’s ecosystems and condemn billions of people to climate-induced misery. Shifting to renewable energy sources and alternative ways of life is the challenge of our time.

Two existential positions, poles apart. Both may be accurate. The contradiction is the crux of the contemporary energy and environment dilemma and one reason governments have done so little in the face of obvious and ramifying threats.

Is there a way out? Not as long as technological optimism and trust in the magic of “the market” sustain the belief that the growth-dependent, consumerist, debt-laden, risk-accumulating world is the best of all possible worlds. Not when those who live in this world and those who aspire to join it see no reason to exchange the current model for an uncertain new model. Not when leaders and citizens alike cannot imagine replacing the current, fossil-fuel-dependent economic and social system. Why? Because too many people believe that the next energy transition, like previous transitions—from human power to animal power, animal to wood, wood to coal, and coal to oil—will make life better for all. As happened before, they believe, the next energy source will spur convenience, higher speeds, greater labor productivity, and more consumer choice—material progress forever. The bridge, this view has it, is new technologies to extract and burn every last bit.

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of affordable oil, coal, and gas. This is the dominant worldview, what we dub the “industrial progressive” view.¹

It is time to choose a different view and a different future. A first step is to recognize that Earth’s “gift” to humanity of high-quality fossil fuels, those that pack the greatest energy wallop, is a one-time nonrenewing and diminishing reserve. There was a “before” (before the late nineteenth century), when fossil fuels powered only a tiny proportion of the world’s work, and there will be an “after,” when fossil fuels are reserved for tasks for which they, and they alone, are best suited. The question humanity faces at this historic juncture is how to navigate the transition, and how to do so given that the fossil fuel era will end and these fuels will be rationed—although on the current path, not soon enough to avert catastrophic climate and other environmental and social impacts.

The choice to keep fossil fuels in the ground in the face of otherwise overwhelming pressures to exploit them to the end is, we have come to believe, the only way to ensure that greenhouse gases and other pollutants remain out of the atmosphere and out of our bodies. The power and momentum of the fossil fuel complex is simply too great. And the predominant approach to ground-level air pollution, high-level climate change, and petrochemical contamination of human beings and nonhumans—that is, to manage fossil fuel emissions—is too ineffectual, too much of an accommodating, end-of-pipe approach. All too often, such an approach reduces a couple of centuries of history to one chemical element, carbon, when the real problem is upstream, in a global infrastructure and power structure that is extremely adept at drilling holes, blasting mountains, and laying pipes.


The central problem is not emissions, but extraction. Put differently, it is not about carbon dioxide but fossil fuels—not about what comes out of the exhaust pipes and smokestacks but what comes out of the ground. To direct political attention away from end-of-pipe management to extraction is to be precautionary, a widely accepted approach for known toxic and ozone-depleting substances but not, as yet, for fossil fuels.

A carbon focus is reductionist, possibly the greatest and most dangerous reductionism of all time: a 150-year history of complex geologic, political, economic, and military security issues all reduced to one element—carbon. This framing implies that the problem only arises once fuels are burned. It effectively absolves of responsibility all those who organize to extract, process, and distribute. It leaves unquestioned the legal requirement to extract created by the selling of fossil-fuel reserves in futures markets and the widespread use of reserves for collateral in financial transactions. So con-
structured, extraction is called “production,” and the burden of harm and of responsibility for amelioration falls on governments and consumers rather than on extractors. Inside the carbon logic, extraction is presumed to be a given—normal, inevitable, even desirable. What is more, the carbon lens portrays the global ecological predicament as one-dimensional: deal with carbon emissions, and everything else will follow.

To focus on fossil fuel extraction, in contrast, is to ask how and why removal of these fuels is deemed inevitable and net beneficial. A fossil fuel focus does not take such how-and-why questions as self-evident (people want the energy, producers get it). It directs analytic and political attention upstream to a whole set of decisions, incentives, and institutions that conspire to bring to the surface hydrocarbons that otherwise sit safely and permanently in the ground. It forces us to consider that once fossil fuels are extracted, their by-products—ground-level pollution, atmospheric greenhouse gases, petrochemical endocrine disruptors—inevitably and unavoidably move into people's bloodstream, into ecosystems, and into the atmosphere and oceans.

To question extraction is to consider deliberately limiting an otherwise valuable resource, rationing and setting priorities for its uses. It is to take renewable energy, conservation, equity, and environmental justice seriously and to create the institutions, local to global, capable of doing so. It is to ask what the prior ethics of fossil fuel allocation have been and what, given the imperative to reverse course and build a sustainable society, they must be. It is to ask what a politics of fossil fuel resistance and abolition would be and to imagine a deliberately chosen post–fossil fuel world.

All this leads to the conclusion—unthinkable for fossil fuel proponents and business-as-usual-only-greener proponents—that the only realistic means of stopping fossil fuel emissions is to keep the fuels in the ground. The only safe place for fossil fuels is in place, where they lie, where they are solid or liquid (or, for natural gas, geologically well contained already), where their chemistry is mostly of complex chains, not simple molecules like carbon dioxide, that find their way out of the tiniest crevices, that lubricate tectonic plates perpetually under stress, that react readily with water to acidify the oceans, and that float into high places filtering and reflecting sunlight, heating beyond livability the habitats below.

And yet the fossil fuel complex is extremely powerful. That power is at once energetic, economic, and political. Its weakness is ultimately geologic and ethical.

**Fossil Fuel Influence**

One measure of the industry’s influence is the fact that 88 percent of the world’s energy comes from fossil fuels. (See Box 14–1.) Sixty-one percent of that is produced by national oil companies—created, subsidized, and defend-
Box 14–1. Fossil Fuels by the Numbers

• Fossil fuels provide 88 percent of the world’s energy.
• Fossil fuel infrastructure occupies an area the size of Belgium.
• Biofuel infrastructure roughly the size of the United States and India would be needed if biofuels were to replace fossil fuels.
• To meet industry and agency projections of increased energy demands, $38 trillion in oil and gas infrastructure is needed by 2035.
• It takes 7.3–10 calories of energy input to produce 1 calorie of food energy.
• Direct fuel subsidies to agriculture in the United States total $2.4 billion.
• Proven fossil fuel reserves, owned by private companies, state companies, and governments, exceed the planet’s remaining carbon budget (in order to keep within a 2 degree Celsius temperature increase) by a factor of five.
• Occupationally related fatalities among workers in the oil and gas extraction process are higher than deaths for workers from all other U.S. industries combined.

Source: See endnote 2.

Perhaps the industry’s greatest source of influence is its ability to advance a vision, one of abundant and cheap energy, of powering and defending nations, of feeding and sheltering billions of people. It is a vision with appeal to nearly every sector of a modern industrial society—manufacturers, investors, military and political leaders, consumers. But its appeal has begun to erode.

For one, under the rubric of the “resource curse” (broadly construed), the social and economic costs have become well established. “The irony of oil wealth,” writes political scientist Michael Ross in *The Oil Curse*, is that “the greater a country’s need for additional income—because it is poor and has a weak economy—the more likely its oil wealth will be misused or squandered. . . . Since the oil nationalizations of the 1970s, the oil-producing countries have had less democracy, fewer opportunities for women, more frequent civil wars, and more volatile economic growth than the rest of the world, especially in the developing world.” In addition, Ross finds, “by 2005,
at least half of the OPEC countries were poorer than they had been thirty years earlier."

From a national security perspective, former CIA director Jim Woolsey says: “It was obvious that oil was dominant in a lot of places that generated trouble. There’s almost nothing that doesn’t get better if you move away from dependence on oil.” Even industry insiders have taken stock and are trying to imagine a different world. “The resources are there,” writes John Hofmeister, former president of the Shell Oil Company in the United States. “The question is: do we want to continue to use these fossil fuels at current—or increasing—rates until they are eventually exhausted? The answer, unequivocally, is no. The economic, social, and environmental costs of such an approach are becoming ever clearer and ever higher.” Or, as the German Advisory Council on Global Change put it, “The ‘fossil-nuclear metabolism’ of the industrialized society has no future. The longer we cling to it, the higher the prices will be for future generations.”

In short, for all the power of the fossil fuel players, their deliberate construction of fossil fuels’ net beneficence and inevitable use is beginning to crumble.

A Politics of Urgent Transition

To limit extraction, not just manage emissions, requires a particular kind of politics. Its thrust is accelerating the transition out of fossil fuels, confronting extremely powerful actors, and creating a norm of the good life, life without endless expansion and extraction.

The politics of this transition is ultimately moral, and so the ultimate strategy is delegitimization. This does not mean a vilification of the fossil fuel industry. The industry has a century and more of vilification, starting with charges against Rockefeller’s Standard Oil (the “Octopus”) and continuing through to today (Hofmeister entitled his book *Why We Hate the Oil Companies*). Nor does this mean simply a repudiation of the industry’s anti-democratic, anti-environmental tactics. Rather, delegitimization means the reconceptualizing and revaluing of fossil fuels—or, to be precise, of humans’ relationship with fossil fuels. It means a shift in understanding of fossil fuels from constructive substances to destructive substances, from necessity to indulgence or even addiction, from a “good” to a “bad,” from lifeblood (of modern society) to poison (of a potentially sustainable society).

In other words, fossil fuels will make a moral transition in parallel to the material transition. Much as slavery went from universal institution to universal abomination and as tobacco went from medicinal and cool to lethal and disgusting, the delegitimization of fossil fuels will flip the valence of these otherwise wondrous, free-for-the-taking complex hydrocarbons. And rather than pin blame on “big bad oil (and coal) companies” or, even worse, on “all of us” because everyone uses fossil fuels, delegitimization simply recognizes...
that a substance once deemed net beneficial can become net detrimental. As in abolition and the delegitimization of smoking, what it takes is some compelling examples (begin with climate disruption and smog, add acid rain and oil slicks, include carbon monoxide and scores of other air pollutants), incisive critics, effective communication, and—for the moral entrepreneurs—a whole lot of persistence and willingness to be vilified.7

Delegitimization of fossil fuels would start with the simple observation that there are some things humans cannot handle. And for these things, humans can decide not to use them, just as they have with respect to ozone-depleting substances, lead in paint and gasoline, drift nets, land mines, rhino horns, and someday, perhaps, nuclear power plants and nuclear weapons.

Fortunately, some bold and clever people, North and South, are already saying no to fossil fuels and other mined materials. Their experiments, indeed their courage, suggest that such delegitimization has begun. This is particularly true among otherwise marginalized peoples. Their politics is not parochial protectionism, not localism. It is simultaneously protecting livelihood and the planet. Every new act of local resistance contributes to a new normative belief, one that says that the game is illegitimate, that it benefits a powerful few and their clients while foisting the costs off on others in space and time. While such local acts of resistance are quickly dismissed as NIMBY (Not in My Back Yard) by defenders of the fossil fuel order, from the perspective of global threat and globalization from below, they are part of a larger project of delegitimization.

And so, what the climate scientists and others started yet cannot finish with their top-down, expert-led, apolitical, managerialist schemes and technological fixes is being augmented and accelerated by moral commitments in small pockets all over the world. But clearly fossil-fuel-dependent societies cannot stop cold. They can, however, start stopping now. One ethical justification for continued fossil-fuel-consumption is to facilitate a future without fossil fuels. Others are self-preservation and self-defense. What is more, because the transition away from current high-energy patterns will require considerable energy, those societies and communities deliberately living on little energy will have an advantage. Local action matters most in part because a top-down, centralized phaseout of fossil fuels by those with the most to lose is highly unlikely.8

Finally, delegitimizing a substance (or a process like exploring and drilling), as opposed to condemning an actor or all of humanity, puts the focus on the offending substance or, more specifically, on its use. Fossil fuels are perfectly “natural”; traditional uses of petroleum (rock oil) for pitch, lighting, and medicinal purposes were, for all we can tell, only harmful locally if at all. In a strategy of delegitimization, the burden shifts from the contest of interest groups (environmentalists versus industrialists, for example) to a
contest over the politics of the good life. Industrialists have enacted one vision of the good life. Its efficacy in the twentieth century can be debated, but the politics of delegitimization are about now and the future, including the distant future. It is an affirmative politics, about creating a different vision of the good life given the biophysical trends under way.

Early Efforts to Keep Fossil Fuels in the Ground

On the face of it, keep them in the ground, for all its environmental and ethical justifications, is just an idea. The world is happily (some might say madly) pumping oil, devouring coal, and capturing natural gas—all at record levels. Everyone wants in the game for reasons of profit and power (or both), everyone from private energy companies to petrostates to investors. The juggernaut is rolling across the landscape; it cannot be stopped.

Except in some places, including some of the unlikeliest of places—major oil-producing countries, for instance—where key actors have begun stopping this monstrous vehicle. None of these exceptions are successful in the sense of a complete shutdown of fossil fuel extraction. None are large-scale. But all are significant in that these actors have had the temerity to challenge an established order that is local, national, and international as well as hugely powerful. What is more, these efforts are occurring largely peacefully and through democratic means. And perhaps most significant, they are doing so at a time when the world as a whole sees no crisis, no existential threat, just the odd pollutant to clean up, emissions to be managed, and efficiencies to be realized.

In the global South, for example, coalitions of indigenous peoples, nongovernmental organizations, and government agencies in Ecuador and Bolivia have rewritten their constitutions to enshrine the right of nature and define a new model of sustainable development, one that excludes fossil fuels. In Ecuador, it is called sumak kawsay in Quichua, buen vivir in Spanish, and the good life in English. The leaders there recognize that petroleum production will eventually decline, that there have been long-term costs to Ecuador, and that costs to the planet are becoming increasingly dangerous. As a first step, the Yasuni-ITT Initiative proposes keeping 20 percent of Ecuador’s known oil reserves in the ground. It calls for coresponsibility with the rest of the world in avoiding emissions that the nearly 900 million barrels of oil in the ITT block could produce. The international community would pay for avoided carbon emissions to protect one of the most biodiverse spots on Earth and to limit in a small way global emissions. It would also protect the rights of at least two indigenous groups that live there in voluntary isolation. The $350 million per year that Ecuador seeks for 13 years (half of what they estimate the reserves would earn from oil extraction) would be placed in a U.N. Development Programme Trust Fund with a board of directors
that includes Ecuadorans as well as members of the global community. If successful, it would be one of the largest global environmental trust funds of its kind. And it would be created not by burning fossil fuels, but by keeping them in the ground.¹⁰

Costa Rica, a small Caribbean country with known oil reserves offshore, enacted a moratorium in 2002 on oil extraction, citing ecological and social damage. In his 2002 inaugural address, President Abel Pacheco declared “Costa Rica will become an environmental leader and not an oil or mining enclave.” He went on to say, “Costa Rica’s real oil and real gold are its waters and the oxygen produced by its forests.” Despite a brief encounter with the oil industry in the 1980s and recent considerations of natural gas exploration, Costa Rica has maintained its stance against this industry in favor of ecotourism and alternative energy sources and has achieved high human development indicators.¹¹

In the global North, however, fossil fuels once left in the ground as too expensive to retrieve are being revisited. In the United States, federally funded research in the 1980s led to major innovations in imaging and mapping gas-rich shale deep beneath the surface. Blasting the shale with high pressure fracking fluids and drilling horizontally in multiple directions with powerful new diamond-studded drill bits add up to what became known as “slick-water, high-volume horizontal hydraulic fracturing,” commonly referred to as hydrofracking or just fracking.¹²

As a result, massive amounts of shale gas can be reached profitably. These shale gas “plays,” as the industry refers to them, are spreading rapidly in the traditional coal and oil states: Pennsylvania, Texas, and West Virginia. But when landsmen began knocking on doors in rural New York State enticing homeowners to lease their property for access to the vast Marcellus Shale beneath them, a keep-it-in-the-ground movement came to life. Landowners, environmental activists, artists, and indigenous peoples organized and protested, putting pressure on state and local officials. In 2010, New York Governor David Patterson ordered a moratorium on hydrofracking permits until the state completed an environmental and regulatory review. As of this writing, the latest state proposals would ban...
hydrofracking in the watersheds from which New York City and Syracuse get their unfiltered municipal supplies; surface drilling would be prohibited on state-owned land, including parks, and on forest areas and wildlife management areas. In the process, the state Department of Environmental Conservation received more than 13,000 public comments overwhelmingly in opposition to drilling in the remaining areas. Not leaving the decision up to the state, many local municipalities have approved or are considering zoning ordinances and outright bans. These are likely to be challenged in state courts. Concerns focus mostly on the threat to water supplies and aquifers from a process that involves the injection of large volumes of water, industrial fracking chemicals, and sand under high pressure. Water and contaminants are involved in every step of the process: transporting water to the drill site, mixing the chemicals, blasting the shale, recovering the fluids that come back with the gas, and, finally, transporting, treating, and disposing of the wastewater.

Among the most vocal and powerful voices in the hydrofracking uprising have been those of the indigenous peoples of New York State. Representatives of the traditional leadership of the Haudenosaunee (the Iroquois) have pointed out that large-scale industrial drilling would likely disturb burial grounds and other sites of historical and spiritual importance. They have called on the U.S. government to uphold their water and land rights as guaranteed in multiple treaties between the United States and native nations. They remind the state and its citizens that while the gas industry’s concern only spans the period of time when the well produces gas, it is everyone’s responsibility to protect the land and the water for future generations.

The outcome of the anti-fracking movement in New York State remains inconclusive. Fracking is on hold for now, but the pressures to exploit the resource are great. And conventional environmental arguments do not seem to be enough. What may turn out to be the most significant outcome is a public increasingly open to the possibility of keeping fossil fuels in the ground, an idea largely attributable to the new and powerful influence of Haudenosaunee leaders and the introduction of indigenous perspectives and values into a debate that would otherwise be narrowly technical and economic.

Farther south, long-standing resistance to destructive coal mining practices in Appalachia appear to be taking a new turn, shifting in places from improving practices and cleaning up waste to ending coal extraction entirely. Around the world there are citizen-led actions to keep destructive substances in the ground and stop destructive practices, from uranium in Australia and gold in El Salvador to gold and diamonds in Guyana and oil in the Norwegian Arctic. These examples, though small in the larger scheme of global energy production and consumption, signal a rippling of resistance
around the globe against extractivist policies and, simultaneously, support for a good life without fossil fuels.16

Envisioning a Post–Fossil Fuel Era

Imagining deliberately keeping fossil fuels in the ground, much less the end of the fossil fuel era, is difficult. No matter how much environmental science is absorbed, how much geologic and ecological perspective is attained, how much ethical commitment is mustered, it is hard to escape industrial progressivism. It just seems like all this modernity will continue, albeit with adjustments—an efficiency here, some greening up there.

In fact, this pervasive impression—that the fossil fuel era has been around for a long, long time and will be for a long, long time to come, indeed that it must be—this impression has been deliberately constructed by the industry and its industrial and governmental enablers. Physical reality, however, speaks otherwise. Unfortunately, for fossil fuel proponents anyway, there is just too much knowledge piled up to believe in the indefinite perpetuation of the fossil fuel era, and not just scientific knowledge but political and strategic knowledge.

So a primary task for those who believe that the fossil fuel era will not continue, and yet will not end soon enough to avoid catastrophic outcomes, is to imagine that end. To facilitate such imagining, arguably a necessary precursor to designing policies and behavior change strategies, we offer two observations as an envisioning exercise.17

First, the fossil-fuel era, which began in the 1890s, when fossil fuels surpassed wood as the dominant energy source, is only about six generations old. Many of us alive now have personally known people who lived before the fossil-fuel era. It was not that long ago. The fossil fuel era is not that permanent, nor is its continuation that inevitable. Given that the initial stage of an energy source’s use is one where benefits are highlighted and costs unknown or shaded (displaced in time and space), we can expect that fossil fuels have the same quality, only on a far grander scale than anything before. Coal’s depredations—from miners’ bodies to asthmatics’ lungs, from decimated mountains in Appalachia to dug-out deserts in Mongolia—are well known. Coal’s early exit is virtually a no-brainer. No wonder the industry’s anti-climate-change activism has been so vehement. Oil, arguably the most consequential energy source of all time, is widely deemed essential (and thus the rush for alternative liquid fuels), but it too will eventually fade out.18

The costs of fossil fuels, from traffic casualties to climate disruption, will eventually catch up. The fossil-fuel era will come to an end well before conventional analysis and decisionmaking would indicate. And just as global fossil-fuel production will decline as all wells and oil fields do, the industry
will decline, too. Just because no one in the industry or anyone dependent on it (virtually everyone) wants to talk about this does not make it otherwise. Fossil fuel production and the fossil fuel industries will most assuredly decline.

Second, one place to start the imagining is, ironically enough, the fossil fuel industry itself. Preliminary evidence suggests that serious people in the oil, gas, and coal industries along with the automobile and petrochemical industries know this game cannot go on. “Energy executives know that the existing supply capacity from traditional sources is about tapped out,” writes former Shell president John Hofmeister. They know the easy stuff is effectively gone. Now, they are learning, it is also changing the climate, melting the very tundra their trucks depend on, blowing apart rigs they thought were secure. What they say publicly is different, of course. Their jobs, their way of life, their personal and professional identity, their future is on the line. They seem to pray that a miracle technology will come along to keep the game going a little while longer. This difficulty is perfectly understandable. And yet people in equally entrenched positions (witness slavery and smoking) have made huge shifts in position.¹⁹

In short, a deliberate policy, state-led or not, of keeping fossil fuels in the ground is at once preposterous and perfectly sensible. Stranger things have happened. How it would happen, at what rate, with what local effects, is still anyone’s guess. That fossil fuels will be in the ground and stay there when the fossil fuel era ends is beyond doubt. The only question is whether enough will stay to stabilize climate, reverse degrading trends, and avert social calamity. Bringing about an urgent transition begins with a certain kind of politics, one of delegitimizing fossil fuels and humans’ deeply problematic relationship to them. This is a politics that recognizes that once fossil fuels are out of the ground, their by-products will permeate our bodies, the oceans, and the atmosphere and cause catastrophic loss. Those politics and the policies and economies that follow constitute a necessary first step in choosing to end the fossil-fuel era.

4. J. Hall, V. Brajer, and F. Lurmann, The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins (Fullerton: California State University–Fullerton, Institute for Economic and Environmental Studies, 2008).


17. “Benefits of Signing the NCD” and “The Declaration,” at www.naturalcapitaldeclaration.org


1. For an illustration of an idealistic energy transition, see “Shift: To A Smarter Energy Future” (documentary), Arcos Films, 2012; for a realistic, historically and empirically grounded view of energy transition, see Vaclav Smil, Energy Transitions: History, Requirements, Prospects (Santa Barbara, CA: Praeger, 2010), Chapter 2.


4. Resource curse statements from Ross, op. cit. note 2, pp. 189, 236, 253.


6. Hofmeister, op. cit. note 5.


10. Ibid.


Chapter 15. Beyond Fossil Fuels: Assessing Energy Alternatives


2. Author’s estimate.


12. Fully 99.7 percent of natural uranium is U-238 while 0.7 percent is U-235; see Ristinen and Kraushaar, op. cit. note 6, p. 184.

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Sustainability gets plenty of lip service, but the relentless worsening of key environmental trends reveals much of that attention to be “sustainababble.” From climate instability and species extinctions to approaching scarcities of freshwater, minerals, and energy, worrisome limits to human economic activity look more pressing each year—all while our political institutions seem impotent to address the challenge.

THE WORLDWATCH INSTITUTE, in this edition of the celebrated State of the World series, takes an unflinching look at what the data say about the prospects for achieving true sustainability, what we should be doing now to make progress toward it, and how we might cope if we fail to do so.