

## Review Essay

### Energy Transformation

Kingsmill Bond.

*2020 Vision: Why You Should See the Fossil Fuel Peek Coming*

September 2018

Available: at [carbontracker.org](http://carbontracker.org)

Global Commission on the Geopolitics of Energy Transformation

*A New World: The Geopolitics of Energy Transformation*

January 2019

Available at: <https://irena.org/publications/2019/Jan/A-New-World-The-Geopolitics-of-the-Energy-Transformation>

Reviewed by Howard A. Doughty

It has been about fifty years since people of my generation were introduced to the perils of the “energy crisis,” the hazards of environmental degradation and the first hints of ecological catastrophism soon to be associated with global warming and the even more disturbing realities of climate change.

Among the earlier books that signified the emergence of neo-Malthusianism were *The Population Bomb* (1968) and *The Limits to Growth* (1972). Each was mocked in its time for its allegedly baseless speculations about imminent disaster. Each provoked images of mass starvation, ceaseless conflict over scarce resources and a return (if our species survived at all) to a standard of living more akin to that of the late eighteenth century and not the technological splendor promised by the more optimistic exponents of automation, computerization, robotics and the coming of the post-industrial, high tech, cybernetic, information age in which material inventions and social innovations would render ignorance, disease, poverty and tyranny obsolete in the artificial surplus society of economic abundance and social equity.

Along the way, we experienced modest shocks such as the oil crisis of the mid-1970s, the widely advertised depletion of the ozone layer and, of course, record-breaking temperatures and alarming climatic events in which every hurricane, draught, wildfire and flood was interpreted as a portent of worse to come.

Although other issues such as the swamps of plastic polluting the oceans, the rise of sea levels threatening shorelines, the melting of the Arctic ice cap, anthropogenic mass extinctions of plants and animals and the implications of our “carbon footprints” upon air, land and water capture our attention, it is probably fair to say the fossil fuels garner as much or more attention than any other aspect of humanity’s interaction with nature.

We have also witnessed whole armies of industry-funded climate change deniers and, simultaneously, holy orders of scientists, engineers and technologists promising that post-industrial technology is fully capable of redeeming the environment that has admittedly been befouled by the effects of the industrial revolution. What technology hath taken away, technology can restore ... and then some.

Of course, there have been plenty of examples of human stupidity along the way. Climate change has been called a “hoax” by the current president of the United States and a “socialist plot” by a recent prime minister of Canada. A great deal of print has been spilt pursuing false hopes such as “fusion energy.” And, of course, there has even been much talk and much investment into illusions such as “clean coal.”

Whenever I hear the phrase “sustainable development,” only one thing is certain: it is *development* that will be sustained. — John Livingston, 1992

Generally, however, the message seems to be sinking in, not only among scientists and environmentalists, but also among entrepreneurs, government policy experts and the general population that something serious needs to be done to change our ways of managing our resource, agricultural, manufacturing, commercial and financial institutions, with even “bit-coin” mining turning out to be a major contributor to ecological calamity.

Beyond the spate of early texts alerting the more perceptive among us to impending difficulties, there have been widely publicized meetings and documents that temporarily put the environment at or near the top of public concerns. The Bruntland Report, *Our Common Future* (1987), the Kyoto Protocol (United Nations, 1998), the Paris climate change agreement of 2015 (United Nations, 2015), and many other symbolic successes and practical failures have pointed to the need for coordinated, sustained and truly transformative action. So far, of course, none have yet to make much headway, largely (but not exclusively) because of the failure of the United States of America to commit, much less to take a leadership role in anything akin to adequate reform. Soon, therefore, public interest has shifted to another threat—real or apparent—and even the most “progressive” political leaders have quickly fallen short on setting (never mind meeting) high expectations.

Recently, however, one document seems to have focussed attention in a new way. Simply by putting a limit on the amount of time we can safely squander and making that deadline seem real and close enough to the present to compel serious concentration, the more optimistic among us are prepared to rally themselves and honestly think: “Maybe this time!”

In the Fall of 2018, the United Nations outlined seventeen essential goals that must be met in order to avoid near-apocalyptic destruction (United Nations. 2018). Upon close inspection, the measures that are deemed necessary are not entirely unattainable; but, failure to meet them is utterly unacceptable. They are, of course, unlikely to be met or even approximated in the absence of what now seems like an almost imponderable metaphysical shake-up in the political economies and cultures not only of the thirty-six advanced industrial (and mainly “western”) countries of the Organization for Economic Cooperation and Development (OECD),

but of the large emerging global powers—notably China and India, but also Indonesia, Brazil and so on, as well as the obvious geopolitical outlier, Russia. At the same time, failure, as some convincingly argue, is no longer an option.

The timeline is set at *twelve years*, and the people who have carved that date into the consciousness of anyone paying even slight attention and caring at all for human welfare, the survival of other species and the maintenance of the newly branded “anthroposphere” people in the very near future have no choice but to demand and to achieve significant progress by the year 2030.

The topics covered in *Sustainable Development Goals* (United Nations, 2018), the latest dramatic contribution to the discussion is so broad that almost any issue of interest to world-savers and utopians could be shoe-horned into one of its seventeen categories. They range from health, education and an end to poverty to world peace, biodiversity and the yin and yang of economic growth and sustainability. For some, sustainability and industrialization are incompatible. For others, the “green economy” is not the best but the only way to ensure a high quality of material comfort without wrecking the so-called balance of nature.

<p><i>Fin du monde, fins de mois / Mêmes coupables, même combat</i> (End of the world, end of the month / same culprits, same fight). - French Yellow Vest (<i>gilets jaunes</i>) chant, 2019</p>
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The two documents under review here go some way toward informing us not only about what is at stake, but how we might salvage what’s left of the global ecology while avoiding the catastrophic consequences so many predict for the animal that John Livingstone (1993) aptly described as the “rogue primate”—domesticated humanity. Both address a key aspect of the human dilemma, the future of the fossil fuel industry which has played an essential role in the industrialization of the human economy and the production of CO<sup>2</sup> and other greenhouse gasses which none but the most recalcitrant analysts hold primarily responsible for global warming. If the survival on the planet of life as we know it is to be assured, then it is plain that a technological transformation on an even greater scale than the transition from human and animal muscle power to water and wind, from sailing vessels to steamships, from canals to railways, from horse-drawn carriages and wagons to automobiles must happen. And it must happen rapidly.

Kingsmill Bond’s *2020 Vision* is premised on the assumption that whole industries and economic sectors do not easily surrender their place in large political economies simply because of fears about environmental pollution. Wast investments are not abandoned out of a desire to serve the common good. The purpose of a capitalist enterprise is, after all, to maximize profit. So, he raises the important question: when may we expect “peak oil”?

Since 1956, peak oil (Hubbert, 1956) has been theorized as the point when the extraction of petroleum reaches its maximum, after which it is expected to enter into an irreversible decline. It refers to the moment of maximum production and is commonly linked to the fact that oil is a non-renewable resource. There is a limit to the amount available and, when it—like the palm trees on Easter Island—is exhausted or becomes too expensive to extract, then we will have to

find alternative sources of cheap energy. Until then, petroleum companies cannot be expected to cease or severely curtail their businesses. Hubbert (1956, p. 37) calculated that peak oil would be achieved by 1971 on the assumption that nuclear power would become so inexpensive and reliable that oil would start its rapid decline within fifteen years; of course, that has not happened as oil production has been growing and oil products have been consumed at ever greater rates (occasional “crises” notwithstanding). Nonetheless, despite the availability of alternative extraction methods (e.g., tar sands, fracking, etc.) fossil fuel sources are not inexhaustible and extraction costs are rising. It is not, however, the impending exhaustion of petroleum, natural gas and coal resources that threatens the fossil fuel industries, but rather the signature mark of capitalist development that explains matters.

With the same inevitability that the internal combustion engine put most farmers out of business within a few decades of the turn of the previous century, the fossil fuel industry will be diminished. It will happen when it starts precipitously to lose value. That will not be at some remote distance in the future. Not for nothing are the Saudi Arabians (who should know) investing heavily in solar panels!

In 2017 Kentucky’s coal-mining museum installed solar panels on its roof in order to save \$10,000 a year on electric costs. – Bill McKibben, 2019
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Bond speculates that the tipping point—the moment at which the stock prices of the main fossil fuel corporations have levelled off and begin to fall never to rebound—may be much less than a decade away. The collapse will not result from our running out of oil, but because renewables will have become so inexpensive that they will command an ever-greater share of the growth market and therefore new investment, while both traditional sources and novel technology fall behind.

The pertinent question, then, will be how much irreparable damage will have been done before the transition begins in earnest and during the length of the move to nearly 100% renewable power. No one, of course, knows the answer definitively and authoritatively. We cannot, however, be reassured by past experience. It is true that James Watt invented the coal-fired steam engine in 1776, but it took until 1840 for coal to supply even five percent of the Earth’s energy, and it didn’t reach 50 percent until 1900—yet William Blake was already writing verse describing the “dark, satanic mills” of Britain’s industrial revolution by 1804. That comparatively leisurely pace is not likely to be repeated any more in the energy sector than it has been in the information technology, nanotechnology, robotics and the like.

Technological change is happening far faster in the early twenty-first century than it did in the early nineteenth or the early twentieth; moreover, so are the consequences of toxic, obsolete technologies. Bond’s slim volume (a mere 41 pages) is produced by the “Carbon Tracker Initiative,” a self-described “independent financial think tank that carries out in-depth analysis on the impact of energy transition on capital markets and the potential investment in high-cost, carbon-intensive fossil fuels. It is plainly not a scrupulously “objective” research organization. It is also not part of what former Canadian prime minister Stephen Harper foolishly called a “socialist plot” aimed at sucking the life-blood out of capitalism or what the current American president absurdly continues to label a “hoax” (all the while cutting federal funding to

environmental science and purging the language of climate change and global warming from the vocabulary of the Environmental Protection Agency). Quite the contrary, Bond and his publisher fits snugly in the capitalist ideological silo, declaring its purpose as “aligning market actions with climate reality.”

*2020 Vision* presents a clear-eyed account of the forces of change—both technological and financial—that are currently in play. It speaks in language familiar to readers of *The Innovation Journal*. It advances a model of change that applies the “theory of the diffusion of innovation ... to the energy transition [pointing out that] as a successful new product conquers a market, it addresses new groups of people, from the innovators to the early adopters, early majority, late majority and laggards. In each country and each sector,” therefore, “renewables are moving along this kind of trajectory,” but in a manner less susceptible to conscious resistance. So, while competing social values might inhibit the adoption of government innovations in controversial areas of public policy, the “invisible hand” of dynamic market forces makes such efforts to retain tradition less effective. So, while sentimentalities and support for certain views of social justice may exert a drag on efforts to alter attitudes toward socio-cultural norms rooted in religion or customs, energy sources appear more susceptible to pressure from market forces.

Bond also presents some alarming information: for instance, the fact that “the fossil fuel sector has \$25 trillion of fixed assets which is increasingly vulnerable to stranding as the energy transition progresses.” Staying with fossil fuels, then, is not so much a tactic to save jobs and protect investment, it is quite the opposite—a way to sacrifice capital, while simultaneously refusing to allocate money to methods that will create wealth and employment sooner rather than later.

India’s national decarbonisation policy is in line with global trends which are seeing renewable energy infrastructure investment running at 2-3 times the level of new fossil fuel capacity investment since 2011. – Tim Buckley, 2017

There is also some bad news for OECD countries. Bond calculates that between 2014 and 2040, the relative share of energy demand growth will be taken up by India (27%), China (19%), the rest of Asia (19%), the Middle East (12%), Africa (12%), Latin America (7%) and Eastern Europe (7%). The now-dominant OECD countries, will drop by 5%. This means that the shift is on. For the first time since the term was coined, the “developing countries” will *really* be developing! This means, if nothing else, that business decisions that do not exploit this trend will have the same fate as local hardware stores in the face of the expansion by “Big Box” home improvement centers and small book stores confronted by Amazon.com. The lessons for investors should be obvious and words such as “socialism” or “sustainability” need not have been mentioned once.

Of course, such words cannot be ignored for long. The impending crisis, rather brilliantly anticipated by James Howard Kunstler (2005) and generally intimated by the socio-economic and ecological implications of late capitalism, forces contextual issues to arise. They do in *A New World* by the International Renewable Energy Agency (IRENA).

Again, the intent is not at all radical, at least in the sense that climate change deniers and global warming conspiracy theorists claim. Indeed, the language that IRENA Director-General Adnan Z. Amin could hardly be more comforting. “It is my hope,” he writes in the forward to the 88-page document, “that this Report will help decision makers in countries to anticipate and navigate the rapidly changing global energy landscape and manage the new geopolitical environment it will create. In doing so, this Report can enable them to mitigate the potential risks and benefit from the many opportunities that transformation offers.”

And that is precisely what *A New World* succeeds in doing. The premise is indisputable. Renewable sources of energy are growing at a rate that exceeds all other energy sources. They are already cost-competitive. The possibilities for addressing climate change are obvious provided that opportunities for change are fully exploited, but the inevitability of a massive alteration in geopolitical power is equally certain. These considerations are taken up here, perhaps for the first time.

Countries such as Denmark already generate more than half their electricity from variable renewable energy sources. – IRENA, 2018
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Among the chief consequences for geopolitics is the nature of renewable resources. Whereas fossil fuels are concentrated in specific locations, renewable energy resources are widely distributed and therefore widely accessible. Hoarding and controlling stocks of oil, natural gas or coal allow power to be concentrated, whereas renewables can be widely available and control can therefore be democratized. Imagine, for example, how the history of the twentieth century might have been altered if Japan were not so dependent on foreign energy resources or, alternatively, if so much petroleum had not been buried under Middle Eastern sands.

Moreover, as *A New World* explains, “since renewable energy sources have nearly zero marginal costs, and some of them, like solar and wind, enjoy cost reductions of nearly 20% for every doubling of capacity,” the capacity of resource “owners” to exploit resource-poor nations are all but eliminated. Symmetrical power relationships, in the absence of extremes of scarcity, undermine the very concept of imperialism and simultaneously strike at the heart of environmental degradation. This, of course, is not good news for any major political power which currently owns or controls the means of power production; it is, however, very good news for the rest of the planet which could potentially benefit (or, at least, ameliorate) the environmental consequences of over two centuries of industrial pollution.

Environmental science has the capacity to improve the global situation. Time, however, is running out and, of course, we all know (or should know by now) that no field of scientific research or technological innovation is without its problems and, often, its unintended consequences. Coal, oil and natural gas are object lessons in that regard. So is nuclear energy as long as the problem of the disposal of spent nuclear fuel rods remains unsolved. This is not to say that we should fear alternative energy sources such as wind, solar, geothermal, tidal, and other potential energy sources. It is merely to urge humility, even in the face of dead certainty, in the event that we continue to do what we have been doing for two hundred years.

It is also to recognize that merely having some of the tools needed to correct past errors does not mean that we have the wit or the will to deploy them. Short-sighted self-interest combined with wilful ignorance, distrust of science, prejudice and paranoia and a measure of arrogance that seems able to trump (so to speak) the best insights and analyses available to us is not to be underestimated. Whether investigating the vast sums of money being put into propaganda by the main petroleum interests and the venomous, vile and vicious attacks levelled against advocates of global environmental sanity, no one should expect that even the most apparently rational and progressive leaders in or near power today will be able to use the instrumentalities of the state to advance the energy transition in time to avoid disaster.

Once climate change becomes a defining issue for financial stability, it may be too late. – Mark Carney, 2015
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The arguments that are aligned with any standard version of “Economics 101” and the presumptions of the market economy itself are credible. Gasoline stations, domestic natural gas furnaces and even the dregs of the coal-fired electricity generators are not likely to evaporate in time to prevent further catastrophic climate change without serious political support for alternative fuels. In the meantime, corporate media throughout North America are using the impending Canadian and American election campaigns to bury the authors of the Canadian New Democratic Party’s flirtation with Naomi Klein’s “LEAP Manifesto” and, in the United States, efforts by presidential candidate Bernie Sanders and emerging leaders such as Alexandria Ocasio-Cortez to promote a Green Energy Plan are being ruthlessly mocked on every side from allegedly “liberal” newspapers and late-night talk show hosts to the most venal dark corners of the social media.

And, of course, caught in the middle and rendered voiceless—with a few honourable exceptions—are the scientists, technicians and policy experts at all levels of government who have already been expelled from the public sector, directly silenced by threat and intimidation, or simply had their research and public information programs defunded.

Meanwhile, as we contemplate the distribution of power, the scientific wisdom and the ethical integrity of all concerned, let us remember that Donald J. Trump’s infamous “Make America Great Again” hats are made in China.

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