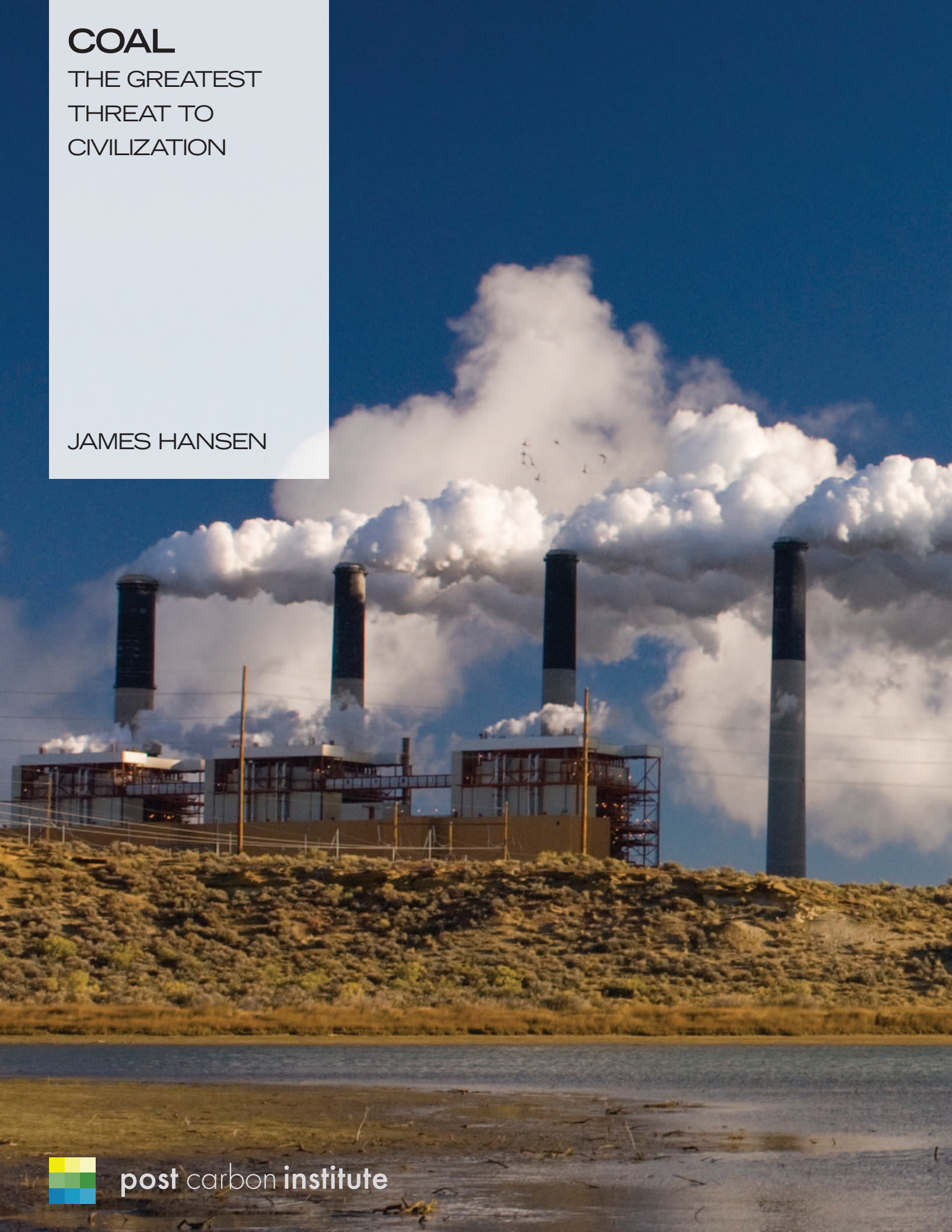


COAL

THE GREATEST
THREAT TO
CIVILIZATION

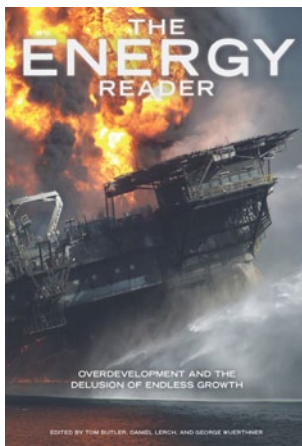
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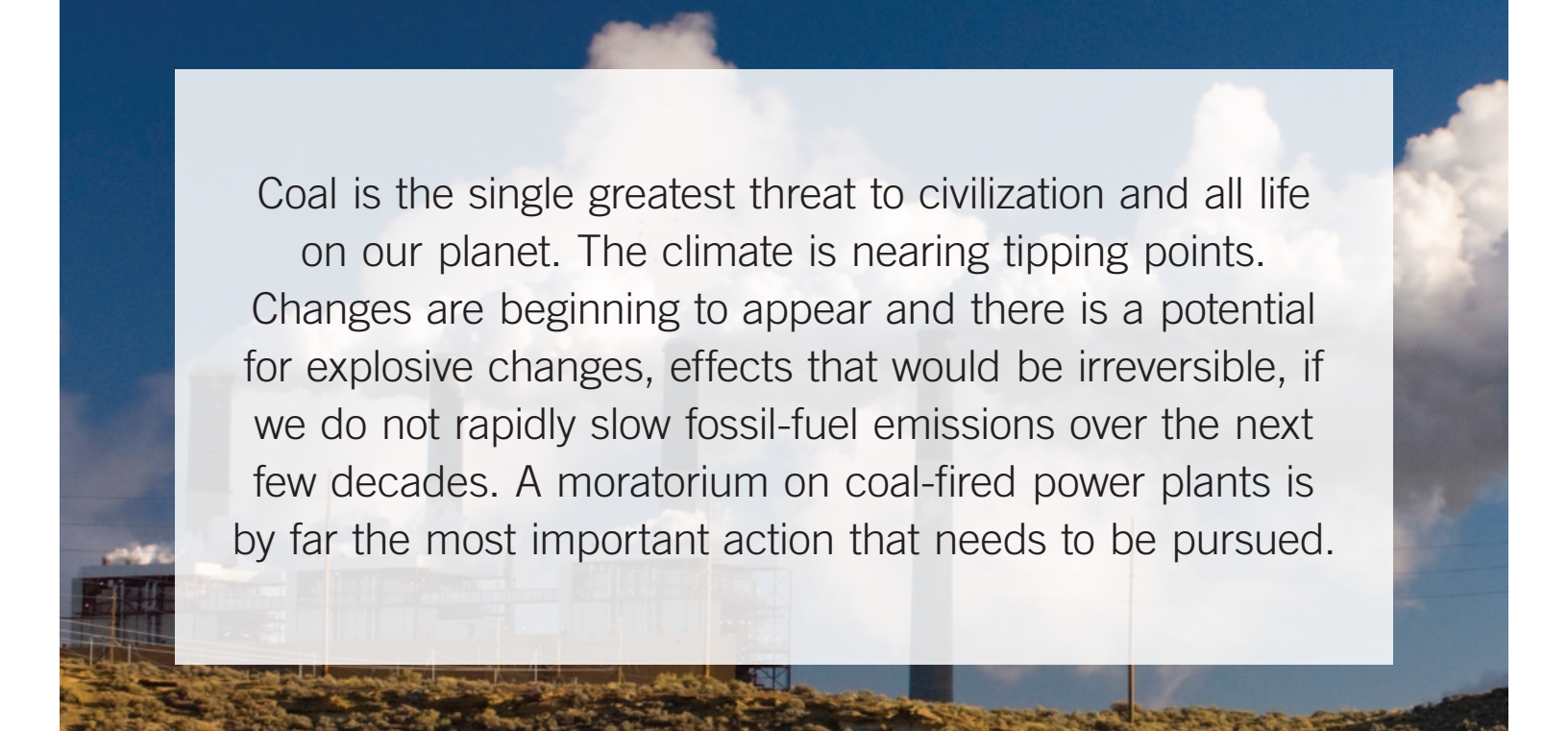
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This publication is an excerpted chapter from *The Energy Reader: Overdevelopment and the Delusion of Endless Growth*, Tom Butler, Daniel Lerch, and George Wuerthner, eds. (Healdsburg, CA: Watershed Media, 2012). *The Energy Reader* is copyright © 2012 by the Foundation for Deep Ecology, and published in collaboration with Watershed Media and Post Carbon Institute.

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Photo: Howie Garber. *The coal-fired Jim Bridger Power Plant near Rock Springs, Wyoming, is one of the United States' leading emitters of greenhouse gas pollution.*



Coal is the single greatest threat to civilization and all life on our planet. The climate is nearing tipping points. Changes are beginning to appear and there is a potential for explosive changes, effects that would be irreversible, if we do not rapidly slow fossil-fuel emissions over the next few decades. A moratorium on coal-fired power plants is by far the most important action that needs to be pursued.

In 2008, I wrote to former British prime minister Gordon Brown asking him to place a moratorium on new coal-fired power plants in Britain. I have asked the same of Angela Merkel, Barack Obama, Kevin Rudd, and other national leaders. The reason is this—coal is the single greatest threat to civilization and all life on our planet.

The climate is nearing tipping points. Changes are beginning to appear and there is a potential for explosive changes, effects that would be irreversible, if we do not rapidly slow fossil-fuel emissions over the next few decades. As Arctic sea ice melts, the darker ocean absorbs more sunlight and speeds melting. As the tundra melts, methane, a strong greenhouse gas, is released, causing more warming. As species are exterminated by shifting climate zones, ecosystems can collapse, destroying more species.

The public, buffeted by weather fluctuations and economic turmoil, has little time to analyze decadal changes. How can people be expected to evaluate and filter out advice emanating from those pushing special interests? How can people distinguish between top-notch science and pseudoscience?

Those who lead us have no excuse—they are elected to guide, to protect the public and its best interests. They have at their disposal the best scientific organizations

in the world, such as the Royal Society and the U.S. National Academy of Sciences. Only in the past few years did the science crystallize, revealing the urgency. Our planet is in peril. If we do not change course, we'll hand our children a situation that is out of their control. One ecological collapse will lead to another, in amplifying feedbacks.

The amount of carbon dioxide in the air has already risen to a dangerous level. The pre-industrial carbon dioxide amount was 280 parts per million (ppm). Humans, by burning coal, oil, and gas, have increased this to 390 ppm; it continues to grow by about 2 ppm per year. Earth, with its four-kilometer-deep oceans, responds only slowly to changes of carbon dioxide. So the climate will continue to change, even if we make maximum effort to slow the growth of carbon dioxide emissions. Arctic sea ice will melt away in the summer season within the next few decades. Mountain glaciers, providing fresh water for rivers that supply hundreds of millions of people, will disappear—practically all of the glaciers could be gone within fifty years—if carbon dioxide continues to increase at current rates. Coral reefs, harboring a quarter of ocean species, are threatened.

The greatest danger hanging over our children and grandchildren is initiation of changes that will be irreversible on any timescale that humans can imagine. If coastal ice shelves buttressing the West Antarctic Ice

Sheet continue to disintegrate, the sheet could disgorge into the ocean, raising sea levels by several meters in a century. Such rates of sea level change have occurred many times in Earth's history in response to global warming rates no higher than those of the past thirty years. Almost half of the world's great cities are located on coastlines.

The most threatening change, from my perspective, is extermination of species. Several times in Earth's history, rapid global warming occurred, apparently spurred by amplifying feedbacks. In each case, more than half of plant and animal species became extinct. New species came into being over tens and hundreds of thousands of years. But these are timescales and generations that we cannot imagine. If we drive our fellow species to extinction, we will leave a far more desolate planet for our descendants than the world we inherited from our elders.

Clearly, if we burn all fossil fuels, we will destroy the planet we know. Carbon dioxide would increase to 500 ppm or more. We would set the planet on a course to the ice-free state, with sea level 75 meters higher. Climatic disasters would occur continually. The tragedy of the situation, if we do not wake up in time, is that the changes that must be made to stabilize the atmosphere and climate make sense for other reasons. They would produce a healthier atmosphere, improved agricultural productivity, clean water, and an ocean providing fish that are safe to eat.

Fossil fuel reservoirs will dictate the actions needed to solve the problem. Oil, of which half the readily accessible reserves have already been burned, is used in vehicles, so it's impractical to capture the carbon dioxide. This is likely to drive carbon dioxide levels to at least 400 ppm. But if we cut off the largest source of carbon dioxide—coal—it will be practical to bring carbon dioxide back to 350 ppm, lower still if we improve agricultural and forestry practices, increasing carbon storage in trees and soil.

Coal is not only the largest fossil fuel reservoir of carbon dioxide, it is the dirtiest fuel. Coal is polluting

the world's oceans and streams with mercury, arsenic, and other dangerous chemicals. The dirtiest trick that governments play on their citizens is the pretense that they are working on "clean coal" or that they will build power plants that are "capture-ready" in case technology is ever developed to capture all pollutants.

The trains carrying coal to power plants are death trains. Coal-fired power plants are factories of death. They need to be shut down. The moratorium on any coal-burning power plants without carbon capture and sequestration (CCS) must begin in the West, which is responsible for three-quarters of climate change (via 75 percent of the present atmospheric carbon dioxide excess, above the pre-industrial level), despite large carbon dioxide emissions in developing countries.

The moratorium must extend to developing countries within a decade, but that will not happen unless developed countries fulfill their moral obligation to lead this moratorium. If Britain should initiate this moratorium, there is a strong possibility of positive feedback, a domino effect, with Germany, Europe, and the United States following, and then, probably with technical assistance, developing countries.

A spreading moratorium on construction of dirty (no CCS) coal plants is the sine qua non for stabilizing climate and preserving creation. It would need to be followed by phase-out of existing dirty coal plants in the next few decades, but would that be so difficult? Consider the other benefits: cleanup of local pollution, conditions in China and India now that greatly damage human health and agriculture, and present global export of pollution, including mercury that is accumulating in fish stocks throughout the oceans.

There are long lists of things that people can do to help mitigate climate change. But a moratorium on coal-fired power plants is by far the most important action that needs to be pursued. It should be the rallying issue for young people. The future of the planet in their lifetime is at stake. This is not an issue for only Bangladesh and the island nations, but for all humanity and other life on the planet.