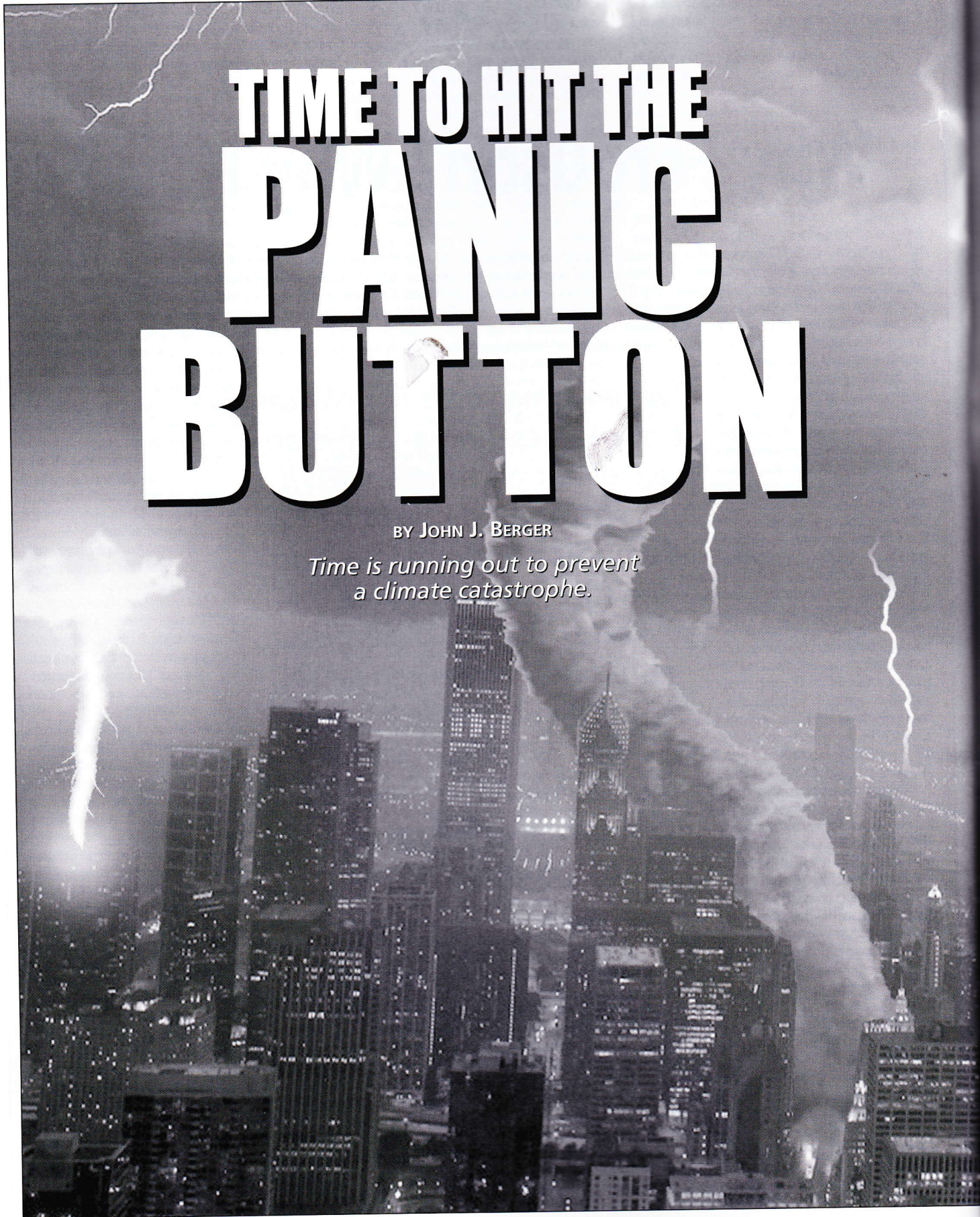


TIME TO HIT THE PANIC BUTTON

BY JOHN J. BERGER

*Time is running out to prevent
a climate catastrophe.*





SINCE THE START of the Industrial Revolution, humans have released 545,000,000,000 metric tons of carbon into the atmosphere. We now have more airborne heat-trapping gases—carbon dioxide, methane, and nitrous oxide—than at any time in the past 800,000 years. We are putting about 10,500,000,000 metric tons of carbon a year into the air. Annual emissions of carbon dioxide—from fossil fuel burning and cement production plus land-use changes—surged 54% from 1990-2011.

The average land and sea temperature has risen by about 1.5°F since the mid 19th century. The Greenland and Antarctic Ice Sheets are melting at increasing rates, as are the world's glaciers. Positive climate system feedbacks—warming that inexorably leads to more warming—are appearing, such as the warming, melting, and thinning of carbon-rich frozen soils known as permafrost. Arctic sea ice is melting very quickly as well, adding still more positive feedback. Sea levels are rising at an accelerating rate. Ocean temperature, currents, and salinity are changing. The oceans are growing dangerously more acidic. Because global temperature has risen, heat waves and other weather extremes have become more common. The onset of seasons has altered. The global water cycle and atmospheric circulation have been affected negatively.

These trends are likely to continue and accelerate for the foreseeable future but, even should emissions stop, adverse climate effects will continue for millennia. The greater cumulative emissions become, the higher the Earth's final temperature, and the more severe the consequences—longer-lasting droughts, more insufferable heat, larger deserts, scarcer food and water, higher oceans, more corrosive seawater, more fetid ocean bottoms, and a paroxysm of species extinctions.

The Earth cannot withstand the ravages of habitat destruction indefinitely, nor the strain of an exploding human population and abrupt climate change. Healthy natural ecosystems will lose their diversity or collapse outright. As their productivity declines, so will the Earth's life-support capacity. People will suffer. Vulnerable populations will begin to contract. Even if heat-trapping gas emissions magically fell to zero tomorrow, the atmosphere still would get another one to two degrees hotter, just from excess heat already absorbed by the oceans.

In a matter of decades, billions of people will lack adequate food and water if society continues on its current irresponsible emissions trajectory. Governments and relief organizations already are struggling to care for millions of refugees. In an overheated world, tens of millions more environmental refugees will be on the move—hungry, sick, and desperate. This is a recipe for conflict and chaos that, like climate change, is compounded greatly by rapid global population growth, most of it in developing countries.

Because of the cumulative nature of carbon emissions and the decades required to convert global economies from fossil fuels to clean energy, the chance to protect the Earth from horrific consequences is slipping away. Merely to have a two-thirds chance of avoiding a global temperature increase of more than 3.6° means we cannot add more than another 270,000,000,000 metric tons of carbon to the atmosphere.

Thus, even if the world held its current annual emissions constant at 10,500,000,000 metric tons of carbon—instead of allowing them to increase rapidly as we are doing—the world would have a mere 26 years to avoid crossing the 270,000,000,000 threshold. Future emissions then miraculously would need to fall to zero in 2039 to avoid overshooting 3.6°, the nominal boundary between safe and unsafe climate change.

We clearly are on the precipice of extremely dangerous changes. Between 2080-2100, we are on track to increase global average temperatures by between six degrees and 10°,

as compared with preindustrial times, according to the scientifically conservative bodies. Some scientists are projecting that seven degrees could be reached by 2060. Such temperatures have not been seen on this planet in 5,000,000 years. Moreover, those average temperatures roughly would be doubled in continental interiors.

Thus, in that overheated world only a few decades from now, up to 30% of the globe would be in drought at any time, up from one percent today. Fifty percent of land where crops now grow would become unsuitable for farming. A seven degree temperature increase could cause most of the world's old trees to die from a combination of drier conditions, heat, and climate-related diseases. Even a temperature increase of 3.6° eventually could drive the Earth's climate past various tipping points at which the climate system itself irreversibly begins to amplify the effects of human greenhouse gas releases.

If our current emissions trajectory continues, one-quarter of all land, plant, and animal species likely will be gone within 50 years. By 2100, half of all species likely would disappear. For all of these reasons, the climate emergency, too long neglected, must become a top financial as well as political priority. It even is more threatening to our long-term security than terrorism and conventional military threats.

Many global studies confirm that we have the technology, financial capability, and renewable energy resources to transition successfully to an energy economy largely free of fossil fuels, but this will require some hard choices. Very large global programmatic investments in energy efficiency, renewable energy technology, agriculture, and forestry, as well as carbon capture and storage, will be needed—and affordability is not the main impediment. The U.S. has a gross domestic product of about 16 trillion dollars but, like most other nations, it prioritizes military and other spending over climate protection.

The International Energy Agency estimates that the world needs 38 trillion dollars in energy infrastructure investment between 2010-35. If past is prologue, most would be spent on gas, oil, and coal energy infrastructure. Yet, if those dollars were redirected from fossil fuel infrastructure into efficient and renewable energy systems, they would make more energy available more cleanly and with vastly more new employment than business-as-usual fossil fuel investments, but socially irrational energy decisions are being made due to the political and economic influence of fossil fuel producers. A relatively small number are responsible for a disproportionate share of the world's carbon emissions. From 1854-2010, nearly two-thirds of all human-induced carbon dioxide and methane were attributable to just 90 major commercial and state entities, according to Richard Heede of the Climate Accountability Institute.

A redirection of capital would defund—at least partially—these entities. For instance,

funds could be made available by ending direct fossil fuel subsidies that total around \$500,000,000,000 worldwide and from fees on carbon-based fuels. If intelligent clean energy and transportation programs were interwoven with enlightened agricultural and forestry policies, humanity could avoid aggravating the climate crisis.

A comprehensive energy plan for every nation is needed—aimed at nothing less than a transformation of each national energy system. The plan needs to provide for a steadily increasing national renewable energy requirement, the electrification of the transportation system, energy storage technologies, and modernization of the electric transmission grid. Such plans also could aim at achieving full employment and economic revitalization, so ordinary people would benefit from—and support—these plans. Jobs would be created in energy efficiency services as well as in manufacturing, installing, transporting, financing, and maintaining new renewable energy equipment. Millions of people could be put to work restoring and enhancing damaged natural resources that remove carbon from the atmosphere, including forests, agricultural lands, grasslands, and wetlands.

Fossil fuel continues to rule

Still, momentous political and logistical challenges stand in the way of these solutions. Efforts to pass sweeping climate protection legislation in Congress have been stymied over the past two decades by the alliance of powerful fossil fuel interests.

Far-reaching campaign finance reform is needed as well. Campaigns for public office should be funded publicly to fend off the corrupting influence of large donations. A government untainted by de facto institutionalized bribery would, in time, induce more people of merit, distinction, and knowledge back into Congress and political life.

To build a broad and knowledgeable constituency for climate protection quickly, the public needs to hear the truth about climate change, and climate science denial needs to be rebutted vigorously. Restoring the Federal Communications Commission's Fairness Doctrine would be a step in this direction. The doctrine used to require broadcasters to provide contrasting views on political issues and that people subject to on-air political attack be given advance notice, when possible, and an opportunity to respond.

What can concerned individuals do now to improve the quality of government and bring climate protection to center stage? Grassroots political activism plus new technology can produce fast results. Pres. Barack Obama employed grassroots organizing and social media to gain the White House in 2008. Social media also was indispensable to the Arab Spring revolutions but, whereas many climate organizations already are active on the web, their initiatives often are lost in an Internet cacoph-

ony, much of it created by powerful commercial interests.

The marketing of forceful climate protection messages to hundreds of millions of people ultimately requires a powerful mass media network devoted to the planetary environmental emergency. Thought leaders, articulate scientists, and entertainment and sports celebrities with large followings need to speak out for climate protection. Large radio and TV networks need to provide daily, in-depth coverage of climate and energy news and analysis, along with relevant scientific, political, and economic developments. Organized groups have to demand it and help broadcasters recruit audiences for it.

Even though governments tend to be captured by special interests and resist needed change that challenges the global fossil fuel industry, even very powerful minority interest groups can be overcome. Bad governments can be forced from power. Through years of struggle, Nelson Mandela and the global campaign to end apartheid demonstrated the power of a well-organized and coordinated international boycott to bring down the racist government of South Africa.

Protecting the climate still is possible, but it is something that must be fought with steadfast determination and implacable will. There is no magic bullet, no formula for protecting the climate—just long, hard work and a great deal of political organizing by many committed people to generate the pressure that will create change.

Only a small fraction of the electorate needs to be mobilized to create intense pressure on those at the apex of power resisting climate protection. Life must become less comfortable and less profitable for them. People can vote against fossil fuels by supporting the right candidates for office and, with their dollars, by curtailing reliance on fossil fuel products, and by urging others not to invest in fossil fuel companies.

Radical change comes from the bottom up. Millions of people do care about the Earth, their children, the future, and the climate. Ordinary people are powerful when deeply committed to a cause. They defeated slavery, guaranteed women the right to vote, fought for civil rights in the U.S. and South Africa, ended colonialism in India and Africa, and brought down governments in the Middle East and elsewhere.

There is no time to lament the climate predicament or make excuses for inaction. The movement for climate protection needs active, wholehearted support. Millions of people believe we are in a climate crisis. They will stand up if inspired to do so—so take action; inspire them; and ask for their help. Chances are you have more power and influence than you think. ★

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