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ABSTRACT:
It is widely believed that man-made greenhouse gas emissions are increasing overall vulnerability to climate-related disasters, and that, consequently, policies aimed at cutting off these emissions are urgently needed. But a broader perspective on climate vulnerability suggests that the most important factors influencing susceptibility to climate-related threats are not climatologic, but political and economic. The dramatic degree to which industrial development under capitalism has reduced the risk of harm from severe climate events in the industrialized world is significantly under-appreciated in the climate debate. Consequently, so too is the degree to which green climate and energy policies would undermine the protection that industrial capitalism affords—by interfering with individual freedoms, distorting market forces, and impeding continued industrial development and economic growth. The effect of such policies would, ironically, be a worsening of overall vulnerability to climate.

1. INTRODUCTION

Severe climate events have become a weapon in the rhetorical arsenal of green politics. Hurricane Katrina became the literal poster child for global warming when the movie placard for Al Gore's *An Inconvenient Truth* depicted a satellite image of the storm blowing out of a set of industrial smokestacks. No climate-related disaster occurs today without being seized upon as a cautionary tale against the purported threat of anthropogenic climate change.

The claim that man-made greenhouse gas emissions are causing large-scale changes to the earth's climate systems—dramatically increasing the risk of climate catastrophe—is omnipresent and trumpeted daily with ever-increasing alarm. Climate-related tragedies past and present are routinely used to underscore the theme of man's vulnerability to the climate. Consider the following from Spencer Weart's book *The Discovery of Global Warming*:

> In 1972 a drought ravaged crops in the Soviet Union, disrupting world grain markets, and the Indian monsoon failed. In the United States the Midwest was struck by droughts severe enough to show up repeatedly on the front pages of newspapers and on television news programs. Most

> dramatic of all, years of drought in the African Sahel reached an appalling peak, starving millions, killing hundreds of thousands, and bringing on mass migrations. Television and magazine pictures of sun-blasted fields and emaciated refugees brought home just what climate change could signify for all of us.[1]

The intended implications are clear: all of us are dangerously susceptible to the ravages of climate; to protect ourselves we must immediately adopt drastic policies aimed at cutting off greenhouse gas emissions.

And such policies are not merely being pondered, but are steadily moving toward political reality. International negotiators will meet in Copenhagen in December 2009 to hammer out a much stronger successor to 1997's Kyoto Protocol, which imposed on its signatories binding emissions cuts.[2] [3] Also, as of this writing (April 2009), a draft bill before the U.S. Congress would impose energy rationing in a variety of guises: a cap-and-trade system rationing U.S. carbon emissions, a renewable energy mandate, forced energy efficiency programs, and more.[4] Should the bill fail, regulation of greenhouse gases might still go forward in the United States since the EPA—following the Supreme Court—has "found" them to be air pollutants under the Clean Air Act.[5]

The lurid examples of climate-related tragedy fuel this political agenda by imparting a sense of panicked urgency. They convey the impression that something is happening that is unprecedented in human history—that where mankind once flourished in a world with a stable, benign climate, we are now facing an apocalyptic hell beyond all capacity to manage.

But vulnerability to the climate has been a feature of human existence for all of human history; there have always been droughts and floods and hurricanes and heat waves—and there always will be, regardless of what happens to atmospheric greenhouse gas concentrations. Moreover, the history of industrial development has been one of an ever-increasing ability to cope with natural disasters—an ever-increasing resilience against them.

Yet none of this is sufficiently appreciated in the climate debate. We in the industrialized world tend to ignore or forget just how harsh and precarious life was in the preindustrial era, and still is today in nonindustrialized countries. We take industrial development for granted and tend not to consider the ways it actually reduces our climate vulnerability. We also take for granted the political and economic freedoms that make industrial development possible and fail to recognize the myriad ways that proposed climate and energy policies would undermine those freedoms.

A proper assessment of proposed green policies requires a broader perspective on climate vulnerability than one that focuses merely on climatologic factors. In particular, the role of political and economic factors must also be considered. To what degree is susceptibility to climate-related threats reduced by policies that expand political freedom and thereby foster industrial development and economic growth? And to what degree is climate vulnerability actually worsened by policies that interfere with market freedoms and thereby restrict development and growth? Given the far-reaching implications of proposed energy and climate policies, such a broader consideration of climate vulnerability is urgently needed.

2. CLIMATE VULNERABILITY: PREINDUSTRIAL AND POST

Nature has never been unqualifiedly hospitable to man. Whatever periods of human flourishing occurred in the preindustrial era, they occurred against a general background of unrelenting hardship and privation. For most of human history, life has consisted of a precarious struggle to eke out a bare subsistence at the constant mercy of drought and disease, storm and flood, famine and plague.

Prior to the widespread utilization of coal in the eighteenth century, the primary sources of fuel for heating, cooking, and other uses were biomass fuels such as wood and animal dung (still true in many poor countries today). With access only to fuels of such low energy-density and to rudimentary technology, people in preindustrial civilizations had little control over nature and were easily overwhelmed by its powerful forces.[6]

Ramshackle dwellings and primitive fuels afforded little protection against the elements. Describing everyday life in sixteenth-century Europe, historian William Manchester writes of

> tiny cabins of crossed laths stuffed with grass or straw, inadequately shielded from rain, snow, and wind. They lacked even a chimney; smoke from the cabin's fire left through a small hole in the thatched roof—where, unsurprisingly, fires frequently broke out. These homes were without glass windows or shutters; in a storm, or in frigid weather, openings in the walls could only be stuffed with straw, rags—whatever was handy.[7]

Shelters of such poor quality were typical for people the world over until as recently as several generations ago. In countries at even moderately northern latitudes, a prodigious labor was required just to keep from freezing through a normal winter—let alone cope with unusual extremes of cold. For instance, a typical household on the early American frontier consumed thousands of pounds of firewood every year—twenty to forty cords annually, according to one estimate (forty cords being a stack of wood four feet high by four feet deep by 320 feet long)—which of course had to be gathered or chopped by hand.[8] And in return for the meager warmth such fuels provided, they posed serious health risks of their own. "They can generate high levels of poisonous carbon monoxide," writes energy analyst Vaclav Smil, "while poorly-vented combustion, in shallow pits or fireplaces, produces high concentrations of fine particulates, including various carcinogens. Repeated inhalation of this smoke leads to impaired lung function and chronic respiratory diseases (bronchitis, emphysema)."[9]

Smil also writes of the "millennia-long stagnation" in the development of preindustrial agriculture, which he attributes partly to "the inadequate power and relatively high energy cost of the only two kinds of prime movers available for field work; human and animal muscles."[10] Primitive technology and ignorance of sophisticated agricultural methods left preindustrial farmers with little control over the results of their toil. The threat of drought, crop failure, and starvation was omnipresent and periodic famines that regularly decimated whole populations were the rule not the exception.[11]

Undernourished and lacking access to clean drinking water or basic sanitation, completely ignorant of medical science, helpless before natural threats they couldn't

understand or predict—individuals in the preindustrial world were completely at the mercy of whatever adversities nature threw their way. Little wonder, then, that life expectancy has been so low for most of human history. Estimates of life expectancy in prehistoric eras put it at somewhere between twenty and thirty years, and it remained below forty years right up through the start of the nineteenth century.[12]

Yet life expectancy in developed countries today is as high as eighty years—and it should go without saying that the majority of people in today's industrialized world enjoy a length and quality of life incomparably superior to the squalid misery alluded to above. In the brief span of two centuries, human life has been completely transformed—transformed by extraordinary advances in science, technology, and medicine and by the growth of market institutions and the expansion of political and economic freedom associated with the birth of industrial capitalism.

Too often, we take for granted the astonishing and life-saving products of industrial capitalism and industrial-scale energy. We in the developed world don't think about the fact that things we regard as completely commonplace and unremarkable would seem, to anyone from any previous period in history, an absolutely unimaginable miracle. We forget, as we flood our homes with light by a casual flick of a switch, that through most of human history (and still today in many parts of the world) the close of day meant darkness and an end to all activity. The precarious existence of the preindustrial farmer doesn't even register as a glimmer in our consciousness as we walk into our modern grocery stores, with their shelves upon shelves of fresh, healthful foods—prepared, packaged, refrigerated, and relatively inexpensive—all supplied and served by a vast infrastructure of agricultural, transportation, and business and marketing systems.

We hardly even notice when our furnaces fire up automatically, sending hot water through radiators or blowing warm air through vents in our well-insulated walls—or when a different setting sends in an air-conditioned breeze to drive off the heat of summer. Rightly concerned about heat waves and spells of extreme cold, we forget just how much more suffering and death such climate events inflict on people lacking modern amenities. This holds true even in developed countries today where the cost of energy has, for example, limited the adoption of air conditioning. More than thirty thousand deaths were attributed to the heat wave that struck Western Europe in 2003—widely taken as a sign of the extreme threat posed by global warming.[13] But, as Patrick Michaels has pointed out, the temperatures that exacted such a tragic toll that summer were lower than those in Western America, where no deaths were attributed to the heat. "The difference," argued Michaels, "is air conditioning run by affordable energy."[14]

Or, consider Spencer Weart's drought example, which he takes as portending the future threat that climate change "could signify for all of us."[15] It is true that severe drought did indeed strike the regions he mentions in 1972, and the consequences were indeed harsh: food rationing in the Soviet Union, famine in India that persisted through the mid-70s, and mass starvation in sub–Saharan Africa, which went on for decades as the drought continued through much of the '80s and '90s. But from a historical perspective, these tragic events are unfortunately nothing unusual. What really stands out as remarkable and unprecedented is the negligible effect of the drought in the United States.

Despite drought conditions severe enough to rate comparison with the 1930s Dust Bowl, Americans saw only minor economic losses and fluctuations in food prices.[16] It is telling that the most that Weart could find to say was that the Midwest droughts showed up on "the front pages of newspapers and on television news programs."[17] Observe that they specifically did not "show up" at all on people's waistlines and barely registered on their pocketbooks. Such resilience is testament to the adaptive flexibility of an industrialized economy and a (relatively) free market—to industrial capitalism's ability to respond quickly when normal conditions are disrupted. While the other regions mentioned suffered a total failure of their food production and distribution systems, the United States donated surplus food supplies to Africa, sold food grains to India, and arranged a massive sale of wheat to the Soviet Union in late 1972.[18] [19] [20]

Contrast this to the helplessness before nature of India's peasant farmers or the Sahel's nomadic tribes. Why were they unable to benefit from the agricultural practices that empowered the American farmers—the irrigation of fields, the use of fertilizers and pesticides, and the application of sophisticated methods of agricultural management? What role did their primitive cultural traditions and their countries' oppressive political systems play in suppressing the industrial development and free market mechanisms that made such advances possible? And in the case of the Soviet Union, should there really be any surprise that its state-owned collective farms were unable to cope with unfavorable weather conditions? Even under good conditions—and with the advantage of some of the most fertile agricultural land in the world—the central planners of the Soviet agricultural ministry were rarely able to coerce adequate food production.

Looked at from the vantage point of human history, recent climate-related tragedies suggest an opposite perspective to that offered by the advocates of green policies. The message these and numerous other examples convey is not "man's vulnerability to climate," but his vulnerability only under the wrong political and economic conditions. Standing out above all else is the unprecedented degree of protection from climate-related threats that exists under industrial capitalism.

Consider the poster child of global warming alarm: Hurricane Katrina. In 1970, a severe tropical cyclone struck the coast of the Bay of Bengal, in what is today Bangladesh. It is estimated that the storm was a category 3 cyclone, and the death toll it left in its wake was estimated to have been as high as three hundred thousand people.[21] Compare this with Hurricane Katrina, which struck New Orleans in 2005. By the time it made landfall Katrina was also a category 3 storm and the directly affected population was comparable to that in Bangladesh.[22] [23] Yet the number of people dead or missing was far, far less—estimates put it at around two thousand.[24]

Without denying the tragedy of the lives lost to Katrina, two thousand versus three hundred thousand is an incredible difference. In assessing what accounts for that difference, one can debate the relative roles of social, political, geographic and climatologic factors, but there can be no question of the fundamental and decisive importance of the technology and infrastructure made possible by industrial capitalism. Unlike the helpless victims of the Bangladesh storm, the citizens of New Orleans could rely on advanced early warning systems and a functioning

communications infrastructure, modern vehicles and paved roads to facilitate evacuation and transport relief supplies, sturdier homes and structures and advanced flood control systems, etc. Indeed, much of this even failed in New Orleans: the levees were breached, many people couldn't or wouldn't evacuate, the relief effort was delayed, and so on. Yet, even in spite of these failures, hundreds of thousands of lives were saved by the products of industrial technology and industrial-scale energy.

This is the real lesson of today's climate-related tragedies: the immeasurable degree to which industrial development under capitalism has *reduced* our vulnerability to climate threats.

3. CLIMATE VULNERABILITY AND DISTORTIONS OF THE FREE MARKET

A corollary lesson is the degree to which our protection against climate disasters is weakened by government policies that obstruct the life-saving benefits of industrial capitalism or otherwise interfere with the mechanisms of the free market.

It is arguable that—though it was orders of magnitude lower than in Bangladesh—the toll in New Orleans was still higher than it need have been. Consider the following 2006 statement from ten of the world's top hurricane experts, who point out that "a Katrina-like storm or worse was (and is) inevitable even in a stable climate" and suggest that while the "possible influence of climate change on hurricane activity" is an important scientific question, it is not "the main hurricane problem facing the United States."

> Rapidly escalating hurricane damage in recent decades owes much to government policies that serve to subsidize risk. State regulation of insurance is captive to political pressures that hold down premiums in risky coastal areas at the expense of higher premiums in less risky places. Federal flood insurance programs likewise undercharge property owners in vulnerable areas. Federal disaster policies, while providing obvious humanitarian benefits, also serve to promote risky behavior in the long run.[25]

By distorting the free market price signals individuals use to guide their choices, these and myriad other government interventions and regulations, going back decades, have lured people into floodplains and produced a higher overall vulnerability to hurricanes and flooding.

Or, consider the role of government policies in enhancing the risks from wildfire—another item on the laundry list of disasters that many fear will be exacerbated by global warming. With every major blaze that occurs today the news reports never fail to include prominent mention of climate change (notwithstanding the obligatory caveat that no individual wildfire can be attributed to it).

In February 2009, for instance, a number of severe bushfires raged through southeastern Australia, killing 173 people and destroying thirteen hundred homes as they burned more than 4,500 square kilometers (1.1 million acres)—the deadliest bushfires in Australia's history.[26] [27] [28] Not surprisingly, this was widely reported in the press as a sign of what global warming has in store for Australia's future. For instance,

a *New York Times* story—ostensibly about the role of arson in setting the fires ablaze—included the following:

> Climate scientists say that no single rare event like the deadly heat wave or fires can be attributed to global warming, but the chances of experiencing such conditions are rising along with the temperature. . . . The flooding in the northeast and the combustible conditions in the south were consistent with what is forecast as a result of recent shifts in climate patterns linked to rising concentrations of greenhouse gases. . . .[29]

Another story asserted that "the government's failure to set tough greenhouse gas emissions targets would endanger lives."[30]

But while there is no question that high temperatures and dry conditions are crucial causal factors in the risk and severity of wildfire, the "only controllable factor"—according to meteorologist and bushfire expert David Packham—is the fuel that feeds the fires: "the dead leaves, pieces of bark and grass that become the gas that feeds the 50m high flames."[31]

Packham argues that the bush, properly managed, need not pose nearly such a deadly threat. The main factor that kept residents as dangerously exposed as they were was the green policies of local government councils that restricted the clearing of trees and brush.

> Fuels build up year after year at an approximate rate of one tonne a hectare a year, up to a maximum of about 30 tonnes a hectare. If the fuels exceed about eight tonnes a hectare, disastrous fires can and will occur. Every objective analysis of the dynamics of fuel and fire concludes that unless the fuels are maintained at near the levels that our indigenous stewards of the land achieved, then we will have unhealthy and unsafe forests that from time to time will generate disasters such as the one that erupted on Saturday.
>
> It has been a difficult lesson for me to accept that despite the severe damage to our forests and even a fatal fire in our nation's capital, the political decision has been to do nothing that will change the extreme threat to which our forests and rural lands are exposed.

In the wake of the tragedy, distressing stories emerged of bushfire victims who had repeatedly pleaded for controlled burns and other fire prevention measures, but who were rebuffed by local governments citing "threats to biodiversity."[32] Regional councils refused to trim out-of-control vegetation on public lands and even prevented people from clearing firebreaks on their own, private property.[33]

Liam Sheahan, a resident who disregarded such restrictions and cleared a one hundred meter swath around his property in 2002, ended up before a local magistrate facing legal charges. A two-year court battle ended with Sheahan's conviction, costing him $100,000 in fines and legal fees. "We've got thousands of trees on our property. We cleared about 247," said Sheahan. The result? "The house is safe because we did

all that. We have got proof right here. We are the only house standing in a two-kilometre area."[34]

In light of such political policies restricting people's freedom to protect their own safety on their own property, it is bordering on criminal to point to emissions reductions—on the assumption that they *might* someday have a salutary effect on Australia's climate—as the primary call to action as a precaution against extreme bushfires.

4. THE THREAT OF MISANTHROPOGENIC CLIMATE POLICY

The industrial revolution and the development of industrial-scale energy required the unprecedented political freedom of England and the United States. This is what has made us comparatively safe from droughts, wildfires, hurricanes and the like. Policies restricting that freedom and interfering with market forces undermine this achievement and increase our climate vulnerability. Property owners have an obvious reason to reduce bush or forest fuel loads long before they pose a risk of unprecedented, extreme wildfire—but too many governments today prohibit such actions. Similarly, if the risk of living in a flood-prone coastal community was properly reflected in market prices—such as flood insurance premiums, home values, unsubsidized relief and recovery costs, and so on—individuals could act accordingly without false assurances of safety. It is only policies that distort such price signals and market forces that give rise to mounting dangers that go unattended for decades.

And the threat of more such destructive policies is only growing. The failure to appreciate how a truly free market operates and the unprecedented degree to which industrial capitalism has reduced vulnerability to climate-related risks is behind much of the alarm over "unchecked climate change." Ignoring the fact that no civilization in human history has ever achieved greater protection against climate disasters than today's industrialized nations, people are whipping themselves into a hysterical frenzy over the belief that changes in the earth's climate will be an unmanageable calamity.

But under capitalism, there is no special problem of adapting to changes in the earth's climate—even large-scale changes. Whether man-made or not, when such changes occur (as they have already occurred in human history), they would merely constitute one set of factors among all the others that are constantly integrated by and reflected in a free market. Individuals are continually making decisions and taking actions to enrich their own lives, based on the best knowledge they can acquire and the opportunities in the market. If, over the course of decades, some regions become warmer and others colder, or some regions become drier and others wetter, or sea levels rise or sea levels fall—these changes would simply be reflected in people's knowledge and economic decisions. There is no reason to regard these changes any differently from any other forces driving continual market evolution and adaptation. And the more widespread industrial civilization is—the more readily available industrial-scale energy and the other products of industrial capitalism are—the easier the adaptation.

But this is not a perspective widely shared today. "Needless to say, a sea level rise of one meter by 2100 would be an unmitigated catastrophe for the planet," shrieks climate activist Joe Romm.

> The first meter of SLR [sea level rise] would flood 17% of Bangladesh, displacing tens of millions of people, and reducing its rice-farming land by 50 percent. Globally, it would create more than 100 million environmental refugees and inundate over 13,000 square miles of this country [America].[35]

Environmental refugees? A sea level rise of one meter by *next month* would be a catastrophe creating environmental refugees. A sea level rise of one meter by 2100—i.e., barely more than one centimeter per year—would be a steady change that could be addressed in myriad ways and need not create a single refugee.*

But advocates of green policies are not interested in freedom. Restrictions on freedom are the essence of green climate and energy policies, which far from loosening the fetters of government interference, will tighten them considerably. "It's important to change the light bulbs," preaches Al Gore, "but it's much more important to change the laws."[36]

Our entire modern civilization is powered by industrial-scale energy. More than 86 percent of the world's energy comes from burning fossil fuels—i.e., from the very process of creating carbon dioxide (and water) by oxidizing hydrocarbons. At the same time, an insignificant 2 percent of the world's energy comes from renewable sources such as solar and wind.[37] Despite the feverish claims of green energy prophets such as Gore, the obstacles to a rapid scale-up of current solar and wind technologies are beyond formidable.[38] [39] Yet, the almost universally accepted "solution" for the alleged problem of man-made climate change is to cut off greenhouse gas emissions by imposing worldwide draconian controls on energy production and consumption.

Even leaving aside the question of whether or not greenhouse gases are the dominant agent driving the earth's climate (which is far from "settled" despite the insistent claims of an unchallengeable scientific consensus to the contrary)—it would still be absurd to adopt the policy of emissions reduction as the "solution."

Even if representatives from all of the major greenhouse gas emitting nations could agree to binding emissions targets (including China and India, whose populations are finally enjoying the benefits of serious industrial development); and even if those agreements were to translate into laws actually enacted in each of those countries (recall that the U.S. Senate voted against ratifying the Kyoto Protocol); and even if those laws were implemented and enforced in ways that actually reduced emissions (until the recent, severe global recession, hardly any Kyoto signatories were on track to meeting their emissions targets, and emissions had been *increasing* under the European Union's cap and trade system); and even if the net effect is that global atmospheric greenhouse gas concentrations actually stabilize and diminish; and even if that actually has the effect of stabilizing or reducing global temperatures—even if all these steps, none of which are trivial, were accomplished—what would be the result? A heavy and permanent stifling of the global economy, a significant expansion of government controls and regulations, a significant restriction of personal freedom,

*Would be a steady change that could be addressed in myriad ways and need not create a single refugee—so long as people are free.

widespread energy privation, and considerable sacrifice inflicted on those who can least afford it—and in the end, a global civilization that, deprived of industrialization and energy, is far, far less capable of coping with severe climate events.

Far from solving the problem of climate-related risk, this absurdly indirect, Rube Goldberg policy would, tragically and ironically, make us more vulnerable to the climate.[40]

5. CONCLUSION

A broader perspective on climate vulnerability suggests that industrial development under capitalism is not merely one factor among others influencing susceptibility to climate-related risks. Rather, it is the dominant factor, reducing climate vulnerability to a degree that makes all other factors irrelevant.

But the life-saving value of industrial capitalism is profoundly unappreciated in today's culture. This is not merely because people have forgotten or ignored its history, but because its opponents have actively sought to bury and distort that history. As Ayn Rand explains:

> No politico-economic system in history has ever proved its value so eloquently or has benefited mankind so greatly as capitalism—and none has ever been attacked so savagely, viciously, and blindly. The flood of misinformation, misrepresentation, distortion, and outright falsehood about capitalism is such that the young people of today have no idea (and virtually no way of discovering any idea) of its actual nature. While archeologists are rummaging through the ruins of millennia for scraps of pottery and bits of bones, from which to reconstruct some information about prehistorical existence—the events of less than a century ago are hidden under a mound more impenetrable than the geological debris of winds, floods, and earthquakes: a mound of silence.[41]

The debate over climate and energy policy raises fundamental questions. But ultimately, it is not a debate over how many parts-per-million of carbon dioxide should be in the atmosphere, or whether the average global temperature should be 57 degrees or 62 degrees—as if we can control that anyway.

Fundamentally, this is a debate about how society should be organized. The advocates of statism have made their position clear and are actively working to advance their cause. It is time for those who value freedom to do the same.

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