

12 Global crisis: Climate change

Introduction: Three villains: Capitalism, states, citizens

Volumes 3 and 4 have charted the growth of globalization processes. In Volume 3 I dealt with the “segmented globalization” of rival empires and with the Second Industrial Revolution, which diffused new industrial technologies through larger swathes of the world. I analyzed the crises posed for most of the world by two World Wars and a Great Depression and noted the diffusion of liberal, socialist and fascist ideologies. In this volume I have charted the further global diffusion of capitalism and nation-states, and the coupling of a decline in international wars and a growth of civil wars across the globe. Yet in truth the global dimension of all this was not particularly interesting from a sociological point of view. For the most part I was merely describing the global expansion of social structures long familiar to us on more local scales. Does capitalism change because it is global rather than regional? Do geopolitics change because they concern 190 nation-states rather than 30? Yes, but not greatly.

However, a major exception was noted in Chapter 2. The emergence of international peace across most of the world was a world-historical change come quite suddenly upon us. This happened for several reasons, but the major one was the threat of nuclear weapons to the globe. This made warfare between the greatest powers completely and utterly irrational. The use of nuclear weapons could be the most extreme form of globalization. They could cause many millions of casualties, ending civilization as we know it, making the world uninhabitable for humans. Insects might inherit the earth. Military power relations had become fully globalized, for they had hit up against the limits of the earth and then ricocheted back on us. Perhaps the most appropriate metaphor is a lethal boomerang, our own inventions coming back to kill us. But humans took evasive action against nuclear war and this transformed societies. There has never been an entity like the European Union, an economic giant but a military dwarf. On a lesser scale many other states show the same novel imbalance, their civilian far outweighing their military functions. The military backbone of most states has turned to jelly, and for them soft have largely replaced hard geopolitics.

But a second, slower-paced boomerang of equal global lethality has been launched, and is just beginning to fly back on us. This is climate change, generated by our own supposed mastery over nature, humanity’s peak of

collective power. More specifically, the problem has been created by capitalism ably assisted by both nation-states and individual consuming citizens. These, unfortunately, are the three most fundamental social actors of our time. Their powers must now all be curbed to avoid planetary disaster – a formidable task. And this, like nuclear weapons, is a global threat since carbon emissions anywhere affects everywhere. The climate knows no national boundaries. It is global.

Throughout this book, as is conventional, I have used GDP statistics to measure economic health. GDP growth has measured the success of national economies. Volume 3 charted the success of the white settler colonies, the Japanese Empire, early Nazi Germany, and the Soviet Union. This volume has focused on the “golden age” of capitalism in the West after 1945, and on recent Chinese and BRIC growth. GDP growth is why capitalism is seen as a great success story. Conversely, we deduce failure where growth has been absent or minimal – as in most colonies, most countries during the 1920s and 1930s, the Soviet Union from the 1960s onward, and most OECD countries very recently. Yet an insistent ironic theme of my volumes has been that almost nothing comes as unalloyed success or failure. Out of wars has come good, while the regimes securing economic growth were sometimes monstrous. The white colonies got economic growth out of genocide; Hitler and the Japanese got growth out of militarism, and Stalin got it with mass murder. But modern economic growth also has a universal dark-side: environmental degradation threatening the destruction of humanity. That would be hubris indeed: our greatest success might become the slayer of our world.

The environmental disaster looming ahead of us has many facets – climate change, ozone, particulates and acid rain, the depletion of the seas, soil and forest erosion, water shortages etc. Here I focus on climate change, popularly known as global warming, caused by the release into the atmosphere of “greenhouse gases” (GHGs). Carbon dioxide, CO₂, comprises more than two-thirds of all GHGs. Once released, most GHGs cannot escape the earth’s atmosphere. Trapping the sun’s rays, they gradually heat up the planet, its atmosphere, seas, and lands. Over the last twenty years the scientific community has come to accept that global warming is happening at an accelerating rate and as an overwhelmingly “anthropogenic” process, that is, caused by human activity. In 2005 the heads of eleven national academies of science wrote a letter to the G8 heads of government warning that global climate change was “a clear and increasing threat” requiring immediate political action. The academies were those of Brazil, Canada, China, France, Germany, India, Italy, Japan, Russia, the UK and the United States – the major developed countries and all four BRIC countries. There is no longer significant room for scientific denial (Oreskes, 2004). As the chief scientific adviser to the Australian government, Professor Ross Chubb, recently declared “There are probably people now who think I am partisan because I’m saying the science is in on climate change.

Well, I don't think that's partisan, I think that I can read English" (*The Sydney Morning Herald*, June 22, 2011).

Such scientists advise government agencies dealing with the environment and provide an inner channel of concern to politicians. This is the one case where my refusal to make science a distinct source of social power wavers. In general I have regarded scientists and technologists as subordinate to other power holders. Ralph Schroeder has argued that in the modern period the enormous growth of the institutions of science technology have converted them into another source of social power. Up until now I have disagreed. In Volume 3, chapter 3, for example, I argued that though inventions powered the Second Industrial Revolution, the inventors were largely subordinated to business corporations. Some became entrepreneurs themselves, if they could find investors; others worked for corporations or sold their patents to them. In the mid-twentieth century atomic scientists produced the most devastating weapons ever, but their employers were the major military powers. They were mostly patriots supporting their own nation's war effort. But now the autonomy and collective solidarity of environmental scientists is much greater, for they have taken the lead in bringing the issues to global consciousness. They do not produce an ideology in the sense of an ultimate meaning system, for their knowledge is "cold," based on observation of facts, and they accept that their theories are refutable – unlike religious or socialist ideologists. Scientists have coped with uncertainty not through faith but probability theory, alternative scenarios and ranges of possibilities. Few are committed to a faith, though James Lovelock's attachment to "Gaia," the Earth as a super-organism, is perhaps one such, while many other environmentalists espouse "ecocentrism," viewing the environment as a moral entity in its own right, of which we humans (like other species) are only a small part. There is in fact tension between science and morality among environmentalists, though scientists tend to stick to the former. As a social scientists I will do likewise. But scientists and social scientists cannot carry the day unaided by mass movements and governments, though as a caste the scientists do have some clout. I hope their views carry the day and that they will prove an exception to my model of power, but I doubt it.

There are two main aspects to climate change, global warming and greater variability. The reports of international scientific agencies are the main way climate scientists explain their research. The "Intergovernmental Panel on Climate Change" (IPCC), set up in 1988 by the UN, produced its 4th Report in 2007. The UN Environment Programme GEO-4 Report (UNEP, 2007), the UN Human Development Report of 2007/2008, the OECD Environmental Outlook to 2030 (2008), and the UK government's Stern Review (2007) all concur that global warming is gathering pace and has a more than 90 percent chance of being anthropogenic. The human activity responsible is industrialization, principally its burning of fossil fuels, above all coal, then oil. Fossil fuels combined produce about two-thirds of GHGs, deforestation another 20 percent,

and agriculture and other land use practices produce the rest. James Hansen (2009), with an impressive track record of accurately predicting global warming trends, says any mitigation policy must have as a central strategy the rapid phasing-out of coal emissions so that they are ended by 2020 in the developed world, and by 2030 in the whole world, except if CO₂ can be captured in safe storage units. Agricultural and forestry practices that sequester carbon must also be adopted. Much of the world's remaining supply of fossil fuels – coal, oil, gas, tar sands and shale oil – must be kept securely in the ground if our grandchildren are to have a livable planet. So I focus on fossil fuels.

Contemporary anthropogenic shocks are new only in scale. Radkau (2008) discerns five historic eras of human-nature interaction: subsistence hunter-gathering, ancient civilizations dependent on water and wood, modern colonialism, the Industrial Revolution, and the most recent, which he calls globalization. Throughout, human groups impacted nature in ways which often had dire consequences for the local environment and sometimes for their own existence. Diamond (2005) gives examples of social collapse through destruction of natural habitats, reduction of wild foods, loss of biodiversity, soil erosion, freshwater pollution, exhaustion of natural photosynthetic resources, human introduction of toxins and alien species, artificially induced climate change, and overpopulation. A fairly recent example came from China. After its seventeenth century crisis the Qing dynasty restored an imperial system based on large granaries, intensive marketing of foodstuffs, and more efficient use of natural resources. Yet its very success brought a massive population surge, which again overtaxed available natural resources. Nature was being overworked by the dawn of the twentieth century. Radkau's industrialization phase first posed only local environmental threats. But with the onset of the global era in the 1950s, the "deepest rupture in the history of the environment" began (2008: 250).

The main culprit has been industrial capitalism, with its relentless short-term search for private profit with no responsibility for the public good or for payment for public harm. A "treadmill of profit" has generated technological change, population growth, and consumer affluence, its exponential economic growth based on fossil fuels – the power of capitalism's creative destruction taken to a ghastly end that Schumpeter never envisaged. Yet capitalism is not acting alone. It is buttressed by political power relations, that is states and politicians whose principal goal is economic growth. They have economic and political interests of their own, for to expand industrial capitalism brings more state revenues and more political popularity. Political success is actually measured by economic growth, driven in democracies by electoral cycles – or in despotic regimes in other ways in which popularity is judged (secret police reports, riots etc.). Yet the political treadmill is not imposed by states on unwilling subjects, for these measure their own success by material consumption, and they will support politicians who they think will deliver this

right now. Politics are also overwhelmingly caged by the nation-state, making the raising of a genuinely global issue like climate change especially difficult. Rational, national and very short-term calculation is essential to capitalist profit, politicians and citizens alike. We want it now, they all cry: this is how we define success! The task of climate mitigation is therefore a very big one – to take human beings off the three main treadmills and the villains of climate change, the arch-villain, capitalist profit, ably assisted by political elites and ever-increasing citizen consumption.

Military power is also involved in a more minor capacity, since industrialization boosted war-fighting ability, which remained the main function of states into the twentieth century. Coal and then oil became critical in war. Since oil is located in relatively few places across the world, and since navies, air forces, tanks and trucks cannot operate without oil, it became the greatest strategic resource, helping precipitate wars. Wars produce the most destructive human impact on the environment, and they consume the most fossil fuels. Thankfully this threat has eased across much of the world. Yet the U.S. Department of Defense is the world's largest consumer of petroleum and the world's biggest polluter. Jorgensen and his colleagues (2010) in a comparative study in the period 1970 to 2000 found that the scale and intensity of carbon dioxide emissions as well as the per capita ecological footprint of nations was directly related to the military participation ratio (the number of military personnel per 1000 population) and military expenditures per soldier (controlling for other variables, like GDP and urbanization). The more militarized a country is, the more it damages the environment. Hooks and Smith (2005) aptly call this "the treadmill of military destruction." They also note a particularly horrific aspect of modern war. Nuclear, biological and chemical weapons brought a new goal to warfare: not merely to crush human bodies but also to render the whole environment uninhabitable, as in the use of napalm in Vietnam and Cambodia. Biological and chemical weapons potentially pose a distinct nightmare ecological scenario of how the human world might end. But this scenario apart, the worst military scenario for climate change is to have large militaries and not use them, for using them in war inflicts great damage on economies and produces decline in GDPs!

Finally, all these practices resonate inside a powerful ideology of modernization in which nature is explicitly subordinated to culture. Humanity's destiny in common-sense proud parlance is to conquer and exploit nature. This ideology outgrew capitalism, for state socialism was equally endowed with it. Though Engels had doubts about the conquest of nature, and though the early Bolsheviks had green ideals, Stalinism brought industrial gigantism and devotion to Five-Year Plans of growth. Progress toward socialism was now measured by gross indicators of production (Goldman, 1972: 18–19, 64–70). McNeill (2000: 336) says the "growth fetish" became a "state religion" everywhere: "The overarching priority of economic growth was easily the most

important idea of the twentieth century.” All four sources of social power are together destroying the planet. The task of combating this is formidable.

It is unclear whether capitalism or state socialism has been worse at despoiling. The “hero projects” of state socialism produced the most terrible episodes of destruction. Capitalism cannot compete with the destruction of the Aral Sea. This has led some to argue that state socialism – sometimes all authoritarian regimes – have done more damage than capitalism or liberal democracy (e.g., Shapiro, 2001; Josephson, 2005). Yet they produce no comparative statistical data. Goldman (1972: 2–5) says the Soviet record was only about as dismal as the West’s, while studies of China say environmental destruction became worse as the economy marketized since local actors became freer to pursue profit at all costs and better at evading government pollution controls (Muldavin, 2000; Ma & Ortolano, 2000). A comparison of post-Mao China with capitalist Taiwan says their levels of destruction were similar (Weller, 2006). Nazi Germany was Nature-conscious, taking especial care with swamp drainage, highway construction and deforestation – forests were a key part of Nazi Teutonic myths. Yet in air pollution the Nazis were no better than the democracies, for they sacrificed the environment to industrialization, especially of military goods (Uekoetter, 2006; Brüggemeier et al., 2005). All modern states have sacrificed the environment to GDP, regardless of regime type. The economic problem is now capitalism only because it became the world’s dominant mode of production. If we all had state socialism, the problem would be just the same.

Global warming trends: Past, present, future

Scientists acknowledge limitations in their ability to measure and predict and they qualify their statements in terms of both statistical probability and the degree of scientific agreement. All figures given later are merely mid-points of possible ranges. Scientists are also just a normal bunch of academics, of varying abilities and research diligence, sometimes too attached to particular paradigms, too keen to grab the headlines, or too beholden to those who finance their research. For all these reasons, exactitude is impossible and controversies and minor scandals intermittently erupt. However, none of the scandals have been serious enough to cast doubt on what is now consensus wisdom.

Scientists use two main alternative measures of GHGs. One focuses only on carbon dioxide, CO₂, while the other converts all six groups of greenhouse gases to CO₂ equivalents, which is labeled CO₂e. The preindustrial concentration of CO₂ in the atmosphere was about 280 parts per million (ppm) while CO₂e was about 290 ppm. By 1990 these had risen to 353 CO₂ and 395 CO₂e. These were the levels at which the Kyoto Protocol agreement hoped to stabilize emissions, and 1990 is often taken as the “baseline” for subsequent rates of increase. By December 2011 the CO₂ level had reached 393 ppm, and was still rising.

This produces global warming. For at least one thousand years up to the twentieth century there were small temperature swings in the oceans and the near-surface air, due to natural forces like solar radiation and volcanic activity. Yet the first five decades of the twentieth century saw a much bigger rise in temperature of about 0.07°C per decade, and since 1980 it has been rising at 2°C per decade. The World Meteorological Association produces global average annual temperatures. It says that the hottest ten years have all been since 1998. In the 2000s the rise has slowed slightly but this seems to have been due to the explosive industrial growth in China, which was powered by coal-fired power stations. As well as carbon, these emit vast quantities of sulphur, which reflect the sun's rays and so tend to temporarily cool the atmosphere. Whereas CO_2 emissions impact on the atmosphere for a hundred years, SO_2 emissions fall out in weeks or months. When the Chinese start fitting sulphur dioxide scrubbers to their power station chimneys, as they will, atmospheric temperatures will surge again.

Global warming is also confirmed by rising sea levels due to thermal expansion and losses of glaciers, ice caps and polar ice sheets; by the decline in global biodiversity; by the shifts of bird, insect and plant ranges; by earlier insect emergence, bird egg-laying, and tree flowering each year; by deforestation; by lengthier crop growing seasons in mid- to high-latitude ranges; and by changes in rainfall and ocean currents (United Nations Environmental Program [UNEP], 2007: 59; Speth, 2008: xxi-xxii). Warming has also a more than 50 percent chance of causing greater extremes of temperatures and winds. In fact the greater variability of weather has now become visible to us, whereas warming is less perceptible. Exceptionally cold weather on the eastern seaboard of the United States in 2010 was assumed by many climate skeptics to discredit the notion of global warming. But it was outweighed by a warmer winter elsewhere in the planet. The IPCC Report (2007: 38) says industrial era growth has a more than 90 percent probability of producing a warming effect unprecedented in more than ten thousand years.

The problem is exacerbated by population growth combined with successful industrialization in developing countries. The OECD countries had contributed about 85 percent of GHG emissions through almost all the twentieth century, but by 2004 their relative share had declined to 46 percent. The enormous population size of China means that it has now overtaken the United States as the biggest polluter, though Australia and the United States remain the biggest per capita. Though GHG emissions per unit of GDP have begun to decline because of increasing efficiency in reduction techniques, the absolute growth in global GDP has outweighed that, especially in China (OECD, 2008).

The IPCC Report projected alternative scenarios of warming ranging between 1.8°C and 4.0°C during the twenty-first century, with the median being about 3°C . This level is almost certainly higher than human beings have ever experienced. More recent studies suggest even higher future temperatures. The Stern

Review (2007: chap. 1) says an increase of 5° C is more than 50 percent likely (so does the MIT Joint Program on the Science and Policy of Global Change, 2008), while the Global Carbon Project of the University of East Anglia (2009) suggests 5°–6° C. Since our temperatures today are only 5° C above those of the last ice-age, these warming projections might make a very big difference to life on earth.

How much difference no one can say precisely. The reports indicate likely horrific consequences, including hundreds of millions of people lacking water or exposed to flooding, numerous species extinctions, reductions in cereals, and increased exposure to malnutrition, diarrhoeal, cardio-respiratory and infectious diseases. These would be more likely if warming was reinforced by variability. The IPCC Report gives a range of temperature rises, which might bring on each disaster, meaning that we cannot correlate a specific temperature with definite consequences. Impacts are also variable across the globe. Temperature rises are greater in northern than southern latitudes and less damaging in temperate zones. For flooding, the numbers affected will be largest in the densely populated mega-deltas of Asia and Africa while small islands are especially vulnerable (Intergovernmental Panel on Climate Change [IPCC Report], 2007; Stern Review, 2007: chap. 3). On top of these projections, “feedback loops” or “tipping-points” might suddenly worsen consequences (UNEP, 2007: 62–5). The ability of the planet to hold increased emissions within natural carbon sinks is declining. If the sinks fill up, the atmosphere will start warming at a much faster rate. A melting Greenland glacier might change sea currents weakening the Gulf Stream on which Western Europe depends for its warmth. Without this, its climate might resemble Labrador’s, for it is on the same latitude. The melting of frozen peat bogs in Siberia and Canada might release enormous amounts of methane into the atmosphere. Increased methane already results from a global shift toward meat-eating. Cows fart a lot more than we do, and the planet does not like it.

These official reports may be overoptimistic, since they assume economic growth will bring much greater energy efficiency. The IPCC “business as usual” strategy (BAU), the do-nothing strategy, assumes that at least 60 percent of carbon emission reduction will occur through greater efficiency, without any mitigation policies. They expect substantial contributions from such innovations as carbon capture, hydrogen fusion fuel, solar panels, or cellulosic biofuels, and from more nuclear power. But it is likely that global population and GDP will continue to grow, wiping out whatever savings are made through greater energy efficiency. Throughout the history of capitalist industrialization increases in energy-efficiency have been outweighed by the growth in population and production that this generates. Growth outpaces efficiency (Raskin et al., 2002: 22). Why should that change now? True, there is now new, single-minded focus on research on alternative energy technologies. Perhaps the ITER international hydrogen fusion fuel project located near Aix

en Provence in France could produce a working plant like a mini-sun, which would put ten times as much electricity into the grid as it consumes. ITER projects an “Age of Fusion” commencing in the last quarter of the twenty-first century. The physics of creating a mini-sun are known, the problem is essentially an engineering one: how to construct a building, which could safely contain the energy released by a mini-sun. According to its own engineers, there is no sign of any such breakthrough.¹

Even stabilizing emissions at present levels would not stop warming, since changes already “baked in” will take decades to work their way through. Thermal expansion of the seas would continue for centuries, due to the length of time required for heat to penetrate deep oceans. Stabilization at today’s emissions levels would bring greenhouse gas levels close to 550 ppm CO₂e by 2050 and a rise in temperature of anywhere between 2 percent and 5 percent – extremely dangerous levels. Radical mitigation measures are almost certainly necessary. The Stern Review (2007: 13) suggests that we must reduce annual global emissions by 80 percent from the 1990 level by 2050 to avoid disaster. Hansen and colleagues (2009) say we have to get back to 350 ppm carbon emissions. So mitigation measures must be global, involving cooperation at the very least between the major OECD polluters and the major new polluters, the BRICs. Though they are egged on to action by the transnational community of scientists and environmental movements, the core of mitigation must come through an unprecedented global extension of soft geopolitics.

The future is not certain. Revolutionary new technologies, driven by the profit motive, might emerge to solve the emissions problem. There are some who believe so. If so, we should go down on our knees before the public and private laboratories that make the breakthroughs and the businesses and governments financing them and bringing them to the market. It would be a third great achievement of capitalism in the present period, a third great burst of creative destruction, after the second industrial revolution and the great postwar boost of consumer demand. If the breakthroughs came in China, it would be a second great achievement of that capitalist party-state. Conversely, without breakthroughs, a disastrous war or pandemic disease killing much of the global population might also send global emissions downward. But the climate modelers have been proved right for over two decades. The threat is highly probable and would be disastrous if it did come to pass. It would seem prudent and rational to take serious mitigating action now.

First steps toward mitigation, 1970–2010

Some actions have been taken already. Legislation against visible pollution became widespread from the 1970s. Then came the CFC crisis. Scientists

¹ Personal communication, Les Michels, France, July 10, 2010.

noted a thinning of the ozone layer protecting the Earth's atmosphere from solar radiation and traced it to chlorofluorocarbon gas propellants (CFCs), then used in air conditioners, refrigerators, aerosols and other industrial processes. Luckily, the aerosol industry began finding technological alternatives just as a number of countries banned CFCs. In 1987 the Montreal Protocol agreement between 191 countries began phasing CFC production out. Less harmful gases now power aerosols and it is believed that natural processes will heal the ozone layer in about fifty years. This was a success of soft geopolitics, though made easier by technological innovation.

Popular consciousness of global warming made rapid progress after the publication of Rachel Carson's best-seller of 1962, *Silent Spring*, a bitter attack on chemical industry pollution. By the 1970s polls were showing that protecting the environment enjoyed majority support, though it was not usually a very deep sentiment. Popularization of environmental science grew after the Club of Rome's pioneering book of 1972, *Limits to Growth*, and was sealed by the statement of the eleven major national academies of science in 2005. Once achieved, scientific consensus diffused inside government administrations as scientific advisers made their presence felt. Here experts did make a difference. As Frank notes, environmentalism took a leap forward with the rise of conceptions of nature as an ecosystem. This enabled a global conception of danger, which was not really possible while environmentalism centered merely on aesthetic celebrations of the beauty of nature. The two combined began to seem like a genuine ideology.

Beck (1992) suggests that the traditional class cleavages of industrial society have given way to a new "risk society" in which he says there is consensus about common environmental and other concerns. States, corporations, social movements and ordinary citizens are all motivated to combat such danger. He is right about the decline of class but where is this consensus? True, scientific pressure has been paralleled by the rise of green movements. Their expansion also dates from the 1970s, as environmental problems were publicized more and as traditional left parties ran out of steam. The movements originated in the New Left, in feminism and in 1960s countercultures among a generation disillusioned with established politics. They fought not only for better ecology but for more local democracy, parading strong ethical sensibilities toward the human and the nonhuman world (Doherty, 2002; Taylor, 1995). Again, the combination tends to make a social movement, which is truly ideological, going beyond mere science. But it is a very diffuse movement. Green NGOs are many and varied. Some are large and global, like Greenpeace with its membership of more than five million, offices in twenty countries, and an annual budget more than \$300 million. Others are small, local, and quickly come and go. Many have a direct radical action fringe. There is little overall leadership or coordination.

Green NGOs began much bigger in the North than the South though they now do have a genuinely global presence. In the North they attract highly



educated groups, more from the arts and social sciences than hard sciences or engineering (except for environmentally related sciences). They are predominantly middle class, dominated by professions in the media, arts and crafts, public sector and social welfare professions like teachers, health professionals, and social workers. These people have more autonomy from hierarchy in their work-lives (and so more freedom of expression), their jobs are more concerned with values or politics, and they are less connected than others to corporate capitalism. They are in a figurative sense the herbivores, not the carnivores, of capitalist democracies. Some of these professions are also highly transnational. Such groups provide the core activists of new social movements more generally, especially those concerned with postmaterialist identity politics, world peace, and human rights, all of which also generate large quasi-transnational INGOs – though like the bigger environmental groups they are in practice international federations whose individual branches are nationally organized. Women are as numerous as men, but youth predominates, especially in direct action groups. Even elementary schools are hot-beds of green sentiments, and this has enabled continual replenishment of the base (Doherty, 2002: 57–66, 217). Public opinion polls generally reinforce this picture, with more concern for the environment among the better educated, those with postmaterialist and leftist values, though they also find that religious people, especially non-Christians, are more concerned than the irreligious, and they sometimes find that the middle-aged, not the young, worry most (Kvaloy et al., 2012).

World polity theory places this little world of highly educated, herbivorous, young people and NGOs amid a much broader “world polity.” It argues that since the mid-nineteenth century a “rationalized world institutional and cultural order” has emerged embodying universally shared and applicable models that shape states, organizations, and individuals’ identities alike (Boli & Thomas, 1997; Meyer et al., 1997; Meyer, 1999). Its adherents argue that common conceptions of the individual, of progress, of sovereignty, and of human rights have arisen and are driven onward, structuring the actions of states, groups and individuals, and providing a common framework for solving global problems. Though they accept that nation-states remain the principal policy-makers, this is essentially a transnational model in which a common ideology diffuses right across national boundaries, persuading all states that certain policies are simply the right thing to do. This vision is one of an emerging common ideology, but it has a strongly pragmatic content too. It is a blend of useful policies and institutions for the world as a whole to adopt set amid a broader moral liberalism, which is said to derive from the Enlightenment – though perhaps that is too eurocentric. Its highly pragmatic and rational streak makes it only half-ideological, and it is not very transcendent or immanent. It is also a highly optimistic scenario. We will eventually do the right thing about climate change, as we will do about most policy issues.

I have so far failed to perceive much of this optimism through much of the twentieth century. Liberalism, socialism and fascism were probably the most important ideologies, and they all derived to one degree or another from a common Enlightenment tradition but they went to great lengths to exterminate each other. From the 1950s world polity theory became a little more plausible, as interstate wars declined, as class conflicts were compromised, and as many states across the world did adopt some common institutions amidst a host of emerging international organizations, from scientific associations to United Nations agencies, from global standard-setting agencies to feminist and environmental NGOs. By the twenty-first century, so say world polity theorists, a single world culture had crystallized as the constitutive element of an emerging world society, a set of “scripts” to be followed anywhere across the globe. No longer confined to the West, world polity, culture and society are now supposedly the common heritage of humanity, institutionalized across the globe. But we have seen that neoliberalism has become one of these scripts, and that is hardly conducive to social harmony or intervention to secure climate change.

Of course, such agencies and movements do exist, exerting some influence. Gender politics have made global progress, and shrewd INGOs have also found lowest common denominators to press their causes. Feminist INGOs shifted their rhetorical framing from discrimination against women (which is interpreted differently in different cultures) to violence against women’s bodies (which is deplored in virtually all cultures), and this has been internationally quite successful. Yet theirs is a constant struggle not a mere enactment of global scripts. They also rely on a “boomerang effect” whereby INGO pressure on international agencies like the UN result in pressure on recalcitrant states, weakening their caging (Keck & Sikkink, 1998). In the field of sex offenses there are stronger indications of a global script. Legal codes have moved in concert across most of the world to tighten laws on rape and child sexual abuse (especially between 1980 and 2000) while loosening laws on adultery and sodomy (especially in the 1960s and 1990s) – though it is the deviant cases like Iran, which tend to grab the media headlines. The authors of this study (Frank et al., 2010) says this is evidence of the growth of a world culture constituted by individualized personal identities, free-standing personhood, at the expense of the protection of the traditional family and nation. But John Meyer’s assertion that there is a single national welfare script is not true, as we saw in Chapters 6 and 11.

Environmental activism has also been viewed from a world polity perspective. Bromley et al. (2010) analyzed about five hundred history, civics, and social studies textbooks used for children of between eleven and eighteen years in sixty-nine countries for the period from 1970 to 2008. They say that the environmental content of textbooks increased substantially over the period, and the issues discussed were increasingly global rather than national, and contained more discussion of universal human rights. The most developed

countries' textbooks showed most concern, while Soviet and then post-Soviet countries showed least.  authors choose to emphasize a common global postnational trend. However, their data indicate that the changes in textbooks resulted from pressure from teachers, administrators and scientists involved in educational institutions. This sector and these professionals are at the heart of the environmental movement, as we saw earlier. Though the authors insist that the textbooks reflect an emerging global culture rather than activist pressure, their results seem to indicate the reverse – scientific and ethical  pressure applied by committed environmentalists. Seeing environmentalism as merely part of a blander world culture or world polity is a mistake. Environmentalism is growing, it has a strongly moral quality, and it may blossom into becoming one of the most significant ideologies of modern times. It would be only the second really significant novel ideology created in the twentieth century, after fascism, but it has not yet had much success (and look what happened to fascism).

There are important weaknesses in environmental movements. There is little presence of either capitalist carnivores or the working class. Environmental activism tends not to be a class struggle issue in the North of the world. Labor unions are still more oriented to jobs and fear that green policies will reduce them. For the foreseeable future this movement will have to develop quite differently from previous radicalisms and socialisms. The movement in the South sometimes differs, for peasant movements in the hinterlands are often prominent, angered by dam-building and deforestation of their habitats by governments and big corporations threatening their cultivation practices and their livelihood. The World Social Forum gives them a little global organization. However, their political clout is limited, except in Andean countries where indigenous peoples have recently surged into power. Yet the bottom line of pessimism is that every government in the world is committed to economic growth.

In most countries environmentalist activists come more from the Left than from the Right, though East Asia is an exception. There environmentalism resonates in the region's traditional religions, Confucianism, Buddhism and Taoism, which are much more ecocentric than either Christianity, Judaism or Islam. This results not only in more environmental protest there than in the West, but it comes at least as much from the Right as from the Left (Kern, 2010). Nonetheless, in the West astute framing by NGOs has led them to blend popularized scientific findings with vivid depictions of habitat damage, endangered cuddly species (the polar bear above all) and idealized Nature, and this makes converts right across the political spectrum. Astute framing is also revealed by their linguistic shift from the goal of "limits to growth" – who wants to limit their standard of living? – to "sustainable development" – two positive words!

The global master frame is that humanity needs a new relationship with nature to achieve a sustainable future. The UNDP Report (2007: 61) declares

a moral imperative rooted in universal ideas about stewardship of the earth, social justice and ethical responsibility. In a world where people are often divided by their beliefs, these ideas cross religious and cultural divides. The Report quotes a famous American Indian proverb “We do not inherit the Earth from our ancestors, we borrow it from our children” and quotes comparable homilies in all the major world religions. To the chagrin of the do-nothings, the greens have seized the moral high ground. They respond by trying to shift the argument away from greening toward the cost of mitigation programs and against “big government.” Ideological battle has been joined, if indirectly.

Greens have sought to bring rather abstract and scientific issues into everyday moral behavior through tree-hugging, recycling, individual carbon-offsetting, and other forms of personal mitigation. Thus individual action might be seen as making a difference. If I bicycle instead of driving, or if I drive a hybrid vehicle, there is both a morally uplifting effect and a miniscule impact on the climate. Ordinary consumers have a lower impact on GHG emissions than do the fossil fuel industry and major industrial consumers, but they are important in bringing pressure and votes. In international polls support for green solutions averages 75 percent, though the intensity of commitment is not high (Scruggs, 2003: chap. 4). In democratic response, the main political parties in Europe and Japan (but not alas the United States) have begun to compete rhetorically for the title of the environmental party, though their actions lag behind their words, especially in a recession. Against the tide of public opinion, the Gillard Labour administration in Australia has passed the world’s first national carbon tax on the 500 biggest corporations, combined with an emissions trading scheme second in size only to the European Union’s. But will it knock them out of power at the next election?

Some countries have mitigated more than others. In Esty’s 2010 Environmental Performance Index Iceland, Switzerland, Costa Rica and Sweden were the best performers, followed by most Western European countries, Japan and New Zealand, plus a few poorer countries like Mauritius, Colombia and Cuba. The United States lags in 61st place, alongside Paraguay and Brazil, but ahead of China and India. On Esty’s ranking of 2007 CO₂ emissions data the top-ranked countries were poor countries without much polluting industry plus Switzerland, the Nordic countries, and (nuclear-powered) France. Then come diverse countries, including Brazil, the remaining West Europeans and Japan. The United States is the lowest-ranked advanced country except for Australia, but ahead of India and China (data available at <http://epi.yale.edu>). The contrast between the two biggest Western economies, Germany and the United States, is enormous. The movement in Germany has conquered some regional governments and achieved notable victories over the utility companies; the movement in the United States has done neither – and its influence there is currently declining. As we shall see later, national and regional divergencies are currently increasing. There is no common global script in sight.

Among this great variety, however, there is one pattern. Scruggs (2003: esp. chap. 5) found among OECD countries during the period 1970–2000 that corporatist countries did better. They have brought labor and business organizations together inside government offices to hammer out compromises on class issues, and on environmental issues scientists and environmentalists have been added. But having peak business and labor organizations present means that lobbying is not confined to industries who have most to lose from environmental policy, which is a major obstacle in the United States. Under corporatism compromises between less and more polluting industries are made before their common program is presented to government and labor. Germany, Sweden, the Netherlands, Denmark, Austria and Finland were the high performing corporatists, while the three liberal countries in the study, the UK, the United States, and Canada, performed worst along with Italy and Spain. Ozler and Ohbach (2009) similarly found that countries high on the Freedom House Index of economic freedoms (a measure of neoliberalism) had a worse ecological footprint, even after controlling for urbanization, per capita GDP, exports and climate. They conclude that the more the market freedom the more relentless the treadmill of profit. Growth and constant reinvestment, driven by market competition, led to greater resource exploitation and higher emissions. The greater the government regulation, the less the footprint. The more states embrace the free market ideal, the more difficult it is achieve sustainability.

This is a worrying finding since this is a neoliberal era in which government regulation is often viewed as bad, especially in the United States, which has the heaviest global footprint per capita but now lags greatly in environmental negotiations (Speth, 2008: 73). The United States has forgotten its environmental tradition surrounding the preservation of wilderness, a popular theme in American culture. New Deal Democrats had favored resource conservation and wilderness preservation, and administrations up to President Nixon continued the tradition. Clean Air and Clean Water Acts were passed under Nixon in 1970–2. But that proved to be the high point. Much of this legislation remains on the books, but subsequent administrations weakened implementation.

Some business sectors remain the main opponent of emissions control proposals, especially in America. The electric utilities, mining, petroleum and natural gas industries have led, aided by big corporate consumers like the auto industry and agricultural crop and livestock producers. Since their bottom lines would be hurt by effective emissions policies, they are willing to spend heavily to avert them. The market fundamentalism of conservative think tanks, which would bring death to the planet, also began to conquer the Republican Party. Conservatives tended to be also progrowth in population policy, being against sex education, contraception and abortion. For their part, many American liberals favoring individual human rights were dubious about state intervention and population control. For the global environment all this was ominous (Hulme, 2009: 274–5; Kamieniecki, 2006: chaps. 4 & 6). Indeed, by 2012 the

near-collapse of moderate Republicanism left a field of presidential contenders vying to outdo each other in ridiculing the whole notion of climate change. They had also found a new energy goal: resource independence, the exploitation of national reserves of newly discovered shale gas deposits so that the United States would no longer need to import oil. They see this as enhancing national security, currently the most sacred goal of American politicians. It actually entails the death of the planet.

Business and political opponents of the environmental movement do not contest the goal of a cleaner environment. Instead they dismiss global warming as a hoax. Business prefers not to discuss green issues but instead finances candidates who can be counted on to oppose emissions bills as a part of a broader rightist agenda. Business has also set up industry environmental groups, whose green titles belie their mission. These emphasize scientific dissensus, aided by their own tame scientists, and the large costs and job-losses of emissions proposals (on costs they are right). Until 2007 the conservative think-tank the American Enterprise Institute was offering grants of \$10,000 to any scientist who would write a skeptical report about climate change (Newell & Paterson, 2010). Faux-green groups denounce big government and call for more domestic energy extraction to increase national security. This is backed up by billions of dollars to finance the election of conservatives, to defeat green candidates, and to finance litigation against government environmental agencies. This helps them set congressional agendas and intimidate the agencies into not implementing legislation. Thus the Environmental Protection Agency, the EPA became “a more flexible, pro-business, cost-conscious, power-sharing facilitator” (Miller, 2009: 57). Subsequent Republican presidents and congresses did nothing to change this trend, and Clinton and Gore, who wanted to change it, were prevented from acting by a Republican-dominated Congress.

Environmental concerns grew nonetheless, energized by pollution scandals like Times Beach, the Love Canal neighborhood, Three Mile Island and the Exxon Valdez oil tanker spillage. The greens shifted focus to the state and local level and regulation followed. Mandatory emissions reductions policies appeared in the 1990s and 2000s in a third of U.S. states. Some U.S. corporations now realized that to comply with standards that varied by state and city was not cost-effective. Seeing that federal legislation was bound to come, they began to put forward their own proposals, usually weaker and more attuned to their bottom lines in order to win a seat at the table where legislative proposals would be discussed. Low-emitting business was ready to accept emissions standards at the Kyoto standard, business as a whole was prepared to support mild cap-and-trade proposals, and investors and some businesses geared themselves up to make profits out of carbon trading and other climate reform proposals (Miller, 2009: chaps. 3–6; Kamieniecki, 2006; Kraft & Kamieniecki, 2007). There is less reason why low-emitting corporations – retailers like Walmart, banks, and many others – should fear greener policies, since their

costs would barely rise. Indeed for several years in the new millennium major business interests did seem to be shifting toward a carbon compromise (Newell & Paterson, 2010: chap. 4). The World Economic Forum organized one hundred CEOs of major global corporations to submit a brief report to the G8 meeting of 2008, urging it to do better than Kyoto in reducing emissions. The report endorsed public-private initiatives, mainly to pioneer new technologies. An unexpected silver lining from the 2008 Recession was the conversion of U.S. auto companies. Having received enormous government subsidies to avoid bankruptcy, they accepted in July 2011 tougher government standards of fuel efficiency that they had earlier fought tooth-and-nail.

But Bush the Younger and a Republican Party becoming more conservative were not helpful. Bush abandoned his earlier promises to regulate CO² emissions and withdrew the United States from Kyoto under pressure from conservative Republicans and industry groups (Suskind, 2004: 127). Vice President Cheney's Task Force on Energy recommended an increase in fossil fuel extraction and billion-dollar subsidies to its producers. This was legislated by Congress in 2005. The administration's political appointees to head the EPA, the Forest Service, the Interior Department, and the Department of Agriculture undermined existing environmental oversight, paying back the contributions that the logging, farming and energy industries had made to Bush's election campaign. Nonetheless, by 2006 Congress was beginning to respond to the scientific consensus. Senate leaders began to craft a proposal that might satisfy business and a congressional majority. In 2007 Bush was also pressured by a Supreme Court decision forcing the EPA to accept responsibilities for climate change. He was forced to release more federal climate data and in 2008 he declared he would support federal limits on GHG emissions, though adding enough qualifications to undermine that commitment. Since most Democrats were already convinced, and since most polls (as in most countries) revealed consistent, if skin-deep support for green reforms, President Obama's initial intentions were greener. However, the Great Neoliberal Recession and Republican gains in Congress in 2010 made further progress impossible in the short-term. Indeed, in 2010 some prominent corporations like BP, ConocoPhillips, and Caterpillar withdrew from the U.S. Climate Action Partnership, the leading business NGO pressing for cap-and-trade schemes.

There was more progress in other OECD countries. Increased regulation, taxes on emissions and cap and trade schemes appeared from the late 1990s. The Kyoto Protocol was signed in 1997, though it only came into force in 2005 when enough countries had ratified it. The European Union has consistently been the global leader in environmental matters because it is fully aware since the Chernobyl nuclear disaster in the Ukraine had spread radiation clouds over its borders that emissions are transnational. The EU proposed an average reduction of emissions of 15 percent from their 1990 level by the year 2012, but the final agreement at Kyoto was only for 5.2 percent. The withdrawal of

the United States from the Kyoto process in 2002 was also a major blow. It now required Russian participation to get the necessary number of countries to put the Protocol into effect, and so the Russians could leverage minimal targets for themselves. Kyoto's coverage came down from 66 percent to 32 percent of 1990 world emission levels. During the compliance period of 2008–2012 countries emitting less than their quota can sell emissions credits to those that exceed their quota. Developing countries were not given targets but urged to propose Clean Development Mechanisms (CDMs), administered by the UN, which would qualify them for carbon credits that they could then sell to OECD countries. Compliance mechanisms are weak and most of the signatories are not on course to achieve the reductions, though these were ironically helped by the collapse of former Soviet bloc economies. Economic recession is good for the climate.

The EU has introduced a mandatory cap and trade scheme. A mandatory carbon tax was considered but rejected after pressure from the UK. The European Trading Scheme (ETS) began in 2005. Its first phase was too soft on business and states for they were given the freedom to negotiate their own terms. There was a race to the bottom as each state favored its own business by issuing too many emissions credits. But the scheme was tightened up in a phase two beginning in 2007 (Skjærseth & Wettestad, 2009). European emissions fell 3 percent in 2008, and 40 percent of this is attributed to the scheme (the recession contributed 30 percent). The EU now said that it could meet its Kyoto commitments (European Environment Agency, 2009). Further tightenings are underway, including the inclusion of an aviation fuel scheme imposed on all airlines flying into Europe for the whole length of their journey, more policing power granted to the European Commission, and reductions in the cap. The EU Commission is a quasi-international state, currently supervising twenty-seven states, an advantage in climate change policy, which no other part of the world enjoys. "The aim is that the European Union leads the world in accelerating the shift to a low-carbon economy," boldly declared José Manuel Barroso, president of the European Commission in 2007.

But the EU was brought back to earth by the Copenhagen UN Climate Change Conference in December 2009. This was commandeered by the United States and China who produced only a nonbinding Accord. This recommended but did not mandate a reduction of emissions to 2° C above preindustrial levels. Most countries noted the Accord without signing it, and it set neither binding commitments nor deadlines. It pledged \$30 billion to the developing world over 2010–12, rising to U.S.\$ 100 billion per year by 2020, to help them adapt to climate change. Tougher proposals to limit emissions were dropped. Individual countries had published their own pledges for reducing emissions provided general agreement was reached, but since there was no agreement, it was unclear whether they would implement them. Copenhagen was somewhere between a disappointment and a disaster. Predictably, the 2010 Conference in

Cancun achieved little, not even publicity since the world's media ignored it. A fund to provide \$1 billion aid per annum to poor countries was approved, without indicating where the money would come from.

Few environmentalists are impressed by this recent history. As of 2010 we have had many nonbinding statements of principles, a climate treaty that fails to protect climate, a convention on desertification that merely documents its extent, and a Law of the Sea that has prevented neither pollution nor fish-stock depletion. Copenhagen was a defeat for the more ambitious goals of the EU which had hoped to get agreement to share out carbon budgets to 2020 and beyond. But neither the United States nor China, nor the other BRIC countries, nor the oil producing countries would go this far. The United States and the Arab oil producers had twice before stymied attempts to set time-bound targets (Jaggard, 2007: chap. 6). In 2011 came signs that the larger developing countries, now become major emitters themselves, were pragmatically allying with the major polluting advanced economies to slow the pace of international conventions. Overall, the most that can be said of existing commitments and programs is that they are a start. Yet they are nowhere near enough.

Every year that commitments are not made, global GDP and emissions grow further, requiring evermore radical reform. It is now doubtful whether emissions could be stabilized at their present level of around 450 ppm CO₂. The Stern Review (2007: 475) said that to reach 450 ppm, emissions in developed countries should peak in the next ten years and then fall by more than 5 percent per year, reaching 70 percent–90 percent below 1990 levels by 2050. It added that this goal “is already almost out of reach.” The UNDP Report (2007: 43–51) thought stabilization at 450 ppm CO₂e would cost about 1.6 percent of global GDP up to 2030 (less than two-thirds of global military expenditures). It would aim at 50 percent reductions of GHGs by 2050 from 1990 levels. Stern believed stabilizing at 550 ppm CO₂e was possible, provided emissions peak in the next 10–20 years and then reduce by up to 3 percent per year so that by 2050 emissions would be only 60 percent of 1990 levels. The question is how? Gilding (2011) believes a more radical plan is necessary. Its Phase One would seek a global reduction of 50 percent in emissions over five years. Phase Two would follow, a fifteen year push to net zero emissions. Phase Three would be an eighty year program of removing enough emission from the atmosphere to return the world to preindustrial emissions levels. All these estimates would involve radical, global policies involving restraints on production and consumption, and probably also the end of economic growth and the arrival of a steady-state economy.

Alternative policy responses: Statist and market solutions

In presenting his environmental Review to the U.S. Senate in 2007, the economist Nicholas Stern declared “Climate change is the greatest market failure the

world has ever seen,” since pollution is an “externality” for market actors. If a factory pollutes the surrounding environment, its pollution and the costs of clean-up are external to the firm, costing it nothing. Since external social costs do not figure in company balance-sheets, companies will continue to pollute with abandon. Furthermore, wherever a scarce resource comes free of charge, as with the air we breathe, it is likely to be used to excess. Coal is the worst offender. Its external costs have been estimated as being equivalent to 70 percent of its market price. So if the coal industry was forced to pay for the costs it inflicts upon us, the price of coal would almost double, which would be a substantial incentive for consumers to switch to less polluting energy sources – and for the coal industry to diversify its activities into such sources. The only agency that could organize this is the state.

States have regulated capitalism since its beginnings, as Polanyi emphasized – regulating factory safety, setting protectionist tariffs, legitimizing and regulating labor unions, permitting corporations an individual legal entity etc. The environmental challenge requires further national regulation but this time combined with international coordination of regulation since emissions in all countries affects everyone’s climate. Emissions are transnational, INGOs are half-transnational, half-transnational, and legislation must be international. This is why a major change of direction for human societies is required. Whereas the civilizing of capitalism so far has consisted of individual state regulation, raising the bars of national cages, this next stage of the civilizing process must lower those bars. For climate change is also an externality for states.

The bedrock of policy, however ineffective it has been so far, must be the global setting and monitoring of emission reduction targets for a minimum of the major polluting countries by binding international agreements, a great extension of the role of soft geopolitics among states. Without this there would be such leakage of GHGs elsewhere that a country imposing, say, a carbon tax on its own would harm its international competitiveness. The free rider problem looms large, for a state might think it rational to do nothing, for if other states reduce emissions such a state benefits too. Let the others bear the costs, we can share the benefits (Nordhaus, 2008). This is why existing protocols do not enter into force until a given number of countries have ratified them. This involves trimming the autonomy of the individual nation-state, while increasing the power of the collectivity of nation-states. State caging needs to be reduced, international caging increased.

But just think how difficult that is. Domestic policy disagreements are usually decided by a simple majority vote in parliament or a ruling elite, but international agreements would require near-unanimity, at least among the main polluters – the United States, the EU, Japan, China, India, Brazil and Russia – and a truly effective regime would require many more states. The diversity of the interests represented across countries is much greater than in any individual nation-state. Many must get international agreements ratified by their

own parliaments, which are often very inward-looking. In the United States international treaties must be ratified by two-thirds of the Senate, nowadays a formidable hurdle. UN and other agencies dealing with environmental issues are among the weakest and worst-financed international agencies. Regulatory slippage results. A regulation might cover 80 percent of the problem, and 80 percent of those being regulated might try to implement it, resulting in an 80 percent success-rate. Not bad, one might think, except that the mathematical outcome is that only 50 percent of the problem would be regulated (Speth, 2004: 103–5; 2008: 84).

It is conventional to distinguish between statist and market-oriented policies (though I will tend to downplay the difference). Statist policies regulate directly by setting national and international quotas for energy consumption and emissions, backed by mandatory energy standards for businesses, buildings, appliances, automobiles, airplanes etc. They also pour public money into investment in cleaner technologies. Regulations have the advantage that they can be targeted so as to directly penalize the most damaging types of emission, with no market signals needed as intermediaries. Regulations can also encourage high-emitting business, like the fossil fuel, power generating and auto industries to diversify into cleaner fossil technology or renewable energy technology, like wind, water or biomass. Deadlines and penalties also signal clearly to investors the potential rewards and time-frames involved in technological innovation; and governments can target their own R & D efforts at the most damaging emissions. The OECD and BRIC countries could provide credible implementation and so could some other developing countries – enough to cover most emissions.

A radical proposal has come from Myles Allen, an Oxford climatologist. He suggests oil, gas and coal companies take responsibility for burying all the carbon dioxide emitted by the fossil fuel products they sell. As he says, “Carbon comes into Europe through a couple of dozen pipes, ports and holes in the ground. It goes out through hundreds of millions of flues and exhaust pipes. Yet European climate policy is all about controlling the flow at the point of emission. It’s like blowing air into a sponge and trying to slow it down by blocking up the holes.” (*The Independent*, October 7, 2010). He slyly adds that this would involve less government, not more. But given the political power of such industries, this is pie-in-the-sky.

Regulation is often easier for the public to appreciate. It already pervades our life and millions of people have been involved in local struggles for mandated recycling, clean-ups and protection of species and lands in the South as well as the North of the world. Environmental regulations are probably more palatable than new environmental taxes, and the public finds them easier to understand than complex cap-and-trade schemes. There are already fines for exceeding vehicle emission standards in the United States, which give a financial incentive to auto companies to comply, while the EU mandatory labeling

of the energy efficiency of refrigerators produced an immediate consumer response, with consumers preferring more efficient appliances. Households produce 35–40 percent of all CO₂ emissions, and in certain respects mitigation can come at lowest cost here (UNDP, 2007: 136–70).

I have argued in Volume 3 and here that state direction of economic activity is relatively efficient when the goal is known and simple and when the means are clear. This was true during the world wars, when the goal was to produce goods that would simply kill people. It is also true in late development programs when the agreed goal is to adapt methods already used by earlier developing nations – whether the late developers were capitalist, like Japan and the East Asian Tigers, or state socialist, like the Soviet Union and China. The weakness of state planning is in shifting gears toward a new type of economy. In climate change policies, however, the core goal is known and simple – to reduce the consumption of fossil fuels and to develop alternative energy technologies. Government regulation can achieve this first goal more directly than can markets, while it can at least assist private firms to develop new technologies with investment of its own.

But regulations also have drawbacks, especially internationally, since regulatory structures differ enormously between countries. The European Union can regulate across its large zone, but no effective global sovereignty exists. The UN is too feeble, other agencies too specialized. States must negotiate elaborately with each other to achieve global agreements, and this is more difficult for regulation than for the main alternatives, taxes or cap-and-trade. International monitoring of compliance is especially difficult. Not all national emission levels are known, while some countries refuse to submit to international inspections, like China. Scandals have also undermined private agencies verifying emissions.

In any case, since the currently dominant ideology is neoliberalism, market friendly solutions commodifying the environment are now all the rage among official bodies and among economists, especially in the Anglophone world (Hulme, 2009: 298–304). Market-friendly policies involve ways of setting a global price on carbon that is higher than the present market price, so that emitters themselves are charged the social costs of their products and given a market incentive to invest in new lower-carbon technologies. Nordhaus (2008) believes this is more efficient than regulations since a carbon price would efficiently transmit knowledge of the costs of GHG emissions to billions of people and thousands of organizations creating the problem. Estimates of the carbon price required today are around \$25–\$30 per tonne of CO₂, but it would have to steadily rise in the future. Different economists envisage different gradients but almost all estimates involve radical pricing changes (Nordhaus, 2008: 15–20; Stern, 2007: 370).

The idea is that this would shift capitalist calculations of profit and loss in green directions. After the initial coercion of setting prices, the treadmill of

profit might be manipulated into reducing rather than increasing emissions. Finance capitalism in the persons of venture capitalists would then also shift its investments into greener industries and products. The advocates of such policies say that capitalism has shown enormous adaptability in the past. It can do so again in the future. Since capitalism is the only economic game in town, they say, we have to use it. Newell and Paterson (2010) note that some venture capitalists are already devising ways of making profit from decarbonization. I place more hope when climate crises really strike hard on a split among capitalists, with low-emitters turning against high ones. This need not be a class issue.

There are two main ways of effecting carbon price change, carbon taxes and “cap-and-trade” schemes, both backed by reductions in tariff and non-tariff barriers for low-carbon products to assist global uniformity. Since taxes and tariffs are the province of states these policies are not actually neoliberal but extensions of a mixed economy. Consider first carbon taxes. These do not guarantee a specific level of emissions reductions, for that depends on market reactions to the tax. But high carbon-emitting business would have a market incentive to shift in the direction of lower emissions – unless it can pass on the increase as price increases to consumers. A carbon tax is also relatively simple to enforce. But it is likely to be fiscally regressive, hurting the poor most. The upside is that since the tax base is so large, a quite low level of taxation would yield massive revenue that could be earmarked for directly environmental purposes or for subsidizing those populations hardest hit by the consequent rising energy prices. Carbon taxes also exercise pressure internationally. A country can impose a tariff on imports whose production involves high carbon emissions, putting market pressure on foreign business and governments. The WTO has said that this would be a legitimate use of tariffs, while it would also appeal to protectionists who rail against free trade. Unfortunately, however, current politicians’ mantra in most countries is no new taxes.

In cap-and-trade schemes an overall authority – a national or regional government or an international body like the EU – distributes carbon permits to companies allowing them to emit GHGs. The cap is the total amount of GHG emissions allowed to all the permits in the system, while trade refers to companies buying and selling permits to each other. A company can either reduce its GHG emissions if its permits do not cover its needs, or it can buy more permits from companies who have surplus permits. In theory, firms that can reduce carbon emissions at a low cost will do so, and sell their excess permits, while firms finding it harder to reduce emissions will only buy enough permits to cover their continuing levels. The total amount of emissions allowed is then gradually reduced as the cap is lowered year by year. This is an incentive for businesses supplying or using fossil fuels to switch toward renewables. The existence of a free-market in emission certificates is supposed to ensure that incentives are administered efficiently, with little cost or corruption. Unlike

taxes, a cap should produce a known quantity of GHG reduction. The key parts of cap-and-trade are the level at which the initial cap is set and the gradient of its annual reductions, for without a pain-causing level of caps, emissions would not be reduced sufficiently.

A third set of policies derive from the concept of ecosystem services. Ecosystems like wetlands and forests provide major environmental benefits like water-filtration and the absorption of carbon in the atmosphere. The idea is that those who own these lands should be paid to conserve them, meaning they do not have to make money by draining swamps for development or cutting down the forest for lumber. This redistributes resources to property-owners, though most of them might be poor peasants. But such schemes would be radical interventions in markets. Though these and cap-and-trade schemes do set up markets, the initial terms of those markets are set politically. This is not a neoliberal scheme.

The main disadvantage of neoliberalism lies elsewhere, in its unrelenting probusiness stance and in the increasing business influence on government. This influence results in the watering down of all emissions schemes. American high-emissions corporations and trade associations finance lobby organizations and politicians denouncing environmental science and urging that big government be rolled back. They pretend to be environmentally conscious. Oil company commercials depict green nature, not black oil, and business rarely fights environmental bills in public, preferring to operate on Congressional committees and subcommittees with the help of subsidized politicians and scientists, quietly stripping green bills of their teeth, slipping deregulation provisions into bills on different subjects (Repetto, 2007; Miller, 2009: chaps. 2 & 6). Business is now the main obstacle to mitigation in the United States, and that potential split between high- and low-emitting businesses has not yet emerged. James Hansen (2009) says that since "special interests have been able to subvert our democratic system," we get only legislation that "coal companies and utilities are willing to allow."

The fossil fuel industries are in reality a part of the big government they denounce. High-emitting industries get big tax concessions bringing their corporate taxes below the national average. The nominal U.S. corporate tax rate is 35 percent but almost all businesses receive exemptions and allowances, which put the real national average at half that. The lowest rate, less than 2 percent, is paid by the defense and aerospace industry, a major emitter with its gas-guzzling planes, ships and tanks. The transportation, petroleum and pipeline, and gas and electric utility industries also pay less than the average rate (Institute on Taxation and Economic Policy, 2004). U.S. mining companies also receive depletion allowances ranging from 5 percent to 22 percent of their gross income from extraction and processing. Fossil fuels got about \$72 billion in subsidies between 2002 and 2008, while subsidies for renewable fuels were only \$29 billion, half of which goes to corn-based ethanol whose climate

effect is minimal. Of the fossil fuel subsidies, \$70.2 billion went to traditional sources like coal and oil. Only \$2.3 billion went to “carbon capture and storage,” a technique designed to reduce GHGs from coal-fired power plants through massive underground storage silos (Environmental Law Institute, 2009). Whether carbon capture can work at an economic price is dubious. No working plant yet exists anywhere. “Clean coal,” trumpeted by the mining corporations, does not exist.

This is not just an American problem, for subsidies are common across the world. One study estimated in 2000 that worldwide subsidies of pollution totaled \$850 billion annually, 2.5 percent of global GDP (Speth, 2008: 100). Reform would lead to job losses and rising prices in this sector, and this has deterred governments from action. The leaders of the G-20 countries agreed in principle in September 2009 to phase-out inefficient fossil-fuel subsidies, saying that to eliminate them by 2020 would reduce overall GHG emissions by 10 percent by 2050. Principle has not yet led to practice, though it might. But since the status quo yields the energy industry high profits, it has little incentive to invest in new technologies. It is difficult to share the optimism of Newell and Paterson (2010) when R & D private investment in alternative energy sources has actually fallen in recent years. Most of the spending is public. One study found that of fourteen key innovations in energy sources in the past thirty years whose finances could be traced, only one was funded entirely by the private sector, while nine were totally public. The cost of educating scientists and engineers also falls on the government (Stern Review, 2007: 353–5, 362–3). For significant emissions reductions, states must become much tougher on fossil fuel industries. This is not anticapitalist, for it merely seeks to penalize those industries that are the worst carbon emitters.

Business says it prefers a cap-and-trade model because this interferes least with markets. Its real belief is that it can sway government policy toward a low cap to which it can easily adjust. Thus existing schemes have been ineffective. One problem is that states often see the high-emitting industries as their energy champions in international competition. They want them to remain profitable and so are responsive to their lobbying. Cap-and-trade is also vulnerable to corruption in credit allocation, though this could be solved by replacing free permits with auctions so that governments do not decide who gets them. The highest bidder gets the permit and this also yields revenue that, in theory, governments use for investment in renewable technology. The EU is scheduled to shift to an auction in 2012, though California is back-tracking on a similar commitment. The northeastern states of the United States already operate an auction but it is performing badly. The utility companies are simply passing on the cost to consumers in higher prices and states use the revenue to ease budget deficits rather than invest in renewables.

Since tough regulation, carbon taxes, and cap-and-trade schemes might all produce some effect, it matters little what blend of statist and market-oriented

solutions are chosen. To work, all would involve government imposing radical restrictions on business and consumers. Only the mechanism is different. What is much more important is that business, especially energy business, be coerced into making concessions. However, this would require changed politicians, and they could only be changed by mass popular pressure, which requires mass consumers changing too.

I have presented these various schemes as if they were in themselves solutions. Yet they are not. All of them – carbon taxes, cap-and-trade, and state-imposed quotas – require a major shift to renewable forms of energy. But using existing greener technologies to solve the problem would require enormous expenditures. The global economy currently uses about sixteen terawatts of electric power generation. To get that total without the aid of fossil fuel from a mixture of current alternative technologies would involve massive industrial complexes spread over very large land-masses. Solar cells in the required quantity might spread over about thirty thousand miles of land. Solar thermal sources might require about a hundred and fifty thousand square miles, biofuels might occupy over a million square miles. Then there are wind turbines, geothermal sources, and nuclear power plants. One can play with the relative weights of each of these but, overall, the currently available alternative energy sources would require a space about equal to that of the United States. That would be a theoretical possibility but not a practicable one (Barnes and Gilman, 2011: 48–9). We can assume some improvements to these technologies over the years it would take to implement this, but absent completely new technologies, the savings would not be large enough to be politically feasible.

Of course, such emission-reduction costs can be set against the potential reductions in GDP and living standards that a do-nothing policy will eventually bring. The Stern Review (2007: 211; cf. OECD, 2007) calculated the cost of policies keeping emissions down to a CO₂e level of 500–50 ppm at 1 percent per annum of global GDP, though adding that the range of possible costs runs from –1 percent (net gains) to +3.5 percent per annum. In 2008, because of worsening climate change, Stern doubled the costs of his proposed policies to 2 percent of GDP (*Guardian*, June 26, 2008). Other economists envisage much higher cost figures of 5 percent reduction in GDP if emissions were kept down to such a level. The Stern Review claimed that all costs would be swallowed up amid large growth of the global economy through the century. It also warned that to do nothing might risk a recession lopping 20 percent off global GDP.

Unfortunately, politicians and electorates prefer to avoid smaller costs right now than much bigger ones some way down the track – when those politicians do not expect to be in office and those electorates are mostly dead. The discount rate is the tool economists use to compare economic impacts occurring today with those in the future. Most economists set a high discount rate for the future since people value the known present much more than an uncertain future. Using a high discount rate reduces the benefit of taking mitigating

actions now, since future benefits are seen as lower. Nordhaus (2008: 10) sets his discount rate at 4 percent, which makes emission-reduction policies much more expensive. The Stern Review set its discount rate at only 1.4 percent, which make such policies profitable. The Review defended this low rate in terms of the increasingly severe future risks that science identifies – but sensing skepticism over its calculations it added an ethical argument as well, our responsibility toward succeeding generations. Objective risk plus ethics are crucial, they say (Stern Team, 2008; cf. UNDP Report, 2007: 62–3).

Unfortunately, the calculations in themselves do not make sense. The cost of building a United States-sized alternative energy complex would be immensely expensive, involving GDP losses of far greater than any of these calculations. It is simply impossible to avoid a major loss of GDP all over the world, given present technologies, if we are serious about climate change. Indeed, the main goal of effective climate change policy has to be a move to a permanently lower level of GDP. That is the only way to preserve the earth – unless some new and cheap miracle technology appears. It might happen, but giving people tax incentives to develop such a technology seems pathetic, the triumph of faith over probability – and faith in exactly the same kind of technological fix that got us into this mess in the first place (as Barnes & Gilman, 2011, note).

The coming political struggle

The main challenge to business domination has come from the small world of environmental NGOs. During the Kyoto negotiations, NGOs were officially accredited to the conference. Though not allowed to attend the core meetings between state delegates, they lobbied them in the corridors, participated in panel sessions, briefed delegates, and produced a useful daily newspaper about conference developments. Betsill (2008a) says that while NGO positions “are not reflected in the Protocol’s text, the environmental community did shape the negotiating process in a number of ways and thus had moderate influence.” However, Humphreys (2008: 169) says that in the case of forestry policy NGOs most influenced the outcome of negotiations if they framed recommendations in probusiness neoliberal discourse. Betsill (2008b), reviewing various studies, says “NGO influence was highest when the political stakes were lowest ... [and when]... negotiations involve limited commitments for behavioral change” (p. 203). NGOs also wield more influence during early negotiations. During later discussions requiring actual commitments, business lobbyists overwhelm them. Business spokespersons are often appointed to states’ negotiating teams and they take items off the agenda or otherwise pare down agreements (pp. 193–4). There is unequal power: business predominates over environmentalists, which helps account for the inadequate treaty outcomes. Green influence is felt more diffusely, over public and party opinion, but with lesser impact on policy crystallization. A world polity has not arrived.

Radical environmentalists completely reject the technical debate over discount rates. They add that any level of discounting ignores the irreversible damage inflicted in the meantime on biodiversity (the killing of plant and animal species) and low-lying countries. Climate change violates principles of sustainable development, earth stewardship, and the inalienable rights of future generations (Hulme, 2009: 124–32; Hansen, 2009). Yet unfortunately the peoples of the world do not endorse such moral absolutism while the unborn do not vote. At a time of recession, the jobs now demand – which conservative politicians say requires a reduction in environmental regulation – is hard to counter. Media reports of environmental problems declined once the Great Recession started, as did politicians' interest and environmental concerns revealed in opinion polls. In polls people often say they would take an x amount of reduction in living standards to save the planet, but when their living standards are actually threatened, they behave differently. Citizen consumption becomes even more desirable when we are deprived of it. Of course, if we were entirely short-term and selfish, we would take no mitigation steps at all, for the climate will probably not significantly worsen in our own lifetimes. But since we do try to make provision for our descendants, there is in principle some hope that we will begin mitigating. Yet the problem is too abstract. It does not hit us hard in our everyday lives – except for some of the poor in poor countries, who lack the power to resist much or to elicit more than a passing glance from us.

There will now unfold a long political struggle, with states hopefully pressured from below and from outside by green NGOs, scientists, and low-emitting business, to constrain business and consumers a little more, year by year. Yet interests vary according to where people are situated in the world. There is pronounced inequality in global emissions by consumers.

The world's poor are virtuous for they barely consume or emit, while the rich pollute greatly because they consume greatly. Those who earn more than \$7000 per annum on average exceed what would be a fair personal emitting limit of 2 tons of CO₂ p.a. These overconsumers include almost all the citizens of advanced countries, though because of the size of the middle class in countries like India and China, overconsumers are now as numerous in developing as developed countries. They purportedly include almost twice as many men as women (Ulvila & Pasanen, 2009: 22–6, 37–8). It isn't just a question of overcoming business opposition. It is also necessary to overcome the short-term interests of the mass of northern citizens and of richer citizens everywhere. In developed countries emissions reductions would paradoxically fall heaviest on the poor since most policies would raise the price of fossil fuel energy and the poor pay a higher proportion of their income to heat their homes and power their cars. If President Obama's now abandoned cap-and-trade legislation were to cut emissions by 15 percent, households in the bottom fifth of the income scale would pay 3.3 percent more of their after-tax income, almost double the 1.7 percent more paid by the richest fifth (*Wall Street Journal*, March 9, 2009).

Equity suggests that redress for emissions programs be made through compensatory progressive taxes. Left parties might be expected to support this, though conservative parties would not.

Climate change impacts the global South more than the North. Poor countries already suffer most from climatic conditions. Roberts and Parks (2007: 71–96) assembled a dataset of more than 4000 extreme weather disasters between 1980 and 2002. This showed that rural people in poor countries suffered the worst and first effects – death, homelessness, and displacement from climate-related disasters on a scale between ten and a hundred times worse than people in the United States (even including Hurricane Katrina). As they say, “rich nations pay for climate change with dollars, and poor nations pay with their lives” (p. 37). The UNDP Report says global warming threatens most the poor and the unborn, the “two constituencies with little or no voice” (UNDP 2007: 2).

Poor countries already tend to be warmer, with more variable rainfall. They depend more on vulnerable agriculture, and have poorer health and infrastructural provision to deal with crises. Some richer countries, like Canada, the Scandinavian countries, Germany, Poland and Russia might actually benefit from global warming, since they could grow more crops and graze animals further north, burn less fossil fuel, and welcome more tourists. Latin America, the Middle East apart from Egypt, and especially Africa and South Asia would be the biggest sufferers. The richer countries also have more resources to adapt to threats. The Netherlands has long spent enormous sums on its flood defenses. Britain, coastal Florida and California could do the same – at least I hope so, since my Los Angeles home is less than a meter above the high-tide mark of the Pacific. In contrast more than a fifth of Bangla Desh would be under water if the sea rose a meter, and the country lacks the resources to do much about it. Yet the voters of the Southwestern states of the United States should be told they may inhabit a giant dust-bowl after the next decades.

The narrowness of a country’s export base indicates the extent of its dependence in the world economy and this is correlated with environmental degradation. Poorer countries understand that structural inequality contributes to their climate vulnerability and constrains their national development, and so in negotiations over climate change they try to inject a broader sense of global injustice. Citing Durkheim, Roberts and Parks (2007: 48–66) argue that norms, trust and diffuse reciprocity are just as important in negotiations as are material interests. If wealthy countries wish to lower this hostility and improve cooperation on climate change, they must acknowledge the broader injustices of the international division of labor, and target them for reform. That, however, is a very ambitious goal, difficult to convey to northern electorates worrying about their own jobs and taxes.

Some developed countries might withdraw from all global negotiations on the grounds that they could weather the coming storm. The UNEP Report lists

several alternative future scenarios. In *Security First or Me First*, government and business seek to improve or maintain only the well-being of the rich and powerful (2007: 401ff; cf. the *Fortress World* strategy identified by Raskin et al., 2002: 25–7). The rich could not entirely insulate themselves, for the catastrophes that might befall poorer countries would have knock-on effects, producing a decline in their own GDPs, while the clamor of massed refugees might make the borders unenforceable without enormous security costs. There might be wars between states competing for declining water, food resources etc. There is present-day evidence from Africa that greater variations in rainfall produces more violent conflict (e.g., Hendrix & Salehyan, 2012). If poorer countries cut down their rainforests in a desperate bid to expand their agriculture to feed their populations, that would intensify global warming for all. It seems more likely that countries would continue global negotiations, though some more enthusiastically than others.

But the North shares responsibility for growing pollution in developing countries, for it has exported many of its polluting industries to them. Poorer countries now produce more manufactured goods for export and so must endure more of the pollution involved in their manufacture, while wealthier countries, where those goods are consumed, shift to cleaner industries and claim moral purity (Jorgenson & Burns, 2007, Roberts & Parks, 2007). It is an illusion that the North is reducing its dependence on carbon, for our lifestyle relies heavily on carbon-intensive imports. When the North suggests using carbon intensity per unit of each country's GDP as a metric in negotiations, this is carbon colonialism for measuring domestic production leaves out the carbon values embedded in trade flows. Who is responsible for China becoming the biggest polluter, the Chinese or foreign capitalists, goes the rhetorical question? These ecosocialist arguments are morally valid. But morality does not rule the world.

The countries of the South naturally want economic growth. They want living-standards like those of Europe and the United States, and they want them now. Yet if the whole world enjoyed current Western life-styles, humanity's ecological footprint would require an astounding five planet Earths (Hulme, 2009: 260)! The tragedy is most evident for the poor of the world who walk the Earth with an exceedingly light carbon footprint. Whatever the morality of past versus future polluters – OECD versus BRICs – why should the people of sub-Saharan Africa or Bangla Desh or Pacific islands have to pay for the sins of others? Developing and poor countries will continue fighting for better terms. They should certainly do so, and we in the developed world should yield much more than we have yet. But morality does not rule the world.


There is some room for hope, for this is not a zero-sum game. Reductions in emissions anywhere benefit everybody. Where there is a common global interest, poor countries also have more leverage than usual. It particularly makes sense to target industries that are inefficient and relatively cheap to improve,

wherever they are – and they are increasingly in poorer countries. Many power generating plants in the developing world and the countries of the former Soviet Union use obsolete, highly polluting technology. For the OECD countries to bring them more advanced technology would be relatively easy and cheap, and the consequent emission reductions would benefit them too. But it would not be enough.

To subsidize just two countries, Brazil and Indonesia, to better preserve their rain forests would bring major benefits. Combating deforestation probably offers the cheapest way to lower overall emissions. Deforestation contributes about a fifth of global GHG emissions. It is an especially perverse market failure. Indonesian farmers fell trees for palm oil, generating short-term profit but large carbon emissions. Their rate of profit is only about 2 percent of what they might get from the carbon market value of the timber if a carbon tax was set at \$25 per tonne, which would therefore be a very effective way of helping the global climate. Even the large-scale hardwood logging enterprises of Indonesia make profits of less than 10 percent of that carbon market value. Clearly, the world's interest is to subsidize Indonesians to reforest more than they deforest. Subsidies would also benefit Indonesians, especially the poor peasants and indigenous peoples who are being expropriated by big landlords, corporations and governments who are leading deforestation (UNDP, 2007: 157–9). At Copenhagen and then next year at Dubai the developed countries accepted the principle that they must subsidize developing countries' programs, though the amounts offered were small and were without enforcement mechanisms. This is not enough.

The two indispensable nations

To counter global warming, two nations are indispensable, the two on whom I have focused most in this volume, the two biggest polluters, the United States and China.

The United States has become a major obstacle to emissions reduction. It lags well behind the European Union and East Asia in climate sensitivity. Here it is definitely not the leader. Though its neoliberalism is highly selective, as earlier chapters emphasized, it is mobilized strongly over climate matters. Big government in this policy arena is supposedly bad. The diversity of this continent-sized country is reproduced by its federal political system. GHG emissions vary enormously between regions. In 2005 the average person in Wyoming emitted 154 tons of 

CO₂ e, more than 10 times the emissions of a New Yorker's 12 tons or a Californian's 13 tons. The lowest 10 emitters were all East or West Coast states, while the highest 10 were all western, midwestern or southern. This is mainly due to the location of coal and oil reserves, though people in rural states also consume more gasoline. This regional distribution roughly corresponds

to the division between Republican and Democratic states. This is a major reason why Republican politicians tend to oppose climate legislation, while most Democrats support it. Many Republican politicians are also antiscience, more provincial, and more insulated from global issues. Congress itself tends to privilege local against national and global issues. A Democrat minority, the so-called blue dogs and black dogs (representing coal and oil districts) also believe they can better hang onto their seats by espousing environmental conservatism. They may be right since emission-reduction policies would require voters in their states to pay more for their fuel needs now. Senators and especially Congressmen often add riders to environmental bills, protecting local emitters (Miller, 2009: chap. 2). The interests blocking progress are strong, popular and can muster arguments with ideological and electoral resonance.

Regional inequality is difficult to redress, since tax systems are not as well-gearred to counteract it. Federal grants to hard-hit states from the proceeds of carbon taxes or cap-and-trade might help offset the cost. At present, however, these states' voters and their politicians currently oppose carbon pricing and cap-and-trade. This is not primarily a class issue since labor's desire to reduce unemployment is stronger than their intermittently green rhetoric. Though Democrats are greener than Republicans, this is truer of middle-class than working-class Democrats. There is no mass movement from below pressing for much mitigation. Add on the recent changes in political power relations on the Hill and it becomes extremely difficult to get filibuster-proof majorities for emissions bills in the House and Senate, unless their bite is stripped out of them.

The passage of the American Clean Energy and Security Act through Congress during 2009 and 2010 presents a dispiriting case-study (Goodell, 2010). It set a goal of reducing carbon emissions by 20 percent by 2020, while permitting 2 billion tons of carbon offsets per year. It included a rather weak cap-and-trade scheme but quite strong measures to improve energy efficiency. It was stronger than the original business-friendly blueprint bill drawn up by the U.S. Climate Action Partnership, a coalition of moderate environmental groups and major corporations like GE and ConocoPhillips, which had set a goal of only 14 percent carbon reduction by 2020. The bill nonetheless alarmed the Republican Party, the blue and black dogs, and the coal and oil companies. They fought back by arguing that the climate bill was nothing more than a national energy tax that would cause energy prices to rocket and destroy jobs. Its cap-and-trade should really be called cap-and-tax, they said. Rep. Joe Barton (Republican, Texas) had just been replaced by Rep. Waxman (Democrat) as chair of the House energy committee. He promised to launch "crafty guerilla warfare" on the bill. Waxman says "I talked to Joe Barton as this process began, expressing a desire to work together with him on this. He told me he didn't believe in the science of global warming, didn't think it was a problem and didn't want to try to solve it."

Big Coal spent \$10 million on lobbying against the bill, and more than \$15 million paying for the federal campaigns of politicians who opposed it. Between 2003 and 2009 the number of lobbyists devoted to climate change soared over fivefold to 2,810 – five lobbyists for every lawmaker. Only 138 of them were pushing for alternative energy. The lobbyists focused on Democrat blue-dogs. Rep. Rick Boucher, a Democrat from the coal fields of southern Virginia, got the biggest single coal cash handout, more than \$144,000 in 2009. Boucher was a former chair of the House energy subcommittee and spoke for the blue-dog votes Waxman needed. Boucher spent six weeks in back-room negotiations between his coal friends and members of the House energy committee.

So the climate bill was amended to include more free permits for polluters, plus \$1 billion a year to support clean coal research – on top of the \$3.4 billion in research funds in the president's stimulus plan. The bill now contained \$60 billion in support for coal – far more than the aid given to all forms of renewable energy combined. Boucher also got the forty or so coal-powered plants currently under construction exempted from the new regulations. The all-important target for reducing carbon emissions by 2020 was cut from 20 percent to 17 percent. The goals for boosting renewable energy were cut nearly in half. EPA authority to regulate carbon emissions was gutted. Instead of an auction for all emissions permits, as Obama had promised, the bill gave 83 percent of them free. All told, major polluters received \$134 billion in allowances. The nation's dirtiest corporations got another government handout.

The climate bill squeaked through the House by a vote of 219 to 212. Almost all the Republicans plus 44 Democrats voted against the measure. Its passage in the Senate was halted when the administration realized it lacked the votes. This is likely to endure if future elections do not shift the balance of power leftward. Political power relations operating through the electoral cycle block progress toward emissions reductions. Yet the participation of the United States in any global program is essential, for the United States emits a quarter of the world's emissions and still has unrivaled geopolitical clout. It is difficult to escape a feeling of gloom when pondering likely American responses to the looming crisis, at least in the medium-term.

China, the other essential nation, is also problematic, though its authoritarian party-state has an advantage. It does not have to defer to business but can almost arbitrarily impose radical programs, including environmental programs. It also has an unusually long attention-span, planning decades ahead, as is also evident in its military and security policies. The extraordinary One Child Policy was forcibly imposed and it ensured that an estimated three hundred million extra births were avoided, the equivalent of a 5 percent reduction in carbon emissions, greater than the entire Kyoto process (Hulme, 2009: 270). Yet the regime's main everyday goal remains economic growth, believing this is what sustains order and its own power, and indeed this is what the people

want. As we saw in Chapter 8, it is now facing serious disaffection among both peasants and industrial workers. In the short-term, therefore, it is unwilling to sacrifice GDP and employment growth in return for greater benefits in the future – like other countries.

Maoist hero projects aiming to conquer nature, like the Great Leap Forward, led to terrible environmental excesses. Contemporary projects like the Three Gorges Dams and the West-East Pipeline maintain this tradition. But rapid economic growth, privatization and power devolution – the arrival of the capitalist party-state – have made things worse, as protective infrastructures have weakened amid the primacy of profit-driven growth (Muldavin, 2000). The township and village enterprises (TVAs), the key to rural economic development, were causing 50 percent of national pollution by the late 1990s. The government recognizes its environmental problems and has enacted much antipollution legislation. But local officials entrusted with enforcing the laws rarely do so, since this might threaten local profits, revenue, jobs, and their own corrupt profits (Ma & Ortolano, 2000). Coal supplies two-thirds of China's energy needs and oil adds another 20 percent. Unsustainable logging, loss of grasslands, water scarcity, vehicle pollution, and serious loss of topsoil all lead to biodiversity losses, climate warming, desertification, and urban pollution. Six of the ten most polluted cities in the world are in China; five of China's biggest rivers are "not suitable for human contact." Yet China's performance may be no worse than other Asian states like South Korea, Malaysia, Indonesia and the Philippines where the problem is too-cosy a relationship between business and officials responsible for environmental protection, both linked to corrupt networks of political patronage (*Economy*, 2004).

The Chinese government is trying to move toward cleaner energy sources. In 2009 China announced it would spend \$440 billion in clean energy R&D over the next decade and it has now overtaken Germany as the leading investor in clean fuels. An HSBC bank report (2009) estimated that 38 percent of China's stimulus package was green, with only South Korea and the EU having a higher green proportion, and its green programs were easily the world's biggest in dollar terms. By 2010 China gave the biggest subsidies to renewable energy users, and had created a National Energy Commission composed of cabinet ministers led by Prime Minister Wen Jiabao himself. China is already producing more than half the world's solar panels, and is the largest producer of wind turbines. The Chinese government, unlike the United States, sees the next generation of technology as centering on new alternative energies and is investing heavily to secure leadership in this field. China might prove to be the first case in which a state-dominated economy leap-frogged over capitalist market economies in the technological race, instead of merely playing catch-up. The main obstacle is China's economic success, its growth rate. Though improvements in energy efficiency have been considerable, out-performing those of the United States, they are more than swallowed up by economic growth. The emissions plan for

2006–10 aimed to reduce energy consumption by 20 percent per unit of GDP. Yet this was less than half the growth in GDP over the period. The Chinese Communist Party's legitimacy depends on it delivering economic growth. It is highly unlikely to go for lesser growth.

Nonetheless, China has been active in global climate change negotiations as de facto leader of the developing countries, the G-77. Most developing countries cannot assemble expert delegations themselves and rely on the BRIC countries, especially China. China has insisted that the developed countries must move first and must provide additional funding and technology transfer to the developing countries. It contrasts the "survival emissions" of developing countries with the "luxury emissions" of developed ones. The latter can be dispensed with, the former means food on the table. These are popular positions in the G-77, but they are not accepted by the United States.

At Copenhagen China refused to allow international inspectors into China. Its sensitivity is matched by the United States. Congress has refused to ratify foreign treaties that might infringe on its authority. National sovereignty as well as capitalism block solutions. American politicians have repeatedly said they will not move until developing countries present reduction proposals. The U.S. Senate said this when rejecting Kyoto by a resounding 95 votes to 0. President Bush the Younger commented "the American life-style is not open to negotiation." But it must be. China kept repeating that the United States must move first. At Copenhagen the United States and China finally agreed on something, but it was to block more definite treaty proposals. Global climate control without the two biggest polluters is impossible but they present major obstacles, the United States because of its neoliberal capitalism amplified by federalism, China because of its extraordinary statist success in achieving economic growth, and both of them because they are not fertile ground for transnational NGOs and they jealously guard national sovereignty. The two indispensable nations are hastening on disaster.

Conclusion

Our collective mastery over Nature was supposedly total but instead proved self-destructive. Greenhouse gas emissions are saturating the atmosphere, the sea and the land of planet Earth. At some point in the twenty-first century if the world does not adopt major mitigating policies, global warming will severely menace human society. It will hit unevenly, poorer countries hardest, but it will also reduce living standards everywhere. It is now virtually impossible that the scientific community has got it all wrong, but it is just possible that human technological ingenuity driven by the desire for capitalist profit will pioneer some alternative emission-free and cheap fuel. That would be a burst of creative destruction by capitalism greater than either the second industrial revolution or the great postwar boom in consumer demand. It seems

unlikely. Necessity is not the mother of invention. A far gloomier possibility might actually have a silver lining: a nuclear war or a global pandemic or even a passing meteorite might wipe out half the human population and so substantially reduce emissions. But none of these look as likely as continuing climate change, bringing gradual disaster.

This will not be an unexpected crisis, like the others discussed in Volume 3. We know many years in advance what the future will likely bring if we do nothing. If human reason dominated societies we could avoid disaster by action now. But it does not. The reason of most actors is limited to short-term alternatives. This drives nationally caged politicians trapped by the electoral cycle and pressured by consumption-mad voters to steer us away from serious mitigation.

There are three major obstacles to any happy outcome. First, northern citizen rights have grown to include a high-emissions consumer culture, soaking up an enjoyable material present in preference to thinking about apparently more ascetic and still abstract futures. Southern citizens are also beginning to savor the immediate pleasures brought by economic growth and understandably want to consume still more. None of these peoples would accept severe rationing or taxing of fossil fuels. Global warming is an abstract threat not yet biting into everyday lives. By the time it does, decades down the line, it may be too late. People are especially unlikely to support major mitigation during a recession.

Second, successful policy would require cutting back the autonomous power of capitalism, driven on the treadmill of short-term profit to destroy the environment. Though there are potential splits between low and high emitting industries, these have not yet happened. The capitalist hurdle is raised higher by the fact that labor is not convinced that environmentalism is in its interest, as well as by the recent surge of neoliberalism denouncing government regulation. Class struggle is asymmetric here – most of the capitalist class opposes emissions regulation, but most of labor does not support it. Third, successful policy would require cutting back the autonomous power and the caging power of the individual nation-state and its politicians, who are driven on two treadmills, one of GDP growth, the other of the electoral cycle (or the authoritarian regime's equivalent). What politician would advocate severe rationing or taxing of fossil fuels?

On the positive side, soft geopolitics among states were boosted in the settlement of World War II, and these plus a burgeoning NGO sector do generate some international and transnational action. Yet far more is needed for effective mitigation. Action requires binding agreements between all the major states, and this is rendered more difficult by North-South hostility and by jealous protection of national sovereignty by the principal polluters. So tackling climate change requires attacking the autonomy of this period's three great success stories – capitalism, the nation-state, and individual citizen rights. This is a formidable, probably an impossible task.

It seems unlikely therefore that we can reduce emissions fast enough to avoid serious consequences. Humanity may have to go through a few disasters, like the wholesale flooding of some countries, before it begins to react. As such crises loom, the gravity of the threat might galvanize low-emissions businesses, electorates, and politicians into drastic global mitigation policies, a Great Awakening says Gilding (2011), accepting and imposing major sacrifices for at least one or two generations. Populations would live in reduced circumstances, but they would live. Alternatively, as crisis worsened, a Fortress World scenario might be adopted by those states and regions suffering less but possessing more power. That might be popular among their citizens who would turn their national cage into a fortress. This could generate new ideologies, not cuddly green ones but nastier ones generating ecofascist regimes or populist charismatic leaders in countries beset by massive refugee flows, enraged terrorists, local wars and mass deaths, producing not global integration but disintegration, with possible escalation into nuclear war. So far I have treated the ideological response to climate change as that of nice, gentle scientific-cum-ethical herbivores. But environmental ideologies might in the future be as varied as other ideologies were earlier in the twentieth century when humans confronted the rise of corporate capitalism and the working class. Ideologies comparable to revolutionary socialism, aggressive nationalism, and even fascism might emerge. We can see the first stirrings of this, perhaps, in the emergence in the United States of a nationalist drive for energy self-sufficiency, attempting to cut the country off from the rest of the world.

These two extremes are not the only possible paths. Some limited progress might be made in mitigation policies but not enough to outweigh the emissions generated by economic growth. This may be the likeliest path. We don't know how long-delayed would be its really bad consequences, but from general recognition of an undesirable trajectory toward disaster might gradually come stiffer mitigation policies. These would inevitably reduce living standards, but the two world wars did see willingness to sacrifice, provided sacrifices were seen as universal and therefore just. The onset of climate disaster might be comparable – indeed to my mind the likeliest possibility for saving human life on earth. The best possible path would be stiffer mitigation policies now or soon, along the lines laid down in recent official reports, but with tighter regulation and stiffer carbon taxes and cap-and-trade schemes – what Newell and Paterson (2010) call Climate Keynesianism. Yet they would have to be backed up by new greener technologies. This combination could still significantly reduce global warming by the mid-twenty-first century. Common to all of these alternative policies of mitigation would be more interstate coercion in regulating, imposing carbon taxes, and setting caps on emissions at both the national and especially the international level. Salvation can come only from a more international human society, pressured by scientific findings and quasi-transnational NGOs. But I don't quite see it happening.

Capitalism must also be reined in. It has been the main polluter yet remains unwilling to pay the social cost of its pollution. At a time when Marxism is almost dead and social democracy is on the defensive, eminent establishment environmentalists like James Gustav Speth (2008: chaps. 8 & 9) float schemes for “changing the fundamental dynamics” of capitalism. He asks governments to revoke charters of corporations that violate the public interest, exclude unwanted corporations, roll back limited liability, eliminate corporate personhood (which gives them the same rights as any person), get corporations out of politics, weaken corporate lobbying, and democratize corporations. He believes capitalism “profoundly threatens the planet” and must be replaced. He accompanies this with wider calls to the citizenry to end its growth fetish and its consumerism, and he asks for a new politics and a new ideology, including the cultivation of postmaterialist values appropriate for a postgrowth society, and an ethic of global equity and sustainability. He admits that all this – which amounts to restructuring all four sources of social power – might seem rather utopian in the United States. Actually, it would be in any country. Yet he is hopeful that it would be practicable if the coming environmental crisis creates citizen demand for radical action.

More moderate scenarios see mitigating policies coming more gradually but cumulatively over two or three decades, through a relatively democratic, integrative, soft geopolitical and peaceful process – assisted perhaps by some great capitalist or government laboratory technological breakthroughs. More malign scenarios foresee intensifying social strife, raising higher the border fortifications of the more prosperous world, while simultaneously making them harder to defend, amid authoritarianism, hard geopolitics and wars. In a future crisis GDP per capita would plummet, even in the richest countries, affected by collapse elsewhere, and likely to turn to costly forms of armed self-defense. Eventually such a decline might reduce emissions, though perhaps after a few climate wars along the way.

No one can predict which path might be chosen, for we are dealing with human beings, capable in the twentieth century of collectively launching two terrible wars for no good reason, while later capable of banishing interstate wars from much of the earth. Who knows what we will do? The choice, said Rosa Luxemburg in 1918, is between socialism and barbarism, though climate socialism would be very different to the socialism she envisioned, closer to the reformism she denounced. Free markets and business-corrupted governments got us into this mess, though the delusions of state socialism contributed mightily in some places too. Consumers’ preferences and votes keep us there. But confronted by a common global problem, the survival of humanity requires devising effective collective decision-making, together with a more socially responsible way of life for its citizens. The twentieth century saw the drifting away from and then back toward market-dominance. Now it must needs to drift away again, but this time away from national caging too – an unprecedented

move, Polanyi's double movement rolled into one. Yet the crisis and the threat remain abstract. Just like the neoliberal threat discussed in Chapter 11, it is not rooted in peoples' everyday experience. Until a very imaginative social movement can bridge the gap between climate change and everyday experience, I fear this chapter is blowing in the wind.

PROOF