

# THE ETHICS OF GLOBAL CLIMATE CHANGE

EDITED BY  
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## CHAPTER 8

*Living ethically in a greenhouse**Robert H. Socolow and Mary R. English*

It was made clear at the December 2009 conference on climate change in Copenhagen (Conference of the Parties 15) that the nations of the world are only beginning to concede that they face a common threat. It was widely reported that there was a deep divide at Copenhagen between delegates from "developed" countries and delegates from "developing" countries, and that the depth of the anger of the delegates from developing countries surprised the delegates from developed countries. Should the anger have been surprising? Not only had some of the developed countries – most notably, the USA – failed to take significant steps prior to the meeting to reduce the impacts of their economies on the climate. In addition, the developed countries had come to the meeting to revise the global structure of climate change mitigation such that all countries (or at least all of the major economies) would share the task. This arrangement, all conceded, entailed a sharp departure from the previous structure, in place since the 1992 United Nations Framework Convention on Climate Change, which dealt with equity across nations by dividing the world into two groups of countries with "common but differentiated responsibilities." Only the group of "Annex 1" countries (approximately, the countries of the Organization for Economic Cooperation and Development plus Russia) was obligated to make legally binding mitigation commitments.

Our chapter identifies a critical requirement for progress: the widespread development of moral imagination, in order for many more individuals to develop a planetary identity that augments their other loyalties. We defend a fresh formulation of equitable allocation of responsibility. We argue for the merits of accounting rules that focus on the world's individuals first and its countries second. Such an accounting would treat equally all individuals whose contributions to global emissions are the same, irrespective of whether they live in the USA or in Bangladesh. This accounting would therefore reflect individual lifestyles, as well as the institutions in each country that mediate lifestyles to create environmental impacts.

The next few decades are a crucial time to develop common values and aspirations through dialog. There is a need, for example, to discuss the desirability of a totally managed planet with many species of plants and animals found only in botanical gardens and zoos, versus a world with greater randomness and wildness. Philosophers have a major role here. Their professional assignment has long been to think about and help others think about what it means to be human. Our chapter argues that they now have an additional task: to help us think about what we as human beings should strive to accomplish during the millennia that lie ahead.

We are mindful that most of our analysis is predicated on the future bringing only modest changes in the globally dominant conceptualization of the good life. Given such a premise, the global targets endorsed at Copenhagen will be very hard to reach. Therefore, our chapter necessarily takes a positive view of the promise of technology to lead the way to an environmentally safer world. We argue for a nuanced view of technology that presumes that the implementation of every option can be done badly or well.

Returning to our original point, attaining the ultimate goal of long-term CO<sub>2</sub> stabilization will require not only a technological but also a moral transformation: one that, we argue, necessitates cultivating a planetary identity using the tool of moral imagination. This moral transformation can and should be fostered now. Realistically, however, it will be slower to take root than a technological transformation. Both the immediate technological transformation and the fundamental moral transformation are essential.

## STRUCTURE OF OUR ARGUMENT

The global climate change problem intersects ethics in countless places. Many of these intersections are well mapped, because they have been encountered with other environmental issues. Here, we seek to identify nine major intersections of climate change and ethics. The first four concern the planet. The remaining five concern humans, individually and collectively.

From the point of view of the planet:

- 1 The problem for the Earth is making room for all of us.
- 2 The Earth has provided us coastlines for cities and weather for agriculture, but it has had many coastlines and all sorts of weather, and they will change again.
- 3 The Earth's climate is being changed by us at an unprecedented rate.
- 4 Solutions that can limit climate change are not innocuous.

From the point of view of humans:

- 5 Each person's "share" of future CO<sub>2</sub> emissions must be small.

- 6 Regardless of where they live, the world's individuals with the largest emissions must reduce their emissions to much lower levels.
- 7 Global climate change raises both the opportunity and the necessity of forging a "planetary" identity, using the tool of moral imagination.
- 8 Global climate change also raises the opportunity and necessity of cultivating *prospicience*.
- 9 We should focus on managing the climate change problem, not on "solving" it.

#### I THE PROBLEM FOR THE EARTH IS MAKING ROOM FOR ALL OF US

The Earth is small, relative to the demands we put upon it. Our demands result from values of self-realization and equal opportunity coupled with consumer values. Many of these values have become widespread only in the past century. In short, global climate change is a consequence of the success of the modern agenda. The good life is nearly universally defined as exuberant consumerism; in other words, as the self-gratifying acquisition of plentiful and varied goods, services, and experiences. This conception of the good life can and should be challenged – see Section 7 below – but for now, it is a major force behind the rapid increase in the emissions of CO<sub>2</sub> and other greenhouse gases.

The problem of global climate change is exacerbated by global population growth. The collision of economic and population growth with environmental limits was prominently foretold in the 1970s,<sup>1</sup> but we collectively chose to disparage and shun the messenger. As a result, the need for action is even more urgent than if we had started to act thirty years ago. In 1960, when the possible effects of CO<sub>2</sub> were first being recognized, the global population was 3 billion. By 1980, the global population had grown to nearly 4.5 billion, and in early 2008 it was nearly 6.7 billion. Looking forward, however, rapid upward or downward changes in global population are not expected. The climb in global population is now less steep, because the transition to replacement-level birthrates is largely accomplished in many parts of the world. As for a future decline, perhaps our descendants will find a graceful way to reduce the global population without war or pestilence – say, down to the 1950 level of 2.5 billion by 2200. If that happens, it will become

<sup>1</sup> Donella H. Meadows, Jorgen Randers, Dennis L. Meadows, and William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Potomac Associates, 1972).

easier for humans to fit on the planet. The time scale, however, is longer than the one we are considering here.

As Socrates famously said of morality, "We are discussing no small matter, but how we ought to live." In the following sections, we concentrate on carbon-intensive human practices but do not deal with the issue of human reproduction. Nevertheless, that too is a question of how we ought to live.

#### 2 THE EARTH HAS PROVIDED US COASTLINES FOR CITIES AND WEATHER FOR AGRICULTURE, BUT IT HAS HAD MANY COASTLINES AND ALL SORTS OF WEATHER, AND THEY WILL CHANGE AGAIN

Historically, we shaped our civilizations around particular environmental circumstances: We built our cities near rivers and coasts, and we planted our crops where the rain fell. These practices were logical at the time, but they are not fortuitous given global climate change. When the earth emerged from the last ice age, the sea level rose nearly 100 meters, but sea level has changed very little during the period of human settlement. A rise of another 5 meters could result if either the ice sheet on Greenland or the ice sheet in West Antarctica were to slide entirely into the sea.

The consequences of sea-level rise for two parts of the world, one rich and one poor, are seen in Figures 1 and 2. Already severely affected by storm surges, Bangladesh is one of the nations most vulnerable to sea-level rise. It is also one of the world's poorest nations.<sup>2</sup>

Climate change can mean disruption for farmers as a result of an overabundance of water in some places and drought in others. Effects can be subtle. In Australia, for example, a persistent drought has led rice farmers to sell some of their land and water rights to wine producers, who can produce a crop of equal or greater monetary value from each acre with one-third as much water. The Deniliquin mill, the largest rice mill in the Southern Hemisphere, once processed enough rice to meet the needs of 20 million people but is now mothballed.<sup>3</sup>

With severe and persistent flooding, drought, and other environmental conditions triggered by climate change, will resettlement be necessary? If so, there will be massive human costs, largely endured by some of the world's poorest people.

<sup>2</sup> UNEP/GRID-Arendal, "Potential Impacts of Climate Change," *Vital Climate Graphics*, online at [www.grida.no/climate/vital/35.htm](http://www.grida.no/climate/vital/35.htm).

<sup>3</sup> Keith Bradsher, "A Drought in Australia, A Global Shortage of Rice," *New York Times*, April 17, 2008.

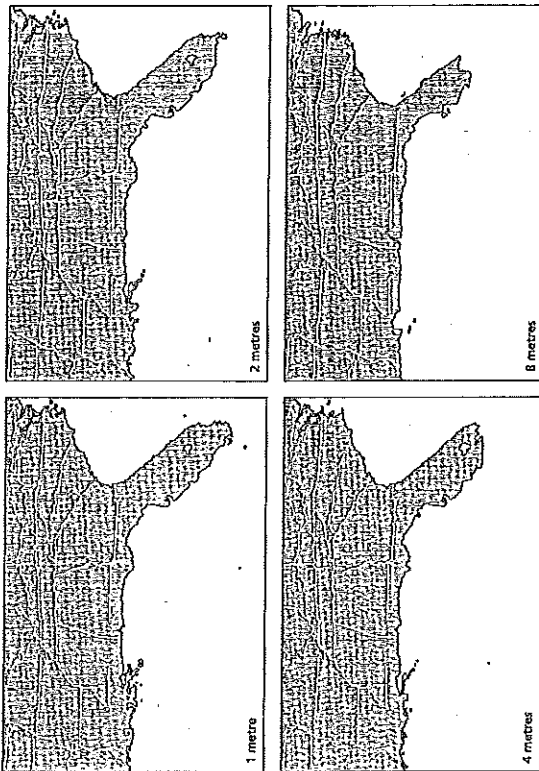


Figure 1 New coastline for the southeastern Gulf states in the USA resulting from sea-level rises of 1, 2, 4, and 8 metres.  
Source: T. Kauson, Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration.

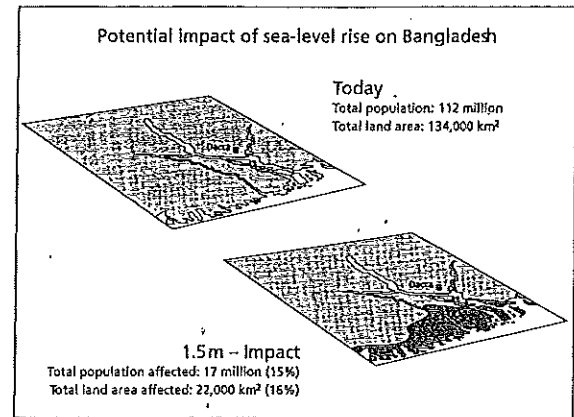
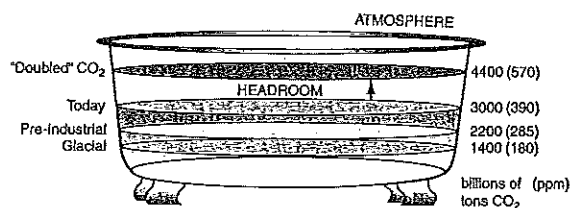
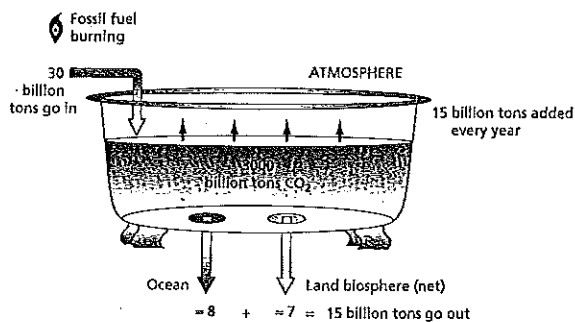


Figure 2 Effect on Bangladesh of a 1.5-meter sea-level rise.

### 3 THE EARTH'S CLIMATE IS BEING CHANGED BY US AT AN UNPRECEDENTED RATE

The climate change problem can be conceptualized by representing the  $\text{CO}_2$  in the atmosphere as a bathtub (Figure 3). Here, we discuss only  $\text{CO}_2$  – the largest contributor to greenhouse gas emissions – while noting that other gases, especially methane, also are important to the total picture.

As shown in Figure 3, the quantity of  $\text{CO}_2$  in the atmosphere today is approximately 3,000 billion metric tons, which equals a concentration of 390 parts per million (ppm). Adding 7.7 billion metric tons of  $\text{CO}_2$  (in which there are 2.1 billion metric tons of carbon) raises the concentration of  $\text{CO}_2$  in the atmosphere about one part per million. In the 250 years since the "preindustrial" (i.e., pre-1750) era, we have added as much  $\text{CO}_2$  to the atmosphere as was added during the 20,000 years of emergence from the depth of the last ice age. With only 1,400 billion more metric tons of  $\text{CO}_2$  in the atmosphere, we will have doubled the concentration of  $\text{CO}_2$  relative to preindustrial levels.

Figure 3 Past, present, and potential future levels of CO<sub>2</sub> in the atmosphere.Figure 4 Net annual global increase in CO<sub>2</sub> today.

The bathtub has two drains, however (Figure 4). While 30 billion metric tons of CO<sub>2</sub> are added from burning fossil fuels annually (about 4.5 metric tons per capita globally, at the current population size), it is estimated that today the ocean drain and the land drain together remove about 15 billion metric tons of CO<sub>2</sub> annually. Much less clear is how the two drains (technically, these drains are called "sinks") divide the job. (Note that the symbol  $\approx$  in Figure 4 means "approximately"; the apportionment of the total removal of 15 billion metric tons of CO<sub>2</sub> per year between the land and the ocean sinks is still uncertain.) The ocean becomes more acidic as a result of the CO<sub>2</sub> entering at the ocean surface.

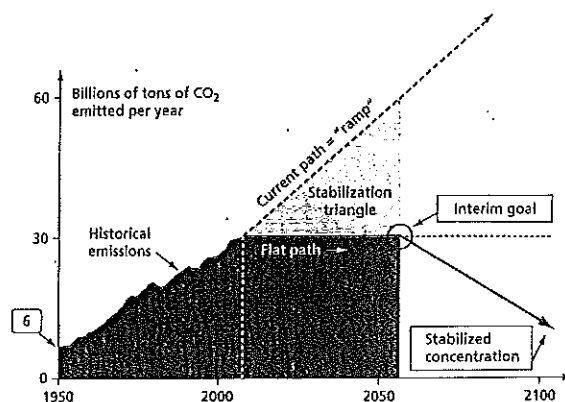


Figure 5 The stabilization triangle.

Why the land today is absorbing CO<sub>2</sub> is not well understood: evidently, in spite of human-caused deforestation, the forests and other plant life of the planet are gaining carbon; we know that this has not always been so – even in the past century.<sup>4</sup>

We have not always emitted CO<sub>2</sub> at the current global rate of 30 billion metric tons per year. As recently as 1950, the total global CO<sub>2</sub> emissions rate was about 6 billion metric tons annually, or approximately 2.4 metric tons per capita at the 1950 global population of roughly 2.5 billion. To stabilize CO<sub>2</sub> emissions at a level just below the 4,400 line in Figure 3, we need to hold total global CO<sub>2</sub> emissions at no more than 30 billion metric tons annually over the next 50 years as an interim goal and then drop to no more than 10 billion metric tons annually after another 50 years. The first 50 years of this job is captured by the "stabilization triangle" (Figure 5).

We have delayed long enough. If we delay yet longer, what will the consequences be, and on whom will they fall most heavily?

<sup>4</sup> Robert H. Socolow and Sau-Hal Lam, "Good Enough Tools for Global Warming Policy Making," *Philosophical Transactions of the Royal Society*, 365 (2007), pp. 897–934.

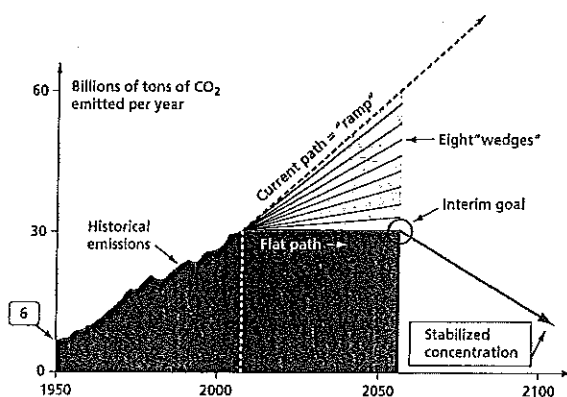


Figure 6 Stabilization wedges.

#### 4 SOLUTIONS THAT CAN LIMIT CLIMATE CHANGE ARE NOT INNOCUOUS

Despite the urgency of the problem, it can be managed. The world today has a terribly inefficient energy system; most of the "physical plant" that we will have 50 years from now has not yet been built; CO<sub>2</sub> emissions have just begun to be priced. The need for CO<sub>2</sub> emission reductions is pressing, but opportunities abound.

Elsewhere,<sup>5</sup> it has been pointed out that the problem of managing climate change can be decomposed into "wedge strategies" using current technologies. Taken together, these wedges enable addressing the climate change problem — not forever, but for the next 50 years (Figure 6).

A "wedge" is a strategy — already commercially available — to reduce CO<sub>2</sub> emissions by 4 billion metric tons per year in 50 years, for a total reduction of 100 billion metric tons over the 50-year period (Figure 7).

<sup>5</sup> Stephen W. Pacala and Robert H. Socolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies," *Science*, 305 (2004), pp. 968–972. (Note that in this chapter, a wedge is slightly smaller: One billion metric tons of carbon per year not emitted in 50 years. One billion metric tons of carbon is 3.67 billion metric tons of CO<sub>2</sub>.) Also see Robert H. Socolow and Stephen W. Pacala, "A Plan to Keep Carbon in Check," *Scientific American*, 295, no. 3 (2006), pp. 50–57.

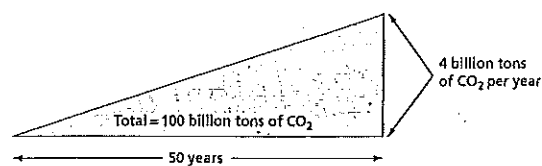


Figure 7 A wedge.

The stabilization triangle can be filled with eight wedges in such categories as:

- efficient use of fuel through, e.g., hybrid vehicles, mass transit, rail freight, and reductions in vehicle miles traveled
- substituting accessibility for mobility through, e.g., video-conferencing and at-home delivery of goods and services
- efficient use of electricity through, e.g., improved motors and lighting
- capture and reuse of wasted energy through, e.g., heat recycling and cogeneration of electricity
- "decarbonized" electricity from, e.g., nuclear power, wind turbines, and coal with CO<sub>2</sub> capture and storage
- "decarbonized" fuel — e.g., biofuels and geothermal heating and cooling
- methane management.

To these pragmatic technologies that are well understood we may be able to add other, more radical climate change management measures through "earth engineering" technologies. The two most discussed examples are (1) tuning the atmospheric CO<sub>2</sub> concentration by capturing large amounts of CO<sub>2</sub> directly from the air and storing it underground, and (2) compensating for global warming with global "dimming" by placing reflective particles in the upper atmosphere.<sup>6</sup> We may also be able to benefit from the arrival of commercially viable nuclear fusion and other options still much in the research stage today.

Neither the current technologies for managing climate change nor the prospective, more sweeping technologies are innocuous.<sup>7</sup> It is a misconception

<sup>6</sup> J. J. Blackstock, D. S. Battisti, K. Caldeira, D. M. Eardley, J. I. Katz, D. W. Keith, A. A. N. Padoa-Schioppa, D. P. Schrag, R. H. Socolow, and S. E. Koonin, *Climate Engineering Responses to Climate Emergencies* (Santa Barbara, CA: Novim, 2009) (archived online at: <http://arxiv.org/pdf/0907.5140>).

<sup>7</sup> National Research Council, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (Washington, DC: National Academies Press, 2009).



to think that the technological alternatives we can draw upon are without flaws and that only a combination of conspiracy and inertia prevents us from sailing into calm waters.

On the contrary, every alternative is problematic, from seemingly benign wind energy,<sup>8</sup> to deeply complex biofuel,<sup>9</sup> to geopolitically challenging nuclear power.<sup>10</sup> Energy conservation may mean regimentation; nuclear power is haunted by questions about waste management and nuclear proliferation; coal – often called “clean” when emissions at power plants are controlled – still can produce detrimental effects on miners, surface water and ground water, and the land mined; and renewable energy at large scale can make immoderate demands on land. Implementation in all instances can be done badly or well. The cure can all too readily become worse than the disease. But it does not have to.

“Solution science” – that is, the study of the environmental and social costs and benefits of stabilization strategies – is emerging. Through this study, which is necessarily interdisciplinary, solutions can be examined for flaws as well as benefits. Ultimately, however, no single solution will suffice. Portfolios of solutions will be needed. And ultimately, the choices about which solutions to pursue and which to forego will be political and ethical choices, based on individual and collective values. We individually and collectively will need to answer the question: What criteria should we use to compare the disruption triggered by various solutions with the disruption triggered by climate change?

#### 5 EACH PERSON'S “SHARE” OF FUTURE CO<sub>2</sub> EMISSIONS MUST BE SMALL

To achieve *long-term* stabilization, roughly 10 billion metric tons of CO<sub>2</sub> emissions per year can be emitted: that is, one-third of today's global CO<sub>2</sub> emissions rate (Figure 8). If the flat path and follow-on descending path in Figure 5 were followed, this rate would be reached in 2100. Comparing

<sup>8</sup> National Research Council, *Environmental Impacts of Wind-Energy Projects* (Washington, DC: National Academies Press, 2007).

<sup>9</sup> D. Tilman, Robert H. Socolow, J. A. Foley, J. Hill, Eric Larson, L. R. Lynd, Stephen W. Pacala, J. Reilly, Timothy Searchinger, C. Sommerville, and Robert H. Williams, “Beneficial Biofuels: The Food, Energy, and Environment Trilemma,” *Science*, 315, no. 5838 (2009), pp. 270–271. See also Robert H. Socolow, J. A. Foley, J. Hill, Eric Larson, L. R. Lynd, Stephen W. Pacala, J. Reilly, Timothy Searchinger, C. Sommerville, and Robert H. Williams, “Response to Letters to the Editor,” *Science*, 316 (2009), p. 1344.

<sup>10</sup> Robert H. Socolow and Alexander Glaser, “Balancing Risks: Nuclear Energy and Climate Change,” *Dalhousie*, 138, no. 4 (2009), pp. 31–44.

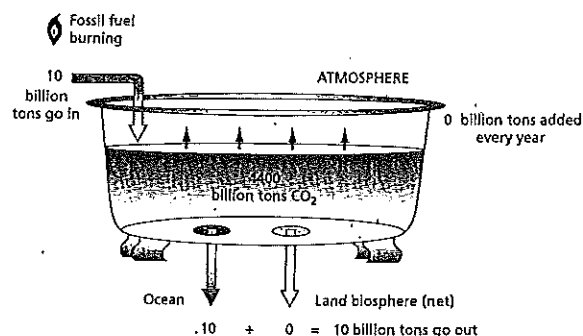


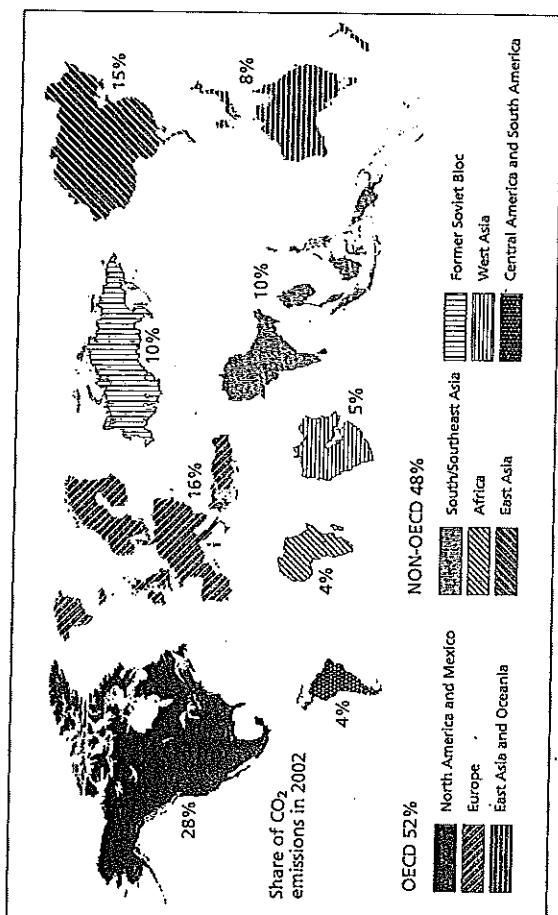
Figure 8 Allowable global CO<sub>2</sub> emissions at “stabilization.”

Figures 4 and 8, we see that we get this answer by assuming (arbitrarily) that at that future time the terrestrial biosphere will be carbon neutral and the ocean uptake of CO<sub>2</sub> will be slightly larger than today.

Dividing target global CO<sub>2</sub> emissions by the growing world population reveals that “stabilization” – that is, a total CO<sub>2</sub> emissions rate that will not contribute to further global climate change – is at a very low level of individual emissions. It is not sufficient simply to limit emissions in the prosperous parts of the world. If per capita emissions from the less prosperous nations of the world – for example, non-members of the Organization for Economic Co-operation and Development (OECD) – were allowed to fully “catch up,” the planet would be overwhelmed by CO<sub>2</sub> emissions. Indeed, total emissions in non-OECD countries already are roughly half of the global total (Figure 9).

In a climate-stabilized world, the CO<sub>2</sub> emissions per capita would be equal to those of people today whom no one would call well-off. What are the implications of this ineluctable fact for both the less prosperous and the more prosperous people of the world?

One implication is that to reach such a low level of global emissions, the world will have to implement low-carbon technologies widely and aggressively. As this happens, everyone's CO<sub>2</sub> emissions will fall, even if they are doing exactly what they have done before: lighting their bedrooms, for example. Another implication is that, as seen in the next section, there is room for the world's least prosperous people to increase their fossil fuel

Figure 9 2002 CO<sub>2</sub> emissions, by region.

emission rates now, even while the required decarbonization of the global economy is getting under way. The poor can be allowed – indeed, enabled – to use diesel engines for village-scale power; liquid propane gas for cooking; grid-connected electricity for lights, refrigerators, and cell-phone charging; and gasoline for motorbikes. A third implication, also discussed in the next section, is that the world's individuals with the largest CO<sub>2</sub> emissions must drastically cut their emissions.

6 REGARDLESS OF WHERE THEY LIVE, THE WORLD'S INDIVIDUALS WITH THE LARGEST EMISSIONS MUST REDUCE THEIR EMISSIONS TO MUCH LOWER LEVELS

As of 2003, the mean per capita CO<sub>2</sub> emissions level was 4.1 metric tons per year, but the distribution of emissions among people was extremely skewed. Only 27 percent of the world's population, or about 1.7 billion people, were above the mean, and they emitted 79 percent of the total global CO<sub>2</sub> emissions. Some of these 1.7 billion people are very rich; others, barely not poor. Moreover, only about 54 percent (about 900 million) lived in the OECD nations. The others (about 800 million) lived in developing nations. For 2030, according to a model embedding assumptions about trends in population and consumption, the individual CO<sub>2</sub> emissions of 2.8 billion people will exceed the 2003 mean, and 62 percent (more than 1.7 billion) of them will live in non-OECD nations.<sup>11</sup>

Evidently, the world needs a new conceptualization of global burden-sharing that takes into account the poor in rich countries and the rich in poor countries. The "greenhouse development rights" (GDR) framework of Baer, *et al.*<sup>12</sup> makes a similar point. The basic ethical implications are clear: Distributive justice in CO<sub>2</sub> emissions is not only about rich and poor nations but also about rich and poor individuals. "Common but differentiated responsibilities," since first invoked in 1992 in the United Nations Framework Convention on Climate Change, has been understood to refer to nations. This view has led to stalemate.

What sort of allocation scheme across the world's countries might emerge if one begins with a focus on the emissions of individuals? Figure 10 shows one

<sup>11</sup> Shobal Chakravarty, Ananth Chikkarur, Helen de Coninck, Stephen Pacala, Robert Socolow, and Massimo Tavoni, "Sharing Global CO<sub>2</sub> Emission Reductions Among One Billion High Emitters," *Proceedings of the National Academy of Sciences of the USA*, 106, no. 29 (2009), pp. 11884–11888 (doi:10.1073/pnas.0905331106).

<sup>12</sup> Paul Baer, Tom Athanasiou, Sivan Kartha, and Eric Kemp-Benedict, *The Greenhouse Development Rights Framework: The Right to Develop in a Climate Constrained World*, rev. 2nd edn (Berlin: Heinrich Böll Foundation, Christian Aid, EcoEquity, and the Stockholm Environment Institute, 2008).

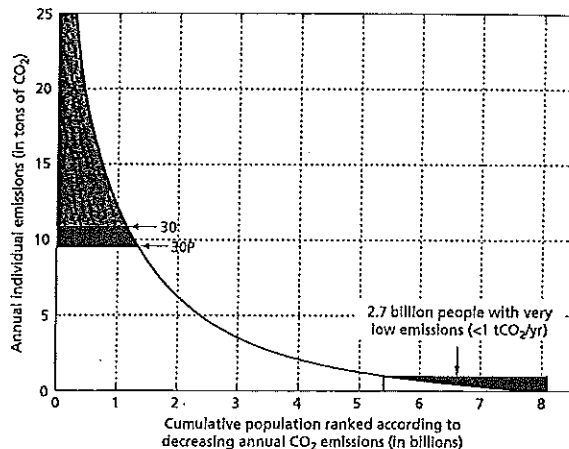


Figure 10. Projected distribution of global emissions across the world's individuals in 2030 and associated numerical constructions relevant to a proposed scheme for equitable distribution across countries.

Source: S. Chakravarty et al., "Sharing Global CO<sub>2</sub> Emission Reductions Among One Billion High Emitters," *Proceedings of the National Academy of Sciences of the USA*, 106: 11884-11888.

approach, where the world's total emissions are allocated across all of the world's individuals, who are lined up left to right, with the highest-emitting individuals on the left. The curve shows projected global emissions in 2030 and was created with the help of recent national income distributions, assumptions about future regional emissions growth, and a few additional assumptions.<sup>13</sup> The global population in 2030 is assumed to be 8.1 billion people, and the total annual emissions of CO<sub>2</sub> in 2030 are assumed to 43 billion metric tons, based on 2007 Energy Information Administration information.

Imagine that the world's nations look at this projected level of emissions and decide, collectively, that it is too large. Instead, say, the world decides that it would be more prudent for 2030 emissions to be only 30 billion

<sup>13</sup> Chakravarty et al., "Sharing Global CO<sub>2</sub> Emission Reductions."

metric tons of CO<sub>2</sub>; i.e., 13 billion metric tons of CO<sub>2</sub> less, or roughly the same as today. (This is just an example; in Copenhagen in December 2009 much of the world was discussing, implicitly, a somewhat tougher target.) The horizontal line marked "30" corresponds to this choice. The gray area at the upper left bounded at the bottom by "30" corresponds to the needed reduction of 13 billion metric tons of CO<sub>2</sub>. It results when the 1.1 billion individuals with the highest emissions all cap their 2030 emissions at 10.8 metric tons of CO<sub>2</sub>. Each country looks into the emissions of those of its inhabitants who are included in these 1.1 billion people and works out its share of the emissions in the gray area, which corresponds to that nation's allocation of the global emissions reduction. (In this specific analysis, the emissions of 270 million individuals living in the USA and 300 million individuals living in China exceed the cap. Because China's high-emitting individuals emit less, however, the magnitude of China's obligation for emissions reduction in 2030 is smaller.) The scheme leaves it to every country to choose how it achieves its targeted reduction of emissions.

Shifting the bottom boundary at the left downward to "30p" to include the black area immediately below the gray area corresponds to keeping the global emissions target unchanged but modifying the scheme so as to pay special attention to the world's very poor. These people closely correspond to the 2.7 billion lowest-emitting individuals represented in the light gray area at the extreme right. The extra emissions reduction allows the emissions of these individuals to be raised to 1 metric ton of CO<sub>2</sub> per year. The two black regions on the graph have the same area. Taking global poverty into account for this particular analysis, the global target of no more than 30 billion metric tons of CO<sub>2</sub> emissions for 2030 is achieved when the individual ceiling is 9.6 metric tons per year. Before the world acts, 1.3 billion people have emissions above that level and 2.7 billion people have emissions below 1 metric ton of CO<sub>2</sub> per year.

Conceivably, a conceptualization that treats all of the world's high emitters alike and all of its low emitters alike, no matter where they live, may be able to break the international logjam and free diplomacy to invent new solutions.

#### 7 GLOBAL CLIMATE CHANGE RAISES BOTH THE OPPORTUNITY AND THE NECESSITY OF FORGING A "PLANETARY" IDENTITY, USING THE TOOL OF MORAL IMAGINATION

We each have multiple social identities as individuals, family members, members of a community or tribe, and members of nested political entities

such as the village, the province, and the nation. Do our individual values and collective norms change as large numbers of us feel that, in addition, we owe allegiance to the planet and all of its people?

A planetary identity decreases the likelihood that I will see remote humans as alien, not worthy of moral consideration. It also increases the likelihood that I will be interested in the survival of other species sharing the planet with me. The emergence of planetarians may be a silver lining in the dark cloud of global climate change. To make the radical changes needed in our CO<sub>2</sub> emission practices, a planetary identity may be necessary. To develop this identity, however, moral imagination will be required. We must individually and collectively overcome our predisposition to see moral issues through narrow lenses.

Moral imagination has been called the ability to discover and evaluate possibilities that are not merely determined by a particular circumstance, with that circumstance's operative mental models, nor framed by a set of rules or rule-governed concerns.<sup>14</sup> It also has been described as the ability to form mental constructions of what is not real to oneself, permitting one to create possible worlds that are either morally better or worse than the world as we find it.<sup>15</sup>

As noted by Arnold and Hartman,<sup>16</sup> moral imagination has its roots in the work of philosophers several centuries ago: in particular, that of David Hume (*A Treatise of Human Nature*) and Immanuel Kant (*Critique of Pure Reason*). In addition, the early twentieth-century work of John Dewey, a philosopher, psychologist, and educator who advocated pragmatism, has contributed to contemporary concepts of moral imagination.<sup>17</sup> For example, John Dewey said of imagination that "only imaginative vision elicits the possibilities that are interwoven within the texture of the actual."<sup>18</sup>

In the past 20 years, moral imagination as a tool for ethical inquiry has been developed by philosophers such as John Kekes,<sup>19</sup> who noted that moral imagination can have not only an exploratory but also a corrective

function; and Mark Johnson,<sup>20</sup> who noted that moral reasoning is basically imaginative, because it uses imaginative structures such as images, narratives, and metaphors. Over the past dozen years, business ethicists in particular (e.g., Patricia Werhane, Denis G. Arnold) have developed and applied the tool of moral imagination.

Werhane has identified several requisites for moral imagination:

- being self-reflective about both oneself and one's situation
- disengaging from one's situation and being aware of the mental model or "script" dominating that situation
- imagining new possibilities outside the prevailing mental model
- evaluating from a moral point of view both the original situation and its dominant mental models and the new possibilities one has imagined.<sup>21</sup>

Moral imagination differs from conventional moral reasoning in two important ways. On the one hand, moral imagination avoids the rigidity that can come from relying mainly on abstract rules such as principles of distributive justice (e.g., the principle of equal shares, the principle of "from each according to his ability, to each according to his need," or the difference principle of John Rawls<sup>22</sup>) or abstract procedures such as cost/benefit analysis. On the other hand, moral imagination avoids the narrowness and, arguably, the flaccidness and moral relativism that can characterize purely situated moral reasoning. As Arnold and Hartman note,<sup>23</sup> citing Kekes: "Without the exercise of moral imagination, cultural myopia, ideology, and limited experience can individually and collectively constrain one's moral outlook."

Moral imagination is necessary but not sufficient for decision-making.<sup>24</sup> Moral imagination gives us freedom from our daily mental models, but we also need to be able to give good reasons for our judgments, if only to communicate them to others. According to Werhane, "a well-functioning moral imagination needs moral reasoning skills to amplify and justify intuitions, abstract and amplify what we learn from stories and cases, linking these together in what one hopes is a coherent and relevant point of view."<sup>25</sup>

<sup>14</sup> Patricia H. Werhane, *Moral Imagination and Management Decision-Making* (New York: Oxford University Press, 1999).

<sup>15</sup> Denis G. Arnold and Laura P. Hartman, "Moral Imagination and the Future of Sweatshops," *Business and Society Review*, 108 (2003), pp. 425-461.

<sup>16</sup> *Ibid.*

<sup>17</sup> Steven Fesmire, *John Dewey and Moral Imagination: Pragmatism in Ethics* (Indianapolis, IN: Indiana University Press, 2003).

<sup>18</sup> *Ibid.*, p. 68 (quoting Dewey in *Art as Experience*, 1934).

<sup>19</sup> John Kekes, "Moral Imagination, Freedom, and the Humanides," *American Philosophical Quarterly*, 28, no. 2 (April 1991), pp. 101-111.

<sup>20</sup> Mark Johnson, *Moral Imagination: Implications of Cognitive Science for Ethics* (University of Chicago Press, 1991).

<sup>21</sup> Werhane, *Moral Imagination*. Also see Patricia H. Werhane, "Moral Imagination and Systems Thinking," *Journal of Business Ethics*, 38 (2002), pp. 33-42.

<sup>22</sup> John Rawls, *A Theory of Justice* (Cambridge, MA: Harvard University Press, 1971).

<sup>23</sup> Arnold and Hartman, "Moral Imagination."

<sup>24</sup> Werhane, *Moral Imagination*. Also see Patricia H. Werhane, "A Place for Philosophers in Applied Ethics and the Role of Moral Reasoning in Moral Imagination: A Response to Richard Rorty," *Business Ethics Quarterly*, 16, no. 3 (2006), pp. 401-408.

<sup>25</sup> Werhane, "A Place for Philosophers," p. 405.

As with traditional moral reasoning, moral imagination and judgment were initially conceived as operating mainly at the individual level but can operate at collective levels as well. Drawing on systems thinking and the work of Henk van Luijk, Werhane<sup>26</sup> has extended the concept of moral imagination to the organizational and systems levels. She notes that each system or subsystem is goal-oriented, and that this goal-orientation – together with the structure and interrelationships shaped by the goals – accounts for the system's normative dimensions. "On every level, the way we frame the goals, the procedures and what networks we take into account makes a difference in what we discover and what we neglect."<sup>27</sup> Systems, like individuals, use mental models. As with an individual's mental models, a system's mental models can be challenged by moral imagination – in particular, by dispassionate self-evaluation.

The concept of moral imagination and judgment can be applied to the problem of global climate change at the levels of individuals, organizations and institutions, and political economies. Global climate change poses the challenge of balancing a critical but diffuse goal – the reduction of greenhouse gases – with more immediate and thus seemingly more vital goals. For example, an immediate goal for both individuals and collectivities is well-being. Typically, as discussed in Section 1, modern conceptions of well-being are translated into consumerism – i.e., the acquisition of abundant and varied goods, services, and experiences. Using the tool of moral imagination, however, well-being can be coupled with virtue and uncoupled from purely material prosperity. The "good life" (or *eudaimonia*) can take on a meaning that includes material simplicity as well as caring about and for others.

Global climate change also poses the challenge of balancing a temporally and spatially vast problem with pressing responsibilities to oneself and proximate others. Through moral imagination and judgment, however, we can individually and collectively realize that these pressing quotidian responsibilities can and should share the stage with our planetary responsibilities. One set of responsibilities does not trump the other. Because immediate responsibilities are tangible while planetary responsibilities are dauntingly huge, it is tempting to duck, ostrich-like, when confronted with the latter. One possible answer is to recognize that no single person or collectivity can "solve" the global climate change problem, but, as discussed in Section 8, all need to cultivate *prospicience*, and, as discussed in Section 9, all can contribute to step-wise management of the global climate change problem.

<sup>26</sup> Werhane, "Moral Imagination and Systems Thinking." <sup>27</sup> *Ibid.*, p. 36.

## 8 GLOBAL CLIMATE CHANGE ALSO RAISES THE OPPORTUNITY AND NECESSITY OF CULTIVATING PROSPICIENCE

*Prospicience* is defined in the *Oxford English Dictionary* as "the action of looking forward, foresight." Derived from the Latin *prospicientia*, the word is rarely used today. It can take on new meaning, however, to describe a new, much-needed intellectual domain. *Prospicience* can be thought of as "the art and science of looking ahead." In the past few decades we have become aware of our deep past: the history of our Universe, our Earth, and life at the genomic level. Can we achieve a comparably sophisticated sense of the Earth and human civilization at various future times?

For example, national populations that climb to a constant level and are stable ever after do not seem likely. Nor does a world in which we have all become middle class, live in peace and tend our gardens, and have smoothly functioning national and global institutions. Instead, directly ahead is an era of countries with falling as well as rising populations, entrenched poverty in specific places, shrinking wilderness, and conflict over access to water, food, minerals, and fuels. Many of us have long assumed that our children and grandchildren will be richer than we are, but environmental concerns force us to examine this assumption. In the face of global climate change, resource scarcity, and an increasing world population, what issues are likely to arise, when, with what options?

*Prospicience* can help us sort out our individual and collective goals and responsibilities for distinct time frames: for example, the next 5 years versus the next 50 years versus the next 500 years. The debate over carbon capture and storage, like the debate over radioactive waste storage, raises questions about what we can feasibly do now or in the near future, in light of what we know and don't know about the distant future. As discussed in Section 9, we must act in the face of necessarily partial knowledge.

## 9 WE SHOULD FOCUS ON MANAGING THE CLIMATE CHANGE PROBLEM, NOT ON "SOLVING" IT

In Section 3, we identified a path of constant global emissions at today's rate, 30 billion metric tons of CO<sub>2</sub> per year, for the next half-century (Figure 5). In Section 6, we further identified a scheme that would result in national allocations to achieve this goal, based on a cap on the world's high emitters and a floor on the world's low emitters (Figure 10). Figure 5, furthermore, shows a world that achieves a longer-term balance of CO<sub>2</sub> flows into and out

of the atmosphere, but after not 50 but 100 years, when the emissions rate falls to 10 billion metric tons per year.

Our primary focus needs to be on what we should be doing *now and in the next few decades*. We have to slow the supertanker before its course can be reversed. This will require technologies available today, but today's technologies will not in themselves suffice. Using them, we must act now, but we also must lay the foundation for the future: for both better technologies and better-informed scientists and citizens. Rather than pursuing the quixotic goal of CO<sub>2</sub> stabilization as soon as possible, with minimal concern for the deficiencies of mitigation strategies, we should pursue a path of step-wise decision-making that leads us with all deliberate speed toward aggressive, globally coordinated CO<sub>2</sub> emissions reductions. The distinction between "as soon as possible" and "with all deliberate speed" may seem trivial, but it is not. "As soon as possible" suggests not only urgency but also hastiness. "With all deliberate speed" suggests not only urgency but also deliberation.

In our deliberations, we should honor the intelligence of those coming after us, even as we try to minimize the burdens of our faulty decisions. There are no once-and-for-all solutions: The well-meant but misguided 1982 Nuclear Waste Policy Act has taught us that. Predicated on the idea that we should shoulder the entire responsibility for our own nuclear waste and not impose this burden on future generations, the 1982 Act instead has resulted in endless delays in arriving at even temporary consolidated storage for spent fuel and high-level radioactive waste. Surely we can and should do better than that.

Over the past 25 years, philosophers, economists, and others have debated our responsibilities to future generations.<sup>28</sup> They ask: Are those responsibilities equal to our responsibilities toward today's generations? In contrast, do we have no responsibilities to future generations? Or is the middle road – that of diminishing responsibilities to future generations as they become more remote in time – the morally right view? Here, we side with the middle road, but mainly for pragmatic rather than ethical reasons. In practice, it seems most plausible to be capable of taking responsibility

<sup>28</sup> Ernest Partridge (ed.), *Responsibilities to Future Generations* (Armonk, NY: Prometheus Books, 1981); Derek Parfit, "Future Generations: Further Problems," *Philosophy and Public Affairs*, 11, no. 2 (1982), pp. 113–121; G. Brundland (ed.), *Our Common Future: The World Commission on Environment and Development* (Oxford University Press, 1987); Robert M. Solow, "Sustainability: An Economist's Perspective," the Eighteenth J. Seward Johnson Lecture to the Marine Policy Center, Woods Hole Oceanographic Institution, at Woods Hole, Massachusetts on June 14, 1991. Reprinted in Robert N. Stavins (ed.), *Economics of the Environment*, 4th edn (New York: W.W. Norton, 2000), pp. 131–138 (available online at [www.econ1.mit.edu/~econ480/notes/sustainability.pdf](http://www.econ1.mit.edu/~econ480/notes/sustainability.pdf)).

for and planning for "the rolling present," as some have dubbed it.<sup>29</sup> Using this concept, our main responsibility to future generations is to provide the next one or two generations with the skills, resources, and opportunities they will need to cope with the problems we have left behind. These generations, in turn, have a similar responsibility toward the two succeeding generations, and so forth.

There is much hubris in believing that our generation can provide a final "answer" that spares all future generations. Instead, we should more modestly seek improvements within our capabilities, acknowledging that those who come after us will, if we carry out our responsibilities today, have greater knowledge – and, one hopes, at least as much wisdom. We are thus linked, generation to generation. We are the captain of the supertanker for a short time; then others succeed us. Our undoing – and theirs – comes if we think we can chart the course for them.

#### CONCLUSION

Despite the importance just noted of not seeking "final answers," we must remember that we want climate change management strategies to work. It is not enough to identify what's wrong with a strategy when it first is proposed. We then must ask: Are there changes that would make this strategy acceptable? How might we get there from here? Can we improve this strategy by addressing its technical defects, environmental risks, governance issues, etc.?

We may decide that a particular strategy for climate change management is simply too unpalatable to be adopted. But given the gravity of the climate change problem, we – both the professional communities and the public – cannot allow ourselves to be excessively squeamish about imperfect strategies. The more dire the consequences of environmental stress from climate change, the less we can allow ourselves to flatly reject strategies such as nuclear power or below-ground CO<sub>2</sub> storage. To achieve environmental soundness and adequate prosperity for all will require not only a technological overhaul but also an overhaul of our individual and collective thinking.

<sup>29</sup> Bayard L. Carter, Lawrence G. Boyer, Jennifer Grund, and John Hartung, "The Problem of Intergenerational Equity: Balancing Risks, Costs, and Benefits Fairly Across Generations," in C. Richard Cothren (ed.), *Handbook for Environmental Risk Decision Making* (New York: CRC Press, 1996), pp. 131–148.