

Responsible for what? Carbon producer CO₂ contributions and the energy transition

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Abstract Judgments of moral responsibility should be informed by both scientific analysis and societal standards. Society distinguishes responsibilities into positive and negative, general and special, and backward-looking and forward-looking. Ekwurzel et al. in *Clim Chang* 2017 shows that 90 major carbon producers have contributed most of the atmospheric CO₂ emissions. Once it became clear no later than the 1960s that continuing CO₂ emissions would progressively undermine the climate, the major carbon producers could see that they were marketing harmful products. The simple and merely negative responsibility to “do no harm” required them to reduce that harm rapidly either by modifying the product in order to capture its dangerous emissions or by developing safe substitutes to perform the same function, that is, by developing non-carbon-based forms of energy. The seriousness of the harms brought by climate change made this responsibility especially compelling. Ceasing to contribute to harm includes ending exploration for additional fossil fuels. The half century of failure by corporate carbon producers to reduce the harms caused by their products now gives them additional responsibility to correct the damage done by their decades of neglect of the underlying negative responsibility. If major carbon producers also wish to fulfill the general responsibility to make more than a minimal positive social contribution, their distinctive capacities of political power, wealth, and expertise qualify them for leadership in the transition to an energy regime that would be safe for future generations to rely on.

The article this accompanies is the third in an important series. The foundational analysis of the contributions of major carbon producers to atmospheric CO₂ emissions and methane emissions was the first to appear (Heede 2014), followed by a rich and concrete analysis of the moral responsibilities of the major carbon producers in light of those contributions (Frumhoff et al. 2015). This third analysis not only refines the calculations of the contributions of major carbon

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producers to atmospheric CO₂ and methane emissions but also expands the calculations to include the contributions of those same producers to global mean surface temperature and global sea level (Ekwurzel et al. 2017). It correctly, and modestly, observes: “Assigning responsibility for climate change is a societal judgment, one that can be informed by but not determined through scientific analysis”.

Fortunately, society has inherited from centuries of ethical reflection a straightforward system of concepts to use in making such judgments carefully, systematically, and non-arbitrarily. Failures of responsibility—in this article, always meaning moral responsibility, leaving aside important issues about legal responsibility—may, for example, be divided into “sins of commission” and “sins of omission.” In a closely related way, the responsibilities may be divided into “negative duties”—duties not to act in certain ways—and “positive duties”—duties to act in certain ways. “Responsibility” and “duty” are often used interchangeably. One can think of a “sin of commission” as the violation of a negative duty, or responsibility, and of a “sin of omission” as the violation of a positive duty, or responsibility.

Other conceptual distinctions similarly provide basic orientation. Responsibilities are usually divided into general and special. A general responsibility may be owed to all human beings, so that any human that one can affect may be entitled to one’s fulfillment of the responsibility. General responsibilities may also be owed to all members of much broader groups, for example, all sentient beings, or all living beings. A special responsibility, by contrast, is owed to only some others: those with whom one has some special relationship. Special relationships come in many varieties. Someone might be a relative (of various degrees of closeness), or a customer, or a stockholder, or a creditor, or a benefactor, or someone to whom a promise was made, or someone toward whom a promise was broken. Often, the nature of the special relationship largely dictates the content of the special responsibility—what a friend owes differs from what an employer owes.

Special responsibilities tend to be additive to general ones: one owes one’s daughter everything that one owes any human being, but much more besides. And additional responsibilities arise as the consequence of failures to honor underlying responsibilities. Once either a special or a general responsibility is betrayed, that underlying responsibility may well remain, but it will then be accompanied by secondary responsibilities, specifically to those affected by the failure, to reverse the bad effects of the betrayal and/or secondary responsibilities to compensate for the initial damage. A promise broken brings additional responsibility beyond the promise originally made.

Another common distinction is between backward-looking and forward-looking responsibilities. As the names suggest, a backward-looking responsibility is based on something that has already occurred. These too come in various kinds, one of which is some kind of betrayal of a special relationship, like the broken promise just mentioned, or a past failure to provide for a daughter something that was owed to her by a parent. A different kind of backward-looking responsibility rests on causal responsibility, or contribution: “clean up your own mess” or, more elegantly, “responsibility for a problem is assumed to fall on those who create it, particularly if they do so knowingly” (Frumhoff et al. 2015).

Forward-looking responsibilities, by contrast, rest on opportunity, not blame. One has responsibility to act, not because one has caused a problem or has any other prior connection, but because one is in a position, or has the capacity, to improve the situation. The “Good Samaritan” in the *New Testament* parable had not knocked the other man into the ditch. He simply had the ability to help him out. It was not his problem, but it was his opportunity. Positive forward-looking responsibilities, since they may impose some

burden or cost on their bearer, must obviously be owed to a limited number of people. Otherwise, one would be bound to continue to solve other people's problems until all one's time and resources were exhausted, and one would have turned oneself into a tool entirely in the service of others with no life of one's own. By contrast, negative forward-looking responsibilities—for example, do no harm—hold all the time toward everyone. What economists like to call “opportunity costs” do not figure in this moral calculus—otherwise, every negative responsibility would seem to be a costly positive responsibility because of opportunities forgone and could then be evaded.

Most concrete responsibilities can be characterized using a number of these conceptual distinctions. For example, one bedrock principle of morality is “do no [unnecessary] harm.” The responsibility not to inflict avoidable harm is a negative, general, forward-looking responsibility: negative, because all that is required is not to do something; general, because it is owed to anyone; and forward-looking, because it is based on what may happen in the future, not on anything that has already occurred in the past. “Clean up your own mess,” on the other hand, while also a bedrock principle, is positive, special, and backward-looking: positive, because what is required is performance of the actions necessary for the clean-up; special, because it is owed specifically to those currently suffering from the mess caused; and backward-looking, because it is based on one's causal role in creating the mess. Strikingly, “do no harm” and “clean up your own mess” are the two sides of the same coin: those who fail to fulfill the first responsibility ordinarily incur the second responsibility. If one does contribute to harm, in violation of the negative responsibility, it becomes one's positive responsibility to correct it—and perhaps compensate for it as well. The preceding is more than enough conceptual background against which briefly to reflect further on the responsibilities of the 90 major carbon producers.

There is nothing wrong—nothing blameworthy—in general about exploring for a product, extracting it, transporting it, refining it—or manufacturing it, in the case of cement—and selling forms of it to people who want to buy them. The study demonstrates what it calls the “contribution” of the 90 producers—83 of coal, oil, and natural gas and 7 of cement—to CO₂ and CH₄ emissions and, as a consequence of the climate forcing by these emissions, to global mean surface temperature and global sea level. This demonstrates, strictly speaking, causal responsibility. But causal responsibility does not entail moral responsibility (Müller et al. 2009). If A falls down the escalator because she is hit from behind by B, but B was tripped by C, B is partly causally responsible but not at all morally responsible for A's fall. The moral responsibility for A's fall belongs entirely to C. Causal responsibility must be blameworthy to become the basis for moral responsibility, and causation—or “contribution”—is blameworthy only if it is a violation of a socially accepted principle. What principle, if any, have the 90 producers violated? What might they consequently be responsible for?

What is remarkable is how utterly basic and elemental are the responsibilities that have been and continue to be violated. By continuing major contributions to harm, the major carbon producers have for decades knowingly and flagrantly persisted in violating the bedrock principle: do no harm. In the beginning of the carbon energy era, very few people understood that CO₂ emissions progressively undermine the stability of the climate as they accumulate in the atmosphere. The cumulative atmospheric concentration of CO₂ had been building since early in the Industrial Revolution, but as long as its harmful effects in disturbing planetary processes were not widely appreciated, it was not blameworthy to continue to make the concrete and sell the fossil fuels. (The often fatal health effects of the air pollution from burning coal were understood earlier, but coal is the worst case.)

By 1965, however, the US President was saying in a special message to Congress: “this generation has altered the composition of the atmosphere on a global scale through radioactive materials and a steady increase in carbon dioxide from the burning of fossil fuels” (Jamieson 2014). Later in 1965, the President’s Science Advisory Committee issued a report treating CO₂ as a pollutant, with an appendix on “Atmospheric Carbon Dioxide” (US, White House 1965). And scientists working for carbon producers were among the first to begin to grasp the significance of CO₂ emissions (Banerjee 2015). In 1978, Exxon scientist Black noted: “present thinking holds that man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical” (Black 1978).

The situation changes radically as soon as one thus realizes that a product one is marketing is harmful, especially when the harm is of the monumental magnitude of progressively undermining the climatic processes that are the pre-conditions for human societies and the economies that sustain them. The historical case of the Little Ice Age demonstrates what chaos and conflict can result from the “fatal synergy” between a mere one degree of climate change (downward) and other intersecting sources of social stress (Parker 2013). Since twentieth century economies needed energy and concrete, it would of course have been impossible simply to stop selling these products immediately when their effects on the climate became predictable. Necessity is an excuse for temporary harm, provided one works energetically to escape the necessity—where the harm cannot immediately be avoided, it ought to be eliminated as rapidly as possible. How, then, does the producer of a harmful product move into compliance with the (negative, general, forward-looking) responsibility to do no harm? By the same two obvious measures that are always available: move aggressively to find non-harmful substitutes that perform the same function insofar as the need for the function cannot itself be reduced, namely, develop non-carbon energy, and pursue robust research into ways to make the old products safer, for example, carbon capture and storage. Modify or substitute in order to stop contributing to harm. This is not complicated or controversial and is a widely shared social judgment.

More than half a century has passed since the warnings in 1965, which were of course not the first, about CO₂. How have the major carbon producers been doing on their responsibility to stop selling harmful products? In a word, shamefully. “The major investor-owned fossil fuel companies did not follow this path. On the contrary, they took essentially the opposite path, denying the reality of the problem of climate change, working to ensure that fossil fuels would remain central to global energy production and that emissions would continue unabated” (Frumhoff et al. 2015). The same is true of the major majority-state-owned companies like Saudi Aramco and Gazprom. “Strikingly, more than half of all emissions traced to carbon producers over the 1880–2010 period were produced since 1986, the period in which the climate risks of fossil fuel combustion was well established” (Ekwurzel et al. 2017).

Unless carbon producers are somehow exempt from the moral principles that society applies to ordinary mortals, their 50 years of flagrant disregard of their simple negative responsibility to do no harm, beginning by reducing any initially unavoidable harm as rapidly as possible through either modification of or substitution for their products, brings to bear the other basic principle that is the other side of the same coin: clean up your own mess. They clearly have now incurred a (positive, special, and backward-looking) responsibility to assist in dealing with the disruptions for which their products are the source by financing adaptation and participating in compensation for damage and loss in proportion to their knowing contribution to the disruptions. The accompanying article shows that their contribution is huge (Ekwurzel et al. 2017). Their clean-up also needs to include denouncing and de-funding trade

associations, *faux* research institutes, politicians, and lobbies that disseminate dis-information about climate science, while violating the simplest moral rules, like “tell the truth.”

Remarkably, the preceding requires no appeal to any positive responsibilities that the major carbon producers, along with the rest of us, have to use any special abilities or capacities we possess to make net positive contributions to society beyond compensating for our own past harm—the responsibilities of opportunity. The major carbon producers possess unsurpassed political power, great wealth, and outstanding scientific and technological skills (Coll 2012). If they chose to display leadership instead of evasion, even at this late hour, they could do a world of good in many obvious ways, such as by seriously lobbying for meaningful, rapidly rising carbon taxes that are not mere symbolic gestures. Substantial research and development of alternative energy is most accurately seen as part of the general, negative responsibility simply to avoid harm by finding less harmful substitutes for products and processes that generate harmful CO₂. So is the cessation of further exploration for yet more sources of carbon that is unburnable safely, especially exploration in areas like the Arctic where the inevitable spills will be spectacularly harmful (Carbon Tracker Initiative and Grantham Research Institute 2013). But socially responsible and valuable firms would not settle for mere harm-reduction, but would move on to make positive contributions to the well-being of society beyond the creation of the jobs necessary to their own business. As noted earlier, some reasonable limit applies to such positive contributions beyond the cessation of harm, since firms also have a responsibility to generate value for their own stockholders. But the responsibility to stockholders cannot possibly be a responsibility to maximize value because maximization in any one case is incompatible with the fulfillment of any other responsibilities at all, positive or even negative, to anyone else. Responsibility to shareholders is firmly constrained by other responsibilities.

Responsibility to shareholders is most certainly constrained by the basic general, negative, forward-looking responsibility not to contribute to harm. Within that category, it is important to highlight responsibilities to members of future generations, because they are powerless to appeal to us on their own behalf. The people of the future—whoever they turn out to be—will have to cope with the world that we leave behind. They have no choice about their starting place, which will be wherever we leave them. We will have done them great harm if we bequeath them a planet with shrinking living spaces because of rising seas, destructive storms, and unsustainable agriculture adapted to weather patterns that no longer occur—and at the same time still leave them dependent on an energy regime that continues to spew out additional CO₂ that will drive the seas even higher, make the storms more destructive, and further undermine the food system. To leave our descendants a livable world is not an act of kindness, generosity, or benevolence, or even the fulfillment of a positive responsibility. It is merely the honoring of a basic general, negative responsibility not to allow our own pursuits to undercut the pre-conditions for decent societies in the future. Finishing the transition from the current carbon-based energy regime to a de-carbonized energy regime promptly and definitively is a necessity, not an optional luxury or a gift. We leave the people of the future with no good choice if we leave them only an energy regime that progressively undermines the security of their lives.

Obviously, this responsibility to future generations does not fall on carbon producers any more than it does on anyone else. But it also does not fall on them any less. And more than most of us they have the political influence, the wealth, and the technical expertise to go beyond avoiding future harm and compensating for past harm and to make positive contributions to the creation of an energy regime that will be safe for people to live with. The time has come for the major carbon producers to face the reality of the unsafe products they persist in marketing and the safer world they could help to create. Otherwise, they risk turning themselves into enemies of humanity.

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