

Carbon Offsetting

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ABSTRACT

Do carbon-offsetting schemes morally offset emissions? The *moral equivalence thesis* is the claim that the combination of emitting greenhouse gasses and offsetting those emissions is morally equivalent to not emitting at all. This thesis implies that in response to climate change, we need not make any lifestyle changes to reduce our emissions as long as we offset them. An influential argument in favor of this thesis is premised on two claims, one empirical and the other normative: (1) When you emit + offset, the net result is the same as that of not emitting. (2) With emissions, the net result is what matters morally. I argue against both premises. The net result of emitting + offsetting is never equivalent to that of not emitting, and even if it were equivalent, the net result is not the only thing that matters morally. My conclusion is that although we should offset our emissions, avoiding emissions is morally preferable. This conclusion supports a stronger claim: that carbon offsets cannot relieve us of our duty to make significant lifestyle changes so as to reduce emissions and thus lessen our contribution to the harms of climate change.

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1. Introduction: Why Care About Carbon Offsetting?

Given the current state of our climate, it seems that morality calls upon us to make significant changes to our way of life. For instance, we ought to travel less, eat less meat, buy fewer new clothes and appliances, and have fewer children. However, there is a moral trick that seems to allow us to keep things as they are for a relatively low price: offsetting our greenhouse gas (GHG) emissions.

The idea behind offsetting is this: if for every unit of GHG that I cause to be emitted I also cause a unit of GHG to be removed from the atmosphere, then my net influence on the atmosphere, and therefore on the climate, is zero. It therefore seems that, morally speaking, when one offsets one's emissions, it is as if they have not emitted at all. The implications of this thesis are significant. For example, it implies that an average American can, without guilt, continue emitting more than 14 metric tons of CO₂ per year (more than three times the global average) as long as they are willing to pay a mere \$210 a year for offsets.¹ In this paper, I argue that this thesis, which I call *moral equivalence*, should be rejected.

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The literature on the ethics of carbon offsetting has been quite limited.² Several recent articles have zoomed in on very particular aspects of the topic (Barry & Cullity, 2022b; Stefánsson, 2022). The aim of this article is to zoom out, sketching the forest rather than focusing on individual trees. I present novel arguments alongside previously known (but often not well-known) ones, and, so as to keep this paper-length rather than book-length, at times I can only gesture at issues that require detailed development in future work.

2. The Argument for Carbon Offsetting

A helpful way to approach this question is to consider an appealing argument in favor of moral equivalence, a version of which is presented by John Broome:

Offsetting your emissions means ensuring that, for every unit of greenhouse gas you cause to be added to the atmosphere, you also cause a unit to be subtracted from it. If you offset, on balance you add nothing. Offsetting does not remove the very molecules that you emit, but the climate does not care which particular molecules are warming it. If you successfully offset all your emissions, you do no harm by emissions. You therefore do no injustice by them. (Broome, 2012, Chapter 5)³

Broome clearly expresses an argument that, in one form or another, is widely endorsed (Broadhead & Placani, 2021; Deigan, 2022).

This argument can be analyzed as consisting of two premises—one empirical and one normative – as follows⁴:

- (1) **Empirical Premise:** When you emit + offset, the net result is the same as that of not emitting.
- (2) **Normative Premise:** Other things being equal, with emissions, the net result is what matters morally.

Therefore,

- (3) **Moral Equivalence:** Other things being equal, emitting + offsetting is morally equivalent to not emitting.

Each of the premises is formulated in a simplified manner and needs clarification. In the empirical premise, by ‘net result’ I mean the total amount of harm caused by climate change that is the result of one’s actions. Humans affect the climate by affecting the concentrations of GHG in the atmosphere. Therefore, this premise says that two courses of action that have the same effect on the atmosphere are also equivalent in the amount of harm they cause through climate change.

The normative premise includes two qualifying phrases. ‘Other things being equal’, which appears also in the conclusion, is needed because there typically are other considerations that count for or against the competing courses of action aside from their influence on climate change. In the real world, other things are never equal. There are additional costs and benefits to emissions and to offsetting that must be taken into account aside from the effects on the climate. On the cost side, emissions typically cause local air pollution, which increases health risks (such as pulmonary diseases) in nearby communities. On the benefit side, emissions are typically instrumental in providing various benefits, which is why we find it difficult to significantly cut them. Offsetting schemes as well have costs and benefits aside

from their effects on the climate. For example, many offsetting schemes are located in developing countries, and benefit members of poor communities. Offsetting schemes, on the other hand, cost money. If we do not emit and do not offset, then we can use that money toward other social goods. It is difficult to account for all of these considerations, and I am not ready to do so in this paper. Instead, I focus specifically on whether, considering only the effects on climate change, we have significant reasons to prefer reducing emissions over the combination of emitting and offsetting.

The second qualifying phrase, 'with emissions', is needed because the claim is not meant to imply a general endorsement of consequentialism. Rather, it is a specific claim about GHG emissions. We will discuss the relationship with consequentialism in more detail shortly (see Section 5.1).

In the remainder of this paper, I will argue against both the descriptive and the normative premises of the argument, but before I do so, I'll briefly describe the types of offsetting schemes available on the market.

3. Types of Offsetting Schemes

If you extract fossil fuels from reservoirs deep underground, burn them as fuel, and thereby emit carbon into the atmosphere, you have no way of reversing the process. Both currently and in the foreseeable future, there is no feasible way of extracting carbon from the atmosphere and burying it back underground without, in the process, releasing even more carbon into the atmosphere or excessively burdening other natural resources. If such a solution were available to us, climate change would be solvable and not the crisis that it currently is.

How, then, might offsetting be achieved? Offsetting schemes can be divided into two general types. The first is offsetting by causing carbon to be removed from the atmosphere and stored elsewhere; the second is by causing not to be emitted carbon that otherwise would have been emitted. Barry and Cullity (2022b) call the first *offsetting by sequestration* and the second *offsetting by forestalling*.

Currently, offsetting by sequestration consists primarily of schemes to increase the intake of carbon by trees (e.g. by planting trees and preserving forests). There are also technologies being developed for capturing CO₂ from the atmosphere and storing it in various reservoirs. At present, such technologies are not available on the carbon-offsetting market, but they are predicted to be so in the future.

Perhaps the most popular method of offsetting by forestalling is building renewable energy power plants (e.g. those based on wind and solar power). If such power plants replace those that run on fossil fuels, then they prevent emissions. Another popular method is to provide more efficient cookware in developing countries and thereby cause less charcoal or wood to be harvested and burnt. Essentially, any idea for reducing emissions can become an offsetting-by-forestalling scheme.

Although it is beyond the scope of this paper, there is a third category of offsetting schemes: those that do not create reductions in greenhouse gasses. These schemes offset emissions by creating some other, non-climate-related environmental benefit. The argument for offsetting presented in the previous section, which focuses on the net effect on the atmosphere, does not apply to this third type of offsetting. Some forms of

consequentialism may legitimize a moral equivalence claim in such cases, but the more common view is that doing a good thing does not generally justify doing a bad one. Hence, it is more difficult to justify a moral equivalence claim with regard to this kind of offsetting.

4. The Net Result is Not Equivalent

The most important objection to carbon offsetting is that, in the real world, such schemes rarely if ever actually offset emissions. This is so especially if one relies both on standard carbon footprint calculators to calculate one's emissions and on the advertised effectiveness of offsetting schemes to calculate how much to invest in offsetting. I believe that failures of the empirical premise are the most significant objections to real-world offsetting practices. I will elaborate on some of these objections, starting with two that I wish to set aside.

Perhaps the most well-known objection is that some offsetting schemes are simply scams. However, this objection is easy to solve by purchasing offsets from reliable sources, such as those included in the Gold Standard (a standardized market set up by the World Wildlife Foundation).

The second reason that the empirical premise is almost always not strictly true is that we can never know precisely how large a GHG reduction an offsetting scheme will create. Additionally, we cannot know precisely what emissions were caused by our own actions as opposed to those of others, so when we offset our emissions, we are using estimates. It is almost certain that the emissions we cause will not precisely equal the reductions we cause; rather, they will be higher or lower. I will set aside this issue for now, and we will return to it in Section 5, when we discuss the normative premise. In the rest of this section, I will present the reasons why even offsets that are purchased from reliable sources do not fully cancel out emissions.

4.1. Net Result Over Time

To measure the net result of emitting + offsetting, it is not enough to measure how much GHG is added to and then removed from the atmosphere at a particular point in time. If the reduction in carbon does not last for long, then over time, the combination of emitting and offsetting will create more warming than would not emitting at all. Thus, measuring the net result requires measuring the effectiveness of the offset *over time*. This fact is often overlooked, and the quote from Broome above provides an example.

It creates an especially big problem for all offsetting schemes involving trees, such as planting trees, preserving forests, or supplying efficient cookware in places where trees continue to be used as fuel. When we burn fossil fuels, we are emitting carbon that would otherwise not have entered the atmosphere for, on average, 100–200 million years.⁵ In contrast, when we store carbon in trees, that carbon is not expected to remain there for nearly that long – trees eventually rot, and most of their carbon returns to the atmosphere within a hundred or so years.⁶ Thus, even when we fund project that preserve trees, the carbon-reducing effects of these projects are relatively short-lived. That means that when we emit fossil fuels and offset those emissions using a tree-based scheme, we are not

canceling out all the effects of our emissions over time. Perhaps the harmful effects of fossil fuel emissions will fade out sooner than 100 million years from now – the IPCC reports sometimes estimate only thousands of years of lasting impacts of current emissions.⁷ Still, such estimates are far longer than the lifespan of offsetting programs involving trees.

4.2. Indirect Emissions

When people fly, for example, they tend to calculate their emissions by starting with the emissions of the aircraft during the flight and dividing it between the people on the plane. However, there are other ways in which we cause GHG to be emitted when we fly – for example, we influence others to fly more often. I believe that this is true especially for people who serve as role models, and therefore as an ethics professor, this issue especially worries me.⁸ In addition, building the aircraft and maintaining it cause emissions. Expanding and maintaining airports cause emissions. Therefore, if you're offsetting only the emissions of the engine during your flight, you are not offsetting all of the emissions that you cause by flying.

In general, emissions calculations tend to account for direct emissions, but indirect emissions should be offset as well. And as illustrated here, it is difficult to know what one's indirect emissions are.

4.3. Additionality and Leakage

There are two common reasons why an offsetting scheme may not cause the expected reduction in atmospheric GHG: *additionality*, in which the project may do something that would have happened anyhow, and *leakage*, in which the project may simply migrate problems from one location to another. Despite the attention these issues receive, they are difficult to eliminate. I will describe each briefly.

Let's start with additionality. Suppose that we are offsetting our emissions by funding a renewable energy power plant. If this power plant replaces a fossil fuel power plant, then, in theory, fewer fossil fuels will be burned. However, if we had not funded the renewable energy power plant, it might have been built anyhow, perhaps funded by consumers or a local authority. If that's the case, then our intervention makes no difference in emissions. The investment we made does not *add* to what would have otherwise happened. This is an example of an *additionality* problem.⁹

Now to leakage. Suppose you pay for the preservation of a forest. Typically, when preserving a piece of forest, you are not reducing the demand for land and trees from forests in general. What might happen is that instead of harvesting the preserved forest, people will log trees from some other, unpreserved forest. Thus, you are not causing any real reduction in the harvesting of trees and thereby in atmospheric carbon; rather, you are only changing the location of the harvesting activities. This is the problem of *leakage*. Imagine water escaping a reservoir through a leaking pipe: Turning off the faucet at the end of the pipe will do very little to keep the water in the reservoir as long as there are holes elsewhere that allow the water to continue flowing.¹⁰

4.4. Increases in the Rate of Climate Change

There is another time-related issue with the empirical premise. Typically, any reduction caused by offsetting schemes will occur at a later time than that of the emissions. In the interval between emitting itself and when the offsetting project takes effect, there will be more GHG in the atmosphere than there would have been if the emissions had been avoided in the first place. At a large scale, such practices will increase the rate of climate change, making it happen more quickly.¹¹ Does such an increase matter? It might. One concern is that the more quickly the climate changes, the less time people and ecosystems have to adapt, and the less time they have to adapt, the higher the risk of collapse and catastrophe. In addition, if climate change will lead to catastrophe, and there is a non-negligible probability that it will, then speeding up that process might bring about the catastrophe earlier. Further research is required to establish to what extent this effect is significant.¹²

4.5. Concluding Remarks Regarding the Empirical Premise

The goal of this section was to demonstrate that if we calculate our emissions using a standard carbon footprint calculator and then offset our emissions using the estimates provided by the offsetting entity, it is likely that our offsets will not fully cancel the effect that our emissions have on the atmosphere over time. In theory, all of these problems can be solved: One solution is to buy extra offsets. It is difficult to know how much extra one needs to buy to overcome all the worries, but in principle, this amount could be estimated. In addition, future technologies can be expected to decrease the effects of emitting (such as by using biofuels rather than fossil fuels) and increase the effectivity of sequestering (by improving carbon capture and storage technologies). This may decrease or even eliminate the most significant problem with offsetting by sequestration, discussed in Section 4.1.

5. Net Result is Not All That Matters

Suppose that there were an offsetting scheme in which the net result of emitting + offsetting were equivalent to that of not emitting. Is the net result all that matters morally? In this section, I argue that there are other considerations in favor of not emitting in the first place.

Some of the objections to the idea that these two actions are equivalent are unconvincing. One such objection is that emitting + offsetting is like committing a crime and then preventing someone else from committing a similar crime. Shortly (in Section 5.1.2), I will explain why this objection fails.

Another objection is that 'if individuals buy offsets only because they are cheap, they fail to be robustly motivated to choose a permissible course of action' (Spiekermann, 2014). The view seems to be that people who do not make an effort to reduce their carbon footprint – and offsetting emissions is not considered to be a significant effort because offsetting is currently so inexpensive – show in this behavior a lack of care about the harms of climate change. This lack of care is a flaw in moral character, and one should

refrain from actions that express such flaws. However, I do not find this objection convincing. I do not think there is a tight connection between buying inexpensive offsets and failing to be robustly motivated to choose a permissible course of action. If there is no other moral problem with emitting + offsetting, then there should be no tension between having good moral motivations and offsetting.¹³

Before presenting objections that I find more appealing, we need to clarify the relationship between consequentialism and the argument for offsetting.

5.1. Consequentialism Vs. Non-Consequentialism

Many people think that, ultimately, the normative premise depends on whether consequentialism is the correct moral theory. Although they are correct to some extent, the precise relationship between the argument for offsetting and consequentialism is more complex than it seems to be.

Roughly speaking, according to consequentialism, all that matters in morality is the value of the consequences (or expected consequences) of our actions – and, therefore, if two courses of action have the same consequences (or expected consequences), then they are morally equivalent. Often, this idea is coupled with a maximizing principle, according to which we are morally obligated to bring about the best outcomes that we can.

Consequentialism does imply that the normative premise of the carbon offsetting argument must be true as well. However, if consequentialism is true, then there are reasons to doubt that you are ever obligated to offset your emissions. Broome (2012, Chapter 4) argues that if you are interested in using your money to do good, a more efficient way to achieve that goal would be to fund tuberculosis treatments for citizens of poor countries. If, say, you flew on a cross-Atlantic flight and now you're wondering whether to contribute \$30 to offsetting schemes or \$30 to tuberculosis treatments, and your only considerations are consequentialist – that is, what will do the most good in the world – then the answer is that you should use the \$30 to fund tuberculosis treatments. Assuming this reasoning is correct, then, why should anybody offset their emissions?

Broome's justification for using the \$30 to offset your emissions is non-consequentialist. He argues that you have a stronger duty to prevent harm caused by *your* actions than you do to prevent harm caused in other ways. If funding tuberculosis treatments always does more good than does making an equal investment in carbon-offsetting schemes, then consequentialism implies that we never have a duty to offset emissions. The maximizing version of consequentialism would have an even stronger implication: that we are always obligated *not* to offset emissions; rather, we must give whatever funds could have gone to offsetting to more efficient causes. Thus, according to consequentialism, the normative premise of the offsetting argument is correct but never applicable in the real world.

It is worth considering what happens if Broome is wrong and if actually, as far as consequences are concerned, funding offsetting schemes *is* an efficient way to use money to reduce harm. In that case, according to consequentialist theories, should you offset your emissions? Not quite – that is, you would have a strong moral reason to use your money to fund offsetting schemes, but that reason would have nothing to do with the idea that you are thereby offsetting your emissions. It would not matter whether the

money is offsetting *your* emissions vs. other people's emissions, or whether it's simply preventing harm by reducing the GHG in the atmosphere in general. Paying to reduce atmospheric GHG would be morally required or at least permitted, independent of one's own carbon footprint.

So what happens if consequentialism is false? Whereas according to non-consequentialists, consequences are not all that matter in general, any plausible non-consequentialism nevertheless maintains that consequences often matter a lot. Sometimes, they may be all that matter. I will present two arguments for such a view.

5.1.1. *Grave Consequences*

The first argument is not one that I've seen made explicitly, but I suspect that something like it drives some intuitions that people have in this context. The argument is that when the consequences are grave, consequential considerations tend to outweigh non-consequential considerations. For example, although non-consequentialists believe that we are not permitted to kill one person to save five, most will agree that we are obligated to kill one to save five million. So far, this claim should not be very controversial. It is also not directly applicable to emissions, given that, at least in the case of individual emissions, the impact of those emissions alone will likely not be nearly as significant as killing five million would be.

However, there is a way to expand this thought so that it applies to smaller-scale emissions as well. Some might think that non-consequentialist considerations are outweighed not only when you can prevent killing five million but also when killing five million *is at stake*. That is, even though we cannot prevent it on our own, we should focus our attention on what might prevent that from happening—i.e. the consequences, rather than non-consequential elements. Now, the harms expected from climate change are much greater than killing five million.¹⁴ Although it is true that the emissions of a single person will not have this grave effect, some might argue that the fact that the aggregated emissions of many people *will* have this grave effect, consequences matter most for the morality of individual emissions as well. This view says that regarding climate change, we should all be consequentialists. Let's call it *climate consequentialism*.

Climate consequentialism implies that the normative premise of the offsetting argument is correct. However, it, like global consequentialism, also implies that when offsetting, it does not matter at all whether the emissions were mine. If I can reduce atmospheric GHG, then I have a strong reason to do so, regardless of the extent to which I contributed to its accumulation. According to climate consequentialism, then, there is no moral difference between offsetting my own emissions and offsetting the emissions of other people. I have no more reason to do one than the other. For this reason, climate consequentialism, like global consequentialism, does not fit well with the idea of carbon offsetting, which I take to imply a special relationship between an agent and her own emissions.

5.1.2. *No Harm*

The second argument for the normative premise appears in the earlier quote from Broome, which says, 'If you successfully offset all your emissions, you do no harm by emissions'. According to Broome, the way we do harm via climate change is by making

a net difference to the atmosphere. If we make no such difference, then we have not done any harm. So, in this case, the net result matters even if consequentialism is false. Some climate activists have mocked carbon offsetting as being akin to taking a morally impermissible action, such as stealing, and then making sure that one less such action is performed somewhere else.¹⁵ But Broome's argument implies that the comparison is misguided. When you emit + offset, it's not that you harm someone and then make up for it by preventing someone else from being harmed – in the latter scenario, there remains a person who was harmed. In contrast, when you emit + offset, nobody is harmed by your actions, so no wrong is done and there is nothing for which to compensate. This argument for the normative premise, which focuses on an agent's responsibility for harm she causes, fits well with the idea of carbon offsetting.

Orri Stefánsson (2022) has recently developed an objection to Broome's argument that relies on more recent work of Broome himself. Broome (2019) argues that due to the chaotic nature of the weather, small changes to concentrations of GHG in the atmosphere will almost definitely change the weather over time. For instance, it can change the course of a storm or the location and duration of a drought. This, in turn, will cause some people who otherwise would have been harmed to be spared, and some people who would have been spared will be harmed. Broome does not cite any empirical research confirming his empirical claim, nor do I know of any. However, if it is true, then it can have moral consequences. Broome (2019) uses this as part of an argument that individual emissions make a difference. However, it can also be used to object to Broome's (2012) argument for offsetting: Because offsetting never occurs at the same time as the emissions, and because the reduction created by offsetting is never precisely equivalent to the emissions, it follows from Broome's (2019) empirical claim that when you emit + offset, you are likely changing the identities of people who will be harmed by weather events. If so, then emitting + offsetting entails harming some people and preventing harm to others.¹⁶

However, contrary to Stefánsson and Willners (2023, p. 147),¹⁷ this argument does not imply that the common objection to offsetting – that it is like stealing and then preventing a robbery – is sound. Part of what makes the combination of stealing + preventing robbery wrong is that the agent has a better alternative available – not to rob at all. However, in the case of emissions, if Broome's (2019) empirical claim is correct, then it follows that even if one leads an ideal carbon negative life (that is, removing more GHG than one emits) or even only removing GHG and emitting nothing, they will be harming people who otherwise would not have been harmed (and sparing people who otherwise would not have been spared). On this view, it is as if no matter what you do, you will steal from some people and prevent theft from others. In such a scenario, that one course of action will involve stealing and preventing is no objection to that course of action because there is no alternative that does not involve both of those actions. Because Broome's empirical claim implies that, in the real world, no matter what you do, your actions harm some people and benefit others, it cannot serve as a reason to prefer not emitting over emitting + offsetting.

5.2. Risk

Now that we are clearer about the complex relationship between consequentialism and the normative premise, let us examine a few problems with this premise. The first has to

do with uncertainty. It's possible that even if the net result of emitting + offsetting turns out to be the same as that of not emitting, the former involves a risk that we are not permitted to take. If you emit nothing, you can typically be certain that you add no GHG to the atmosphere and cause no climate harm. However, when you emit + offset, you cannot be certain that your emissions are *actually* offset. There is a risk that you might end up adding GHG to the atmosphere and causing climate harm despite the action you took to avoid doing so.

Does this added risk make the combination of emitting and offsetting worse than not emitting? In many simple cases, imposing risks on others is impermissible even if ultimately nobody is harmed. It is impermissible to shoot a loaded gun in a random direction while closing your eyes because doing so could harm someone. This is true even if, were you to shoot, you would have hit nobody. And even when imposing risks on others is permissible, doing so requires justification. Ambulances are allowed to speed and run through red lights in cases of emergency, but ordinary people driving to work are not.

A simple approach to risk imposition is that if a course of action is just as likely to yield benefits as it is to yield harms, then it is permissible. More precisely, if the expected value – that is, the values of various possible outcomes of the actions weighted by their probabilities – is neutral or positive, then, as far as risk imposition is concerned, the action is fine. However, some argue against this simple view. Lara Buchak (2019) argues that in the context of climate change, morally speaking, we ought to be significantly risk averse.¹⁸ Her argument relies on two claims. First, she argues that there is more than one attitude toward risk that is rational. All agree that extreme risk aversion – that is, deciding on the basis of the worst outcomes possible even when they are extremely improbable – is irrational. Buchak claims, however, that when an individual is making decisions for herself, some degree of giving extra weight to worse outcomes or giving extra weight to better outcomes can be permissible from the perspective of rationality. Given that, if there is more than one way to rationally weigh risks, how should you make decisions when you know that your actions will not only affect yourself but also affect others, who may have a different attitude toward risk than you do?

Buchak's second claim is that even if you are rationally risk-seeking, it would be unfair to impose risks on other people who are rationally risk-averse. If you have no way of knowing their attitude to risk, then imposing risks on them (especially when the risks are of great consequence) is unfair. Climate harms will affect many people, many of whom are members of future generations and are not even born yet. Buchak argues that fairness requires that, in such circumstances, we must be significantly risk averse.¹⁹

If Buchak's view is correct, it implies that even if the expectation is that one's actions will result in net zero effect to the atmosphere, the fact that there is a risk that these actions could add GHG to the atmosphere counts against them. An expectation of net zero would not be enough. This problem, too, can be solved in principle by buying even more offsetting credits, enough so that even when extra weight is given to the worst scenarios, the risk-weighted utility function yields a neutral or positive value.

5.3. Personal Involvement

As explained above, underlying the argument for offsetting is the view that agents are more responsible for harms caused by themselves than they are for harms caused by

others. This non-consequentialist intuition, I argue, is one of a family of intuitions in which the degree of personal involvement of an agent in harming plays an important role in determining the responsibility they have for that harm. I further argue that this counts against emitting, even if the emissions are offset.

Non-consequentialists typically believe that doing harm is significantly worse than allowing harm (Woollard & Howard-Snyder, 2022). For example, killing someone is considered worse than letting someone die. Another common intuition is that being complicit with (Kutz, 2000) or participating in (Wieland & Van Oeveren, 2020) a harmful scheme, even if the complicity or participation do not affect the outcome, are in themselves morally objectionable. Characterizing these intuitions in a precise way is not an easy task, and it is not a project I can undertake here. What I would like to suggest, however – and this is a rough idea that I hope to develop further in future work – is that these intuitions have a common denominator: Each is a way in which an action becomes bad (or worse) because it makes the agent personally involved (or more personally involved) in harmful activities. For example, *doing* might be worse than *allowing* because the agent becomes part of the cause of the harm (Woollard & Howard-Snyder, 2022); complicity might involve an intention to do one's part in a collective harmful project (Kutz, 2000); and participation might involve adding to an underlying element that causes harm (Wieland & Van Oeveren, 2020). There may be better accounts for the ways in which personal involvement in harm can be increased, but the best option will be one that makes sense of our intuitions. For the purposes of this paper, I will work with these intuitions.

Emitting large quantities of GHG into an atmosphere that already carries far greater than 400PPM of carbon changes the climate and causes tremendous harm over time. Large quantities of emissions are just the sum of many small emissions. For that reason, causing any emissions is a way of increasing one's causal involvement in bringing about harm. And this, as illustrated above, can make it worse than an alternative that is otherwise equivalent in its consequences.

Consider an analogous example²⁰: Suppose that many people are secretly adding small amounts of toxin to a source of drinking water, and you know that they are doing so and know for certain that people will drink this water and suffer tremendously from the aggregated toxin. Now suppose that you can choose between two courses of action that are morally equal in every aspect except that in the first, you add the toxin to the water and then extract an equivalent amount of that toxin, and in the second, you add no toxin to that water. My intuition is that the second course of action is significantly preferable because in the first, you are involving yourself in a harmful scheme. If you share this intuition, the same should apply to emitting + offsetting.

True, being involved in increasing the amount of GHG in the atmosphere is unavoidable for us at present. Nevertheless, because degrees of personal involvement matter, the more involved you are in bringing about harm and the more that your involvement was avoidable, the worse the set of actions is. By emitting + offsetting, you increase your involvement in causing harm in comparison to *not* emitting, which is another reason why reducing emissions is better than offsetting even if the net result is the same.

5.3.1. *Objections and Responses*

When presenting this section to colleagues, I've received some objections, and I will address two of them here. In the first, people object with the following kind of case²¹: Suppose that you buy extra offsetting credits such that you know for certain (in an imaginary world) that emitting + offsetting will result in less atmospheric GHG than will not emitting at all. Would it make sense not to emit just because it implies less personal involvement in emissions? It seems to these objectors that given the grave harms expected as a result of climate change, all we should care about is reducing atmospheric GHG and the resulting climate harms. A concern about getting our hands dirty is misplaced. Now, if even a slight emissions reduction is enough to make it morally preferable to emit + offset, that logic seems to push in the direction of thinking that with emissions, all we should care about is the net result. In other words, we should adopt *climate consequentialism*.

Although I have sympathy with this objection, I do not think it is quite right. I agree that when emitting + offsetting will create a *significant reduction* of atmospheric GHG in comparison to not emitting, then emitting + offsetting is preferable. However, when the difference is less significant, I, for one, do not have clear intuitions. Suppose that I'm rich and that, if I want, I can buy a private jet and fly around freely, burning a huge amount of fossil fuels. Suppose further that I know for a fact that if I do not do so, someone else will buy the jet and emit a lot of fossil fuels, though slightly less than I would have emitted. If these are my only two options, then I think it would be wrong for me to buy the jet because of the personal involvement it would entail. However, if I knew for a fact that by buying the jet I would cause a significant reduction of emissions, that would be a different matter. This leads me to think that although it is true that with regard to climate change, we should normally care more about the net impact of our actions than about any other consideration, it is not true that net impact is all we should care about. I suggest that climate consequentialism is good to use as a heuristic because it usually yields correct prescriptions; however, it is not a correct moral theory.

Now to a second objection.²² My argument relies on an example of adding a toxin to a water reservoir. The objector suggests that GHG and this toxin are not comparable. Why? Because there are two features of a toxin that are absent from GHG. When GHG harms people, it is not by going into their bodies and causing harm, as a toxin does. There is a much more roundabout causal process. As far as personal involvement is concerned, perhaps this difference matters. In addition, a toxin is something that typically causes harm. In contrast, emissions are primarily a byproduct of benefitting activities. Moreover, as discussed above (section 5.1.2) due to the chaotic nature of the climate, small quantities of emissions can be expected to cause nearly as much good as they do harm (Broome, 2019, p. 113). To respond to this objection, we need to think of examples that are more like GHG with regard to these two features.

Imagine then that, instead of a toxin, you dump carrots into a water reservoir and suppose doing so benefits you in some way, for instance, it is enjoyable. Carrots do not in themselves harm anybody. Normally they even add some beneficial nutrients to the water. However, this particular water reservoir contains a chemical that is harmless on its own but that, when mixed with carrots, tends to trigger a chain reaction that makes the water toxic. Suppose that when carrots are added to this water source, two out of three of the carrots cause the water to become more toxic, and one out of three causes the water

to become less toxic. Many people have thrown carrots into the water, so the water is already on its way to becoming harmful, but it can always become more harmful.

You throw in a carrot, then you take a different one out. Morally speaking, is this case much different than the original toxin case? I think it is not. In a context in which it is known that carrots interact this way with the water and that the harmful process is already underway, throwing carrots into the water is no different than throwing a toxin into the water. That the carrots in themselves do not harm people seems to be beside the point. In addition, even if small additions of carrots would do nearly as much good as harm, given the larger context and the probabilities, it seems we should treat carrots in this imaginary case just like we treat the ordinary toxin.

5.4. Funding Someone Else's Moral Obligations

A third problem with the view that the net result is all that morally matters arises in offsetting schemes that involve the funding of a project that causes people to emit less, where it is the case that those people should have done so on their own.²³ That is, in these cases, the offsetting involves getting people to do what they should have done on their own, but probably would not have done. For example, suppose that we fund the building of a renewable energy power plant for a community that could fund it themselves, or that could reduce its energy consumption enough that the power plant would be superfluous. Or suppose that we fund the preservation of a forest by paying a government or agency to make sure that people do not chop it down. Such offsetting schemes exist, the logic being that those people are, practically speaking, not going to build such a plant themselves or reduce their energy consumption, or that if we do not guard the forests, they will be harvested. So, by funding such a project, one would as a matter of fact be reducing emissions. But does it matter what that community should have done? I think it does.

To be clear, I agree that these offsetting projects are good projects that are worth our financial support. My objection is to the idea that we can think of them as moral offsets for our own emissions. I argue that if you emit + offset by causing others to carry out their moral duties, such actions would not completely count as an offsetting of *your emissions*. Causing others to carry out their moral duties is less attributable to us than are actions we perform ourselves, such as our own emitting.²⁴ Of course, consequentialists think that it doesn't matter morally who the action is attributed to. Once again, I am here relying on the claim from earlier – that the argument for offsetting being discussed doesn't fit well with consequentialism anyhow.

To illustrate that this issue is independent of the issue outlined in the previous section, consider the following pair of cases. Imagine once again a water reservoir that people are irresponsibly polluting. And suppose once again that you know in advance that people will be harmed by the resulting toxic water. In the first scenario, you add a toxin to the reservoir and then extract from the reservoir an equal amount of that toxin. In the second case, you add the toxin to a reservoir and then pay another person, who was going to add an equal amount of the toxin, to refrain from doing so. In the previous section, I argued that we have reason to prefer not to pollute at all over the first scenario. Here I want to consider whether we have reason to prefer the first scenario over the second.

To me it seems that we do. This intuition becomes clearer to me when I think about compensation. In the first scenario, I do not think you would have to compensate people that are harmed by the water. It seems to me fitting to feel guilt about the harm done to them, and this guilt is explained by the badness of your causal involvement, but it does not amount to a compensatory obligation. In the second scenario, however, it seems that you would be obligated to contribute to the compensation of the victims.

My suggestion is that when one causes someone else to do (or refrain from doing) something that they were morally obligated to do (or refrain from doing), it counts less in their favor. In the water polluting example, this explains why a polluter should extract toxin rather than pay someone not to pollute. And for this reason, when an offsetting scheme amounts to funding the moral duties of others, it does not morally offset one's own emissions.

6. Conclusion

The argument for moral equivalence is premised on an empirical and a normative claim, and I argue here that both should be rejected. All of the discussed objections amount to considerations in favor of reducing emissions over emitting + offsetting. These considerations differ in their degree of significance. Despite the various arguments against the normative premise, it still seems right that the net effect matters more than the other considerations discussed in this paper. This suggests that climate consequentialism, while false, serves as a good heuristic. More significant are the objections to the empirical premise, the most significant of which is the problem with the timescales of different carbon reservoirs discussed in Section 4.1.

Where does this leave us? Let me be clear about what I have and have not argued. I have argued that, other things being morally equal, emitting + offsetting is always morally inferior to not emitting. *I did not argue that we should not offset our emissions.* It is currently practically impossible not to cause any emissions. Moreover, many reductions of emissions come at a cost, and these costs must be morally weighed against the costs of emitting. We all cause emissions, and I believe that offsetting our emissions is a good way to take responsibility for them. The main point of this paper is to argue that there are significant moral considerations in favor of reducing emissions rather than offsetting them.

I think a stronger conclusion is also justified: I believe that significantly reducing emissions without relying on offsets is not only morally preferable but is also a moral obligation. This has significant ramifications for how we conduct ourselves in our daily lives and professions. For instance, it is still standard in academia and other professions to travel overseas several times a year to conferences, workshops, and meetings, emitting about 1 ton of GHG per person for each transatlantic flight.²⁵ Some people do so by relying morally on carbon offsets. Although an all-things-considered moral calculation is complicated and beyond the scope of this paper, I believe that the considerations discussed in this paper support the conclusion that offsetting is not enough; we need to change the norms of our profession and travel less. This is an example of what I take to be a downstream implication of my argument.

My conclusion is nothing more than the very first principle in Oxford University's Offsetting Principles: 'Prioritise reducing your own emissions' (Allen et al., 2020). What I take this paper to have contributed is not a new conclusion but rather clarity about *why* it is the correct conclusion.

Notes

1. Average per capita emissions are taken from the World Bank: <https://data.worldbank.org/indicator/en.atm.co2e.pc>. The price of offsetting schemes is based on prices in the Gold Standard offsetting market, created by the World Wildlife Foundation: <https://marketplace.goldstandard.org/collections/projects>. There are other markets with less expensive offsetting schemes, but because incidents of fraud have been discovered in such markets, I cite here what seems to me a more reputable one.
2. In a survey on the ethics of carbon offsetting, Hyams and Fawcett (2013) mention Broome and Spiekerman as two exceptions to a general silence in the literature. Recently though it seems like things are changing and the two articles mentioned above, published while I was working on this paper, seem to be the beginning of a trend.
3. Interestingly, the ease of offsetting in conjunction with the equivalence thesis led Broome to the conclusion that the moral obligations of individuals vis-à-vis climate change are more stringent than others think. According to Broome, we all are obligated not to cause any emissions at all, and one important consideration he gives is that it is easy to achieve this goal as long as offsetting is available and cheap. My conclusion in this article will be more stringent on offsetting, and because the combination of offsetting and emitting is not equivalent to not emitting, this must lead to a less stringent view on emitting. Because we cannot practically achieve a state of zero emissions, we cannot be obligated to do so. Rather, we are obligated to do our best to reduce our emissions, knowing that we cannot eliminate them altogether.
4. For simplicity, I formulate this premise so as to make a stronger claim than Broome makes. Broome does not go the extra step to argue that there is a complete moral equivalence – only that one has committed no injustice. However, in the book he argues that duties of justice are what should primarily concern individuals in the case of climate change. Furthermore, although he sometimes says that it is better to reduce emissions than to emit + offset, he provides no justification for this claim. Thus, the argumentation in his book seems to imply that individuals have no moral reason to prefer reducing emissions over emitting + offsetting. Regardless of whether this is his view, however, I think that putting things as I do here is a helpful way to think about the topic. If it turns out that some of what I say is actually compatible with Broome's views, so much the better.
5. <https://earthobservatory.nasa.gov/features/CarbonCycle>
6. Broome mentions this problem in his discussion of schemes that involve planting trees, but he does not seem to realize that the same problem arises for other tree-involving schemes. In fact, one of the two examples of offsetting schemes that he recommends is providing efficient cookware in countries where people cook with firewood.
7. For instance, IPCC (2021, Box TS.4).
8. In Section 5.4, I argue that if I causally influence someone to fulfill their moral obligations, what they do is less attributable to me. Here I argue that if I cause other people to emit, that addition counts as part of the net effect of my actions. One reader, I embarrassingly forgot who, pointed out to me that these claims seem to be in tension. I offer two notes in response: First, in this section, I am not talking about normative attribution but rather am focusing on the descriptive element. Descriptively, one course of action leads to more atmospheric GHG than the other course of action, due to influence on other people. Second, even normatively speaking, I suggest that causal influence is something we should care about even if it is less

morally attributable to us. Influencing others to do good things is good, even if their good deeds do not count as much as ours do. Likewise, influencing others to do evil is bad, even if they are morally responsible for their actions much more than we are for being bad influences.

9. Another possibility is that the power plant being built does not replace a fossil fuel power plant but rather just increases the energy available to a community that otherwise would have had to do with less. Although this change might be good for those communities, it does not reduce emissions.
10. Tim Campbell pointed out to me that the phenomena of leakage and additionality also work in the other direction, giving us reason to believe that we are responsible for fewer emissions than carbon footprint calculators tell us we are. If I choose not to board a plane or not to eat meat, often I make no impact on emissions because, as things are set up, the plane will fly anyhow, and the meat will be consumed by someone else or go to waste. Even if there are many people acting like me, what might happen is that prices will go down because of reduced demand, and then other people who care less about climate change will just consume more. However, this complication does not always arise. For instance, when one drives a private car, there is no doubt that the emissions are additional.
11. For a related discussion regarding the rate of reproduction, see Torpman (2021). Barry and Cullity (2022b) briefly discuss one aspect of this time-lag problem – that if the offsetting occurs at a later time, it might increase the risk for people living in the nearer future and decrease the risk for people living in the distant future.
12. Interestingly, some offsetting markets show awareness of this issue and allow the offsetter the possibility of choosing how long they want it to take until the offsetting scheme materializes. Lufthansa, for example, gives you the option of buying a scheme that creates an immediate GHG reduction at a high price (€770 per ton), a reduction that will take place ten years later at a much lower price (€20 per ton), or anything in between (<https://www.lufthansa.com/us/en/offset-flight>).
13. Sandel (2005) briefly raises three objections to carbon offsetting (by which he primarily means compulsory offsetting due to international reduction conventions). Two of his objections, that offsetting removes a moral stigma that should be attached to emissions and that it undermines a sense of shared responsibility, can be understood as objections either to the premise that the net result is zero or to the premise that net result is all that matters. Both primarily rely on an empirical claim that I cannot assess here.
14. The World Health Organization estimates that climate change will kill 5 million people between 2030 and 2050 alone: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>.
15. See for example: <https://climateadproject.org/offsets/>
16. Stefánsson uses this to argue that after one has emitted, even non-consequentialists should agree that it is morally preferable to use one's money to do the most good, perhaps by funding tuberculosis treatments, than to use it for offsetting one's emissions. I am inclined to think that, contrary to Stefánsson's view, emitters have a stronger moral obligation to reduce atmospheric GHG than to solve other problems that they were not involved in creating. However, to formulate this thought in a precise way requires more work than I can do here. See Barry and Cullity (2022b) for a suggestion.
17. As well, it seems to me, as John et al. (forthcoming). Unfortunately, the official version of their paper has not yet been published, and I discovered their manuscript too late in the process to examine it thoroughly.
18. For more context within decision theory and some discussion of Buchak's views, see Thoma (2023).
19. Suppose we had a machine that changes the amount of GHG in the atmosphere, but we are not sure exactly how it would change. There is a 51% probability that it will decrease atmospheric GHG by amount x and a 49% probability that it will increase atmospheric GHG by the same amount x . Buchak's view implies that we should not use this machine. I do not have any clear intuition about this case.

20. My water-polluting examples are inspired by Barry and Cullity (2022a). They, however, do not discuss the issue of personal involvement.
21. I thank Ron Aboodi and David Enoch for raising this objection.
22. I thank Garrett Cullity for this objection.
23. I am not the first to raise this issue. A formal version of it was recently developed by Barry & Cullity (2022a). I point out some shortcomings of their specific account in an online symposium conducted by PEA Soup and available here: <https://peasoupblog.com/2022/02/ethics-discussion-of-barry-and-cullitys-offsetting-and-risk-imposition/> (retrieved May 4, 2023).
24. Two notes: First, perhaps some emissions we cause are less attributable to us for the same reason, if it is the case that we causally influence someone to do what they are morally obligated not to do. However, I do not think this is the typical case. When you board a plane, the pilot is the one most directly causing the emissions. I doubt whether the pilot is morally obligated not to fly in typical circumstances. When you use technology that consumes a lot of energy, the people working at the power plant are most directly responsible for the emissions. I think in typical cases they are morally obligated to continue running the plant, because if they do not, there will not be energy for morally permissible and even crucial needs.
 Second, there is some literature about related questions of how one should take into consideration the fact that other people are not doing what they are morally obligated to do. David Enoch (2018) argues that the fact that others are violating their moral obligations is generally not important in itself. If my argument in this section is correct, and the obligations of others influence whether the result of your action is attributed to you or to them, then it amounts to a way in which the violations of others can be important in themselves, a way that Enoch has not considered.
25. Based on figures of the United Nations' ICAO carbon emissions calculator for air travel: <https://www.icao.int/environmental-protection/CarbonOffset/Pages/default.aspx> (retrieved May 4, 2023).

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