Legitimate Expectations about Stranded Fossil Fuel Reserves: Towards a Just Transition

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While the energy transition is needed now more than ever, it also brings adverse consequences for some agents. The question arises of whether these transitional losers are owed any kind of transitional aid. This chapter answers this question by developing a harm-based account of legitimate expectations, according to which one should not harm others by wrongfully causing false expectations. It applies this to the transitional losses of fossil fuel owners, companies and states, who see their reserves becoming worthless if the energy transition succeeds. Without entering into the parallel issue of the past injustices committed by fossil fuel producers (which may take the form of compensatory duties towards the victims of climate change), this chapter argues that private actors should receive transitional aid from states for having been provided with false expectations about regulatory stability, while states cannot make a similar claim on the global level. Transitional aid should be given in the form of compensation that is limited to investment costs induced by false expectations.

Introduction

When circumstances and knowledge change, we sometimes need to change the world or how we behave. When the changes are large-scale and desirable given a particular set of values and principles, we can speak of a transition (Hölscher et al. 2018). One of the biggest challenges humanity has ever faced, and the focus of this chapter, is the transition to a low-carbon society and economy (Edmond 2020). At least since 1995 – when the Intergovernmental Panel on Climate Change (IPCC) published their second report (Gosseries 2004, 7; Meyer and Sanklecha 2011, 460) – the world has been confronted with the knowledge of the dangerous and irrevocable effects of global warming due to the emissions from fossil fuel use: extreme weather events, ruined habitats, higher sea levels, drought, crop failure, heatstroke, increased incidence of diseases, higher weather unpredictability, etc. Combatting climate change, therefore, would avoid immense harms. Even if we leave out these harms, moreover, a zero-carbon economy might be more prosperous in the long run than a high-carbon economy (Fay 2015, 154). Even on a national scale, in the medium to long term, this outcome is likely to be net beneficial.

In the short term, however, for many agents, the energy transition will bring significant 'transitional losses': benefits that cannot be realized because of the transition. When an industry or corporation has to stop or reduce its activity, the owners of the corporation suffer from reduced stock valuations and lower profits, workers lose their jobs, the communities and states in which these corporations are established suffer from decreased economic activity, losses in tax revenue and increased expenditures on social transfers for newly unemployed workers, consumers can no longer consume the corporations' products and suppliers' resources lose value (Green and Gambhir 2020, 4–7). In economic terms, the energy transition will affect the value of their assets. Assets are resources that have value because they will benefit its owner(s) in the future. They could refer to various inputs to production and sources of wealth, including capital, labor, and natural endowments (Colgan, Green, and Hale 2021, 586). Owning these resources has beneficial consequences of an enduring nature: it brings benefits or burdens in the long run. Unfortunately, this makes them vulnerable to being stranded, which means that these assets 'have suffered from

unanticipated or premature write-downs, devaluations, or conversion to liabilities' (Caldecott et al. 2013, 7; Caldecott 2017, 2) or, in other words, they 'los[t] economic value well ahead of their anticipated useful life' (Generation Foundation 2013).

While we are mostly concerned with the winners of the energy transition, the question arises of what is owed to those who are disadvantaged by the transition, to those who see their assets being stranded. One way to respond to these losses is reformative: one determines what justice requires, implements the necessary changes and lets all losses (and gains) lie where they fall (Green 2019, 3). The opposite, conservative approach favours preserving the pre-existing situation or status quo, which is also called grandfathering (Damon et al. 2019, 1; Knight 2013, 1; Knight 2014, 571; Schuessler 2017, 141). Conservative measures can vary from providing transitional aid, exemptions from new rules or paying compensation. Whether and how to deal with the potential production that is foregone or reduced, Pye et al. (2020, 2) contend, is an important challenge for reaching a just transition. Similarly, Green and Gambhir (2020, 2) stress that the losses caused by the energy transition 'raises complex normative and political questions about which of these burdens on which kinds of agents and groups should be mitigated, and how this should be done'. Kartha et al. (2016) also consider the relevance of these transitional losses as something that must be further investigated.

In trying to justify the implementation of conservative measures, authors have been arguing that high-emitters have acquired a right to their level of emissions (Bovens 2011), that the status quo is relevant because it influences how good or bad the consequences of a change are (Knight 2014) or that some grandfathering might be required to reach a political agreement. However, these accounts have been overwhelmingly rejected (Caney 2009; Gosseries and Hungerbühler 2006; Schuessler 2017). An emerging response to the question of how to deal with transitional losses focuses on the concept of legitimate expectations (LE). LE was first mentioned in the 1970s by Buchanan (1975) and Rawls (1971) but only received significant attention approximately 10 years ago by being applied to different topics and contexts: administrative law (Brown 2011; Brown 2012; Brown 2017; Brown 2018), territorial rights (Moore 2017; Waligore 2017), immigration (Carnes 2020), punishment (Matravers 2017), hospitality and membership (Weinman 2018) and climate change (Meyer and Sanklecha 2011; Meyer and Sanklecha 2014). The concept is still under development and subject to debate. This chapter will contribute to this discussion by providing an account of LE that can indicate the normative relevance of transitional losses.

In doing so, it focuses on a particular set of climate change-related transitional losses – the losses of fossil fuel reserve owners, because these present not only a large but also a clearly defined category of potentially stranded assets. These reserves can be considered as assets: when they are extracted from the ground, they can deliver energy for domestic use or be an important source of revenue (Caney 2016). When they should be left under the ground, however, they get stranded. Given that fossil fuel reserves can be owned by states or companies, this chapter investigates both whether states can refer to their expectations to justify the protection of their reserves from being stranded or any other form of transitional aid and whether companies can do so.

An example of a state where the argument readily applies is Australia. Compared to other countries, the world's second-biggest exporter of coal has been doing little to reduce pollution. The government faces pressure to take measures, but instead of phasing out coal production, they are committed to digging for more (Mao 2021). LE might justify the continuation of their plans.

An example in which companies might be able to use the argument is found in Norway. Oil companies currently pump out over 1.6 million barrels of oil a day from their offshore operations. It has been estimated that there are still 1–3 billion barrels of oil under the seabed of the Lofoten archipelago. When the parliament decided to withdraw their support for oil exploration, oil companies referred to their expectations and interest in long-term planning to oppose the change. The head of the Norwegian Oil and Gas Association reacted as follows: 'The whole industry is surprised and disappointed. [The government] does not provide the predictability we depend on' (The Independent 2019). Before assessing these arguments, I first indicate which reserves should stay under the ground according to considerations of inter- and intragenerational justice (section 1). I then develop a harm-based account of LE (section 2). Finally, I investigate whether the argument works for fossil fuel reserve owners, both on the level of states and companies (section 3).

1. Towards a Fair Fossil Fuel Reserves Stranding

Before appealing to the normative relevance of their expectations, fossil fuel owners could consider whether justice actually requires the stranding of their reserves. If this is not the case, they do not need to refer to their expectations at all. The argument of LE is only relevant for fossil fuel owners whose reserves should stay under the ground according to more general principles of justice. In what follows, therefore, I sketch what a fair fossil fuel stranding consists of.

To begin, let us consider the kinds of agents that own fossil fuel reserves. First, there are (public or private) investor-owned companies. These companies are registered and operate in a state (or in multiple states, in case of multinational companies) but are not owned by the state itself. State-owned or government-owned companies are a second category. These companies are created by a government to undertake commercial activities on the government's behalf (Kenton 2019). Heede and Oreskes (2016) distinguish a third category of owners: nation-states, in which reserves are managed by the state directly. A ministry or an administrative branch operates instead of a company. Both in the case of state-owned companies and nation-states, states are the owners of the reserves. They own 90% of the remaining proven recoverable resources (Heede and Oreskes 2016). BP (2018) also concluded that the majority of the proven reserves of coal, oil and gas are controlled by state-owned companies like Saudi Aramco and governments directly. The normative relevance of the expectations of states, therefore, is potentially more far-reaching than the relevance of companies' expectations. Nevertheless, I investigate whether the LE argument works for both kinds of agents.

Note that I presuppose the traditional view that natural resources are subject to the sovereignty of states. Other agents like companies can own these resources if it follows from a voluntary transfer or agreement. Alternative views consider the agents that own the property under which the resources are located (private individuals, groups of individuals or companies) as the rightful owners (Caney 2016, 22) or argue that natural resources are owned by all humanity (Beitz 1979, 136–143). I stick with the traditional view, as I am concerned with transitional losses as a consequence of the energy transition and not with losses as a consequence of rethinking ownership claims. Importantly, the stranding of one's resources is compatible with this view. As Caney (2016, 23) explains, 'it is widely recognized that there are moral limits on what states may do with the natural resources in their jurisdiction'.

Since the effects of climate change already exist, there is a duty towards both presently living and future generations to avoid the dangerous consequences of climate change. At the twenty-first Conference of the Parties (COP21) in Paris in 2015, 195 countries agreed that the average global temperature rise should be kept 'well below' 2°C above pre-industrial levels and that they will 'pursue efforts' to avoid an increase of 1.5°C (UNFCCC 2015, 3, article 2). From this, we can infer the remaining carbon budget – the amount of greenhouse gas emissions that can still be emitted (Meinshausen et al. 2009). Realizing the 2°C target with a 67% chance of success would leave us with a remaining budget of 1,150 gigatonnes of carbon dioxide ($GtCO_2$) starting from 2020. To not exceed 1.5°C of warming, this would be 400 $GtCO_2$. Higher or lower reductions in non-CO_2 emissions could slightly increase or decrease these carbon budgets (IPCC 2021, 29).

Unburnable carbon, then, refers to the fossil fuels that could have been burnt if there would be no need for climate change mitigation, given the availability of fossil fuel reserves (Carbon Tracker Initiative 2011, 2013, 2017; Heede and Oreskes 2016). The amount of unburnable carbon is difficult to determine as there are huge uncertainties about future production and revenues (Pye et al. 2020, 2). Burning all resources that are recoverable over all time with both current and future technology, irrespective of current economic conditions, would emit 11,000 $GtCO_2$ – 11 times the carbon budget (McGlade and Ekins 2015, 187–188). Fully producing the world's *reserves*, i.e., resources that are proved to be recoverable under current economic conditions and a specific probability of being produced (McGlade and Ekins 2015; Society of Petroleum Engineers 2008), would lead to an estimated 2,734.2 $GtCO_2$ (Heede and Oreskes 2016, 15), which is around three times the budget.

In determining whose reserves should be stranded and for whom the LE argument, therefore, is most important, there are several criteria to consider. Distributing the remaining permissible production benefits according to countries' number of inhabitants, to begin with, follows from the basic idea that each counts as one (Singer 2010,

190). However, there are a couple of reasons to deviate from this equal per capita distribution. Consider countries' past productions. People living in countries with high levels of past productions have already enjoyed benefits earlier in their lives, which entitles them to fewer benefits in the future. Fossil fuel production in the past also yielded benefits that are still present today, including the provision of infrastructure like schools, hospitals, streets and railroads (Meyer 2013, 605– 607). This implies that developing countries should benefit most from the remaining carbon budget and that reserves should be stranded most in developed countries – even though some developing countries have also produced significant amounts (Heede 2014, 328). Considering needs leads to similar conclusions in favour of developing countries if one focuses on countries' level of development, as measured by, for instance, the Human Development Index (HDI) (Bos and Gupta 2019, 2; Caney 2016, 27–31;

Lenferna 2018, 219; Roser and Seidel 2016, 156). Finally, efficiency matters too. The carbon intensity of a fossil fuel refers to the amount of carbon that is emitted per unit of energy its combustion delivers. This is determined by the carbon intensity of the fossil fuel itself, the impact of the extraction process and geographical factors like the distance between the place of extraction and a country's supply and demand centres (Caney 2016, 24; McGlade and Ekins 2015, 189). If we realized the 2°C target in the most efficient way, approximately one-third of the world's oil reserves, half of the world's gas reserves and more than 80% of the world's coal reserves would stay unproduced. The Middle East would carry half of the unburnable oil and gas, the USA and the former Soviet Union states would own half of the unburnable coal (McGlade and Ekins, 2015, 3). Most reserves, thus, should be stranded in these regions and in highly developed countries.

2. Legitimate Expectations: A Harm-Based Account

If a state or company's reserves become stranded, and the stranding is justified given the discussed normative considerations, should they simply accept this and leave their fossil fuels and the benefits they could have yielded underground? One way in which these unrealised benefits could still have some normative relevance is through the expectations one had about them. The focus on expectations is evident if one considers the concept of stranded assets: assets that suffer devaluations that are unanticipated (unexpected) or premature (earlier than expected). Having stranded assets, thus, is nothing more than having unfulfilled expectations. If one wants to investigate the relevance of stranded fossil fuel reserves, therefore, one has to investigate the normative relevance of these reserve owners' expectations.

An expectation that cannot be ignored, that is morally relevant or that counts normatively is called legitimate. It should be fulfilled, or some kind of compensation or an apology is required (Meyer and Sanklecha 2014, 371– 372). Imagine, for instance, that two housemates, A and B, have enjoyed for a long time having dinner together on Fridays. They take turns in preparing dinner, and since this Friday it is A's turn, A expects that B will turn up if she prepares dinner. If B does not turn up, this seems morally wrong (Meyer and Sanklecha 2014, 370; Green 2020a, 402). However, not all expectations seem to be normatively relevant. Considering a case originally presented by Simmons (1996, 258) and recently discussed by Green (2020a, 402), imagine that Kant's daily walks create expectations in the Konigsberg housewives that they will be able to set their clocks by his passing. One day, however, Kant decides to stay home to read Rousseau. It seems that Kant did not do anything wrong and that the housewives cannot make any normative claim.

There are a variety of views on what makes an expectation legitimate. My *harm-based account* of LE starts from the bedrock principle of morality that one should not wrongfully harm others. I argue that by causing false expectations, one harms the expecting agent and that this is wrongful if one is morally responsible for having caused the harm. An expectation is legitimate or normatively relevant, consequently, if another agent is morally responsible for having caused the expectation and the subsequent harm. One should either fulfill the expectation in order to avoid having wrongfully harmed the other agent or one should compensate the harm.

In this way, my account focuses on the normative relevance of actual expectations. Most other LE accounts, in contrast, argue that the expecting agent gained a right or entitlement to the content of the expectation because the law (cf. Brown 2018, 54–57), the justice of the expectation (cf. Matravers 2017; Meyer and Sanklecha 2014, 377–387), a society with a just basic structure (cf. Rawls 1971, 10) or a legitimate authority (cf. Meyer and Sanklecha

2014, 375–377) has created the entitlement. In practice, the expector may also expect that he will enjoy these benefits, but having the actual expectation is not necessary for having the entitlement. Green (2020a, 418) calls this an expectation-independent model of LE. Instead of using the term legitimate *expectations*, I argue, it would be better to speak of a specific kind of (legitimate) entitlements that follow from previous acts or interactions if certain conditions are fulfilled. The kind of interactions that generate these entitlements, arguably, are promises or agreements. This chapter does not focus on these promissory entitlements to save assets from being stranded. After all, if we accept that contracts and promises should be just before they give rise to entitlements, this way of arguing could not justify fossil fuel owners benefitting more than their fair share, nor would it work for any other losses that follow from just transitions.

To indicate the normative relevance of actual expectations and how this leads to my harm-based account, I first explain the importance of expectations in people's lives. Expectations are important for how well people's lives go as they enable agents to make plans (Brown 2017, 440; Buchanan 1975, 419– 422; Green 2020a, 398; Hodgson 2012, 315; Meyer and Sanklecha 2014, 375). Making plans is deciding on future actions in advance, for instance, whether one will buy a house. Making plans, in turn, is valuable because it enables one to realise them or, in other words, achieve goals: by planning to buy a house, one could save money for it. Realising plans or achieving goals, finally, is valuable as it can further the fulfillment of one's needs/interests, like having a home. Realising these goals can also be a way of exercising autonomous agency (Rawls 1971, 358–360). The goals of states are determined by the citizens they represent and could be, for instance, having a good health care system or having sufficient energy supply. A company's goals could be providing quality customer service or being financially healthy and are determined by its owners.

How do normative claims arise from this? Moore (2017) contends that the human interest in having stable background conditions and future-oriented projects gives rise to the entitlement that one's expectations become fulfilled (Moore 2017, 235–236). In the dinner example, this would mean that B should show up because A has an interest in enjoying his company. However, Moore only explains why B has a positive duty to fulfill the expectation – why it would be laudable if B showed up. In other words, she only grounds a duty of charity/supererogation. The normative relevance of A's expectation, however, seems stronger: B's duty to show up is a matter of justice, A has a *right* to expect that B will show up. My harm-based account of LE conceives the duty to fulfill one's expectations as a stringent negative duty of justice by inferring it from the principle that one should not wrongfully harm others, in which harming refers to the 'thwarting, setting back, or defeating of an interest' (Feinberg 1987, 32). Given the value of having correct expectations for one's ability to make and execute plans, providing false expectations harms the expecting agent. An expectation is legitimate or normatively relevant, therefore, if fulfillment is required to avoid that the expectation- creator wrongfully harmed the expector by having created a false expectation. An important implication is that LE claims require that there is an agent that caused the expectation.

Having a LE does not always imply, however, that the expectation should be fulfilled. If the content of the expectation is unjust, it is impermissible for the expectation-creator to fulfill the expectation, even if this implies that he wrongfully harmed the expector. Having created an expectation in someone, after all, does not entitle one to commit injustices. In these cases, the expectation-creator should compensate the costs he incurred on the expector by causing the false expectation. Another implication of my harm-based account, therefore, is that in cases of just transitions, LE claims can only justify compensation for the costs of having acted upon false expectations, which have been called preliminary losses (Colla 2017, 298–299) or reliance losses (Robertson 1998, 361). The expected but unrealised benefits themselves, the so-called primary losses (Colla 2017, 298–299) or expectation losses (Robertson 1998, 361) cannot be claimed.

Neither does having a LE imply, thus, that the expector's (disrupted) plans were not morally objectionable. One could object that, if this is the case, the expectation loses its normative relevance and the need for compensation is nullified because the expector does not deserve to be compensated. I disagree with this. The expector's bad intentions, I contend, do not alter the fact that others should not wrongfully harm him and that he is owed compensation if it does happen. The duty not to cause false expectations, in other words, also holds towards morally imperfect agents. If the unjust expectation were fulfilled, the expector would have to compensate the costs he incurred on his victims, but due to the changed circumstances, this is not the case. The expector, then, has *moral luck*: even though his actions were

determined by factors beyond his control and not by moral considerations, they can still be assessed as morally decent (Nelkin 2021). He still might be blameworthy, however, for his past actions. Allocating compensatory duties for having committed past injustices is not incompatible with claiming that the same agent could also make normative claims himself.

However, merely harming the expector by causing a false expectation is not enough for giving rise to normative claims: the expectation and the subsequent harm must also be caused wrongfully. An act of harming is wrongful and therefore requires compensation if one is morally responsible for causing the harm (Denaro 2012, 150; Feinberg 1987, 34–35; Feinberg 1990, xxvii–xxix; Thomson 1986, 383). Brown (2017, 2018) has already focused on the responsibility for creating an expectation. He does not, however, clearly articulate how the creation of an expectation is normatively relevant, nor does he explain when one is responsible. Instead of providing criteria for responsibility, he presents four illustrative, inexhaustive ways or 'modes' in which an agent can be responsible. In doing so, he aims to 'step outside the narrow constraints of the doctrine of legitimate expectations as it occurs in both English administrative law and European Community law, for example' (Brown 2018, 64), but his less narrow account, in my view, attributes responsibility and LE claims too easily. Inadvertently, negligently or intentionally causing an expectation or causing an expectation in bad faith can lead to responsibility but does not necessarily do so. These modes explain how one can be causally responsible, but to be morally responsible, additional criteria must be fulfilled. By adding these criteria, it can be explained how intuitively appealing criteria like reasonableness or justice are relevant. Brown's theory, in contrast, has counterintuitive implications, as Green (2020b, 465) indicates: 'If an agent acts irrationally, unreasonably, or viciously in forming an expectation, or if the content of their expectation is unreasonable, immoral, or unjust, this would not affect the determination of legitimacy'. However, instead of rejecting the focus on responsibility for creating expectations, as Green does, the concept of responsibility should be refined. In this way, fossil fuel owners' expectation-related harms justify compensation claims less easily.

According to most philosophers, an agent can be considered morally responsible for an action if the person has control over the action (if the action was avoidable) and if the person could have foreseen its consequences (Rudy-Hiller 2018). Mostly, the creation of an expectation and the subsequent harm is avoidable, as one usually has control over the behavioural and communicative acts that lead to expectations in other agents. The foreseeability condition is less often fulfilled. How people form expectations is determined by many factors that are difficult to foresee: one's other beliefs, cognitive abilities, critical attitude, etc. The expecting agent might also be responsible if she could have avoided the creation of her false expectation by being more careful in forming her beliefs. If A, for instance, forms the expectation that B will invite her to a four-star restaurant because he asked whether she was hungry, B could not have foreseen this and A could have avoided this, making it her responsibility if she gets harmed by having this false belief. In this way, the epistemic validity or reasonableness of the expectation matters: if an expectation is unreasonable (if there are no good reasons for it), its creation is more likely to be unforeseeable by the expectation-creator and avoidable by the expecting agent. Before an expectation can be normatively legitimate, thus, it should fulfill a certain baseline of epistemic validity: epistemic validity limits the responsibility of the expectation-creator. In this way, the focus on responsibility explains our intuition that reasonableness matters, a criterion that is also important in other LE accounts (cf. Gosseries and Hungerbühler 2006, 111; Green 2019; Meyer and Sanklecha 2014, 370; Moore 2017).

While Brown (2017, 2018) is too generous in assessing the legitimacy of expectations, Green (2020a) is too restrictive. Instead of focusing on whether one is responsible for having caused an expectation, Green's practice-dependent LE account only considers an expectation normatively relevant if it follows from a shared norm that governs a social practice in which the relevant actors partake. The social practice of taking turns in preparing dinner, for instance, is governed by the shared norm that the other person will show up. The expectation that B will show up when it is A's turn to cook, then, is legitimate because it follows from this norm. The duty to fulfill the expectation of adhering to the mutually recognised norm, Green contends, is 'similar in nature to the special rights that arise from a promise or contract' (2020a, 404). According to this practice-dependent account, expectations can only be legitimate on the interpersonal level, Green goes further, as expectations about large-scale societal transitions (or stability) do not follow from shared norms that govern social practices in which the regulator and regulated agent mutually participate.

The promissory obligations that follow from participating in social practices ground important rights, and Green provides a valuable framework for identifying the conditions for this. However, these promissory claims should be distinguished from claims that focus solely on the normative relevance of the expectations themselves. Expectations that do not arise from participating in social practices might not ground promissory obligations but can still be normatively relevant in other ways. For my claim that expectation-related harm is normatively relevant if another agent is morally responsible for causing the expectation, it is not clear why the expectation should follow from a social practice or shared norm. If I assert to a friend that it will not rain because I do not want our trip to be postponed and it rains so heavily that his clothes are soaked and damaged, my friend's expectation is legitimate in the sense that I am responsible for the harm he suffers, even though there was no social practice governed by a rule that it should not rain. That the expectation should be reasonable and therefore might require a fine-grained assessment of the context, moreover, does not imply in any way that the involved agents must participate in a shared social practice, as Green asserts. Rejecting this practice-dependent condition extends the applicability of the LE concept to expectations like those of fossil fuel owners about their future productions.

Green's (2020a, 416–419) second concern about the usefulness of LE for responding to transitional losses has been referred to as the moral costs problem. Real-world decision-makers, Green contends, do not possess the epistemically privileged position normative theorists assume and will face significant costs in identifying the relevant expectations. To do so, they need to infer agents' expectations from their testimony and conduct. While financier moral costs refer to the economic costs of states to conduct these investigations, agent moral costs refer to the costs associated with the intrusive practice of people having their expectations investigated. However, these costs can be reduced significantly by placing the burden of proof on the expecting agent, who is in an epistemically better position than the state. A governmental agency, then, only has to evaluate the LE claim based on the evidence provided. In this way, agent moral costs are mitigated as the expecting agents can decide for themselves which information they want make available or not. Financier moral costs are also reduced as the relevant information is directly accessible to the expectors. Additionally, only the agents that might have LE will make a claim, not everyone that is negatively affected by the transition needs to be investigated, as Green (2020a, 417) asserts. For some claims, still, it might not be worth doing the efforts to enforce them, but this also holds for other kinds of claims and is not peculiar to LE. Moreover, this is only problematic for trivial claims, not for claims of fossil fuel owners, which concern huge amounts of money.

Green (2020a, 417) also claims that the moral costs problem is particularly great when it comes to legal transitions (or large-scale transitions in general, regardless of how they are triggered) because these affect large numbers of agents with heterogeneous expectations. However, this does not only lead to more investment costs, there is also more at stake in terms of justice claims that can be realised. The more agents that make similar claims, moreover, the more cost-effective it is to enforce them (possibly by the assistance of representative structures). The costs, thus, of identifying the relevant expectations and the harms that follow from this are not such that it is better to throw the concept overboard, also not (certainly not) when large-scale transitions are at stake.

3. Expectations about Fossil Fuel Productions: Legitimate for Companies, Illegitimate for States

Now, I investigate whether fossil fuel reserve owners (companies and states) could use the LE argument to justify transitional aid. A first implication of my harm-based account, as explained, is that there should be an agent that caused the false expectation about future production benefits. The expectation that the value of fossil fuel reserves will remain the same can be divided into expectations about regulatory, economic and physical stability, as fossil fuel reserves can be stranded by regulatory, economic or physical events. In case of regulatory stranding, asset devaluation is caused by the introduction of governmental regulations like carbon pricing or subsidy removals or by litigation and changing statutory interpretations. Economic stranding occurs when assets become stranded due to a change in relative costs or prices, due to technological changes or evolving social norms or behaviour. Physical stranding, finally, is the result of environmental changes (Caldecott 2017, 5).

So far, the literature has focused solely on LE about regulatory stability, because only the fulfillment of these expectations is under human control: 'Moral, political, and legal philosophers of LE … are not interested in predictive expectations writ large—encompassing the weather, or the laws of gravity, for instance—but, rather, in predictive

expectations *about the behaviour of other agents*' (Green 2020a, 398). Meyer and Sanklecha (2014, 370) also stress that the fulfillment of an expectation must be under human control before it can be considered legitimate. However, what should be under human control according to my harm-based account of LE is not the fulfillment but the creation of an expectation. Consider my friend's expectation that it will not rain. There was no human control over the fulfillment of his expectation, but as its creation was under human control, it is still normatively relevant.

Nevertheless, I also focus on the causation of false expectations about regulatory stability. One reason for this is that the energy transition is most likely to occur due to regulations: 'more and more literature recognizes the potential stranding of assets and resources due to future climate change mitigation regulations' (Bos and Gupta 2019, 4). Another reason is that in the case of causing false beliefs of regulatory stability, it is more likely that the expectation is caused by another agent. An obvious candidate is the regulatory body that decides about the policies that affect a fossil fuel owner's future production. In the case of companies, there is a strong, centralised regulatory body that decides on the regulations to which they will be subject: states. Previous governmental policies and (lack of) decisions could make companies expect that the rules are going to stay the same (whether states are responsible for it still needs to be proven). States, as explained, also own fossil fuels themselves. For them, there is no similar strong and centralised institution on the international or global level that can enforce regulations and thereby cause expectations. If a state's reserves become stranded, it is more likely to be a result of environmental organisations that sue governments by reinterpreting existing laws or non-regulatory stranding, rather than the introduction of new regulations (van Asselt 2021). States can be blamed for having caused LE, but they cannot use the argument themselves.

The second implication of my harm-based account is that fossil fuel owners cannot claim the expected production benefits, but only compensation for the costs of having relied on this expectation, since causing an expectation cannot entitle someone to commit injustices. These costs consist of investing in extractive infrastructure and in explorations to find new reserves. For companies, these costs are high. They have been pumping billions of dollars into fossil fuel projects, buying offshore platforms, building new pipelines and extending lifelines to coal power plants (Tabuchi 2021). Additionally, they have been investing substantial sums in fossil fuel explorations, which is especially costly as they have to pay the countries in which they do the explorations. According to some estimates, investor-owned companies invest over $700 billion per year in explorations and productions. States, in contrast, own a lot of reserves but invest relatively little in explorations. For them, the energy transition does not require so much that they stop investing, but that they do not exploit their already proven reserves (Heede and Oreskes 2016, 18–19). Unfortunately for fossil fuel-rich countries, however, LE claims are not relevant for their unrealised benefits but only for investment costs.

The compensation owed for fossil fuel companies' useless investments might be relatively small compared to the compensation they should pay themselves for their past injustices. Companies that have produced more fossil fuels than permissible should compensate the agents who can now produce less in order to reach the climate target and/or the victims of climate change. Moreover, fossil fuel companies might not only exceed permissible production levels: they are also responsible for high consumption levels. The fossil fuel industry, after all, does not only cause emissions by producing fossil fuels that get burnt later, manufacturing and transportation also release a huge amount of emissions. As Grasso (this volume) explains, just 15 oil companies are responsible for 30% of the global industrial greenhouse gas emissions between 1965–2018, which creates duties of reparation and decarbonisation. While the Norwegian government might have to compensate Norwegian oil companies' useless investments after unexpectedly withdrawing subsidies to carry out oil exploration, thus, these oil companies themselves, arguably, also bear significant compensatory duties as a consequence of their past productions.

That companies have been provided with false expectations, however, is not enough to claim compensation. The expectation-creator should also be responsible for having caused the expectation. This can only hold if the expectation is reasonable. Importantly, the belief should not be reasonable given the expector's actual set of evidence but given the evidence that he *should* have. Only then can the creation of an expectation be considered foreseeable by the expectation-creator and unavoidable by the expector, allowing the former to be held responsible. An agent, thus, cannot make his expectations legitimate by ignoring relevant announcements or by failing to consider relevant evidence about future changes in regulations. The evidence one should have, then, depends on the

availability of information and the means to acquire information. The capacities of states, multinationals and large companies are larger than those of medium- and small-sized companies. In this way, the epistemic validity condition is another reason why LE claims are more difficult to make for states, especially for developed states that have a greater capacity to assess carbon risks compared to developing states (Bradley, Lahn and Pye 2018).

Green (2020a, 406) suggests there are never good reasons for expecting that regulations will stay the same: 'It is in the nature of a legislature that it make, and hence change, laws … and this renders untenable the idea … that any particular law will never change'. The idea that a particular law will never change, indeed, might be untenable, but that it will stay the same in the near future, for a certain amount of time, can definitely be reasonable. Regulatory stability, I contend, is likely when existing regulations, given certain knowledge about relevant circumstances and facts, correspond with the conception of justice of the regulatory system. Colla (2017, 287–288) refers to this conception of justice as internal normativity. It should be distinguished from the expector's or society's conception of justice (external normativity) and from objective justice – the objective truth about what is just (insofar such a truth exists). When relevant things happen, however, this affects the reasonableness of the expectation of regulatory stability (Colla 2017, 290– 291; Lemos 2007, 19). Expectations about the stability of permissions to produce fossil fuels might be illegitimate because of the changed knowledge about the effects of greenhouse gas emissions on the climate. This has created, in the words of Meyer and Sanklecha (2011, 454), 'a time of radically changed circumstances in which all predictions are suspect'. However, that they are suspect does not mean they are illegitimate. Changing circumstances are not enough to make the expectation of regulatory stability illegitimate. It should also be shown that, because of this new knowledge, the existing (lack of) regulations no longer fit with the justice conception of the regulatory body.

While my harm-based LE account focuses on internal normativity, many existing LE accounts consider objective justice a condition for legitimacy (cf. Gosseries and Hungerbühler 2006, 111–115; Moore 2017). This position faces several problems. First, there is the metaphysical task of justifying that there is an objective truth about what justice entails and the difficulty of sorting out how that truth can be known. Secondly, the condition that transitional losers' expectations must be just before they can be normatively relevant would make the concept of LE quite useless. If their expectations are just, after all, they should not have transitional losses and if they did have transitional losses, it is not necessary to invoke their LE, as they can refer to general justice principles. The biggest difficulty, however, lies in explaining why objective justice would matter for the normative relevance of an expectation in the first place. Imagine that Donald Trump caused the expectation in a developing country that the United States (US) will not mitigate climate change and that, therefore, the country prepares for the devastating consequences of global warming by investing huge amounts in adaptation measures. If eventually the US does mitigate under the new president and avoids climate change together with the rest of the world, the developing country's investments were useless, and compensation seems justified. That the content of the expectation was unjust (that the US will not mitigate climate change) does not seem to be relevant, it is not immoral to take this unjust expectation into account when making plans for the future. Trump and the US should not be released from their duty to compensate for the caused harm.

Only the justice conception of the regulatory body matters, thus, as it is relevant for assessing the reasonableness of the expectation of regulatory stability. If the regulator provided evidence for the belief that it does not care about intergenerational justice or avoiding climate change, a fossil fuel owners' expectation of regulatory stability is legitimate and justifies compensation if it is frustrated. On the global level, there is no strong, centralised regulator that can be held responsible for causing such beliefs, in contrast to the domestic level. States, I contend, have been providing clear signals that no strong regulations will be implemented that require fossil fuel owners to keep their reserves underground. One indication is how a state has responded to similar cases in the past. If one lives, for instance, in an extremely traditionalist society in which rules hardly ever change or in which there is always strong opposition to change, one could expect the same rigidity in the future (Gosseries and Hungerbühler 2006, 111). Usually, laws or policies relating to environmental issues are highly political and subject to change. However, because of its intergenerational and global aspect, climate change is a unique case. As Jamieson (2010, 83) notes, 'Our current value system presupposes that harms and their causes are individual, that they can readily be identified, and that they are local in space and time'. Therefore, one can better look at how a state has been responding to climate change itself.

Unfortunately, since the dangerous effects of climate change have become known, states have done disappointingly little. The longer they wait to act, the more legitimate it becomes for companies to expect that no strict regulations will be implemented. Moreover, states have continued granting licenses to companies to conduct explorations, and they have continued supporting the activities of fossil fuel industries by paying subsidies (Kartha et al. 2016). Perhaps the Paris Agreement, in which states agreed that global warming should not exceed 2°C, might be relevant. However, as this did not lead to binding national targets (Arellano and Roberts 2017), it cannot be seen as a clear sign that mitigation measures will be imposed either. In this way, states are foreseeably causing expectations in companies that they will be able to keep benefitting from fossil fuel productions. If the energy transition eventually succeeds, they have to pay compensation for the harm that follows from these unfulfilled expectations.

Conclusion

The energy transition is one of the most important challenges humanity has ever faced. However, like many other transitions, it brings adverse consequences for some agents, which gives rise to the question of whether transitional losers are owed any kind of transitional aid. This chapter focused on states and companies that will see their fossil fuel reserves becoming worthless if the transition succeeds. Inter- and intragenerational justice require that two-thirds of proven recoverable reserves stay underground, mostly in countries that are wealthy and/or have a lot of carbon-intensive fossil fuels. As stranded assets concern expectations by definition, the concept of LE can be a powerful argument to save fossil fuel owners' reserves from being stranded or to justify transitional aid.

The chapter presented an account of LE that is in equilibrium both with the general principle that one should not wrongfully harm others and with intuitions that, for instance, reasonableness and justice (at least the regulator's conception of it) matter. According to this account, LE claims follow from the duty not to wrongfully harm others by creating false expectations. In particular, I argued that if an agent is responsible for the creation of expectations in another agent, she should fulfill these expectations to avoid having wrongfully harmed the other agent or compensate the harms that these false expectations brought about if fulfillment is not permissible, which is the case when just transitions are at stake. It follows that states – which own the lion's share of the world's fossil fuel reserves – cannot use the LE argument because there is no strong, centralised regulatory body at the global level that can be blamed for having caused false expectations, because their expectations led to relatively few investments and because they should have known about the stranding. While states cannot complain, however, they can be blamed, as they are powerful structures that have a lot of control over the legislation they impose. Despite the consensus that climate change requires strong mitigation measures, by not taking action, states caused expectations in companies that existing regulations will continue to exist. If the energy transition takes place, companies should be compensated for the costs of having these false expectations, which consists of investments in exploring fossil fuel reserves and preparing to extract them.

The concept of LE is also relevant if the energy transition does not succeed. The adverse consequences of climate change would already ground compensation duties, but false expectations about the avoidance of these harms could provide additional claims. After all, if the victims would have known that climate change would not be mitigated, they could have invested in adaptation. Green investors could also complain that they have been provided with false expectations that their investments would be profitable. One could have LE about conserving the existing rules, thus, but also about the implementation of new mitigation measures – which is actually also a kind of conservation: conservation of the climate. Referring to one's LE, in fact, does not need to be conservative in any way, as one's expectations are not necessarily based on the existing state of affairs. Future research, therefore, could elaborate on both the theoretical development and the wider application of this concept and make us better at realising transitions fairly.

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