Justice can and should become a part of feasibility assessments for climate mitigation policies

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Concerns of justice are rarely considered within feasibility assessments of climate mitigation policies, even when present conditions and climate action itself have serious implications for vulnerable populations, potentially undermining the desirability and eventual success of mitigation. Hence, we propose a feasibility and desirability assessment framework for future assessments to evaluate practicality and desirability-based constraints while accounting for recognitional, procedural, and distributional justice, increasing transparency within the climate policy process.

The 2015 Paris Agreement created goals for climate action to ensure future wellbeing: limiting global warming to 1.5 °C and keeping it well below 2 °C[1]. While the 1.5 °C goal looks increasingly unlikely to be achieved[2], unprecedented climate mitigation actions could achieve the 2 °C goal, motivated by the agreed desirability of limiting climate impacts[3]. The scale of the task ahead, the lack of significant progress to date, and uncertainty about the impacts of mitigation actions prompted the Intergovernmental Panel on Climate Change (IPCC) to undertake an assessment of the gap between actual and necessary actions and their impacts. In the Special Report on 1.5 °C, the IPCC identified the requirements for achieving the 2015 Paris Agreement Goals, defining the assessment as a study of '*required conditions for …and potential responses to implementation of climate action*[4], viz a feasibility assessment. Within this Report, feasibility is defined as the 'capacity of a system to achieve specific outcomes'[5] wherein the feasibility is constrained by certain conditions within the system. These conditions include the availability of technology, materials, and resources, and the identified responses span economic, social, political, and environmental impacts[5].

A feasible option is described as a 'state of affairs which we can bring about'[6]. A feasibility assessment then answers the question of how to achieve that state, often for a policy-maker attempting to identify a practicable policy pathway to that state. Accordingly, decision-makers evaluate constraints and opportunities through feasibility assessments. Constraints exist on the solution space (*feasibility of what?*), the place and time (*feasible where and when?*), and capacities of actors (*feasible for whom?*)[6,7]. Feasibility constraints can be 'hard' or 'soft'; the former are governed by the rules of nature and logic and could preclude a proposal as impossible, whereas the latter have a cultural or economic nature, are more malleable, and may indicate improbability (instead of impossibility) in implementation[6,7].

Climate change mitigation strategies involve global changes in numerous aspects of human activity, and as such they can have huge implications for justice, with negative outcomes including food insecurity, poverty, landlessness and displacement[8–11]. Strategies involving land-based carbon dioxide removal (CDR) are particularly significant here because they can have extensive consequences through the land system[12–14]. The IPCC's Special Report on 1.5 °C connects justice with socio-cultural feasibility by recognising equity as a driving criterion[5], but also reveals a distinct lack of consideration of justice and equity in climate-related feasibility assessments[15].

The limited consideration of justice in such feasibility assessments is a serious problem; it undermines the feasibility assessment itself through an implicit but erroneous assumption that justice impacts have no bearing on whether an action can be implemented, restricts understanding of the desirability of that action, and so means that an action that is successfully implemented can actually work against mitigation's main aim of wellbeing. The IPCC feasibility assessment frameworks, by conflating the idea of feasibility (what can be done) and desirability (what should be done), fail to fully explore either[16]. To tackle this problem, we explore the space for justice to be considered within feasibility assessments. We consider key concepts of recognitional, procedural and distributional justice while highlighting why, where, and how justice can be operationalised within feasibility assessments. We argue that defining desirability as a measure for evaluation of justice concerns would allow operationalisation. We also use these arguments to build a conceptual framework of feasibility that encompasses justice, for use in future assessments of feasibility to reduce ignored unjust consequences for people and the environment. The framework may function as an analytical tool for policy-makers to comprehensively identify and critically assess constraints to implementing a policy target. These constraints may reflect and address diverse regions and stakeholders. We hope that this

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feasibility framework will allow decision-makers to derive policy solutions while acknowledging the consequences of implementing them.

The feasibility conundrum

An assessment of feasibility tries to constrain the solutions space within the bounds of realistic societal and natural conditions[17], as conceptualised in Fig. 1. In policies, the solutions space is restricted to the priorities and preferences of a particular geopolitical region, which can vary across different topics, e.g., wellbeing, nature conservation and climate change mitigation.

To be considered feasible, policy actions must have a probability of implementation that is higher than zero under current circumstances, because they are not deemed 'impossible' on the basis of hard constraints[6,17]. This means that the policy option in consideration is *already on the table*[18], with feasibility then associated with the ease with which that policy can be implemented. This ease of implementation is largely contingent upon soft constraints such as the current socio-economic and political conditions, existing socio-economic structures, political support or willingness, social acceptability and an assessment of whether socio-political and economic sacrifices are too great[19].

Treatment of both hard and soft constraints leaves considerable room for improvement. Both categories are in practice time-dependent, although hard constraints are typically viewed as immutable. For example, Gaus[20] outlines how technological innovations and intellectual progress changed the Malthusian assumption of 'hard constraints' on human progress[20]. In climate mitigation, the IPCC has been criticised for underestimating the potential of technological innovations such as solar photovoltaics, along with rates of uptake, which have actually grown around 43% each year[21,22]. Logical constraints, hard constraints which are derived from epistemic applicability, as well, are often products of concurrent moral codes. For example, lobby and pressure groups, especially those that serve the interests of the most powerful, play an important role influencing moral codes of the time[23]. Conversely, socio-political and other soft constraints, while representing fewer fundamental barriers, may entirely rule out certain options. For example, inconsistencies and time-lags in the policy process could preclude achievement of some climate goals[24].

Given their potential to act in different but overlapping ways, hard and soft constraints deserve probabilistic weights that go beyond binary outcomes and allow either to make an option infeasible. These weights should reflect the fact that an activity that is *not feasible* given current conditions may become so in the future if conditions were to change[17], or that an activity can itself create feasibility by altering its own context over time. Hence, a feasibility assessment should evaluate the possible implementation of policy actions as well as reflect the constraints considered during the policy-making process. Not accounting for this might give rise to the conundrum of an option being considered infeasible due to constraints that the option itself could change, or being considered feasible without accounting for impacts that would make it less so. The prevalence of unjust conditions may hinder essential climate action, for example, urgent energy transitions may put heavy economic burdens on marginalised and vulnerable peoples due to a lack of consideration of justice[25–31]. Failure to reflect such a dynamic nature of constraints has the obvious and severe drawback of precluding ethically or practically ambitious options that could in fact be possible.

Justice and practicality

We define a justice lens to understand hard and soft constraints in terms of recognitional, procedural and distributional justice (Table 1). While hard and soft constraints may prevent actors and institutions from achieving certain goals, it is important to acknowledge that these constraints may themselves be consequences of injustice. Existing socio-economic conditions are often a result of past unjust practices such as imperialism, colonialism, and capitalist resource exploitation. Moreover, the impacts of climate change are unequal and form a major concern for distributional justice, even without considering historical responsibility. This means that some of the most powerful actors in any given policy context may be direct beneficiaries of past or present injustices. These unjust contextual factors mean that the present status quo cannot be thought of as a neutral, non-value-laden constraint on future options[19].

Acknowledging this lack of neutrality allows us to understand the implicit biases in current feasibility assessments. For example, Schuppert and Seidel[18] assessed the Budget Approach proposed by the German

Fig. 1 | Conceptual model to create a set of feasible options, representing the policy process which goes from a larger conceptualisation of goals (grey area) to creation of feasible options to achieve the goal. The space for solutions (green area) is constrained by hard and soft constraints (blue area). Addition of justice (hatched areas) increases the constraint space but can also increase the solution space.
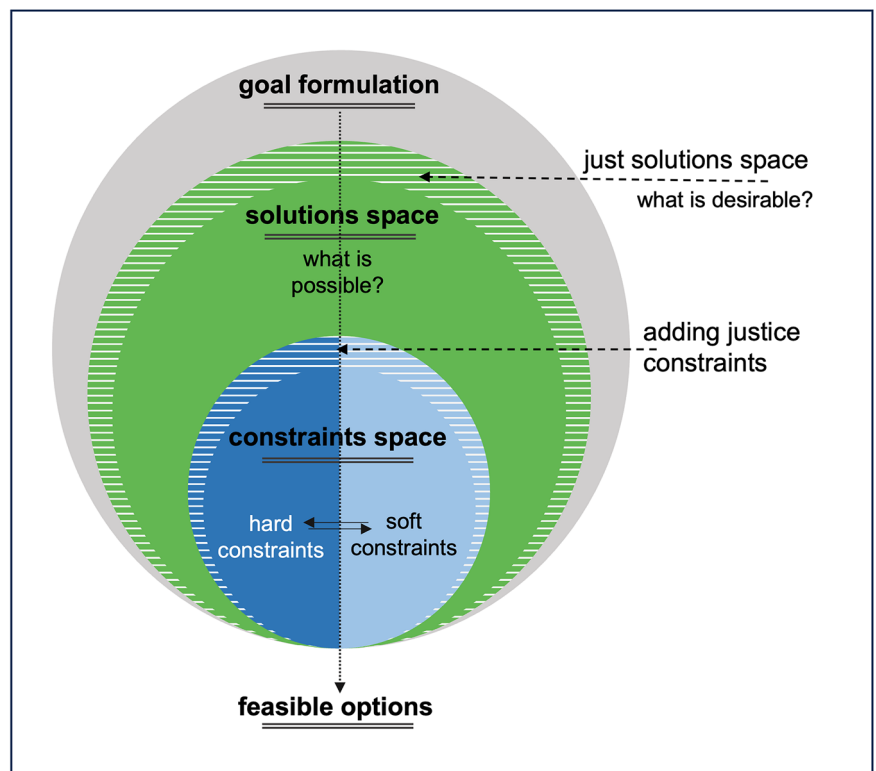
Table 1 | Glossary of justice concepts

Term	Definition	Source
Recognitional justice	Identifying and respecting different identities which may make certain people more vulnerable than others. Compounding vulnerabilities are classified as intersectionality. These differences may stem from unequal and unjust historical practices, socio-economic and political structures and their path dependencies	Kaijser and Kronsell[28]; Martin et al.[29]; Patterson et al.[9],
Procedural justice	Meaningful consultation and active participation of all concerned stakeholders. Procedural injustice stems from the ignorance of key stakeholders within decision-making for matters that will have an impact on their lives.	Sovacool and Dworkin[30],
Distributional justice	Equitable distribution of rights, benefits, costs, and burdens between all members of society. Distributional injustice refers to mismatches between those who bear responsibilities and those who benefit.	Klinsky and Dowlatabadi[31],

Advisory Council on Global Change, and identified policy choices based not on benefits that might be generated but on agreement by the maximum number of decision-makers or by powerful lobby groups. This approach has worked to the benefit of fossil fuel corporations, which, since the inception of the United Nations Framework Convention on Climate Change (UNFCCC), have opposed and resisted ambitious climate action by creating social legitimacy and by pursuing their interests in the political arena through economic and political power[32,33]. This was exemplified in the 28th Conference of Parties (COP) held in the United Arab Emirates in 2023, which was presided over by the CEO of a state oil company[34]. Similarly, the president of Azerbaijan who presided over the 29th COP, was criticised for stating that oil and gas are a 'gift from God'[35]. Azeri fossil fuel companies continue to benefit from the sale of fossil fuels, supported by a deal signed by the European Union to double oil and gas imports from Azerbaijan by 2027, in response to the Russia-Ukraine war[36]. Powerful lobby groups, under the guise of consensus, are able to shape constraints on feasibility, and will inevitably support policies that do not harm their business interests, or those that do not require dramatically lower use of their products in the short term, even where this is at the cost of the vulnerable global population.

Therefore, critical normative scrutiny is essential in feasibility assessments, otherwise they legitimise and perpetuate unjust and unequal conditions in the world in which they are created[19]. Without acknowledgement of this problem, the most just option from a feasible set is likely to be the 'least unjust'[17], rather than one that directly addresses injustice. We propose the incorporation of a justice lens in decision-making processes to promote policies that account for the necessities of all sectors of society.

Accordingly, through Fig. 1 we explore the idea of including options that are 'desirable' within the solution spaces, by understanding conditions that are necessary to ensure just environments. Solutions falling within either of the two categories (practicality and justice) are not necessarily mutually exclusive and generally coexist. Including justice-based constraints inevitably increases the total number of constraints that have to be considered, but does not always increase their total impact because they may illuminate solutions that would erroneously have been viewed as infeasible if their implications for justice were ignored. Giving hard and soft constraints equal probabilistic weights make it possible to consider a larger number of solutions with a better understanding of biases and trade-offs involved in the choice of feasible options (Fig. 1). Where the solutions space is reduced, we contend that a more transparent policy process results, as decision-makers narrow down the list of potential policy actions based on clear criteria.

Integrating justice in feasibility assessments through desirability
In addition to normative arguments for considering justice as a core component of climate mitigation's aim of ensuring wellbeing, it can also strongly affect the contextual feasibility of policy actions. For example, the protests against the carbon tax and rising fuel prices in France leading to the Yellow Vest movement (*Les Gilets Jaunes*) were a response not only to climate policies enacted to be consistent with current structures but also to the fundamentally economic root causes of high unemployment and cancellation of wealth tax, among other unjust economic conditions perceived as being exacerbated by climate action[37]. Policies such as the carbon tax overlook the inherent inequities already present in society and the consequences of added burdens such as end-consumer taxation, on a vulnerable population[38].

Even if securing just living standards could ease the implementation and increase the durability of climate action, it could also undermine these where other soft constraints or dominant interests are opposed to those standards. In either case, explicit and objective consideration of justice is important to understand eventual outcomes. To secure these standards, McKinnon[39] points out the need to build a connection between ethical principles (linked with justice) and policies by bringing independently justified principles into policy debates and analysis. We propose to use desirability as a bridge for this purpose.

Desirability is defined as the evaluation of both the moral appeal and moral costs of specific outcomes[40]. In other words, desirability could be considered as the evaluation of policy impacts on different moral values. While there are interrelations between feasibility and desirability as concepts, their evaluation depends on different contextual normative values[16]. However, because normative moral values may be vague and prone to changes in different contexts, we apply the terms of justice (Table 1) to operationalise desirability, according to the independent principles suggested by McKinnon[39], and advancing the study by Tank et al.[16]. Also pertinent is the Idea of Justice[41], which addresses unjust policy outcomes through rationally justifiable means. This allows for justice also to be dealt with as a question of the here and now, by identifying unjust contexts, procedures and outcomes of policies and addressing them through rational means. Explicit consideration of desirability allows for a more transparent process of policy assessments[16]. Terms of justice can be applied in various stages in the feasibility assessment process, allowing similar assessments of baseline conditions, the policy-making process itself, and the potential impacts of policy implementation. This approach focuses on moving from existing conditions towards more just policy processes rather than having an idealised utopic future state defined in advance.

There is ample evidence of the usage of elements of desirability to evaluate fulfilment of justice claims and the broader acceptability of climate actions outside of feasibility assessments. The Sustainable Development Goals (SDGs) have been deployed as a means of comparison for desirability evaluation of potential policy and strategy impacts in various studies[42–46]. Stechow et al.[42] analysed the synergies and trade-offs between sustainable energy objectives and the energy-related climate strategies for modelling 2 °C scenarios and found that while some technologies yielded some co-benefits, risks and trade-offs simultaneously increased[42]. Halsnæs et al.[47] analysed trade-offs and justice-related challenges of sectoral mitigation options using the SDG targets, through the differential experiences of different groups of vulnerable people[47]. Assessment of policy-specific vulnerabilities to climate action has been carried out within studies focusing on Just Transitions within sectors such as energy, bioeconomy, and food systems[48–50]. Tribaldos & Kortetmäki[51] demonstrate this through the example of just food system transitions by creating a framework for the assessment of impacts of potential transitions on justice-related principles and associated relevant indicators[51]. Derivations of principles applicable for particular policies or strategies and specific regions may help in formulating evaluation frameworks.

Ways forward for feasibility assessments

There has been a shift of focus from feasibility assessments carried out to identify plausible policy options, to assessments which aim to identify the enablers and constraints to policy implementation[52]. We recognise that both of these aims are important in different stages of the feasibility assessment process. In the case of the former, it is important to ask the question, *'why are certain policy options considered over others?'*. Inclusion of additional possible solutions in the solutions space (see Fig. 1) means that there is no prioritisation of one policy option over another without due consideration of all associated trade-offs and synergies possible. In the case of the latter, an in-depth evaluation of relevant constraints to implementation as an aim provides the decision-makers with all possible contingency options.

Figure 2 illustrates how feasibility assessments could become more transparent through a conceptual framework that prioritises critical normative scrutiny into a constraints space composed of application-based and desirability-based constraints which pertain to practical and justice-based concerns, respectively. These constraints function within the scope of the constraints space as described in Fig. 1. The goal of this conceptual framework is to provide decision-makers with possibilities from which decisions could be made on the basis of contextual priorities. Scrutinising the policy process (Fig. 2, orange) requires a better understanding of the *actors* making the policy, the actual policy *actions* and the *outcomes* of those actions and how they interact with the components of application (Fig. 2, green) and desirability (Fig. 2, blue) constraints and vice versa. Thus, this conceptual framework is consistent with the ideas presented by Tank et al.[16] about transparency and explicitness of feasibility assessments, while considering contextual normative values.

Owing to the complex nature of policy processes, almost all the constraint components interact together and separately with each of the components of the policy process. For example, actors must make changes according to their capacities while also making procedures just and practical. Similarly, policy actions are constrained by policy implementation practical constraints of the process while also having to account for the identification and representation of different voices, and equitable distribution of responsibilities between them. Finally, policy outcomes impact material and procedural capacities, the creation and identification of diverse identities along with the distribution of costs and benefits. These interactions create

trade-offs and synergies which need to be represented in the policy process. Studying this in detail allows a better understanding of the policy process itself.

While policy-makers would benefit from the results of this assessment, the assessment would be carried out by monitoring and evaluation agencies and organisations. These could be departmental bodies of governments like just transition commissions or non-governmental public bodies such as climate change committees presenting reports to the government. While carrying out this assessment, it is important that all relevant stakeholders within the policy process such as local communities, formal and informal institutions, NGOs and activists and private and public sector representatives along with local policy implementation authorities get a meaningful representation and voice within the policy process for this assessment to have a significant impact. Moreover, differential capacities and potential outcomes must be highlighted in order for policy-makers to make decisions for future policy actions based on comprehensive and transparent information.

Conclusion

Feasibility assessments are designed to understand the plausibility of implementing policy actions but have increasingly only promoted policies which are practical but not always just due to implicit trade-offs made between practicality and justice in an unjust present-day context. The consequence of this is often a skewed understanding of necessary actions, a biased decision-making process and unjust outcomes and implications, undermining necessary climate action. This study proposes an alternative way of thinking about feasibility assessments where it is not only possible to identify and evaluate a larger number of plausible policy options, but also to provide a thorough evaluation of a wider range of plausible constraints, practical or justice-related. The inclusion of desirability to represent fulfilment of justice claims, along with application-based practical constraints, informs decision-makers about existing and potential implicit biases within policy processes. We propose that the aim of future assessments of feasibility of climate policies should be to make transparent the trade-offs and synergies that decision-makers must grapple with before implementing policies, a key feature in mitigation strategies increasingly undermined by obfuscation and competing interests. Implementing this framework will

Fig. 2 | Conceptual framework for future feasibility assessments inclusive of justice concerns within the constraints space. The framework is structured in three main components, each with three elements. As the basis of feasibility assessments, the policy process (orange) consists of actors, actions and outcomes. Two groups of constraints bind these policy elements in a balancing act and define the space for the scope and context in which the policy process is operating: application-based constraints (green) with capacity, process and impacts, and desirability-based constraints (blue) with recognitional, procedural, and distributional justice, respectively. The balance between application- and desirability-based constraints is associated with a continuous flow of synergies and trade-offs that should be represented in the policy process. It is only after acknowledgement of a comprehensive set of possible constraints that the scope of the policy may become clearly defined, helping decision-makers to transparently make choices on policy actions.
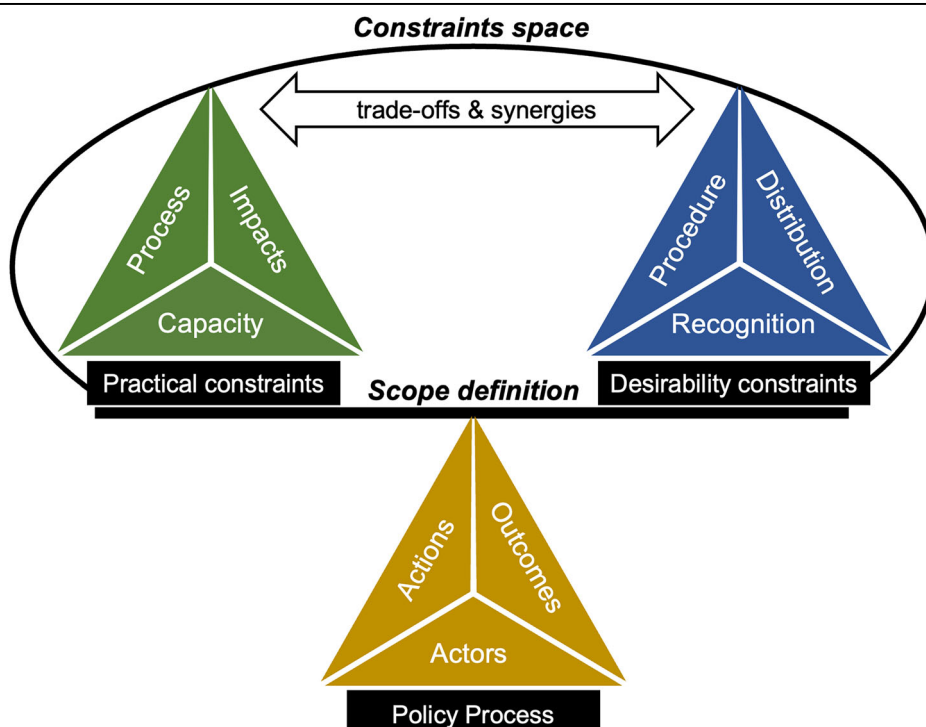
require significant work, particularly because none of its elements are simple to measure. But we contend that efforts to conduct practical assessments in this way will themselves be useful, in interrogating crucial issues and moving feasibility assessments towards a more just, coherent and constructive ground.

Data availability

No datasets were generated or analysed during the current study.

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Author contributions

M.S. conceptualised the ideas in the manuscript in collaboration with C.B. and E.D.G. M.S. wrote the original manuscript and prepared the figures and tables. M.S. C.B., E.D.G. and M.R. reviewed and edited the manuscript. M.R. acquired the funding.

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The authors declare no competing interests.

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