

Sustainable Energy for All? Assessing Global Distributive Justice in the Green Climate Fund's Energy Finance

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Abstract

There is growing international attention to the goal of universal energy access. Despite this, large financial gaps remain a major obstacle for realizing global energy justice for all communities. Drawing on political theories of global distributive justice, this article develops and applies a framework for how multilateral development assistance for energy projects can be evaluated in relation to three guiding principles. First, the *global difference* principle asserts that resources should be distributed to maximize the condition of the least well-off humans. Second, the *local benefits* principle asserts that resources should be distributed in ways that enhance the public goods of local communities, particularly those that are historically marginalized. Third, the *global equality of opportunity* principle asserts that all social groups and states have the capabilities to equitably access institutional structures relevant to the distribution of resources. We apply this framework to an analysis of finance for all energy projects within the Green Climate Fund (GCF) from 2015 to 2018. In doing so, we offer a nuanced understanding of the successes and failures regarding the performance of the GCF's energy portfolio in relation to global distributive justice.

As part of the Paris Agreement in 2015, the United Nations Framework Convention on Climate Change (UNFCCC), the parent body to the Green Climate Fund (GCF), announced for the first time the pursuit of "climate justice" (United Nations Framework Convention on Climate Change [UNFCCC] 2015, CP/21. preamble). Noting climate justice as a key goal in climate action evolves the discourse on climate action not only to include greenhouse gas mitigation but to link climate mitigation and adaptation projects to human rights and social justice (Cameron et al. 2013). The Agreement also extended an earlier pledge to jointly mobilize US\$ 100 billion annually for developing countries, prioritizing those most vulnerable to climate change, through 2025 (UNFCCC 2015, CP.21.9; Decision.114). This was at least in part to be achieved through the UNFCCC's GCF, to which countries pledged US\$ 10.3 billion for an initial four-year period. In 2018, the GCF launched its first replenishment period (GCF-1) and raised an additional US\$ 9.8 billion, making it the largest dedicated climate fund in the world (Green Climate Fund [GCF] 2020). The Paris Agreement also

committed to the idea that mitigation actions be pursued “on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty” (UNFCCC 2015, CP/21.4).

One problem the GCF has committed to addressing is lack of access to clean energy. Approximately a billion people worldwide, or 13 percent of the global population, still lack access to electricity—many of whom are concentrated in the forty-six least developed countries (International Energy Agency [IEA] and World Bank 2017; United Nations Conference on Trade and Development [UNCTAD] 2021).¹ Lack of access to energy hinders the provision of health care, reduces education opportunities, increases gender inequality, and constrains the ability to engage in the global economy. In response to this issue, as part of the Agenda for Sustainable Development, the United Nations has committed to universal access for all people to “affordable, reliable, sustainable and modern energy” by 2030. Estimates of funds needed to achieve universal energy access vary but average an additional US\$ 50 billion annually to current global energy investments (Craine et al. 2014; IEA 2017; IEA and World Bank 2017; Sustainable Energy for All [SEforAll] 2017). In 2015, total public finance to energy projects amounted to US\$ 20 billion, and less than 20 percent of that went to “high-impact countries,”² where energy access is lowest (SEforAll 2017). Due to the linkages between energy use and economic development, high-impact countries often overlap with countries categorized as low income or the least developed (IEA and World Bank 2017; UNCTAD 2021). Between 2011 and 2015, less than 10 percent of public development funding to support energy access went to sub-Saharan Africa, where the electrification rate is only 43 percent and needs are greatest (IEA 2017; SEforAll 2017).

There are gaps when it comes to issues of justice in energy and climate finance, but beyond basic notions of inequity, it is unclear what ideals of justice might look like in practice. Specifically, we lack analytical tools to gauge how institutions like the UNFCCC can be assessed in relation to global distributive

1. The UN Conference on Trade and Development 2021 list of least developed countries is as follows: Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People’s Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Timor-Leste, Togo, Tuvalu, Uganda, United Republic of Tanzania, Yemen, and Zambia.
2. “The 20 countries with the highest absolute gaps in access to electricity and/or clean fuels and technologies for cooking, measured by population” (IEA and World Bank 2015). The twenty “high-impact” countries with electricity access deficits include India, Nigeria, Ethiopia, Democratic Republic of the Congo, Bangladesh, United Republic of Tanzania, Uganda, Kenya, Myanmar, Sudan, Mozambique, Madagascar, Democratic People’s Republic of Korea, Angola, Niger, Malawi, Burkina Faso, Chad, Mali, and South Sudan (IEA and World Bank 2017). The twenty “high-impact” countries with clean cooking access deficits include India, China, Nigeria, Bangladesh, Indonesia, Pakistan, Ethiopia, Democratic Republic of the Congo, the Philippines, United Republic of Tanzania, Myanmar, Vietnam, Kenya, Uganda, Sudan, Afghanistan, Mozambique, Democratic People’s Republic of Korea, Madagascar, and Ghana (IEA and World Bank 2017).

justice. This is one of the reasons why scholars and practitioners have limited means to attempt to hold multilateral institutions and their member states accountable in relation to justice and equity commitments. As Beitz (2005, 24) argues, “a theory of global distributive justice should concern itself primarily with the basic structure of international society—that is, the economic, political, and legal institutions and practices that influence the global distribution of advantages.” While political theorists have addressed the question of what a just distribution of development assistance would look like, existing approaches are narrow in scope and do not address a full spectrum of issues related to global distributive justice. This results in a limited understanding of how multilateral funds are performing in relation to global distributive justice in renewable energy-related finance.

Although renewable energy projects are only one kind of climate project that multilateral funds support, finance for renewable energy accounts for approximately 90 percent of all climate finance flows (Chirambo 2018). Moreover, energy systems are integral to sustainable development, livelihood opportunities, and basic living standards. As such, multilateral funds and their member states should be held accountable for ensuring that renewable energy projects are developed in vulnerable and underserved communities. We ask, what should global distributive justice encompass, and how might its realization be assessed in the case of multilateral renewable energy finance in the GCF?

This article adopts a cosmopolitan view of global justice which argues that principles of justice should have a global scope (Caney 2001a, 974; Sovacool et al. 2014). A cosmopolitan approach has the benefits of viewing the ultimate unit of moral concern as every human being rather than those in a particular social group or constrained by international boundaries (Nagel 2005; Pogge 2008, 175). It may do so by extending Rawlsian ideals of distributive justice to the global level; concerning itself with moral global or international duties to rectify durable poverty and inequality caused or exacerbated by structures of global order (Beitz 2005, 22; Pogge 2008); and assigning responsibility to fulfill these duties to the institutions to which standards of justice can be applied (Nagel 2005). This article focuses specifically on global distributive justice. Similar analytical tools are necessary for other dimensions of energy justice, including procedural justice, spatial and temporal justice, recognition justice, and capabilities justice, but these are outside the scope of this article.

The article focuses on what global distributive justice for multilateral renewable energy finance should look like in practice and how its realization might be assessed in relation to three guiding principles. First, the *global difference* principle asserts that resources should be distributed to maximize the condition of the least well-off humans (Beitz 1999, 150–153; Richards 1982, 292–293). In practice, this means assessing the amount of funding directed to the countries, communities, and individuals with the greatest need. Second, the *local benefits* principle asserts that resources should be distributed in ways that benefit the public goods of local communities, particularly those that are historically marginalized. This

includes things such as supporting the provision of clean water, healthy local air quality, livelihood opportunities, and reliable access to energy services. While global public goods, such as greenhouse gas mitigation and biodiversity protection, are also important, these priorities should not come at the neglect of pressing local needs. In practice, this means assessing the extent to which the types of projects funded concentrate benefits locally. Third, the *global equality of opportunity* principle asserts that all social groups and states, and particularly those that are historically marginalized, have the capabilities to equitably access institutional structures relevant to the distribution of resources.

We analyze the GCF's energy project portfolio as a means to illustrate patterns of funding in relation to each global distributive justice principle. Analysis is based on review of publicly available documents of all approved GCF funding proposals from 2015 to July 2018. Specifically, we utilize readily available data to evaluate the GCF's performance in relation to each of the three principles. As we will explain, institutional data gaps inhibit a full assessment of the GCF's performance, particularly in relation to the principles of local public goods and global equality of opportunity. However, some insights about the GCF's performance can be gleaned. In the concluding section, we summarize our findings and identify areas for future research related to global distributive justice in energy finance.

Existing Scholarship on a Cosmopolitan Approach to Global Distributive Justice

Some scholarship in the field of energy justice takes a cosmopolitan approach when examining distributive justice of energy systems, positioning access to energy as a human right (Sovacool et al. 2014). As Sovacool argues, "the industrialized economy—which now reaches into almost every part of the globe—is entirely dependent on the energy services provided by modern energy systems" (947). It follows that energy services are a prerequisite for other basic goods, such as "welfare, security, health care, education and the right to employment" (947). To deprive populations of energy services is to deprive them of the ability to access these basic goods and is therefore a fundamental element of climate and development aid to consider.

A cosmopolitan approach to international relations runs counter to prominent positions that states should only promote their self-interest, that moral duties do not extend beyond national boundaries, or that global ideals of distributive justice violate the independence of states and national sovereignty (Caney 2001b, 983). We embrace four themes of cosmopolitanism that are particularly relevant to global distributive justice and how it relates to renewable energy finance. First, cosmopolitan theorists posit that the ultimate unit of moral concern is every human being and therefore must count all individual lives as equally valuable (Nagel 2005). While some cosmopolitan theorists hold that there are some specific duties unique to national contexts, there is general

agreement that at least some moral obligation or entitlements should extend to every human being, regardless of international boundaries, citizenship, race, class, gender, or other demographic or political characteristics (Caney 2001b, 988; Pogge 2008, 169).

Second, these duties should include forms of global distributive justice, among other forms of justice, such as procedural, recognition, and capabilities. Global distributive justice refers to how benefits and burdens of living together as part of a global society can be shared between us with considerations of equity (Armstrong 2012). Notably, there are differing views among cosmopolitan theorists in terms of whether duties are owed to individuals as compared to states (Beitz 1999; Caney 2001b; Pogge 1994). We hold that while states are often the arbitrators of global distributive relations, we should strive for distributive justice that values equity in resources between individuals and communities.

Third, these obligations extend from the global interconnectedness of human well-being in the historical and contemporary world order. Moral global and international duties should address, at least in part, durable forms of poverty and inequality caused or exacerbated by structures of the global economic and political order (Beitz 2005, 22; Pogge 2008). This includes deprivations caused by forms of unequal economic and ecological exchange between nations and peoples which is supported and sustained by unequal trade regimes, structural adjustment programs, forms of colonization, coercion, and other systems of exploitation. It also includes conditions of climate and energy injustice, with those peoples and countries least responsible for causing greenhouse emissions, most vulnerable to its negative impacts, and often least the beneficiaries of climate-related funds for renewable energy and other mitigation strategies (Khan et al. 2019).

Fourth, in a world order that lacks democratic and legitimate systems of global governance commensurate with the challenges we face as a global society, a cosmopolitan approach assigns responsibility to fulfill duties to institutions to which standards of justice can be reasonably applied (Nagel 2005). Even in cases where such institutions were not expressly set up to address concerns of distributive injustice, global justice calls for making demands on the imperfect institutions that we have in place. For theorists of global justice, this means moving beyond abstract ideals to the intricate realities of the context in which global justice demands can be made (Sen 2009). Moreover, because there exists a basic order of governance structuring relations between states, individuals have obligations to other humans irrespective if they are members of the same institutions (Pogge 1994, 91).

Existing Approaches to Assessing Global Distributive Justice in Climate and Energy Finance

Limited scholarly attention has focused on concerns specific to what might constitute global distributive justice in multilateral aid for climate and energy

projects. Studies generally focus on a single dimension of distributive justice rather than providing a holistic and multifaceted understanding. We discuss five different areas of attention in related scholarship.

First, several studies focus on the extent to which aid is reaching those countries most in need rather than reflecting donor interests or preferences. One area of attention is on the distribution of finance to specific groups of countries, such as the least developed countries (LDCs) or small island developing states (Cipler et al. 2013). Others have developed indicators to assess what would constitute a just distribution to individual countries. For example, Eni-Ibukun (2013) argues that a distributive justice assessment of the Kyoto Protocol's Clean Development Mechanism (CDM) should be based on two indicators: greenhouse gas emissions reduction potential and Human Development Index for the country. In other words, countries with large emissions and low human development should be deemed most worthy of funds. The author found that just two countries, China and India, host 70 percent of total projects from the Kyoto Protocol's CDM, and only 84 of 129 eligible countries have any registered CDM projects (3). Factors contributing to this inequality in project distribution include a lack of institutional support to developing countries in the project development, financing, and implementation phases. This disadvantages countries and project developers that lack financial and institutional capacity. Moreover, there is a preference of investors for high-return and low-risk projects (234–237).

A smaller number of studies have focused on the distribution of finance at a subnational level and the extent to which resources are reaching the most marginalized social groups within countries. For example, Barrett's (2014, 130) study of the subnational distribution of climate finance in Malawi found that those areas most in need receive relatively little finance. The type of finance provided at a subnational level is also of relevance. In a study of Madagascar's planned transition to renewable energy, Cholibois (2020) found that distinct forms of funding, including grants, concessional loans, and private finance had divergent energy justice impacts related to the types of projects funded. Subnational inequality in funding distribution is also influenced by allocation criteria in funds such as the UNFCCC's Adaptation Fund, which lack consideration of differences in need between subnational communities (Persson and Remling 2014).

Scholarship has assessed the extent to which international aid supports local public goods as compared to global public goods (Marcoux et al. 2013). Hicks et al. (2010) differentiate between "green aid," which addresses global environmental problems like climate change and biodiversity loss, and "brown aid," which addresses local environmental problems like water pollution, land erosion, and sewer systems. Notably, while they found that brown aid overall outpaced green aid, the LDCs, which tend to have large local environmental needs, received far more green aid than brown aid. They argue that green projects offer few tangible benefits to politicians and constituents in recipient countries, while being favorable to wealthy donor interests.

Allocation formulas that prioritize global goods, rather than local goods, are also reflected in major multilateral institutions, such as the Global Environment Facility (GEF) (Cléménçon 2006). Specifically, the GEF's Resource Allocation Framework, active until 2010, was based solely on a nation's ability to contribute to environmental benefits beyond its borders. This formula resulted in an inequitable distribution of funds, with most resources going to a relatively small number of countries (Cléménçon 2006). Due to concerns related to inequity in funding distribution, the updated System for Transparent Allocation of Resources Framework has incorporated additional criteria related to gross domestic product per capita and a minimum allocation threshold. This has resulted in a slightly greater proportion of funding directed to low-income and highly vulnerable small countries (Global Environment Facility 2010).

Other scholars have theorized or assessed fairness or justice in relation to the share of donor contributions (Ciplet et al. 2012; Grasso 2010). For example, the concept of "fair shares" has been developed to evaluate the extent to which countries are providing climate finance in relation to their historical responsibility for causing climate change and their financial capabilities (Ciplet et al. 2012). A final thread of scholarship focuses on concerns with equal access to aid and barriers to access such as co-financing regimes and conditionality of funding (Hancock 1992; Tippmann et al. 2013). Notably lacking is a more comprehensive framework to assess adequacy of international finance with attention to multiple dimensions of global distributive justice.

Framework to Assess Global Distributive Justice in Multilateral Development Finance

In this section, we develop a framework to assess global distributive justice in multilateral development finance with three guiding principles. The first principle, the global difference principle, builds from a Rawlsian theory of justice. Rawls ([1971] 2009, 302) argues that social and economic inequalities should only be permitted if they are "of greatest benefit of the least advantaged members of society." While Rawls only applied this principle at the domestic level, numerous scholars contend that Rawls does not provide a convincing account for why this should not extend to the international or global realm (Brock 2009, 46; Moellendorf 2018, 14). Hirsch (2001, 165) argues that the global difference principle could be employed to "help regulate the distribution of wealth among countries" through targeting aid to "maximize the wealth of the economically least privileged society in the global society."

We take this principle a step further, to be more in line with a Rawlsian view of the difference principle, which would focus on maximizing the benefit of international finance for those countries, social groups, or individuals least advantaged or most marginalized. In this case, the group that is targeted can be as large or larger than a country, but it may also extend to a specific social group or set of individuals at a subnational or cross-national level. This reflects a

growing understanding among cosmopolitan theorists who challenge post-Westphalian understandings of who counts, which includes transterritorial “communities of risk” as well as communities of agency, such as transnational social movements (Fraser 2010, 5, 31).

The global difference principle can be assessed at various scales with distinct benefits. Analyzing and comparing the distribution of finance at the scale of states and groups of states offers a satellite view of broad patterns of investment and prioritization in the international system, which is our primary focus. Subnational analysis, which requires adequate project-level data, offers the ability to answer fine-grained questions related to demographic considerations, including, but not limited to, gender, race, rurality, ethnicity, or religious affiliation. Subnational-level analysis can also be used to assess inequity in relation to particular advantages in society, such as access to electricity, health care, or a clean environment, and the capabilities that extend from such privileges, such as good health and a meaningful livelihood.

The second principle, the local benefits principle, asserts that resources should be distributed in ways that benefit local communities, particularly those that are historically marginalized. As discussed earlier, wealthy countries tend to prioritize global public goods in their environmental funding, because this benefits them directly (Hicks et al. 2010). While protecting global public goods, such as maintaining biodiversity or preventing climate change, may have long-term benefits for the least advantaged peoples, these benefits are temporally delayed and offer few, if any, direct benefits. They are also rarely what marginalized peoples would prioritize as their most pressing funding needs (see Hicks et al. 2010). Moreover, projects that support global public goods rarely offer secondary benefits of environmental projects for communities, such as employment opportunities, infrastructure development, and health improvement opportunities. This is because their primary purpose of such finance is not to enhance the well-being of impacted communities. These projects are often not located within the least advantaged communities. If they are located in such communities, the benefits of such projects may be exported elsewhere. For example, in the case of the largest solar park in India, the local community received very few project benefits, while their communal land was developed for a solar park that exported energy elsewhere (Yenneti and Day 2016).

Notably, the local benefits principle builds from the global difference principle to address temporal and spatial dimensions of justice. While temporal justice considers how resources are allocated across generations, spatial justice refers to “the fair and equitable distribution in space of socially valued resources and the opportunities to use them” (Soja 2009, 3). As such, funding and related projects should concentrate benefits in ways that address immediate and urgent needs that are local in scale to those peoples most disadvantaged and promote direct employment, environmental health, and economic benefits.

Third, the equality of opportunity principle asserts that all social groups and states, and particularly those that are historically marginalized, have the

capabilities to equitably access institutional structures relevant to the distribution of resources. Rawls argues that “social and economic opportunities are to be arranged so that they are ... attached to offices and positions open to all under conditions of fair equality of opportunity” (Rawls [1971] 2009, 302). What this makes clear is that it is not just the outcomes of distributive injustice that matter but the institutional structures that generate inequality or equality of access to social and economic opportunities. As such, according to this principle, global institutions should strive to create conditions so that persons or states of equal motivation “have equal opportunities to attain an equal number of positions of a commensurate standard of living” (Caney 2001a, 120). Moreover, opportunities should not be worsened by class, culture, gender, race, nationality, ruralism, or other demographic characteristics (Caney 2001a). Thus, while the first two principles focus on distributive justice outputs (equitable allocation of finance and support of local public goods), the equality of opportunity principle directs attention to the inputs of global distributive justice. It asks, are opportunities to access finance distributed equitably? This, for example, includes ensuring that all countries and social groups have equal opportunity and capacity to submit a competitive funding proposal, even if their proposal is ultimately rejected. A summary of the Framework, including what elements can be assessed to determine adherence to the principles, can be seen in the Table 1.

Table 1

Framework to Assess Global Distributive Justice in Multilateral Finance

<i>Principle</i>	<i>Meaning</i>	<i>What Should Be Assessed?</i>
Global difference	Resources are distributed in ways that maximize the benefit for those countries, social groups, or individuals least advantaged or most marginalized	The amount of funding directed to the countries, communities, and/or individuals with the greatest need
Local benefits	Resources are distributed in ways that benefit the public goods of local communities, particularly those that are historically marginalized	The extent to which projects financed address immediate and urgent needs that are local in scale to those peoples most disadvantaged
Equality of opportunity	All social groups and states have the capabilities to equitably access institutional structures relevant to the distribution of resources	The extent to which opportunities to compete for resources are distributed equitably

Methods, Limitations, and Findings

We analyzed the documents from the GCF's complete approved project portfolio from 2015–2018, totaling seventy-six projects and programs. The analysis was completed in summer 2018. The funding proposals were publicly accessible versions of project and program proposals available on the GCF's website. We performed text searches on all seventy-six proposals to determine if energy interventions were present within the funding proposals. This identified fifty-one projects containing energy interventions. The gross value of energy interventions throughout the GCF portfolio was US\$ 2.4 billion, or approximately 65 percent of approved GCF funds. We then coded the fifty-one funding proposals containing energy interventions in detail to identify the character and extent of energy interventions, and we developed distinct areas of focus in relation to our three principles of global distributive justice. For the purposes of this analysis, only approved funding from the GCF was included; co-financing amounts as well as disbursed funds are not. GCF funding approved for individual projects spanned a wide range of dollar amounts, from US\$ 5 million (FP075) to US\$ 378 million (FP025) and averaged US\$ 50 million of GCF funds.

The energy interventions throughout the portfolio varied greatly in scope and included, but were not limited to, new construction of renewable energy generation, large-scale dam refurbishment, financing mechanisms for renewable energy market creation, solar pumps and solar-powered irrigation for small farmers, capacity building and technical assistance for energy equipment, financial mechanisms for off-grid electricity access, policy framework development, and programs for energy efficiency measures on public buildings.

Our methods have some limitations. The analysis is focused on approved funding proposals. As projects are implemented, they may be adjusted or cancelled. Moreover, due to the vague and disaggregated nature of some project budgets and funding proposals in general, the overall dollar amounts in this analysis are estimates, not exact figures. The budgets in the funding proposals varied greatly in detail, with some project component costs not specified by line item. If several interventions were present in one project component, but without specific language detailing funding allocation, dollar estimates were equally distributed between the interventions named. We omitted three projects with energy interventions from our budget analysis in which energy constituted only a small part of the project but was not specified with line item costs. Nine of the projects included in this analysis are multicountry programs. Unless specific budget allocations by country were explicitly stated within the project proposal, we categorized all countries as receiving equal funds. Dollars were not double counted in the analysis.

Specific to the global difference principle, the data analyzed were at a country level, which did not account for subnational differences in need. Fourth, specific to the local benefits principle, we classified projects in urban areas that provide renewable energy to existing electricity grids as energy generation and

energy efficiency projects. It is possible that some of these projects have energy access benefits that are not accounted for in our analysis. Thus, rather than a representation of exact dollars spent in local versus global public goods, our categorization offers a means to estimate which types of public goods have been prioritized in the project proposals that have been funded. Table 2 illustrates how we applied the Framework to the GCF energy project portfolio, if we encountered issues with accessing sufficient data to assess each principle, and if our findings suggest the GCF is adhering to principles of global distributive justice.

The Global Difference Principle

In the area of the global difference principle, we sought to assess the extent to which resources have been distributed to maximize the condition of the least well-off humans. Here we assessed relevant data in two main areas for renewable energy. First, we evaluated the extent to which there was prioritization of the most economically disadvantaged countries. Specifically, we compared country income status using World Bank (2018) data in relation to where the projects and dollars were allocated. Our analysis finds that the distribution of dollars for energy projects overall are not reaching the poorest countries around the world. Figure 1 illustrates the distribution of GCF funds for energy interventions in low-, lower-middle-, upper-middle-, and high-income countries. This figure shows that low-income countries were allocated by far the least funding for energy projects.

Second, using IEA and World Bank (2017) data, we evaluated country energy access status in relation to where the projects and dollars were allocated. Specifically, we assessed the funds approved for high-impact-energy countries, where energy access is lowest in absolute terms, versus all other countries for energy interventions within the GCF portfolio. We found that energy funding overall for the twenty high-impact countries did not outpace the average allocation of funding to other countries, despite their specific needs. High-impact countries were allocated only US\$ 369 million, or 15 percent of the energy intervention dollars in the GCF portfolio. This amount accounts for merely 0.6 percent of the annual dollars needed to achieve the UN Sustainable Development Goal of universal energy access by 2030 (IEA 2017).

Overall, based on available data, contrary to the global difference principle, energy funds have not been distributed to maximize the condition of the least well-off humans. Distribution of energy funds by the GCF was predominantly allocated to high- and middle-income countries and did not prioritize countries that lack access to electricity.

The Local Benefits Principle

In relation to the local benefits principle, we assessed the extent to which resources have been distributed in ways that benefit the public goods of local

Table 2

Global Distributive Justice Principles Applied to the Green Climate Fund

<i>Global Distributive Justice Principle</i>	<i>As Applied to GCF Energy Project Portfolio</i>	<i>Are There Readily Available Relevant Data?</i>	<i>Do Data Suggest That the GCF Is Adhering to This Principle in Its Energy Finance Portfolio?</i>
Global difference	Prioritization of most economically disadvantaged countries in terms of projects funded and dollars allocated?	Yes	No
	Prioritization of the countries with the largest population who lack access to electricity in terms of projects funded and dollars allocated?	Yes	No
Local benefits	Prioritization of enhancing energy access across all countries?	Yes	No
	Prioritization of enhancing energy access in low-income countries?	Yes	No
	Prioritization of enhancing energy access in "high-impact" countries?	Yes	Yes
Equality of opportunity	Equitable number of funding proposal submissions across country income categories?	No	N/A
	Equitable number of funding proposal approvals across country income categories?	Yes	No

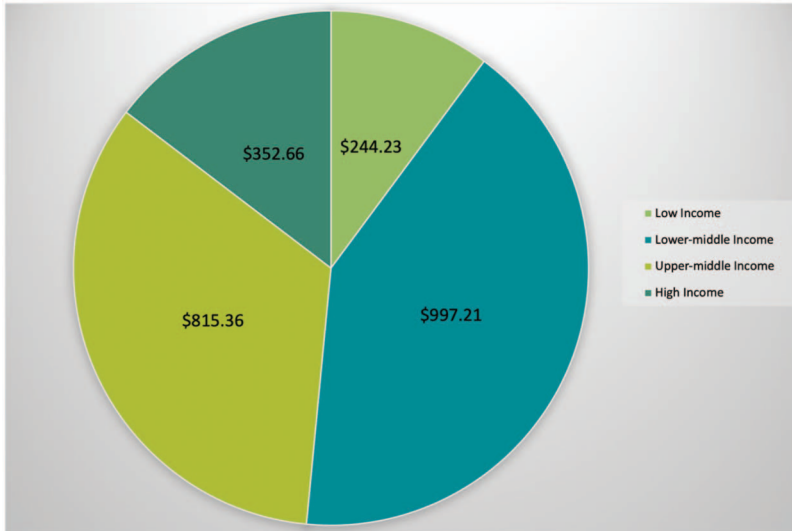


Figure 1
Total Dollar Allocations for Energy Projects by Country Income Group (US\$ mill)

Country income data sourced from World Bank (2018).

communities, particularly those that are historically marginalized. This directed our attention to the types of projects funded, as a proxy for whether or not the funds were oriented toward an activity that would have local benefits. Specifically, we assessed the extent to which the GCF has prioritized enhancing energy access for those deprived of energy services. Energy access has a primary objective of supporting local communities to enhance access to electricity and related development opportunities. While energy access projects may also support global public goods associated with greenhouse gas mitigation, these benefits are limited given that low-income and high-impact countries have very limited greenhouse gas emissions to mitigate. We have used the GCF's definition and tracking method to analyze energy access interventions. The GCF defines energy access as "electricity and/or fuels in people's homes, and in businesses and community services" (GCF 2018a, 14). The GCF specifies that energy access benefits will be tracked "through off-grid energy projects rather than through on-grid" systems (14).

Through our initial reading of project proposals, we identified three broad categories of types of energy interventions: large-scale renewable energy installations intended to replace or upgrade traditional power generation and transmission ("renewable energy generation"); energy efficiency upgrades of buildings, appliances, or community spaces ("energy efficiency"); and provision of new energy access ("energy access"). Following categorization of energy interventions, we individually coded the budget details according to the three categories and

repeated the process as a pair. We compared funding for energy access projects with financing for energy efficiency and renewable energy generation projects. While these projects may provide local public goods, such as contributing to less local pollution, their primary objective and function is to achieve greenhouse gas mitigation, which contributes to the global public good of a stable global climate.

We assessed funding for energy access in three ways. First, we assessed the extent to which the GCF prioritized enhancing energy access across all countries. Energy access interventions were found in twenty-seven of fifty-one funding proposals but received by far the fewest dollars. As shown in Figure 2, only US\$ 352 million, or 15 percent of energy funds, and 9 percent of the total project portfolio from 2015 to 2018, was approved for energy access improvement. Most interventions categorized as energy access were grouped into three primary goals: first, new electrification for the energy poor; second, clean cookstoves; and third, improved agricultural equipment, such as solar-powered water pumps. Only four funding proposals out of fifty-one with energy interventions are primarily concerned with energy access improvements (FP005, FP027, FP070, FP081). The other twenty-three proposals within which energy access interventions appeared only included energy access as portions of the projects.

Renewable energy generation and energy efficiency interventions received the vast majority of funding, accounting for almost US\$ 2 billion, or 85 percent

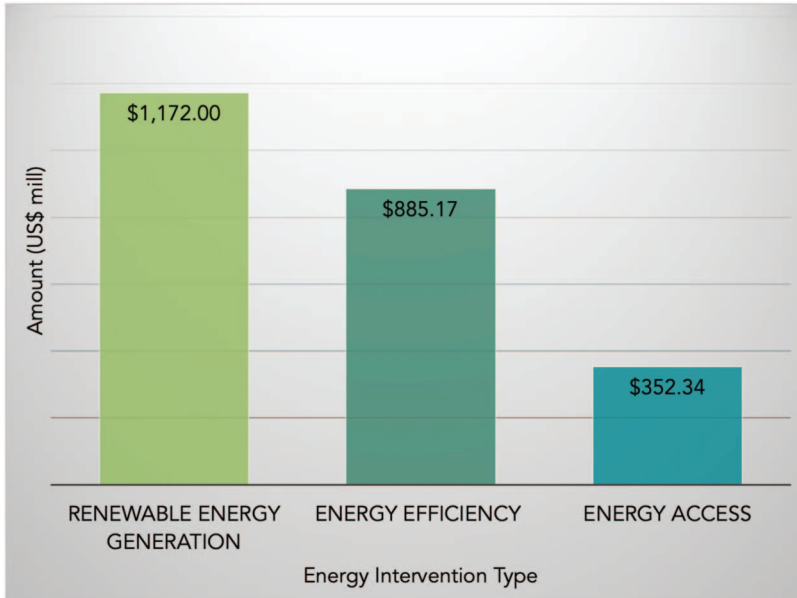


Figure 2

Total Dollar Allocations in the GCF Portfolio for Renewable Energy Generation, Energy Efficiency, and Energy Access Interventions

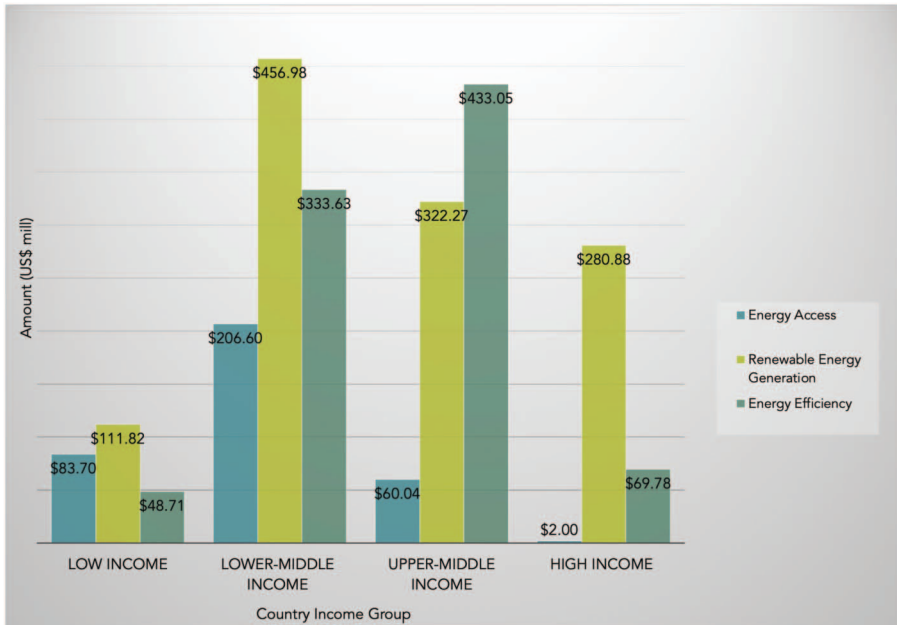


Figure 3

Total Dollar Allocations for Renewable Energy Generation, Energy Efficiency, and Energy Access Interventions by Country Income

Group Country income data sourced from World Bank (2018).

of GCF energy funds. As Figure 3 shows, low-income countries received the fewest dollars for these interventions, a total of US\$ 161 million. These projects were mostly found in middle- or high-income countries that already have a developed energy sector and are focused on improving grid reliability and reducing the carbon intensity of that system. Renewable energy generation interventions were approved for a total of US\$ 1.17 billion. Examples of renewable energy generation projects are those such as proposal number FP017 in Chile and FP039 in Egypt. Both are utility-scale projects with clearly stated goals of large-scale renewable energy deployment through centralized grid systems for greenhouse gas abatement and a pathway to low-carbon development.

Energy efficiency interventions were allocated US\$ 885 million of GCF funds. Several projects in the portfolio targeted energy efficiency measures as their primary goal, and these centered around policy and financial interventions rather than project development. For example, project FP009 in El Salvador aimed to create an investment mechanism to support small and medium enterprises to undertake energy efficiency measures. Three funding proposals combined energy efficiency and energy access interventions. All three projects assisted agricultural communities by targeting the installation of decentralized

energy sources in combination with energy efficiency installations in productive and household energy applications.

Second, we assessed the extent to which the GCF prioritized enhancing energy access in low-income countries specifically. As detailed in Figure 3, energy access is the second most funded activity in low-income countries, after energy generation, but above energy efficiency.

Third, we assessed the extent to which the GCF prioritized enhancing energy access in high-impact countries. Figures 4 and 5 detail the funds approved for high-impact-energy countries versus all other countries for energy interventions within the GCF portfolio. As shown by Figure 4, energy funds allocated to high-impact countries tended to be for energy access purposes. Of the US\$ 369.5 million in funding allocated to high-impact countries, 60 percent was for energy access purposes. Moreover, perhaps unsurprisingly given their particular needs, high-impact countries received more funding for energy access than all other countries. Figure 5 shows the breakdown of dollars approved by energy intervention type for high-impact countries versus all other countries. As previously discussed, renewable energy generation and energy efficiency interventions were the principal energy efforts supported financially within the GCF portfolio and overwhelmingly went to countries that are not high impact. This is to be expected by the overarching goal of greenhouse gas mitigation of these categories. One would not expect high-impact countries with low development and low emissions to require energy retrofits.

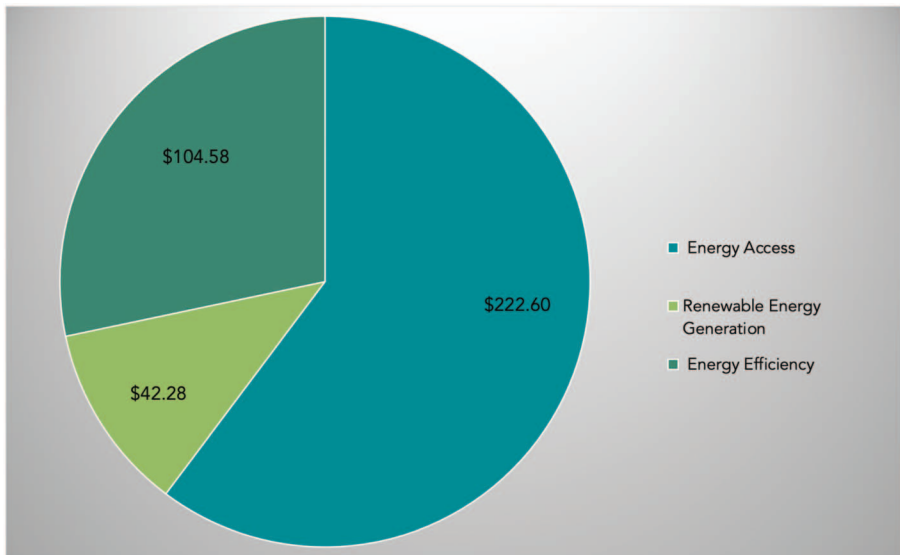


Figure 4

Funds to High-Impact-Energy Countries for Each Energy Intervention Category (US\$ mill)

High-impact country data sourced from IEA and World Bank (2017).

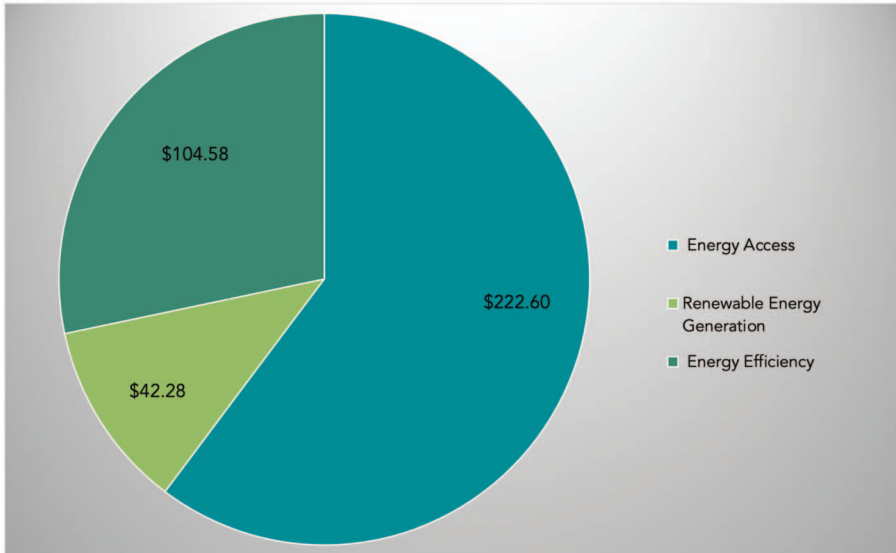


Figure 5
 Funding Allocations for Energy Projects Between High-Impact Countries Versus All Others in the GCF Portfolio

High-impact-energy country data sourced from IEA and World Bank (2017).

Overall, with the exception of relatively small amounts of funding devoted to energy access in high-impact countries, very limited priority has been devoted to energy access.

The Equality of Opportunity Principle

For the equality of opportunity principle, we sought to assess the extent to which all social groups and states, and particularly those that are low income, have the capabilities to equitably access institutional structures relevant to the distribution of resources.

To assess equality of opportunity, we posed two questions. First, is there an equitable number of proposal submissions across country income group categories? In a context of equal opportunities for all countries to participate, we would expect to find a similar number of proposals submitted across income groups. Unfortunately, we were unable to obtain data for those proposals that were submitted but not approved. Despite numerous calls from civil society to increase transparency related to the full funding proposals pipeline, the GCF does not make funding proposals publicly available until they are approved by the Independent Technical Advisory Panel and elevated to the Board of Directors for approval. This means that information about geographic location, project type, sponsoring accredited entity, and funding amount does not

become accessible until the project is fully developed and coming up for approval (GCF 2021). The late stage at which funding proposals are available for public disclosure does not allow a full analysis of how the GCF Secretariat prioritizes and appraises funding proposals. As a result, our answer to this first question is inconclusive.

Second, we asked, is there an equitable number of proposal approvals across country income categories? While we are unable to surmise how many proposals have been rejected, in a context with equal opportunities for all countries to participate, we would expect to find a similar number of proposals approved per country across income category groups. The exception to this is high-income countries, which we would expect to have zero approved proposals, given that GCF funding is not intended for developed countries. As shown in Figure 6, aside from high-income countries, low-income countries accounted for the lowest share of approved proposals, with only 0.6 approved proposals per country (19 approved proposals for 33 countries). This is compared to 0.7 approved proposals per country for lower-middle-income countries (32 approved proposals for 46 countries) and 0.9 approved proposals per country for upper-middle-income countries (47 approved proposals for 55 countries). Notably, upper-middle-income countries account for nearly half of overall approved proposals, despite representing only 21 percent of countries. In sum, the analysis suggests that there may be barriers of opportunity to equitable participation for

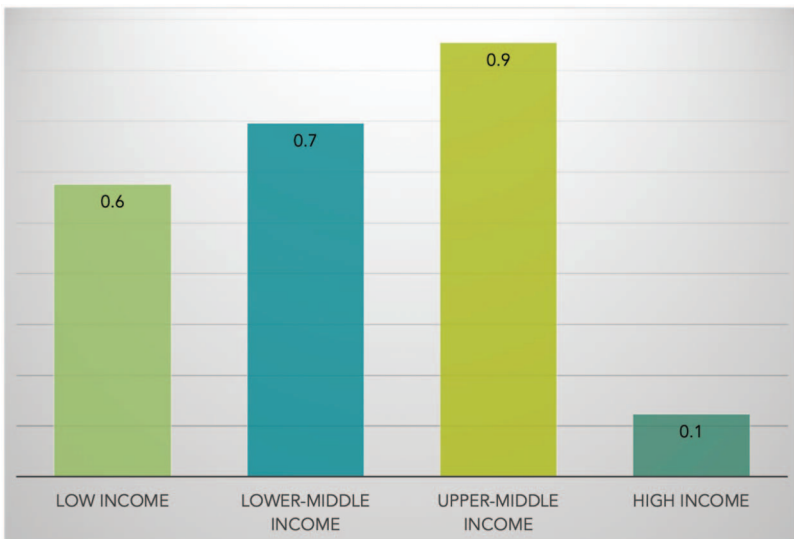


Figure 6

Number of Approved Energy Funding Proposals per Country in Each Income Group

Country income data sourced from World Bank (2018).

low-income countries. However, data gaps regarding rejected proposals make this inconclusive.

Conclusions

We have developed a framework to assess global distributive justice in multilateral development finance for renewable energy. This responds to a need to develop robust, nuanced, and theoretically grounded methodologies and measures of justice in international development and governance. Such frameworks can be built on and customized by international development institutions, states, and civil society organizations to ensure greater accountability to principles of justice and equity in development practices. Without a commitment to utilizing such tools, multilateral development institutions, such as the GCF, may function in ways that are not consistent with hard-fought commitments to equity and justice won by marginalized states and peoples.

In relation to our framework, we found that the countries with the greatest need, including those most economically disadvantaged and those most lacking in energy services, were not prioritized in energy funding allocation by the GCF. As such, at an international scale, the data suggest that the GCF's energy portfolio during the period assessed has not adhered to the global difference principle. This is notable given the explicit commitments of the GCF to prioritize groups like the LDCs and African countries and to catalyze a "paradigm shift" in climate finance.

In terms of the local public goods principle, the results are mixed. One favorable finding is that the locally oriented priority of enhancing energy access was prioritized in the high-impact countries in which energy deprivation is greatest. However, funding to these countries was relatively small overall. Moreover, the GCF's funding practices neglected energy access within low-income countries as well as more broadly across all countries. Perhaps not surprisingly, the more globally oriented activities of energy efficiency and renewable energy generation, which support the donor country priority of greenhouse gas mitigation, received far more overall funding. These findings are particularly striking because, as noted earlier, the GCF is the largest of only two multilateral climate finance institutions that name energy access in their results frameworks, and it is considered to be a leader in climate finance. A tension is evident between prioritizing projects that can achieve significant emission reductions and those projects that provide energy to energy-deprived communities with low greenhouse gas mitigation potential. Importantly, this tension is likely exacerbated by the fact that the two main thematic funding windows of the GCF are adaptation and mitigation, neither of which explicitly targets the issue of energy deprivation.

In relation to the equality of opportunity principle, due to a lack of available data for rejected funding proposals, our analysis is inconclusive about the extent to which there was equal opportunity of participation in terms of funding

proposals submitted across country income groupings. Despite this, the disproportionately low number of approved funding proposals per country in the low-income group suggests potential opportunity gaps for these states. It is perhaps not surprising that upper-middle-income countries received by far the largest share of approved proposals. This could be because these countries tend to have strong institutional capacity combined with large energy footprints and thus high greenhouse gas mitigation potential. It is notable that the GCF has made recent efforts to enhance its support for low-income states. This includes the provision of “readiness support” for LDCs as well as a “Structured Dialogue with Least Developed Countries” in 2018, with the objective of strengthening LDC engagement and capacity with the GCF (GCF 2018b).

Further research is warranted in three main areas. First, beyond the broad international analyses presented in this article, research should assess subnational energy funding dynamics within the GCF. This would create further nuance related to dimensions of distributive (in)justice at the domestic level, such as that related to gender, socioeconomic class, livelihood, and ethnicity. Such an effort would no doubt encounter challenges related to the availability and comprehensiveness of project-level data. Patterns of inequality will continue to be obscured unless institutions like the GCF commit to providing detailed tracking and transparency related to energy and other funded projects at all stages of the proposal and project life cycle.

Additionally, the framework presented in this article should be applied to other multilateral and bilateral institutions that fund energy projects. Such analysis could be coupled with institutional analyses to identify the institutional characteristics that facilitate greater and lesser performance related to global distributive justice. Such knowledge could be useful in guiding or pressuring related institutions to become more effective in advancing justice objectives.

Finally, similar frameworks are needed for other forms of justice at a global level, including procedural, recognition, and capabilities justices. While distributive justice has received the lion’s share of attention in the international aid literature, these other considerations are equally important to evaluate in order to have a comprehensive and nuanced understanding of the extent to which multilateral development finance is ameliorating or reinforcing global relations of inequality.

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