Stockholm Environment Institute

Bridging the gap: finance for energy access in the Green Climate Fund

SEI briefing paper
April 2020

Diana Dorman

David Ciplet

Stockholm Environment Institute
Linnégatan 87D 115 23 Stockholm, Sweden
Tel: +46 8 30 80 44 www.sei.org

Contact: adis.dzebo@sei.org
Editor: Marion Davis
Layout: Richard Clay
Cover photo: Bridge © Joel Vodell / Unsplash

Stockholm Environment Institute is an international non-profit research and policy organization that tackles environment and development challenges.
We connect science and decision-making to develop solutions for a sustainable future for all.
Our approach is highly collaborative: stakeholder involvement is at the heart of our efforts to build capacity, strengthen institutions, and equip partners for the long term.
Our work spans climate, water, air, and land-use issues, and integrates evidence and perspectives on governance, the economy, gender and human health.
Across our eight centres in Europe, Asia, Africa and the Americas, we engage with policy processes, development action and business practice throughout the world.

Contents

Key messages

- There is growing international attention to the need to ensure universal energy access, but large financing gaps remain a major obstacle to achieving that goal.
- Energy access interventions have received significantly less funding from the Green Climate Fund than other types of energy projects that do not explicitly support the energy-poor.
- Energy funding by the Green Climate Fund is also largely neglecting "high-impact" countries most in need of energy access, as well as low-income countries more broadly.
- The Green Climate Fund should enhance project tracking and reporting of energy access projects, pursue targeted initiatives to remove institutional barriers, and provide greater incentives for energy access projects.

Introduction

Access to energy lays the foundations of modern life and is necessary to escape poverty. Yet 840 million people – over 11% of the global population – still lacked access to electricity in 2019.[1] Energy poverty hinders access to health care, reduces education opportunities, increases gender inequality, and limits people's ability to engage in the global economy.[2]

Populations lacking energy access are geographically concentrated: About 80% live in 27 countries[3] – referred to here as "high-impact" countries – mostly in sub-Saharan Africa and South Asia.

The 2030 Agenda for Sustainable Development set universal clean energy access as a development priority for 2015–2030.[4] Sustainable Development Goal 7 is "to ensure access to affordable, reliable, sustainable and modern energy for all" by 2030. However, despite the global attention this issue has received, large financing gaps pose a significant obstacle to universal energy access.[5]

Public climate finance is currently a small portion of sustainable energy finance, but it is recognized as an important catalyst to leverage additional public and private funds to close the energy gap.[6] The Green Climate Fund (GCF), which became operational in 2015, is particularly important in this context. It is the world's newest and largest multilateral climate finance entity, with the mission to support transformative change, including the explicit goal to increase low-emission energy access. It thus has a direct and important role to play in reducing the energy access deficit.[7]

The GCF defines energy access interventions as those that "seek to increase household, community or productive uses of energy by an off-grid, mini-grid or cooking system".[8] Advancing renewable energy access contributes to two core objectives of the Fund: contributing to low-emission development, and aiding in building climate resiliency for the most vulnerable populations.[9]

The GCF categorizes projects within two thematic windows – mitigation or adaptation – or as a combination of both, considered to be "cross-cutting" projects. Though energy access projects often have adaptation benefits, projects that are primarily energy-focused are evaluated within the mitigation window. Improving sustainable energy access is one area of focus (called "impact area") within this window.

Based on an analysis of publicly available documents of all approved GCF Funding Proposals from 2015 to July 2018, this briefing paper examines how much funding is directed to improving

energy access. We find that energy access interventions have received significantly less funding than other forms of energy projects that do not explicitly support the energy-poor. Furthermore, energy funds in the GCF are largely neglecting the high-impact countries, which are most in need of energy access, as well as low-income countries more broadly.

The sustainable energy gap

Decentralized renewable energy technologies are seen as vital to closing the energy gap. To reach universal energy access by 2030 with the least-cost option, an estimated 70% of the households that still lack electricity will need to be served by renewable, off-grid or mini-grid systems.[10] These technologies have advanced immensely since the turn of the century, but energy development is still capital-intensive and thus limited by financial resources.

Estimates of the funding needed to achieve universal access to clean electricity vary greatly, but average US$50 billion per year.[11] This would only constitute 1.7% of annual global energy investments – yet galvanizing financing for energy access is a significant obstacle.[12]

Over 90% of annual global energy investments are made through private sources,[13] which have been slow to fund energy access for those in poor and rural countries, as these projects are seen as low-return, high-cost and high-risk investments.[14] High-impact countries in particular are largely dependent on international public development finance for energy projects.[15]

Public development funds for energy, however, tend to focus on large-scale infrastructure projects that benefit industry and urban population centres. These funds neglect small and rural communities[16] as well as high-impact countries more broadly. In 2015, total public development finance to energy projects amounted to US$20 billion, and less than 20% of that went to projects in high-impact countries.[17] Moreover, between 2011 and 2015, less than 10% of public development funding to support energy access went to sub-Saharan Africa, where the electrification rate is only 43% and needs are thus greatest.[18]

There are several reasons for the slow progress on public financing for energy access. First, providing energy access to rural areas is expensive and logistically difficult, which is why international institutions tend to prioritize larger projects in urban areas. Renewables now account for a greater share of new energy generation than fossil-fuelled projects, but the nature of the funded projects means it is mainly urban populations who are getting electricity, while remote rural communities are left behind. Only 6% of the new energy connections powered by renewables that were made between 2012 and 2015 were from off-grid or mini-grid systems that serve rural populations.[19]

Second, energy finance has prioritized renewable energy projects that maximize greenhouse gas mitigation and meet urban energy needs. Rural communities with significant energy access needs simply do not offer large mitigation benefits, as their emissions are relatively low. The same is true of Least Developed Countries or high-impact countries more generally, as their existing electricity use is limited and dispersed, and they do not have large, energy-intensive industries.[20] Mitigation projects funded by institutions such as the GCF typically prioritize projects with large emission reduction potential, leaving little funding for energy access projects in high-impact countries with small carbon footprints.[21]

Third, funders often cite corruption and a lack of institutional capacity in high-impact countries. The World Bank has argued that the costs of petty corruption in relation to energy are likely to fall disproportionately on the poor. In the cases of India and Bangladesh, losses due to corruption have been blamed for how little funding is left to expand networks and improve access – and for the resulting poor service, blackouts, and high tariffs that the poor cannot afford.[22] To offset losses from corruption, state subsidies may be provided to households who already have electricity, to reduce the cost, while poor households who lack energy access receive fewer social expenditures.

Importantly, analyses of barriers to energy access funding have largely neglected factors within international finance institutions that keep funds from reaching high-impact countries and communities. This calls for a closer examination of the specific funding processes in institutions such as the GCF as potential barriers to achieving universal energy access on the ground.

Despite the funding gaps, energy access trends for both electricity and clean cooking are improving. Electrification rates have increased, from about 60 million new connections gained per year from 2000 to 2012, to 100 million new connections annually from 2012 to 2014,[23] and 135 million new connections per year from 2014 to 2016.[24]

Still, progress is not being made fast enough to achieve Sustainable Development Goal 7 by 2030. If current rates of electrification continue, an estimated 650 million people will still lack access by 2030 – 9 in 10 of them in sub-Saharan Africa.[25] Furthermore, rural populations are lagging far behind urban zones, with 87% of those without electricity living in rural areas.

Analyzing GCF support for energy access projects

We set out to understand how much the GCF and affiliated parties have supported energy access initiatives, and which countries have received funds for energy access improvements. We completed the analysis of the GCF's 76 approved projects in the summer of 2018, reviewing publicly accessible versions of project and program proposals available on the GCF's website.

We performed text searches on all 76 funding proposals to determine whether they included energy interventions, and found 51 that did. We then read the proposals for those 51 projects in detail to identify the character and extent of energy interventions. Through this initial reading, we identified three broad categories 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").

We then coded the budget details according to the three categories, repeating the process twice, once with a different researcher. For the purposes of this analysis, we counted only approved funding from the GCF itself, not co-financing amounts or disbursed funds. Finally, we compared the results in relation to country income data from the World Bank and country energy access data from the International Energy Agency and the World Bank. This allowed us to determine whether GCF funds were going to low-income and high-impact countries.

This analysis has limitations. First, because it is based on approved funding proposals, it does not reflect whether, as projects were implemented, they were adjusted or cancelled. Second, 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 proposals varied greatly in detail, with some 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. Dollars were not double-counted for energy interventions. 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 multi-country programmes. Unless specific budget allocations by country were explicitly stated within the project proposal, we categorized all countries as receiving equal funds. 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 these projects have energy access benefits that are not accounted for in our analysis.

Findings

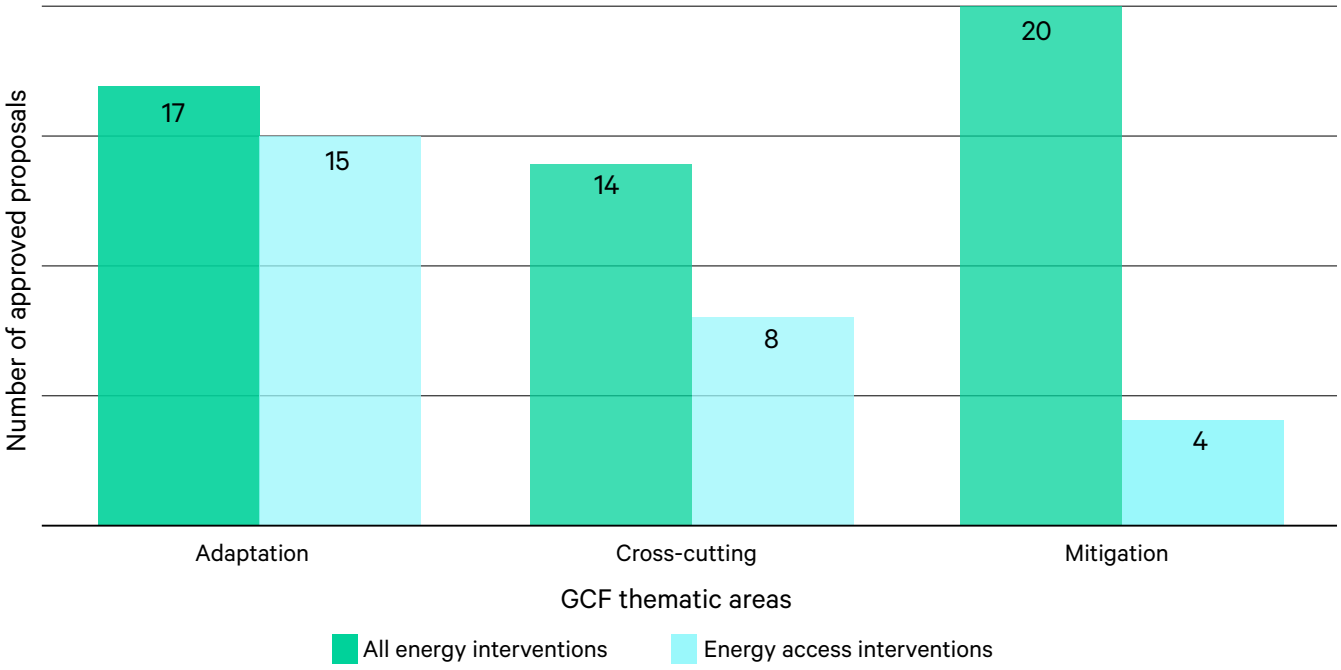
Summary of energy proposals in the GCF

The GCF portfolio in July 2018 totalled US$3.7 billion in funding approved by the Green Climate Fund Board, and an additional US$9.7 billion from co-financing. This amounted to US$13 billion of combined financing for climate projects.[26] GCF funding approved for individual projects spanned a wide range, from US$5 million (FP075) to US$378 million (FP025), and averaged US$50 million of GCF funds.

Of the 51 proposals that included energy interventions, the 48 project budgets included in the analysis constitute about 80% of the approved portfolio. The energy interventions within the portfolio varied greatly in scope, including – but 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 programmes for energy efficiency measures on public buildings.

We found a majority of the approved proposals with energy access interventions were within adaptation projects rather than in mitigation projects, as shown in Figure 1.

Figure 1: Number of approved funding proposals with energy interventions by thematic area. Note that adaptation projects featured more energy access interventions than mitigation or cross-cutting projects.



Renewable energy generation and energy efficiency

The gross value of energy interventions throughout the GCF portfolio was US$2.4 billion, about 65% of approved GCF funds. Renewable energy generation and energy efficiency interventions received the vast majority of funding – almost US$2 billion, or 85% of GCF energy funds (Figure 2). Renewable energy generation interventions were approved for a total of US$1.17 billion, and energy efficiency interventions were allocated US$885 million of GCF funds.

Energy efficiency interventions were included in 16 proposals, often combined with renewable energy generation interventions. These projects tended to focus on middle- or high-income countries that already have a developed energy sector and are focused on improving reliability and reducing the carbon intensity of that system.

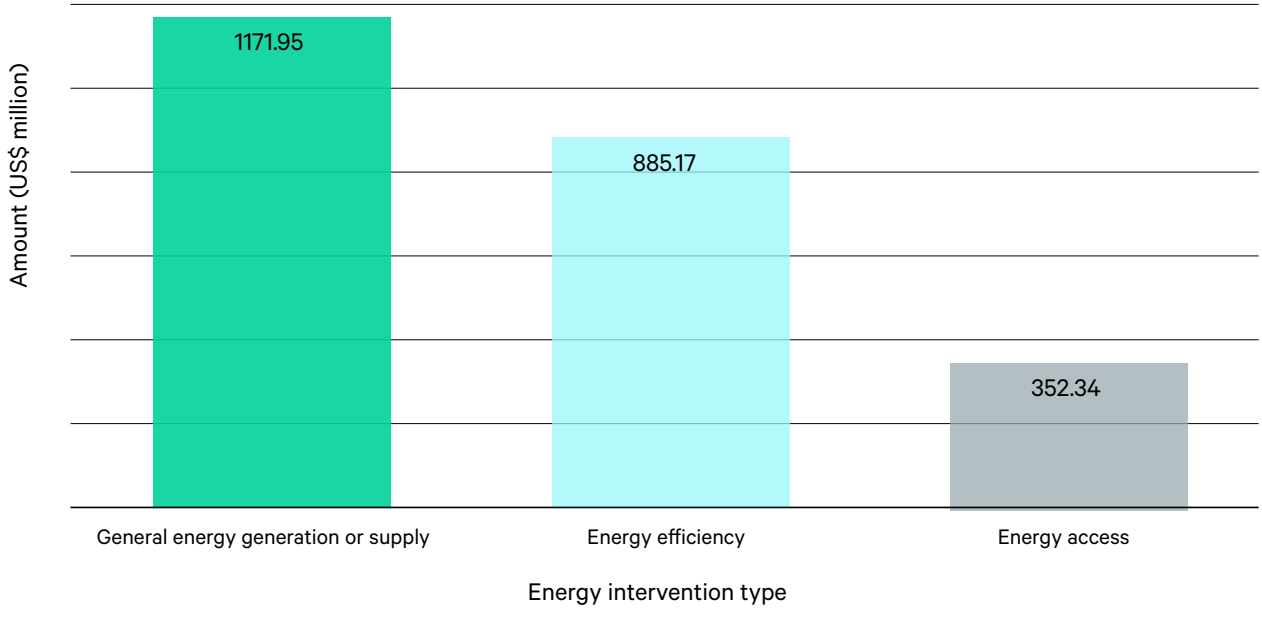
Several projects in the portfolio targeted energy efficiency measures as their primary goal, and these centred on policy and financial interventions, rather than project development. For example, project FP009 in El Salvador aimed to create an investment mechanism to help small and medium enterprises (SMEs) undertake energy efficiency measures.

Three proposals combined energy efficiency and energy access interventions. All three aimed to help agricultural communities by targeting the installation of decentralized energy sources in combination with energy efficiency installations in productive and household energy applications.

Renewable energy generation interventions received the most funding, totalling US$1.17 billion (Figure 2). Ten of the 20 renewable energy generation proposals featured this type of intervention as the primary energy focus, while the remaining 10 were more varied in project goals and combined with either energy efficiency or energy access components.

Examples of renewable energy generation projects include FP017 in Chile and FP039 in Egypt, both 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. These projects have strong fiduciary support in the GCF project portfolio and represent numerous projects approved by the GCF Board. Similar to the trend seen in the energy efficiency projects, these proposals tend to be in middle- or high-income countries with power sectors that are already developed and are key to avoiding climate change.

Figure 2: Total dollar allocations for renewable energy generation, energy efficiency and energy access interventions.



Energy access interventions

Energy access interventions were included in proposals, but received by far the fewest dollars – only US$352 million, or 14% of the total allocated to energy interventions (Figure 2), or 9% of the total project portfolio. Most interventions categorized as energy access were grouped into three primary goals; 1) new electrification for the energy poor, 2) clean cookstoves, and 3) improved agricultural equipment such as solar-powered water pumps.

Only four funding proposals were primarily concerned with energy access improvements (FP005, FP027, FP070, FP081). The other 23 proposals that included energy access interventions only presented them as portions of larger projects.

Which countries are receiving financing for energy projects?

Energy projects and interventions made up a significant portion of the GCF project portfolio, but for the most part, the funds allocated to these energy projects are not reaching the poorest or high-impact energy countries. Figure 3 illustrates the overall dollar distribution of GCF funds for energy interventions in low-, lower-middle-, upper-middle-, and high-income countries. Middle-income countries received by far the most funding for energy interventions within the GCF portfolio, about US$1.8 billion. Energy efficiency and renewable energy generation projects received almost equal funding in the two middle-income country categories. The energy projects in high-income countries were mostly for renewable energy generation interventions, and total almost US$353 million across all energy intervention types. Low-income countries received the fewest dollars for these interventions, a total of US$244 million.

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, but were overall much lower than energy funds approved for other countries.

Figure 5 breaks down the dollars approved by energy intervention type for high-impact countries vs. 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 suggests the GCF has prioritized greenhouse gas mitigation over energy access. One would not expect high-impact countries with low development and low emissions to require energy retrofits, and these countries offer limited greenhouse gas mitigation benefits. High-impact countries were only allocated US$369 million, or 15% of the energy intervention dollars in the GCF portfolio. This amount accounts for merely 0.6% of the annual dollars needed to achieve the Sustainable Development Goal of universal energy access by 2030.

Figure 3: Dollars allocated to each income group for each energy intervention type. Country income data from the World Bank.[27]

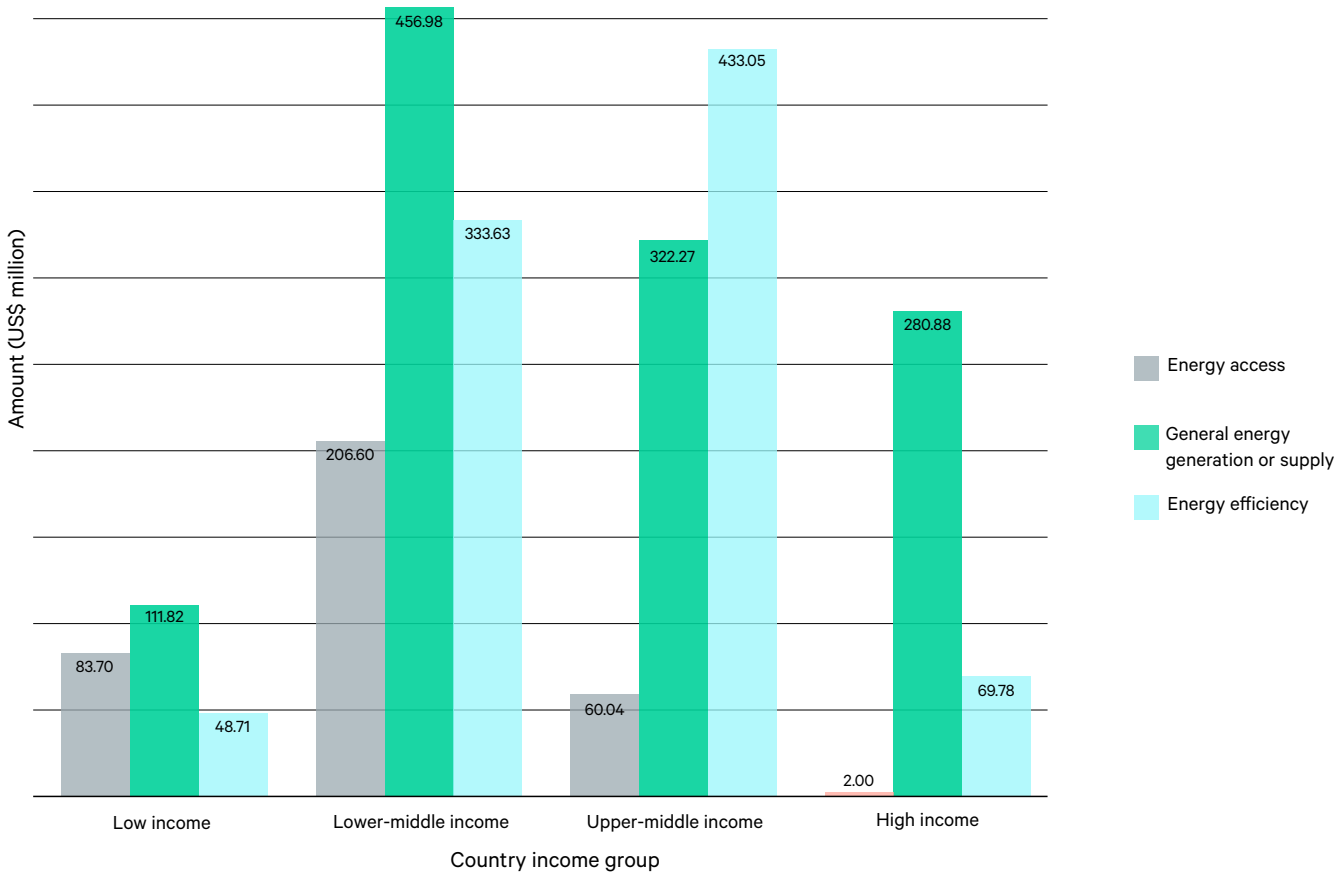


Figure 4: Funds to high-impact energy countries for each energy intervention category.[28]

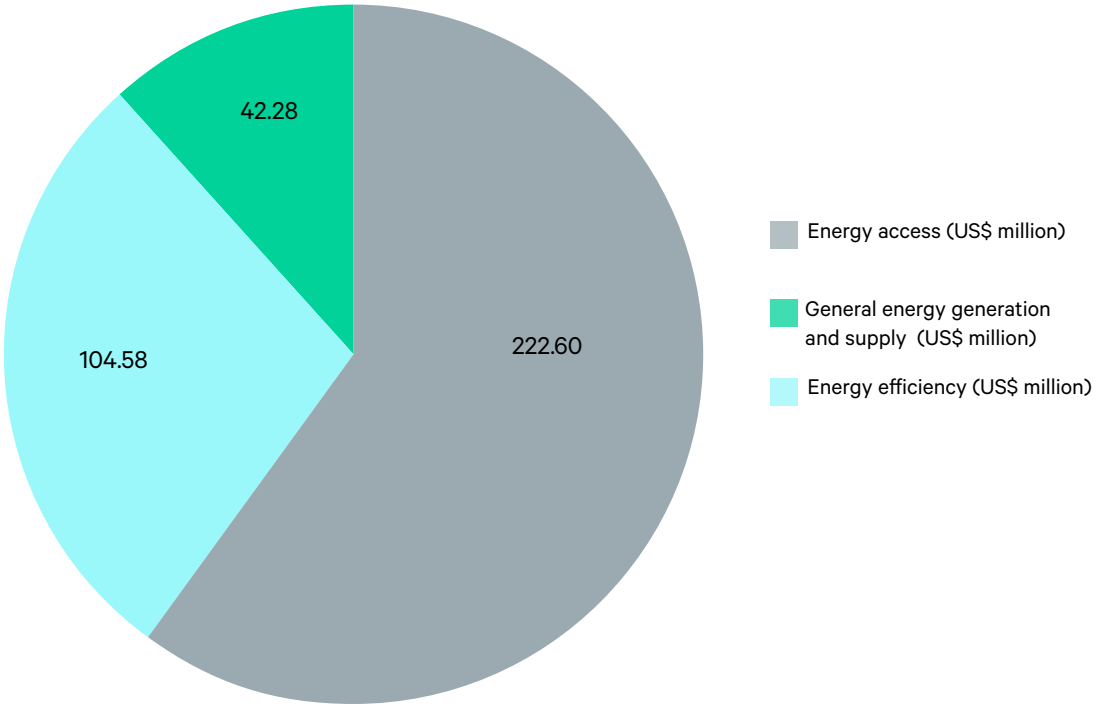
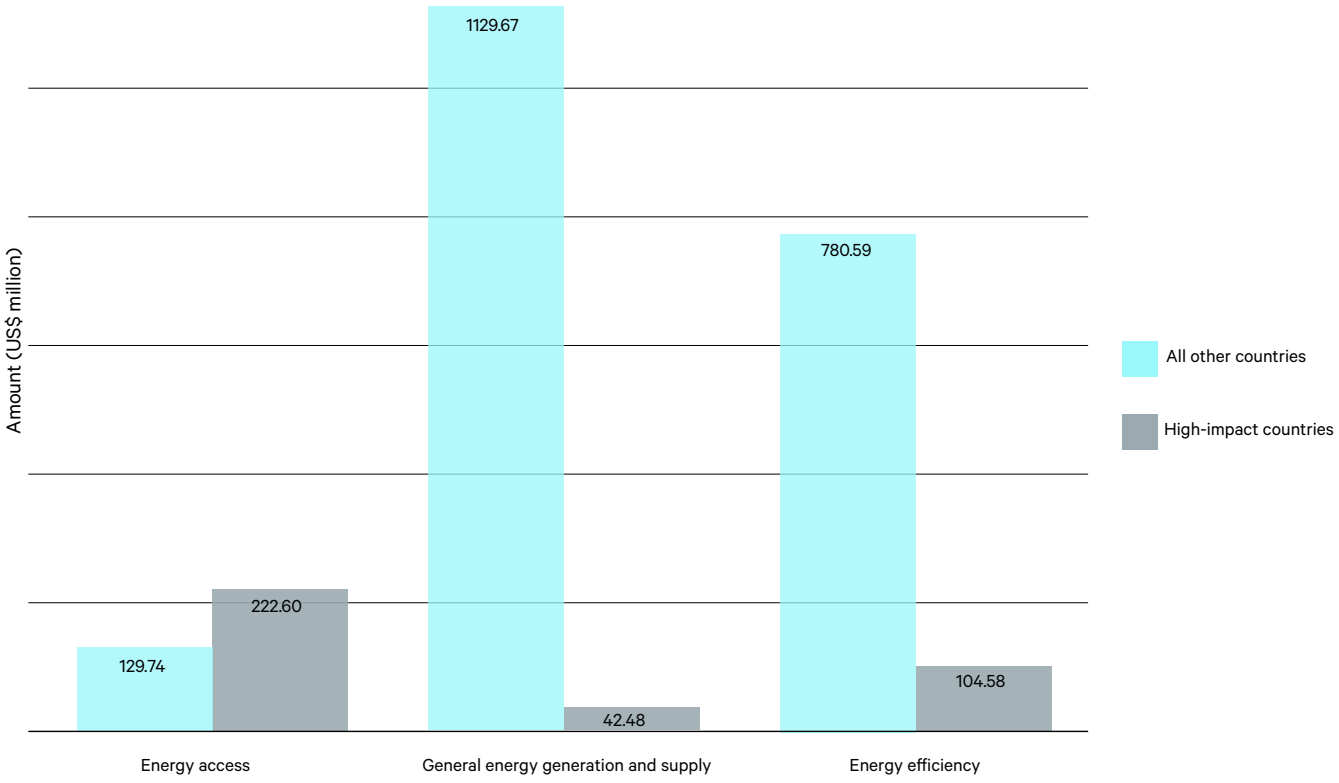


Figure 5: Funding allocations for energy projects between high-impact countries versus all other in the GCF portfolio.[29]



Conclusions and policy recommendations

The analysis finds that only 15% of approved GCF funding for energy-related projects, and 9% of the total project portfolio from 2015 to 2018, focused on improving energy access. Moreover, high-impact energy countries received only 14% of energy funds over that three-year period, accounting for less than 1% of the funding needed annually to achieve universal energy access.

The distribution of energy funds by the GCF clearly favours non-high-impact countries, and is mainly benefiting high- and middle-income countries. The analysis further suggests that despite the GCF's commitment to improving energy access, such projects are underrepresented in the project portfolio. The GCF is doing relatively little to advance low-carbon development in the large number of neglected communities that lack access to clean and affordable energy.

These findings are particularly striking because, as noted in the introduction, 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 renewable energy and energy efficiency projects that can achieve significant emission reductions, and those small-scale and decentralized projects that provide energy to high-impact communities with low greenhouse gas mitigation potential.

Our analysis also found a lack of clear definitions in relation to energy access projects as well as insufficient data to assess the expected energy access benefits. A majority of energy access interventions were included within adaptation projects, and co-benefits were not highlighted. Mitigation projects, meanwhile, included very few energy access interventions, suggesting that energy access benefits are not highlighted properly within the GCF project categories. A lack of focus on energy access within project categories can signal to affiliated project developers that energy access is not a priority of the GCF.

In addition, the smaller share of energy access projects within the mitigation thematic window as compared with the adaptation window is likely due to inadequate performance metrics. Specifically, with a focus on greenhouse gas reduction, the metrics neglect social and economic contributions to energy poor communities with small carbon footprints.

We propose two main strategies that the GCF should pursue in order to address the current energy access funding deficit, particularly in high-impact countries. First, the GCF should enhance project tracking and reporting of energy access projects. Transparency regarding funding to energy access is hindered due to a lack of project categorization definitions related to energy access and insufficient information provided in project proposals and annual reports to assess energy access benefits. The following measures would enhance transparency:

- Establish a detailed and uniform definition for energy access projects, comparable to those provided for other energy and adaptation project categories.
- Establish subcategories of distinct forms of energy access projects (grid vs. off-grid, agricultural support, public buildings, etc.).
- Require funding proposals to detail any energy access benefits, consistent with definitions.
- Provide detailed data in annual reports on overall progress toward energy access targets, project dollars supporting distinct energy access project types, and funding to projects in high-impact countries.

Second, the GCF should pursue targeted initiatives to remove institutional barriers currently inhibiting energy access finance, and provide greater incentives. Current institutional obstacles include evaluation criteria in the mitigation and adaptation funding windows that do not sufficiently reward energy access benefits.

Notably, some energy access projects will not significantly reduce emissions, particularly in high-impact energy countries and rural areas. However, these energy access is still crucial for equitable development, and these projects would ensure that it is provided by low-carbon sources. Thus, they should still be encouraged by the evaluation criteria. However, the current support structures and incentives for energy access proposal development are inadequate. We recommend the following measures:

- Develop explicit requests for proposals for renewable energy access-focused projects, including those with low greenhouse gas mitigation potential.
- Enhance support structures for renewable energy access proposal development, including financial and capacity-building support.
- Conduct a review to evaluate the extent to which the criteria set in both the mitigation and adaptation windows create obstacles for energy access projects, and evaluate potential incentives to create greater balance between types of energy projects financed.
- Make related changes to facilitate more favourable evaluation of energy access projects, including those that have limited greenhouse gas mitigation potential and that pose greater financial, capacity or technical barriers.

Acknowledgements: The authors would like to thank Emily Schaldach for her support in the coding of GCF projects. We'd also like to thank Adis Dzebo, Kevin Adams and the anonymous reviewers for their excellent input and support in developing this project.

Endnotes

1. IEA, IRENA, UNSD, WB and WHO (2019). *Tracking SDG 7: The Energy Progress Report 2019*. International Energy Agency, International Renewable Energy Agency, United Nations Statistics Division, World Bank, and World Health Organization, Washington, DC. https://www.worldbank.org/en/topic/energy/publication/tracking-sdg7-the-energy-progress-report-2019.

2. Mulugetta, Y., Ben Hagan, E. and Kammen, D. (2019). Energy access for sustainable development. *Environmental Research Letters*, 14(2). 020201. DOI:10.1088/1748-9326/aaf449.

3. *The Global Tracking Framework 2017* focuses particular attention on the 20 countries "with the highest absolute gaps in access to electricity and/or clean fuels and technologies for cooking, measured by population".

   The 20 "high-impact" countries with the greatest electricity access deficits are: India, Nigeria, Ethiopia, Democratic Republic of 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.

   The 20 "high-impact" countries with the greatest clean cooking access deficits are: India, China, Nigeria, Bangladesh, Indonesia, Pakistan, Ethiopia, Democratic Republic of Congo, Philippines, United Republic of Tanzania, Myanmar, Vietnam, Kenya, Uganda, Sudan, Afghanistan, Mozambique, Democratic People's Republic of Korea, Madagascar and Ghana.

   See: IEA and World Bank (2017). *Global Tracking Framework 2017 – Progress Toward Sustainable Energy*. International Energy Agency and World Bank, Washington, DC. https://trackingsdg7.esmap.org/downloads.

4. See https://sustainabledevelopment.un.org.

5. Chirambo, D. (2018). Towards the achievement of SDG 7 in sub-Saharan Africa: Creating synergies between Power Africa, Sustainable Energy for All and climate finance in-order to achieve universal energy access before 2030. *Renewable and Sustainable Energy Reviews*, 94. 600–608. DOI:10.1016/j.rser.2018.06.025.

   See also: Kaijage, E., Nyagawa, S., Best, S., Cosmas, R., Temba, S., Mtwanga, B. and Mahanga, N. (2017). *Money Is Power: Tracking Finance Flows for Decentralised Energy Access in Tanzania*. IIED Working Paper. International Institute for Environment and Development, London. https://pubs.iied.org/16623IIED/.

6. See Chirambo (2018), Towards the achievement of SDG 7 in sub-Saharan Africa. Also:

   Akbar, S. and Kleinman, G. (2017). *The Climate Change–Energy Access Nexus*. World Bank Group, Washington, DC. http://documents.worldbank.org/curated/en/465151494924794652/The-climate-change-energy-access-nexus.

   Rai, N., Best, S. and Soanes, M. (2016). *Unlocking Climate Finance for Decentralised Energy Access*. IIED Working Paper. International Institute for Environment and Development, London. https://pubs.iied.org/16621IIED/.

   Bhattacharyya, S. C. (2013). Financing energy access and off-grid electrification: A review of status, options and challenges. *Renewable and Sustainable Energy Reviews*, 20. 462–72. DOI:10.1016/j.rser.2012.12.008.

7. See, e.g., Rai et al. (2016), *Unlocking Climate Finance for Decentralised Energy Access*.

   For an overview of the GCF portfolio, see: GCF (2019). *Status of the GCF Portfolio: Approved Projects and Fulfilment of Conditions*. GCF/B.23/Inf.12. Green Climate Fund, Incheon. https://www.greenclimate.fund/document/gcf-b23-inf12.

8. GCF (2018). *Update on the Further Development of Some Indicators in the Performance Measurement Frameworks*. GCF/B.20/Inf.01. Green Climate Fund, Incheon. https://www.greenclimate.fund/document/gcf-b20-inf01.

9. UNFCCC (2011). *Governing Instrument for the Green Climate Fund*. FCCC/CP/2011/9/Add.1 No. Decision 3/CP.17. United Nations Framework Convention on Climate Change, Durban, South Africa. https://www.greenclimate.fund/document/governing-instrument.

   For an analysis of how this applies in practice, see, e.g., Sharma, V. (2019). Access for adaptation? Reviewing the linkages between energy, disasters, and development in India. *Energy Research & Social Science*, 52. 10–19. DOI:10.1016/j.erss.2019.01.025.

10. IEA (2017). *Energy Access Outlook 2017: From Poverty to Prosperity*. International Energy Agency, Paris. https://doi.org/10.1787/9789264285569-en.

    IRENA (2017). *REthinking Energy 2017: Accelerating the Global Energy Transformation*. International Renewable Energy Agency, Abu Dhabi. https://www.irena.org/publications/2017/Jan/REthinking-Energy-2017-Accelerating-the-global-energy-transformation.

11. Authors' analysis based on estimates in:

    IEA and World Bank (2017). *Global Tracking Framework 2017*.

    IEA (2017). *Energy Access Outlook 2017*.

SEforAll (2017). *Missing the Mark – Gaps and Lags in Disbursement of Development Finance for Energy Access 2017*. Energizing Finance series. Sustainable Energy for All, Washington, DC. https://www.seforall.org/publications/energizing-finance-missing-the-mark-gaps-and-lags-in-disbursement-of-development.

Craine, S., Mills, E. and Guay, J. (2014). *Clean Energy Services for All: Financing Universal Electrification*. Sierra Club, San Francisco, CA, and Washington, DC. https://www.sierraclub.org/sites/www.sierraclub.org/files/0747_Clean_Energy_Services_Report_03_web.pdf.

12. World Bank (2017). *State of Electricity Access Report 2017*. ESMAP Paper 114841. Washington, DC. https://www.worldbank.org/en/topic/energy/publication/sear.

    IEA (2017). *Energy Access Outlook 2017*.

    IRENA (2017). *REthinking Energy 2017*.

    Bhattacharyya (2013). Financing energy access and off-grid electrification.

13. IRENA and CPI (2018). *Global Landscape of Renewable Energy Finance*. International Renewable Energy Agency and Climate Policy Initiative, Abu Dhabi. https://www.irena.org/publications/2018/Jan/Global-Landscape-of-Renewable-Energy-Finance.

14. Meltzer, J. P. (2018). *Blending Climate Funds to Finance Low-Carbon, Climate-Resilient Infrastructure*. Global Economy & Development Working Paper 120. Brookings Institution, Washington, DC. https://www.brookings.edu/research/blending-climate-funds-to-finance-low-carbon-climate-resilient-infrastructure/.

    Akbar and Kleinman (2017). *The Climate Change–Energy Access Nexus*.

    Wilson, E., Rai, N. and Best, S. (2014). *Sharing the Load: Public and Private Sector Roles in Financing pro-Poor Energy Access*. IIED Discussion Paper. International Institute for Environment and Development, London. https://pubs.iied.org/16560IIED/.

    Bhattacharyya (2013). Financing energy access and off-grid electrification.

15. SEforALL, CPI and World Bank (2017). *Understanding the Landscape – Tracking Finance for Electricity and Clean Cooking Access in High-Impact Countries 2017*. Sustainable Energy for All, Climate Policy Initiative and World Bank, Washington, DC. https://www.seforall.org/publications/energizing-finance-understanding-the-landscape-2017.

16. Akbar and Kleinman (2017). *The Climate Change–Energy Access Nexus*.

    Rai et al. (2016). *Unlocking Climate Finance for Decentralised Energy Access*.

    Bhattacharyya (2013). Financing energy access and off-grid electrification.

17. SEforAll (2017). *Missing the Mark*.

18. IEA (2017). *Energy Access Outlook 2017*.

    SEforAll (2017). *Missing the Mark*.

19. IEA (2017). *Energy Access Outlook 2017*.

20. De Lopez, T., Tin, P., Iyadomi, K., Santos, S. and McIntosh, B. (2009). Clean Development Mechanism and Least Developed Countries: Changing the Rules for Greater Participation. The Journal of Environment & Development, 18(4). 436–52. DOI:10.1177/1070496509347744.

21. SEforAll (2017). *Missing the Mark*. See also:

    Brechin, S. R. and Espinoza, M. I. (2017). A case for further refinement of the Green Climate Fund's 50:50 ratio climate change mitigation and adaptation allocation framework: toward a more targeted approach. *Climatic Change*, 142(3–4). 311–20. DOI:10.1007/s10584-017-1938-8.

22. Lovei, L. and McKechnie, A. (2010). *The Costs of Corruption for the Poor: The Energy Sector*. Report No. 26833. World Bank, Washington, DC. http://documents.worldbank.org/curated/en/343191468762311247/The-costs-of-corruption-for-the-poor-the-energy-sector.

23. IEA (2017). *Energy Access Outlook 2017*.

24. IEA, IRENA, UNSD, WB and WHO (2018). *Tracking SDG 7: The Energy Progress Report 2018*. International Energy Agency, International Renewable Energy Agency, United Nations Statistics Division, World Bank, and World Health Organization, Washington, DC. http://documents.worldbank.org/curated/en/495461525783464109/Tracking-SDG7-the-energy-progress-report-2018.

25. IEA et al. (2019). *Tracking SDG 7*.

26. GCF (2018). *Status of the GCF Portfolio: Approved Projects and Fulfilment of Conditions*. GCF/B.20/Inf.06. Green Climate Fund, Incheon. https://www.greenclimate.fund/document/gcf-b20-inf06.

27. See World Bank Country and Lending Groups guide: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

28. High-impact country data sourced from: IEA and World Bank (2017). *Global Tracking Framework 2017*.

29. High-impact country data sourced from: IEA and World Bank (2017). *Global Tracking Framework 2017*.

Visit us

SEI Headquarters
Linnégatan 87D Box 24218
104 51 Stockholm Sweden
Tel: +46 8 30 80 44
info@sei.org

Måns Nilsson
Executive Director

SEI Africa
World Agroforestry Centre
United Nations Avenue
Gigiri P.O. Box 30677
Nairobi 00100 Kenya
Tel: +254 20 722 4886
info-Africa@sei.org

Philip Osano
Centre Director

SEI Asia
10th Floor, Kasem Uttayanin Building,
254 Chulalongkorn University,
Henri Dunant Road, Pathumwan, Bangkok,
10330 Thailand
Tel: +66 2 251 4415
info-Asia@sei.org

Niall O'Connor
Centre Director

SEI Tallinn
Arsenal Centre
Erika 14, 10416
Tallinn, Estonia
Tel: +372 6276 100
info-Tallinn@sei.org

Lauri Tammiste
Centre Director

SEI Oxford
Florence House 29 Grove Street
Summertown Oxford
OX2 7JT UK
Tel: +44 1865 42 6316
info-Oxford@sei.org

Ruth Butterfield
Centre Director

SEI US
Main Office
11 Curtis Avenue
Somerville MA 02144-1224 USA
Tel: +1 617 627 3786
info-US@sei.org

Michael Lazarus
Centre Director

SEI US
Davis Office
400 F Street
Davis CA 95616 USA
Tel: +1 530 753 3035

SEI US
Seattle Office
1402 Third Avenue Suite 900
Seattle WA 98101 USA
Tel: +1 206 547 4000

SEI York
University of York
Heslington York
YO10 5DD UK
Tel: +44 1904 32 2897
info-York@sei.org

Sarah West
Centre Director

SEI Latin America
Calle 71 # 11–10
Oficina 801
Bogota Colombia
Tel: +57 1 6355319
info-LatinAmerica@sei.org

David Purkey
Centre Director

SEI Stockholm Environment Institute

sei.org

@SEIresearch @SEIclimate