ASSESSMENT OF OPPORTUNITIES FOR USAID TO DEEPEN CLIMATE FINANCE SUPPORT FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY IN DEVELOPING COUNTRIES

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# List of Acronyms

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<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>BNEF</td>
<td>Bloomberg New Energy Finance</td>
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<tr>
<td>CEADIR</td>
<td>Climate Economic Analysis for Development, Investment and Resilience</td>
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<td>CEIA</td>
<td>Clean Energy Investment Accelerator</td>
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<td>CPI</td>
<td>Climate Policy Initiative</td>
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<td>DFC</td>
<td>Development Finance Corporation</td>
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<td>DFI</td>
<td>development finance institution</td>
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<td>DIV</td>
<td>Development Innovation Ventures</td>
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<td>GCF</td>
<td>Global Climate Fund</td>
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<td>GEF</td>
<td>Green Environment Facility</td>
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<td>GHG</td>
<td>greenhouse gas</td>
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<td>IEA</td>
<td>International Energy Agency</td>
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<td>International Finance Corporation</td>
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<td>IRENA</td>
<td>International Renewable Energy Agency</td>
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<tr>
<td>LTS</td>
<td>long-term strategy</td>
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<td>MDB</td>
<td>multilateral development bank</td>
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<td>NDC</td>
<td>Nationally Determined Contribution</td>
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<td>PPA</td>
<td>power purchase agreement</td>
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<td>REC</td>
<td>Renewable Energy Certificate</td>
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<td>REN21</td>
<td>Renewable Energy Policy Network for the 21st Century</td>
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<td>SMEs</td>
<td>small and medium enterprises</td>
</tr>
</tbody>
</table>
# Table of Contents

1 Executive Summary ..........................................................................................................................1

2 Introduction ....................................................................................................................................10

3 Recent Events and Trends Affecting Climate and Clean Energy Finance.................................13

   COVID-19 and Public Funding ........................................................................................................13
   COVID-19, Energy Demand, and Clean Energy Investment .................................................................14
   Technology and Business Model Innovations ....................................................................................16
   Climate Risks Awareness and Investors .............................................................................................18
   Trends in Sustainable Debt ................................................................................................................18
   Corporate Clean Energy Targets and Global Supply Chains .................................................................19
   Integrated Climate and Economic Recovery Approaches .................................................................21
   Coal Project Pipelines ........................................................................................................................24
   Climate Finance and People-Centered Transitions ..........................................................................25

4 Ten Clean Energy Investment Mobilization Levers for USAID to Enhance Climate Finance Flows ..................................................................................................................................26

   Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing ......31
   Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance. 38
   Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity 41
   Lever Four: Development of Public and Infrastructure Investments for Sustained Growth .........................43
   Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment 46
   Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities ...........................................49
   Lever Seven: Establishment of Market-based Mechanisms to Improve Project Profitability .................50
   Lever Eight: Capacity Development for Entrepreneurs to Drive Technology and Business Model Innovation ........................................................................................................................................54
   Lever Nine: Support to the Financial Sector to Develop Green Finance Products and Regulations .........57
   Lever Ten: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment ... 60

5 Cross-Cutting Recommendations .....................................................................................................62

   Increase Climate Finance Expertise in USAID..................................................................................62
   Explore Opportunities for Greater Collaboration ..............................................................................62
   Carefully Consider Energy Efficiency Support Programs and Potential Interactions with Energy Access and Renewable Energy Deployment ..................................................................................63
   Recognize the Need for Broader Sectoral Reforms ..........................................................................64
   Integrate Climate Finance Considerations with Technical Assistance and Capacity Development Programs .........................................................................................................................65
   Formulate People-Centered Transition Approaches ..........................................................................65
   Explore Opportunities to Enhance Tracking of Climate Finance Impacts ...........................................65

6 Assessing Opportunities and Measuring Impact ............................................................................67

   Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing ......68
   Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance. 68
   Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity ..........................................................................................................................68
   Lever Four: Development of Public and Infrastructure Investments for Sustained Growth .........................69
   Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment 69
   Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities
7 Conclusions and Areas for Further Research
References
Appendix 1: List of Interviewees
Appendix 2: Workshop Participants
List of Figures

Executive Summary Figure 1. Entrepreneur-centric approach for climate finance ........................................ 3
Executive Summary Figure 2. Relative focus of USAID clean energy climate finance levers .......................... 5
Figure 1. Entrepreneur-centric approach for climate finance .............................................................................. 5
Figure 2. Global investment in clean energy and low-carbon technologies (Source: IEA World Energy Investment 2021) .................................................................................................................................. 12
Figure 3. Global investment in end-use and energy efficiency compared with annual average investment needs, 2025-2030, by scenario (Source: IEA World Energy Investment 2021) .................................................................................................................................. 15
Figure 4. Annual sustainable debt issuance by type (in $USD billions) (Source: BNEF 2021) ......................... 19
Figure 5. Global corporate PPA volumes, by region (Source: BNEF 26 January 2021) ................................. 20
Figure 6. Projected renewable shortfall for RE100 members (left) and renewable shortfall for the RE100, by region (right) (Source: BNEF 26 January 2021) ........................................... 20
Figure 7. Green recovery spending as a function of total spending and percent gross domestic product (Source: Callaghan and Murdock 2021) ................................................................................................................................. 23
Figure 8. Green recovery spending by technology and economy type (Source: Callaghan and Murdock 2021) ......................................................................................................................................... 24
Figure 9. Draft framework for implementing an enhanced climate finance strategy ......................................... 27
Figure 10. USAID clean energy climate finance levers by type and focus ......................................................... 28
Figure 11. High-impact opportunities for clean energy blended finance (Source: CPI 2018) ....................... 37
Figure 12. Building blocks to support energy efficiency market transformation (Source: McNeil 2020). .................... 40
Figure 13. Job creation per million dollars of capital investment in clean energy technologies (Source: IEA Sustainable Recovery 2020) ................................................................................................................. 44
Figure 14. Debt forgiveness via reverse auction and carbon bonus (Source: Bodnar et al. 2020) ................. 48
Figure 15. Voluntary REC prices (Source: Antoniou 2021/NREL) ................................................................. 52
Figure 16. RECs by region (Source: Antoniou BNEF 2021) .............................................................................. 52
Figure 17. Draft schematic for the Global Clean Tech Innovation Network (Source: NREL 2021) .. 57

List of Tables

Executive Summary Table 1. Project Portfolio Levers, Barriers Addressed, and Innovative Measures ................................................................. 5
Executive Summary Table 2. Policy and Infrastructure Levers, Barriers Addressed, and Innovative Measures.......................................................................................................................................... 6
Executive Summary Table 3. Entrepreneur and Financial Innovation Levers, Barriers Addressed, and Innovative Measures.................................................................................................................................................. 7
Table 1. Ten High-Priority Clean Energy Investment Mobilization Levers for USAID .................................. 29
Table 2. High-level, Qualitative Assessment of the Ten Climate Finance for Clean Energy Levers .................. 30
Table 3. Levels of Support for Clean Energy Blended Finance Facilities with Examples (Source: CPI 2018) .................................................................................................................................................. 34
Table 4. Blended finance instruments and potential risks addressed (Blended Finance Task Force 2018) .................................................................................................................................................. 35
Table 5. A Framework for Considering Climate Finance within Broader Development Goals (Source: Multilateral Organization Performance Assessment Network 2021) .................. 66
Table 6. High-level, Qualitative Assessment of the Ten Climate Finance for Clean Energy Levers .... 72
1 Executive Summary

Background

United States Agency for International Development (USAID) is updating its climate strategy and climate finance strategy in line with Biden administration goals. Under the USAID-National Renewable Energy Laboratory (NREL) Partnership, USAID brought on NREL from May through August 2021 to conduct a short-term assessment of potential areas where USAID could strengthen its climate finance for clean energy programming. Climate finance in the context of this assessment is defined to include grants, loans, loan guarantees, bonds, equity, and funds for clean energy investments; specialized climate finance facilities, e.g., the Green Environment Facility (GEF) and the Global Climate Fund (GCF); and technical assistance and capacity development programs that create enabling environments to mobilize public and private sector climate finance.

NREL first analyzed current trends in climate finance and clean energy, with a particular focus on impacts from the COVID-19 pandemic and the resulting economic downturn. Additionally, NREL interviewed several climate finance and clean energy experts and convened a targeted stakeholder workshop. Through these engagements, NREL identified a variety of potential areas where USAID can enhance its climate finance for clean energy strategy. These areas have been organized into ten key levers and implementation measures. The climate finance levers are intended to support USAID’s role of helping the U.S. government achieve broader climate development goals as well as its own agency-level goals. The U.S. government goals as announced in April 2021 include focuses on:

- Enhancing climate ambition and enabling the transformations required to reach net-zero emissions by 2050
- Mobilizing financing to drive the net-zero transition and adapt to climate change
- Transforming energy systems.

Related to these goals, USAID has announced a new initiative, “Mobilizing Private Investment for Climate Solutions.” Under this initiative, USAID will leverage an investment of $250 million to attract $3.5 billion in private sector financing to address the climate crises over the next three years. USAID will support pathways to net zero emissions for up to 20 fast-growing economies by dramatically scaling up USAID’s private sector climate finance programs including through policy reform and institutional strengthening to achieve dramatic reductions in emissions by 2030. Specific targets for the next five years include helping 20 countries to mobilize up to 20% of needed funding to implement their nationally determined contributions and helping 20 vulnerable countries double the private sector funds leveraged toward resilience and adaptation goals by 2025. USAID will support transactions and technical assistance to mobilize additional private capital in the climate space.

The climate finance levers we identify in this report consider USAID’s comparative strengths and experience and are centered on targeting limited public funding to drive large-scale, private sector investment into priority clean energy sectors in partner country markets. We also provide a high-level assessment of the potential expected impacts and the scale and nature of the resources required to help USAID determine how to prioritize interventions based on individual country or regional context. The report also provides steps that individual USAID Missions and that USAID centrally could employ to help prioritize these interventions. The Missions and operating units will play a key role in helping define

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1 For more information, see: [https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/](https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/).

the climate finance strategy because they are well positioned to help make informed decisions on which interventions would be the most appropriate and impactful use of climate funds, including those that could currently assist with recovery efforts and complement ongoing or planned programming in various sectors.

Throughout the report, we highlight specific examples of effective energy efficiency and renewable energy programs. We also present several technology-agnostic measures at a high level as clean energy measures. However, these measures would require refinement and program design centered on specific technologies, deployment sectors, etc. Multiple stakeholders also noted the importance of considering broader power sector mitigation opportunities, including improving the efficiency of existing coal plants, supporting decommissioning of uneconomic coal plants, reducing transmission and distribution losses (technical and nontechnical), and generally promoting overarching clean energy transition efforts. Thus, the levers include aspects relating to broader power sector transformation. Of course, coal retrofitting and decommissioning programs are only appropriate for those countries with significant existing coal-fired power generation capacity, and especially for those markets with older coal plants, those that use less efficient technology, and those that use emissions-intensive fuel inputs.

Many markets hold significant untapped potential for energy savings as well as unique challenges. Energy efficiency at the utility level could help lower emissions where generation is fossil fuel-intensive. There may also be opportunities to support energy efficiency among the residential, commercial, and public sectors. However, end-use energy efficiency is more diffuse because it requires the deployment of large numbers of efficient appliances, equipment, lighting, and behavioral programs distributed throughout the residential, commercial, industrial, and public sectors. While some of these measures may not have the same emission reductions benefits as utility-sector efficiency measures or bulk renewable energy deployment, they could have other significant co-benefits such as job creation and economic activity. In part because of the diffuse nature of efficiency deployment, energy efficiency may also face greater financing challenges than large-scale renewable energy. Much of the energy efficiency opportunity concerns small and medium enterprises (SMEs), or even individual households, that lack access to the necessary resources to secure loans. Financiers generally do not understand how to assess the risks associated with energy efficiency investments and how to reduce transaction costs. Accordingly, this report strongly focuses on opportunities to further mobilize investment into end-use energy efficiency technologies.

While we present a variety of clean energy mobilization measures, we recognize that USAID will make decisions on the allocation of funds between energy efficiency and renewable energy based on the present value of the marginal abatement costs net of co-benefits, benefits from consumer savings (consumer surplus), the scale of potential emission reductions in each local context, and the speed and feasibility of achieving the emission reductions. Increasing household energy efficiency in developing countries is often a slow and difficult process, especially where electricity rates are subsidized or not fully cost-reflective. USAID will need to weigh the relative benefits and challenges of respective measures as part of its program decision making.

The levers in this report recognize the need to create clear, transparent, and stable enabling environments that can attract a variety of local and international investors while also highlighting the importance of on-the-ground transactions. For climate finance to be effective, the result must be countless financial transactions between local customers and businesses, which could take the form of smaller entrepreneurs or larger technology and service providers. Especially in developing countries and those with nascent clean energy economies, entrepreneurs serve a vital role in the climate finance ecosystem because they are the primary entity connecting with the customer, technology and service providers, financiers, development support services, and policy framework, as shown in Executive Summary Figure 1. Entrepreneurs are often SMEs that contribute significant economic activity and can be engines for...
ingenuity and job creation in many economies, including those in the developing world. SMEs may also be more likely to be owned by or employ women, hire younger and older workers, and employ those without formal training or education.

Intermediaries play another important role. They can help provide capacity development to entrepreneurs and connect them with support services. Thus, to the extent possible, this strategy includes several measures that center on entrepreneurs and intermediaries, the connective tissue between the bottom-up, on-the-ground transactions and top-down policy—an area that is often a major gap in the design of many climate finance and development strategies. We include a variety of other important stakeholders as well in the levers, e.g., utilities, power system planners and policymakers, system operators, large corporate purchasers, and technology and service providers, all of which play critical roles. There may be much larger and faster potential for greenhouse gas (GHG) reductions from energy efficiency for large industrial and commercial customers and utility-scale renewable energy and distributed energy resources, including front-of-meter battery energy storage systems. Because of the respective benefits of working with both large and small players, this report includes measures that center on engaging with either or both types of entities are included in this report.

For both green recovery and the broader clean energy transition, having a people-centered development approach that focuses on capacity development with on-the-ground partners is important. Only a people-centered clean energy transition that considers local priorities, cultures, and socio-economic dynamics can enable long-term, low-carbon pathways; we need greater consideration for gender, social justice, just transition, and energy and climate equity issues within the framework of climate finance to ensure that all can benefit from decarbonization. Programs that focus on project implementation and transactions that result in immediate deployment and investment impacts are missing an opportunity to provide the deep-dive capacity development required to move economies toward a net zero by 2050 pathway.

**Summary of Key Trends**

The COVID-19 pandemic tightened budgets for many sources of public sector funding. The result is that recovery efforts must further focus on using scarce public finance to maximize the crowding-in of private sector capital to meet growing climate finance gaps in developing countries. Although some countries have initiated green recovery policies to help economies rebound from the downturn, of the fifty largest countries in 2020, only 18% of current recovery funding is considered green (Cahill et al. 2021).

Additionally, the pandemic temporarily decreased energy demand across the world, more so for developed countries than for developing countries. However, energy demand is generally expected to return to previous levels. Investment in renewables increased over the last year in developed countries while decreasing in developing countries. Energy efficiency investments also decreased faster because of the pandemic. Decreases in clean energy investment levels could in part be caused by the economic downturn and related issues, such as tighter corporate and utility budgets and limited ability for end-users to pay energy bills, but may also be caused by decreases in clean energy costs. For example, costs
continue to decline for solar and wind as well as for integrating technologies, such as electrochemical battery storage and green hydrogen.

Overall, clean energy investments still fall short of the levels needed to get the world on track to a net zero by 2050 future. In 2020, $150 million was invested in clean energy. According to the International Energy Agency (IEA), investment levels need to increase to $1 trillion annually (IEA 2021). While the overall investment picture is currently bleak, it has some bright spots. For example, corporate clean energy procurement has continued to increase quickly, with participants diversifying both in terms of subsector (such as heavy industry) as well as emissions scope, with more corporations making Scope 3 emission reductions for supply chains a greater priority. Additionally, the financial sector has accelerated the mainstreaming of climate risk, enabling more investment from large sources of finance such as asset managers, institutional investors, and central banks. Investments in research and development and innovation in technologies and business models continue, with ever-increasing interest in opportunities such as battery energy system storage and green hydrogen. Thus, while COVID-19 negatively impacted public coffers, increased momentum in investment and innovation in the private sector offers promise for a climate finance approach centered on leveraging private sector capital.

**Clean Energy Climate Finance Levers for USAID**

The following three tables (ES 1, ES 2, and ES 3) each highlight the three respective climate finance themes, Project Portfolios, Policy and Infrastructure, and Entrepreneur and Financial Innovation; the ten levers in these three themes; and a subset of measures, specifically focusing on those that may be more innovative or go beyond the bounds of USAID’s current programming. The full report details a variety of additional measures, which include new programs piloted by others and notably impactful existing USAID programs. Pursuing these additional measures could help USAID replicate and scale successful programs that would result in additional near-term impacts.

As illustrated in Executive Summary Figure 2, the levers include a mix of top-down measures that can result in significant clean energy deployment and GHG reductions as well as more bottom-up measures that have greater focus on people, capacity development, and social impacts. The top-down measures center on mobilizing investment in clean energy and de-investing in uneconomic, high-emitting resources. The bottom-up measures focus on support for SMEs, entrepreneurs, energy access, post-conflict development, and cross-sectoral innovation for rural and urban applications. Several measures could combine elements of both depending on the specifics of the program and policy design. In general, we suggest that the combined elements category emphasize elements of a bottom-up approach to the greatest degree possible to ensure that social benefits are maximized.

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3 Corporate GHG emissions reporting protocols define three scopes. According to the U.S. Environmental Protection Agency, “Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain. Scope 3 emissions include all sources not within an organization’s scope 1 and 2 boundary. The scope 3 emissions for one organization are the scope 1 and 2 emissions of another organization. Scope 3 emissions, also referred to as value chain emissions, often represent the majority of an organization’s total GHG emissions” (US EPA).
The dual focus on innovations and scaling existing effective programs aligns with U.S. government goals to support Nationally Determined Contribution (NDC) implementation over the next 2-3 years along with longer-term net zero, resilient strategies. While innovations in programming are necessary to address emerging challenges and to further push the boundaries of mitigation measures to achieve net zero and other ambitious targets, new programs can take significant time to design, procure, initiate, and implement before impacts are achieved.

Executive Summary Table 1. Project Portfolio Levers, Barriers Addressed, and Innovative Measures

**Project Portfolios Theme**
The following three project portfolio levers center on creating project pipelines by providing capital, improving local capacities to develop and access financing for projects, and reducing soft costs and enhancing liquidity of clean energy projects.

Barriers addressed: Shortage of high-quality clean energy projects, insufficient channels to guide available funds in the right direction, and a lack of intermediaries

**Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing**
USAID, with partners like the U.S. International Development Finance Corporation (DFC) or through blended finance mechanisms, can provide project preparation and de-risking support. Areas of potential focus include currency risks and financing the construction phase of project development. Because of the large array of existing support facilities, USAID may want to carefully consider opportunities to support riskier, emerging technology solutions or markets. Additionally, USAID could use its convening power to bring in more investors to scale financial resources.
Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance

USAID can support wholesale efforts that can drive transformation while also acknowledging the need for greater NDC implementation support in the form of project pipeline development through aggregated or bulk procurement of energy efficiency and renewable energy technologies. USAID could build on effective approaches such as those demonstrated by intermediaries Ujala LED program in India and the Clean Energy Investment Accelerator to formulate additional models for aggregated procurements. This could include a variety of end-users, e.g., national and subnational governments, private sector entities, and communities, to create economies of scale for technologies not yet deployed at significant levels. Potential technologies include heat pumps, industrial motors, clean energy mini-grids, solar plus behind-the-meter storage, LEDs, and other types of efficient appliances and equipment. USAID may want to explore regional approaches for small and medium-sized countries to ensure that aggregations are of significant size.

Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity

Several stakeholders engaged in interviews and the stakeholder workshop think that there is significant potential for further efforts around energy efficiency and renewable energy securitization, and they think that this is an area where USAID could provide more support, building on impactful work by the International Finance Corporation (IFC), the Global Climate Finance Innovation Lab, the World Bank, and others. Potential areas for further work around securitization include:

- Creating regional or subregional frameworks for securitization
- Working with other donor agencies or financial institutions to develop risk mitigation measures
- Bringing in local and international investors to invest in initial tranches
- Providing capacity development to local entrepreneurs to use standardized contracting to support creation of upstream conforming project pipelines.

Executive Summary Table 2. Policy and Infrastructure Levers, Barriers Addressed, and Innovative Measures

Policy and Infrastructure Theme

The following four levers focus on helping partner governments develop enabling environments that attract investment in clean energy and design large-scale government-driven clean energy investment programs. The primary stakeholder engaged would include policymakers, including ministries of energy, planning and investment, construction, and finance as well as energy regulators. Barriers addressed: Stimulus spending on clean energy is falling short of what is needed to ensure economic recovery, a net-zero emissions by 2050 pathway requires significantly strengthening clean energy and climate policies, and NDCs and long-term strategies (LTSs) do not yet sufficiently engage with the private sector to identify and alleviate key constraints to scaling up private investment in climate action.¹

Lever Four: Development of Public and Infrastructure Investments for Sustained Growth
USAID can work with partner countries to develop robust economic recovery packages that focus on enabling environments for quick-start energy efficiency, renewable energy, and transmission investment to support job creation and economic impact. USAID can complement development of these strategies with follow-on policy and program technical assistance and capacity development for implementation, i.e., Lever Five. Green recovery measures could include Cash for Clunkers, retrofit, and other programs proven to reduce emissions, drive investment, and be cost-effective.

Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment
Few developing countries have formulated LTSs for clean energy transitions. As recent analysis from the Multilateral Organization Performance Assessment Network found, “NDCs without LTSs are short-sighted; NDCs are incremental steps along an LTS-defined pathway” (Multilateral Organization Performance Assessment Network 2021). USAID could further build out its Transparent LTS project and use its strong policy and decision-support expertise to develop frameworks for LTSs and associated investment strategies. USAID can work with countries to formulate ambitious plans that can facilitate significant mitigation in the power sector by 2050.

Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities
USAID can address an important need by working with partner countries to develop detailed NDC investment strategies that identify large-scale infrastructure projects, policies for investment mobilization, climate finance capacity development requirements, technical assistance on designing funds and green banks for energy efficiency and renewable energy programs, and financing resources. Another core area that would be highly complementary would be convening local, regional, and international private sector, multilateral development bank (MDB), and development finance institution (DFI) partners to develop commitments to supporting NDC implementation for a given country.

Lever Seven: Establishment of Market-based Mechanisms to Improve Project Profitability
USAID could explore supporting innovations in tradable certificates, such as white certificates for energy efficiency and Renewable Energy Certificates (RECs). This could include supporting the uptake of distributed RECs, time-valued RECs, and Peace RECs. Because of the challenges regarding regular REC prices and additionality, supporting REC innovations could be an opportunity to provide revenue to projects that are not already viable and that may offer additional benefits. There can be challenges with REC market design, and political engagement and support is one aspect of ensuring effective implementation.

Executive Summary Table 3. Entrepreneur and Financial Innovation Levers, Barriers Addressed, and Innovative Measures

Entrepreneur and Financial Innovation Theme
The eighth, ninth, and tenth levers center on supporting technology and business model innovation and new approaches to decision making through capacity development and technical assistance, especially focused on the private and utility sector stakeholders.

Barriers addressed: Significant innovation will be required to meet a net zero by 2050 pathway; national development banks and private financing institutions lack capacity and are under-used as part of the
global climate finance framework; and public, private, and utility investors are making poorly informed energy investment decisions that do not reflect the latest costs and risks.

**Lever Eight: Capacity Development for Entrepreneurs to Drive Technology and Business Model Innovation**

USAID can work with partner countries to identify relevant innovation networks and national technical institutes and support capacity development to invent and adapt clean energy technologies and new business services. USAID could work in its Development Innovation Ventures (DIV) team to design clean energy and, ideally, regionally specific entrepreneurship programs to help facilitate this support. USAID could set up this program to target certain sectors, e.g., SMEs, and technologies and applications, e.g., clean energy and IT applications; energy-water-food-waste nexus technologies for urban and/or rural utility service applications; clean energy for productive use in post-conflict areas.

**Lever Nine: Support to the Financial Sector to Develop Green Finance Products and Regulations**

USAID can develop strategic partnerships with key climate finance providers, e.g., GCF and GEF, and complementary in-country or regional capacity development programs that can improve the ability of local actors to access climate finance resources. Depending on the strategic partnerships, the capacity development programs could include working with public and private sectors to develop project pipelines; collaborating with national banks and private banks to improve their access to climate finance and ability to design green financing products; and developing related guarantees or clean energy funds with other partners to support provision of the green finance products.

**Lever Ten: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment**

Many utilities and governments in developing countries lack high-quality, localized, and up-to-date cost information on clean energy technologies and may have a misperception about the economic viability of existing and new fossil fuel resources. Power sector stakeholders may also lack the capacity to undertake detailed economic and technical assessments of their current plants. USAID can work with power sector partners in its collaborating countries to help develop data, modelling, analysis, visualization and communication, and stakeholder engagement processes to understand the potential for early coal plant retirement and replacement clean energy investments. Relatedly, USAID could also provide analytical support to understand the jobs and economic impacts of alternative clean energy pathways.

USAID can implement these levers and related measures or a subset of them through the following key steps. These steps are not necessarily sequential, and some may be iterative or concurrent. USAID may benefit from additional in-house climate finance and development finance capacity to support this process.

- **Prioritize a portfolio of services with expert teams ready to provide support:** The proposed climate finance levers and measures will need to be narrowed and further defined based on consideration of USAID’s comparative advantage, expected impact, the level and nature of resources, and feedback from the regional and country missions and other operating units as to which areas could be most impactful.

- **Formulate headquarters-level global climate finance toolkits, training programs, and support for innovation measures:** This could include services that can be offered across multiple countries, such as innovative procurement, infrastructure finance, risk reduction instruments, and global incubator and entrepreneur support activities.

- **Offer these services and the expert team to Missions for tailored application:** Missions will be key to identifying potential areas of climate finance support that align with partner country and U.S.
government interests and to deploying this support. However, Missions may have limited climate finance knowledge and access to experts, especially with new services being provided. USAID will need to provide sufficient capacity development to the Missions, conduct knowledge management to support ongoing internal learning, and have mechanisms for Missions to easily engage key experts and resources.

- **Expand partnerships with international finance institutions, U.S. finance industry, and global and regional finance initiatives:** USAID can develop a variety of investor partnerships to support coordinated delivery, including higher-level strategic agreements with key climate finance partners, e.g., DFC and other U.S. agencies, MDBs, GCF, and the GEF. USAID can also bring the U.S. finance industry into a climate finance advisory board that can inform approaches to engaging the private sector, such as making investment commitments and participating in foreign country investment strategies.

- **Create and build upon existing global and regional platforms for peer learning and innovation in finance mobilization:** USAID has a wealth of experience in clean energy policy technical assistance and capacity development that could be further shared and disseminated through regional and global platforms such as the U.S. government-supported Low Emission Development Strategies Global Partnership, the NDC Partnership, and others. By sharing best practices, tools, and approaches at promoting climate finance investments into clean energy, USAID can further its global impact.
2 Introduction

USAID is updating its climate strategy and climate finance strategy in line with Biden administration goals. Under the USAID-National Renewable Energy Laboratory (NREL) Partnership, USAID brought on NREL from May through August 2021 to conduct a short-term assessment of potential areas where USAID could strengthen its climate finance for clean energy programming. Climate finance in the context of this assessment is defined to include grants, loans, loan guarantees, bonds, equity, and funds for clean energy investments; specialized climate finance facilities, e.g., the GEF and the GCF; and technical assistance and capacity development programs that create enabling environments to mobilize public and private sector climate finance.

NREL first analyzed current trends in climate finance and clean energy, with a particular focus on impacts from the COVID-19 pandemic and the resulting economic downturn. Additionally, NREL interviewed several climate finance and clean energy experts and convened a targeted stakeholder workshop. Through these engagements, NREL identified a variety of potential areas where USAID can enhance its climate finance for clean energy strategy. These areas have been organized into ten key levers and implementation measures. The climate finance levers are intended to support USAID’s role of helping the U.S. government achieve broader climate development goals as well as its own agency-level goals. The U.S. government goals as announced in April 2021 include focuses on:

- Enhancing climate ambition and enabling the transformations required to reach net-zero emissions by 2050
- Mobilizing financing to drive the net-zero transition and adapt to climate change
- Transforming energy systems.\(^5\)

Related to these goals, USAID has announced a new initiative, “Mobilizing Private Investment for Climate Solutions.” Under this initiative, USAID will leverage an investment of $250 million to attract $3.5 billion in private sector financing to address the climate crises over the next three years. USAID will support pathways to net zero emissions for up to 20 fast-growing economies by dramatically scaling up USAID’s private sector climate finance programs including through policy reform and institutional strengthening to achieve dramatic reductions in emissions by 2030. Specific targets for the next five years include helping 20 countries to mobilize up to 20% of needed funding to implement their nationally determined contributions and helping 20 vulnerable countries double the private sector funds leveraged toward resilience and adaptation goals by 2025. USAID will support transactions and technical assistance to mobilize additional private capital in the climate space.\(^6\)

The climate finance levers we identify in this report consider USAID’s comparative strengths and experience and are centered on targeting limited public funding to drive large-scale, private sector investment into priority clean energy sectors in partner country markets. We also provide a high-level assessment of the potential expected impacts and the scale and nature of the resources required to help USAID determine how to prioritize interventions based on individual country or regional context. The report also provides steps that individual USAID Missions and that USAID centrally could employ to help prioritize these interventions. The Missions and operating units will play a key role in helping define the climate finance strategy because they are well positioned to help make informed decisions on which interventions would be the most appropriate and impactful use of climate funds, including those that

\(^5\) For more information, see: [https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/](https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/).

could currently assist with recovery efforts and complement ongoing or planned programming in various sectors.

Throughout the report, we highlight specific examples of effective energy efficiency and renewable energy programs. We also present several technology-agnostic measures at a high level as clean energy measures. However, these measures would require refinement and program design centered on specific technologies, deployment sectors, etc. Multiple stakeholders also noted the importance of considering broader power sector mitigation opportunities, including improving the efficiency of existing coal plants, supporting decommissioning of uneconomic coal plants, reducing transmission and distribution losses (technical and nontechnical), and generally promoting overarching clean energy transition efforts. Thus, the levers include aspects relating to broader power sector transformation. Of course, coal retrofitting and decommissioning programs are only appropriate for those countries with significant existing coal-fired power generation capacity, and especially for those markets with older coal plants, those that use less efficient technology, and those that use emissions-intensive fuel inputs.

Many markets hold significant untapped potential for energy savings as well as unique challenges. Energy efficiency at the utility level could help lower emissions where generation is fossil fuel-intensive. There may also be opportunities to support energy efficiency among the residential, commercial, and public sectors. However, end-use energy efficiency is more diffuse because it requires the deployment of large numbers of efficient appliances, equipment, lighting, and behavioral programs distributed throughout the residential, commercial, industrial, and public sectors. While some of these measures may not have the same emission reductions benefits as utility-sector efficiency measures or bulk renewable energy deployment, they could have other significant co-benefits such as job creation and economic activity. In part because of the diffuse nature of efficiency deployment, energy efficiency may also face greater financing challenges than large-scale renewable energy. Much of the energy efficiency opportunity concerns small and medium enterprises (SMEs), or even individual households, that lack access to the necessary resources to secure loans. Financiers generally don’t understand how to assess the risks associated with energy efficiency investments and how to reduce transaction costs. Thus, this report strongly focuses on opportunities to further mobilize investment into end-use energy efficiency technologies.

While we present a variety of clean energy mobilization measures, we recognize that USAID will make decisions on the allocation of funds between energy efficiency and renewable energy based on the present value of the marginal abatement costs net of co-benefits, benefits from consumer savings (consumer surplus), the scale of potential emission reductions in each local context, and the speed and feasibility of achieving the emission reductions. Increasing household energy efficiency in developing countries is often a slow and difficult process, especially where electricity rates are subsidized or not fully cost-reflective. USAID will need to weigh the relative benefits and challenges of respective measures as part of its program decision making.

The levers in this report recognize the need to create clear, transparent, and stable enabling environments that can attract a variety of local and international investors while also highlighting the importance of on-the-ground transactions. For climate finance to be effective, the result must be countless financial transactions between local customers and businesses, which could take the form of smaller entrepreneurs or larger technology and service providers. Especially in developing countries and those with nascent clean energy economies, entrepreneurs serve a vital role in the climate finance ecosystem because they are the primary entity connecting with the customer, technology and service providers, financiers, development support services, and policy framework, as shown in Figure 1. Entrepreneurs are often SMEs that contribute significant economic activity and can be engines for ingenuity and job creation in
many economies, including those in the developing world. SMEs may also be more likely to be owned by or employ women, hire younger and older workers, and employ those without formal training or education.

Intermediaries play another important role. They can help provide capacity development to entrepreneurs and connect them with support services. Thus, to the extent possible, this strategy includes several measures that center on entrepreneurs and intermediaries, the connective tissue between the bottom-up, on-the-ground transactions and top-down policy—an area that is often a major gap in the design of many climate finance and development strategies. We include a variety of other important stakeholders as well, in the levers, e.g., utilities, power system planners and policymakers, system operators, large corporate purchasers, and technology and service providers, all of which play critical roles. There may be much larger and faster potential for greenhouse gas (GHG) reductions from energy efficiency for large industrial and commercial customers and utility-scale renewable energy and distributed energy resources, including front-of-meter battery energy storage systems. Because of the respective benefits of working with both large and small players, this report includes measures that center on engaging with either or both types of entities are included in this report.

For both green recovery and the broader clean energy transition, having a people-centered development approach that focuses on capacity development with on-the-ground partners is important. Only a people-centered clean energy transition that considers local priorities, cultures, and socio-economic dynamics can enable long-term, low-carbon pathways; we need greater consideration for gender, social justice, just transition, and energy and climate equity issues within the framework of climate finance to ensure that all can benefit from decarbonization. Programs that focus on project implementation and transactions that result in immediate deployment and investment impacts are missing an opportunity to provide the deep-dive capacity development required to move economies toward a net zero by 2050 pathway.
3 Recent Events and Trends Affecting Climate and Clean Energy Finance

The following sections describe the impacts of the COVID-19 pandemic and associated economic downturn on climate finance, the power sector, clean energy investment, and project development. They also highlight recent technology, business model, and power planning developments; key drivers for clean energy investment, including increased awareness by investors, governments, and utilities of climate risks; and interest by corporations in investing in clean energy to meet climate commitments. Finally, they explore emerging opportunities to work with countries on green recovery or other public investment packages, including climate finance for clean energy and integrated approaches that consider social impacts.

COVID-19 and Public Funding

The COVID-19 pandemic and resulting economic downturn has had broad implications for climate and clean energy finance. One of the primary impacts has been further constraints on national budgets, including those of developing countries as well as the developed countries that support MDBs and DFIs. While the United States and some European countries have increased climate finance commitments, the potential exists for significant reductions in public funding from other governments for climate and broader development measures. Reduced spending could slow progress toward supporting economic growth and poverty reduction as well as hamper the fight against climate change.

For developing countries, COVID-19 has exacerbated economic downturns through a combination of increased development needs and reduced domestic fiscal capacity. The pandemic’s economic fallout led to an increase in global extreme poverty in 2020, the first in almost 25 years (Attridge Gouett 2021). This fallout includes gross domestic product contractions in 9 out of 10 emerging economies and 1.6 billion informal sector workers facing the risk of unemployment (Bhattacharya et al. 2020). At the same time, the pandemic has negatively impacted the fiscal and debt positions of many developing countries. Fifty-four percent of low-income countries are in debt distress or at high risk of entering debt distress (Bhattacharya et al. 2020). Because of downgraded credit ratings, no African country has had access to the sovereign debt market since February 2020 (Bhattacharya et al. 2020). COVID-19 has compounded developing countries’ already reduced fiscal space right at the time when climate and development finance require the most focus and resources.

MDBs and DFIs have a critical and unique role to play in scaling up climate finance in developing countries. They can contribute through policy dialogues and collaborations with the private sector to link short-term projects and initiatives with the long-term economic transformation needed to fight climate change (Macquarie et al. 2020). However, even before the pandemic, DFIs and MDBs could not obtain sufficient funding to meet climate finance targets. Developed countries have fallen short of their pledge to invest $100 billion per year by 2020 in developing countries through concessional finance (mostly through DFIs and MDBs). Although climate finance from developed to developing countries, including public finance and direct mobilized private finance, has increased from $52.2 billion in 2013 to $78.9 billion in 2018, it is highly unlikely that this number reached $100 billion in 2020 because of the pandemic (Bhattacharya et al. 2020). Even this $100 billion target may be significantly too low: the IEA suggests that the world needs $1 trillion in annual investment from now through 2050 to achieve net zero by 2050 targets (IEA 2021).

Similarly, the funding gap to meet the Sustainable Development Goals has ballooned from $2.5 to $4.2 trillion, with $700 billion of this increased gap coming from pandemic-related reductions in private
capital inflows and the other $1 trillion resulting from an increase in financing needs (Attridge and Gouett 2021). DFI and MDB investment in low-income countries has remained stagnant despite increased capital needs. Although DFIs and MDBs have invested more in higher-risk developing countries in the years before COVID-19, more than 70% of investment from DFIs and MDBs still goes to countries with credit ratings at or close to investment-grade (Attridge and Gouett 2021).

With the onset of the pandemic, MDBs and DFIs have faced a dilemma between needing to enhance development and climate impact and mobilize additional private finance and protecting their own financial viability, especially as the developed countries from which MDB and DFI source funding experience their own economic downturns. The pandemic has reinforced the tendency of some of these organizations to invest in lower-risk projects using project-level debt. However, as developing countries increasingly require more investment to recover from COVID-19, DFIs and MDBs need to consider higher-risk, upstream investments, like grants and loan guarantees to support R&D or market creation, which have the potential for the greatest impacts and crowding in of private finance (Attridge and Gouett 2021). The pandemic has created conditions that require even further donor coordination and leverage of limited public capital to maximize impacts and crowd-in of private finance.

**COVID-19, Energy Demand, and Clean Energy Investment**

Overall, the COVID-19 pandemic reduced energy demand globally, but this is probably a temporary adjustment for most countries. Developing countries generally instituted weaker lockdowns and had lower decreases in primary energy demand in 2020 relative to 2019. Africa, the Middle East, and Southeast Asia all had decreases in primary energy demand around 2%, compared to the 4% global average (International Energy Agency [IEA] Global Energy Review 2021). In terms of sectoral usage, pandemic lockdowns caused residential electricity demand to increase, but reductions in commercial and industrial electricity demand far outweighed these increases (IEA Global Energy Review 2020). However, energy demand has begun to climb again and is expected to fully rebound as the world economy recovers from the pandemic, with electricity consumption in developing countries set to grow at around three times the annual rate of advanced economies (IEA Financing Clean Energy 2021).

COVID-19 also had differing impacts on renewable energy deployment in developed versus developing countries. For instance, the pandemic did little to slow renewable energy deployment in developed countries, with the aggregate result being that globally renewable energy deployment continued to grow. More than 256 gigawatts (GW) of new capacity were added globally in 2020, which surpassed the previous record by 50% (Renewable Energy Policy Network for the 21st Century [REN21] 2021). Despite the pandemic, renewable energy reached its highest record share in the global electricity usage mix in 2020, estimated at 29%, while demand for coal and oil dropped. Initial steps toward recovery in the second half of 2020 helped drive this unprecedented growth. However, in line with previous trends, the overwhelming portion of capacity was deployed in advanced and large economies and used private finance (Macquarie et al. 2020). Figure 2 demonstrates that although fossil fuel electricity generation usage and investment are expected to either rebound or slow their declines (mostly in China for coal and other parts of Asia for coal and gas) in 2021, the pandemic showcased the resilience of the renewable energy sector to adverse economic conditions as renewable power investment continued its increase in 2020. This was likely a result of lower operating costs and preferential access to grid infrastructure (REN21 2021; IEA World Energy Investment 2021).

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7 Note that there are differing opinions within the MDB and DFI community as to the accuracy of these numbers. For example, there may be relevant investments from MDBs that are not captured owing to confidentiality agreements signed with the private sector.
In contrast to the growth of renewables in developed markets during the pandemic, clean energy investments in developing countries decreased, indicated by an 8% decline from 2019 levels to less than $150 billion in 2020 (IEA Financing Clean Energy 2021). This decrease may have been caused by multiple factors, including the pandemic and possibly from cost reductions for some clean energy technologies. For example, increased economies of scale; increased competition among suppliers; research and development (R&D) investments; and policies such as auctions have all contributed to a 12% decrease for solar photovoltaics and a 14% decrease for onshore wind from 2017 to 2018 (International Renewable Energy Agency [IRENA] 2020). As the IEA noted in their June 2021 World Energy Investment report, “thanks to rapid improvements and costs reductions, a dollar spent on wind and solar photovoltaic deployment today results in four times more electricity than a dollar spent on the same technologies ten years ago” (IEA World Energy Investment 2021). Tighter public sector budgets also contributed to the decrease in clean energy investments as did weaken corporate balance sheets. Consumers’ reduced ability to pay and other financial pressures have also impacted the position of utilities in emerging and developing economies to support energy transitions (IEA Financing Clean Energy 2021; IEA World Energy Investment 2021).

Even before the pandemic, deployments of energy efficiency measures had been steadily decreasing. The COVID-19 pandemic introduced additional layers of uncertainty that could have exacerbated this decrease and may continue to have negative impacts on energy efficiency investments. First, the economic crisis probably delayed investments in energy efficiency improvements (i.e., construction retrofits) by businesses and households simply because of increased economic uncertainty (IEA EE 2020). Second, the pandemic introduced uneven sectoral impacts in terms of energy usage that could increase the volatility of potential energy savings and make energy efficiency investments riskier (IEA EE 2020).

In developing countries, building energy efficiency investments generally stagnated or declined, differing greatly from developed countries, where building energy efficiency investments increased. Although China, Japan, and South Korea saw modest levels of growth, the United States did not increase overall investment levels in building efficiency, and South and Southeast Asian countries saw declines (IEA World Energy Investment 2021). However, the nature of the investments in building energy efficiency also differs between developed and developing countries. Developed countries are tending to focus on renovating existing buildings to increase efficiency while developing countries are generally centering their efforts on investing in energy-efficient new construction (IEA World Energy Investment 2021).
In contrast to the increase of investment in efficient buildings, industrial energy efficiency investments contracted by about 1% in 2020, with reductions mostly coming from heavy industrial sectors (IEA World Energy Investment 2021). The COVID-19-caused reduction in demand led to lower industrial output, which limited investment potential for energy efficiency. Enabling policies like efficiency standards and incentives for energy savings heavily affect industry efficiency investments, but these policies cover only 35% of industrial energy demand, creating a deficit that must be narrowed to meet climate goals (IEA World Energy Investment 2021). Developing countries face even larger policy gaps as few have mandatory industrial energy savings mandates, with China and India as being two notable exceptions (IEA World Energy Investment 2021).

IRENA estimates that renewable energy investments across markets would need to increase from 2013-2018 averages of $300 billion to $800 billion per year through 2050 (IRENA 2020). These investment numbers do not include integrating technologies such as energy storage. Figure 3 shows that current and projected investments in energy efficiency (the 2016-2020 and STEPS bar) fall short of the amount required to meet Sustainable Development Scenarios and net-zero emissions by 2050. In fact, investments must grow by 3% annually to meet the Sustainable Development Scenarios and 4% to meet net-zero emissions; the pandemic has pushed the rate of progress down to 0.8% (IEA World Energy Investment 2021). As noted previously, the IEA suggests that overall clean energy investments would need to be around $1 trillion per year to meet net zero by 2050 targets (IEA 2021).

**Technology and Business Model Innovations**

Despite the challenges for clean energy deployment resulting from COVID-19, technology and business model developments continue to support the industry. These developments include increasing momentum behind batteries and hydrogen storage. Utility-scale battery storage is an important technology for increasing renewable energy generation and deferring or reducing expensive investments in transmission and distribution systems (Torres, Hyman, and Quin 2021). In 2020, global battery storage capacity grew by 1.7% over the previous year to 14.2 GW, representing 7.5% of total storage capacity (REN21 2021).
Growth of battery energy storage has been overwhelmingly concentrated in advanced and large economies, with China and the United States leading the way in capacity additions (REN21 2021). Interestingly, the drivers for battery energy storage in China and the United States may be very different, with deployment in California spurred by wildfires and utility-driven blackouts to reduce wildfire threats. In China, battery deployment may have been driven more by electricity reliability concerns. Lower battery prices have also led to increases in multiple end-uses beyond utility-scale, including behind-the-meter\(^8\) and hybrid renewables-plus-storage\(^9\) projects (REN21 2021).

Innovation has driven these cost reductions for batteries as the electricity storage industry has historically had the fastest levels of innovation compared to other clean energy technologies measured by patent approvals (REN21 2021). In 2020, advanced economies dedicated investment toward long-duration battery technologies, including research on electrochemical batteries and solar flow batteries, a pilot deployment of an aqueous air battery system in Minnesota, and research on battery technologies beyond lithium-ion in California (REN21 2021). While lithium-ion batteries make up 92% of worldwide battery deployment, these additional energy storage technologies provide an opportunity to meet the long-term storage needs of the grid as they mature, because lithium-ion batteries are suited only for short-duration storage, typically a maximum of 4-5 hours (Energy Storage Primer).

Green hydrogen, or hydrogen produced from renewables, is gaining attention as a potential additional solution for long-term, low-carbon storage, although the current global deployment is minimal. As of the end of 2020, hydrogen production (including non-renewable hydrogen) had a global operating capacity of around 82 megawatts (MW), less than 0.05% of global energy storage capacity and only about 0.1% of global hydrogen supply as of 2020 (REN21 2021; Flowers 2020). However, about 130 GW of renewable hydrogen projects have been announced, planned, or are under construction, primarily in advanced economies (REN21 2021). The lack of deployment is mostly because of high costs; green hydrogen remains about twice as costly as hydrogen produced using fossil fuels and carbon capture (REN21 2021). Although still not cost-competitive, green hydrogen costs have decreased by 40% on average between 2015 and 2020. Further cost reductions are expected: hydrogen produced from wind power is projected to be less expensive than natural gas-produced hydrogen by 2030 (Munuera 2020).

National plans and international collaboration on green hydrogen have increased across both the public and private sectors. For example, large energy companies have forged partnerships to develop greater renewable hydrogen capacity, such as the United Nations Green Hydrogen Catapult. Furthermore, several countries in Europe have developed national plans for hydrogen production. For developing countries, green hydrogen presents an opportunity because of its potential as a decentralized energy solution, e.g., through fuel cells, as well as a decarbonization solution for hard-to-abate sectors such as industry (De Sisternes Jimenez and Jackson 2020). However, many developing countries lack qualified engineers to install and monitor green hydrogen systems (De Sisternes, Jimenez, and Jackson 2020). That said, the potential to develop a green hydrogen economy and become a regional green hydrogen hub could provide political motivation to some countries to pursue high levels of cost-effective renewable energy penetration as a key preparatory measure.

There are also many examples of clean energy business model innovation, such as Energy-as-a-Service and peer-to-peer business models. With increasing digitalization in the power sector—smart meter market compound annual growth rate has reached 6.7%—Energy-as-a-Service has emerged as an innovative model where providers offer energy-related services instead of only supplying electricity (IRENA Energy-as-a-Service 2020). For example, Octopus Energy, a retail energy firm, has created a digital

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\(^8\) Refers to onsite installations, where the meter is on the energy user’s side  
\(^9\) Refers to projects where renewable generation (usually solar) is integrated with a storage technology (usually batteries)
platform that pays customers to use renewable energy during peak times, reducing system costs and making the grid more efficient (Chandaria 2021). In addition, with the growth in distributed clean energy, peer-to-peer electricity trading has emerged as a business model, allowing consumers to go from being passive end-users to active electricity market participants. Peer-to-peer models can increase the efficiency of grid systems that in turn can decrease grid maintenance and management costs and reduce the need to make additional capital investments in expensive transmission and generation assets (IRENA peer-to-peer 2020).

**Climate Risks Awareness and Investors**

Experts have long recognized the importance of measuring, managing, and mitigating climate risk to inform investment decisions (Macquarie et al. 2020). Progress in this field will enable more widespread capital for climate change mitigation and adaptation for the $379 trillion in global financial assets under management, of which only 1.1% would be needed to make up the $4.2 trillion Sustainable Development Goal funding gap in developing countries (Attridge and Gouett 2021).

Large financial institutions have made greater pushes to develop principles for sustainable investing and have made significant strides in mobilizing more capital for climate investments. For example, European institutional investors established the Institutional Investors Group on Climate Change to promote progress toward a net zero future by 2030.10 The Institutional Investors Group on Climate Change represents over 200 investors, mostly pension funds, across 22 countries that have over 37 trillion euros in assets. The Institutional Investors Group on Climate Change is working to address a variety of related challenge areas, including corporate disclosure and institutional governance and investment decision-making. As another example, the Net Zero Asset Manager Initiative now has over 70 members committed to “press companies in their portfolio to achieve net zero emissions by 2050 or sooner” (Kerber 2021).11 The Net Zero Asset Manager Initiative supports its signatories by engaging with clients and corporations on net zero targets and setting targets for assets. Both the Institutional Investors Group on Climate Change and the Net Zero Assets Manager Initiative also advocate for policy changes.

One example of a successful climate-risk-aligned asset management firm is Impax, one of the United Kingdom’s leading sustainable investment managers. Impax’s assets under management ballooned from 16.1 billion pounds at the end of 2019 to 27.8 billion pounds by the end of 2020 (Gyftopoulou 2021). Over its 15+ year history, the firm has landed many institutional clients, including the California State Teachers’ Retirement System pension, the United Kingdom’s Environment Agency Pension as well as BNP Paribas, one of Sweden’s largest national pension funds (Gyftopoulou 2021). Impax’s firm commitment to sustainability has allowed it to succeed as climate-aligned investment has become more popular, demonstrating the explosive potential of and opportunity in sustainable investment.

Importantly, asset managers and institutional investors are not alone. Fintech companies have continued to find new ways to mobilize retail investments through innovative models that help build sustainable portfolios or direct proceeds to climate-aligned needs (Milanovic 2021). Additionally, central banks have begun to write climate risks into their own practices, and several central banks are pursuing climate stress test pilots (Woellert 2021).

**Trends in Sustainable Debt**

Figure 4 shows one sign of progress in the field of climate risk: sustainable debt issuance has increased 29% to $732 billion from 2019 to 2020, a record despite the pandemic, showing the increasing mainstreaming of climate finance even with economic headwinds (Bloomberg New Energy Finance

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10 For more information, see: https://www.iigcc.org/our-work/.
11 For more information, see: https://www.netzeroassetmanagers.org/.
[BNEF] 2021). Sustainable debt can be delineated into two general types of debt: activity- and behavior-based bonds and loans. Activity-based debt can be used to finance new or refinance existing environmental or social projects using mechanisms such as 1) green bonds and loans that focus on environmental projects; 2) social bonds that focus on social projects; and 3) sustainability bonds that can be used for either type of project. On the other hand, behavior-based debt is tied to sustainability targets, mostly for large corporations, which incentivize issuers to achieve institutional environmental, social, and governance targets (BNEF 2021).

Environmental, social, and governance-related debt is a newer concept that enables large corporations to meet sustainability targets such as GHG reductions, waste reduction, and renewable energy usage. Sustainability-linked loans and bonds have much more participation from a variety of industries, such as industrial, materials and healthcare, compared to activity-based debt, which focuses on energy and utilities, financials, and government (BNEF 2021). Therefore, behavior-based debt provides an opportunity for these large corporations to increase the sustainability of their supply chains in developing countries. Key behavior-based debt mechanisms include sustainability-linked loans and bonds.

![Figure 4. Annual sustainable debt issuance by type (in $USD billions) (Source: BNEF 2021)](image)

Activity-based bonds and loans are ideal for clean energy deployment because of renewables’ relatively high capital costs, low operating costs, and 20+ years of potential stable cash flows. It is no surprise that government, financial institutions, and utilities issued the largest amounts of green and sustainability bonds ever in 2020 (BNEF 2021). In that same light, it makes sense that energy companies borrowed 47% of green loans in 2020, followed by utilities and financials (BNEF 2021). Furthermore, investors see green and sustainability bonds as reliable because institutional investors represent the most prominent underwriters (buyers) of the securities (BNEF 2021). In developing countries, activity-based debt provides an avenue for scaled access to capital. For example, India issued $30 billion in green bonds from 2014 to 2020 for renewable energy (BNEF 2021).

**Corporate Clean Energy Targets and Global Supply Chains**

Corporate renewable energy procurement continues to expand rapidly, with corporations buying a record 10 GW of renewable energy in 2020. This trend has continued in early 2021, showing that clean energy remained a priority for corporations despite the pandemic (Renewable Energy Buyers Alliance 2021). Direct procurement, in which companies sign power purchase agreements (PPAs) with developers,
usually through onsite or offsite wind or solar, instead of using RECs or utility programs, has enabled corporations to rapidly scale up their renewable energy usage (Figure 5). Direct corporate clean energy procurement has grown the fastest of all procurement methods (Hardison et al. 2020). However, Figure 6 shows that despite the growth in procurement models, the corporate renewable energy gap, i.e., the difference between corporate procurement targets and actual procurements, is still projected to increase every year through 2030. Finally, Figure 5 shows that although the United States and Europe continue to grow and lead the way in total installations from direct corporate procurement, the Asia-Pacific region has seen the fastest rate of corporate PPA growth (Koons 2021).

![Figure 5. Global corporate PPA volumes, by region](Source: BNEF 26 January 2021)

A few key drivers have accelerated corporate clean energy investment. First, more diverse companies outside big tech are entering clean energy procurement, most notably heavy industry, where procurement doubled in 2020 (Renewable Energy Buyers Alliance 2021). Second, grid decarbonization has emerged as...
an investment focus for corporations beyond just deploying clean energy, leading to greater focus on integrating energy storage and other technologies to increase resilience and decrease system costs (Renewable Energy Buyers Alliance 2021). Third, initiatives like RE100, Science Based Targets Initiative along with the Renewable Energy Buyers Alliance have enhanced their reach to address Scope 3 (supply chain) emissions, which have further increased the push for corporate clean energy procurement, especially in developing countries, where many of these suppliers are located.12

By April 2021, RE100 had over 200 members who had made 100% renewable energy commitments. Other companies that have not joined RE100 have announced renewable energy targets below100%. Under the Race to Zero initiative, nearly 1700 companies have set net zero targets (Harrison 2021). Corporations have set a variety of other targets. For example, Google is aiming for 24/7 clean energy by 2030; Microsoft is aiming to go carbon negative (Harrison 2021). While this trend is generally promising, details show that gaps remain. Many of the net zero targets have been assessed as low-impact, low-ambition (Harrison 20 May 2021). According to BNEF, the real defining factor as to whether the net zero target has credibility is whether it includes Scope 3 emissions, which current standards do not mandate.

Finally, climate finance has continued to become mainstream in financial markets. Large firms like Blackrock ($9 trillion in assets) continue to use their financial heft to push corporations to report and improve climate performance (Kaplan 2021). At the same time, there are questions about the validity of these supposed financial commitments to divest from coal and accusations of potential greenwashing.13 In fact, GreenWatch, a watchdog that uses artificial intelligence to monitor corporation progress toward achieving targets, found a high likelihood (95%) of greenwashing in the communications they analyzed. Based on this analysis, the group concluded that the only way to fight greenwashing is to move from voluntary climate reporting to regulatory disclosure (Kishan 2021).

**Integrated Climate and Economic Recovery Approaches**

Developing countries face the daunting task of integrating COVID-19 recovery with NDCs and LTSs. NDCs are one of the key areas where USAID has pledged to support pathways forward in 20 developing economies. Although climate change and renewable energy policies generally increased across the world in 2020, countries still have much work to do to align these policies as a whole-of-economy approach to their NDCs (REN21 2021). Despite the multitude of NDC support programs—at times causing confusion and overlap—many countries lack the capacity to translate their NDCs into robust, actionable investment strategies.

LTSs have emerged as an essential piece of the fight to limit global warming as countries aim to create visions to achieve ambitious GHG mitigation strategies, including net zero goals (Ge 2019). An LTS creates narratives to bring climate and development agendas together to maximize effectiveness of climate action, guide policy priorities, and garner political support (WRI LTS 2020). Country LTSs often include goals and pathways for mitigation, adaptation, resilience, inclusive development, and human well-being (WRI LTS 2020). Importantly, LTSs function as key guideposts for short- and medium-term action plans to ensure consistency with net zero pathways (Ge 2019). Currently, 42 countries have submitted LTS documents, most of which focus on creating pathways to ambitious net zero goals (Ge 2019). However, only seven of these LTS submissions come from developing countries, demonstrating the need for further collaboration with developing countries to establish nationally driven LTSs.

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12 RE100 is a platform for getting commitments from corporations to procure 100% of their electricity demand from renewable energy resources. Science Based Targets Initiative supports corporations in setting emission reductions targets in line with 1.5 degree Celsius climate change targets. The Renewable Energy Buyers Alliance supports corporations in realizing their clean energy procurement targets, focusing on implementation in the United States.

The lack of integrated long-term climate development and finance strategies is indicated by the continued focus of climate finance to support projects rather than systemic interventions (Coony and Oppermann 2020). Climate finance is often allocated without full consideration of holistic climate objectives (Coony and Oppermann 2020). The recovery from the COVID-19 pandemic presents an opportunity for developing countries to create and implement long-term, low-carbon development investment strategies to avoid fossil fuel-dependent brown development that can result in locked-in emissions for decades. Such an approach is no doubt country- and context-specific, but it would require coordination across sectors and interim steps to achieve a full-scale economic transformation consistent with long-term decarbonization pathways. Climate finance must also shift from project-based financing instruments, i.e., grants and loans, to policy-based financing to strengthen enabling environments (Coony and Oppermann 2020) as well as risk mitigation measures that can effectively leverage investment at scale.

A coordinated approach that focuses on regulatory strengthening and long-term capacity development will maximize effectiveness of scarce public funding and increase opportunities to access private sector capital. One example of the coordination required is the need to shift infrastructure investments from fossil fuel to renewables and energy efficiency. To meet NDCs, these countries not only have to build up renewables and grid-integrating infrastructure, but they also must economically scale down investments in fossil fuels. These changes require more than project-based finance and must instead focus on upstream investments in systems and people to shift the economic structure to a low-carbon pathway. On a global level, climate-aligned finance only meets 10% of investment needs in developing countries, showing the structural realignment from a green recovery required to meet Paris NDCs (Coony and Oppermann 2020).

While some countries may have addressed clean energy investment mobilization measures in other public sector climate or energy plans, green recovery plans present a new opportunity to include clean energy measures in broad sweeping legislation and programs. Although some developing countries have incorporated clean energy in their own economic recovery plans, the number is not significant (Cahill et al. 2021). Furthermore, only 18% of recovery funds identified so far for the 50 largest countries are planned to be spent on green measures, outlining the need for greater climate alignment (Cahill et al. 2021). Colombia and Nigeria are examples of two developing countries that have significant clean energy measures in their economic recovery plans. Colombia will spend $4.1 billion on 27 renewable energy and transmission projects to create 55,000 jobs (Evans and Gabbatiss 2020). However, this fiscal commitment also includes funds for high-emission projects like transport infrastructure and mining projects. Nigeria’s comprehensive recovery package includes support for women in small businesses, green agriculture, and public infrastructure, and it carves out 10% ($619 million) to install solar home systems to provide electricity access for 25 million Nigerians without grid access (Nyong et al. 2021). It also provides incentives in the domestic solar industry to create more jobs. Furthermore, despite being Africa’s largest crude oil producer, Nigeria is one of a few countries to remove some fossil fuel subsidies during the pandemic (Nyong et al. 2021).

Figure 7 shows green recovery spending by overall spending and percent gross domestic product. Poland is the only non-advanced economy assessed as a current leader in green recovery. Turkey also demonstrates some early progress. Figure 8 shows that higher income countries are more likely to focus on building efficiency, job creation, and R&D for green recovery spending because they provide the cheapest emission reductions while aligning climate with growth. Lower-income countries focus mostly

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14 Green measures and recovery funding here is defined as investments in short-term economic recovery combined with long-term sustainability and decarbonization.

15 For a list of the top 25 countries that provide the most fossil fuel subsidies, see: https://www.iea.org/topics/energy-subsidies.
on infrastructure development (clean and natural), which indicates a focus on aligning climate and development initiatives to materially improve livelihoods. Green recovery is not the only mechanism to program clean energy investments in countries, and green recovery may only be relevant for the next couple of years—until the next global economic recession or depression.

Figure 7. Green recovery spending as a function of total spending and percent gross domestic product
(Source: Callaghan and Murdock 2021)
A green recovery will require not just clean energy and sustainable development but also a robust commitment to phasing out coal-powered generation. Currently, 13 high-income countries have committed to phasing out coal by 2030 (Myllyvirta 2021). Overall, coal plant approvals have fallen 80% from where they were five years ago (IEA World Energy Investment 2021). However, for developing countries, coal-fired electricity capacity likely will not peak until past 2030 (Myllyvirta 2021). China, Cambodia, Indonesia, and Pakistan are planning to increase coal-fired generation capacity (IEA World Energy Investment 2021). The Philippines announced a moratorium and plans to phase out coal in the coming decades (IEA Electricity Market 2020). Vietnam plans to increase both renewable energy and coal-fired power generation capacity simultaneously (IEA World Energy Investment 2021).

Based on current trends, 900 GW of coal-fired power generation capacity in the developing world (compared to only 450 GW in advanced economies) will have to be retired or cancelled in the next 10 years to meet emissions budgets consistent with limiting global warming to 1.5 degrees Celsius, emphasizing the importance of finding viable mechanisms to finance these retirements (Myllyvirta 2021). Coal plant retirement will require removing policies that insulate coal plants from competition, refinancing or securitizing plants to free up capital to invest in clean energy, and providing transition financing for affected workers and communities (Bodnar et al. 2020). In fact, where clean energy already outcompetes coal, as is the case in many markets, these policies would not even require additional public funds (Bodnar et al. 2020). The development community needs to work with partner countries to support them in considering phasing out coal as they craft their economic recovery and climate change strategies. Otherwise, countries run the risk of locking in fossil fuel-dependent development pathways, regardless of progress made in clean energy.
Climate Finance and People-Centered Transitions

Developing countries face the challenge of aligning climate finance and COVID-19 recovery with socioeconomic equity and facilitating energy justice. At a broader level, navigating this problem includes linking various sectors outside of energy, such as trade, finance, information technology, health, and industry to ensure that economic recovery has equitable distributional impacts and is socially inclusive (Cahill et al. 2021). For example, many developing countries face labor informality, a lack of connectivity, limited digitalization, and food insecurity issues, among other issues, for which a clean energy or green recovery must account and ideally seek to leverage potential synergies (Cahill et al. 2021). Unfortunately, no international framework currently exists for differentiating climate from development finance, which has made it difficult to systematically analyze when climate and development solutions can be integrated and when they clash (Bhattacharya et al. 2020).

Empowering communities, SMEs, entrepreneurs, women, workers, and local financiers will be key to supporting a just economic recovery. Understanding the viewpoints of local communities will enable solutions that meet the needs of marginalized groups with the most development needs who are also most affected by climate change. Robust stakeholder engagement is one of the most important aspects of any program design that effectively addresses local concerns and priorities of a clean energy transition. This often takes significant time and resources to do well, and it requires using local groups with deep, nuanced understandings of the political, social, economic, and cultural contexts. Effective workforce development with clean energy in mind can empower local citizens to participate in and benefit from a country’s energy transformation (Cahill et al. 2021). Finally, program design must work with local financiers and banks, who have much better on-the-ground economic and social knowledge along with a stake in the community. This will facilitate improved investment opportunities as well as a better understanding of how climate finance interacts with local development needs (Attridge and Gouett 2021).

16 The phrase “a people-centered transition” was adopted from the June 2021 IEA report, “Financing Clean Energy Transitions in Emerging and Developing Economies.” It is defined as ensuring that transitions account for social and economic impacts on individuals and communities, especially in terms of affordability and fairness.
4 Ten Clean Energy Investment Mobilization Levers for USAID to Enhance Climate Finance Flows\textsuperscript{17}

NREL has identified ten key clean energy investment mobilization levers USAID can apply to increase the scale of investment in clean energy in partner developing countries at the national and subnational levels. These levers were selected through research, interviews with clean energy and climate finance experts, and a stakeholder workshop.\textsuperscript{3} The levers serve as an input into the broader climate finance strategy that USAID is developing. They should be refined and developed into a suite of services to inform regional and country Missions and other operating units in considering development of new support programs, with significant adjustments made to adapt to regional and local climate finance barriers, opportunities, and priorities. The levers are not fully independent, and programs could include aspects of multiple levers to maximize impact.

This report describes ten priority clean energy investment mobilization levers further in the subsequent sections using integrated examples. The examples include a mix of new ideas; recent innovations that can be scaled; successful USAID programs; programs implemented by others that USAID could buy into for additional impact; and opportunities for deeper collaboration and coordination with key partners. In each lever, specific measures are noted in bold. Key innovations are highlighted in text boxes. For several of the levers, USAID has previously implemented relevant measures with its partner countries. Many of the levers build on USAID’s efforts on clean energy enabling environments by exploring ways to further integrate potential climate finance support. This report recommends adapting, replicating, and significantly scaling USAID programs with the most impact, and in some cases, updating approaches to reflect emerging demand.

The dual focus of the levers on innovations and scaling existing effective programs aligns with U.S. government goals to support near-term NDC implementation over the next two to three years along with longer-term net zero, resilient strategies. While innovations in programming are necessary to address emerging challenges and to further push the boundaries of mitigation measures to achieve net zero and other ambitious targets, new programs can take significant time to design, procure, initiate, and implement before impacts are achieved.

Figure 9 shows the steps USAID can take to implement these levers and related measures. Note that these steps are not necessarily sequential. USAID may benefit from additional in-house climate finance/development finance capacity to support refinement and implementation of the climate finance strategy. The implementation framework suggests ways for USAID/Washington to engage with regional and country missions and other operating units to identify climate finance opportunities and offer related expert services. It also highlights areas for further developing strategic partnerships with the broader climate finance community and supporting regional and global learning.

\textsuperscript{17} The concept of climate finance levers was adapted from the 2020 World Bank report, “\textit{Transformative Climate Finance: A new approach for climate finance to achieve low-carbon resilient development in developing countries},”
Prioritize a portfolio of services with expert teams ready to provide support:
- Proposed climate finance levers and measures will need to be narrowed and further defined based on consideration of USAID’s comparative advantage, expected impact, the level/nature of resources
- Initial feedback sought from the regional and country missions and other operating units as to which areas could be most impactful.

Formulate headquarters-level global toolkits, training programs, and support for innovation measures:
- USAID can identify services that can be offered across multiple countries, such as innovative procurement, infrastructure finance, risk reduction instruments, and global incubator and entrepreneur support activities.

Offer these services and the expert team to Missions for tailored application:
- Work with Missions to identify potential areas of climate finance support that align with partner country and U.S. government interests and deploying this support.
- Provide sufficient capacity development and conduct knowledge management to support ongoing internal learning and have mechanisms for Missions to easily engage key experts and resources.

Structure partnerships with U.S. and international finance institutions:
- Develop a variety of investor partnerships to support coordinated delivery, including higher-level strategic agreements with key climate finance partners (e.g., DFC and other U.S. agencies, MDBs, GCF, GEF).
- Bring in U.S. finance industry into a climate finance advisory board that can inform approaches to engaging the private sector (such as making investment commitments, participating in forums on country investment strategies, etc.).

Create and build upon existing global and regional platforms for country-driven peer learning & innovation in finance mobilization:
- Further share USAID’s wealth of knowledge and experience through regional and global platforms such as the U.S. government supported Low Emission Development Strategies Global Partnership, the NDC Partnership, and others to enhance its global impact.

Figure 9. Draft framework for implementing an enhanced climate finance strategy
Figure 10 shows that the levers include a mix of “top-down” measures that can result in significant clean energy deployment and GHG reductions as well as more bottom-up measures that have greater focus on people, capacity development, and social impacts. The top-down measures center on mobilizing investment in clean energy and de-investing in uneconomic, high-emitting resources. The bottom-up measures focus on support for SMEs (as clean energy service providers and end-users), entrepreneurs, energy access, post-conflict development, and cross-sectoral innovation for rural and urban applications. Several measures could combine elements of both depending on the specifics of the program and policy design. In general, we suggest that the combined elements category emphasize elements of a bottom-up approach to the greatest degree possible to ensure that social benefits are maximized.

Table 1 highlights the three respective climate finance themes, Project Portfolios, Policy and Infrastructure, and Entrepreneur and Finance; the ten levers in these three themes; and related measures. Table 2 provides a high-level, qualitative assessment of the relative outlays in terms of cost and risk and potential impacts of each lever. Table 2 is repeated and explained in detail in Section 7 of the report.
<table>
<thead>
<tr>
<th>Project Portfolio Levers</th>
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<tbody>
<tr>
<td><strong>Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing</strong></td>
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<tr>
<td>● With partners like DFC or through blended finance mechanisms, provide project preparation and de-risking support, including addressing challenges around currency risks and financing construction phases.</td>
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<tr>
<td>● Use USAID’s convening power to bring in more investors to scale financial resources.</td>
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<tr>
<td><strong>Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance</strong></td>
</tr>
<tr>
<td>● Collaborate on innovations such as bulk energy efficiency or aggregated renewable energy procurements for the public and private sectors to create economies of scale and lower costs.</td>
</tr>
<tr>
<td>● Develop capacity to catalyze creation of investable project pipelines and improve access to climate finance.</td>
</tr>
<tr>
<td><strong>Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity</strong></td>
</tr>
<tr>
<td>● Support multi-stakeholder efforts to develop frameworks for asset-backed securitization of energy efficiency and clean energy projects.</td>
</tr>
<tr>
<td>● Develop standardized energy savings performance contracts, power purchase agreements, solar, mini-grids, and other contracts that adhere to international investor standards.</td>
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<tr>
<th>Policy and Infrastructure Levers</th>
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<tr>
<td><strong>Lever Four: Development of Public and Infrastructure Investments for Sustained Growth</strong></td>
</tr>
<tr>
<td>● Support development of green recovery packages or other government-funded efforts that rely on clean energy enabling environments for quick-start, inclusive job growth, e.g., technical assistance on design of Cash for Clunkers rebate programs for inefficient appliances and equipment, clean energy funds, weatherization programs, and on-bill financing.</td>
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<tr>
<td>● Complete jobs, economic, and social analysis to determine priority programs.</td>
</tr>
<tr>
<td><strong>Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment</strong></td>
</tr>
<tr>
<td>● Develop reverse auctions or debt swaps to support investment in system-friendly renewable energy and coal plant retirement.</td>
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<tr>
<td>● Develop sectoral policies and regulations to promote clean energy, such development of energy efficiency standards, building codes, minimum energy performance standards, mandates, and streamlined grid access.</td>
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<tr>
<td><strong>Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities</strong></td>
</tr>
<tr>
<td>● Provide support for formulating detailed clean energy investment strategies, roadmaps, and plans in line with NDCs and LTSs.</td>
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<tr>
<td>● Engage extensively with the private sector, including forums to garner investment commitments, development of joint solutions, and dialogues to get buy-in on identified measures.</td>
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<tr>
<td><strong>Lever Seven: Establishment of Market-based Mechanisms to Improve Project Profitability</strong></td>
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<tr>
<td>● Provide technical assistance on market designs that better capture the value of energy efficiency, demand response, and distributed energy resources, such as capacity markets, energy markets, or ancillary markets.</td>
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<tr>
<td>● Provide support for developing innovations in tradable certificates, including Peace, Distributed, and time-valued RECs, and Carbon Bonuses.</td>
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<tr>
<th>Entrepreneurial and Financial Innovation Levers</th>
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<tr>
<td><strong>Lever Eight: Capacity Development for Entrepreneurs to Drive Technology and Business Model Innovation</strong></td>
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<tr>
<td>● Engage with national and regional innovation and investment networks to provide capacity development to help entrepreneurs invent or adapt clean energy technologies and new business services.</td>
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<tr>
<td>● Demonstrate emerging solutions through combined policy-pilot project efforts.</td>
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<tr>
<td><strong>Lever Nine: Support to the Financial Sector to Develop Green Finance Products and Regulations</strong></td>
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<tr>
<td>● Expand existing strategic donor partnerships, e.g., GCF and GEF.</td>
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<tr>
<td>● Collaborate with national development banks and commercial banks to improve their access to climate finance resources, ability to design green financing products, and ability to develop related guarantees or clean energy funds.</td>
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<tr>
<td><strong>Lever Ten: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment</strong></td>
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<tr>
<td>● Help develop energy efficiency, clean energy, and other power sector investment data, modelling, analysis, visualization and communication, and stakeholder engagement processes to determine the potential for early coal plant retirement and replacement and additional clean energy investments.</td>
</tr>
<tr>
<td>● Provide analytical support to understand the jobs and economic impacts of alternative clean energy pathways.</td>
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</tbody>
</table>
**Table 2. High-level, Qualitative Assessment of the Ten Clean Energy Investment Mobilization Levers**

<table>
<thead>
<tr>
<th>Lever</th>
<th>Program Cost</th>
<th>Risk Taking</th>
<th>Potential Impacts (Qualitative Assessments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>2: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance</td>
<td>M</td>
<td>M</td>
<td>L-M</td>
</tr>
<tr>
<td>3: Contract Standardization and Support for Securitization to Increase Liquidity</td>
<td>L</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>4: Development of Public and Infrastructure Investments for Sustained Growth</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>5: Improvements to Enabling Environments to Attract Long-term Investments</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>6: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>7: Establishment of Market-based Mechanisms to Improve Project Profitability</td>
<td>L</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>8: Capacity Development for Entrepreneurs to Drive Technology and Business Innovation</td>
<td>M-H</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>9: Support to the Financial Sector to Develop Green Finance Products and Regulations</td>
<td>M-H</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>10: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

Key: H = High; M = Medium; L = Low
PROJECT PORTFOLIO LEVERS

The following three project portfolio levers center on creating project pipelines by providing capital, improving local capacities to develop and access financing for projects, reducing soft costs, and enhancing liquidity to clean energy projects.

Barriers Addressed:

- Shortage of high-quality clean energy projects
- Inadequate channels to guide available funds in the right direction
- Insufficient number of intermediaries to help facilitate investments.

Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing

One of the most well-recognized challenges for clean energy project proponents in developing countries is difficulty accessing capital because of real or perceived high risks. Stakeholders noted that project developers often encounter barriers to finding enough equity or debt. Project developers also face a chicken-or-the-egg challenge as to which piece of the capital stack can be secured first. One interviewee noted that de-risking should be an area of focus for climate finance institutions, especially because public funds are so limited and because of the large scale of private sector investment mobilization required to meet climate change targets. Financial de-risking measures may offer greater leverage as compared with direct investments. Finance de-risking measures can include guarantees, insurance, hedging, junior or subordinate capital, securitization (covered further under Lever Three), results-based incentives, contractual mechanisms, and grants.

Another interviewee mentioned the importance of de-risking for markets in Sub-Saharan Africa where there is significant real or perceived high risk for both equity and debt, increasing the cost of capital for clean energy projects. A government program that was particularly effective in this area was the U.S. Africa Clean Energy Finance Initiative, a project preparation facility implemented by the Overseas Private Investment Corporation (now a part of the DFC) and the U.S. Trade and Development Agency. The Africa Clean Energy Finance Initiative supported 32 regional and country-specific projects in Africa by providing funding to developers—especially small-scale entrepreneurs—to help cover the costs for environmental impact assessments, legal counsel, and resource measurement studies (U.S. Department of State 2016). The program succeeded at advancing projects toward financial closure and leveraging investments for clean energy projects (U.S. Department of State 2016). The program was especially praised for providing early-stage support while also having a high risk tolerance and a light-touch, flexible design (U.S. Department of State 2016).

Textbox 1: Innovation Highlight: Scaled Support for Project Preparation and De-risking

USAID, with partners like the DFC or through blended finance mechanisms, can provide project preparation and de-risking support. Areas of potential focus include currency risks and financing the construction phase of project development. Because of the large array of existing support facilities, USAID may want to carefully consider opportunities to support riskier, emerging technology solutions or markets. Additionally, USAID could use its convening power to bring in more investors to scale financial resources.

USAID could work with partners to provide de-risking mechanisms through blended finance or direct government support that can attract initial investors who can offer much needed capital for project
development, construction, and operational phases. This could include working directly with other government institutions, like the DFC. For example, USAID could consider providing subsidies that can enable partners like the DFC to offer equity and debt solutions for projects or markets that might otherwise be outside of DFC’s mandated risk tolerance.

USAID could **invest in existing project preparation facilities to scale them** and develop additional facilities where needed. Project preparation facilities provide valuable services to the private sector by developing the capacity of entrepreneurs to address risks, structure deals, and successfully garner support from financiers and investors. While project preparation facilities such as the Africa Clean Energy Finance Initiative have proven to be effective approaches to mobilizing clean energy investments, it is important that any new facilities are designed within the current ecosystem. Although the Africa Clean Energy Finance Initiative is an example of a government-funded project preparation facility, project preparation facilities can also be supported through blended finance approaches, which are further described in the following paragraphs.

The Overseas Development Institute’s website published a November 2018 list of project preparation facilities, and an associated 2018 report provides good insights into best practices for designing project preparation facilities. A 2016 USAID assessment highlights key energy project preparation facilities available in Sub-Saharan Africa. This includes two project preparation facilities that USAID has supported: the Clean Technology Initiative Private Financing Advisory Network and the Sustainable Energy Fund for Africa. An updated assessment of existing facilities may be needed to fully understand if there are any existing gaps in the types of services being provided or geographical, technology, and sectoral coverage. USAID could also explore supporting project preparation facilities that target working with under-represented groups, such as women-owned or operated businesses.

Project preparation facilities can be designed at the subnational level, such as the case with the Sub-National Climate Finance Initiative, a Global Innovation Lab for Climate Finance winner from last year. This initiative is currently raising funds for their technical assistance facility, which received $150 million from the GCF investment last year. A variety of additional project preparation facility examples and resources may be helpful in designing project preparation facilities, including:

- The 2018 report from the Climate Policy Institute, “Designing Technical Assistance Activities for Adaptation and Resilience Companies.” Although the focus of the report was to help a fund that was developing a technical assistance facility for an adaptation project, the facilities reviewed for this analysis were largely centered on clean energy.
- The Green City Finance Directory: The Climate Policy Initiative (CPI) serves as Secretariat for the Cities Climate Finance Leadership Alliance and maintains a directory of project preparation facilities. The project preparation facilities listed in this directory are focused on cities, but many have broader remits: [https://www.citiesclimatefinance.org/green-city-finance-directory/](https://www.citiesclimatefinance.org/green-city-finance-directory/)

Another way to support project preparation is to cover the costs for feasibility and/or social and economic impact studies. However, one workshop participant (USAID staff) noted that some development partners are overly focused on keeping the costs of the studies low by using consultants who produce results that do not adhere to international investment standards and thus defeat the purpose of the support. It is important that the structure, content, and quality of the studies are designed in a way to reduce uncertainties, address risk, and attract investors.

USAID could **scale investments in blended finance facilities** that can integrate investment from donor countries, multilateral development banks, development finance institutions, foundations, and impact

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18 For more information, see: [https://www.climatefinancelab.org/project/sub-national-climate-finance-initiative/](https://www.climatefinancelab.org/project/sub-national-climate-finance-initiative/).
investors. Blended finance can be an effective mechanism for de-risking by using limited public and philanthropic funds to leverage more significant levels of private sector investment. In a blended finance arrangement, the public and/or philanthropic funds often provide the higher risk and concessional capital to reduce risk to the private investors. The concessional support can be direct, e.g., subordinated debt or equity, or in the form of a grant or working capital that can support project development (CPI 2018).

USAID already has extensive experience using blended finance approaches. According to Convergence, an advisory firm focused on blended finance, USAID has supported 78 energy-focused clean energy transactions via blended finance mechanisms to date. Although not focused on clean energy, USAID has also worked with private enterprises and investors to develop the Althelia Amazon Biodiversity Fund (Haeni 2021). The USAID-funded CATALYZE Activity does not appear to currently have a blended finance facility centered on clean energy but could possibly serve as yet another mechanism for doing so; this should be confirmed with the program managers. USAID could build on its expertise to further refine and grow its blended finance offerings and partnerships with other blended finance facilities. If USAID has not yet had the opportunity to do so, USAID could mine its previous transactions to glean learnings to inform future blended finance programming. Additionally, because USAID has done a lot of work in the blended finance area, one interviewee active in the blended finance space suggested that it could potentially do more to share its experiences with other donors to support replication as well as work to bring these donors into partnerships to co-design or contribute to facilities.

An example of a blended finance facility focused on clean energy is that of Climate Investor One. Climate Investor One provides whole-of-life financing for on-grid renewable energy projects in Africa, South and Southeast Asia, and Latin America. Climate Investor One has its own project preparation facility that provides development and technical assistance support to projects, which can then be followed by construction financing that is offered as an all-equity model (Personal communication with Michael Jordan 2021). The facility implements its whole-of-life through a development fund, a construction fund, and a refinancing fund (Climate Finance Lab). Using an all-equity approach addresses the barrier that project developers face in accessing construction financing for which lenders require that developers address not just risks during construction but also during project operation. Construction risks are significant, because of technical and environment uncertainties, resulting in high borrowing costs. Many projects fail at the construction phases because of the challenge of accessing affordable debt and managing initial project development. Overall, Climate Investor One has already scaled beyond its initial target of $530 million and is on track to deliver 1.7 GW of additional renewable capacity, 5.1 Terawatt-Hours (TWh) of electricity annually for 13 million people, and 1.9 million tons of avoided CO₂ emissions (FMO 2019). Additional examples of blended finance facilities include the United States-India Catalytic Solar Finance Facility, the United States-India Clean Energy Finance Initiative, and the Southeast Asia Clean Energy Facility.¹⁹

Table 3 outlines the different levels at which blended finance facilities can provide support and includes relevant examples of clean energy facilities. The levels include project preparation support and intermediaries, project and corporate level support, publicly managed facilities, public-private funds, fund of funds, and mainstreamed facilities (CPI 2018). Blended finance facilities can include a variety of different instruments. Table 4 highlights some of the key instruments that blended finance facilities can address and their relevant risks.

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<table>
<thead>
<tr>
<th>Level</th>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>Project Preparatory Support</td>
<td>Africa Clean Energy Facility, United States-India Clean Energy Facility,</td>
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<td></td>
<td>Convergence, Aligned Intermediary, The Lab, PRIME Coalition (United States)</td>
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<tr>
<td>Project or Corporate</td>
<td>Quarzazate Concentrated Solar Plant, La Ventosa wind farm, Lake Turkana</td>
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<td></td>
<td>Wind Project</td>
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<tr>
<td>Publicly Managed Facilities</td>
<td>China Utility-Based Energy Efficiency Finance Program, IFC Managed Co-</td>
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<tr>
<td></td>
<td>Lending Portfolio Program</td>
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<tr>
<td>Public-Private Funds</td>
<td>Climate Investor One, Danish Climate Investment Fund, Asia Climate</td>
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<tr>
<td></td>
<td>Partners</td>
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<tr>
<td>Fund of Funds</td>
<td>GEERED, GEEREF Next, Catalyst</td>
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<tr>
<td>Mainstreaming</td>
<td>Green investment banks or facilities; Catalytic Finance Initiative</td>
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<tr>
<td>INSTRUMENTS</td>
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<tr>
<td>1. Guarantees</td>
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<td>2. Insurance</td>
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<td>3. Hedging</td>
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<td>4. Junior or subordinated capital</td>
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<td>5. Securitization</td>
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<td>6. Contractual mechanisms</td>
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<td>7. Results-based incentives</td>
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<td>8. Grants</td>
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Table 4. Blended finance instruments and potential risks addressed (Blended Finance Task Force 2018)

- Y indicates the instrument addresses the risk.
One workshop participant noted the importance of designing blended finance facilities in a way that shortens origination times for projects and does not require undue amounts of paperwork or time from recipient projects and companies, to ensure that the facilities truly accelerate project development and reduce resources and time required. Another suggested that by teaming up with other donor agencies, USAID could support a facility that is more effective at a larger scale or combined dollar amount. For example, USAID is doing this in forestry under the Lowering Emissions by Accelerating Forest Finance Coalition. Stakeholders recommended that USAID should be careful in taking inputs from the private sector, avoid letting them overly steer the direction of the facility, and hold off on developing any major partnerships until a framework and objectives are solidified.

One of the most important aspects of blended finance is designing facilities that do not target markets or borrowers that do not need it. Well-designed blended finance facilities will likely require in-depth study of a given market, including consideration of the overall policy environment, technology, and proposed applications. For example, India likely does not require blended finance for utility-scale or other distributed solar projects, but it could potentially benefit from blended finance for newer markets such as offshore wind and riskier markets such as off-grid solar and mini-grids. Blended finance may also be especially effective for new technologies, such as demonstrating green hydrogen applications in islands and remote communities, in middle-income countries with existing natural gas infrastructure, e.g., Thailand, or in countries that could serve as regional hubs, e.g., Chile and Morocco (World Bank 2020). Blended finance could also support investments in transmission to integrate renewables, e.g., linking isolated renewable resources to the grid and demand centers; strengthening grids for dispatch flexibility; increasing their ability to absorb intermittent renewable energy generation resources, such as through battery energy storage systems; and enabling cross-border trade to improve utilization of hydropower and other complementary resources.

CPI identified two key elements that can help define a market’s need for blended finance support to catalyze clean energy projects:

- High relevance for climate change mitigation and energy access
- Conducive environments for private sector investments (CPI 2018).

CPI recommends that blended finance facilities target and address risks most cited by private sector investors in a given market. Additionally, CPI suggests that to achieve scale will require additional technical assistance to promote development of relevant project pipelines (see Lever 2) and streamlined application processes. Figure 11 outlines a few of the markets that CPI assessed where blended finance support of clean energy projects has potential impact, according to the key elements. These include large markets, e.g., India and South Africa, as well as small markets, e.g., Mongolia, Cambodia, Uganda, and Rwanda, with geographic concentrations mainly in South and Southeast Asia and East Africa.

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The Lowering Emissions by Accelerating Forest Finance Coalition aims to raise global climate ambition and contribute to halting tropical and subtropical deforestation and forest degradation by 2030. Coalition participants will pay for high-quality emission reductions based on verified forest conservation in tropical and subtropical forest countries, supporting efforts to reduce and end deforestation. Lowering Emissions by Accelerating Forest Finance is a voluntary global coalition bringing together companies and governments to provide tropical and subtropical forest conservation at a scale not seen before. The initial group of participants includes the governments of Norway, the United Kingdom, and the United States as well as a group of leading international companies including Amazon, Airbnb, Bayer, BCG, GSK, McKinsey, Nestle, Salesforce, and Unilever. Corporate participants must meet a series of stringent requirements, including a science-based target or equivalent, independently verified decarbonization target, published GHG inventory, and independently audited reporting on use of emission reductions. Emergent Forest Finance Accelerator, a U.S. nonprofit organization, serves as the administrative coordinator of Lowering Emissions by Accelerating Forest Finance. The Lowering Emissions by Accelerating Forest Finance Coalition was announced on April 22, 2021, at the Leaders Summit on Climate and is included in the White House Fact Sheet.
Figure 11. High-impact opportunities for clean energy blended finance (Source: CPI 2018)

Currency risk remains a challenge in many markets. To avoid this risk, clean energy companies need to borrow in local currency over longer loan tenors to avoid exposure to fluctuations between the local currencies in which cash flows are received and foreign currency denominated debt. Although a good practice is to denominate PPAs in a major international currency, e.g., USD or euros, indexed to inflation, this could cause challenges on the buyer side and may not be an option for developers in some markets. While currency risks in developing countries (especially richer ones) have improved in recent years because of sounder monetary policy, the pandemic started another bout of depreciation (CFLI 2021).

The Global Climate Finance Innovation Lab ARM-Harith Cities & Climate Transition Fund is an example of one such fund that offers a new way to address local currency risk. The fund does this by refinancing infrastructure investments originally denominated in U.S. dollars into local currency when the project is operational. In addition to project-level capital support, companies may require working capital to identify and develop projects. Working capital could be provided through grants, repayable grants, and other mechanisms and is vital for identifying projects, supporting project preparation, and conducting feasibility assessments. Another example of a catalytic de-risking project that USAID undertook was support to CrossBoundary, a commercial and industrial solar developer looking to enter the market in Sub-Saharan Africa. USAID provided Cross Boundary with a refundable grant as subordinated capital that would require repayment to USAID only if the project was successful. (USAID “The CrossBoundary Energy Partnership”). The $1.3 million grant USAID provided attracted $17.5 million in debt and equity, demonstrating a mechanism that can provide significant leverage of public funding.

The U.S. government has already announced that it would provide substantial new funding to the GCF. Interviewees noted that directing increased funding toward the GCF private sector facility could be especially catalytic. The private sector facility requires accredited entities to partner with the private sector, which could serve as a model that supports more transformational change and long-term sustainability by ensuring that projects have private sector interest and are financially viable.
Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance

Stakeholders noted the significant need to develop the capacity of in-country public sector partners to formulate investable project pipelines and access climate finance. Many developing country governments lack experience engaging with multinational investors and developing international commercial deals, which can significantly impede project pipeline development (CFLI 2021). On the project pipeline side of things, common areas for capacity development include the need for improved knowledge and practices to support identifying projects, conducting pre-feasibility assessments, structuring finance models, and accessing investor and banking networks. In terms of accessing climate finance grants for technical assistance or capacity development programs, one interviewee noted the need to enhance the capabilities of local regional partners to identify climate finance funding technical assistance and capacity building programs for clean energy projects, formulate applications, and successfully implement and report on project impacts.

USAID could work to further support development of project pipelines through technical assistance, capacity development, and possibly financial support. This could include project identification and development of competitive bidding processes as well as efforts to capture project experiences and share related guides and tools that can enable replication and scaling by government entities. The Power Africa Private Sector Partners is one model that other development assistance organizations could adapt and replicate with its focus on bringing in private sector investment and connecting it with local and international development partners to help meet clean energy and development goals.21 So far, the program has brought in over 160 companies. Additionally, USAID could work to further partner with subnational governments to develop clean energy project pipelines, e.g., working cities or provinces to develop financing and cost recovery approaches for onsite solar photovoltaics and LED street lighting for public buildings and facilities.

USAID could also explore demonstrating additional innovative approaches to aggregating procurements for multiple projects to achieve scale and drive down unit costs. One example of aggregated or bulk procurements is for energy efficiency improvements. Large organizations such as national governments can possess enough buying power to create economies of scale and lower costs of efficient equipment and construction practices. Private or quasi-public organizations also can play an important role in procurement in the private sector, e.g., Energy Efficiency Services Limited in India, through mass purchase and

\[21\] For more information, see: https://www.usaid.gov/powerafrica/privatesector.

Textbox 2: Innovation Highlight: Bulk or Aggregated Procurements

USAID can support wholesale efforts that can drive transformation while also acknowledging the need for greater NDC implementation support in the form of project pipeline development through aggregated or bulk procurement of energy efficiency and renewable energy technologies. USAID could build on effective approaches such as those demonstrated by intermediaries Ujala LED program in India and the Clean Energy Investment Accelerator to formulate additional models for aggregated procurements. This could include for a variety of end-users (e.g., national and subnational governments, private sector entities, and communities) to create economies of scale for technologies that are not yet being deployed at significant levels. Potential technologies include heat pumps, industrial motors, clean energy mini-grids, solar plus behind-the-meter storage, LEDs, and other types of efficient appliances and equipment. USAID may want to explore regional approaches for small and medium-size countries to ensure that aggregations are of significant size.
redistribution. USAID can work with the public sector, nongovernmental organizations, consulting firms, and partners to develop lists of pre-approved energy efficiency appliances, equipment, and lighting and procurement practices to include in procurement guides for the public sector. This information and additional capacity development with public sector entities in partner countries can help government entities procure energy efficiency improvements in bulk, driving down costs. USAID can also work with governments to design incentives for reducing public sector energy use, such as sharing the savings from the improvements with the relevant agencies and procuring bodies. Additionally, USAID can work to build the capacity of SuperESCOs that can bundle projects and provide technical inputs to smooth investment pipelining.

An example of a bulk energy efficiency procurement program is India’s Unnat Jyoti by Affordable LEDs for All (Ujala). The program works through competitive bidding at the national level with LED manufacturers offering their best prices. The procured bulbs are then issued to power distribution companies for sale to their customers. Because of the competitive bidding process and economies of scale achieved through the bulk procurement process, the program does not require subsidies. The program sold more than 230 million LED bulbs to households in India over the first three years of its operation and offset peak demand by 6 GW. The program has since been expanded to include ceiling fans and air conditioners, and countries like the United Kingdom, Canada, Nepal, and Bangladesh have also applied this approach (Chunekar and Mulay, and Kelkar 2017). India offers a significant opportunity because of the large scale of the potential market and the previously limited entry of LEDs into the market. Bulk procurement programs have also been developed for smaller markets such as Nepal. There could also be opportunities to apply regional approaches that could aggregate across multiple markets.

Another example is Evensen Dodge, a financial advisory firm, which worked with USAID under a Global Development Alliance to support Mexican states and municipalities with bundling small clean energy projects into portfolios of $100 million to attract institutional investors. The portfolio approach also helped to establish checks and balances, reduce corruption, and enable the establishment of public trust funds with investment committees (Personal communication with Eric Hyman 2021).

A final example is that of the Clean Energy Investment Accelerator’s (CEIA’s) work to unlock clean energy investments in commercial and industrial sectors in emerging and developing markets. The CEIA applied aggregated procurement approaches in markets like Vietnam, bringing together multiple international brands and local suppliers to participate in a shared competitive bidding process. These CEIA-led efforts could be expanded to new markets and new sectors with additional support. The CEIA’s approach could also be applied to aggregating projects with public sector partners, building on the program’s experience working with the Santa Rosa City government in the Philippines.

Figure 12 demonstrates how bulk procurement can be a key early measure for kick-starting market development for a given energy efficiency technology, with further market support provided by follow-on measures such as incentive programs and equipment performance standards.

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22 For more information, see: https://eeslindia.org/en/home/.  
23 For more information, see: https://www.dodgeglobal.com/citiesfunding.php.
USAID could also look to **train and fund embedded climate finance advisors to support governments**. This could include working with local partners to improve access to climate funds, including from the GCF and its national accredited entities, the GEF, etc. For example, USAID could work to further develop the existing local capacity to formulate well-designed plans to engage the GCF or other funders. USAID could provide follow-on program support to GCF projects. USAID could work with local partners to develop climate finance proposals that align with the Climate Finance Access Network, a new platform organized by the Rocky Mountain Institute that will initially support advisors through funding from the Canadian government and those placed by the Global Green Growth Institute. The Climate Finance Access Network will focus on capacity development in Least Developed Countries and Small Island Developing States. USAID could explore augmenting this program by funding additional embedded climate finance advisors as well as supporting the advisor training program.

The Low Emission Development Strategies Global Partnership (LEDS-GP) has a Regional Accelerator for Agriculture, Climate and Energy. This country-driven program supports the mobilization of climate financing by accelerating the development of bankable, climate resilient loan pipelines. Embedded regional experts work with communities of practice to identify technology focus areas, screen viable projects, provide advisory and matchmaking support to connect project proponents with existing project preparation and other finance facilities, and facilitate regional learning. USAID could consider working with the Low Emissions Development Strategies Global Partnership to scale this program to **enable local project proponents to access regional project pipeline advisory support coupled with matchmaking services to regional project preparation facilities and investors.**

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24 For more information, see: [https://rmi.org/our-work/areas-of-innovation/climate-finance/climate-finance-access-network/](https://rmi.org/our-work/areas-of-innovation/climate-finance/climate-finance-access-network/).
Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity

Nascent and developing clean energy markets often lack project standardization. For renewable energy, although 89 emerging markets offer PPAs with lengths of 10 years or greater, more than half (54) do not have PPA standardization. However, even PPAs of 10 years may be too short. Many also lack standardized contracts, such as for energy savings performance contracts (Fischer et al. 2014). This insufficient standardization for energy efficiency and renewable energy projects poses challenges, including increasing the difficulty for financiers and investors to compare proposal risks and mitigation measures and projected cash flows and net returns.

Lack of standardization also makes it difficult to develop secondary debt markets that can be accessed through securitization of energy contracts and the associated assets (CFLI 2021). Secondary markets hold promise for energy efficiency and renewable energy financing to lower transaction costs and promote financial liquidity, thereby making clean energy investments more accessible to pension funds, insurance companies, and private equity. Keys to accessing secondary market capital for clean energy include (1) scale, to cover transaction costs and qualify for larger investors and (2) standardization to create clear definitions and uniform credit risk analysis. Several examples from the United States could serve as models for secondary markets in developing countries.

USAID can work to further partner with countries to develop contract structures that adhere to international standards that can attract domestic and foreign investment. Examples of such contracts include energy savings performance contracts; PPAs between utilities and independent power producers; business-to-business power purchase agreements, e.g., for onsite PPAs, offsite direct or physical and offsite virtual financial contracts for differences; and business-to-residential PPAs. USAID could seek opportunities for it to take on any potential stranded risks.

USAID could assess the potential value of leveraging efforts by the IRENA to develop standard contracts for small and medium grid-connected solar projects. These include PPAs, implementation agreements, operations and maintenance agreements, supply agreements, installation agreements, and finance term sheets, which can be found on IRENA’s Open Solar Contracts website.25 Developing similar types of contracts for other solar applications as well as for energy efficiency contracts and additional renewable energy technologies could be useful.

Textbox 3: Innovation Highlight: Securitization

Several stakeholders engaged in interviews and the stakeholder workshop think that there is significant potential for further efforts around energy efficiency and renewable energy securitization, and they think that this is an area where USAID could provide more support, building on impactful work by the IFC, the Global Climate Finance Innovation Lab, the World Bank, and others. The potential areas for further work around securitization include:

- Creating regional or subregional frameworks for securitization
- Working with other donor agencies or financial institutions to develop risk mitigation measures
- Bringing in local and international investors to invest in initial tranches
- Providing capacity development to local entrepreneurs to use standardized contracting to support creation of upstream conforming project pipelines.

25 For more information, see: https://opensolarcontracts.org/.
USAID could investigate the potential to further partner with the Scaling Solar program led by the World Bank Group with which USAID has previously worked in Africa.²⁶ The Scaling Solar program creates viable markets for solar power through a one-stop-shop for the purpose of making privately funded, grid-connected solar photovoltaic projects cost competitive. The Scaling Solar program provides a suite of resources that cut across Levers 2 and 3, including technical assistance on assessing the size and location for photovoltaic projects, support on competitive tendering processes, development of bankable loan applications, competitive financing on appropriate loan terms for the bidders, and risk management and credit enhancements. The Scaling Solar program is currently active in Afghanistan, Côte d’Ivoire, Madagascar, Togo, and Uzbekistan, with successful prior efforts in Zambia and Senegal. The bankable project documents do not appear to be publicly available (Scaling Solar n.d.).

USAID could build on contract standardization efforts by scaling and replicating securitization initiatives. Securitization is the pooling of assets into a debt product that other investors can buy in a capital market. In effect, securitization enables developers to sell off assets so that they can recycle that capital into new projects. Securitized debt can be much less expensive than project or corporate debt and has been vital to providing lower-cost financing for the home mortgage, car, and credit card markets in the United States. To achieve successful standardization, the underlying assets should be initially financed using standardized terms and grouped into tranches by risk level to enable the buyers of the securities to accurately assess underlying risks and facilitate price discovery.

The Global Climate Finance Innovation Lab has supported two important concepts in the areas of standardization and securitization that serve as interesting examples:

- **Green Receivables Fund**: This initiative builds upon an existing securitization framework in Brazil to establish a new mechanism that supports renewable energy and energy efficiency.²⁷ This includes efforts to create a green certification criterion, separate construction and operational risks, and develop a financial model to assess renewable energy and energy efficiency projects. The initiative has raised initial funding and is currently seeking additional funding so that it can be replicated in other sectors.

- **Solar Securitization for Rwanda**: Access of Finance Rwanda and the Development Bank of Rwanda pooled residential solar home system loans into tradable asset-backed securities.²⁸ The program targeted an initial issuance of $9 million in debt for 175,000 households with the potential to scale to $100 million for 2 million households and reach other markets in East Africa. This initiative is still under development.

One key area for potential USAID support is working with countries on the enabling legal frameworks for securitization. Additionally, USAID could collaborate with development partners to provide funding to design initial market issuances and offer a first loss credit enhancement. One workshop participant (USAID staff) highlighted the role that domestic pension funds can play in early investment and oversight. They suggested that having a pension fund invest in a security could reduce the likelihood of corruption and help to attract pension fund investors. Thus, USAID could play a valuable role by using its in-country and global networks to bring in both domestic and international investors to ensure that initial issuances are successful and result in real impact.

²⁶ For more information, see: https://www.scalingsolar.org.
²⁷ For more information, see: https://www.climatefinancelab.org/project/green-receivables-fund-green-fidc/.
²⁸ For more information, see: https://www.climatefinancelab.org/project/solar-securitization/.
POLICY AND INFRASTRUCTURE LEVERS

The following four levers focus on helping partner governments develop enabling environments that attract investment in clean energy and designing large-scale, government-driven clean energy investment programs. The primary stakeholders would include policymakers, including in ministries of energy; planning and investment; construction; and finance as well as energy regulators.

Barriers addressed:
- Stimulus spending on clean energy is falling short of what is needed to ensure economic recovery
- Net-zero emissions by 2050 pathways require significantly strengthening clean energy and climate policies.

Lever Four: Development of Public and Infrastructure Investments for Sustained Growth

Because of the impact of the COVID-19 economic downturn on fiscal resources and the potential for rising interest rates, green recovery packages could look quite different in developing countries and focus more on enabling environments for mobilizing private sector investment than on large government spending packages.

A variety of analyses are emerging about which types of green recovery measures may be most effective in terms of different types of impacts. Figure 13 shows job creation potential for the same amount of investment by technology. Based on the IEA’s analysis, building efficiency retrofits and efficient new buildings may create the most jobs per million dollars.29 In energy efficiency, the IEA suggests that “stimulus policies targeting the building and construction sector often have the greatest macroeconomic impacts” (IEA 2020). These improvements can include high-efficiency insulation and building envelopes and high-efficiency heating, cooking, hot water, and lighting systems (IEA 2020). For new buildings, support programs for prefabrication can help bring down costs and improve efficiency. Solar photovoltaic and industrial energy efficiency also offer significant job creation potential. In industry,

Textbox 4: Innovation Highlight – Developing a New Paradigm for Economic Recovery

USAID can work with partner countries to develop robust economic recovery packages that focus on enabling environments for quick-start energy efficiency, renewable energy, and transmission investment to support job creation and economic impact. USAID can complement development of these strategies with follow-on policy and program technical assistance and capacity development for implementation (i.e., lever five). Green recovery measures could include Cash for Clunkers, retrofit, and other programs that have been proven to reduce emissions, drive investment, and be cost effective.

29 It is not clear from the report or from the IEA’s detailed methodology over what time period the jobs would be created. The full IEA methodology for the 2020 Sustainable Recovery report can be found here: https://iea.blob.core.windows.net/assets/85427c61-3584-4233-8092-0479e2f7dba0/SustainableRecovery-EmploymentAnalysisMethodology.pdf.
specific technology opportunities focus on motor replacement and deployment programs for heat recovery or heat pumps. Actual job creation numbers will vary by market, specific technologies, and applications; this chart is meant to be illustrative.

![Figure 13. Job creation per million dollars of capital investment in clean energy technologies](Source: IEA Sustainable Recovery 2020)

In terms of specific types of programs, Cash for Clunkers can encourage end-users to replace older, less efficient equipment and appliances. The American Recovery and Reinvestment Act of 2009 included programs to replace older, inefficient cars and home appliances with new ones. This program provided a boost to suffering U.S. automakers and appliances while constituting a quick win for efficiency. Similarly, China’s $7 billion 2009 program “Promotion of Energy-Efficiency Products to the Benefit of the People” provided high-efficiency air conditioners to rural areas, leading to permanently lowering the cost of these units through economies of scale. These programs have also proven their effectiveness in countries such as Mexico and Colombia (IEA 2020).

Home energy retrofits also drive significant job growth because labor is about 60% of retrofit expenses. The American Recovery and Reinvestment Act of 2009 also included a $5 billion program of weatherization retrofits targeted at low-income households. This program is estimated to have created 28,000 jobs and helped provide hard evidence of the effectiveness of government investments in energy efficiency to create jobs because of the labor intensity of these projects. In developing countries, strong investment in retrofits, which may be targeted to low-income households or small businesses, have the

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**Figure 13. Job creation per million dollars of capital investment in clean energy technologies**

(Source: IEA Sustainable Recovery 2020)

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30 “PV” stands for photovoltaic and “CCUS” stands for carbon capture, utilization, and storage.

31 Note that the recommendation to include Cash for Clunkers in this report was made by the Energy Efficiency for Development program. One reviewer (USAID staff) suggested that they had seen some negative findings about these programs as applied in the United States and Europe. Further assessment of these programs may be warranted.
potential to not only create many short-term construction jobs but also help to build the ecosystem of small business contractors to design, pipeline, and implement energy efficiency projects.

To have the most immediate impact, green recovery packages should focus on scaling existing programs and advancing projects that are already in the pipeline. This could include efforts around clean energy infrastructure development, such as support for identifying transmission investment needs that can help integrate the highest quality, lowest cost renewable energy and workforce development programs. Additional measures could include programs that support upgrading utility- or municipality-owned street lighting networks and setting minimum performance standards for new buildings, leased buildings, appliances, and equipment. Focusing on public buildings, including government buildings and other public facilities such as school and hospitals, is also important.

One workshop participant noted that green recovery may not be the most appropriate angle for instilling political will in all partner countries. Understanding a country’s priorities and interests is critical for motivating increased clean energy ambitions. Some countries may have goals to become regional clean energy leaders not only in terms of deployment but also in creating local economic clusters that can supply clean energy technologies, services, and fuels. For example, becoming a regional green hydrogen exporter would require integrating high levels of cost-effective, grid-integrated renewable energy and could spur countries to increase renewable energy deployment goals. In other words, green recovery is one framing for near-term clean energy growth pathways, but there may be others that may fit better with a given country’s political and economic priorities. Additional considerations regarding green recovery are the relatively short timeframe for intended impacts, e.g., 1-2 years, and the possibility of limited interest in green recovery measures a year or two from the time of this report’s finalization. However, economic downturns are cyclical, and the next major global economic recession could bring renewed interest in such an approach.

USAID can provide technical assistance and capacity development to countries on green recovery or other public investment measures that align with national economic and climate priorities. USAID can also provide follow-on technical assistance and capacity development to ensure the effective design and implementation of measures, i.e., as part of the enabling environment measures identified under Lever Five. Technical assistance could include support for designing clean energy funds that can offer rebates or grants, such as those that can support energy efficiency programs. USAID can also work with DFIs, MDBs, and foundations to explore opportunities to provide seed capital for these clean energy funds. USAID can also help countries focus on those measures that have both near- and longer-term job, economic, and social impacts.

In addition to deep-dive country support, USAID could offer its developing country partners the opportunity to participate in forums like the Low Emissions Development Strategy Global Partnership’s Inclusive Green Recovery Community of Practice. This community of practice is a no-cost learning platform for developing countries to exchange best practices and approaches on green recovery strategies. USAID can also join this forum to share insights from its partnerships with countries, further leveraging the impacts of its work.
Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment

Many developing countries do not have the enabling environment required to implement their ambitious NDCs and achieve sustainable development goals (IEA Financing Clean Energy 2021). Enabling policies for access, such as bulk procurement, improved interconnection, licensing, and auctions; revenue predictability, such as energy savings performance contracts, Renewable Portfolio Standards, and PPAs; and operational solvency, such as removal of subsidies, cost-reflective tariffs, and feed-in tariffs are needed even more to support clean energy investments (IEA Financing Clean Energy 2021). Improving the performance of utilities, and thus their position as credit-worthy offtakers, through loss reductions is another important intervention that is a vital part of a sustainable approach to increasing the flow of climate finance.

Another core component of enabling environments is improving broad awareness of clean energy technologies across a variety of stakeholders. For example, energy efficiency investments rely on familiarity and know-how concerning technologies, policies, certification, and implementation. A healthy ecosystem includes government officials, technical contractors, and certification agencies. Not least, the main actors in creating a sustainable environment for change are private sector actors such as equipment and construction material manufacturers, developers and builders, and businesses of all sizes seeking to reduce energy costs. Effective capacity building (training) programs work across these sectors and foster interaction among them. U.S. partners also play an important role in sharing best practices and lessons learned. Key among capacity-building activities is raising awareness of the financial returns on energy efficiency investments to owners, tenants, and financiers to open investment channels.

One of USAID’s core strengths is collaborating with country partners to develop a wide array of clean energy policies, regulations, and programs. USAID has also supported important work on energy efficiency that could be replicated and scaled to additional countries at both the national and subnational levels. USAID can work with partner countries to develop energy efficiency appliances and equipment performance standards, building codes, and design energy efficiency funds that provide direct financing or rebates. This could include measures that target SMEs and low-income households, e.g., on-bill utility energy efficiency financing. High-level energy efficiency policy plans can include road-mapping and resource planning (McNeil 2020). For more difficult measures, like building codes, USAID could consider coupling policy support with blended finance mechanisms (i.e., Lever One) to provide a cohesive program that combines policy plus financial support, as well as serving as political motivation to country counterparts. For renewable energy, policies have included work on improved interconnection

Textbox 5: Innovation Highlights: New Policy Paradigms for Long-Term Clean Energy Transitions

Few developing countries have formulated LTSs for clean energy transitions. As recent analysis from the Multilateral Organization Performance Assessment Network found, “NDCs without LTSs are short-sighted; NDCs are incremental steps along an LTS-defined pathway” (Multilateral Organization Performance Assessment Network 2021). USAID could further build out its Transparent LTS project and use its strong policy and decision-support expertise to develop frameworks for LTSs and associated investment strategies. USAID can work with countries to formulate ambitious plans that can facilitate significant mitigation in the power sector by 2050.

USAID can leverage its reverse auction experiences to help implement similar approaches to securitizing and retiring economically inefficient and energy-inefficient coal plants and investing in new clean energy and transmission capacity. Related to this could be utilization of reverse auctions for system-friendly renewable energy that can enable competitive procurement for storage that can provide firm, clean energy capacity to offset coal plant capacity.
practices, net metering, renewable energy zones, renewable portfolio standards, RECs, PPAs, and a wide array of other measures that support deployment of utility-scale battery energy storage, smart grids, advanced metering infrastructure, etc.

USAID has also worked with countries on integrated approaches that consider a variety of potential clean energy resources. A workshop participant noted the importance of supporting integrated resource planning in the Latin American region, and how this process is a key enabler. USAID has experience working with utility and government partners on integrated resource planning in countries such as Ghana and Nigeria (Lagos State). Integrated resource planning provides an impactful analysis and stakeholder engagement process that can bring together regulators, policymakers, and utilities to develop a cohesive utility clean energy strategy that considers both energy efficiency and renewable energy resources. A related approach is to work with utilities and governments at the national and/or subnational level to develop distributed energy resource plans or roadmaps that set “goals and targets for electric power generation, transmission, and distribution systems and the major milestones needed to reach them” (Doyle et al. 2020). To ensure that either type of plan takes into consideration impacts, costs, and benefits to different segments of society, countries should design the planning process in a way that engages diverse stakeholders. This could include groups that represent consumers, environmental advocates, women, and local communities.

USAID has extensive experience supporting renewable energy auctions through the Scaling Up Renewable Energy Program. Scaling Up Renewable Energy has been working with country partners since 2017 to prepare, design, and implement auctions that use open, transparent, and competitive procurement processes. Examples include supporting successful auctions in both India and Colombia. USAID could further scale and replicate the renewable energy auctions to bring benefits to additional markets. The auction model applied in India combined procurement for renewable energy technologies and storage. Supporting storage, including utility-scale battery energy storage systems, is an important way to demonstrate this technology. Technology-neutral renewable energy auctions focus on the energy services being procured rather than the technology solutions and may pave the way for further utilization of utility-scale battery energy storage systems (Maurer et al. 2020).

Additional opportunities for improving auction design include helping countries develop rules that are clear, transparent, and not overly complex, avoiding domestic content requirements that can lead to inefficiencies and setting long-term PPAs to 15-20 years with prices inflation-indexed in U.S. dollars or euros (Torres, Hyman, and Quin 2021). USAID may also have an opportunity to provide financial solutions with auction winners to help risk-share, especially given the emerging trend of transferring risks from the buyers to suppliers, which results in higher costs (Torres, Hyman, and Quin 2021).

USAID could build on its renewable energy auction expertise and support reverse auctions for refinancing coal plants to enable early retirement. Figure 14 illustrates how these reverse auctions can work. In the business-as-usual case, coal asset owners are incentivized to keep plants open as long possible to make a return on investment from electricity consumers (Bodnar et al. 2020). The debt forgiveness via reverse auction mechanism enables these coal asset owners to retire their coal plants and replace them with clean energy capacity. The asset owners who submit bids and win the auctions use the financing to retire their coal plants and install clean energy capacity, reducing emissions. Then they can use the revenues from selling clean energy to pay off their previous coal plant debts. At the same time, a third-party verifier can provide carbon credits for replacing the coal plant with clean energy, which the asset owner can then present to the government or DFI for additional revenue, further incentivizing participation from coal asset owners. Reverse auctions can work in regulated and deregulated markets and can be combined with carbon bonuses—an added revenue stream—that is further described under Lever Nine. Direct refinancing may be more feasible in countries with state-owned utilities.
Finally, workshop participants highlighted the importance of financing for transmission upgrades or improvements to integrate renewable energy resources. USAID has strong capabilities in Renewable Energy Zone processes that use robust analyses and stakeholder engagements to determine the best areas for developing low-cost, high-quality renewable energy projects based on location and private sector interest. Like the approach to bringing investors and financing solutions into the renewable energy auction process, USAID could also work to engage with financial partners early in the Renewable Energy Zone development to assess needs and develop solutions for any potential financing challenges that may impede investments in the transmission extensions or improvements to integrate the Renewable Energy Zone.

In line with USAID’s commitment to support countries with NDC implementation, USAID could make additional efforts to **develop NDC implementation policy regimes** that align with countries’ climate priorities. Ideally, USAID could help design policy regimes not only to support successful NDC implementation but also to raise countries’ ambitions for higher-level commitments. USAID could **expand its partnership with countries to develop LTSs**, working toward net zero targets with consideration for equally longer-term policy pathways that plan for incentive phase-outs, transitions to performance-based incentives, and development of competitive markets and procurements that can drive down costs of innovative and near-commercialized technologies, e.g., battery storage. This effort could build upon the Transparent LTS project.
Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities

An interviewee noted that in general, the space for supporting countries in analyzing NDC targets and developing and updating NDCs is overly crowded, complex, and confusing to country stakeholders. Much NDC support centers on analysis feeding into NDC targets and policy support measures, such as those facilitated through the NDC Partnership. However, one area where USAID could address a potential gap is to work with countries on formulating robust NDC investment strategies. There are some examples of initial work in this area, including initial supports provided by NDC Partnership, e.g., to Honduras on a high-level investment strategy, the Inter-American Development Bank’s NDC Invest platform, United Nations Development Programme, United Nations Environment Programme, and other programs. However, no examples of support for detailed energy sectoral or economywide NDC investment strategies were identified.

The clean energy-focused elements of an NDC investment strategy could include:

- Developing a plan for implementing policies to attract investment in renewable energy and energy efficiency (related to Lever Five)
- Identifying large-scale project pipelines and a plan for building capacity and mechanisms for streamlining development of pipelines for smaller projects (related to Levers Two, Three, and Four)
- Co-designing financing mechanisms with other U.S. government agencies, e.g., DFC and ExIm; climate funds, e.g., GEF and GCF; and other multinational and regional development banks
- Thoroughly engaging the private sector through investor forums and formulation of public-private partnerships. One partner noted that this as an especially important area where USAID could use its comparative advantage to bring key investors to the table to co-create solutions.
- Developing capacity among public and private sector stakeholders to develop additional project pipelines and support accessing project preparation facilities, financing, and investment (this relates to Levers One and Two).

Another related opportunity is for USAID to work with existing networks to garner private sector investment commitments for NDC implementation as well as partner with government and utility counterparts to identify joint solutions and build private sector buy-in. USAID has shown that it can be highly effective in mobilizing private sector voices to support specific policies. One example of a particularly impactful effort for engaging the private sector with scalability and replicability is that of Power Africa’s Private Sector Partners initiative. This partnership includes more than 150 private sector entities and has supported 126 clean energy transactions valued at $22 billion with a further investment commitment totaling $40 billion.
Another example of a successful effort where USAID mobilized private sector commitment is that of the USAID Vietnam Low Emission Energy Program. The Vietnam Low Emission Energy Program collaborated with the CEIA in Vietnam to get large corporate renewable energy buyers to sign a declaration in support of a new business-to-business renewable energy power purchase agreement regulation. This early expression of commitment with ongoing engagement by the private sector has been vital to encouraging the government of Vietnam to move forward with new policy that could make the country a regional leader in supporting corporate renewable energy procurement.

USAID could build on these types of efforts to develop private sector support from investors, clean energy end-users, and service providers of renewable energy and energy efficiency technology for broader NDC implementation. USAID can do this by tapping into a variety of networks to identify private sector interest in a given country, including its own Finance and Investment Network of more than 390 companies and development partners. USAID can involve U.S. business associations, e.g., local AmChams, other chambers of commerce, and the United States- Association of Southeast Asian Nations Business Council; global platforms, e.g., United Nations Framework Convention on Climate Change industry groups, Renewable Energy Buyers Alliance, RE100, EP100, and CEIA; and regional groups. USAID could consider leading consortia of other MDBs and DFIs to develop coordinated public sector funding commitments to NDC implementation.

**Lever Seven: Establishment of Market-based Mechanisms to Improve Project Profitability**

The United States has several existing and emerging ways for energy efficiency, demand response, and distributed energy resources to participate in organized competitive power markets run by Independent System Operators. This may involve participating in capacity markets, energy markets, or ancillary service markets. These markets offer these resources opportunities for monetization. For example, energy efficiency, demand response, and distributed energy resource participants in the capacity market are compensated through a capacity payment that includes a fixed monthly payment plus pay-for-performance compensation for delivering the committed resources. Some developing countries are beginning to incorporate elements of these market designs; however, there is the potential for improvement and expansion to additional markets that have been or are in the process of being liberalized.

In addition to power market design, a variety of other measures are intended to provide additional revenue streams and improve the profitability of GHG mitigating projects. These types of market-based mechanisms can include carbon cap-and-trade, carbon tax-or-trade, and voluntary carbon markets as well as more indirect approaches to GHG mitigation, such as energy efficiency white certificates, RECs, and related measures.

Although carbon markets came up in several discussions, stakeholders had mixed evaluations as to their current utility. One interviewee who was

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**Textbox 7: Innovation Highlight: Support Creation of New Types of RECs**

USAID could explore supporting innovations in tradable certificates such as white certificates for energy efficiency and RECs. This could include supporting the establishment in uptake of distributed RECs, time-valued RECs, and Peace RECs as a few examples. Because of the challenges regarding regular REC prices and additionality, supporting REC innovations could be an opportunity to provide revenue to projects that are not already viable and that may offer additional benefits. There can be challenges with REC market design, and that political engagement and support is one aspect to ensuring effective implementation.
instrumental in creating the first carbon market design felt that they are no longer politically viable while others still view them as important mechanisms. Yet others view carbon markets as a more direct avenue for GHG mitigation as compared with RECs, for example. Based on internal USAID analysis (Simpson and Hyman 2021), some consider that USAID may still have a role to play in further supporting development of carbon markets for clean energy based on its extensive experience helping develop markets for REDD+ and other sectors. Specifically, USAID could work with public and private sector partners to support purchasing carbon credits, provide loan guarantees for carbon market funds, and work through regional efforts such as Asia EDGE and Power Africa to promote carbon markets (Simpson and Hyman 2021). Another approach to carbon credits would be supporting the creation of carbon taxes, which may be simpler although it could raise more political concerns unless offset by general income or sales tax reductions. Across the mechanisms, USAID could consider offering technical assistance and capacity development on related aspects of establishing market-based mechanisms, including setting standards, developing best practices, and conducting country assessments.

One key consideration for carbon markets and other market-based mechanisms is ensuring that the markets can support new projects that would have not otherwise been financially viable. Because utility-scale solar and wind projects are now economically competitive with fossil fuel resources in several markets, some of the carbon registries have stopped certifying these projects. Thus, carbon markets may be most relevant for utility-scale renewable energy in low-income countries as well as utility-scale battery energy storage, smart grids, mini grids, and demand management in a broader set of medium- and low-income countries (Simpson and Hyman 2021). Because of the political challenges with establishing mandatory carbon markets, the most viable approach may be to support mandatory markets driven by voluntary procurements by corporations, especially multinational corporations based in North America, Europe, and Australia, to enable them to meet their climate targets. Corporations may be especially interested in buying carbon credits in those markets where they have supply chain or other presence. One workshop participant noted that carbon markets may be of special interest in the Latin American region, although countries are looking toward improved Carbon 2.0 approaches that build upon previously applied models.

Supporting the creation of REC markets is another way to provide a market framework for investments in renewable energy. One interviewee suggested USAID explore ways to invest directly in RECs to cover USAID’s own energy demand in markets. However, RECs also come with several challenges. For example, Figure 15 shows that voluntary REC prices have generally been below $1/MWh for the last 10 years, although a recent spike to $1.40/MWh occurred in 2020 (Antoniou 2021/NREL). Oversupply is the primary cause of these low prices. While corporations and other voluntary buyers are purchasing RECs to meet clean energy targets, purchasing low-cost RECs may not be an effective mechanism to incentivize additional renewable energy projects (BNEF July 2021). Additional challenges include a lack of standardization and transparency across REC markets.

Figure 16 illustrates the variety of compliance and voluntary REC markets. Lever Five can support other types of corporate procurement mechanisms for creating long-term enabling environments, such as third-party PPAs, green tariffs, and on-site generation, which may provide some advantages in project additionality and visibility.
One such innovation is the establishment of Peace RECs. The following quote describes the role that Peace RECs can play in enabling clean energy investment in qualifying conflict zones and may be an especially important mechanism to support the transition from conflict to development programming from a clean energy perspective.

Africa and the Middle East combined receive roughly 6% of global climate finance, with a small fraction of that going to fragile states. Renewable energy projects in these regions face several barriers to finance, including political uncertainty, conflict risk, and lack of credit for energy off-takers and project developers. When developers can secure financing, it is prohibitively expensive, or the due diligence process is exceptionally cumbersome.
Traditional RECs are most commonly purchased on an annual basis on the spot market, and long-term contracts are rarely used. However, long-term contracts are most beneficial to make an impactful contribution to Peace REC-eligible projects as they can provide upfront capital or commitments for new projects. (The Lab 2021)

Peace RECs have already had some uptake in the market, with a notable 2020 purchase by Microsoft from an off-grid solar developer in Congo. The Peace REC Aggregator is also a recent idea supported by the Global Innovation Lab for Climate Finance. Investors can pool funds into the aggregator to provide catalytic capital to projects that will generate Peace RECs that can then be sold through 10-year contracts. Additional REC innovations include distributed RECs, RECs with granular hourly stamping, and the use of blockchains to enable efficient REC trading (Antoniou 2021).

USAID could also explore opportunities to support REC innovations.
ENTREPRENEURIAL AND FINANCIAL INNOVATION LEVERS

The eighth, ninth, and tenth levers center on supporting technology, business model innovation, and new approaches to decision making through capacity development and technical assistance, especially focused on the private and utility sector stakeholders.

Barrier Addressed:
- Meeting a zero-emission pathway by 2050 requires significant innovation
- COVID-19 has hampered global capacity to bring innovations to market

Lever Eight: Capacity Development for Entrepreneurs to Drive Technology and Business Model Innovation

Multiple stakeholders emphasized the need to support a green economic recovery by engaging with entrepreneurs, especially SMEs, and providing a coordinated approach to support deployment of integrated clean energy, IT, and digitalization solutions for SMEs. SMEs make up 45% of employment and 33% of the gross domestic product in developing economies. Facilitating connectivity and digitalization of the SME sector will be vital to a robust recovery in developing countries (IEA Financing Clean Energy 2021). Another area of support echoed in multiple interviews was the need to build the capacity of entrepreneurs to adapt and develop clean energy innovations locally. Building this capacity is crucial for SMEs because they face greater funding gaps compared to larger firms and often lack access to capital because they are forced to rely on informal credit and bank loans (IEA Financing Clean Energy 2021). Capacity development can be coupled with grant programs to provide working capital to entrepreneurs to develop innovations.

Although this report focuses on identifying opportunities for USAID to use climate finance to drive investment into renewable energy and energy efficiency, there is increasing awareness of the intersection of energy with other sectors such as agriculture, water, wastewater, and solid waste. For example, improvements to the efficiency of water and wastewater services can often result in significant energy and water savings. Integrated applications of utility services have become more important as cities, especially those in Southeast Asia and Africa, continue to expand rapidly and further stress limited existing infrastructure.

Clean energy applications in agriculture can reduce emissions and bring services such as solar irrigation and cold storage to poorly electrified areas. Combined applications of solar and agriculture have been shown to improve crop yields, reduce water usage, and provide habitats

Textbox 8: Innovation Highlight: Develop the Capacity of Entrepreneurs to Adapt and Invent Integrated Clean Energy Solutions

USAID can work with partner countries to identify relevant innovation networks and national technical institutes and provide partner countries with capacity development support to invent and adapt clean energy technologies and new business services. USAID could work within its Development Innovation Ventures (DIV) team to design clean energy and, ideally, regionally specific entrepreneurship programs to help facilitate this support. USAID could set up this program to target certain sectors, e.g., small and medium enterprises; technologies; and applications, e.g., clean energy and IT applications, energy-water-food-waste nexus technologies for urban and/or rural utility service applications, and clean energy for productive use in post-conflict areas.
for pollinators. Additional areas for innovation include circular economy and new business models that can facilitate upcycling of batteries and recycling of wind and solar power plants that have exceeded their useful life. Another example of innovation is in crowd-sourced financing. Crowdsourcing of energy efficiency represents an innovative financing mechanism showing some promise in the United States. A great example of this is BlocPower – Crowdsourced Microfinance for Energy Efficiency in Underserved Communities, an initiative funded by the U.S. Department of Energy Building Technologies Office (BTO). All of these are areas for further innovation and work to support adoption in local contexts.

Additionally, USAID could look to support other crosscutting innovations, such as digitalization and blockchain for RECs, energy trading, etc., and other technologies and services where U.S. companies may have comparative advantages, including on utility-scale wind and solar power, smart transmission and distribution, communication technologies, demand-response tools, and energy storage (Torres, Hyman, and Quin 2021). This could include opportunities for U.S. businesses and suppliers to adapt technology or services to developing country markets. These efforts could build on work done under the Climate Economic Analysis for Development, Investment and Resilience (CEADIR) activity, which convened a forum to “highlight opportunities for selling equipment, technologies, and services in key emerging markets; offer guidance on working with partners and potential sources for financing and investment; discuss market challenges and marketing strategies; and facilitate networking” (Torres, Hyman, and Quin 2021).

USAID has actively facilitated innovation, including through its DIV program that provides tiered grants to innovators and researchers. DIV has supported over 225 innovations in 47 countries and achieved a 5:1 social benefit return (USAID DIV). DIV offers the following funding depending on the level of innovation development:

- **Stage 1: Pilot (Up to $200,000)**
- **Stage 2: Test and Position for Scale (Up to $1,500,000)**
- **Stage 3: Transition to Scale (Up to $15,000,000)**
- **Evidence Grants (Up to $1,500,000)**

DIV supports innovation in a variety of sectors including but not limited to clean energy. USAID may have opportunities to expand DIV programs focused on energy efficiency and renewable energy and perhaps support some of the cross-sectoral, integrated approaches highlighted previously.

USAID can also **demonstrate technologies, finance solutions, and business models as well as help create markets through combined policy-pilot project approaches**. For example, storage, both utility-scale and behind-the-meter, is an important technology for supporting the grid integration of variable renewable energy. However, storage has yet to be financed at scale in developing countries. USAID has had great success working with country partners to design renewable energy auctions. USAID could potentially replicate approaches applied in India to design procurements for firm power that combine variable renewable energy and battery storage through technology-neutral renewable energy auctions. These efforts would enable offtakers32 to benefit from the lower cost renewable energy while also accessing grid support technologies in the form of storage. Offtakers would also have increased opportunities to couple renewable energy generation with demand response. Combining policy reforms and pilots would enable USAID to demonstrate a variety of near- and long-term benefits and help kickstart new markets in a very tangible and immediate manner.

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32 An offtaker is the buyer of a product (in this case energy), usually used in contractual terms.
USAID can also play a role demonstrating finance and business model innovations. For example, through the CEADIR activity, USAID previously explored market opportunities for supporting utilization of parametric insurance to “reduce the risk of cashflow problems from potential revenue losses and contract penalties” (Enríquez et al. 2020). Parametric insurance “pays policyholders a fixed, agreed amount of money when insufficient or excessive resource flows reach a predefined threshold,” thereby reducing some of the cashflow risks with variable renewable energy projects. Parametric insurance is available in some larger markets, e.g., Mexico and Brazil; however, smaller countries usually have limited offerings (Enriquez et al. 2020). USAID could support development of this financial product by convening domestic insurance companies and reinsurers to explore development of parametric reinsurance products and facilitate capacity development, work with insurers to develop pilots and potentially offer incentives, help facilitate aggregations with renewable energy industry associations to promote cost savings, and build the capacity of local banks to consider how to encourage or require renewable energy borrowers to buy parametric insurance (Enriquez et al. 2020).

USAID also has additional opportunities to partner with other programs and expand U.S. government agency collaborations to provide additional innovation support globally. For example, the U.S. government has previously supported financial innovation through initial funding to the Global Innovation Lab for Climate Finance. The Lab’s multi-year grants expire at the end of 2021, thus representing a renewed opportunity for the U.S. government and USAID to invest in the Lab and help shape its future direction. USAID could also work with the Lab to co-design follow-on programs to ensure program scaling and implementation beyond pilots. This could take the form of additional funding or strategic partnerships between USAID implementing units and the Lab initiative leads.

Finally, USAID could consider engaging in the Global Clean Energy Incubator Network either as direct supporters or to facilitate connections with relevant programs. NREL, the U.S. Department of State, and the Department of Energy will launch the network in Q3 2021. This network will advance progress in reducing global GHG emissions while accelerating economic growth through technology deployment by

- Scaling up the scope and effectiveness of clean energy incubators in emerging economies
- Sharing knowledge and expertise across all countries
- Increasing the capacity of entrepreneurs to develop their technologies
- Facilitating stronger international connections between innovation stakeholders.

The workshop on September 1, 2021, will bring together U.S. and other government leaders, clean tech incubators, the private sector, and philanthropy to present a shared vision for collaboration on clean energy incubation to rapidly reduce the time it takes to get innovations to market to support a global net zero by 2050 transition. The discussion will focus on proven models for incubation that can be replicated internationally and maximize global capabilities for technology innovation that can facilitate investment and create jobs, while also helping countries achieve their decarbonization goals. Figure 17 provides a schematic of the Global Innovation Network.
Lever Nine: Support to the Financial Sector to Develop Green Finance Products and Regulations

There is significant opportunity to work with national development banks to better access climate finance, including accredited entities to the GCF and commercial banking access to multilateral development banks, funds, bilateral donors, and impact investors (Torres, Hyman, and Quin 2021). Similarly, there is significant work to be done with local private sector financing institutions to assess risks of renewable energy and energy efficiency projects and design green financing options. The USAID-funded CEADIR Activity identified that “commercial banks in many developing countries were still hesitant about clean energy lending due to incorrect perceptions of the technology costs, business models, and risks” (Torres, Hyman, and Quin 2021). CEADIR found that some banks in Central America that were willing to provide clean energy loans were offering loan products that were not appropriate for these types of loans. Many renewable energy loans need to have long repayment periods, low or no collateral requirements, and repayments denominated in local currency (Torres, Hyman, and Quin 2021).

Another interviewee emphasized the need to make approaches practical and do the capacity development and regulatory work while also developing financial solutions such as funds, guarantees, or green financing products to ensure tangible results. CEADIR identified partial loan guarantees as helpful in promoting commercial banks to lend but mentioned that they must be coupled with broader capacity development (Torres, Hyman, and Quin 2021). USAID can work with financial institutions on designing financial products and making applications to financial institutions for loan guarantees. There is a precedent for this under the CEADIR activity: USAID worked with banks in Central America to develop, expand, or improve clean energy credit lines for SMEs, resulting in loan guarantees from the USAID Development Credit Authority (now part of the DFC) (Torres, Hyman, and Quin 2021).

Access to commercial bank financing faces both technical and market barriers. Technical barriers relate to incapacity to identify performance risks and verify cost savings, while market barriers include (a) loans not being secured by property or equipment; (b) inability to escrow future streams of cost savings; (c) lack of access to credit information and/or insufficient credit quality of borrowers; and (d) in the case of building energy efficiency, disconnect between occupancy time horizon in a property and loan tenor and...
split incentives (landlord and tenant). Technical de-risking for energy efficiency involves building commercial banking sector capacity to assess performance risks of energy efficiency projects, including such factors as required financing and cash flows, and includes direct support for integration of banking and engineering assessments of projects. Market de-risking for energy efficiency typically focuses on use of blended financing facilities to provide energy efficiency financing on attractive terms and/or with guarantees, per Lever One.

Another element of ensuring that the capacity development is done in a practical way is by enabling the financiers to see working renewable energy and energy efficiency projects while facilitating discussions and matchmaking events with potential borrowers and developers (Torres, Hyman, and Quin 2021). Capacity development should also be done in a sustained manner, e.g., over 18 months or longer, and involve senior management to ensure high-level commitment (Torres, Hyman, and Quin 2021).

Multiple interviewees noted that USAID can play an important role in mobilizing climate finance by developing the capacity of local financial stakeholders. USAID has already conducted important work in the area of local capacity development to finance clean energy through the CEADIR Activity that could be used as a launching point for further support. CEADIR adapted an existing Clean Energy Lending Toolkit produced by the USAID-funded Analysis and Investment for Low-Emission Growth Activity and translated it into French and Spanish. With Power Africa support, CEADIR used the toolkit for bank trainings and diagnostics in 14 countries in Central America and Africa. The toolkit helped banks assess markets; understand risks, technologies, and business models; develop loan products and appraise applications; link financial supply with demand; develop analytical tools for evaluating solar applications; and prepare case studies. USAID could have opportunities to update its efforts by conducting additional training, capturing additional technologies, translating the toolkit into more languages, and further customizing versions to local market contexts.

To reach local banking institutions, it is vital that USAID collaborate closely with in-country banking networks to scale and replicate solutions. One example of a program providing such support is the Greening the Banks initiative, which focuses on improving the ability of local banks in Southeast Asia to provide green financing solutions.33 The Greening the Banks initiative centers its efforts on increasing the awareness of risks and investment opportunities through developing data and market information, facilitating deal development by matching supply (banks) with demand (developers and utilities), enhancing the capabilities of banks to use green financing, and providing working capital to energy service providers (Allotrope). The Organisation for Economic Co-operation and Development will also develop and deliver innovative, integrated clean energy finance training programs in Indonesia and the Philippines by bringing in multiple stakeholders, and it is interested in partnering with USAID.

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**Textbox 9: Innovation Highlight: Develop Strategic Partnerships with Key Climate Finance Entities**

USAID can develop strategic partnerships with key climate finance providers, e.g., GCF and GEF, and complementary in-country or regional capacity development programs that can improve the ability of local actors to access climate finance resources. Depending on the strategic partnerships, the capacity development programs could include working with public and private sectors to develop project pipelines, collaborating with national banks and private banks improve their access to climate finance and ability to design green financing products, and developing related guarantees or clean energy funds with other partners to support provision of the green finance products.

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33 For more information, see: [https://www.allotropepartners.com/greenfinance](https://www.allotropepartners.com/greenfinance).
USAID could also consider a partnership with the IFC Alliance for Green Commercial Banks. The Alliance is a new global initiative convened by IFC to bring together financial institutions, research institutions, and innovative technology providers to develop a community of green commercial banks in emerging markets to collectively finance the infrastructure and business solutions needed to urgently address climate change. Currently, five large commercial banks in Asia, including HSBC and Bank of China, participate in the Alliance. IFC’s assistance to commercial banks focuses on five pillars: (1) increasing the percentage of loans focused on climate-related projects; (2) developing new green financial products; (3) training and certifying bank employees on green finance; (4) achieving carbon neutrality in bank operations and investments; and (5) establishing a climate risk management system.

A more innovative area for USAID could be working with local financial institutions to explore opportunities to offer cash-based lending, which would enable smaller developers to obtain loans. Loan-to-value financing models tend to favor large-scale developers that can finance projects on their balance sheets. If USAID could work with banks to offer cash flow-based financing, for example, through an offtake guarantee, then more developers could access lower-cost debt and expand quicker. Energy developers face hurdles if they try to expand but cannot raise enough equity to finance their projects while also having an insufficient balance sheet to fall back on. Cash-flow lending also enables more cash for debt servicing, which can in turn reduce risks to the lending institution.

Additionally, USAID can work with financial regulators to establish standards and regulations for green loans, green bonds, climate bonds, and Sustainable Development Goal (SDG) loans. Green bonds can be an important tool not only for supporting investment in energy efficiency and renewable energy but also for securitizing uneconomic coal plants that have been selected for early retirement (Bodnar et al. 2020). USAID could provide technical assistance for designing such regulations as well as work to bring in the local investment community, including government pension funds that can provide a powerful oversight function to help attract international investors.

USAID could also partner with others to help countries develop green banks or clean energy funds. Whitney et al. 2020 defined green banks as “…often a publicly owned, commercially operated, specialized financing institution or facility that acts as a focal point for scaling up domestic investment in climate-friendly, sustainable projects. Most, though not all, green banks surveyed…have public ownership and are largely funded with public capital.” Green banks can play an important role in leveraging public sector funding to crowd in private sector capital and can be a vital tool for mobilizing investment to implement NDCs, green recovery strategies, and other energy efficiency and renewable energy policies. USAID could provide the capital to help countries design green banks, offer technical advice, and partner with philanthropy and the private sector to provide initial capitalization of the green banks. National and subnational governments may choose to establish clean energy funds to disperse low-interest loans or grants to small businesses. In addition, these

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**Text Box 10. Green Bonds**

“Green bonds—fixed-income instruments issued on the capital markets to a small group of investors—were created to finance projects with positive environmental attributes. These instruments can be certified by a third party such as an Approved Verifier under the Climate Bonds Standard and Certification Scheme, and they typically come with stringent environmental requirements. Green bonds can be issues by governments, state-owned enterprises, companies, or other entities with a credit rating and a commitment to green energy. These bonds can be backed by revenue streams from projects…taxes and fees levied by a government, or the balance sheet of the issuing entity that repays the bond from other sources of revenue. The bonds are rated and priced according to the repayment risk of the issuing entities. Green bonds represent an approach that governments and large asset owners with steady and diverse sources of revenue can use to refinance the debt on their existing coal assets and obtain more favorable financing to phase out and replace their existing coal fleet.” (Bodnar et al. 2020).
funds can be used to provide direct financial incentives for adopting energy efficiency technologies at the manufacturer, distributor, or retail level. An example of this is home appliance rebate programs or on-bill financing of efficient light bulbs. The administration of these funds can be done either by the government ministry responsible for energy efficiency in the national plan or through utilities, which may have better direct access to retailers and consumers.

**Lever Ten: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment**

Based on NREL’s experience with developing countries on power sector modelling and analysis, it has become clear that some countries lack detailed cost and risk data for energy technologies. It is important to have accurate cost and risk data so that policymakers and utilities can make the appropriate planning and investment decisions that can bring the lowest cost, cleanest, and most reliable technologies that can benefit consumers. The basic data and analysis infrastructure critical to developing codes and standards also can be applied in the context of finance pipelines. A few main examples are energy consumption and benchmarking databases, software to simulate energy cost reduction as a result of energy efficiency and renewable energy investment, and return on investment calculators. These resources need to be deployed at all points in the financing chain, including investors, government actors, consumers, and the industry of design consultants and certifying bodies.

USAID can play an important role in helping countries understand the financing and climate risks associated with power sector assets. For example, USAID has worked in the Philippines, Ghana, Vietnam, India, and many other countries to conduct robust grid modelling analysis for clean energy integration. This type of analysis can include development of detailed levelized cost of energy for various renewable energy and fossil technologies. This information coupled with additional financial feasibility analysis can help countries identify which coal plants will become uneconomic and when.

Furthermore, the Greening the Grid platform, managed through the USAID-NREL partnership, includes information and guidance to support countries in power system transformation and grid modernization. This platform includes detailed toolkits that provide overviews of best practices for addressing renewable energy development and integration challenges through various mechanisms as well as specific guidance for how to apply these mechanisms to develop robust practices. Specifically, these toolkits help countries deploy large-scale wind and solar generation effectively, develop grid and interconnection requirements, and create grid integration road maps. This platform can provide countries with the information and guidance needed to prepare their grids to best integrate climate-friendly investments while mitigating risk.

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**Textbox 11: Innovation Highlight: Assess Opportunities for Early Coal-Fired Power Plant Retirement**

Many utilities and governments in developing countries lack high-quality, localized, and up-to-date cost information on clean energy technologies and may have a misperception as to the economic viability of existing and new fossil fuel resources. Power sector stakeholders may also lack the capacity to undertake detailed economic and technical assessments of their current plants. USAID can work with power sector partners in its collaborating countries to help develop data, modelling, analysis, visualization and communication, and stakeholder engagement processes to understand the potential for early coal plant retirement and replacement clean energy investments. Relatedly, USAID could also provide analytical support to understand the jobs and economic impacts of alternative clean energy pathways.

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34 For more information, see: https://greeningthegrid.org.
Developing countries lag in climate risk disclosure development, with less than half of major companies in emerging markets reporting energy- or emissions-related metrics (IEA Financing Clean Energy 2021). USAID could work with the public and private sectors in developing countries to develop international reporting standards and climate risk reporting protocols. To support energy efficiency investments, USAID can work with countries to establish benchmarking tools and visualizations. These tools can help inform which areas are the most cost-effective for energy efficiency retrofits (McNeil 2020).
5 Cross-Cutting Recommendations

The interviews, stakeholder workshop, and additional research as well as NREL’s own insights have informed several cross-cutting recommendations that USAID could consider as it updates its climate finance for clean energy and energy efficiency strategy. Most of these higher-level insights affect implementation of multiple or all levers, and many could also pertain to areas of USAID’s climate finance strategy that go beyond clean energy.

Increase Climate Finance Expertise in USAID

When the Better Utilization of Investments Leading to Development Act was signed into law in 2018, the Development Credit Authority in USAID was consolidated with the Overseas Private Investment Corporation under the DFC. The transition of the Development Credit Authority from USAID to DFC has resulted in a capacity gap in USAID because now few personnel have deep development and climate finance expertise. While the DFC can provide valuable transaction-based support, the DFC has a small staff size and thus very limited capacity to engage in more strategic advisory-based assistance. Thus, USAID should bring on additional in-house climate finance expertise to help further develop and implement USAID’s strategy.

Explore Opportunities for Greater Collaboration

USAID is a highly collaborative institution that works actively with a variety of public and private sector partners, international development and finance institutions, innovation support programs, civil society, academia, and others. USAID does, however, have opportunities to build on its collaborative approach to further develop strategic partnerships with key climate finance institutions. Climate change actions must make significant impacts for the next 2-3 years, and the climate finance space has become increasingly crowded and confusing for local partners. Therefore, USAID should develop a series of strategic partnerships and ongoing, thorough collaborations at multiple geographical levels (global, regional, and country) that go beyond current practices. Ideally, USAID could spearhead partnership examples that drastically change what climate development cooperation looks like and that could serve as a model for other donor agencies.

For example, USAID has had previous successes partnering with GCF in the Pacific region to support local partners with capacity development. Both the GCF and the GEF expressed interest in doing regular knowledge exchange and coordination as well as potentially exploring more in-depth collaborations. The GEF and GCF have developed a vision for collaboration. Something similar could be established between USAID and the GEF, USAID and the GCF, and USAID and other climate finance partners.

- USAID could structure a partnership around the GEF-8 replenishment, which begins in 2022. Additionally, there could be opportunities to co-design country support or sequence support, which may be the easier approach. The GEF also noted that there could be opportunities for USAID to fund and direct strategic support programs, such as new GEF efforts that focus on green hydrogen and net zero buildings. Additionally, there could be value in developing avenues for further coordination with the GEF and its implementing agencies and to promote additional knowledge sharing between organizations.

- The GCF highlighted that USAID could play an important role by bringing additional investors to the table with GCF and others. GCF suggested potential areas for USAID to work on green financing issues because GCF is more focused on analysis and capacity development specific to a project.
USAID could also consider co-financing projects with the GCF as well as helping to replicate and scale effective GCF pilot projects in a country or region. GCF also suggested that USAID can play a role in developing capacity among direct access entities to formulate viable proposals to the GCF, including working with local accredited entities. Direct access entities are subnational, national or regional organizations that need to be nominated by developing country National Designated Authorities or focal points. Organizations nominated to become Direct Access Entities may be eligible to receive GCF readiness support. This funding is designed to help organizations in developing countries prepare to become Accredited Entities, as well as helping those which have already been accredited to strengthen their organizational capacities.35

- Additionally, USAID could partner with GCF in a strategic capacity to help develop multi-country projects that could provide a paradigm shift, bringing in new instruments and a systemic approach for projects that can be scaled regionally.
  - Examples of local direct access entities include:
    - Indonesia: Kemitraan, PTSMI
    - South Africa: DBSA, SANBI
    - Brazil: BNDES, CEF, FUNBIO
    - India: IDFCBank, IEISL, NABARD, SIDBI, YesBank
  - A full list of direct access entities can be found on GCF’s website, and examples of direct access entities projects can be found on the country web pages.

For potential deeper collaborations with both the GEF and GCF, USAID could look to map out its priorities relative to the partner organizations’ and identify potential pilot countries where USAID and partner organizations have strong country support programs and where initial deeper coordination and joint trial efforts have potential. Regular meetings at the headquarters and regional levels would be useful in spurring deeper coordination.

**Carefully Consider Energy Efficiency Support Programs and Potential Interactions with Energy Access and Renewable Energy Deployment**

There is significant untapped energy savings potential as well as opportunities to work with utilities and national and subnational governments on the appropriate policy, market drivers, and financial support programs that can help scale investment in energy efficiency across multiple sectors. It is vital that USAID design energy efficiency programs in a way to fully capture the potential benefits and unique challenges of energy efficiency deployment. There may be significant energy savings and emission reduction potential working with utilities to address nontechnical and technical losses in the transmission and distribution systems. However, when it comes to deploying end-use technologies, such as efficient appliances, equipment, and lighting, these technologies are much more diffuse and may require different approaches than those that work for deploying large-scale renewable energy. Energy efficiency may also be more difficult to finance compared with renewable energy and more difficult to sell to some end-users.

The fact that renewable energy prices are rapidly declining and in some cases may result in lower energy tariffs could further complicate the ability to finance energy efficiency. USAID could explore forward-looking models such as smart time-of-use equipment that considers the time when renewable energy is generated and when energy is consumed. Another important consideration is the potential interaction between energy efficiency and microgrids because energy demand is a key factor in driving the microgrid

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35 For more information, see: [https://www.greenclimate.fund/accreditation](https://www.greenclimate.fund/accreditation).
business model. Finally, USAID should pay attention to the trend of digitization of energy and understand what the impact of technology will be to the value of power as a function of time. The data is starting to suggest that daytime energy prices will go to very low and possibly negative values, dramatically increasing commercial opportunity. However, this will put increased emphasis on blended energy matrices and the complexity of dynamic pricing, like Texas. With all these challenges, USAID should ensure a continued focus on supporting partner countries in developing robust climate finance approaches to mobilizing investment into energy saving technologies, while also considering the implications of the potential interaction between energy efficiency and other clean energy applications.

Recognize the Need for Broader Sectoral Reforms

Multiple interviewees noted the need to consider broader power and finance sector reforms that go beyond specific measures to support energy efficiency and renewable energy and could provide important enabling environments for deploying these technologies at scale.

- **Power:** Many elements of the broader clean energy transition may affect opportunities to invest in energy efficiency and renewable energy. For example, it is important to have a grid that can integrate renewable energy; otherwise, as penetration rates increase, significant curtailment could hurt the investment profile for projects. Grid integration technologies and practices can include things like energy storage, improved flexibility of existing resources, grid enhancements and extensions, and improved grid operations for greater reliability. Removal of fossil fuel subsidies, cost-reflective electricity tariffs, disaggregation of utility asset ownership, development of wholesale power markets, use of competitive bidding processing, and international or intranational transmission infrastructure and supply agreements are also vital to the overarching enabling environment for clean energy (Torres, Hyman, and Quin 2021). A lack of public support for siting renewable energy projects can also hinder development of low carbon generation sources (Hutchinson et al. 2021). USAID has been active in supporting several of these areas.
  - One workshop participant highlighted that one of the major impact areas for reducing emissions would be working with utilities to address technical and nontechnical losses in the transmission and distribution, leading to less dispatch of electricity generated from high-emitting resources.
  - An area for potential growth would be to help grid operators develop their capacity, technical standards, workforce, and knowledge, potentially in partnership with the Global Power System Transformation Consortium, which is working across developed and developing country system operators. Additional cross-cutting enablers can include things like dynamic energy markets that provide value for capacity, frequency support, and resilience.
  - Workshop participants also noted a need to support regulators more, which could be an especially important component for engaging with countries in the Latin American and Caribbean region to develop enabling environments that can mobilize investment into energy efficiency and renewable energy.

- **Finance:** Three interviewees noted the need to support the creation of capital markets, especially in Africa. Capital markets are the most effective mechanism for driving domestic capital, and they will be required to provide long-term debt in local currency and enable scaling of clean energy sectors. As one stakeholder noted, “you can’t have green bonds in a country where there is no bond market.” USAID can consider further support in this area and/or collaboration with other institutions that are actively working with countries to establish capital markets. For example, the World Bank and the

36 For more information, see: https://globalpst.org/.
IFC implement the Joint Capital Markets Program to support the development of local capital markets that can facilitate long-term finance in local currencies (World Bank).

**Integrate Climate Finance Considerations with Technical Assistance and Capacity Development Programs**

USAID supports a large array of highly impactful policy technical assistance, capacity development, data and knowledge development, and detailed analysis efforts. USAID may have opportunities to scale these efforts and ensure a direct line of sight for any downstream investment opportunities. USAID should also ensure that public and private sector financial partners are brought into projects in the design stage to co-develop financial solutions. The Power Africa program has been effective in partnering with the Africa Development Bank and is a good example that could be expanded to other regional and country-level programs. Other examples include bringing in financial partners early into the policymaking process to identify potential finance challenges for which solutions could be co-designed and prepared to support project implementation downstream. For instance, as part of renewable energy auction programs, USAID could assess whether there are any potential financing challenges and collaborate with public and/or private sector partners to design financing solutions for bidding projects.

**Formulate People-Centered Transition Approaches**

There are significant opportunities to integrate climate finance with social equity, energy, and climate justice, just transition, gender, energy access, post-conflict development and related approaches, and consideration of how climate finance can improve the livelihoods of the poorest and most disadvantaged communities in the countries that USAID works. Some of these measures could involve electrification and supporting uptake of clean energy in the residential sector including for community-based projects. Another key opportunity is to focus on the SME sector, which often has more opportunities for women and broader segments of the workforce. Regarding energy access, there has been a recent focus on supporting productive use applications in microgrids that can serve as anchor tenants for microgrids, enabling residential access to energy that is perhaps less expensive and creating a stronger business model for microgrid operators. Centering energy access around productive use may also provide stronger impacts in terms of promoting job growth in commercial sectors. By focusing on universal commercial energy access, companies can lower operating expenses and have greater potential to broaden their enterprises, lowering the cost of production. Providing higher-paying jobs with transferable skills may ultimately have a larger economic impact and support residential energy access while offering greater leverage of public sector support.

**Explore Opportunities to Enhance Tracking of Climate Finance Impacts**

USAID has been doing significant climate finance and clean energy work for decades. While USAID has an established protocol for tracking program impacts, there may be opportunities to refine the measurement and evaluation approach to capture all relevant benefits more fully. One interviewee noted the need for USAID to further standardize its approach to capturing investment mobilized, investment leveraged, etc., because of concerns that these impacts are being reported incongruently across programs, making it difficult to compare impacts on an apples-to-apples basis. Interviewees agreed that it could be important to include a climate finance tag in USAID’s standard indicators to not only capture investment leveraged but also which policy supports, institutional capacity development, training, etc., pertain to climate finance. These tags could capture important financial flows and jobs metrics as well as investment raised for companies. One interviewee highlighted the importance of USAID and other development
partners taking on projects that are higher risk but could offer more transformative impacts. Thus, USAID could consider further assessing and tracking risks and how to reduce them through its interventions.

Participants noted that not all types of levers or interventions and country programs will offer similar types of impacts. Some countries, such as the largest emitters that are emerging economies, may be especially important from a climate perspective. Others with small levels of emissions and limited energy access may present less of an opportunity in terms of GHG reductions but could offer significant development benefits. In general, the big-ticket items like major infrastructure investments and utility-scale projects will offer the greatest GHG reductions. On the other hand, programs that target smaller projects, like small and medium infrastructure investments for SMEs, residential clean energy programs, and energy access programs may present smaller GHG reductions but have larger benefits in terms of gender equality, social equity, and energy justice.

In a recent large-scale research effort by the Multilateral Organization Performance Assessment Network, researchers conducted over 80 interviews from representatives of leading multilateral organizations, Organisation for Economic Co-operation and Development stakeholders, and other climate development partners and then developed the following lessons for tracking climate finance impacts. In essence, the research found that “the focus of measuring climate finance may distract from thinking of climate as part of broader development.” The authors suggest shifting the framing as follows:

Table 5. A Framework for Considering Climate Finance within Broader Development Goals
(Source: Multilateral Organization Performance Assessment Network 2021)

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translating NDC short-term oriented priorities into country operations</td>
<td>Programming according to long-term country strategies for low-carbon, resilient development</td>
</tr>
<tr>
<td>Focusing on multilateral organization climate finance targets that potentially trigger side effects such as bean-counting behaviors and over-counting adaptation finance</td>
<td>Measuring results in terms of greater resilience or transition to carbon-neutral growth rather than measuring inputs (climate finance), and targeting Multilateral Organization support based on income level, GHG emission intensity, and climate vulnerability</td>
</tr>
<tr>
<td>Fragmenting climate finance in limited-scale projects rather than systemic interventions, and using a limited number of financial instruments</td>
<td>Allocating public climate finance, including domestic resources, and Multilateral Organization resources to transformational projects and programs with the greatest leverage of additional funds, including from the private sector, using a variety of financial instruments complemented by policy dialogue and strengthening enabling environments</td>
</tr>
<tr>
<td>Focusing adaptation finance on lower-risk areas, such as climate-proofing infrastructure, to the detriment of overall resilience</td>
<td>Authorizing safeguard-risky financing to capture synergies with other areas, e.g., biodiversity, pollution, water, and sustainable urban development</td>
</tr>
</tbody>
</table>
6 Assessing Opportunities and Measuring Impact

The following section and summary in Table 6 offer a high-level, qualitative assessment of the ten climate finance for clean energy levers. The assessment includes a rough estimate of potential outlays in terms of program costs and risk to USAID as well as possible benefits in the form of direct, near-term\(^{37}\) GHG reductions, investment mobilization, innovation, job creation, and social impacts. The costs, risks, and impacts are assessed relative to the other respective levers and are not absolute. This assessment is intended more as a thought exercise and would require additional analysis to develop a quantitative assessment based on refined levers and measures that would serve as inputs to USAID’s final climate finance strategy. The key takeaway from this assessment is that the different levers each have unique strengths and that taken together, the levers can offer a comprehensive package with diverse impacts.

- **Cost** is the amount of funding required from USAID to support a program. The cost estimates are very high level and would be more accurately assessed by USAID staff. “Low cost” is less than $5 million, “moderate cost” is $5-15 million, and “high cost” is $15+ million. The costs are based on estimated investments required for a large country or regional programs for groups of smaller countries.

- **Risk** is the uncertainty to USAID that a program will have the intended impacts and/or that some capital outlays do not result in effective projects. Risk is not necessarily strictly negative. USAID should ideally take on some riskier programs because it is an indication of added value and entry into a space in the market as an intermediary that the private sector likely will not fill.

- **GHG reductions** decrease emissions by substituting clean energy for nonrenewable energy sources. High emission reductions would be the equivalent of a utility-scale renewable energy project in a market with a coal-heavy energy mix.

- **Investment mobilization** captures private and public sector capital that supports downstream efforts. High investment mobilization would be equivalent to a utility-scale renewable energy project.

- **Innovation** pertains to the support for creating or adapting clean energy technologies, services, business models, and financial solutions for new markets. High innovation would be successfully supporting dozens of new concepts in being piloted or supported in proceeding to the next development or funding stage.

- **Job creation** is the estimate of new, gross jobs added. Job creation is difficult to assess but could include both direct jobs (less likely) as well as indirect impacts, e.g., jobs created from policies and programs that USAID provides technical assistance to help design (more likely). High job creation would be technical assistance for developing a policy estimated to create at least 1,000 jobs. Job creation estimates should also consider the timeframe over which the jobs are created, short-term or long-term. Job quality and who gets the jobs, i.e., equity considerations, are also important.

- **Social** impacts vary by program but pertain to positive impacts related to gender, energy access, just transition, energy and climate justice, and social equity. These impacts would need to be refined and customized for specific levers and measures to be captured appropriately. High social impacts intend to capture a program where social benefits are prioritized over other types of impacts.

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\(^{37}\) Near-term meaning within 2-3 years of program initiation.
Lever One: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing

Because of the potential capital outlays under a blended finance program and the investment required to assess, design, and operate a blended finance facility, this program is potentially high-cost. Stakeholders also noted the possible challenges in designing effective blended finance mechanisms, so the program is higher risk. However, USAID has significant previous blended finance experience to analyze and build upon. Another risk factor is that some subset of the projects or companies that are supported are likely to fail. Of course, this is also an indicator of a successful program. If there were no failures, it could be taken as an indication that the program has not taken on sufficient risk and potentially is not adding value to the market.

Through direct support to financing projects and companies, this lever should ideally have significant impacts in terms of GHG reduction and investment mobilization. Innovation, however, is not a primary focus for this lever because it is more centered on scaling project pipelines for market-ready technologies. Finally, social impacts will likely be insignificant unless certain types of projects that provide clean energy services to underserved communities are emphasized or if project preparation support targets certain types of companies, e.g., women-owned or majority women-owned businesses. Another example is blended finance facilities that are designed to support clean energy mini-grids to provide productive use applications for SMEs in rural communities, which would also have the intention of having greater social impacts.

Lever Two: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance

Most of the cost for this lever comes from the labor needed to develop and implement training programs and/or fund embedded advisors. Because there are no direct capital outlays, costs are assumed to be moderate. Capacity development comes with moderate risk because the impacts of capacity development programs are highly dependent on the selection of viable recipients and the degree to which training programs are carefully crafted and implemented to have their intended effects. Extenuating circumstances such as staff turnover can also negatively affect the impacts of a capacity development program. Capacity development for local partners to formulate investable project pipelines focuses primarily on training and knowledge and skill building. Therefore, GHG impacts should be low to moderate because the focus is on investing in human capacity rather than directly supporting projects.

This lever will likely have lower relative impacts on innovation because it centers on scaling pipelines for commercialized approaches. Job creation is also assumed to be lower because the focus will be on supporting those with existing roles. However, some of the projects that the training recipients develop could result in job creation further downstream. The social impacts could be moderate, and the recommendation is to include strong targets to focus training on women and under-represented or marginalized communities. Training programs could also focus on supporting development of community projects in disadvantaged areas, e.g., post-conflict zones and just transition communities.

Lever Three: Clean Energy Contract Standardization and Support for Securitization to Increase Liquidity

This lever could be relatively low-cost compared to others because it would primarily rely on technical experts and targeted legal support to help formulate standardization approaches and support stakeholder
engagement processes. Securitization focuses on refinancing existing projects, so there could be some challenges capturing the additionality of this effort in terms of supporting new projects; the result may be lower direct GHG reduction impacts. The focus of this lever instead would be to support improvements to future projects and to provide an avenue for developers to recycle capital. USAID could develop a methodology to capture long-term potential GHG impacts as an estimate of the investment mobilized and assumptions about energy mixes in the target countries and regions. This lever has moderate risk because it would take additional capacity development and a fair amount of stakeholder engagement to ensure that the standardized contracts and securitization mechanisms take hold in a market. It would also be important for USAID to bring stakeholders into the process early on, including investors in early tranches. USAID may also need to work with partners to develop de-risking mechanisms to ensure that securitizations are attractive to national and international investors. The primary benefit of standardization and securitization is the potential to mobilize millions to billions of dollars of investment. This lever provides some level of innovation in terms of supporting new business models for securitization in markets that are not already applying them. However, because of the more upstream nature of this lever, it likely has lower direct, immediate job and social impacts relative to the other levers.

**Lever Four: Development of Public and Infrastructure Investments for Sustained Growth**

This lever will likely have moderate cost with the primary costs coming from labor needed to provide technical assistance, capacity development, and stakeholder engagement for developing green recovery or other economic development-focused strategies. The risks are considered lower for this lever and focus primarily around getting and maintaining sufficient political buy-in and ensuring that the overall framing aligns with partner country economic and clean energy priorities. Depending on the ambition of the green recovery strategy, there is the potential for significant GHG reduction impacts. For example, large-scale investments in reducing transmission and distribution losses to improve the economic viability of utilities, investments in transmission to integrate utility-scale renewable energy, ambitious energy efficiency funds and bulk procurement programs, and coal decommissioning plans could all result in large emission reductions.

Because green recovery or other economic development-focused strategies center on creating jobs and economic activity, this lever could lead to high investment mobilization impacts under an effectively designed program. Innovation could be moderate to high depending on the degree to which green recovery packages center on supporting entrepreneurs in developing or adapting new technologies, business models, and financing products. The social impacts should be moderate to high under a well-designed green recovery program, although the specific nature of those impacts will depend on the needs in a given country. For example, green recovery packages could have significant elements that center on gender, just transition, development of community projects in under-served areas, support for transitioning conflict zones, energy access measures, and other relevant measures.

**Lever Five: Improvements to Enabling Environments to Attract Long-Term, Private Sector Investment**

The qualitative impacts assessment for the long-term enabling environments follows a similar pattern to Lever Four, i.e., moderate program costs, lower risk, and moderate to high GHG reductions depending on specific programs. One difference is in relation to investment mobilization. The green recovery and system level investment lever focuses on near-term economic activity and job creation. Thus, any measures will focus on quick-start projects, resulting in direct and near-term investment mobilization impacts. On the other hand, LTSs inherently have a longer duration and may have lower immediate
investment impacts. However, the cumulative potential for investment mobilization over an LTS should outweigh that of a near-term green recovery program. Furthermore, any LTSSs should include innovation and support to entrepreneurs and SMEs as a key component. Additionally, LTSSs should include strong social components with the potential for similar opportunities as those alluded to under the green recovery lever.

**Lever Six: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities**

Lever Six has a similar cost, risk, and benefits profile to Levers Four and Five. Like the green recovery lever, formulation of NDC investment strategies should have potentially significant near-term investment mobilization impacts. The innovation, job creation, and social impacts will depend on the design of the investment strategy, but generally, NDC investment strategies should include strong components around supporting entrepreneurs and programs that provide clean energy transition broadly throughout a country’s economy.

**Lever Seven: Establishment of Market-based Mechanisms to Improve Project Profitability**

The cost for supporting creation of market-based mechanisms is assumed to be somewhat lower relative to other measures. The risks are moderate, but countries can mitigate them if they carefully assess opportunities and design mechanisms to address additivity and transparency. This lever will likely have low GHG reductions because market mechanisms are not expected to be major movers for additional clean energy investment. There is the potential to support some innovation. For example, Peace RECs are a nascent tool that could be replicated and scaled to additional markets to provide clean energy investment opportunities in marginalized communities transitioning from conflict zones. Other innovations include distributed RECs and time-valued RECs that can be used to match the time of energy demand to the time that the REC was created. Additionally, some groups are looking at blockchains to facilitate new REC trading platforms that have greater efficiency. Finally, market-based mechanisms could have moderate social impacts if innovations, such as those of Peace RECs and others, focus on providing greater value for clean energy projects in marginalized communities.

**Lever Eight: Capacity Development for Entrepreneurs to Drive Technology and Business Model Innovation**

The cost for a capacity development program could be higher, especially if they include grants to provide working capital to entrepreneurs. Because this lever focuses on supporting innovations in technologies and business models, USAID inherently faces higher risk because of funded participants possibly failing. The near-term GHG and investment mobilization numbers may be lower because this lever centers on training and piloting efforts, but in the longer term, successful programs could lead to more significant GHG reduction and investment mobilization effects. The innovation impacts for this lever are high because this lever centers on supporting development of new technologies and business models and/or adapting technologies and business models to new markets. Immediate job creation benefits are not likely to be high, although similar to GHG reduction and investment mobilization impacts, these should be significant in the long-term if successful innovations are supported. USAID should focus training programs on entrepreneurs, including those in under-represented groups who are developing solutions that offer benefits to groups in society that may otherwise be largely left out of the clean energy transition. For example, these could include cross-sectoral energy-water-food nexus solutions in urban or rural applications in economically disadvantaged communities.
Lever Nine: Support to the Financial Sector to Develop Green Finance Products and Regulations

Costs and risks for Lever Nine are assessed to be moderate. Costs would primarily come from labor needed for implementing partners to design and facilitate training programs and to provide technical assistance on design of new green financing products. Programs could also have higher costs if they include seed funding or de-risking mechanisms. Risks are moderate but could be lessened by bringing in financial institution leadership early in the process to ensure high-level engagement and commitment to rolling out new financing solutions. This lever likely has lower immediate direct GHG impacts because most of the resources will go toward upstream training and product design, but in the longer term, it could lead to significant emission reduction impacts. Ideally, programs should be structured to include initial pilots to prove immediate investment mobilization, and like GHG reduction impacts, the program should include long-term investment mobilization that extends beyond the program period. There are several proven financial approaches, so this program will likely not have high innovation, although unique solutions could be explored. USAID should work with partner institutions to develop financing products that can support deployment of clean energy technologies in under-served communities, e.g., financing solutions for low- to medium-income householders. Additionally, training programs should be designed to include gender and other diversity approaches.

Lever Ten: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment

Developing updated cost and risk data and plant assessments would require significant analysis but is not anticipated to require a large investment. There is some risk that the analysis does not inform investment decisions, so USAID could work closely with government and utility partners to ensure buy-in and engagement throughout the data development process. Immediate GHG reductions and investment mobilization may vary depending on the degree to which partners influence decisions, but they are assumed to be moderate in the near term. This lever likely has low innovation because it focuses on proven technologies and approaches; however, early decommissioning of uneconomic coal plants, an idea that is gaining steam, is a new concept not yet demonstrated or implemented in many developing countries. Near-term job creation and social impacts will likely be lower because this lever focuses more on upstream decision making. However, this lever could create mid- to-long term job and social impacts especially if coupled with effective just transition programs.
Table 6. High-level, Qualitative Assessment of the Ten Clean Energy Investment Mobilization Levers

<table>
<thead>
<tr>
<th>Lever</th>
<th>Program Cost</th>
<th>Risk Taking</th>
<th>Potential Impacts (Qualitative Assessments)</th>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>GHG Reduction</td>
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<tr>
<td>1: Blended Finance to Catalyze Projects and Companies and Provide Utility Refinancing</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>2: Capacity Development to Scale Project Pipelines and Improve Access to Climate Finance</td>
<td>M</td>
<td>M</td>
<td>L-M</td>
</tr>
<tr>
<td>3: Contract Standardization and Support for Securitization to Increase Liquidity</td>
<td>L</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>4: Development of Public and Infrastructure Investments for Sustained Growth</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>5: Improvements to Enabling Environments to Attract Long-term Investments</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>6: Formulation of National Strategies to Define Climate Finance and Clean Energy Opportunities</td>
<td>M</td>
<td>L</td>
<td>M-H</td>
</tr>
<tr>
<td>7: Establishment of Market-based Mechanisms to Improve Project Profitability</td>
<td>L</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>8: Capacity Development for Entrepreneurs to Drive Technology and Business Innovation</td>
<td>M-H</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>9: Support to the Financial Sector to Develop Green Finance Products and Regulations</td>
<td>M-H</td>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>10: Provision of Data, Information, and Analysis to Inform Climate Risk-Averse Investment</td>
<td>L</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>

Key: H = High; M = Medium; L = Low
7 Conclusions and Areas for Further Research

Overall, this report seeks to build a framework and provide structured input for USAID’s climate finance strategy through three climate finance themes, Project Portfolios, Policy and Infrastructure, and Entrepreneur and Financial Innovation, and the ten clean energy investment mobilization levers that fall under these themes. This report then contextualizes these ten levers with a series of cross-cutting recommendations that account for the overlapping natures of these levers and recognize the complex and diverse nature of both USAID’s and their partners’ work as well as the context in the developing countries that USAID operates. Finally, this report qualitatively assesses the costs, risks, and impacts of the ten levers across a variety of categories. The levers each have different levels of impacts in various combinations of categories, showcasing both the coverage of impacts they can have when used together as well as the availability of different options available to achieve similar goals in varying contexts.

Although this report offers many initial ideas as to where USAID could enhance its climate finance for clean energy strategy, there remain areas for further research. Additional analysis can help clarify and distill USAID’s climate finance strategy as well as ensure that USAID’s efforts in this field remain broad enough for effective implementation and specific enough to account for regional and national contexts.

- First, USAID could conduct impact studies on emissions of different technologies relevant to the power sector, including coal, natural gas, various renewable energy technologies, and storage. These impact studies should aim to quantitatively analyze the emissions profiles for these technologies and map them to different impact categories such as the ones listed in Table 3. These studies can also aim to calculate and compare cost curves of the technologies while accounting for the cost of emissions as well as the areas of impact. In the end, these studies could serve to provide more solid conclusions on the emissions impacts of different clean energy transition pathways.

- Second, there may be value in additional study of the impacts and opportunities for some of the specific measures included in this report. For example, there is limited understanding of the level of effectiveness and impacts of RECs in supporting renewable energy markets in developing countries and opportunities to improve REC market design. Further assessment as to the most viable models for supporting coal plant refinancing and retirement would also be needed before such programs could be rolled out. Similarly, the stakeholders consulted for this report had mixed views about the relative benefits of measures such as Cash for Clunkers, green recovery packages, and carbon markets. USAID could consider supporting additional investigation of various policy and financing program tradeoffs, if it has not done so already, and also consider sharing these insights with other donors and development institutions to help inform broader knowledge on clean energy investment mobilization and policy best practices.

- Third, USAID could compile and analyze existing blended finance facilities to see if gaps exist that USAID could address in the near-term. Additionally, if USAID has not already done so, it could more systematically analyze its blended finance transactions to date to identify learnings that could inform design future effort. This research would allow USAID to determine whether it would be valuable to establish new facilities and/or invest in existing facilities in such a way that provides additional value and impact. USAID could also consider sharing insights with other donor agencies and development partners to support replication of good practices and possibly determine avenues for additional collaborations.

- Finally, USAID could conduct a SWOT analysis to identify where USAID’s comparative advantage lies, i.e., what USAID has traditionally been good at in the energy and climate sphere, and how other relevant assistant organizations are positioned in the space relative to USAID.
References


Gyftopoulou, Loukia (2021). Wealth Manager. “‘We were patient with rejection’: Inside Impax’s meteoric rise.” Accessed June 18 at: https://citywire.co.uk/wealth-manager/news/we-were-patient-with-rejection-inside-impax-s-meteoric-rise/a1478950.


Personal communication with USAID (May 20, 2021). Email exchange with Eric Hyman, USAID staff.

Personal communication with USAID (July 19, 2021). Email exchange with Michael Jordan, USAID staff.


## Appendix 1: List of Interviewees

The following list of persons were interviewed between late May and mid-June 2021 to inform the findings for this preliminary summary report.

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Primary Affiliation(s)</th>
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<tbody>
<tr>
<td>Alayza, Natalia</td>
<td>Analyst, Finance Center</td>
<td>WRI</td>
</tr>
<tr>
<td>Apanada, Marlon</td>
<td>WRI SE Asia Lead/CEIA Philippines Lead/Greening the Banks Lead</td>
<td>World Resources Institute</td>
</tr>
<tr>
<td>Berardi, Filippo</td>
<td>Coordinator—Climate Change Focal Area</td>
<td>Global Environment Fund</td>
</tr>
<tr>
<td>Christianson, Giulia</td>
<td>Acting Global Director, Finance Center Director, Sustainable Private Sector Finance and Head of Sustainable Investing</td>
<td>World Resources Institute</td>
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<tr>
<td>Feinstein, Charles</td>
<td>Consultant</td>
<td>Independent; Former Director of World Bank Energy and Extractives</td>
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<tr>
<td>Fischer, Remco</td>
<td>Climate Program Officer</td>
<td>UNEP FI</td>
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<tr>
<td>Gulamani, Safia</td>
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<td>Convergence</td>
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<td>Jordan, Michael</td>
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<td>USAID</td>
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<tr>
<td>Kerr, Thomas</td>
<td>Climate Lead for South Asia</td>
<td>World Bank; Formerly at the IFC</td>
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<tr>
<td>LaRocco, Phil</td>
<td>Professor; formerly of E+Co</td>
<td>Columbia University</td>
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<td>Larrea, Joan</td>
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<tr>
<td>Manda, JoAnne</td>
<td>Finance Working Group Lead</td>
<td>Low Emissions Development Strategies Global Partnership</td>
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<td>McNeil, Michael</td>
<td>Energy/Environmental Policy Research Scientist/Engineer</td>
<td>Lawrence Berkley National Laboratory</td>
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<tr>
<td>Perera, Alex</td>
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<td>Rogers, Michelle Murphy</td>
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<td>Allotrope Partners, Co-lead of the Clean Energy Investment Accelerator</td>
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<tr>
<td>Scandling, Evan</td>
<td>Vietnam Lead</td>
<td>Allotrope Partners; Clean Energy Investment Accelerator</td>
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<td>Sinha, Kavita</td>
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<tr>
<td>Thwaites, Joe</td>
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<tr>
<td>Wells, John Bruce</td>
<td>Chief of Party</td>
<td>USAID Vietnam Low Emission Energy Program I and II</td>
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<tr>
<td>Williams, David</td>
<td>International Climate and Clean Energy Advisor</td>
<td>National Renewable Energy Laboratory</td>
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</table>
Appendix 2: Workshop Participants

The following list of persons participated in the July 14, 2021, workshop.

<table>
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<tr>
<th>Name</th>
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<td>Lawson, Sarah</td>
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<td>Aznar, Alex</td>
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<td>Global Environment Fund</td>
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<td>Independent; Former Director of World Bank Energy and Extractives</td>
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<td>Fische, Federico</td>
<td>Regional Coordinator for Latin America and the Caribbean</td>
<td>the Climate Finance Access Network (CFAN)</td>
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<tr>
<td>Foster, Jeremy</td>
<td>USAID-NREL Partnership Lead</td>
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<tr>
<td>Gulamani, Safia</td>
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<td>Convergence Finance</td>
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<tr>
<td>Hecht, Ahni</td>
<td>USAID-NREL Partnership Staff</td>
<td>NREL</td>
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<td>Jayatileke, Sashi</td>
<td>Climate Finance Advisor</td>
<td>USAID</td>
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<td>Jordan, Michael</td>
<td>Power Africa</td>
<td>USAID</td>
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<tr>
<td>Lam, Garrett</td>
<td>Special Assistant to the Chief of Staff, Office of the Administrator</td>
<td>USAID</td>
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<tr>
<td>McNeil, Michael</td>
<td>Energy/Environmental Policy Research Scientist/Engineer</td>
<td>Lawrence Berkeley National Laboratory</td>
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<td>Speer, Bethany</td>
<td>Senior Analyst</td>
<td>NREL</td>
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<tr>
<td>Tom Haslett</td>
<td>Energy Division</td>
<td>USAID</td>
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<td>Troy, Chris</td>
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