

## **ACKNOWLEDGEMENT**

This report was commissioned by Sustainable Energy for All (SEforALL). The SEforALL team was led by Olivia Coldrey, Christine Eibs Singer, Annette Aharonian and Tamojit Chatterjee, who worked in close collaboration with a team from Climate Policy Initiative that researched and wrote this report: Morgan Richmond, Chavi Meattle, Nicole Pinko, Sean Stout, Haysam Azhar, Federico Mazza and Melina Dickson, with guidance from Barbara Buchner, Angela Falconer, Bella Tonkonogy, Vikram Widge and Caroline Dreyer.

We are grateful for substantive inputs received from the Steering Committee as this research effort evolved from inception through publication: Monojeet Pal (AfDB), Alex Evans (GLPGP), Oliver Reynolds (GOGLA), Drew Corbyn (GOGLA), Katrina Pielli (Senior Consultant), Usha Rao (UNDP), Malcolm Bricknell (MECS), John Leary (MECS), Simon Batchelor (MECS), Ed Brown (MECS), Dirk Roos (EIB), Hendrik Engelmann-Pilger (EIB), Cyril Renault (AFD), Anne-Sophie Rakoutz (AFD), Mark Correnti (Shine), Kee-Yung Nam (ADB), Vibhuti Garg (IEEFA), Gianluca Tonolo (IEA), Ute Collier (IRENA), Giorgio Gualberti (OECD), Jens Sedemund (OECD), Besnik Hyseni (World Bank).

This report also benefited from information and data received from numerous colleagues. We would like to especially thank Gianluca Tonolo (IEA), Lucila Arboleya Sarazola (IEA), Shrikant Avi (CCA), Tim Bauer (EnviroFit), Felix ter Heegde (SNV), Ha Hoang Thanh (Nexus for Development) and Sheila Addo (Ghana, NPA).

We would like to thank all SEforALL staff for their support, especially Stephen Kent, Meriam Otarra, Tracey Crowe, Emi Mizuno and Ugochukwu Nwadiani. We also thank Jenny Nasser (editor).

Valuable guidance and oversight were provided by Damilola Ogunbiyi, Chief Executive Officer and Special Representative of the UN Secretary-General for Sustainable Energy for All.

SEforALL acknowledges with gratitude the financial assistance provided by the Charles Stewart Mott Foundation that made this report possible. We also acknowledge the Austrian Development Agency, the Ministry for Foreign Affairs of Iceland, and the IKEA Foundation for their core support to our work.

For a full list of SEforALL supporters, please visit www.SEforALL.org.

Cover photo by Dominic Chavez/World Bank.

## **FOREWORD**

This research is being released as the world gears up for one of the most critical convenings on climate change since the landmark Paris Agreement was reached in 2015. The expectation for this year's COP26 in Glasgow is that it becomes a watershed moment for the fight against climate change, one that will catalyse commitments to decarbonatization that will put countries on a netzero pathway.

Meanwhile, 759 million people worldwide have no access to electricity, and roughly 3 times that number have no way of cooking cleanly. The consequences of these energy access gaps are grave: from undermining developing countries' economic growth to jeopardizing people's health and polluting our environment.

The global energy transition needs to be both clean and just, which means mitigating climate change and creating new opportunities for people to flourish through not just energy access but energy for development.

COP26 is an opportunity for countries to demonstrate real urgency and commitments to tackle the climate and energy access crises handin-hand. By working together, developed and developing countries can create clean energy offers to ensure access gaps are closed while addressing the climate crisis.

The value of Energizing Finance: Understanding the Landscape 2021 is that it provides a detailed picture of current energy finance commitments to guide the decision-making of governments, development banks, the private sector and other leaders.

In its fifth year of publication, the report identifies public and private finance commitments for energy in 20 developing countries – known as the high-impact countries (HICs) – that together are home to nearly 80 percent of those living without access to energy. This analysis highlights where critical investments are needed to achieve Sustainable Development Goal 7 (SDG7) and provides recommendations to overcome current barriers hindering financial flows to clean energy access and, consequently, climate action.

Based on data from 2019, the report highlights significant shortfalls in investment for electricity and clean cooking in the HICs. For example, it finds that finance committed to residential electricity access was less than one-third of the USD 41 billion estimated annual investment needed to attain universal electricity access by 2030.

Finance commitments continue to fall dramatically short of the estimated USD 4.5 billion of annual investment required to achieve universal access to clean cooking. Continued reliance on polluting fuels for cooking is proven to cause premature death and is a major contributor to climate change. Clean cooking needs to be a part of countries' development and climate action plans, including Nationally Determined Contributions (NDCs), yet only 43 countries out of the 165 countries mention cooking and cookstoves in their NDCs submitted to UNFCCC.

One of the positive trends from this year's research is that finance commitments for renewables in the HICs reached a new high in 2019. This progress needs to continue to meet SDG7 and the Paris Agreement targets, and there is positive momentum on this front.

Another important development is the move away from coal finance. During the UN General Assembly last month, China announced it would stop financing coal-fired power overseas and as part of the High-level Dialogue on Energy, seven other countries committed to stop their financing of coal in the No New Coal Energy Compact.

The hope is that these investments will be redirected to clean energy, with priority given to those countries whose energy systems are underdeveloped to date.

Only concerted, ambitious action can secure a low-carbon and equitable future for everyone. The insights found in *Energizing Finance: Understanding the Landscape 2021* provide direction for our collective efforts.

**DAMILOLA OGUNBIYI** 

CEO and Special Representative of the UN Secretary-General for Sustainable Energy for All and Co-Chair of UN-Energy **BARBARA BUCHNER** 

Borbane 4. Juline

Global Managing Director and Executive Director, Climate Finance, Climate Policy Initiative

## **EXECUTIVE SUMMARY**

#### INTRODUCTION

Sustainable Development Goal 7 (SDG7) sets out a global aim to ensure access to affordable, reliable, sustainable and modern energy for all. The Energizing Finance: Understanding the Landscape report, developed by Sustainable Energy for All in partnership with Climate Policy Initiative and produced annually since 2017, provides a comprehensive analysis of tracked finance commitments flowing to the two key areas of energy access: electrification and clean cooking. This fifth edition of the report tracks finance for electricity and clean cooking committed in 2019 to 20 Sub-Saharan African and Asian countries — known as the high-impact countries (HICs)<sup>1</sup> — which together are home to more than 80 percent of people globally without energy access.



For the seventh consecutive year, the world is falling far short of the level of investment required to achieve energy access for all. Finance for electricity in the HICs declined substantially in 2019 to USD 32 billion from USD 43.6 billion in 2018, and finance committed to residential electricity access fell to USD 12.9 billion, less than one-third of the USD 41 billion estimated annual investment needed to attain universal electricity access by 2030.<sup>2</sup> Clean cooking investment has also stagnated, falling critically short of the USD 4.5 billion in annual investment required for universal access. Annual tracked commitments to clean cooking in HICs have languished around USD 130 million between 2015 and 2019 (except in 2017 when commitments dropped precipitously to less than USD 50 million), and the overall clean cooking investment portfolio continues to be dominated by a few large projects in a small number of countries, funded by a handful of capital providers.



SDG7 is inextricably linked to the clean energy transition and must be achieved for a just transition and to deliver other SDG targets. No major country or region is decarbonizing its power sector at the pace required to meet the goals of the Paris Agreement, with continued financing of fossil fuel projects driving misalignment across a wide range of markets (CPI 2021). A failure to make substantial progress towards SDG7 and to transition to clean energy also affects attainment of other SDGs, including good health and well-being (SDG3), gender equality (SDG5), reduced inequalities (SDG10), and climate action (SDG13), as the social and economic impacts of poor energy access compromise progress on intersecting SDGs.

<sup>&</sup>lt;sup>1</sup> Electricity HICs are Angola, Bangladesh, Burkina Faso, Chad, Congo (DR), Ethiopia, India, Kenya, Korea (DPR), Madagascar, Malawi, Mozambique, Myanmar, Niger, Nigeria, Pakistan, South Sudan, Sudan, Uganda and United Republic of Tanzania. Clean cooking HICs are Afghanistan, Bangladesh, China, Congo (DR), Ethiopia, Ghana, India, Indonesia, Kenya, Korea (DPR). Madagascar, Mozambique, Myanmar, Niger, Nigeria, Pakistan, Philippines, Uganda, United Republic of Tanzania and Vietnam. More details on HICs available in Box 1.

<sup>&</sup>lt;sup>2</sup> The HICs are home to 76 percent of the global population without access to electricity (580 million people), so USD 11.9 billion is substantially lower than their proportional need based on IEA's estimate that USD 41 billion in annual investment is needed globally to attain universal electricity access by 2030 (IEA et al. 2021).



#### The Covid-19 pandemic puts efforts to achieve SDG7 – already at risk – further behind. After six years of decline in the number of people without electricity access in Africa, that figure most likely increased in 2020 due to the Covid-19 health crisis and its associated economic downturn. Those impacts have shifted government priorities, caused supply chain disruptions, and limited activities associated with

enhancing energy access to underserved populations (IEA et al. 2021).3 The pandemic has also threatened progress in clean cooking access; under today's current and announced policies, 2020 and 2021 will see a reversal in hard-won, incremental progress, and by 2030, 2.4 billion people will remain without access to clean cooking.<sup>4</sup> Despite the ambition of domestic pandemic stimulus packages to date, only a fraction of pledges contain energy access components, risking further sidelining finance for sustainable energy access.

This report serves as a baseline for government leaders, public and private investors, and energy access enterprises that seek to drive the energy transition and meet the electricity and clean cooking access targets of SDG7. This Executive Summary follows the same structure as the report, highlighting 1) key findings on finance commitments to electricity across the HICs, 2) analysis from a case study on Mozambique regarding the need to invest in climate resilience in the electricity sector, 3) key findings on finance commitments to clean cooking across the HICs, and 4) analysis from a case study on Ghana and Vietnam exploring their divergent technological approaches to clean cooking access.

#### KEY FINDINGS ON FINANCE FOR ELECTRICITY

#### FINANCE CONTINUES TO FALL FAR SHORT OF NEEDS AND ACTUALLY **DECLINED IN 2019**

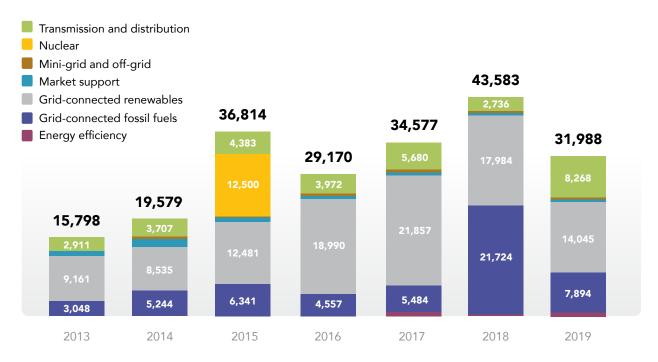
Tracked finance for electricity in the HICs declined in 2019 for the first time in three years. Total tracked finance commitments were USD 32 billion in 2019, a 27 percent decline from 2018 when USD 43.6 billion in finance was committed to electricity in HICs. This decline is attributable to a combination of factors including delays in financing projects, lower capital costs per megawatt of generation, and a decline in commitments from key financiers including institutions in China and India. Of the USD 32 billion, an estimated USD 12.9 billion, or approximately one-third of finance commitments, benefitted residential consumers. The HICs are home to 76 percent of the global population without access to electricity (580 million people), so USD

12.9 billion is substantially lower than their proportional need based on the IEA's estimate that USD 41 billion in annual investment is needed globally to attain universal electricity access by 2030 (IEA et al. 2021).

Investments shifted in 2019 in the direction of energy solutions aligned with the Paris Agreement, relative to 2018. Investment in fossil fuel generated electricity declined from 2018 to 2019; in 2018, 50 percent of total electricity finance was committed to grid-connected fossil fuels compared to 25 percent in 2019. This shift reverses a troubling trend where in 2018 fossil fuels accounted for the largest portion of new electricity finance commitments to HICs for the first time in at least six years. There was also an increase in finance tracked for transmission and distribution infrastructure in 2019, to its highest level since this report series began in 2013.

<sup>&</sup>lt;sup>3</sup> Final data not yet available on 2020 access shifts but it is predicted that 2020 will have yielded growth in the number of people without electricity access.

FIGURE 1 Finance to Electricity by Sector, 2013-2019 (USD mn)



Country-level progress towards electricity access among HICs has been mixed. While the Indian government announced in 2019 that more than 99 percent of its population has access to electricity,<sup>5</sup> access rates remain low in other countries. In the seven<sup>6</sup> countries that *Tracking SDG7: The Energy Progress Report 2021* predicts will make up more than 50 percent of the global population without electricity access by 2030 under current and announced policies, only USD 5.8 billion in total was committed to electricity in 2019. In other words, less than 20 percent of all finance committed to the HICs.

Tracked commitments to off-grid and mini-grid solutions declined from an all-time high in 2018 and remain a very small proportion (0.9 percent) of finance tracked to electricity. Each year since tracking

began in 2013 has seen finance remain well below the level of investment necessary for off-grid and mini-grid solutions. Decentralized electricity solutions are crucial to achieving universal access - the World Bank's 2020 Off-grid Solar Market Trends Report notes that these need to reach more than 600 million people with Tier 1 products to support universal access, requiring USD 6.6 to 11 billion in additional finance between 2020 and 2030. Bilateral and multilateral development finance institution (DFI) finance fell sharply between 2018 and 2019; those entities accounted for USD 260 million of finance to the decentralized electricity sector in 2018, compared to USD 34 million in 2019. Finance commitments to off-grid and mini-grid solutions did however become more geographically distributed in 2019, with 19 HICs receiving some finance commitments to the sector,7 up from 13 in 2018.

<sup>&</sup>lt;sup>5</sup> Though India does indeed have access rates far beyond those of other HICs, the 99 percent formal access rate is potentially overstating true access in India as the government deems a village "electrified" if 10 percent of its households and public places are connected, thus likely overestimating total genuine electricity access of households. "India Nears Power Success, But Millions Still in the Dark" (T&D World. 2018.).

<sup>&</sup>lt;sup>6</sup> Congo (DR), Niger, Nigeria, Uganda, Pakistan, Tanzania and Sudan.

<sup>&</sup>lt;sup>7</sup> Only Korea (DPR) did not have any tracked finance to the sector in 2019.

#### A CASE STUDY IN MOZAMBIQUE DEMONSTRATES THE CRITICAL NEED TO INVEST IN CLIMATE RESILIENCE IN THE ELECTRICITY SECTOR

This case study assesses the existing and potential climate resilience of electricity finance in Mozambique. Electricity infrastructure assets across the globe are increasingly at risk from climate change impacts – with severe implications for sustainable energy access for all. Projected increases in the frequency and severity of floods, droughts and storms pose a grave risk to Mozambique's highly centralized electricity delivery system. A single hydropower plant — the Cahora Bassa dam — contributes more than 50 percent of the country's electricity supply via a single high-voltage power transmission line, making the electricity sector vulnerable, and hence, less secure.8

Recent finance committed to Mozambique's electricity sector has in large part targeted grid-connected fossil fuel projects (USD 1 billion in 2018 and USD 877 million in 2019). Expanding generation capacity by diversifying fuel sources with renewable energy technologies such as solar and wind is crucial to Mozambique's economic well-being, as is a move away from expansion of electricity supply through fossil fuel generation, which carries immense economic and climate risks. Moreover, Mozambique's low population density and affordability challenges mean that mini-grids and off-grid solutions should be considered permanent, cost-effective parts of Mozambique's energy mix to increase access and resilience to climate change.

There is substantial opportunity to invest in climate resilient energy infrastructure. The Global Commission on Adaptation finds that the benefits of climate-proofing existing infrastructure and building new infrastructure outweigh the costs by 4:1. In

Mozambique, the creation of a sector regulator (ARENE) in 2018, the progressive phasing-out of tariff subsidies, relevant reforms within the national power utility (EDM) as well as significant financial support from donors in the off-grid electricity sector are all positive indicators for private investment, which could be increasingly directed towards resilient electricity infrastructure.

#### A TRANSFORMATION OF INVESTMENT IN THE ELECTRICITY SECTOR IS REQUIRED TO ACHIEVE UNIVERSAL ACCESS

Public financiers including national governments, bilateral donors, philanthropies and DFIs must collectively increase their own funding and accelerate efforts to mobilize commercial capital to Sub-Saharan African economies with persistent underinvestment in electricity access. These actors must support enabling conditions for private investment in Sub-Saharan Africa through actions including, but not limited to:

- Systematic country-level interventions built on data and evidence to identify investment bottlenecks and new ways to crowd in privatesector finance (for example through the World Bank's Maximizing Finance for Development) and to boost investor confidence.
- Increasing national governments' borrowing capacity, and by extension their access to international debt and commercial capital markets through, for example, making available currency-hedging instruments and guarantees, and through monetizing carbon offsets.
- Increasing the number of accredited entities to access climate finance funds.
- Increasing engagement and coordination between and among DFIs, national and regional development banks and institutions to better leverage finance, local experience and expertise.

<sup>&</sup>lt;sup>8</sup> Many HICs in Sub-Saharan Africa are highly reliant on aging hydropower infrastructure.

The adoption of policy reforms, sustainable and innovative business models, and financial instruments is important to accelerate deployment of finance to the mini-grid and off-grid sector.

Decentralized solutions represent an enormous opportunity to increase electricity access as they can be deployed quickly and in modular form and are often more affordable at the household level than the alternatives. The sector is failing to reach its potential with limited private investment and falling DFI finance commitments in 2019. Several actions should be taken concurrently to increase commitment volumes and efficacy to the sector. These actions are also discussed in detail in the forthcoming *Energizing Finance: Taking the Pulse 2021* report.

- Increase market support to assess customer demand and improve credit assessment and financing mechanisms, including through securitization, currency hedging, guarantees and risk pooling.
- Accelerate blended finance solutions to deploy grants and concessional finance alongside commercial investment more efficiently to derisk electricity projects that commercial investors might find too risky.
- Formalize licenses for private-sector mini-grid developers and develop coherent national policy around subsidy planning to increase the viability of private-sector involvement.

Sustained effort is needed to increase the climate resilience of existing and future energy infrastructure. With ever-growing electricity demand across sectors and increasing shares of intermittent generating technologies like wind and solar, the resilience of the power sector to climate change-induced impacts is more crucial than ever. Building climate resilience requires the mainstreaming of climate-related risk into government policies and design planning. Systems thinking to address growing climate risk requires investment in energy storage technologies, energy efficiency mechanisms, information systems to capture granular climate data, and tools and frameworks to integrate climate risk into investment decisions, including pricing.

Efforts towards increasing electricity access and accelerating a low-carbon energy transition should be strategically paired with clean cooking investments to leverage finance and policies across the three sectors. Electric cooking is a technology solution that could combine progress made in electrification with new progress in clean cooking, especially over the longer term. Countries like India, Nepal and Nigeria have piloted projects and campaigns to tap the transformative potential of electric cookstoves. A strategic rethink of government policies and subsidies, such as adjusting electricity tariffs to favour electric cooking, rebalancing subsidies between gas and electricity, and strengthening countries' distribution networks, could place electric cooking front and centre.

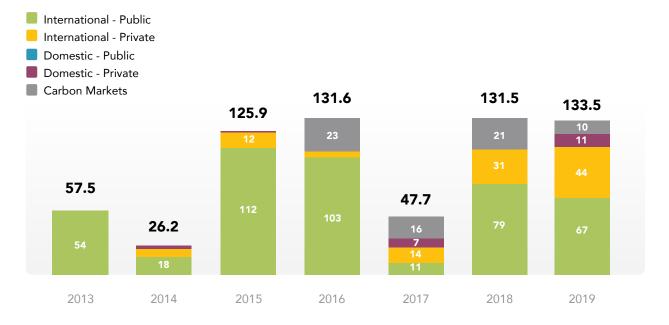
#### **KEY FINDINGS ON FINANCE FOR CLEAN COOKING**

## CHRONIC UNDERINVESTMENT IN CLEAN COOKING CONTINUES

Despite incremental progress, clean cooking commitments chronically fall short of the USD 4.5 billion in annual investment required to achieve universal access. Annual tracked commitments languished at around USD 130 million between 2015 and 2019 (except in 2017, when there was a drop in commitments by multilateral DFIs, driven by just a handful of projects). The continued underinvestment in clean cooking solutions, year on year, compounds the negative health, climate and gender impacts associated with traditional cooking methods.

The overall clean cooking investment portfolio continues to be dominated by a few large projects in a small number of countries, funded by a handful of capital providers. While there were no large-scale multilateral DFI projects for clean cooking solutions in 2019, 70 percent of the finance committed to Bangladesh and Kenya came from just seven projects. Additionally, improved cookstoves (ICS), which attracted 58 percent of public finance, mobilized no private finance commitments in 2019 and only a small amount of committed finance in 2018. Carbon finance, a mechanism through which clean cooking project developers sell credits for verified emissions reductions (VERs) also received lower levels of finance commitments in 2019 than in 2018.

FIGURE 2
Clean Cooking Commitments in HICs by Source (2013-19, USD mn)



Country-level progress is highly heterogenous and Sub-Saharan Africa is being left behind. Countries in Sub-Saharan Africa including the Congo (DR), Madagascar and Mozambique, where an average of 96 percent of the population lack access to clean cooking solutions, each received less than USD 1 million in finance commitments in 2019 – less than 1 percent of the annual investment needed in each country. For the second year in a row, a significant portion of clean cooking finance commitments went to Kenya, which has increased access to clean cooking solutions by 14 percent in urban areas since 2018, and Bangladesh, where access has remained static since 2018. The remaining 18 HICs in this analysis, home to over 1.9 billion people without access to clean cooking solutions, received only 38 percent of all tracked finance commitments in aggregate in 2019.

large-scale finance commitments multilateral DFIs were found. Overall finance commitments from multilateral DFIs reached USD 4.5 million in 2019, down from USD 45 million in 2018, and comprised only 7 percent of total public finance. The largest multilateral DFI project tracked in 2019 was a USD 2 million World Bank commitment to ICS distribution in Bangladesh. The remaining multilateral DFI commitments were all well under USD 1 million per project and focused on a mix of ICS, liquefied petroleum gas (LPG) stoves and fuel, and advanced biomass stoves and fuel. The World Bank's Energy Sector Management Assistance (ESMAP) Clean Cooking Fund, announced in 2019 and operational in 2020, is expected to significantly increase multilateral DFI finance commitments for clean cooking in future years.

#### Private-sector investment in clean cooking increased.

Tracked private finance commitments for clean cooking projects increased to their highest levels since tracking began in 2013, reaching USD 56 million in 2019, up from USD 32 million in 2018 and USD 21 million in 2017. Investment from the private sector also continued to flow to a range of clean cooking fuels and technology, such as LPG, ethanol and biogas projects. ICS, however, attracted no tracked private investment in 2019.

#### A CASE STUDY OF DIVERGENT TECHNOLOGICAL APPROACHES TO CLEAN COOKING ACCESS IN GHANA AND VIETNAM

In Ghana, LPG for cooking has gained traction in recent years under a government policy target aiming to reach 50 percent of households using LPG by 2030, but investment still falls well short of that required. The LPG value chain expansion required to meet the 2030 policy target requires approximately USD 400 million in total (including USD 279 million for cylinders) (GLPGP, KfW & EU 2018),9 compared to USD 2 million in tracked finance commitments in 2019 for residential LPG cylinders. 10 A disciplined LPG market model (the so-called branded cylinder recirculation model (BCRM)) using branded, instead of consumer-owned, cylinders — in line with international best practice — will help make Ghana's LPG ecosystem less fragmented and more bankable, therefore attracting and catalysing investment while ensuring better safety for producers and consumers alike. Moreover, this market model can be paired with pay-as-you-cook financing solutions to close both affordability and accessibility gaps for clean cooking.<sup>11</sup> In Vietnam, following strong LPG uptake, on-site residential biogas has become a commercially and technically viable clean cooking solution for rural and peri-urban farming households. A long-running publicprivate Biogas Programme has facilitated a commercially sustainable biogas market in Vietnam and demonstrated the potential to harness waste-to-energy clean cooking solutions to enable decarbonization and achieve the country's Nationally Determined Contribution (NDC) target.<sup>12</sup> Moving forward, Vietnam should seek to improve its regulatory framework regarding carbon finance — a key pool of capital — and look towards larger-scale urban applications (for example, in restaurants) alongside on-site, household biogas. With 80 percent of 8.5 million farming households yet to install biodigesters, targeted financial support can also help biogas, and therefore clean cooking, become a reality for these households.

<sup>&</sup>lt;sup>9</sup> In the period 2019–2030; investments are primarily dedicated to cylinders and other infrastructure including bottling plants, pallets and cages.

See Box 7 and Appendix IV for more details on LPG value chain methodology.

<sup>11</sup> Acknowledging LPG is a fossil fuel, it is clean relative to baseline "cooking-as-usual."

<sup>&</sup>lt;sup>12</sup> Vietnam's NDC includes a target of constructing 500,000 biodigesters by 2030.

<sup>&</sup>lt;sup>13</sup> Providing Tier 1/2 access under the Multi-Tier Framework (MTF).

In both Ghana and Vietnam, the viability of (renewable) bio-LPG is yet to be explored but could, in time, provide for a new addition to the clean cooking mix; a dropin solution that leverages existing LPG infrastructure. With nine years remaining, meeting SDG7 will demand a whole suite of clean cooking solutions — from ICS<sup>13</sup> to electric stoves — to move households up the energy ladder and towards universal clean cooking. Closing the clean cooking access gap requires a comprehensive approach that considers three key policy pillars: availability, affordability and accessibility.

# CLEAN COOKING INVESTMENT MUST MOVE FROM THE BACK BURNER TO THE FOREFRONT

Governments must make clean cooking a national priority. Countries like India and Indonesia have shown that ambitious and targeted domestic programmes are instrumental in rapidly increasing clean cooking access, especially for urban populations. Depending on individual country contexts and available resources, there must be movement on all fronts including, but not limited to, consumer awareness and behavioural change programmes, and capacity building for policy and financial institutions. There is also a pressing need for governments to focus on programmes designed to effectively target vulnerable populations, and to coordinate with international donors to create a sustainable, well-funded market for clean cooking solutions. While this report is unable to capture direct domestic public finance for clean cooking solutions, more innovation is needed to direct large-scale funding to smaller companies and facilitate the scaleup of manufacturing, supply chains and distribution to transform markets.

Clean cooking should be integrated across crosssectoral planning and awareness campaigns to leverage electrification and climate initiatives. It is critical that clean cooking is integrated into climate policies, electrification plans and relevant sectoral policies given the sector's cross-cutting nature. This includes NDCs, net-zero roadmaps, integrated energy plans, and Covid-19 recovery plans - to bring the clean cooking agenda, and associated investment need, into the spotlight. For instance, only 43 of the 165 countries that have submitted NDCs to the UNFCCC mention cooking and cookstoves in their NDC, including just 12 HICs. Efforts must be directed to sensitize and instill awareness in government agencies and the general population of the positive health impacts and co-benefits of using cleaner fuels and technology for cooking.

The current piecemeal, project-by-project approach to clean cooking investment by international public financiers requires a strategic rethink across the value chain. Finance commitments from DFIs have long focused on a limited number of countries and technologies, largely directed towards ICS and transition solutions rather than a suite of clean cooking fuels and technologies. DFI investments must be pushed across the ecosystem - supporting innovation and business models through research funding, pilot demonstration activity, and large-scale programmes in the field, partnering with national DFIs, coordinating with local stakeholders, and leveraging their mandates to bring the clean cooking agenda to global prominence as well as incentivizing private-sector financiers through the clean-cooking value chain. The World Bank's ESMAP has taken a substantial step in the right direction by establishing the USD 500 million Clean Cooking Fund, with contributions to date from the Netherlands, Norway and the United Kingdom to capitalize it.

 $<sup>^{14}</sup>$  Domestic governments' expenditure on clean cooking has increasingly been expressed as policy tools, which are not included in the tracking methodology. Additional information is available in Appendix 1.

<sup>&</sup>lt;sup>15</sup> Afghanistan, Bangladesh, Ethiopia, Ghana, India, Korea (DPR), Madagascar, Myanmar, Niger, Nigeria, Pakistan and Uganda. Data from Solar Cookers International.

<sup>&</sup>lt;sup>16</sup> This investment is not tracked in the current report that captures finance in 2019.

Increased innovation in financial instruments as well as a drastic increase in local currency finance and blended finance are needed to deploy the scale of capital necessary to reach universal clean cooking access. A number of business models and finance mechanisms have benefitted the clean cooking sector in several countries, including results-based financing (RBF), 'pay-as-you-cook' services, and carbon finance. Efficiently designed voluntary carbon markets provide opportunities by raising investment in exchange for emissions reductions from efficient stoves and cleaner fuels. While tracked carbon finance commitments were lower in 2019 than in 2018, supporting negotiations on Article 6 of the Paris Agreement and facilitating access to the voluntary carbon markets could provide a critical source of investment for clean cooking solutions by monetizing high-quality carbon offsets generated by these projects. Crowdfunding, driven by environmental and social impact concerns, is also a promising instrument but must be adapted to individual country

contexts, accounting for differences and stages of market development.

Increased targeting of public finance is necessary to leverage and de-risk private capital to mobilize more finance. Private finance has shown an openness to a variety of clean cooking solutions, particularly LPG and ethanol stoves. This is despite a lack of policy support for developing sustainable markets for clean cooking solutions in many HICs. RBF has the potential to play a pivotal role, particularly as the clean cooking sector can expand metrics for success to include outcomes such as positive health and gender equity impacts. Blended finance can prioritize co-benefits with other SDGs; for example, Bangladesh's blended finance clean cooking programme created more than 3,000 direct and indirect jobs for women in 2019. In Indonesia, an RBF pilot provided incentives to ten private-sector suppliers, five of which were women-led businesses.