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BUILDING A JUST WORLD AND A SUSTAINABLE PLANET

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Roadmap for the Brazil G20 Presidency's Clean Cooking Strategy

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Acknowledgements

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Context: The State of Clean Cooking Access and Urgency for Action

Today, a staggering 2.1 billion people across the globe lack access to clean cooking solutions to meet their daily cooking needs.[1] Despite recent advancements in energy access, the rate of progress lags, jeopardizing the health of millions of households reliant on traditional, polluting cooking methods and hindering the energy transition.

Clean cooking is an essential component for achieving Sustainable Development Goal (SDG) Target 7.1—ensuring access to affordable, reliable, sustainable, and modern energy for all. Under current policies, however, 1.8 billion people will lack access to clean cooking in 2030, according to the latest *Tracking SDG 7* report.[2] Much of the progress over the past two decades has occurred in Asia, where over 1 billion people gained access, but still leaves a gap of around 1 billion people. In Latin America and the Caribbean, strong progress was made in the past two decades, however recently the clean cooking access rate has stabilized at around 90 percent, calling for renewed efforts to close the last-mile access gap. In Sub-Saharan Africa, progress on clean cooking access has not kept pace with population growth. Without accelerated action, is the International Energy Agency (IEA) estimated that some 950 million people in sub-Saharan Africa will remain without clean cooking access in 2030.[3]

Continuing along this path is not an option. Lack of clean cooking access not only threatens the achievement of SDG 7; it also impedes progress toward meeting the closely related goals of health and well-being (SDG 3), gender equality (SDG 5), climate action and life on land (SDG 13 and SDG 15), as well as poverty elimination (SDG 1), and food security (SDG 2). Household air pollution (HAP) linked to cooking with traditional stoves and fuels results in millions of premature deaths each year, with women and children accounting for most of them. It is well-known that women bear a disproportionate share of the health and safety risks associated with traditional biomass cooking and cooking-related tasks. Women's time spent on fuel collection, which averages 18 hours per week,[4] takes a toll on their health and physical safety and contributes to their time poverty, leading to opportunity costs (e.g., in education and income generation). The use of traditional cooking fuels is also a large contributor to

1 International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division (UNSD), World Bank, World Health Organization (WHO). Tracking SDG 7: The Energy Progress Report 2024 (Washington, DC: World Bank, 2024).
2 IEA et al., Tracking SDG 7: The Energy Progress Report, 2024.
3 International Energy Agency (IEA). World Energy Outlook 2024 (Paris: IEA, Forthcoming 2024).
4 UN Women. "SDG 7: Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All" (New York: UN Women, n.d.).

greenhouse gas (GHG) emissions through such pollutants as carbon dioxide (CO_2), methane (CH_4), and black carbon (BC), at both the point of use and production. It is estimated that 2 percent of total global CO_2 emissions and 58 percent of global BC emissions come from the use of traditional fuels. Furthermore, cooking with wood fuels and charcoal is an important contributor to deforestation and biodiversity loss.

A significant scale-up in financing will be required to reach clean cooking access for all by 2030. Investments in clean cooking equipment and infrastructure will have to increase. IEA estimates that a cumulative total of about US$60 billion will be needed to provide the up-front investments required to extend access.[5] About half of these will be in Africa, where only 7 percent of clean cooking investments have flowed in the last five years.

Unaffordability of many proven, safe, and scalable clean cooking services limits uptake by many low-income households While not the only challenge to the adoption and sustained use of clean cooking technologies, affordability challenges must be recognized as a key barrier, especially for low-income and vulnerable groups. IEA estimates that over half of households lacking clean cooking are unable to afford it on an ongoing basis—owing to a combination of initial costs of the new stove and equipment, as well as the ongoing cost of fuel.[6] However, households who can afford to make the switch to cleaner cooking solutions can save in the long-term, with households currently purchasing firewood or charcoal for cooking able to pay back the initial upfront cost within a year. Still, many households lack sufficient funds for fuel on an ongoing basis and end up reverting to their traditional cooking methods for some of their meals—a practice known as fuel stacking.[7] Targeted affordability support, therefore, plays an important role in extending access, but must be considered in the broader context of can be sustainably provided while balancing the associated fiscal implications, equity, gender-dimensions of this support, and ongoing behavior bias.

The global community has rallied around clean cooking in recent years, building important political momentum. In 2023, both the United Nations and the International Energy Agency released global roadmaps to achieve universal access to clean cooking on route to reaching net-zero emissions in 2050 and called for countries and regions to develop domestic plans and programs that consider their own efforts in this broader timeline.[8,9] In 2024, the Government of Tanzania, the Government of Norway, the International Energy Agency (IEA), and the African Development Bank (AfDB) organized the Summit for Clean Cooking in Africa in May 2024. This was the first ever leaders-level summit on providing clean cooking access in Africa, bringing together 5 heads of government and 21 ministers to focus

[5] International Energy Agency (IEA). *World Energy Outlook 2023* (Paris: IEA, 2023).
[6] International Energy Agency (IEA). *Financing Clean Energy in Africa* (Paris: IEA, 2023).
[7] Empresa de Pesquisa Energetica (EPE) (Energy Research Office). *Atlas of Energy Efficiency Brazil 2023* (Brasilia: EPE, 2023).
[8] International Energy Agency (IEA). *A Vision for Clean Cooking Access for All* (Paris: IEA, 2023).
[10] International Energy Agency (IEA). From Taking Stock to Taking Action: How to Implement the COP28 Energy Goals (Paris: IEA, 2024).

on the issue. Outcomes of the Summit included a record US$2.2 billion mobilized by public and private sources for clean cooking access in Africa. In addition, 130 entities—including governments, enterprises, and civil society organizations—signed on to the Clean Cooking Declaration, including 12 African countries who pledged to implement a suite of proven policies and programs to advance clean cooking objectives in their respective countries.

At the Summit for Clean Cooking in Africa, Brazil committed to building on this momentum through its G20 and Conference of the Parties (COP) 30 presidencies, prioritizing clean cooking for the G20's Energy Transition Sherpa Track. During the third meeting of the Energy Transition Working Group, the G20 presidency requested the support of the IEA, Sustainable Energy for All (SEforALL), and World Bank's Energy Sector Management Assistance Program (WB-ESMAP) in preparing recommendations and co-organizing events related to the clean cooking challenge.

Overview of the Clean Cooking Roadmap

The resulting Roadmap for the Brazil G20 presidency's Clean Cooking Strategy recommends a set of actions to achieve universal access to clean cooking services by 2030 and meet the 2050 net-zero emissions target. In addition to these dates, the Roadmap includes three other critical ones that provide an opportunity to review and strengthen clean cooking commitments: (1) 2025, when Brazil will host COP 30; (2) 2035, which coincides with the fifth round of the Nationally Determined Contributions (NDCs) review; and (3) 2040, a milestone for reaching access to modern energy cooking services (MECS). These dates are aligned with the United Nations SDG targets and the goal to reach global net zero emissions by 2050, which is aligned with IPCC scenarios that limit global warming to 1.5°C. These dates are also aligned with other global roadmaps for clean cooking, including the United Nations "Achieving Universal Access and Net Zero Emissions by 2050" and the International Energy Agency's "A Vision for Clean Cooking Access for All."

In order to hit the key milestones of the G20 Clean Cooking Roadmap, the focus in the near-term is to rapidly provide all households with at least improved and cleaner cookstoves. Meeting this target is also essential to hit the COP28 target doubling energy efficiency, where clean cooking represents the largest single efficiency gain in sub-Saharan African and other developing economies to 2030.[10] After 2030, continued efforts are needed to upgrade all buildings to modern cooking services by 2040—a switch that provides the full suite of health, time-savings, convenience, safety, and efficiency benefits clean cooking has to offer. In parallel, from now to 2050, efforts to decarbonize global energy systems continue to advance, reducing the emissions intensity of the electricity grid and blending low-emissions fuels into standard cooking fuels over time. When coupled by the shift to modern cooking—alongside a particular focus on the shift to electric cooking—the share of global cooking still reliant on emitting sources is small, emitting less than 50 Mt CO_2eq by 2050, which are offset via other negative emissions sources within the energy sector.

To hit these important milestones, we suggest the following concrete actions as the key focus areas in the lead-up to Brazil's COP 30 in Belem in 2025:

[10] International Energy Agency (IEA). From Taking Stock to Taking Action: How to Implement the COP28 Energy Goals (Paris: IEA, 2024).

- Ensure that all updated NDCs for countries with a clean-cooking access deficit include targets to reach universal access to clean cooking.[11] These governments should also integrate these targets into all relevant national planning exercises, including National Energy Strategies, Universal Access Plans, and National Adaptation Plans (NAP); as well as long-term-low-emission development strategies (LT-LEDS) and other related net-zero targets. Finally, clean cooking should be fully integrated into energy-sector documents and regulations, including Just Energy Transition Plans, tariffs designs, and measures against energy poverty.
- Reinforce efforts by governments, multilateral entities, and the private sector to commit to mobilizing additional finance for clean cooking from various sources, including development and climate funds, as well as funding sources not traditionally involved in clean cooking (e.g., health, deforestation, and gender). Finally, clean cooking should be integrated into other forms of development finance agreements related to climate and energy (e.g., the New Collective Quantified Goal on Climate Finance).
- Establish a center or network of excellence on clean cooking, leveraging capacity across existing institutions, to support greater data collection, knowledge development and best practice exchanges. This effort could focus on:
  - Developing a new Clean Cooking Supply-side Accounting methodology for more timely, granular, and robust data collection on clean cooking and cooking fuel use at the national level.
  - Ensuring clean cooking is fully integrated into all long-term, national-level energy planning exercises and that the energy planning tools utilized for such analyses continue to improve the representation of cooking in their models (e.g., in terms of emissions, costs, additional geographic granularity, and fuel stacking).
  - Creating a Best Practice Repository for clean cooking policies, regulations (e.g., pricing, safety, and quality), and program design; including exchanges anchored by regional representatives with recent experience in successfully addressing the clean cooking gap. These exchanges could include best-practice sharing in specific contexts (e.g., marginalized and vulnerable communities), covering such topics as successful financing vehicles, business models, public awareness campaigns, and approaches to target support and address ongoing affordability barriers.
  - Establishing standard annual reporting on financial flows to clean cooking to help improve the delivery of already committed funds and impact tracking. This could be accompanied by an ongoing dialogue between stakeholders on how best to channel various types of funding, informed by robust project monitoring, and could inform best practices on financial tracking and monitoring, which actors could voluntarily adopt.

[11] Among countries that have included clean cooking in their Energy Compacts, Rwanda and Sierra Leone are interesting cases. For inclusion of clean cooking in energy planning, the Tanzania Rural Energy Master Plan offers a good example.

    - Developing clear guidance on how national clean cooking targets in NDCs interface with carbon credits, both in compliance and voluntary markets, recognizing the significant role carbon credits have played in advancing clean cooking in some contexts.
- Invite partners to submit country, regional, or fuel-specific strategies and recommendations that inform actions in support of clean cooking transitions.[12] This could include creating regional or industry working groups to engage the private sector on strategic planning in the clean cooking space. This could include calls for those industries, in conjunction with other partners, to develop sector-specific roadmaps aligned with the high-level targets laid out in this strategic Roadmap.
- Develop a list of key knowledge products, coordination efforts, and initiatives that could play an essential role in reinforcing the global clean cooking effort. This list could be routinely revisited, in consultation with strategic partners within the G20 context. It could highlight needed knowledge products; in-country capacity building; ecosystem development support; and key needs for implementing entities and enabling resource coordination.

In this Roadmap, we go into greater detail on ways to implement these measures and achieve the milestone targets. Accordingly, it is organized into four sections corresponding to the Clean Cooking Strategy's four key pillars for driving sustainable change in the clean cooking sector. Section 1 addresses the **policy and regulatory frameworks** required to accelerate the deployment of clean cooking solutions. Section 2 examines various **funding mechanisms and innovative financing models** that can support the scaling up of clean cooking services. Section 3 focuses on fostering **market competition** and developing **robust supply chains** to ensure the growth and maturation of the clean cooking industry. Finally, Section 4 highlights the importance of **impact assessments, knowledge sharing, and data collection** to inform more effective policy decisions and clean cooking interventions.

[12] Examples include the Organization of the Petroleum Exporting Countries' strategy for liquefied petroleum gas (LPG); the African Energy Commission's multi-fuel strategy to be launched at COP 29, which is open for consultation; country strategies (e.g., Kenya); the Modern Energy Cooking Services' resources website, the Clean Cooking Alliance's future reports and tools website; and Sustainable Energy for All's policy hub.

1. Policies for Universal Clean Cooking Access

Strong policy and regulatory frameworks are necessary to accelerate progress on clean cooking, especially to reach the most remote and vulnerable groups. Given the nature of the challenge, successful policy frameworks must be multisectoral and address hurdles the market will not address without government intervention. These include establishing the conditions for the development of financing instruments, building an ecosystem for market and industry development and consumer affordability support, and developing a knowledge framework. The subsections below describe the key factors for prioritizing the sector and developing a conducive policy environment.

1.1. Elevating clean cooking to a national priority

The first step in establishing a strong foundation for clean cooking is the **development of a comprehensive national strategy**. This strategy should serve as the cornerstone of the country's efforts, providing a clear roadmap for universal access to clean cooking. It should set specific goals, identify key stakeholders (e.g., government agencies, private-sector entities, and civil society organizations), and define actions and timelines, as well as they are well integrated within broader energy policies and plans. By considering the evolution of the country's fuel-mix pathways, the strategy should aim to expand access to clean cooking solutions, providing long-term visibility and ensuring mid-term adaptability. This approach would allow enterprises and investors to identify promising investment areas.

With a strategy in place, the next step is to **design clean cooking programs that translate the strategy into actions**. These programs should be tailored to address specific country challenges and opportunities, ranging from expanding access to clean cooking technologies to raising public awareness of their advantages. In that regard, they should cover all aspects of clean cooking, including technology dissemination, user education, financing, and monitoring and evaluation (M&E). The main goal is to allocate the necessary investment support for clean cooking–related activities. By establishing well-structured and targeted programs, the country can ensure that clean cooking initiatives effectively reach those in greatest need, while positively impacting public health, local economic development, and the environment.

Access to clean cooking is not a stand-alone issue; it should be considered an integral part of broader national planning and regulatory frameworks. By doing so, clean cooking can become a key component of national energy planning, health strategies, environmental

regulations, and poverty alleviation programs. Cooking must be recognized as a key energy service and the highest energy expenditure of low-income household groups. This integration would facilitate decision-making processes across government departments and align clean cooking with other national priorities and plans, thereby maximizing the impact of policies on the overall development agenda. To elevate it to a national priority, **clean cooking must be mainstreamed into other national efforts**. On the energy, climate, and infrastructure fronts, this includes Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), National Energy Planning, Universal Electricity Access Planning, National Development Plans, and Just Energy Transition strategies. In addition, clean cooking should be integrated into health, gender equality, and clean air policies, as well as education and labor and training programs.

When implementing the national clean cooking strategy, it is crucial to maintain momentum to ensure long-term success. Appointing **a dedicated clean cooking champion is critical for promoting institutionalization and responsibilities over clean cooking results**. By coordinating with relevant stakeholder agencies and sectors, it can leverage their networks and expertise to help mobilize resources to the sector. The explicit prioritization of clean cooking in the financing requests submitted to multilateral and bilateral finance institutions could accelerate progress to achieve this goal (see Section 2 for additional funding mechanisms). An adequate clean-cooking coordination framework is key to driving the agenda forward.

1.2. Creating a conducive policy environment

Policy recommendations for advancing access to clean cooking services are as follows:

- **Build a strong local supply chain**. It is important to establish policies that will aid the growth and expansion of local manufacturing, distribution, and retail networks. This could include providing incentives for local entrepreneurs, considering tariff and trade-agreement measures to reduce the costs of eligible technologies and fuels, facilitating access to financial resources, and investing in capacity-building efforts to expand supply chains to reach last-mile consumers and marginalized groups. Strengthening the supply chain must go hand in hand with establishing and implementing cookstoves and fuel standards to guarantee the safety, efficiency, and sustainability of clean cooking solutions (see Section 3 for additional measures to strengthen the market and industry development).
- **Increase consumer acceptance and demand-side policies that create a profitable business environment**. The long-term use of clean cooking technologies relies heavily on consumer approval. Therefore, consumer needs and preferences should be well-understood, and policies should prioritize awareness creation and education on the advantages of clean cooking. This involves grassroots-level, awareness-raising programs (e.g., in schools, savings and credit cooperatives [SACCOs], health centers, and government offices), as well as collaboration with manufacturers to understand local cooking practices

and develop policies to facilitate the transition to modern fuel markets. Promoting stove users' ongoing participation, feedback, and empowerment are essential for improving products and services. These efforts aim to boost consumer acceptance, making clean cooking the preferred option for households and ensuring sustained adoption. Policy nudging that helps consumers avoid decisions based on a lack of awareness or gender bias is also key to changing behaviors toward healthier choices. Additionally, policies can encourage gender-responsive strategies and take into consideration how intrahousehold dynamics affect decision-making around energy use and technology adoption.

- **Develop well-designed and financially sustainable affordability support mechanisms** customized to meet the needs of population segments. On the demand side, affordability and credit constraints are major barriers to the widespread adoption of clean cooking solutions. Addressing these challenges includes reviewing existing energy prices and electricity tariffs, fine-tuning subsidy target mechanisms for low-income households, adopting digitalization tools to improve the target and timing of subsidies, and coordinating with social protection frameworks. In addition, innovative financing approaches (e.g., results-based financing [RBF], carbon credits, and impact bonds) and recognized business models (e.g., pay-as-you-go [PAYGO] and microfinance options) should be explored to increase the sustainability of affordability policies (see Section 2.2 for additional measures).
- **Include the productive use of cooking energy**[13] **and institutional cooking** in clean cooking policies and strategies. It must be recognized that commercial and industrial activities, as well as institutional settings (e.g., schools, hospitals, community kitchens, and government facilities), play a significant role in advancing clean cooking. Beyond the impact of the service itself, these environments can be utilized to disseminate knowledge, empower communities, and transform cooking behavior. The productive use of cooking services must also consider the health impact of workers and their labor rights.
- **Incentivize institutions and legislate for clean cooking facilities**. Clean cooking programs should incentivize institutions to transition to clean cooking fuels and legislate for all new commercial and residential buildings to incorporate provisions for installing clean cooking facilities. Social housing programs should include the necessary infrastructure to allow for affordable, clean cooking solutions. Clean cooking strategies and programs must also pay special attention to people living in informal settings, internally displaced persons (IDPs), and refugees. These contexts call for specific measures and solutions that should consider the changing nature of informality and displacement and the evolving need for accessing clean cooking services.

[13] The productive use of cooking services refers to the use of cooking for income generation through industrial and/or commercial goals.

2. Increased Funding and Finance for Clean Cooking

Access to clean cooking services requires an increase in total funding, the design of innovative financing strategies and cost-effective solutions. IEA (2023) estimated that reaching universal access to clean cooking over this decade would require an annual investment of approximately US$8 billion (i.e., for stoves, equipment, and supporting infrastructure).[14] It is equivalent to nearly 56 percent of global public financial flows for supporting clean energy in developing countries.[15] Though feasible to achieve, competing priorities and growing needs for public funding suggest the need for smart and cost effective strategies that use blended instruments to leverage both public and private finance. It is necessary to channel development and climate funds through mechanisms that unlock concessional and private finance. These funding requirements highlight the need for a multifaceted approach that combines increased funding with innovative financing mechanisms to attract a wide range of investors. In short, an efficient combination of concessional, non-concessional, and commercial funds will be needed.[16]

2.1. Increasing total available funding

It is critical to promote and prioritize clean cooking operations in the investment pipeline of funds already available for these activities. Aligning current public funding sources with clean cooking initiatives will help channel existing resources toward scaling up clean cooking solutions and expand access to underserved populations. **Accessing and effectively utilizing climate and development funds are crucial for driving progress.** By strategically leveraging financial resources that have a track record of success or significant potential, stakeholders can accelerate the deployment of clean cooking technologies and implementation of best practices.

Policy makers and stakeholders should maintain the momentum surrounding the interconnected benefits of transitioning to clean cooking technologies, which can **attract and allocate new funds toward clean cooking solutions.** A multiple-entry-point strategy is essential to promote and scale up clean cooking initiatives effectively. Programs and funds from the various areas in which clean cooking generates key benefits should include clean

[14] International Energy Agency (IEA). *A Vision for Clean Cooking Access for All* (Paris: IEA, 2023).
[15] Based on the SDG 7.a.1 International Financial Flows Dataset, the global average in 2018–22 amounted to US$14.1 billion per year; recent data reveals that international flows have declined over the past two years.
16 Grant funding can be utilized to unlock concessional funds at no or low interest. In 2024, IDA commitments totaled US$34.2 billion, of which 21 percent was in the form of grants and the rest in other forms of debt instruments.

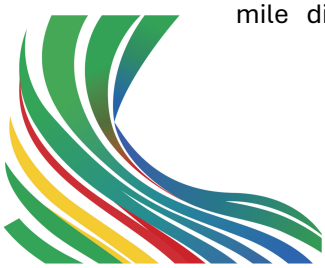
cooking components. This approach recognizes the social, environmental, and economic development outcomes that these operations can bring. By integrating clean cooking into the mandates of targeted funds, substantial benefits can be unlocked across a range of areas (e.g., energy savings, electricity access, decreased air pollution, climate mitigation, improved health, environmental and forest conservation, and gender equality). Research and development (R&D) funding sources should also be included.

Developing trustable and measurable instruments will be essential to build confidence and leverage meaningful private-investor participation. Carbon credits and impact financing instruments provide an opportunity to engage the private sector and mobilize resources toward clean cooking targets. In this approach, it is important to prioritize the gender component and provide incentives for energy utilities and other privately managed companies to invest in Environmental, Social, and Governance (ESG) resources in this space. Market-based solutions and strategic public-private partnerships can help mobilize private funding. This includes implementing supportive policies, regulations, and financing mechanisms that reduce risks, improve commercial viability, and crowd in more private capital.

2.2. Channeling funding through an effective set of instruments

Addressing the clean cooking challenge requires a multi-pronged funding approach that utilizes effective instruments for channeling resources into several key areas, as follows:

- **Addressing consumer affordability**. Results-based financing (RBF) is a proven instrument for linking public resources directly to the achievement of desired outcomes. RBF corrects a temporary market failure by monetizing the social and environmental benefits of clean cooking adoption not priced in by the market and subsidizing market actors' costs to build consumer awareness and uptake. Other promising instruments that can complement RBF approaches include carbon credits and impact bonds, which channel resources directly to end users; these may require developing business models to better account for emissions reductions. Such mechanisms can effectively internalize externalities by lowering capital costs, fuel costs, and tariffs, making stoves and fuels more affordable for end users. As the landscape of consumer finance continues to evolve, well-designed direct government support aligned with social protection programs can effectively address the consumer affordability challenge.
- **Strengthening the clean cooking value chain and market development**. The development and promotion of resilient and robust clean-cooking value chains require the strategic deployment of financing instruments that do not distort the market. Financing instruments play a vital role in supporting a clean cooking environment, from product innovation to last-mile distribution. In addition to the above-mentioned tools, it is worth highlighting



guarantees, equity and equity-like instruments, and securitization of carbon-credit revenue streams. Other mechanisms with proven efficacy in adjacent landscapes (e.g., aggregation and securitization in the electricity sector) can be piloted in the clean cooking space. It is important to design appropriate mechanisms to finance essential elements for market development within the clean cooking value chain, which are often common facilities and services used by the industry (e.g., laboratories, standards, methodologies, data, and capacity).

In the clean cooking ecosystem, access to finance instruments is often a challenge for both companies and consumers. Access to affordable capital is a key barrier for small- and medium-sized enterprises (SMEs) to scale their operation and reach more households. One key strategy to increase the flow of financing targeting clean cooking SMEs is to provide support for local commercial banks. This involves technical assistance to help understand the clean cooking market, assess risks, build capacity, and develop appropriate financing products. To overcome consumers' financing constraints, microfinance and digital platforms can play an important role. Concessional loans for on-lending can make capital for SMEs more accessible and affordable. It is likely that concessional finance will also be needed to provide SMEs business skills development and other services to facilitate investment. Private equity funds, primarily from impact investors, can provide early-stage seed capital when backed by de-risking support from donors, notably the provision of first-loss tranches.

- **Supporting government-led initiatives and policies**. Securing adequate financing for policy implementation, public programs, and regulatory activities requires incorporating clean cooking initiatives into a broader range of government funding mechanisms. Technical Assistance Funds provide financing for capacity building, advisory services, and knowledge transfer. Development Policy Financing offers policy-based loans, credits, and grants to help governments implement public programs. Investment Project Financing funds specific projects and investments aligned with priorities of the clean cooking sector. Pilots Financing Instruments provide innovative approaches through small-scale pilots, while Program for Results (PforR) financing broadens support and impact.

Deciding on the most appropriate funding sources and financing instruments depends on the context. It is essential to promote the establishment of public-private innovation dialogues, with active participation from local communities and financial systems. Moreover, higher-vulnerability and high-risk situations (e.g., people living in extreme poverty, refugees, and internally displaced persons [IDPs]) often require a higher proportion of concessional finance. The design of incentives for the private sector and coordination between stakeholders require taking into account the uncertainty and timeline of the associated risk. The comparison of results and potential leverage of the various instruments is highly context-dependent. The effectiveness of funding allocation must consider those differences; otherwise, some groups would be left behind.

2.3. Enhancing coordination of clean cooking initiatives

The widespread adoption of clean cooking solutions necessitates a coordinated approach between funding and financing strategies, highlighting the importance of ecosystem coordination. Driving progress in this space requires a number of key steps. Project transparency must be improved to foster accountability and attract needed funding. Also, encouraging cooperation among the wide range of stakeholders—from bilateral cooperation entities, philanthropic institutions, and the international community to R&D centers and financial institutions—is pivotal to mobilizing the required capital. This should involve national and regional development banks, as well as national and regional platforms and parallel financing structures.

A national or regional coordination platform is necessary for scaling up operations and facilitating the channeling of support and funds within a framework that unlocks public and private finance. A systematic approach is central to guaranteeing the efficient allocation of resources and promoting the sustainability of clean cooking services. National and regional platforms that reduce transaction costs for SMEs to access carbon and impact finance funds are also necessary for unlocking private investment while empowering the community and creating local jobs. In addition, maintaining coordination among stakeholders across the clean-cooking value chain is vital for effective knowledge sharing and implementation of best practices. Furthermore, ensuring coordinated reporting activities for funded projects will promote accountability and alignment with clean cooking objectives. Moreover, it is important to develop gender-targeted initiatives to address specific financial access barriers and enhance women's participation; gender-specific incentives must be considered throughout all funding and financing processes.

3. Clean Cooking Market and Industry Development

The clean cooking market has shown promising signs of maturation, but substantial work remains to transform it into a vibrant, sustainable industry capable of attracting more private finance, including corporate equity and debt. In 2022, investments in the sector exceeded US$200 million and revenue surpassed US$100 million—both record highs for the industry. However, investment continues to be concentrated in a small number of enterprises. In 2022, the seven largest companies by capital raised accounted for 90 percent of total investment in the industry, a figure unchanged since 2020. Notably, liquefied petroleum gas (LPG) enterprises have dominated funding over the past two years, with 59 percent of total funding in 2021–22 directed toward companies offering only LPG.[17]

Scaling up access to clean cooking requires both a profitable clean cooking market and a healthy clean cooking industry. Requisite conditions for successful private-sector involvement include the existence of national strategies and plans, appropriate institutional frameworks, favorable market conditions, and political willingness to tackle the issue. (These factors are closely linked to the policy and financing recommendations addressed in Sections 1 and 2.)

With the enabling conditions for the clean cooking market in place, industry partners need to play a key role in the delivery of clean cooking solutions. In order to accelerate growth, the industry must focus on two pillars: (1) implementing concrete, industry-led measures to enhance the market and (2) advancing coordination efforts through collaboration within the sector.

3.1. Implementing industry-led measures for market enhancement

To deliver its products more effectively, the clean cooking industry needs to strengthen its value chains for technologies and fuels. Key priority actions for the industry are as follows:

- **Develop in-country partnerships**. Effective delivery of clean cooking projects hinges on strong in-country partnerships. International and local companies should enhance their ability to forge partnerships that improve fuel sourcing; the identification of manufacturers, dealers, and distributors; and investments. Establishing joint ventures and public-private

[17] Clean Cooking Alliance (CCA). *Clean Cooking Industry Snapshot*, fourth edition (Washington, DC: CCA, 2023).

partnerships can leverage on-the-ground delivery capacity and well-established supply chains. They enable arrangements for collaborative investment to mitigate financial risks and capitalize on synergies in shared ownership projects.

- **Invest in** localized expertise and Research and Development (R&D) along the full value chain, which can be central for some clean cooking solutions. Building local expertise and R&D capacity is essential for the adoption and sustained use of clean cooking solutions. With enhanced R&D capacity that helps to better understand consumer needs and preferences, technological innovations in products must look towards consumer preferences; reduce costs; and develop locally sourced clean fuels, skills, businesses, and supply chains; the industry can better promote customized local clean cooking solutions that are adaptable, as well as strengthen the resilience and formalize all aspects of the value chain (i.e., transport, refilling, connection, installation, manufacturing, assembly, maintenance and repair, and quality and performance testing).[18] Furthermore, this would help establish a tax base to increase government revenues.
- **Align on standards and regulations**. Working toward establishing industry-wide agreements on standards and regulations; creating a level playing field that fosters healthy competition; and ensuring clear, regulated labeling of clean cooking technologies will help improve consumer choices.
- **Develop sustained planning and investment in fuel production and distribution and high-quality stove manufacturing, which successful clean cooking initiatives require.** A country's specific characteristics will determine the level of resources that should be considered for locally produced or imported stoves and fuels. The industry should invest in feasibility studies, market analyses, and advocacy efforts. Also, strategic planning for storage and distribution networks is essential to accelerate the local production of fuels and stoves. By enhancing collaboration within the industry, these efforts will support the creation of a robust supply chain that ensures the consistent availability and quality of clean cooking solutions.
- **Promote and sponsor consumer adoption campaigns**. The clean cooking industry is reaching an underserved customer base; 83 percent of customers are accessing clean cooking products for the first time and 31 percent are living below the poverty line (US$3.20 per day).[19] Grassroots-level communication campaigns on the benefits of clean cooking products can help increase household uptake. At the same time, clean cooking companies and manufacturers must bear in mind that the drivers of household consumers' behavior is not always aligned with programmatic concerns (e.g., air pollution reduction). Customer responsiveness, along with other key drivers (e.g., affordability and availability of products and fuels, convenience, safety, and perceived influence on social status), has been shown to be a key indicator for increasing uptake among existing customers and attracting new ones.

[18] This recommendation is more important in countries where the value chain is not yet developed.
[19] CCA, Clean Cooking Industry Snapshot, 2023.

Taking a user-centered approach and developing innovative business models aligned with cultural and social norms can support the transition away from illegal and informal fuel markets.

3.2. Advancing efforts through within-industry collaboration and coordination

Beyond individual measures, greater collaboration and coordination within the industry are essential for strengthening the clean cooking market. By working together, industry partners can advance clean cooking efforts through the following initiatives:

- **Establish working groups to develop roadmaps for specific energy sources**. Driving clean cooking commitment and implementation requires deepened, industry-led vertical collaboration across the entire supply chain. Energy-source roadmaps with a clear agenda for future years are crucial for accelerating clean cooking access. Working groups should be established to develop these roadmaps and convene regularly to assess progress through forums, as well as investment platforms and industry work groups. Sector-specific examples include electric cooking, bioethanol and biogas, LPG, and renewable biomass. These roadmaps should address enabling elements for the sector (energy-source strategy, innovation, and data exchange), supply approaches (importation, generation, and production), and demand-side challenges (last-mile fuel distribution, fuel standards and regulations, and carbon market environments).
- **Commit to country reporting on deployment and investment**. The entire clean cooking ecosystem, including the industry, would benefit from increased knowledge sharing, building on successes and learning from past experience. The industry should commit to collecting and sharing clean cooking project and market data to improve local tracking of clean cooking progress; increasing transparency on project outcomes (including stacking); and allowing for market-related data and benchmarks for efficient investments in clean cooking.
- **Advocate for integrating clean cooking initiatives into the broader energy industry**. Integrating clean cooking initiatives into the broader energy industry will unlock intra-sectoral synergies, create increased demand, improve deployment efficiencies, and promote clean cooking solutions across the energy landscape.

4. Bridging the Knowledge Gap

Knowledge gaps about the clean cooking sector have hindered the accelerated transition to modern energy cooking solutions. Gaining a better understanding of what drives the adoption and sustained use of clean cooking solutions is a key element in bridging the gap. This includes knowledge on cooking practices (both barriers faced and enabling factors); improved data, modeling, and planning tools; policy and regulatory impacts; knowledge sharing and capacity building at multiple levels; and sectorwide standards.

4.1. Filling gaps to inform better policies

The societal benefits (e.g., better health, gender equality, a cleaner environment, and improved livelihoods) and costs of transitioning to clean cooking solutions are often poorly understood and valued. Because the public-goods benefits of clean cooking are seldom prioritized, it is critical to gain an understanding of the wider costs and benefits of the transition. Beyond this, it is also important to understand other barriers to and enablers of cleaner solutions. Many of these factors are behavioral, meaning that greater insight into local cooking practices can help inform solutions that accommodate prevailing cooking methods and customs. Addressing these dynamics is key to ensuring the successful transition to clean cooking solutions. This is also essential for accurately estimating intervention costs and benefits to inform more effective policy making.

4.2. Promoting knowledge sharing

Beyond direct knowledge-generating efforts, **knowledge sharing within and among countries, companies, and other stakeholders should be encouraged** to learn from observed policy, legal, and regulatory successes, as well as the most effective technologies and business models. One proposed approach, which builds on the Global Coalition for Energy Planning, is to establish a Center of Excellence comprising organizations, governmental institutions, universities, and research centers ensuring best practices for energy planning, innovation, and research. A linked public platform sharing standards, data, planning tools, and reports could also be established. As with the center, this knowledge-sharing platform should build on existing efforts to maximize synergies. Local knowledge sharing within and between communities should also be encouraged. Prioritizing capacity-building efforts tailored to local stakeholders and researchers can ensure that local know-how is fostered, sustained, and spread. Finally, to equip local markets with the right skills, including specific clean cooking skilling programs in learning institutions should be encouraged.

4.3. Including women and vulnerable populations

To ensure a just energy transition that leaves no one behind, **it is important to prioritize actions targeting clean cooking solutions for those groups most impacted by the lack of access** (e.g., women and children). Gaining a deeper understanding of how they are variously affected by the lack of clean cooking (e.g., through dedicated gender analyses) is key to developing responsive policies and actions. Throughout the process, it is therefore important to ensure greater inclusion of women in research and capacity-building efforts. The impact of the implemented policies can be tracked using standardized gender indicators, data, and metrics (e.g., percentage of women involved in research, share of projects focused on women, and participation rates of women in policy-making efforts).

Beyond planning efforts aimed at those most adversely impacted by the lack of access to clean cooking, it is equally important to include populations that have historically been left behind (e.g., indigenous and displaced communities). This includes evidence-based decision-making that places all marginalized groups at the core of the clean cooking transition. Working toward inclusive clean-cooking policies that are cognizant of the diverse needs of the most vulnerable and marginalized groups should be prioritized in policy development over the coming years. To this end, multi-stakeholder collaboration involving development, humanitarian, and national government partners will be critical.

The employment dimensions of traditional versus clean cooking solutions may present themselves as "hidden" costs of the transition. The transition to clean cooking can potentially change existing value chains, which would impact households and communities that currently benefit from traditional cooking solutions (e.g., through the current trade of charcoal and wood fuels). The trade of charcoal, in particular, is considered an important source of informal labor and revenue and thus would necessitate actions to generate and innovate alternative sources of revenue for those impacted.

4.4. Enhancing data, modeling, and planning tools

Resources supporting the transition to clean cooking access for all must be allocated efficiently. This requires enhanced data collection and analysis, modeling, and planning tools, together with mechanisms developed to produce reliable statistics to support data-driven decision making. The continuous review of these efforts is needed to ensure routine updates and revisions of clean cooking programs, policies, regulations, and national targets.

Highly granular data on cooking behaviors is also needed to allow for detailed cost estimates associated with the clean cooking transition, as well as better estimates of the costs of inaction. Given the pervasiveness of fuel stacking, data on the level of this

practice and its impact on the costs and benefits of a clean cooking transition should also be collected. In addition, data should be collected on marginalized groups, including displaced populations, as they are frequently excluded from national data-collection efforts and countrywide energy-access surveys. Such efforts should take a participatory approach involving local stakeholders since leveraging their expertise will produce more representative results, build local capacity, and foster a sense of ownership through community engagement.

The development of modeling and planning tools that account for local realities can further increase the pace toward universal clean-cooking access. Open-source tools, which deploy granular data, allow decision-makers to explore the costs and benefits of investment options based on user-defined criteria. Such tools are essential for transparency and local ownership. Detailed documentation can facilitate more locally led initiatives and dissemination. Local stakeholders, including academic institutions, can ensure that the tools' longevity and relevance are retained within the country.

As more data and tools are made available, **sector wide data standards must be established to facilitate the sharing of datasets between stakeholders and organizations**. Adopting standards ensures that the growing volume of data is effectively utilized to support the clean cooking transition.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