



RESULTS REPORT

Sharing Progress on the Path to Adoption of
Cleaner and More Efficient Cooking Solutions



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An always expanding list of Alliance partners is available within the Alliance community's searchable online directory (<http://community.cleancookstoves.org/>). We are also grateful to those carbon market participants that provided additional survey information about their clean cookstoves market activities via Ecosystem Marketplace's 2014 survey of carbon offset providers. For additional information on the results of that survey and a list of clean cookstove carbon offset provider respondents, see Sharing the Stage: State of the Voluntary Carbon Markets 2014, available on the Ecosystem Marketplace website (<http://www.ecosystemmarketplace.com/>).

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2013 RESULTS REPORT

Sharing Progress on the Path to Adoption of
Cleaner and More Efficient Cooking Solutions

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Designed by:



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1. Overview

The Global Alliance for Clean Cookstoves (the Alliance) was launched in 2010 with a goal to drive the adoption of clean and efficient cookstoves and fuels in 100 million households by 2020. The Alliance's strategic business plan provides a clear roadmap for the creation of a dynamic market for clean cooking solutions via a three-pronged approach focused on strengthening supply, enhancing demand, and creating an enabling environment for sector growth. Phase one of its strategic plan, which extends from 2012-2014, has been focused on launching global and in-country efforts to rapidly grow the sector.

Overview of Alliance Activities in 2013

The Alliance's partner base grew steadily in 2013, with 365 new partners by the end of the year. In 2013, many market-enabling activities, including efforts to strengthen supply, were well under way, with the establishment of a suite of funding mechanisms to drive enterprise capacity building and innovation. The Alliance also commissioned numerous market assessments and launched Country Action Plans to inform its selection of eight initial focus countries (Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria, and Uganda). In addition, several critical enabling environment activities were also in progress, including a process to create the first internationally recognized standards for the sector, support to enhance regional testing centers, and numerous studies to demonstrate the potential benefits of scaling up cleaner, more efficient cooking.

Beyond these efforts to accelerate market growth globally, the Alliance also worked to facilitate safe access to fuels and energy in humanitarian settings, promote the empowerment of women, and ensure the wide range of benefits associated with the adoption of clean cooking, including improved livelihoods, public health, and reduced environmental degradation and climate change mitigation.

Results Reporting Overview

The Alliance remains committed to routine monitoring and reporting on sector progress. The *2013 Results Report: Sharing Progress on the Path to Adoption of*

Cleaner and More Efficient Cooking Solutions is the second Alliance results report illuminating traction and trends in the cookstove and fuel sector. Building on results reporting first conducted by the Alliance in 2012, this report tracks partners' self-reported progress in 2013 toward their shared adoption goal. As such, where possible, the report also offers year-over-year analysis of Alliance partner activities, including analyses comparing new and repeat respondents to ensure that results are accurately stated and interpreted.

Data Collection

The majority of the data was collected via an online survey designed and administered by Forest Trends' Ecosystem Marketplace with technical and outreach support from the Alliance secretariat and its regional market managers. The Alliance also partnered with Ecosystem Marketplace to analyze the survey results that are presented in this report. Submitted responses were reviewed for clarification and confirmation where necessary.

This year, the report has also integrated information from the Alliance's **Clean Cooking Catalog**, a new global database of cookstove and fuel performance information using key indicators such as stove features, specifications, emissions levels, efficiency, fuel types, and safety from laboratory and field-testing. The continued integration of additional technologies into the catalog will enable better tracking of trends in the availability of cleaner and more efficient stoves and fuels over time.

The report structure begins with a **"Results"** section that highlights partners' aggregate accomplishments, globally. A new **"Focus Country Views"** section provides a more in-depth description of the momentum within each of the Alliance's eight focus countries, pairing data analysis with real-world experiences as described by key Alliance representatives working on market development in each of the focus countries. Finally, the broader implications of these global and focus country results are explored in a **"Discussion"** section that relates the Alliance's strategy and sector developments to its current growth trajectory.

2. Results

Interpreting the Results

Findings are not meant to be comprehensive of the sector as a whole, but rather serve to illustrate the momentum of the Alliance's partners and the sector in general. Readers should consider these findings as conservative, to be weighed alongside the rapidly expanding body of knowledge in the sector.

Respondents Profile

Approximately 45% of partners that were active in 2013 responded to the survey (Table 1), with a total 458 organizations participating in the 2013 survey compared to 246 in 2012. Almost three out

of every four organizations that reported engaging directly in the clean cooking value chain in 2013 also responded to the 2012 annual survey.

Figure 1 illustrates respondents' headquarters and countries of operation. Partners active in Asia were central to market activity and growth, with the number of responses from Asia-based partners almost tripling in 2013. This is partly due to the Alliance's intensified support to and survey outreach in China (Section 3).

The response rate for partners from Africa also rose steadily, with an increase of 33% from 2012. In keeping with 2012 results, Africa retained its position as

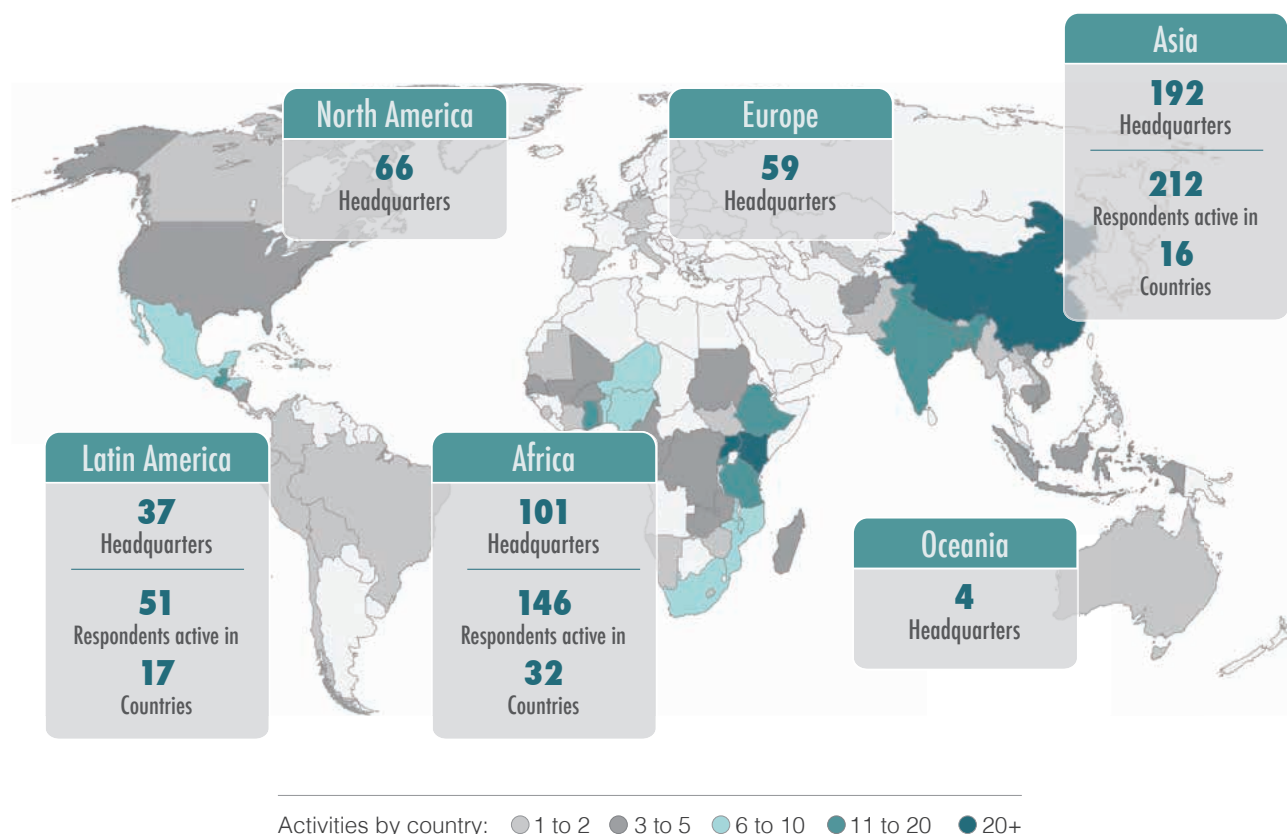
Table 1: 2013 Alliance Partner Performance: By the Numbers

Response Rate:	458	Partner Headquarters:	
		Africa: 22%	US & Canada: 14%
		Asia: 42%	Europe: 13%
		Latin America: 8%	Oceania: 1%
Stoves Manufactured:	11.7 million	Portability:	
		Portable: 68%	Fixed: 32%
Stoves Tested:	75% of all stove models	% Testing Occurrences by Setting:	
		Lab: 39%	Both: 14%
		Field: 47%	
Stoves Disseminated:	14.3 million	Stove User Location:	
		Africa: 31%	Latin America: 6%
		Asia: 63%	
		Stove User Setting:	
		Rural, above poverty line: 3%	Urban/peri-urban, above poverty line: 7%
		Rural, below poverty line: 76%	Urban/peri-urban, below poverty line: 14%
Fuels Produced:	8.3 million (kg)* 3.4 million (L)*	Fuel Types Produced:	
		Briquettes/pellets: 33%	Liquid petroleum gas: 27%
		Biogas: 22%	Ethanol/alcohol: 9%
Fuels Disseminated:	10.0 million (kg)* 2.0 million (L)*	Fuel Types Disseminated:	
		Briquettes/pellets: 36%	Liquid petroleum gas: 34%
		Ethanol/alcohol: 18%	Charcoal: 10%

Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on thousands of data points from 458 survey respondents. * kg = kilogram and L = liter

Figure 1: Distribution of Regional Response Rates by Respondent Headquarters and Count of Reporting Partners Active In-Country



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 458 organization responses. Shading represents locations of respondents' activities, not headquarters.

a key region for organizations working in the sector, and in a variety of roles. Responses from Latin America showed an even greater increase at nearly double the 2012 rate (+76%).

Manufacturing and Distribution

Stoves

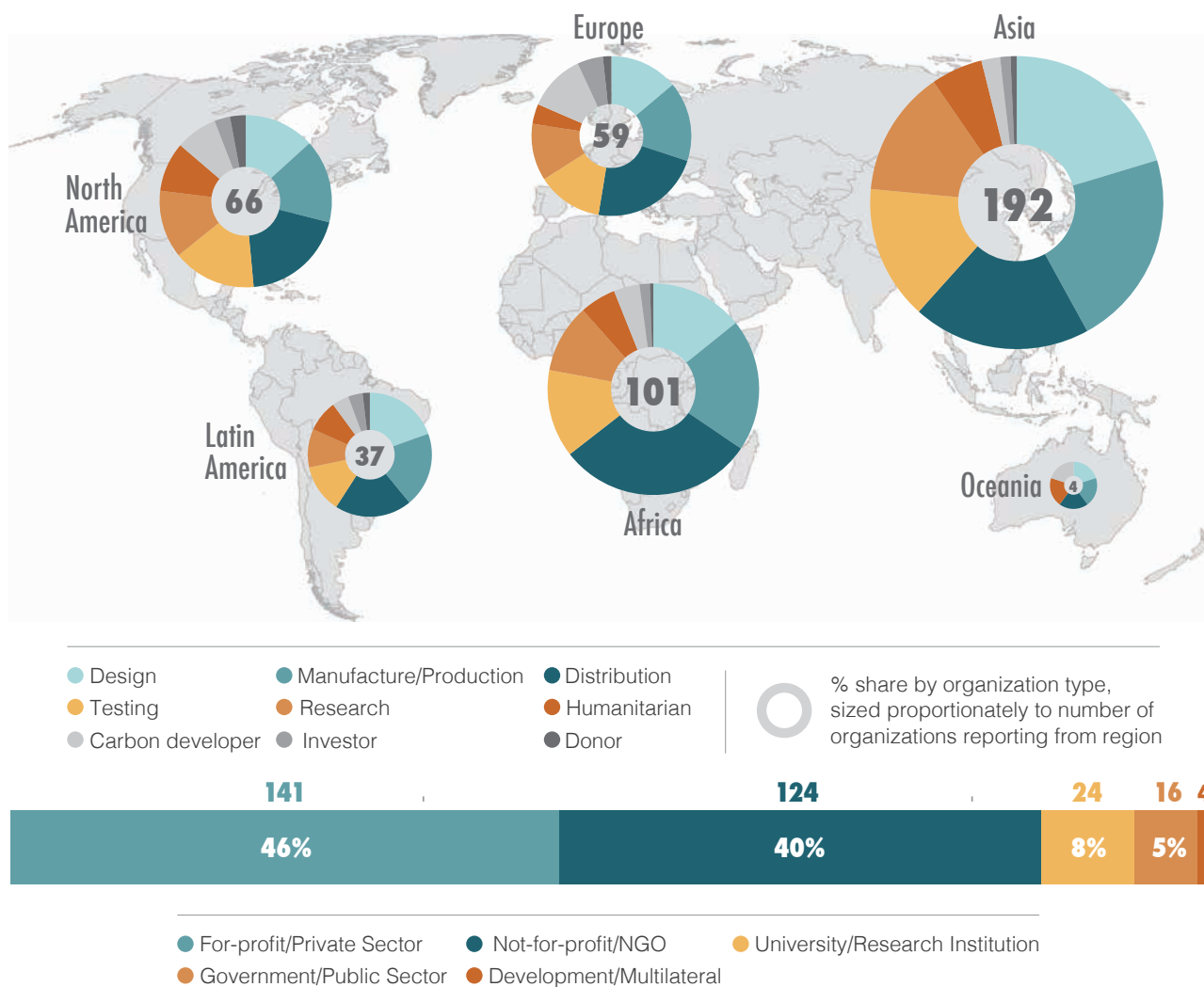
The number of stoves manufactured by Alliance partners grew 22%, to 11.7 million, in 2013, from 9.6 million in 2012. Consistent with 2012 findings, two-thirds of these stoves were portable, while the remaining third were built in place. Two out of every three stoves tracked in the report survey were manufactured in China. Stoves manufactured in China were distributed across a reported seven countries, but most commonly within China itself. Another 2 million stoves were manufactured in Africa - a critical focal area for distributors, humanitarian agencies, and the Alliance.

Overall, close to half of the growth in manufacturing from 2012 can be attributed to first-time respondents, with those reporting in both 2012 and 2013 actually reporting lower manufacturing volumes (Figure 4). Part of this decline may be attributed to organizations shifting focus along the supply chain; reported activities in Ethiopia, for example, suggest a 2 million+ shift from last year's production into this year's distribution.

Globally, **respondents distributed 14.3 million stoves in 2013, growing by 75% over distribution reported in 2012 (8.2 million) (Figure 3).** **Partners reporting stove distribution activities in both 2012 and 2013 marked a 19% year-on-year increase in distributed volumes.**

Figure 5, which tracks the volume of stoves distributed in 2012-2013 by partners' distribution capacities, shows that organizations of all sizes saw

Figure 2: Distribution of Survey Response Rates (Region) by Respondents' Roles in Value Chain



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 458 organization responses.

increases in the volume of stoves distributed. First-time respondents contributed to over half of 2013 distribution volumes (Figure 6).

At least 4.8 million stoves were sold to retailers that then sold them to end users in 2013 or planned to do so in the future. Trade fairs were the primary outlet for organizations to market their products (Figure 7).

Alliance partners also distributed a substantial proportion of stoves and fuels directly to end users of which poor and low-income consumers in rural areas were the most commonly targeted user types, followed by users above the poverty line in urban and peri-urban areas (Figure 8).

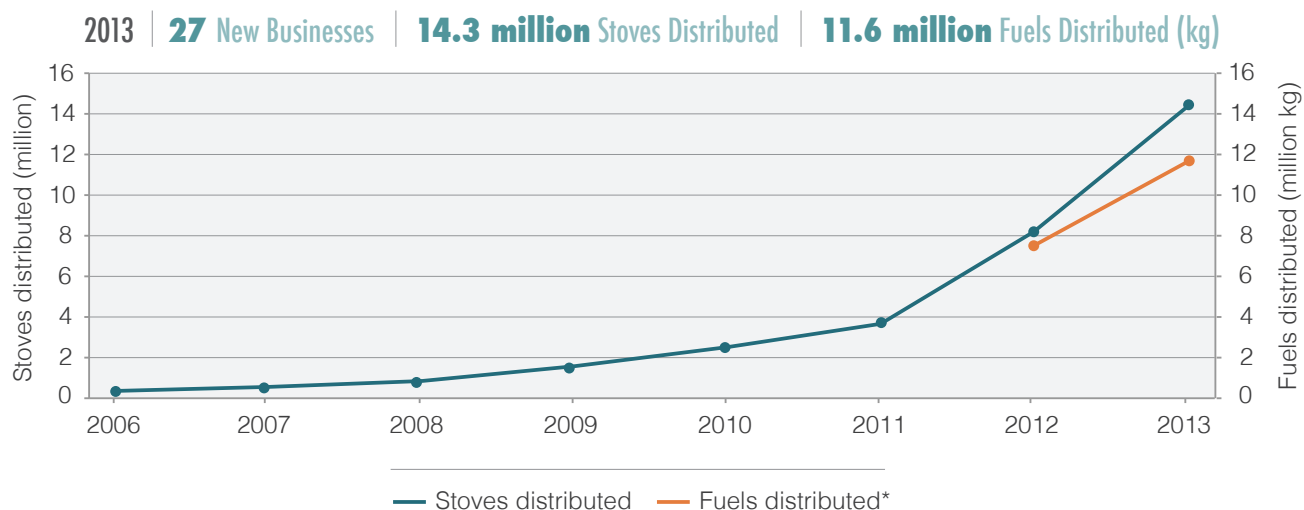
Emergency aid programs account for approximately 3% of the 14.3 million cookstoves distributed, impacting at least 400,000 crisis-affected house-holds in nine countries, as reported through an on line database hosted by the Safe Access to Fuel and Energy (SAFE) Reference Group which the Alliance co-chaired in 2013 (Box 1).

This is an almost fourfold increase over the 82,000 stoves reported as distributed in humanitarian settings in 2012.

Fuels

Partners distributed at least 11.6 million kilograms (kg) of fuel in 2013 – 55% more than

Figure 3: Cumulative Survey Respondents Active in Stove Market and Stove Distribution to Date by Year of Business Start



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 282 organizations reporting year of business start, of a total response rate of 458 organizations. 2006-2011 amounts based on tracking led by the U.S. Environmental Protection Agency's Partnership for Clean Air (PCIA), which led the results reporting process for the sector prior to the establishment of the Alliance.

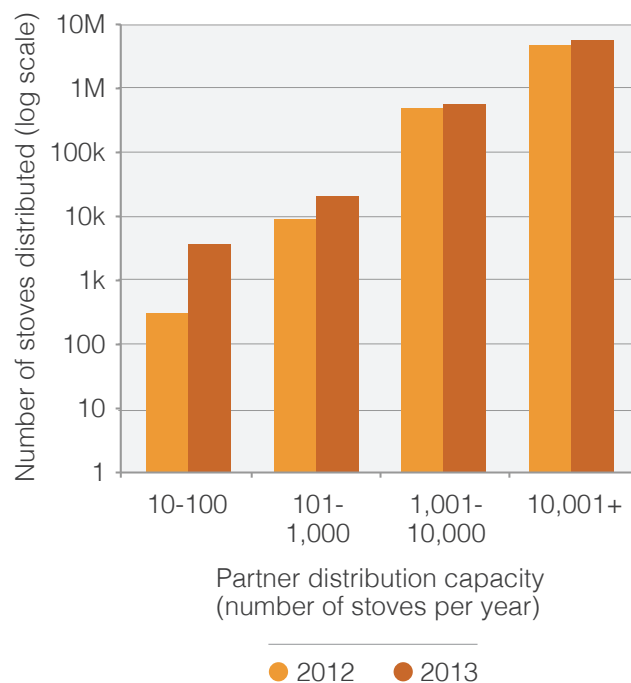
Figure 4: Volume Comparison by Respondent Activity and Survey Year



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 458 organization responses from 2013 and 246 organization responses from 2012.

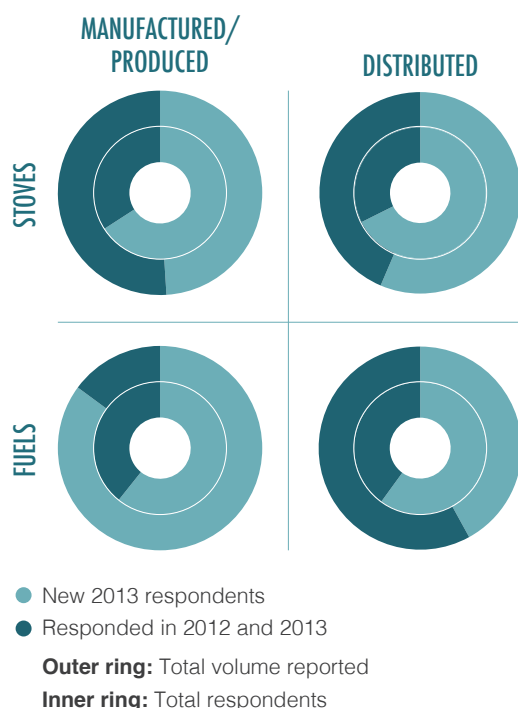
Figure 5: Distribution Response Rate In-Depth Comparison 2012-2013



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 92 organization responses from 2012 and 2013.

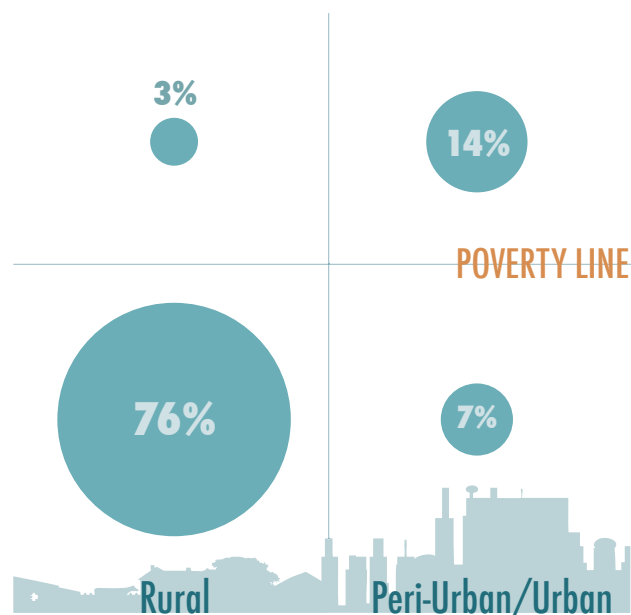
Figure 6: Comparison of Respondents by Survey Year and Market Activity



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.
Notes: Based on 458 organization responses from 2013 and 246 organization responses from 2012.

was reported in 2012 and over one-third of which was clean-burning liquid petroleum gas (LPG) (Table 1). Behind this increase in fuels distribution was an increase in production, which grew 84% from 2012 to 11.7 million kg in 2013. Fuel producers in India

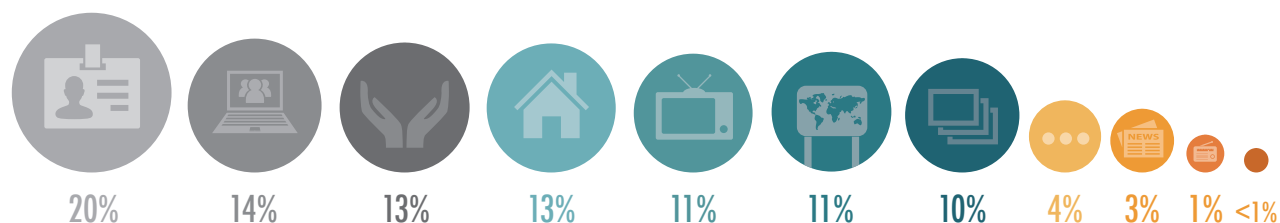
Figure 7: Stove Distribution by End User Income and Setting



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.
Notes: Based on 237 observations.

contributed a significant proportion of this volume. In addition, fuels production and distribution volumes also drew significantly upon new respondents, with close to half or more volumes reported by first-time respondents.

Figure 8: Percent Share of Primary Methods Utilized to Market Stoves and Fuels



Primary methods of marketing stoves:

- Trade Shows
- Internet
- Public Demonstration
- Door-to-Door Campaigns
- TV Ads
- Billboards/Other Outdoor Advertising
- Flyers
- Other
- Newspaper/Other Print Media
- Radio Ads
- Mobile Messaging

Source: 2013 Results Report. Global Alliance for Clean Cookstoves.
Notes: Based on 586 observations (respondents had option for multiple selections).

Box 1: Humanitarian Activities and Safe Access to Fuel and Safety (SAFE)

The Alliance has a goal of 1 million households in humanitarian settings adopting clean cooking solutions. As part of the Safe Access to Fuel and Energy (SAFE) in humanitarian settings initiative, the Alliance has been leading efforts to integrate fuel and energy access into humanitarian responses by commissioning research, facilitating sector coordination, building partnerships, and enhancing the capacity of humanitarian workers.

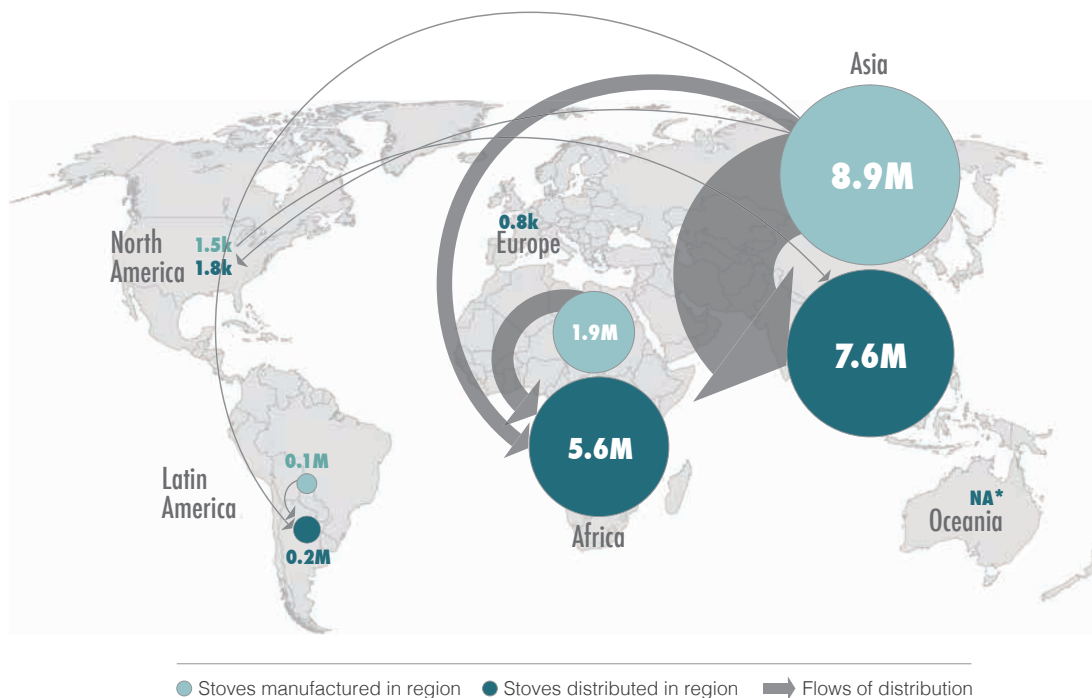
In 2013, the Alliance convened manufacturers, humanitarian implementers, and carbon financiers to discuss the technology needs of humanitarian projects, including technologies that are currently available and adaptations that are necessary for these contexts. This workshop, held in Nairobi, helped manufacturers and humanitarian agencies begin to bridge the gap between supply and demand for cookstoves in humanitarian settings. The workshop also focused on the benefits, challenges, and potential pathways to utilize carbon finance of humanitarian initiatives.

The Alliance co-chairs the SAFE Reference Group, a consortium of international humanitarian agencies working to improve access to fuel and energy for crisis-affected populations. The Alliance also served on the steering committee to develop the United Nations Refugee Agency's (UNHCR) SAFE strategy.

The UNHCR SAFE strategy is one of five guidance documents readily available to humanitarian practitioners: these include the SAFE Decision Tree Diagrams on Factors Affecting Choice of Fuel Strategy in Humanitarian Settings; the SAFE Matrix on Agency Roles and Responsibilities for Ensuring a Coordinated Multi-Sectoral Fuel Strategy in Humanitarian Settings; the Food and Agriculture Organization (FAO) Guidance Note on SAFE in Humanitarian Settings; and the World Food Programme's (WFP) SAFE handbook.

One-third of the 29 humanitarian projects described in this year's Results Report survey reported utilizing the WFP handbook or other SAFE guidelines. An additional 19 cookstove and fuel projects were reported in 2013 by partners of the Alliance through the SAFE Reference Group's online project database. These projects provided cleaner stoves and fuel to approximately 400,000 crisis-affected households in nine countries.

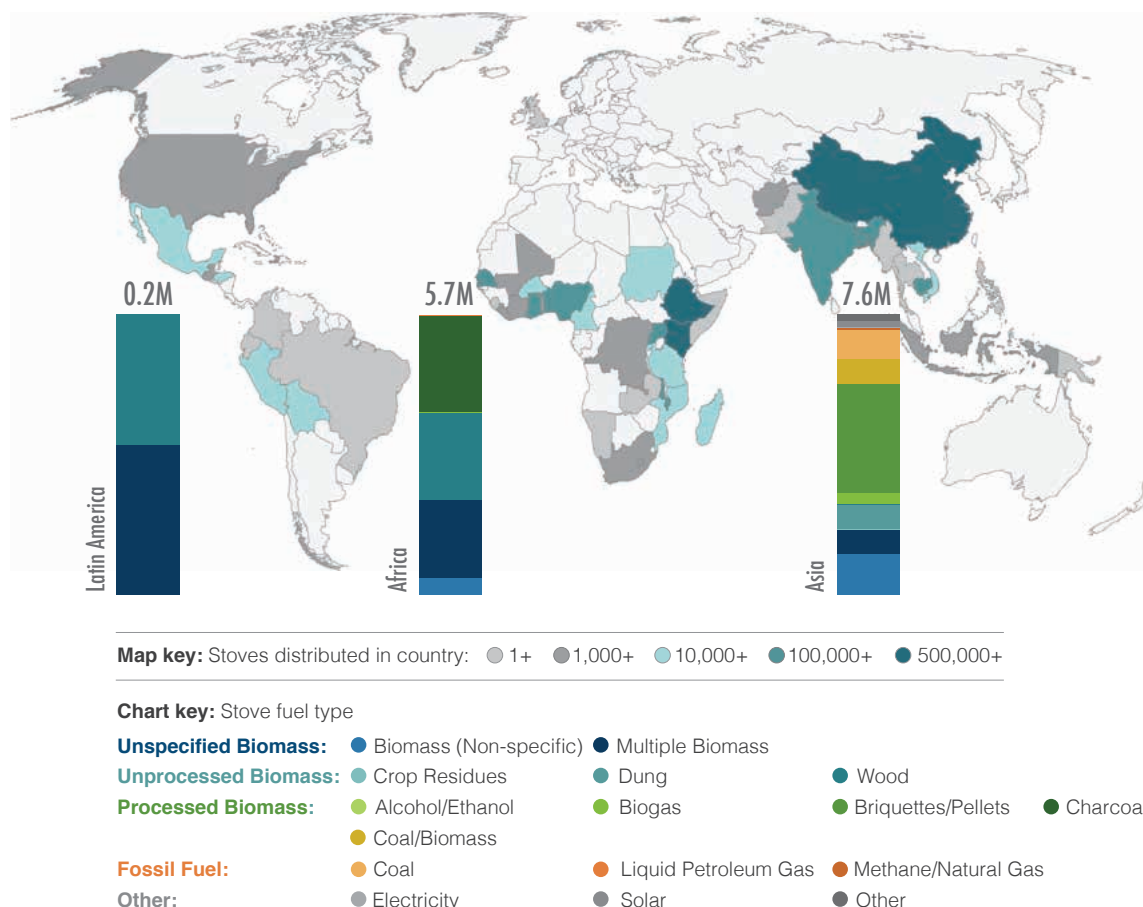
Figure 9: Stove Flow from Manufacturing to Distribution



Source: 2013 Results Report. Global Alliance for Clean Cookstoves

Notes: Based on 176 organization responses for stove manufacturing activities, and 206 organization responses for stove distribution activities. * Data is insufficient to report partner volumes.

Figure 10: Volume of Stoves Distributed by Country, Region, and Stove Fuel Type



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 545 observations.

Regional Results

Approximately two out of every three stoves (9.2 million) were distributed in focus countries where the Alliance is intensively supporting partners to promote enabling environments for social investment and market development (Figures 9 and 10). Stoves manufactured in focus countries make up 89% of all stoves reported. Alliance focus countries also showed significant year over year growth, with the number of stoves manufactured and distributed doubling in focus countries compared to more moderate market changes in non-focus countries.

While most regions experienced modest gains, responses from Asia-based partners represented the most sizable change, growing to encompass 192 organizations, which constitute 40% of total respondents.

The Alliance's 130 partners in China, in particular, led the global clean cooking sector in both manufacturing (representing 68% of the total volume) and distribution (a smaller 43%).

Behind Asia, Africa was the second most-active region for Alliance partners and the primary target of finance for carbon offset projects promoting clean cooking technologies. In these countries, as well as in Latin America, partners were predominantly engaged in the stove and fuels distribution value chain, while Europe, Oceania, and North America saw a slightly greater response rate from donor agencies, investors, and carbon market actors (Figure 2).

Overall, surveyed partners were based out of 64 countries in 2013, two more countries compared to 2012, while their direct and indirect market activities were even more far-reaching, encompassing a total

Box 2: The Clean Fuels Story

The Alliance has a comprehensive approach to the adoption of clean cooking solutions in developing countries. This includes focusing on fuels as well technologies, requiring the Alliance to build strategies to promote informed fuel switching, highlighting best practices for implementers to ensure sustained adoption through market-based fuel interventions, and strategically communicating the evidence that will strengthen the future of clean fuels use in the cooking sector.

While clean cooking fuels production and distribution is underrepresented in this year's survey responses, results reflect a 55% increase from the volume of fuels distributed in 2012. Activities in 2013 were also notably cleaner; liquid petroleum gas (LPG) and briquettes/pellets lead the way as the most popular fuels sources reported by total volume produced and distributed.

The clean cooking fuels space is extensive and multi-faceted, and as the Alliance continues to work to expand its efforts in this area, a number of fuel-related efforts are noteworthy to highlight.

I. Processed biomass fuels making an impact

Wood and other sources of biomass are likely to continue to be a major source of domestic energy use going forward. Innovative and scalable improvements to fuel processing and the supply chain are needed to improve the fuels that are available.

Biomass is among the largest sources of energy worldwide, but burned in its raw form, often provides less heat control, harmful indoor and outdoor emissions, and reduced combustion efficiency. Processing biomass into forms such pellets or briquettes leads to a higher energy dense fuel source and also provides entrepreneurial opportunities along the fuel value chain. Sustainable Green Fuel Enterprise (SGFE), an Alliance Spark Fund grantee, has developed a type of clean energy that offers a more sustainable alternative for Cambodia's cooking fuel consumption and utilization. SGFE is manufacturing char-briquettes made of biomass waste using modern processing techniques and innovative technologies. The char-briquettes substitute the local traditional unsustainable charcoal, reaching over 400 households every month.

Another Spark grantee, Eco-Fuels Africa, has been training marginalized farmers in Uganda to turn locally sourced biomass waste into briquettes using simple, locally made kilns. Their clean-burning fuel briquettes (green charcoal) burn as well as charcoal from wood, burn longer and more cleanly and at lower cost than charcoal from wood, and can also be used in the same stoves Sub-Saharan Africans already use.

II. Biogas sees organic growth

Widespread dissemination of biogas digesters in developing countries began in the 1970s and has grown, for example, to over 31 million biogas plants in China and India alone, using mostly animal manure as the primary input for the biodigesters¹. In other areas of the world, the use of biogas technology has waned; however, there will continue to be opportunities for domestic biogas use for household cooking needs, technology improvements, and a wider variety of organic inputs to feed the digesters. SimGas, a design and production company and Alliance Spark grantee, has developed two improved biogas systems for the east and southern African markets that convert manure and organic household waste into methane gas, which can be used for cooking and lighting.

III. Ethanol demand centuries in the making

Ethanol has been used as a fuel for nearly two centuries, primarily in the transportation sector and most often as a substitute for petroleum-based liquid fuel. With its many benefits ranging from decreased greenhouse gas (GHG) emissions and short-lived climate pollutants (SLCPs) and being derived from renewable sources, its use as a

² http://www.hedon.info/tiki-download_forum_attachment.php?attId=30

Box 2: The Clean Fuels Story (cont.)

clean cooking fuel option has gained traction over time. The impact venture development partnership, CleanStar Ventures, is taking the lessons learned from their work in Mozambique where they launched a commercial-scale rollout of ethanol cooking solutions to low-income urban households to develop an ethanol stove with a refillable fuel cartridge, complementary household appliances that can use ethanol, and a fuel distribution process that leverages partnerships with multinational corporations. The overall goal of their work is to create a global distribution network for ethanol that layers on the oil and gas distribution network. These trends and efforts demonstrate that fuel interventions are making progress and many more opportunities are present as the Alliance looks towards more ways to support the scale-up for clean cooking solutions.

IV. LPG for cooking increasingly considered a scalable option

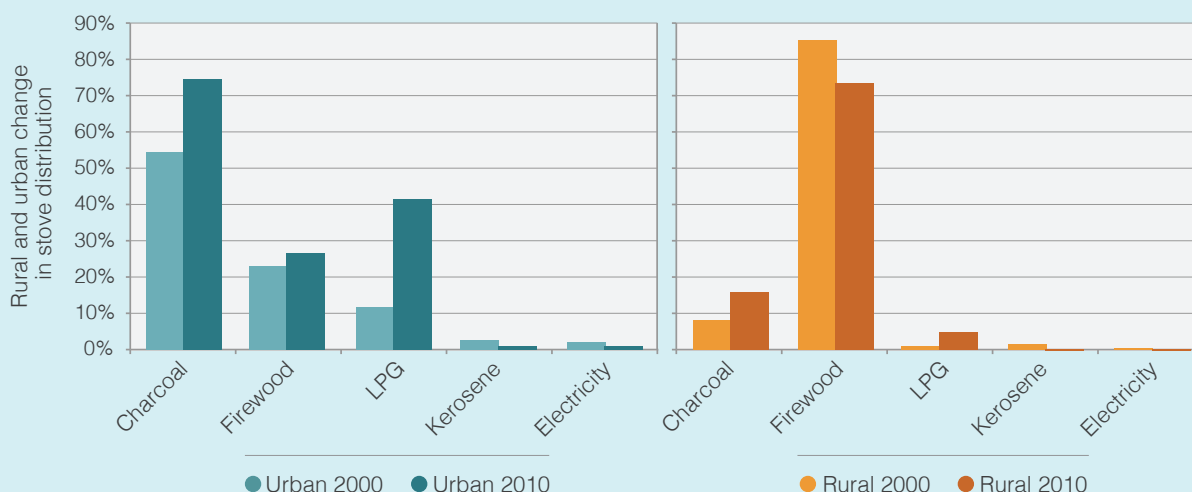
LPG, until recently, was not considered a scalable option for clean cooking for the base of the pyramid, due to supply, distribution, and cost constraints. Several countries and major private sector players are now committed to rapidly expanding access to LPG for the base of the pyramid over the next decade, however.

Case study 1: LPG in Ghana – Moving toward successful fuel switching and adoption

The LPG sector in Ghana has demonstrated tremendous resilience as government policies have waxed and waned since the 1980s. With rapid deforestation and environmental pollution resulting from widespread use of wood and charcoal, the government has been keen on promoting the use of LPG as a cleaner-burning fuel through a variety of national promotion programs, subsidies, and cylinder recirculation models. And while Ghana's current LPG market is still facing a number of challenges, the market is primed for an acceleration of investment and LPG supply that will create a sustainable and bankable LPG market. Trends show that the increase in household incomes in Ghana over the past decade has enabled a shift from woodfuels and kerosene to LPG for cooking.

The Alliance and its partners in the LPG community have been working with the Ghanaian government and practitioners to assess how to reform the underlying LPG market structure, evaluate the critical supply and demand drivers to achieve national LPG access and use, and develop a national plan to realize the government's national LPG goals.

Figure 11: Ghana Fuels Distribution Trends by Stove Fuel Type and Setting 2000-2010



Source: Population and Housing Census of Ghana, 2000 and 2010. Ghana Statistical Service.

Box 2: The Clean Fuels Story (cont.)

Case study 2: LPG in Indonesia – Successful Fuel Switching

Strides in LPG adoption are not limited to just Alliance focus countries. In 2007, the Indonesian government initiated an energy program to replace kerosene usage by providing free starter packages to households and small- and medium-sized enterprises (SMEs) consisting of 3 kg cylinders, a stove set, and initial gas, while simultaneously reducing the government subsidies to kerosene.

Less than six years after the program started, 54 million households and SMEs had received the LPG packages. Before the program was implemented, the majority of households (about 87.5%) relied on kerosene for household cooking, either on its own or in combination with other types of energy. After the program, the majority of households switched to LPG as a source for domestic cooking, increasing from 6.4% to 91.1%.³

³ <http://phdtree.org/pdf/32245436-energy-poverty-reduction-by-fuel-switching-impact-evaluation-of-the-lpg-conversion-program-in-indonesia/>

of 83 country locations. Almost one in four survey respondents (103) directly employ or otherwise partner with another Alliance partner organization for some aspect of their business, demonstrating the extent of partners' interconnectedness across the value chain.

At both ends of the value chain, growth can be attributed to a larger response rate capturing both new and existing partners' activities – as well as a year-over-year increase in sector activities reported by existing businesses. For example, despite a large influx of new manufacturer responses, especially from China, the newly reported volumes did not see a proportional increase – indicating that many of the largest market participants were previously captured in 2012.

Standards and Testing

In 2013, 75% of all stove models were reported as tested. While many manufacturing organizations reported testing their products internally in order to guide product design and development, only slightly less than half (48%) of manufacturing and distribution organizations reported that an independent, third-party organization or testing center tested their stove.

Around 60% of organizations that responded to the detailed testing section in the survey are independent third-party testing centers. These testing centers reported operating in every geographic re-

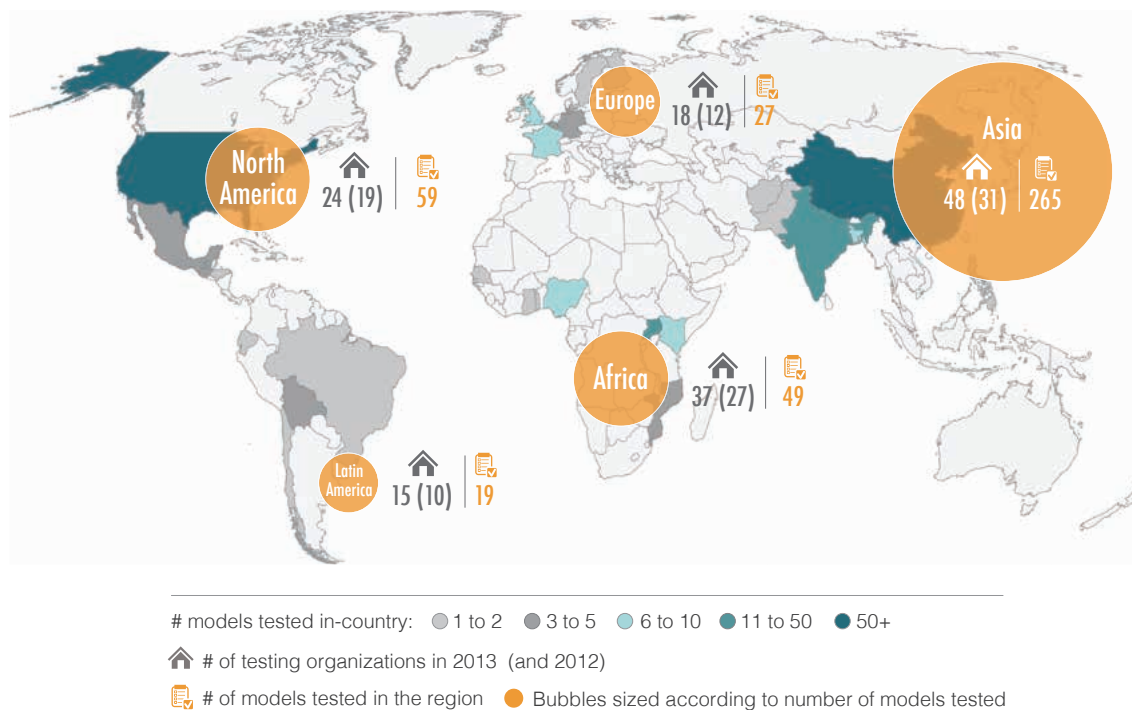
gion (Figure 12) – a **significant increase in geographic coverage of testing services over 2012.**

This year, for the first time, the survey integrated information from the Alliance's Clean Cooking Catalog, a global database of cookstove and fuel performance information using key indicators such as stove features, specifications, emissions levels, efficiency, and safety from laboratory and field-testing. While 17% of stoves reported by partners had been submitted to the Catalog, fewer have made their testing results publicly available in the Catalog. Of the Catalog-reported stoves, 31% have provided testing details; meaning, overall, only 7% of total reported stoves in this year's report had submitted testing results to the Catalog.

Across all testing activities – which partners reported via the Catalog or otherwise – over half (61%) of tested stoves were submitted to the standard water boiling test (Figure 13 and 14). The kitchen performance test also continued to be well utilized in 2013. In 2013, safety testing, a relatively new protocol, was a significant fraction of testing occurrences. Several instances of durability testing, which has recently been developed into a standard protocol, were also reported.

This year was the first that the Alliance has tracked manufacturing and distribution by International Workshop Agreement (IWA) performance tiers. Performance on safety, efficiency, emissions and/or indoor emissions along the IWA spectrum was

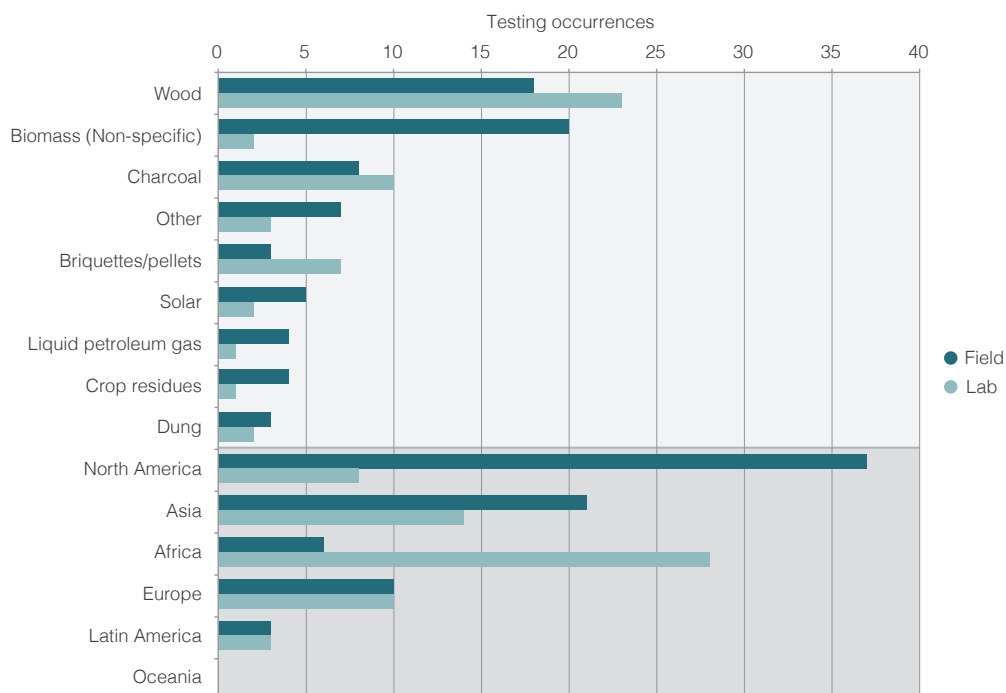
Figure 12: Regional and Country Distribution of Testing Activities by Manufacturers and Testing Organizations



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on responses from 419 unique stoves with locations, out of 437 unique stoves tracked.

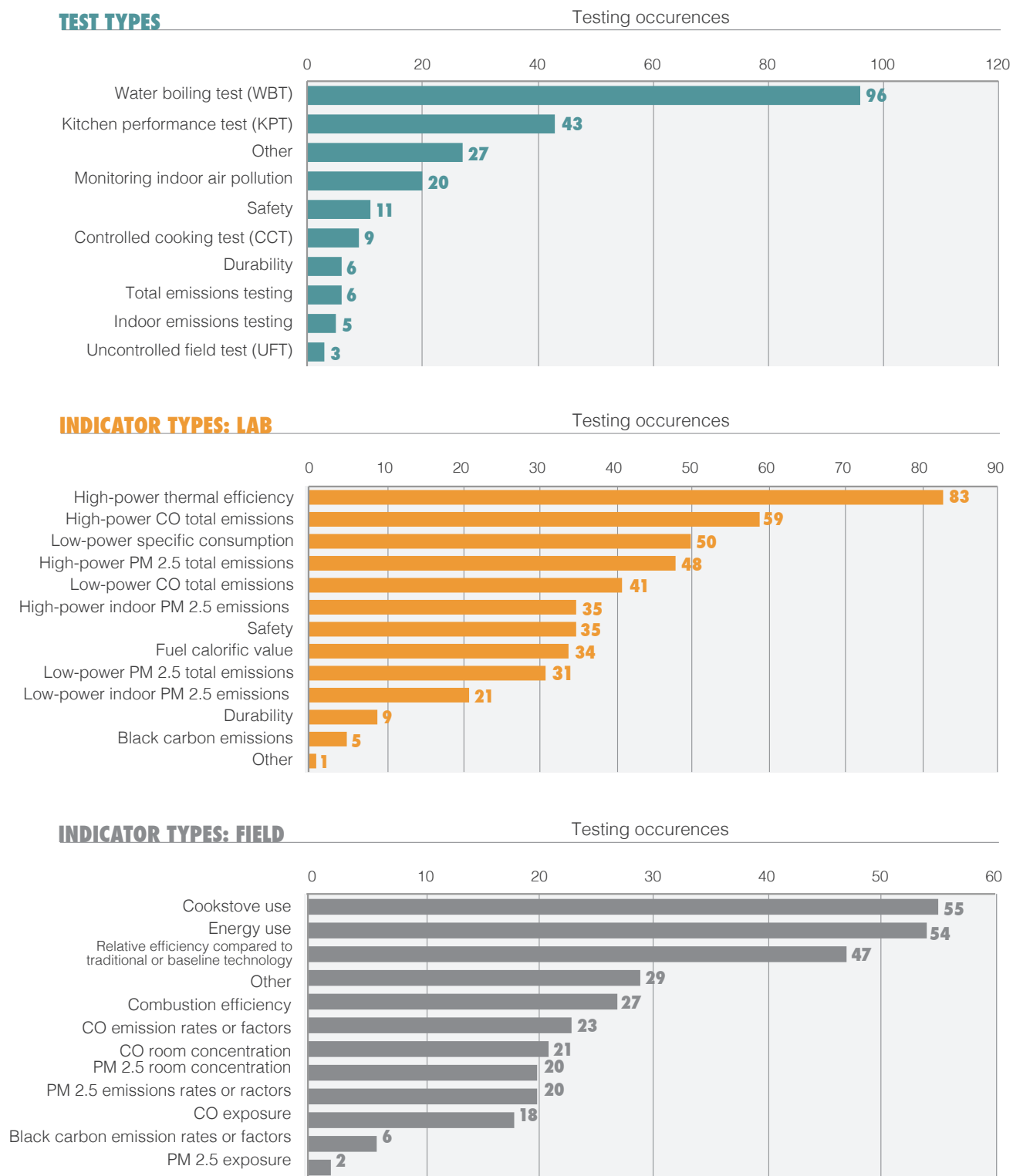
Figure 13: Testing Occurrences by Stove Type and Testing Organizations' Headquarters (Count)



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 263 observations.

Figure 14: Occurrences of Testing by Test and Indicator Types



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 1000 observations.

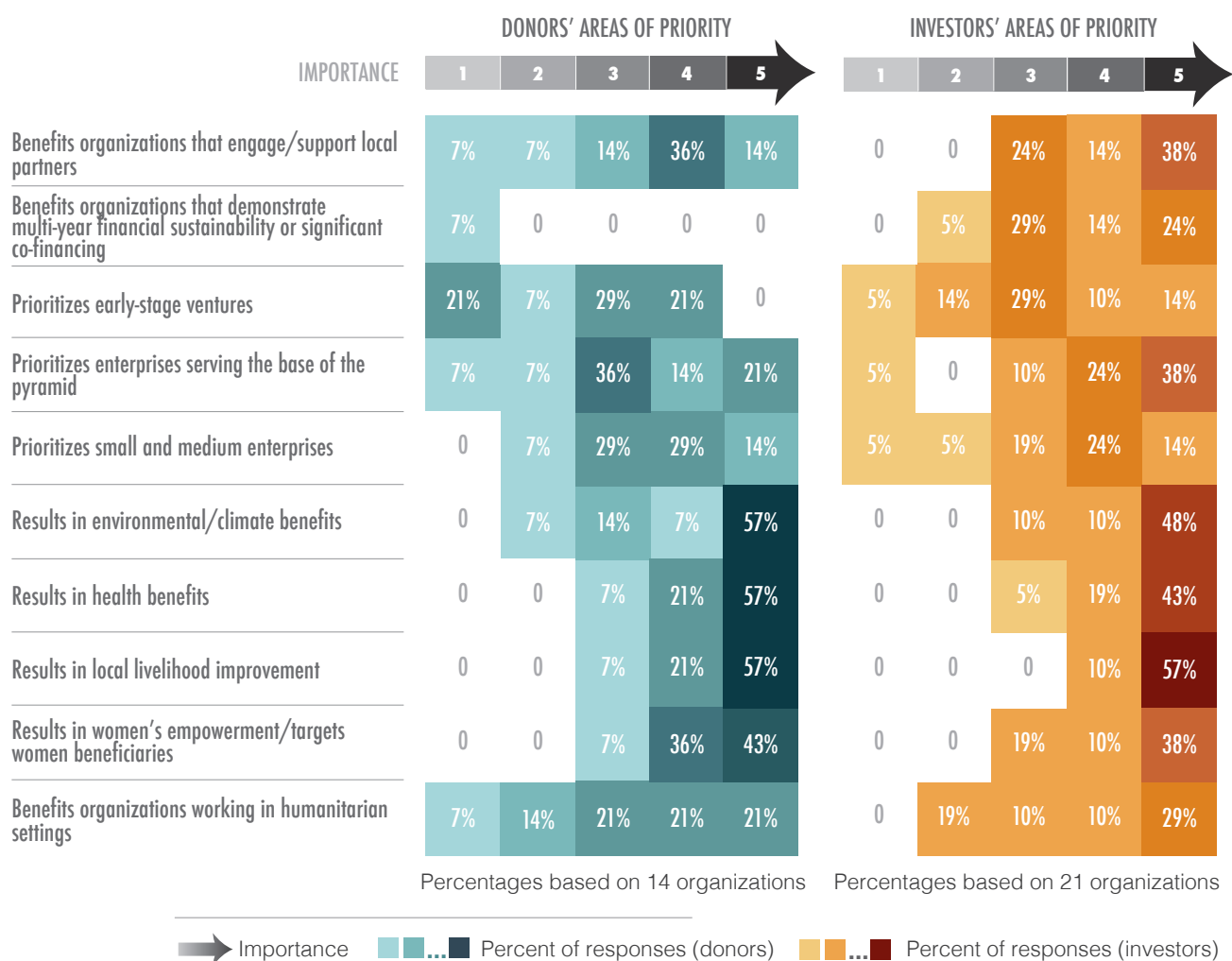
Box 3: Progressing Partnership: The International Organization for Standardization (ISO)

All stakeholders benefit from a common terminology for communicating, understanding, and improving stove performance and adoption. To accomplish this, the Alliance partnered with the International Organization for Standardization (ISO), a network of 164 national standards bodies, to develop international stove standards.

Building from earlier progress, ISO Technical Committee 285 was approved and launched in July 2013. The TC 285 includes dozens of experts drawn from the 34 participating and observing countries.

At the first plenary meeting in February 2014, the ISO TC 285 formed four Working Groups and two Task Groups to develop standards and perform tasks for the following topics: Harmonized Laboratory Protocols, Conceptual Framework for Testing, Guidelines for Field Testing, Social Impacts, Fuels, and Communications. Over the next year, these groups will be considering the technical details of the standards and guidelines, which will then be submitted to the full committee for comment and voting. The working and task groups will convene in October 2014 in Guatemala to discuss progress to date and finalize their recommendations.

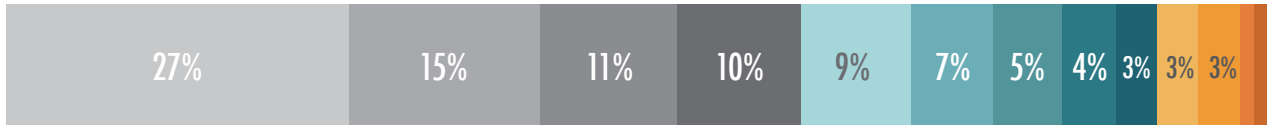
Figure 15: Ranked Priority Areas for Donors and Investors



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 35 organization responses.

Figure 16: Percent Share of Researchers by Research Area



Count of Researchers by Research Area: ● Evaluating Technology Performance ● Adoption ● Market Studies ● Air Quality ● Other ● Health ● Methods/Protocol Development ● Environment ● Fuels ● Gender ● Social/Behavioral ● Livelihoods ● Climate

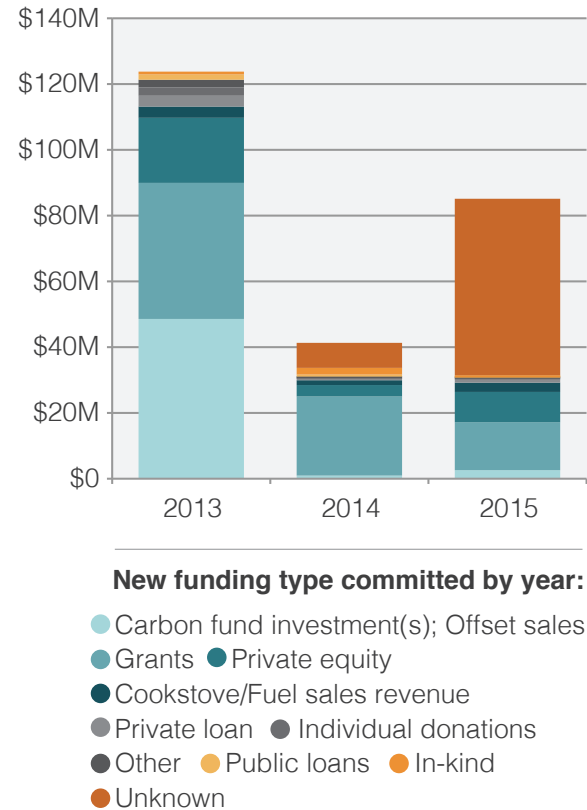
Source: 2013 Results Report. Global Alliance for Clean Cookstoves.
Notes: Based on 92 organization responses.

reported for 0.5 million stoves. It is clear, however, that a vast majority of the available performance data remains focused on efficiency. With such a small number of partners providing publicly reported stove performance data, it is difficult to provide accurate estimates of the number of stoves by performance tier at this time.

Research and Evaluation

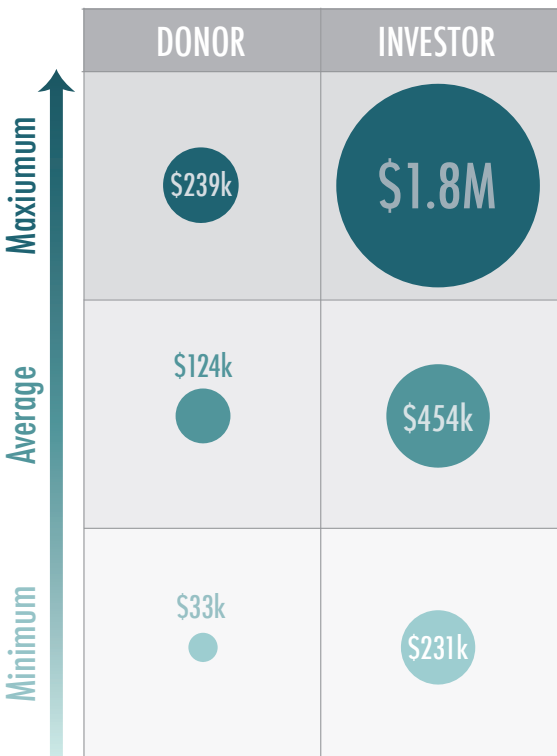
While testing ensures that clean stoves and fuels have the potential to perform as expected, research and evaluation helps to inform future designs, improve current practices, identify and mitigate barriers, and elevate best practices.

Figure 17: Value of New Funding Committed by Funding Type



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Figure 18: Average Investment Size, Donors, and Investors



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.
Notes: Based on 35 organization responses.

In 2013, research topics were decidedly focused on end users, with over half (53%) of all research focused on evaluating technology performance, adoption, and market studies (Figure 15). Health was the next-highest reported research topic, with air quality and health-related research making up 17% of all research topics. It should be noted, however, that the number of researchers focused on each area is not necessarily proportional to the financial and human resources devoted to each topic. We know, for example, that applied health research is generally far more resource intensive than lab- or market-based research.

Over **one-third of partners said they measure and report on the social and environmental impacts of their work**, while over half of respondents utilize impact data for internal purposes – including marketing to investors, and stove and fuels end users – their most commonly cited motivation was to respond to donor or investor requirements. Indeed, as can be seen in Figure 15, Alliance partners that identified as donors or investors were keen to prioritize funding to organizations that could demonstrate measurable results – particularly demonstrable benefits to the environment, climate, health, and livelihoods. The largest proportion of donors and investors (57%) ranked these criteria as their key decision

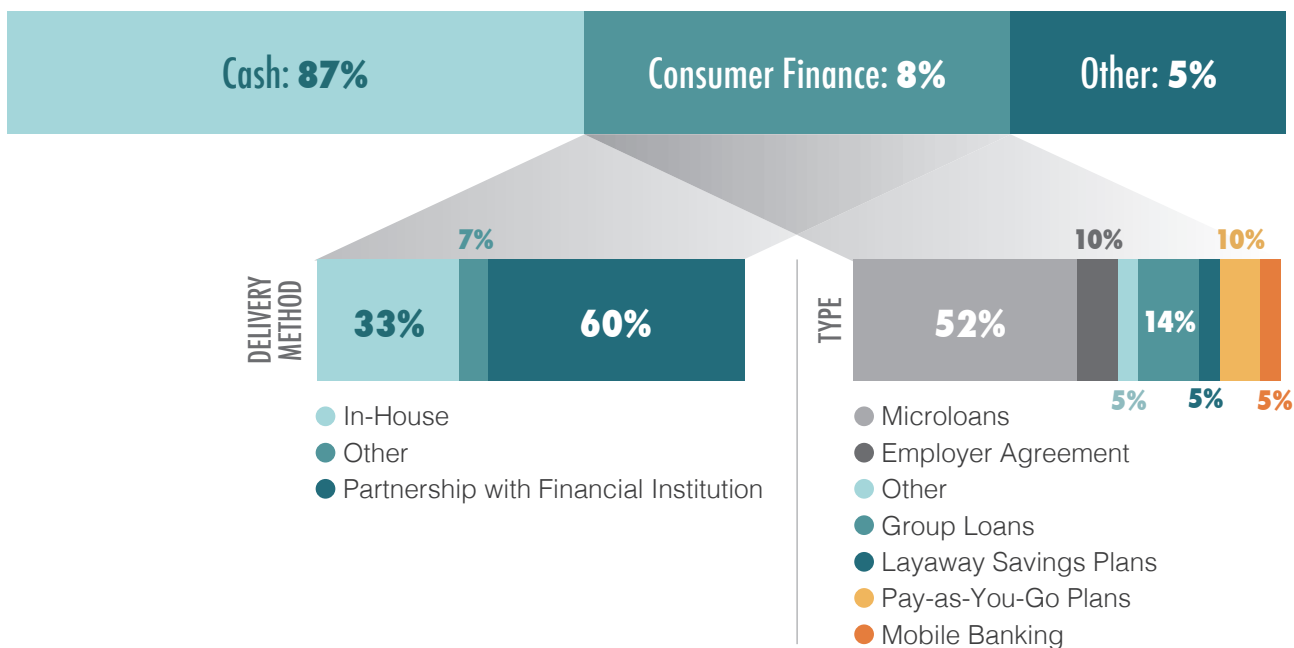
point, followed by consideration of organizations that support women's empowerment or closely engage and/or support local partners.

Finance and Carbon Markets

Partners reported \$240M in new funding commitments made to their organizations or enterprises in 2013, including commitments disbursed in 2013 (\$113M), as well as commitments made in 2013 for 2014 (\$41M) and 2015 (\$85M). Behind carbon offset sales in 2013 (\$45M), government grants were the dominant source of funding in each year (\$56M total), followed by private equity investment (\$26M) (Figure 17).

While private equity investment made up a smaller proportion of the previous years' financial support, Figure 18 illustrates that at the low, average, and high end of award sizes, single private investments injected more capital into recipient businesses than did the typical donor award. Most often – but not always – private equity investments were reported by organizations engaged in stoves and fuels design, production, and distribution, while grant-based resources were targeted toward organizations working beyond the sector's direct value chain to support research and evaluation, humanitarian goals, training, and other supporting mechanisms.

Figure 19: Primary Methods of Stove Payment, Consumer Finance Type, and Delivery Method



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 287 observations.

In the 2013-2015 time frame, the revenues from stove and fuel sales contributed or are expected to contribute approximately 10% of all funds flowing into the sector, a total of \$14M, including \$3M in in-kind payments. Last year, the vast majority of this value was contributed by end users in the form of cash payments for stoves and fuels, while another 8% of purchases were financed by a variety of consumer finance vehicles including microloans, group lending, and employer agreements (Figure 19).

At least 43% of new funding reported for 2013 was attributed to carbon offset sales (\$45M) or carbon fund investments (\$3.6M). This includes a commitment from Sweden's Energy Agency to pay above-average prices for offsets that comply with Europe's Emissions Trading System. A full \$35M of this value flowed from the sale of 4.5 million carbon offsets (each representing one tonne of carbon reduced) from projects in Africa.

Altogether, clean cookstove distribution projects earned and sold 6.3 million carbon offsets in 2013, down 63% from 2012's 16.9 million, despite a comparable survey response rate. 62% of these offsets were certified to the Gold Standard (seeing an average offset price of \$12/tonne). Another 38% were certified to UN Clean Development Mechanism methodologies. Across all markets and certification types, the sale of carbon offsets drove the distribution of 1 million stoves to almost as many households (955,813).

Gender

Almost all cookstove and fuel organizations are aware that women, as the primary users of cookstoves, comprise their largest clientele. Nearly two-thirds of respondents targeted women in distribution activities, for example.

Although many of respondents to this year's survey reported that they employed women directly or engaged with them as entrepreneurs, there was less of an emphasis on engaging women in manufacturing/production, finance or after-sales service activities: only one-third of organizations reported those as areas of focus.

While 80% of partner organizations reported employing women, with 10% of those holding a leadership or management position, only 23% reported actively using selection criteria to recruit women.

Figure 20: Gender Inclusion in Stove Distribution

Engages women as employees and/or entrepreneurs



Uses selection criteria for recruiting women as distributors



Provides incentives for women distributors



Uses gender-informed marketing messages and methods



Engages women as entrepreneurs in after-sales service for repair and/or maintenance needs



Conducts gender-informed training for entrepreneurs and/or employees



Source: 2013 Results Report. Global Alliance for Clean Cookstoves.

Notes: Based on 247 observations.

At least 77% of partners reported having a gender-focused strategy – be it though gender-topical meetings, gender training, or some other form of strategy. Other gender-inclusive practices are less wide-spread (see Figure 20).

Most organizations (35%) cited funding as a key barrier to further implementation. Other commonly cited issues include internal capacity, capacity of partners, ability to scale, and sustainability of such operations.



3. Focus Country Views

As part of its strategy to accelerate clean stoves and fuels adoption in 100 million households by 2020, the Alliance prioritized eight “focus” countries, namely Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria, and Uganda for intensive engagement during Phase 1 of its efforts based on a data-driven and consultative process of evaluating potential impact, scalability, opportunity to test innovative business models, ability to leverage other resources, and greatest need. A wide range of complementary market development efforts are being undertaken in each of these countries, including collecting and

publishing market information, working with governments to create favorable regulatory and policy environments, and enhancing the clean cooking value-chain through capacity building and improved access to finance. It is through the partners in these countries, and the regional market managers who support them that the Alliance’s differentiated efforts, successes and lessons learned can be readily seen. This section explores these experiences in-depth, accompanied by country performance data that illustrates early outcomes and potential pathways to progress.



A View From Bangladesh

BY THE NUMBERS*

695k
Stoves
manufactured

690k
Stoves
distributed

AVERAGE RETAIL PRICE: **\$9**

99% OF STOVES TESTED**

LOCATION



EMPLOYMENT

Employees:
670



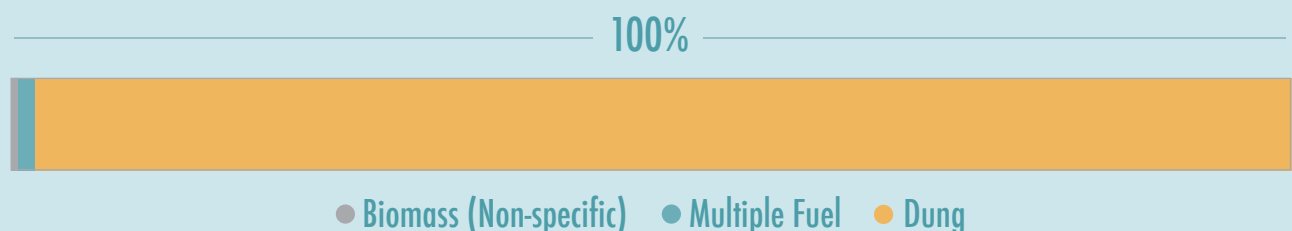
24% women

Microentrepreneurs:
13,422



63% women

STOVE FUEL TYPES



* Data on clean fuels manufactured and distributed not available at this time due to limited responses.

** Includes internal and third-party testing.

The government of Bangladesh has been researching, developing, and supplying improved cookstoves since the 1980s – largely motivated by the potential health benefits offered by these stoves. The challenge now is to jump-start a private-sector supply chain that better connects buyers to the market.

On the demand side, the first step is to let people know why they should pay for something they are used to getting subsidized or for free, says Asna Towfiq, the Alliance's Regional Markets Manager for Bangladesh.

"The problem is that people here look at cookstoves the way they look at contraceptives," she says. "They see it as a product the government and NGOs promote rather than as a commodity the private sector should get involved in." In many cases, these stoves come from large international or non-profit organizational projects. Indeed, all of the financing reported by partners in Bangladesh for 2013 stems from some form of grant – be it from a government, development multilateral, or foundation.

And the potential market is still largely untouched, with the almost 700,000 manufactured and distributed stoves reported representing only a fraction of the estimated size of the Bangladeshi market. The organizations currently supplying stoves are aware of the need for expanding the market-based approach to scale up, since only so much can be accomplished through grants.

"Bangladesh needs domestic manufacturers, because imports can't fill the gap," Towfiq says, explaining that Bangladeshis, unlike people in many other countries, use fixed stoves unique to the country rather than portable ones in other countries. She hopes to see offshore manufacturers setting up in Bangladesh itself – a development that would help promote knowledge-sharing between Bangladesh and the rest of the world.

"We're hoping that some foreign manufacturers will create local stove factories here," she says. *"We're educating people in other countries about the growing cookstove market happening in Bangladesh."* The Alliance aims to start by boosting imports, in part by advocating for a reduction in the 60% tariff that currently deters manufacturers abroad. Even with the tariff, however, imports can be made viable by importing just the combustion chambers and then building the stove around them domestically.

Bangladesh's Country Action Plan (CAP) called for the creation of a private-public partnership, which will act as a conduit between the cookstove sector and the governmental agencies that impact it. Next steps involve a nation-wide awareness campaign through a government initiative called the Household Energy Platform (HEP), with relevant public and private actor support.

While this is not the first time for such a campaign, the focus has shifted: the new campaign will be focused on the fuel efficiency and potential for long-term cost savings of an improved stove, whereas past campaigns have focused on indoor pollution and health issues alone, without considering the economic constraints that face many poor Bangladeshis.

"When you're talking to extremely poor people, they can't really care about health benefits" Towfiq says. *"At some point, it comes down to the basic need to cook."* To make stoves more affordable for this segment, the Alliance has recommended financing programs built in part on carbon finance to help lower costs.

For the emerging middle class, the Alliance has proposed a campaign that emphasizes prestige over health. For this customer segment, *"the idea is to make clean cookstoves something people aspire to,"* Towfiq says. *"It's got to be something they want, rather than something they need."*



A View From China

BY THE NUMBERS*

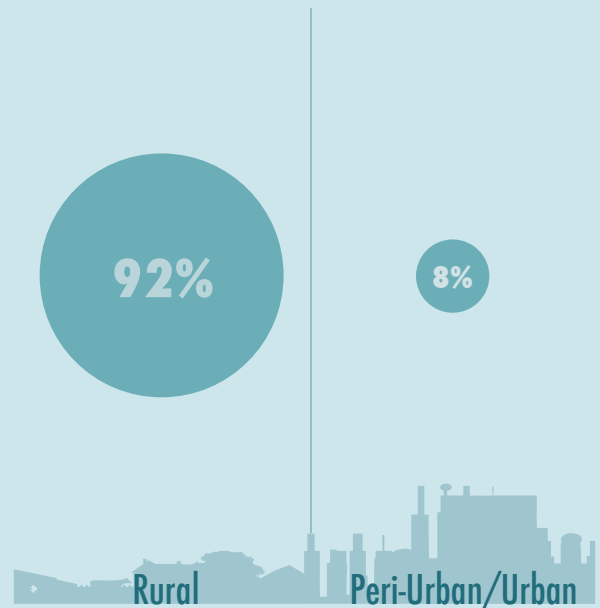
7.8M
Stoves
manufactured

6.3M
Stoves
distributed

AVERAGE RETAIL PRICE: **\$234**

100% OF STOVES TESTED**

LOCATION



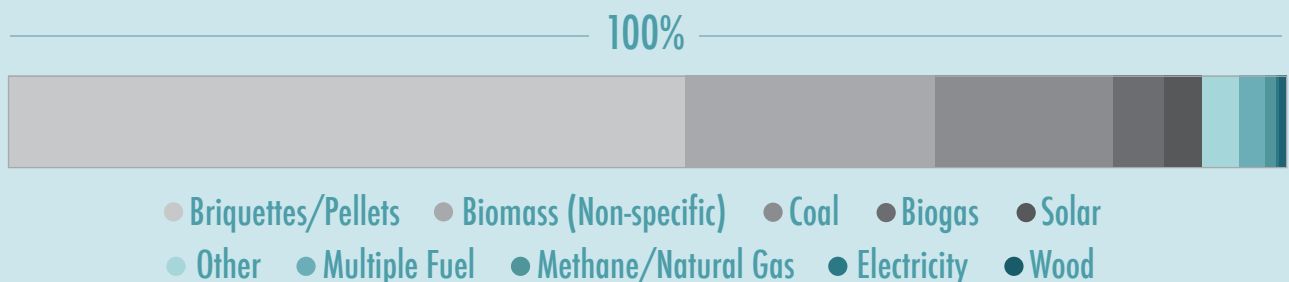
EMPLOYMENT

Employees:
8,064



28% women

STOVE FUEL TYPES



* Data on clean fuels manufactured and distributed not available at this time due to limited responses.

** Includes internal and third-party testing.

When Jichong Wu joined the Alliance in late 2012, he assumed he would have a hard time persuading the Chinese government to support a market-based initiative for distributing clean cookstoves as China's improved stove programs have been historically heavily subsidized. But then he sat down across from the Ministry of Agriculture officials who had overseen the government's last big clean cookstove push in the 1980s-1990s.

"It was actually a smooth discussion," he says. "They not only agreed with me – they told me the government has already started on that transition path." Specifically, officials from the Ministry of Agriculture told him they had concluded from past experience that a fully subsidized cookstove program would not work.

"When you gave stoves away for free, people stopped using them at some point," Wu explained. "To ensure actual adoption of more efficient stoves, the government has learned they have to ask the end user to pay something – even if it's only one third of the cost – because otherwise they're not invested."

He then found the manufacturers, too, were in favor of the market-based approach. *"Our market research team interviewed two manufacturers during a field visit for a national study – Liangqi, in Chongqing City, and Huabao, in Hubei Province – and asked what they thought of the government procurement or subsidy program," he says. "I expected them to be all for subsidies, because they provided a guaranteed buyer, but both of them said they would rather shift away from a subsidy program because they realized this was not a healthy market."*

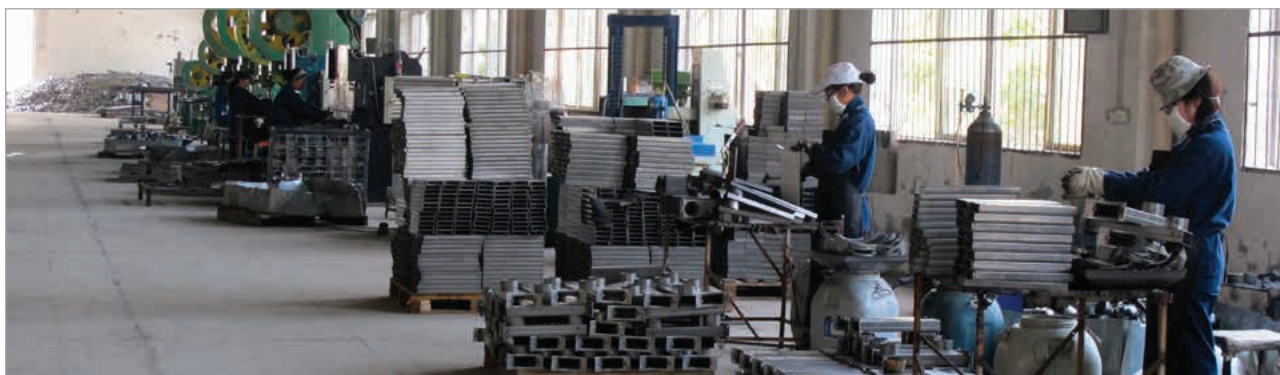
This confidence may come from several successful distribution efforts that currently rely on a holistic quality product instead of on initial subsidies. Hebaiyi Bioenergy Technology Development, a com-

pany based in Liaoning, has seen success through meeting with environmentally conscious village leaders and using word of mouth to increase distribution to nearby villages. Mr. Tong, Sales Manager, explained that while the leaders help the company get their foot in the door, *"Quality after-sale services is key to our business too."*

With the backing of both government and industry, the Alliance teamed up with the Ministry of Agriculture on a year-long study of the market, and now they are embarking on a three-year pilot program from 2015 through 2017 that will test the findings of the study and mobilize actions to spur the adoption of eight million improved stoves. *"The ultimate goal of these efforts is to help China launch a new national clean stove program,"* says Wu.

On the international front, he also sees an opportunity for China, as an exporter of cookstoves, in South-South technology transfers and best practice sharing with other developing countries. Already, 14% of the reported stoves manufactured last year in China, and tracked through to distribution, were exported. However, for this to increase, companies need to value research and development (R&D) like Xunda Science and Technology Group. With heavy emphasis on R&D, Xunda has sold their products not only across countries in the "Global South," including Bangladesh, Guatemala, and India, but also to the United States and several European countries.

Xunda is not the only Chinese manufacturer interested in exporting clean cookstoves. A delegation from the China Alliance for Clean Stoves (CACS), led by Wu, visited Uganda in 2013 to gain better insight into the East African market, including its trade and investment policies, and to explore partnerships with local manufacturers and distributors.



A View From Ghana

BY THE NUMBERS*

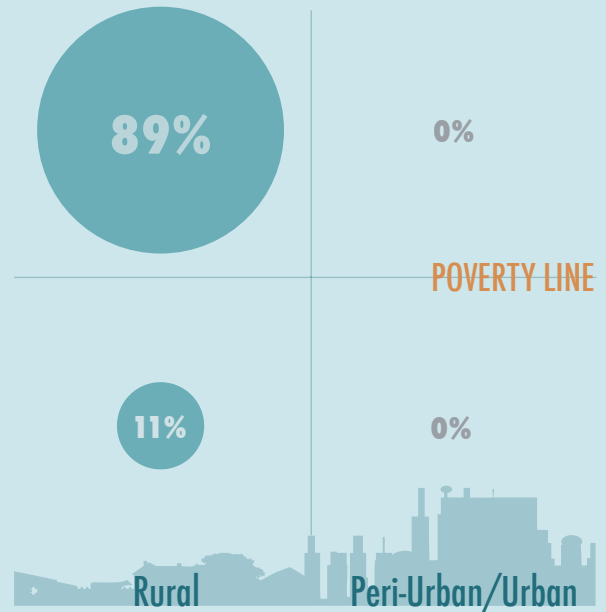
406k
Stoves
manufactured

414k
Stoves
distributed

AVERAGE RETAIL PRICE: **\$16**

98% OF STOVES TESTED**

LOCATION



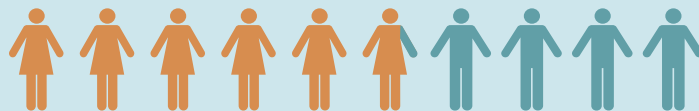
EMPLOYMENT

Employees:
107



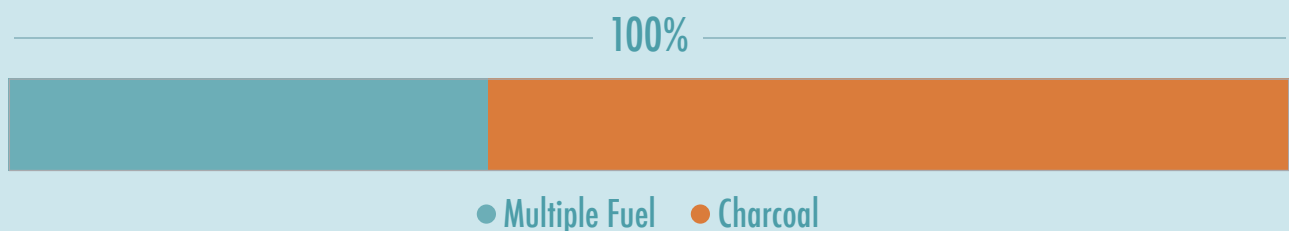
19% women

Microentrepreneurs:
1,140



57% women

STOVE FUEL TYPES



* Data on clean fuels manufactured and distributed not available at this time due to limited responses.

** Includes internal and third-party testing.

More than 80% of Ghanaian households cook with wood or charcoal, and the sector is well positioned and committed to scaling up adoption of cleaner biomass stoves and cleaner fuels, like LPG.

In fact, the government has committed to ensuring half of solid fuel-using households gain access to LPG by 2020. One way the Alliance intends to help ratchet up the use of LPG stoves is by facilitating a “Coca-Cola model” of distribution: instead of expecting people to refill empty cylinders themselves, distributors will start swapping empty cylinders for full ones – saving people time, trouble, and money.

The Alliance spent much of 2013 helping cookstove manufacturers here to strengthen their businesses. It is a process that is designed to attract investors, and market manager Kwesi Baffour Sarpong says five companies could be “investor-ready” within a year. Sarpong estimates that this effort has already boosted production to 900,000 stoves in 2014, up from 406,000 reported in 2013.

This increased supply will be crucial as the Alliance launches a nationwide awareness campaign in January 2015. It is a campaign that Arijit Basu believes will generate greater demand. He is the Global Alliance’s Regional Director for Market Development in Africa and Asia, and he says Ghana is the only country where clean cookstoves may enjoy a price advantage even before you factor in the fuel savings.

“One challenge we generally face in the countryside is that rural people tend not to buy clean cookstoves because the wood is free, so efficiency doesn’t matter,” he says. “But in Ghana, there is an economic incentive because it’s the only country where the traditional stove is double the price compared to the improved cookstove, but people just don’t know it.”

Last year’s reported average price of \$16.07 remains affordable. That could be good news for local producers, because some imported stoves may not be optimal for making banku, a dumpling-like bread made from either pounded cassava or fermented corn meal. Like the ugali of Kenya, banku forms a thick paste that must be stirred as it cooks – and stirring any meaningful quantity requires big pots that sit on low-lying stoves. On top of that, says Sarpong, most restaurants make their own traditional staples, and that means the country is dotted with massive traditional stoves that could be ten times the size of a typical household model.



“This overlap between commercial and home stoves is unique to Ghana, and you have to factor that into the investment needs,” he says. “Otherwise, you’ll have a shortfall.”

Sarpong joined the Alliance in July 2013 and immediately found two motifs that have been playing out across the sector: “fragmentation” and “good on the surface”.

“People in Ghana tend to be comfortable working by themselves and not in groups,” he says. “For that reason, the local companies and the local alliance looked good on the surface, but internally, things weren’t as properly structured as needed.”

He also found that: manufacturers who donors found shabby on the surface often made first-rate products. There is now a testing center in Accra to ensure stoves meet the standards of ISO 285.

“We picked seven companies who had previously had subpar applications, and then we came in with third-party consultants for on-the-ground due diligence,” he explains. “After that, the donors said they were willing to fund companies they wouldn’t have funded without having done the due diligence first.”

So he turned the process around and began visiting manufacturers in person before accepting their applications – a reality-based approach that helped win the support of Foreign Minister Hanna Tetteh, who is an active member of the Alliance’s Leadership Council – helping to ensure continued government support.

A View From Guatemala

BY THE NUMBERS*

9.8k
Stoves
manufactured

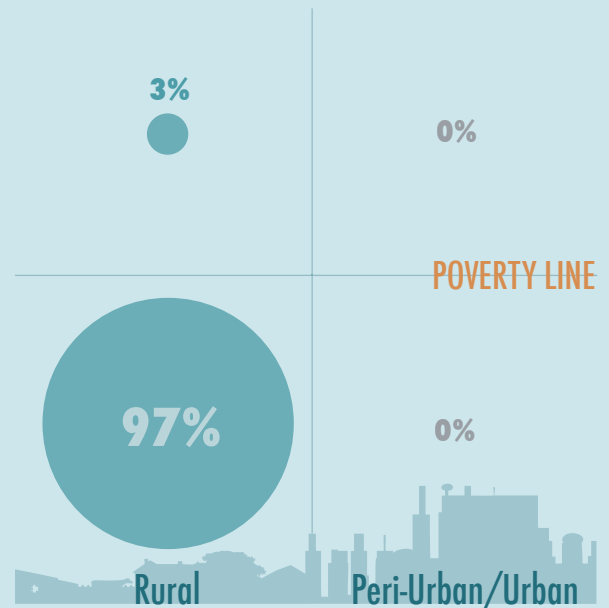
1.5M+
Fuels
manufactured (kg)

8.2k
Stoves
distributed

AVERAGE RETAIL PRICE: **\$106**

100% OF STOVES TESTED**

LOCATION



EMPLOYMENT

Employees:
176



18% women

Microentrepreneurs:
39



49% women

* Data on clean fuels manufactured and distributed not available at this time due to limited responses.

** Includes internal and third-party testing.

Stove fuel type data not available for this country at this time, due to limited responses about stove characteristics.

In 2012, President Otto Pérez Molina and his cabinet participated in a ground-breaking and bridge-building initiative called Despertemos (Awakening), which invited 1500 government officials to live among Guatemala's poor and rural communities. That's when he and his Commissioner for Competitiveness and Investment, Juan Carlos Paiz, first realized the impact that something as simple as clean cooking could have on their existing priorities of hunger and malnutrition, not to mention additional health, environment, and livelihood benefits.

That same year, the Alliance commissioned a market assessment of the Guatemalan clean cooking sector, and in 2013 Paiz, a member of the Alliance's Advisory Council, was one of 150 local participants invited to validate and discuss the study. Impressed with what he saw, he introduced Alliance Executive Director Radha Muthiah to President Molina, who became the first sitting president of any country to join the Alliance's Leadership Council.

Together, they put clean cookstoves and fuels on the national agenda for the first time, launching an inter-ministerial working group that will soon become a legal entity within the government structure and drawing nearly 30 manufacturers, implementers, and importers into the Guatemalan Cluster for Improved Cookstoves and Clean Fuels.

The Cluster soon began organizing monthly meetings and periodic exhibitions around the country while reinforcing lines of communication with the government to keep all the players coordinated. While the current number of stoves tracked in 2013 remains under 10,000 (less than all other focus countries), 2013 represents the beginning of larger distribution programs.

In November 2013, the Inter-Institutional Wood and Energy Roundtable set a goal of disseminating 650,000 cookstoves over the next 10 years, and the government is stepping up to deliver under the leadership of the Ministry of Energy and Mines.

The Alliance harnessed this energy to involve more than 100 national and international stakeholders in the creation of the Country Action Plan, which was released in May 2014 and outlines a course of action with related international institutions and initiatives including the World Bank's Central America Clean Cooking Initiative, the UN's Sustainable Energy for All, and the combined Low-Emissions Development

Strategy of the US Agency for International Development and the Inter-American Development Bank.

Guatemala is the Alliance's newest focus country and the first in Latin America. That makes it the proving ground for efforts to distribute stoves that are larger and more expensive than those in other parts of the world, because stoves here range in price from around \$30 to over \$200 dollars – averaging at \$106 dollars – mostly because of the broad surface or plancha (griddle) needed for making tortillas.

"It's not always that the end user can't pay for a stove, but they may not be able to pay for it up front," says the Alliance's Chloe Shields, who has worked closely with Guatemalan partners over the last year. *"There are challenges of credit, and a history of donation-based models have filled part of that void."*

Guatemalan partners are receptive to the Alliance's market-based approach, which can work to grow both business and impact as more base-of-the-pyramid consumers gain and sustain access to clean cooking technologies. To address the upfront cost barrier, several NGOs have expressed an interest in shifting to a co-payment model, where donations can cover most of the cost of the stove, but families would still pay part of it. This establishes a connection between the buyer and the supplier, and also generates the sense of ownership. The change may have already started, as responses from Guatemalan partners in 2013 indicate that the majority (84%) of financing for enterprises stemmed from stoves and fuels revenue.



A View From India

BY THE NUMBERS

90k
Stoves
manufactured

4.8M
Fuels
manufactured (kg)

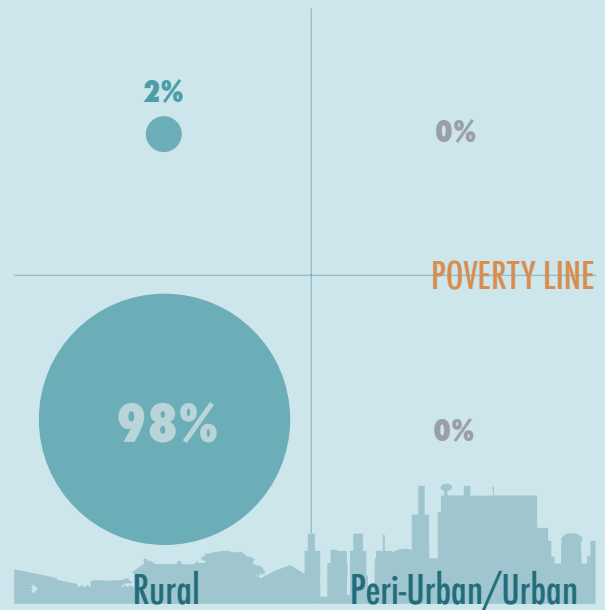
159k
Stoves
distributed

4.8M
Fuels
distributed (kg)

AVERAGE RETAIL PRICE: **\$25**

94% OF STOVES TESTED*

LOCATION



EMPLOYMENT

Employees:
252



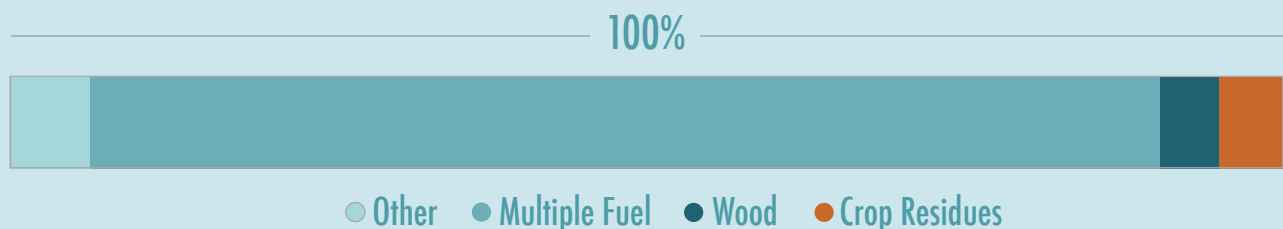
25% women

Microentrepreneurs:
1,606



66% women

STOVE FUEL TYPES



* Includes internal and third-party testing.

India's business community is primed to scale up solutions such as efficient use of biomass and the extension of clean fuel supply chains for LPG and induction stoves to rural areas, according to Sudha Setty, the Alliance's India Country Representative.

Setty emphasizes that India's clean cookstoves sector *"will have to bring about behavior changes if it's to be successful."* Thus, the Alliance is concentrating on two population segments – poorer urbanites and rural people with little or no access to electricity – with a likely emphasis on LPG, briquettes, and, for those with electricity, induction stoves.

The overall energy efficiency of induction stoves is still being assessed, but these modern appliances generate notably less household pollution than the wood-burning variety. They are also popular among India's emerging middle class, where demand is driven by both status and marketing.

Induction stoves are particularly relevant to India since 75% of households have some access to electricity which is often subsidized. With the ability to heat quickly and evenly, alongside programmable temperature controls, induction cookstoves' estimated market size has already doubled to 6-7 million units sold in 2012-2013.

The current biomass stove data represented in this year's report falls short of capturing the momentum

of India's manufacturing and distribution activities – partly because reporting did not include figures from state-level biomass stove programs that historically distribute tens of thousands of improved stoves annually or from the large number of local artisans producing improved stoves for local consumption. The Alliance is in discussion with central ministries and states to support pilot stove programs focused on cleaner, more efficient stoves and fuels.

Similarly, while there is great momentum surrounding the adoption of clean fuels, results data only captured a fraction of in-country activities (4.7 million kg manufactured and distributed). Another study found a steady year-on-year increase in LPG sales, driven in part by India's Vision 2015 strategy to release 55 million new LPG connections by 2015 and achieve minimum 75% penetration of LPG across all of India, including rural areas.

India's interest in LPG began in 1955, when Burma Shell started marketing LPG in Mumbai, and it has since then become the most popular clean cooking fuel in India. Today, LPG production in India accounts for 63% of the clean fuels distributed or manufactured. Part of its success can be attributed to the cultural prestige of owning an LPG stove and their ease of use.

"An improved biomass stove is smaller than what people are used to, and they are uncertain about its usage and effectiveness," says Setty. "But if you give a household an LPG stove, they are excited to use it because it is an aspirational product."

Ultimately, Setty says that India's sheer size and diversity influence how the market will unfold. *"India is definitely not a one-size-fits-all place."* Different states and regions eat and cook food differently, requiring various stove technologies and fuels. In addition, awareness-raising messages must be tailored to the many local languages.

On the sales side, the local language barrier can be partly overcome by India's large share of village-level micro-entrepreneurs active in the sector. Additionally, 66% of active micro-entrepreneurs are women, who can have a gender advantage in helping educate women at home about benefits.

To further India's adoption of clean stoves and fuels, the Alliance will launch advocacy and awareness campaigns in phase two, which is set to begin in January of next year and run until December 2017.



A View From Kenya

BY THE NUMBERS

612k
Stoves
manufactured

577k
Fuels
manufactured (kg)

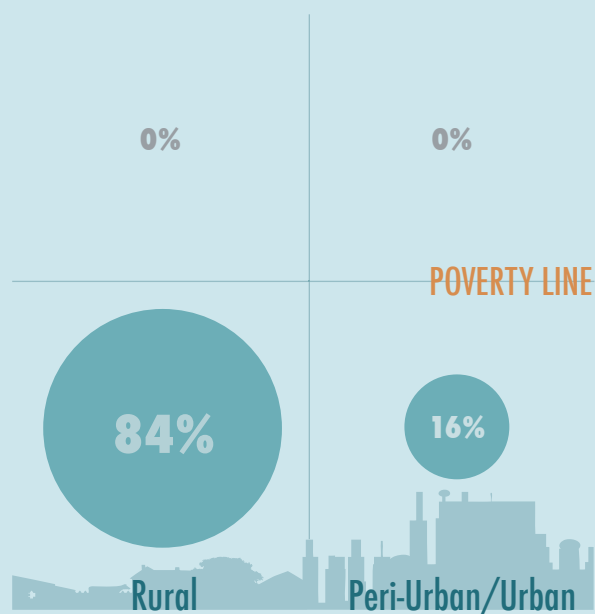
1.0M
Stoves
distributed

1.9M
Fuels
distributed (kg)

AVERAGE RETAIL PRICE: **\$24**

54% OF STOVES TESTED*

LOCATION



EMPLOYMENT

Employees:
959



46% women

Microentrepreneurs:
1,675



47% women

STOVE FUEL TYPES



* Includes internal and third-party testing.

The improved cookstove sector in Kenya started in the early 1980s with the Kenya Ceramic Jiko (KCJ), and today about half the homes in Nairobi and Mombasa use this relatively efficient charcoal burning stove to make everything from rice to chapatti – a flatbread that takes hours to prepare over traditional smoke-belching stoves. But while the stove's a winner in cities, where people buy their own charcoal, it has been less successful in the countryside, where wood is free and three-stone fires are common. Progress is being made outside the cities, however; according to survey respondents, the majority of Kenyan stoves sold in 2013, 84%, were to the rural poor.

Historically, the government has concentrated on policy development and joint programs with development partners, but has not had a dedicated cookstove initiative as seen in some other countries. The Alliance helped spearhead the creation of an inter-ministerial committee on cookstoves comprising of all the relevant ministries, with the Ministry of Energy chairing.

What makes Kenya unique is that many of its manufacturers have developed without support from government or international donors. Most KCJs are assembled in home-grown shops concentrated in the cities, and those independent shops have historically lived off their sales. Of the one million plus stoves distributed in Kenya in 2013, just 612,000 of those reported were manufactured domestically, likely due to reports from smaller producers getting missed by the survey.

While an entrepreneurial mindset already exists, the challenge is to help local craftsmen and entrepreneurs master the art of business management. *"We're now starting to see artisanal manufacturers approach this as a real business – as something they can grow wealthy from,"* says

Alliance regional representative for East Africa Daniel Wanjohi.

The Alliance is also working with international stove manufacturers to both support the development of manufacturing plants in Kenya and to encourage stove imports. Initially, engaging three global players – Envirofit, EcoZoom, and Burn – raised resentment among domestic suppliers. But now that inclusion is proving to be positive, as many local producers are starting to innovate and improve their locally produced cookstoves.

"The Kenyan market has huge potential, and the injection of international companies is a game changer," explains Wanjohi, *"People are now starting to understand and appreciate why they need to formalize their operations and produce quality products. They also understand why they need to ensure every part of their business has been documented: because it applies to the financial aspect."* For example, the Alliance is finding that artisans are motivated to be good accountants – if they are given a reason to be.

In October 2014, the Alliance will launch a multi-media awareness raising pilot in Kenya, with road shows, radio spots in local languages, and printed material. The Alliance is also exploring partnerships with fast-moving consumer goods companies such as edible oil and dairy to further spread the message about the benefits of clean cooking. *"The demand will grow,"* says Wanjohi. *"And I have no doubt the providers will be able to scale up and meet it."*

Alongside increased cookstoves will come clean fuel use. While there has been limited participation in Kenya, Wanjohi expects that recent Alliance-led efforts to engage more fuel organizations will result in a significant change come the next reporting period.



A View From Nigeria

BY THE NUMBERS

40k+
Stoves
manufactured

750k+
Fuels
manufactured (kg)

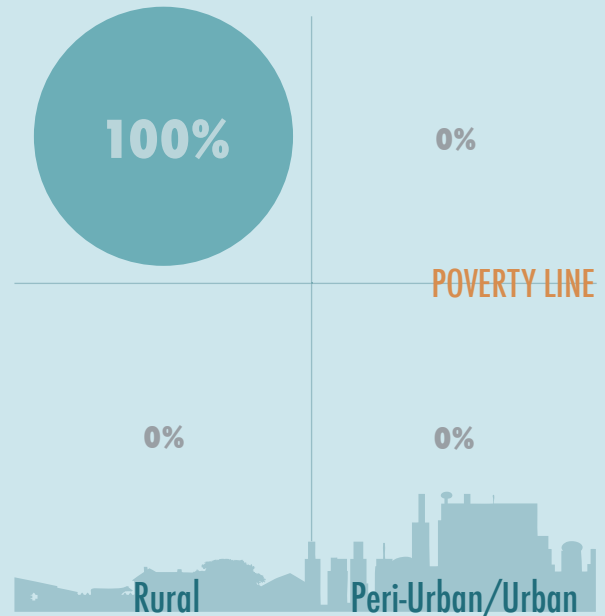
296k
Stoves
distributed

600k+
Fuels
distributed (kg)

AVERAGE RETAIL PRICE: **\$30**

95% OF STOVES TESTED*

LOCATION



EMPLOYMENT

Employees:
78



31% women

Microentrepreneurs:
219



77% women

* Includes internal and third-party testing.

Stove fuel type data not available for this country at this time, due to limited responses about stove characteristics.

Oil has propelled Nigeria to the top of Africa's economic pyramid while leaving close to 100 million people in poverty. As a result, more than 70% of the population depends on wood-burning stoves, and most of those 30% who do not use wood use kerosene – a subsidized fuel associated with serious health concerns.

"We're a big country full of huge paradoxes," says Ewah Eleri, who coordinates the Nigeria Alliance for Clean Cookstoves. "As one of Africa's largest producers of petroleum, we're also one of its largest producers of LPG," he says. "But we export 90% of what we produce, so most of our own people remain dependent on wood-burning and kerosene stoves."

To change that, Eleri has engaged members of the National Assembly to get clean cookstoves on the national budget for the first time ever. That has led to the creation of testing centers at six universities across the country, and the Alliance recently arranged for a researcher from the University of Nigeria, Nsukka, to travel to Oregon for training on in-stove testing and protocols.

"Now he's come back and he is helping to train others," Eleri explains. "This way, as the federal stove program takes shape, we will have a degree of certainty as to quality." This can help increase the number of locally designed stoves that are tested.

Nigeria's Ministry of Environment is also working to foster greater adoption of cleaner cookstoves and fuels through initiatives like the Rural Women Energy Security (RUWES) project. A key component of RUWES is the National Clean Cooking Scheme (NCCS), which focuses on using social networks in rural settlements to facilitate increased use of improved woodstoves, LPG, ethanol and biogas.

"In a perfect world, we'd just shift everyone to LPG, and then you and I wouldn't be sitting here talking about efficiency and the use of wood," Eleri says. "But instead of a perfect world, we have widespread poverty and persistent policy gaps." For now, the goal is to persuade the 70% who use biomass to shift to more efficient methods and to persuade those who use kerosene to switch to cleaner fuels, including ethanol and LPG. After that, LPG should begin replacing biomass.

On the biomass front, US-based Envirofit is partnering with Nigerian household goods maker Aluminum Power to manufacture and distribute efficient wood and charcoal stoves. Meanwhile, several companies



have started importing ethanol and gel stoves from China, with a reported 700 thousand stoves produced last year in China that are destined for the Nigerian market.

The problem with LPG is twofold: First, the cylinders and burners are expensive, so the rural poor simply can't afford them. Second, the cylinders come in standardized sizes, which makes them a hard sell even among those who use kerosene.

"If you need kerosene, you can buy what you can afford based on the money in your pocket," says Eleri. "But with LPG, you have to buy cylinders standardized at 3, 6, 12.5, or 50 kilograms; so if you can't afford 3 kilograms, you can't afford any."

On the LPG supply front, some promising solutions are starting to emerge – Kreditanstalt für Wiederaufbau (KfW; German development bank) is helping Nigerian venture capital firm Alitheia team with O&O PLC, a Nigerian oil and gas company, to start making cylinders. There are plans underway to reduce the cost of cylinders by implementing a policy pioneered in Ghana: namely, by swapping charged cylinders for empty ones. At the same time, the Nigeria Alliance is lobbying for reduced import duties and tax holidays for companies that invest in cylinder manufacture in Nigeria.

Eleri believes that 50% of Nigeria's households could be converted to LPG by 2020, saying *"that's quite achievable, because we have the resources to do so, but we'll need very bold measures from both the government and the private sector to achieve this."*

A View From Uganda

BY THE NUMBERS

152k
Stoves
manufactured

1.6M
Fuels
manufactured (kg)

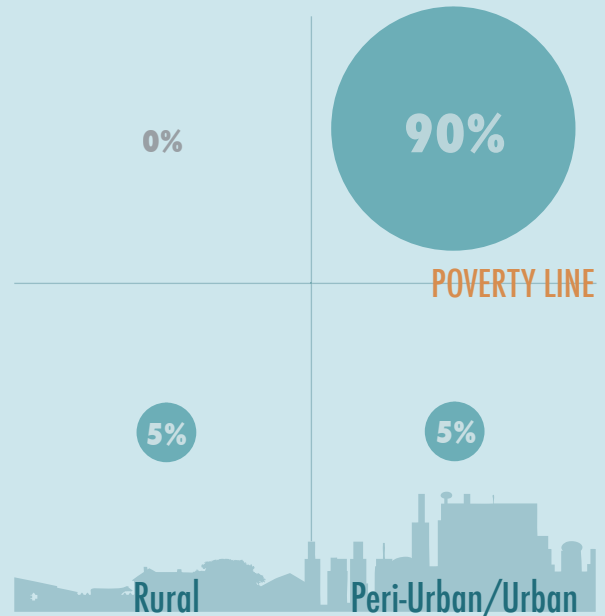
335k
Stoves
distributed

2.8M
Fuels
distributed (kg)

AVERAGE RETAIL PRICE: **\$14**

44% OF STOVES TESTED*

LOCATION



EMPLOYMENT

Employees:
4,564



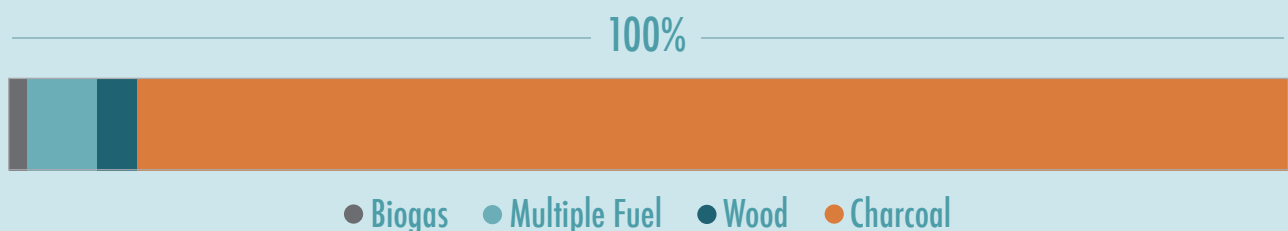
6% women

Microentrepreneurs:
891



38% women

STOVE FUEL TYPES



* Includes internal and third-party testing.

The Alliance's active engagement in Uganda started relatively recently, since the country was a major focus of the World Bank's ACCES (Africa Clean Cooking Energy Solutions) program. *"We didn't want to be duplicating efforts,"* says Arijit Basu, the Global Alliance's Regional Director for Market Development in Asia and Africa. *"At some point, however, we realized there were areas where the Alliance could complement ACCES efforts and provide added value."*

As a result, in May of 2014, the Alliance offered to support the Uganda National Alliance for Clean Cookstoves (UNACC), which brings together 80 partners, many of them small-scale cookstove manufacturers. As with Kenya, the smaller manufacturing volumes were more difficult to track, leading to a discrepancy between manufactured and distributed volumes. With these small businesses, and a reported 90% of Ugandan partners receiving their main source of revenue from stove sales, providing support to entrepreneurs to help grow their businesses is critical.

"UNACC is chaired by the Ministry of Energy, which means we have the government on our side," says Basu. *"In fact, UNACC's office is in the Ministry of Energy. That's enabled us to get some inter-ministerial dialogue going between the Ministry of Education, the Ministry of Environment, and others that can support the sector."*

The country has more than 50 small-scale manufacturers, most of which make fewer than 100 units per month, and Basu realized that all of them were buying the sheet metal for the external casings from one company: Roofings Ltd. He also learned that the preferred provider of combustion chambers was a company called Uganda Clays.

"Here we had this relationship between the cookstove manufacturers and the component providers," he says. *"So we went to Roofing Ltd and told them that the goal of the Alliance is to help facilitate the distribution of three million stoves in the next three years, and we asked if they'd like to meet the people who will be buying the sheet metal to make those stoves."* The Alliance followed the same approach with Uganda Clays, and now both companies may be willing to support new customers with capacity-building exercises and volume discounts.

"I think the leadership at both companies is trying to do a good thing, but they're also trying to make

a profit," says Basu. *"So there is both a corporate social responsibility and a commercial angle to this."*

Carbon finance can also help with profits and sustainability. Almost 90% of Ugandans live in the countryside, where wood is free. That is one reason the country has lost a third of its forests since 1990, and it is also a reason that nearly 200,000 stoves were distributed through carbon finance projects in 2013 – more than in any other country surveyed. *"Carbon finance can help the sector in three ways,"* says Basu. *"It can empower consumers, it can create awareness, and it can provide loans to small companies looking to scale up."*

Uganda, through the Uganda National Bureau of Standards (UNBS), is participating in the international standards process and developing national standards. The UNBS has been participating in local UNACC meetings as well, and they have put their voice behind efforts to make testing mandatory for all stove manufacturers – a clear need, as this year's results report shows that less than half of all stoves are currently being tested. The Alliance has also supported the growth of testing center partners Center for Integrated Research and Community Development Uganda (CIRCODU) and Center for Research and Energy and Energy Conservation (CREEC) which provide laboratory and field-testing services to manufacturers in-country as well as throughout the East African region.

In the months ahead, UNACC will hire a full-time director to manage its activities. In October, they will begin a detailed mapping of the sector to lay the groundwork for a series of catalytic grants designed to give small and medium enterprises the capital they need to meet the coming demand.



4. Discussion

The Alliance's 2013 annual Results Report provides compelling evidence that the global clean cooking market is scaling up. With over 14.3 million stoves distributed in 2013, the Alliance and its partners have made remarkable progress and remain on track, if not slightly ahead of target, to achieve the adoption of cleaner and more efficient cookstoves and fuels in 100 million households by 2020. Worth celebrating, too, is the fact that this expanded distribution was reported by partners and programs of all sizes, as well as by new entrants to the sector.

This 2013 report is an effort to benchmark early stage progress across the sector during the Alliance's first phase. The quantitative and qualitative data in this report highlights the momentum among Alliance focus countries, where successes and challenges continue to inform broader global efforts to scale adoption of clean cooking solutions. Initial Alliance efforts focused primarily on strengthening supply and enabling markets, and thus growth in adoption of cleaner, more efficient cookstoves and fuels was not immediate. Alliance staff will continue to work intensively with our partners to build local capacity, drive investment in the sector, and develop a body of sector learning that will further adoption of clean cookstoves and fuels. Beyond efforts in Alliance focus countries, knowledge sharing efforts and customized tool kits will help facilitate progress among Alliance partner countries. Focus countries will also serve as regional hubs to support scaling up in neighboring countries as well.

The Alliance remains "fuel neutral" in recognition of the fact that the 3 billion people around the world who rely on biomass for fuel and heating do not have equal access – in terms of supply or affordability – to cleaner fuels. It must also be flexible in its approach since the policy contexts, barriers, and facilitators of market expansion in cleaner fuels and stoves are unique to each market. Nevertheless, early trends are promising, and illustrative of the encouraging momentum to strengthen the global clean cooking market in Phase II. Moreover, wherever possible, the Alliance will help households "leapfrog" to the cleanest possible fuels to achieve healthier outcomes faster.

Much of the sector's growth in 2013 can be attributed to a few different factors. Concerted efforts to strengthen the sector in Alliance focus countries: Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria, and Uganda have increased our partners' clean cookstove and fuel sales. At the same time, efforts to support standards, expand research to address key evidence gaps, and increase investment have created a more welcoming environment for new entrants to the sector. Through increased engagement with Chinese manufacturers, many of whom are eager to scale their overseas business, as well as more intensive efforts to increase response rates among our partners in other focus countries, it is clear that partners are increasingly willing to share information in order to ensure that their efforts are 'counted' toward the 100 million adoption goal. In almost every country, the response rate increased from 2012 figures. At the same time, nearly 75% of 2013 respondents who were directly engaged in the clean cooking value chain also responded to the 2012 annual survey. As such, key findings – particularly related to market growth – are likely the result of increasing market scale and not solely an increased response rate.

Both donors (private and public) and private investors play critical and mutually supportive roles in facilitating sector growth. Public funding has facilitated transformational progress on standards development, testing, research, coordination with the humanitarian sector, and the development of indicators to evaluate social impacts. At the same time, increased private sector investment is needed to drive innovation, support consumer finance, and enable entrepreneurs to evolve their business models to achieve scale. As the sector matures, the proportion of private finance, including private equity, convertible debt, and commercial loans, is anticipated to match public funding sources (including bilateral, and multilateral grants and loans).

Other early trends are also promising, including the expansion of resources to programs operating in humanitarian settings. The Alliance is closely collaborating with several global humanitarian

implementers, including the United Nations High Commissioner for Refugees (UNHCR) and the World Food Programme to develop a robust humanitarian program to scale up clean cooking and fuel solutions for refugees, internally displaced people (IDPs), host communities, and other crisis-affected populations.

In contrast, results indicate the need for better tracking of clean fuels activities, as well as a continued need for gender inclusiveness in all aspects of program and product design and adoption. While the results show that there is a growing focus in the sector on mainstreaming gender throughout business models and project designs, there is still a need to strengthen and scale these efforts to ensure that the most effective approaches are implemented and that women's empowerment and gender impacts are scaled. There is a continued need to monitor and evaluate effective gender-informed approaches, build capacity of partners in this area, provide finance for innovative empowerment interventions, and to raise awareness and conduct advocacy to influence gender and energy policies.

Further work is also needed by the sector in testing and monitoring of clean cooking technologies and fuels. While the majority of the Alliance's partners understand the need to evaluate their cookstove, product, and/or fuel performance, less than half (48%) of manufacturing and distribution organizations reported that a third party tested their cookstove. Data compiled in the report suggests promising momentum around third-party testing activities in-country, however, with a noteworthy year-on-year increase in the number of testing organizations that were operating in every geographic region. The other good news is that new standardized protocols developed through the ISO process are being utilized; several instances of durability and safety testing were reported.

Increasing the availability of stove performance data in the sector will also be critical as it enables better tracking of trends in the availability of cleaner and more efficient stoves and fuels over time. In addition, testing results are also intended to inform the public about the potential health, environmental, and economic benefits of clean cookstoves and provides evidence to donors, investors, and consumers, keeping the market transparent and competitive. A greater number of organizations will have to allow third-party testing of their products; however, and more work has to be done

to encourage public reporting of these externally validated stove performance results. This year, only 7% of submissions to the Alliance's Clean Cooking Catalog included testing results. The Alliance will continue to encourage organizations to share testing results publicly, including through the Catalog, and will further facilitate the process through new Catalog features for automatic submission of information.

Until very recently, innovation within the sector has focused on achieving environmental benefits, with a focus on reducing fuel use through improving stove efficiency. As a result, there has been substantial progress in scaling up more efficient cooking technologies. Across the sector, recent efforts aimed at achieving health and climate benefits through cleaner cooking have resulted in an additional emphasis on reducing emissions, and as a result, exposures to household air pollution. Early trends indicate progress in the distribution of 'cleaner' fuels and technologies. In order to ensure health, climate (through lower emission stoves), and environmental (though more efficient stoves) benefits, the Alliance and its partners will continue to increase the rate at which the adoption of cleaner and more efficient stoves is taking place.

Finally, while this report is a key tool for benchmarking and tracking the Alliance's progress, it should be viewed as only one component of the Alliance's overall monitoring and evaluation strategy. Accurately tracking progress towards the adoption of 100 million cleaner and more efficient stoves will involve a more intensive effort to address the following:

- **Repeat customers:** Until now, as the market is being established, the assumption has been that stove purchases represent first time purchases, i.e. stoves are being distributed to new households. In reality, and particularly as the market grows, an increase in the number of cleaner and more efficient cookstoves acquired per household can be anticipated, and repeat customers will have to be quantified to avoid double-counting.
- **Stove stacking:** Similarly, the reality is that households often tend to use more than one "burner equivalent" to meet their cooking and/or heating needs. Strategies to better capture the use of multiple stoves need to be implemented, particularly since the continued use of lower-quality stoves

will hinder the ability to achieve potential benefits with the cleaner technologies, including time savings for women, increased public health, and a healthier environment. This would involve awareness-raising activities to facilitate the near exclusive use of the best technologies, and a commitment to increasing access to multiple burner 'equivalents' to meet all the household's cooking needs.

- **Intensity of adoption:** While it is most pragmatic for partners to report on distribution, strategies for assessing the extent to which households are using these

stoves need to be refined and implemented. Key drivers and deterrents to sustained adoption, including availability of spare parts and maintenance, will need to be addressed. Clearly, not all of these issues can be adequately assessed on the basis of voluntary partner reporting. The Alliance will employ pragmatic approaches to complementing self-reported data, including participatory approaches to monitoring progress, country-specific monitoring strategies in focus countries developed to track progress against country action plans, and collection of in-depth qualitative and quantitative data on sustained adoption.

Key Alliance Resources and Online Tools:

Alliance Homepage

www.cleancookstoves.org

Partner Directory

community.cleancookstoves.org

Reports and Research

www.cleancookstoves.org/resources/reports-and-research/

REPORT:

Igniting Change: A Strategy for Universal Adoption of Clean Cookstoves and Fuels

www.cleancookstoves.org/resources/fact-sheets/igniting-change.pdf

PRESENTATION:

Alliance Business Plan

www.cleancookstoves.org/resources_files/alliance-business-plan.pptx

Testing, Standards, and Technology

Clean Cooking Catalog

catalog.cleancookstoves.org

Standards and Testing

www.cleancookstoves.org/our-work/standards-and-testing/

Carbon Finance

Carbon Finance Platform for Clean Cooking

carbonfinanceforcookstoves.org

Investment

Increasing Investment in the Clean Cooking Sector

investment.cleancookstoves.org

Country Strategy

Partner Country Toolkit (also available in Spanish)

www.cleancookstoves.org/resources_files/partner-country-toolkit.docx

Country Action Plans / Market Assessments

www.cleancookstoves.org/resources/reports-and-research/

Adoption

A recipe for developing adoption and impact indices

www.cleancookstoves.org/blog/recipe-for-developing-adoption.html

Gender

Scaling Adoption of Clean Cooking Solutions through Women's Empowerment: A Resource Guide

www.cleancookstoves.org/our-work/gender-guide.html

Humanitarian

Safe Access to Fuel and Energy Online Knowledge Hub

www.safefuelandenergy.org



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