

# PARTNERSHIP FOR CLEAN INDOOR AIR (PCIA)



PCIA BULLETIN

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We are excited to share with you the outcomes of the 5<sup>th</sup> Partnership for Clean Indoor Air Forum. With more than 350 participants from 40 countries, this was our largest Forum to date. At six full days, it also was the longest. From the kick-off event showcasing the engagement of the highest levels of the Peruvian government to 65 outstanding presenters, more than 80 informative posters, 31 participant-led open space sessions and a half of day of stove testing, attendees obtained a wealth of information to enhance their stove programs.

With generous sponsor support, we provided airfare assistance for 77 household energy and health leaders to participate in the Forum. See a list of the sponsoring organizations on page 26 of the Bulletin.

We hope you will enjoy reading the in-depth coverage of the Forum on the following pages. Special thanks to the contributing writers who shared their impressions with us. You can also download the Forum agenda, presentations, photos and updated participant roster (a terrific resource) from the PCIA website at [www.PCIAonline.org/proceedings/2011Forum](http://www.PCIAonline.org/proceedings/2011Forum). We again offer congratulations to the recipients of the 2011 Global Leadership and Special Achievement Awards. You can read more about these organizations in the special PCIA Award Supplement.

As we announced during the Forum, the PCIA is integrating with the Global Alliance for Clean Cookstoves (GACC). EPA is proud to have launched the Partnership along with a handful of other organizations at the end of 2002. Over the last eight years, EPA and Winrock International have been pleased to co-lead the PCIA. We have supported the stove community with the quarterly Bulletin, an interactive website, regional capacity building workshops, the biennial Forum and much

more. You can see highlights from these events in the [photo montage](#) shown at the Forum. We'll share more outcomes of the PCIA, including the 2010 PCIA Partner results, in the final Bulletins to be published during the remainder of this year.

While this was the last PCIA Forum, we look forward to working with GACC on future regional and global cook stove community meetings. EPA and the United Nations Foundation (UNF) have signed a Memorandum of Understanding outlining our intent to transition the convening, coordination and outreach functions of the PCIA to the GACC over the next 6

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### 5th Biennial PCIA Forum

Over 350 household energy and health experts convened at the Forum in Lima, Peru. View all of the Forum presentations and other highlights on the [proceedings page](#).

– 12 months. You'll receive announcements and invitations to participate in this process as it unfolds, and can look forward to receiving more information about future GACC activities, including their newsletter, website and meetings.

For the foreseeable future, EPA will continue to provide capacity building and technical assistance to partner organizations on priority areas such as stove design and performance, monitoring and evaluation and carbon finance. In addition, EPA's Office of Research and Development will expand its stove testing activities. Winrock International will continue its leadership role in the stove community.

They are currently leading indoor air activities under the new USAID-funded WASHplus and Increasing Adoption of Renewable Energy programs, coordinating the World Bank Biomass Energy Initiative for Africa program and supporting GACC working group activities.

We look forward to working with each of you to build on the successful activities highlighted during the PCIA Forum. Together we will continue to take action to rapidly increase the use of clean, efficient, reliable, affordable and safe home cooking and heating technologies and fuels.

## FEATURE ARTICLES - 2011 Forum Highlights By Day

### Monday: Peruvian National Cookstove Day

This year's Forum kicked off with a Peruvian National Cookstove event that gave participants the opportunity to learn about Peru's national campaign, *Half a Million Improved Cook Stoves: For a Peru Without Smoke*, to which the First Lady Pilar Nores de Garcia and her organization, Instituto del Trabajo y la Familia, along with other civic organizations and the Peruvian government have provided strong support. The event, organized by local co-sponsors GIZ/EnDev-Peru, as well as the Technical Secretariat of the Presidency of Council Minister's Social Affairs Interministerial Commission, the Ministry of Women and Social Development, the Partnership for Clean Indoor Air, Insitute for Labor and Family, and Pan American Health Organization, took place at the Museo de la Nación on Monday. This event provided an important opportunity to share the experiences and knowledge of the national campaign, highlight the Peruvian government's commitment, both nationally and internationally, to clean indoor air,

and review the progress and challenges of the various components of the campaign.

The day began with welcoming speeches by Peru's Minister of Culture, Dr. Juan Ossio Acuña; the Minister of Health, Dr. Oscar Ugarte; the Minister of Energy and Mining, Pedro Sánchez; and the Partnership for Clean Indoor Air's Coordinator, [Brenda Doroski](#). Kris Balderston, U.S. Department of State and representing the Global Alliance for Clean Cookstoves, also spoke about expanding the global community of improved stoves. Dr. José Antonio Chang, the Prime Minister of Peru, provided an opening speech reiterating Peru's national commitment to improved cook stoves. [Dr. Virginia Borra](#), Minister of Women and Social Development and President of the Board of Directors of the National Campaign, discussed the strategy, achievements and challenges of the national campaign. Campaign achievements include the installation of 126,916 improved cook stoves to date. [First Lady Pilar Nores](#), also President of the Instituto del Trabajo y la Familia,



Peruvian National Stove Campaign opening dignitaries panel.



First Lady, Pilar Nores, discusses the Peruvian national campaign.

discussed the commitment and participation of non-governmental organizations. In her presentation, the First Lady emphasized the importance of strategic public-private partnerships which:

- Focus on changing determinants;
- Provide a multi-sector approach;
- Coordinate joint activities at the local, national and regional level;
- Coordinate state, civil society, business and international cooperation; and
- Develop, monitor and evaluate integrated interventions.

Participants then divided into thematic groups in which [presentations](#) were given around the following topics:

- political commitment;
- certification of improved stoves;
- health;
- promotion and proper use of stoves; and
- fuel use reduction and carbon credits.

The day's events concluded with reflections led by Dr. Manuel Peña from the Pan American Alliance for Nutrition, Health and Development and a closing speech by Dr. Antonio Brack, the Minister of the Environment. This event gave Forum participants an opportunity to learn what can be done at the national level and provided them with ideas on how to overcome challenges and accomplish successes in their own countries, with a goal of undertaking their own national campaigns.

## Tuesday: Welcome & Charge to the Group

The 5<sup>th</sup> Biennial PCIA Forum began with a review of the previous day's kick-off event. The National Peruvian Day garnered a high degree of interest and support; the presence of multiple high-level representatives of different ministries was very inspiring for Forum participants. The initiative of Pilar Nores as an encouraging leader and the government of Peru deserve to be celebrated; they lead an excellent example. Their work proves that now is the right time for other countries' governments to take similar action! When participants were asked what they expected to gain from attending the Forum, they shared wanting to learn about various technologies, technological improvements and carbon finance, as well as wanting to network with Partners from other parts of the world. There was also a

specific interest expressed in learning more about indoor air pollution (IAP) and reduction of health risks.

The key question for the Forum was presented: What can each of us do to rapidly increase the use of cleaner, more efficient cook stoves?

In small groups, participants came up with diverse suggestions including:

- Promote solar cookers in all sunny regions;
- Utilize microcredit to make cleaner technology available to as many people as possible;
- Introduce micogasifiers all over the world; and
- Solve the problem of getting initial funding to purchase institutional stoves for women.

The opening session also covered who makes up PCIA as an organization, and how far we've come in our work throughout the years. PCIA has 460 member organizations working in 115 countries around the world, with 350 participants from 35 countries together at this Forum. Representation in previous Forums was asked by a show of hands: approximately five of the 2011 participants were at the first PCIA Forum in 2003 in New York; approximately 10 were present in Morocco in 2005; approximately 20 in India in 2007; and approximately 30 in Uganda in 2009.

## World Café

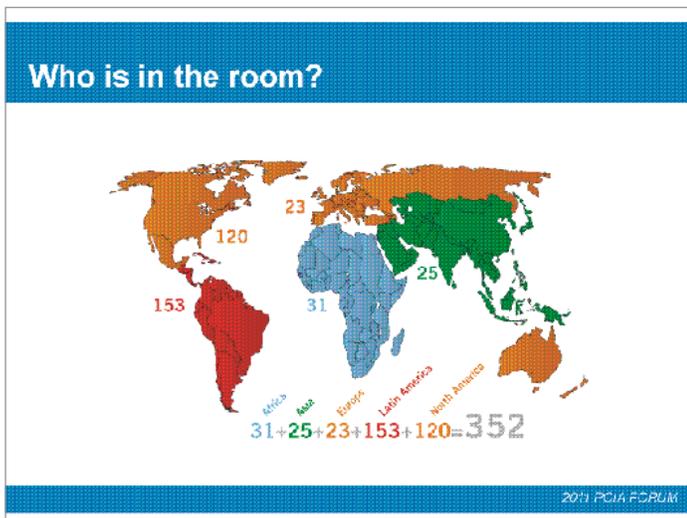
During the World Café session, participants discussed their perceptions about the PCIA community with their group members. The three questions raised were: successes and assets of the PCIA community; results and challenges; and requests and offers. Various groups responded that they appreciate the global character of this community and view the opportunity to network as a great success. One challenge identified was to include stronger gender perspective.

## Global Alliance for Clean Cookstoves

[Leslie Cordes](#) from the UN Foundation/Global Alliance for Clean Cookstoves spoke about the Global Alliance for Clean Cookstoves, which will allow for more resources and wider range of high-level recognition than this field has had to date. As PCIA integrates into the Alliance over the coming year, the Alliance looks forward to cooperating with current PCIA Partners!



Participants discuss the PCIA community's successes and challenges.



Snapshot of 2011 Forum attendees.

## Exciting New Developments and New Evidence for Action

One of the reasons household energy and indoor air pollution is a complicated issue to tackle is due to its immensely broad scope; it is an issue that encompasses:

- Public health;
- Gender issues;
- Climate change;

- Economic development; and
- The environment.

There is new evidence from across all of these sectors indicating that now, more than ever, is the time to take action. To get started on this discussion, [Nigel Bruce](#) from the World Health Organization kicked off a panel on new developments, cutting edge studies on the health effects of indoor air pollution and the need to move to much larger emissions reductions to achieve maximum health benefits. He emphasized that further studies are needed on pregnancy, neo-natal outcomes and severe pneumonia. Next, [Tami Bond](#) from the University of Illinois at Urbana-Champaign spoke about the connection between cookstoves and short-term forcers of climate change, such as black carbon. She stressed that clean air matters locally and globally, as household solid fuel produces about 25 percent of black carbon globally. Tami's tagline "mi humo es su humo" ("my smoke is your smoke"), summed up the interconnected nature of the issue perfectly. [Massamba Thiye](#) from the United Nations Framework Convention on Climate Change then moved to a practical overview of recent changes to the Kyoto Protocol's Clean Development Mechanism (CDM) that simplified the process for getting financing for cookstoves projects. The CDM decided to develop standardized baselines and simplify the program of activities related to cookstoves. There are currently almost 30 cookstoves programs nearing completion of the CDM process, with almost 20 more in the pipeline. [Jim Jetter](#) from the U.S. EPA rounded out the discussion by covering hot topics in cookstove testing and fuels, such as processed fuels, natural draft stoves, and the convergence of lab and field testing.



Panelists describe new developments in household energy and indoor air.

## Powerful Results of National Cook Stove Programs: Case Studies



*Attendees learn about exciting national stove programs in Mexico, Indonesia, and Nepal.*

National governments are stepping up to the plate to take action on clean cook stoves. [Salvador Blanco](#) from the National Institute of Ecology opened the panel with a presentation on Mexico's biomass program. The program is part of the National Development Plan for 2007-2012, and has an impressive goal of distributing 600,000 stoves by 2012. Salvador highlighted the idea that to achieve the greatest success, countries should integrate their cook stoves programs into national level policies. [Michael Kelly](#) then discussed Indonesia's LPG cook stoves program, which promoted the use of LPG over kerosene through the distribution of LPG conversion kits to communities – accompanied with training on how to assemble and use them. Michael stressed that national government commitment was key to the program's success. [Wim van Nes](#) of SNV concluded the panel by discussing Nepal's biogas program. He talked about a multi-stakeholder approach to deploying biogas digesters and integrating communities and households into their management. So far, the program has distributed 356,000 biodigesters. Some challenges they've faced include the long period of time it takes to develop a sustainable commercial sector (5-10 years) and the substantial investments required over that time to start the program. They continue to aim for

### Results of Indonesia's National Program

Over three years, 54 million families were impacted, and end-users saved 42 percent per month from not having to purchase kerosene. Additionally, the government saved \$1.4 billion.

impressive goals, and the next step will be to install an additional 1 million biogas plants in 15 countries by 2016.

## Responding to Humanitarian Crisis in Haiti

Access to appropriate fuels and cooking equipment are critical during times of humanitarian crisis, but cooking needs are not often integrated into standard disaster response protocols. However, recently, the distribution of improved stoves and fuels during emergencies has become a more widely recognized need. During this session, two PCIA Partners shared lessons learned from their experiences getting appropriate and improved stoves to those most in need after the January 2010 earthquake in Haiti.

[Stuart Conway](#) presented on the work Trees, Water & People (TWP) was doing prior to the earthquake with local Haitian NGO AMURT to build locally-made earthen rocket stoves in northwest Haiti since 2007, with plans for durability and portability modifications, as well as potential for entrepreneurial development. After the disastrous earthquake in 2010, the organization also began distributing Stove Tec stoves in displaced persons camps with MPP – a rural people's movement interested in promoting fuel-efficient stoves among their 61,000 members – and the International Lifeline Fund. The organization also conducted urban and rural focus groups with the Paradigm Project as well as controlled cooking tests and cooking demonstrations. While the demand for stoves in camps was vast, issues of cost and customs difficulties called for a more locally-focused solution. TWP conducted a series of field assessments in Port au Prince that surveyed fuel use changes, user satisfaction, durability, and usage rates for a number of imported and locally produced stoves, which surfaced logistical, durability and consistency challenges. Based on their findings, TWP is making design improvements



*Trees, Water & People get improved stoves to Haitians following the 2010 earthquake.*

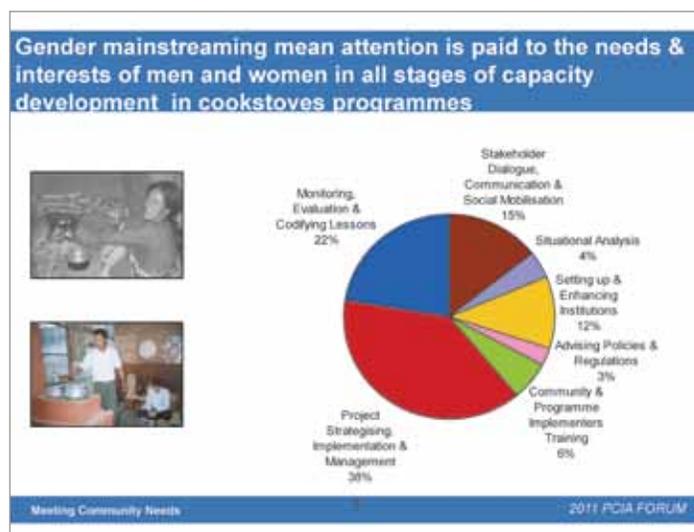
to a commonly-used, inexpensive local stove called “Recho Mirak” that has easily replaceable parts, capitalizing on local tinsmith expertise. They have already seen positive test results for these modified stoves, which will continue to be an important part of their future work in Haiti.

[Vahid Jahangiri and Hoi Trinh](#) from International Lifeline Fund (ILF) also presented on their post-earthquake work with both household and institutional stoves, to address immediate cooking needs, provide economic benefits, improve health and curb deforestation in Haiti. ILF was the lead agency in distributing household and institutional stoves in Haiti in 2010, providing training, monitoring and testing. ILF also tested over a dozen models, conducted focus groups with urban and rural women, and was active in camps – conducting assessments, cooking demonstrations, trainings and other community events, as well as monitoring immediate and long term impacts. A key finding was that economics is a main driver of people’s acceptance of the improved stoves. Because of the extreme need for an alternative to expensive, environmentally-damaging charcoal, ILF began working with briquettes and found that getting the needed quantity of raw materials was difficult; the density, recipe and moisture content all play a significant role in the end product, explaining that “not all briquettes are made equal.” They faced similar challenges to TWP regarding availability of raw materials, logistical and security related difficulties, and the trade-offs between imported versus locally-produced stoves. In the end, they stressed the importance of testing stoves in humanitarian situations and being flexible in which technology you are using, since it needs to fit the needs of the user, not the stove implementer. Due to these efforts, ILF was presented with the 2011 Global Leadership Award.

### Concurrent Session: Meeting Community Needs

During the session titled “**Expanding the Role of Women in Cook Stoves Programs**,” [Erin Patrick](#) from the Women’s Refugee Commission (WRC) and Stephen Gitonga from the United Nations Development Programme, spoke on the importance of addressing women’s issues when designing and executing cook stoves programs. Erin represented the WRC’s Fuel and Firewood Initiative (WRC), which is in partnership with the Inter-Agency Standing Committee (IASC) Taskforce, the UN World Food Programme’s SAFE Initiative and the Global Alliance for Clean Cookstoves. This organization aims to ensure that women and girls have

safe access to appropriate cooking technologies through effective policy, advocacy and research. Erin stated that while obvious to most, clean cook stoves and fuels must meet the needs of the cooks within the homes, which are mostly women. She reminded the audience that the end-user must like the product, or else it will not be adopted or used. Drawing from her experience, Erin emphasized that women must be engaged in all aspects of a project’s development in order to succeed. The WRC has developed a toolkit for ensuring that women’s perspectives are included during project development.



*The importance of including women in all aspects of program design and implementation was highlighted.*

1. Through participatory assessments, the WRC asks groups of women questions about their cooking habits and preferences. Past participatory assessments have highlighted the need for better training on cookstove technology, better explanation of the benefits of using clean stoves and a more intuitive design. They have also suggested that to be truly effective, clean cooking technologies need to address environmental degradation, protection risks and livelihood development.
2. Second, through decision-tree diagrams, WRC targets humanitarian staff to help develop an appropriate cooking fuels strategy that takes into account the needs expressed by the women.

As a result of these findings, all SAFE projects now use different fuels and stoves based upon the stated preferences of the women. Also, the World Food

Programme launched a design competition on clean cookstoves in Darfur, and then had women vote for the best design. Stove centers have also been set up for women to come and try different stoves and provide their feedback. WRC still faces several challenges, including a lack of uniform implementation of SAFE guidelines by partners, the need for continued advocacy and a lack of awareness among the donor community of the need to distribute clean cookstoves along with clean fuel, in order to ensure adoption.

In a continued discussion on the role of women, [Stephen Gitonga](#), an energy specialist at the United Nations Development Programme (UNDP), spoke on the need to integrate women's issues into the development of national cook stoves programs. Some of his key messages included:

- How investment in capacity development that is well-targeted from a gender perspective is critical to achieving universal access to clean cookstoves;
- How capacity development costs represent the significant portion of overall costs of a nation's improved cookstoves program; and
- How upfront public investment is essential.

Stephen noted that gender targeting also makes programs cost-effective because it ensures that resources are directly targeted at need and demand. He reminded the audience that gender mainstreaming means that attention is paid to the needs of men and women in all stages of capacity development. Stephen noted progress in developing effective national institutions and initiatives, which are taking into account the different needs of women and men. However, he also noted the following as challenges:

- Improved cookstoves are generally not reflected in national strategies, policies and budgets;
- Investments do not always align with national priorities; and
- Institutional capacity remains broadly limited.

In the future, UNDP aims to support the development of national targets and gender-disaggregated data, and will highlight this issue during 2012, which will be the Year of Universal Energy Access for All at the United Nations.

During the session titled "**Toolkits for Meeting Communities Needs**," [Marion Pratt](#) from the U.S. Agency for International Development (USAID) and Marta Rivera

from Fundacion Solar presented on different toolkits available or under development for communities to implement clean cook stoves projects. Marion emphasized the critical importance of bringing in outside experts to test and evaluate the stoves that a program uses. She stated that since it is impossible for an organization to objectively evaluate its own work, outside feedback is essential. She also shared that USAID intends to continue to promote its recently-developed *Fuel-Efficient Stove Toolkit for Humanitarian Settings* and also plans to develop a toolkit specifically around solar stoves in the future.

 **Lessons Learned**

- Drafting a Toolkit is a LOT of work!!!!
- Conducting studies and stove testing in highly insecure areas is a logistical nightmare
- Independent evaluations are critical
- Battling the rushed nature of response remains a huge challenge



*Important lessons learned around using tool kits to advance stove programs.*

[Marta Rivera](#) highlighted the different reasons for engaging in clean cook stoves projects, including energy efficiency, climate, public health and gender issues. She stated that there was a need to develop a Central American cook stoves toolkit that could guide work on a broader scale throughout the region and would contain social and cultural, financing, and technical components. The first step in developing this toolkit was to develop a regional survey to capture core needs across this significantly diverse region. According to preliminary survey results: firewood gathering is conducted by the whole family and presents significant risks, adoption levels of clean cook stoves technology increase following awareness-raising campaigns, and increased measuring and evaluation leads to greater adoption and impact. Rivera and her team also faced challenges for adopting broad cook stoves in Central America, which include the low quality of stoves available, history of "give-away" programs that distort local markets, lack of awareness about health hazards of unclean stoves, and the geographic remoteness of those using firewood.

The next steps for Fundacion Solar include completing their survey, gathering additional field information and drafting an initial improved cook stoves toolkit.

During the session titled **“Working with Targeted Communities,”** participants learned about the experiences of two organizations with unique approaches to meeting the specialized needs of the communities they work in. [Andrée Sosler](#), Executive Director of the Darfur Stoves Project, explained the importance of providing choices to communities that are user-centered. In the refugee communities where they work, some of the key strategies they have used are cook offs, pilot tests and trainings. In addition, Andrée strongly emphasized the importance of collecting feedback and making modifications based on that feedback. Darfur Stoves has found the need for multiple iterations and mass customization of stoves – to help minimize the behavior change required and ensure a high adoption rate.

In a related presentation, [Kate Kennedy Freeman](#) presented on the Millennium Village Project’s (MVP’s) recognition of the variance in local cooking practices and foods in different areas, and its impact on the performance of the stove. In order to ensure that their stove programs are able to adapt to local communities, they use three primary tools: controlled cooking tests (CCT); adoptability surveys; and cooking investigations, with follow up by MVP site teams to ensure accurate fuel use estimates. MVP also uses public events such as stove “launches,” cooking demonstrations and public CCTs to promote improved stoves. Based on the resulting discussion, many Forum attendees expressed interest in utilizing these techniques in their own programs.

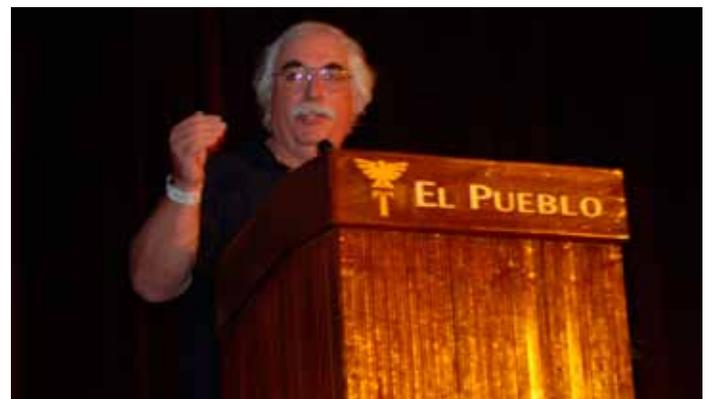
## Poster Session

The Forum featured an opening-night poster session and reception which featured [80 posters](#) and provided a unique opportunity for attendees to network with other participants, share exciting developments in their program and see firsthand how others are reducing the burdens of indoor air pollution from indoor smoke in the communities they serve.



## Wednesday: Keynote and Call to Action

Dean Still from the Aprovecho Research Center, who delivered the morning’s keynote address, discussed the many aspects of addressing indoor air pollution from household energy use, which include (but are not limited to): technical, policy, commercial and organizational areas. He articulated how we are fortunate to have experts working in each of these areas, but that our challenge now is to become effective collaborators. His key message was “to aprovechar, or take advantage of, diversity.”



*Dean Still inspires attendees with his focus on effective, diverse collaborations.*

Forum organizers asked participants to reflect on the similarities between their projects and those with alternative fuel sources. Some participants raised concern over users having to adopt two new technologies in the case of solar. Some lessons gleaned from the presentations were: 1) monitoring is key; and 2) some technical improvements are required.

## Exploring Clean Cooking Solutions: LPG, Solar and Biogas



*Panelists describe exciting advances in clean cooking and heating technologies.*

The next four presentations echoed Dean's message as they discussed different clean cooking technologies and fuel options. [Emmy Wasirwa](#) from Wana Energy Solutions Ltd. and [Nickolay Urbina](#) from Rural LPG Projects presented on LPG; [AmyJo Mathias](#) from Solar Cookers International and [Rocio Maldonado](#) from Bolivia Inti Sud Soleil presented on solar; and [Vidya Sagar Devabhaktuni](#) from SKG Sangha presented on biogas. The focus of the presentations was on the low or zero emissions of these technologies. AmyJo particularly emphasized how the solar integrated cooking system makes the best use of diversity. It is a combined approach which includes both the solar cooker for sunny weather and a fuel-efficient stove for when it is cloudy. She reminded everyone of their collective goal — improving, health, quality of life and environment — and insisted that by working together and by combing technologies, we can better achieve that goal.

### Key approaches from all the presentations included:

1. Making the project bankable;
2. Working with local authorities;
3. Having women sell to other women;
4. Exhibiting a model kitchen in the marketplace;
5. Involving men; and
6. Conducting door-to-door sales.

## Knowing How Your Stove Performs: WBT, CCT and KPT Basics

Surveys of PCIA Forum participants over the years show that more and more organizations are relying on testing, but many participants still have not conducted stove testing. The goal of this session was to highlight the benefits and challenges of testing for those who had little firsthand experience and to address questions that others may have encountered. [Michael Johnson](#) from the Berkeley Air Monitoring Group opened the session by providing an overview of testing methodologies and the benefits of testing, including improving stove design and performance, informing stakeholders and funders, guiding implementation and accessing carbon financing. Michael also encouraged participants to look forward to a new version of the Water Boiling Test (WBT) and results from the Global Alliance Standards and Testing working group, as well as improved connections between laboratory and field performance of stoves.

[Jim Jetter](#) from the U.S. EPA presented results from recent testing of over 20 stoves for fuel consumption, efficiency, fire power, cooking power and emissions of multiple air pollutants. Results will be reported in scientific journal articles and will be available on the PCIA website. Jim shared results that demonstrated different useful ways to quantify emissions, and how results depend on test conditions. Jetter also shared that EPA is developing a research plan for clean cook stoves. [Otilio Fernando Chaparro Tejada](#), the Executive President of Peru's Servicio Nacional de Capacitación para la Industria de la Contrucción (SENCICO), described the new testing facility for Peru's national stove program. SENCICO is also planning to develop a mobile laboratory to test stoves that cannot be moved or replicated in the Lima testing facility. They are happy



*Jim Jetter outlines results from recent testing of 20 stoves.*

to share their experiences with other countries and welcome visits to the facility. They can also send videos to interested individuals who cannot visit in person.

To continue the presentations on testing, [Klas Heising](#) from GIZ/EnDev Bolivia shared experiences from their Bolivian testing laboratory. Klas highlighted the need for protocols to measure robustness and vulnerability in order to understand how stoves perform in multiple usage conditions with different fuels. Klas emphatically suggested that the one item that can make the biggest difference in a testing facility is a thermocouple data logger for automated generation of documentation and reports. In addition, [Sam Bentson](#) from Aprovecho Research Center described their work conducting Water Boiling Tests (WBTs) at the Aprovecho lab and Controlled Cooking Tests (CCTs) in the field, most recently in Rwanda, to test the performance of an adapted local mud stove and assess the correlation between lab and field testing. Preliminary results show that, surprisingly, stoves appear to be performing better in the field than in the lab. This project with CARE Rwanda is the first of three U.S. EPA-funded competitively selected WBT and CCT training and technical assistance projects to evaluate and improve the performance of stoves. Trainings will next take place with SNV Lao and VERC Bangladesh, so we can look forward to more robust conclusions.

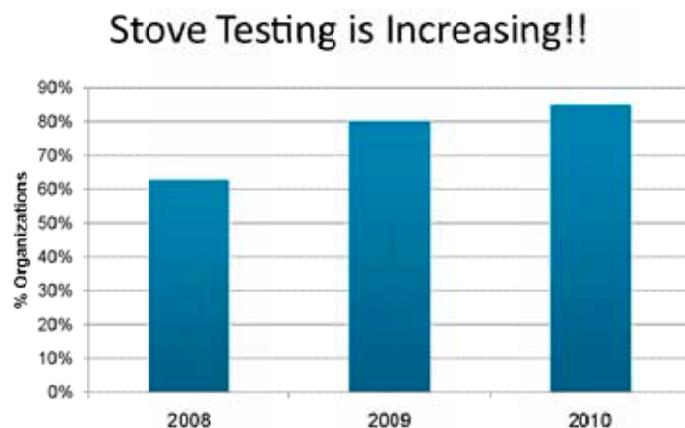
[Michael Johnson](#) returned to discuss using the Kitchen Performance Test (KPT) to assess fuel consumption in the field and the effectiveness of implementation programs in India, Nepal and Peru. Michael highlighted the importance of careful sample design to match groups to get comparable data and follow-up studies to assess the effects of maintenance and training. The measurements of additional fuel savings due to maintenance and training provide valuable, quantitative evidence for including maintenance and training efforts in stove programs. [Yanju Chen](#) from the University of Illinois

at Urbana-Champaign described emissions measurements from normal use in Nepal, India, Uganda and Honduras. The PM emission factors in these field studies were much higher than those measured in the laboratory-controlled tests. They demonstrated that while improved stoves are more efficient, emissions and PM emission factors can still be improved. Such real-time measurements can provide information about the source of PM emissions spikes and provide guidance for improving stove design.

## Concurrent Stove Performance Demonstrations

After the morning sessions, participants were given a chance to stretch their legs, put their sun block to good use and try out the tests themselves. They divided into three groups: Water Boiling Test (WBT), Controlled Cooking Test (CCT) and Kitchen Performance Test (KPT), based on stove testing experience information provided in each person's registration form. The WBT and CCT groups split off into smaller sub-groups led by PCIA members with high levels of experience in each test.

Learning from their peers, participants helped to weigh wood, measure water, light stoves, time tests and record results; and through this process, they ultimately learned how to measure their stoves' performance and their programs' impacts. This hands-on practice gave each person a chance to ask questions about testing procedures and equipment, seek advice from their peers, and get more familiar with each test. Experienced testers shared tips for efficient testing, and interesting stories of testing experiences. Some participants were using unfamiliar stoves, so this session also demonstrated the challenges of learning how to use a new stove, especially in windy conditions. These challenges led one group leader to share the advice that you should know how to use the



Attendees get hands on experience with lighting and testing stoves.

particular stove before conducting the test. Afterward, one participant shared that this firsthand experience of conducting a test made the process less nebulous and she is looking forward to learning more about testing.

Indoors, participants who had previously learned about or performed the lab-based and controlled WBTs and CCTs, gained instruction on the field-conducted KPT led by [Michael Johnson](#). KPTs are becoming more common practice among PCIA members and this session allowed more people to become well-versed in the tools and time required to conduct the KPT. PCIA would like to thank all of the testing leaders and give a special thanks to Jim Jetter for coordinating the Stove Testing Demonstrations!

### Concurrent Session: Advances in Stove Performance & Fuel Preparation

Wednesday afternoon presented participants with a choice between three concurrent sessions: charcoal; gasifier stoves; and fan stoves and fuel preparation.

Wood gas stoves have long been present at stove forums, often amazing onlookers with their silent clean burn, and invariably creating some interesting (and sometimes heated) discussions. During the **Gasifier Stoves session**, [Christa Roth](#) introduced a recent review of gasifier stoves published by GIZ HERA. Top loading updraft stoves ('TLUDs') create conditions wherein primary air partially combusts wood gas, with the resulting gases then mixed with heated air above the fuel where they burn very cleanly. Gasifier stoves can be used to produce biochar. [Morgan DeFort](#) from Colorado State University (CSU) presented some work done at CSU testing a wide range of forced and natural-draft gasifier stoves. Many of the stoves tested produced strikingly lower levels of carbon monoxide (CO) and particulates than rocket-type stoves, as they are much cleaner than three stone fires.



*Christa Roth discusses with Amanda Ravenhill the significant emissions reductions from gasifier stoves.*

Discussions ensued around the usability of batch-fed gasifier stoves, as well as the flexibility of fuels they can accept (including rice husks) and the requirements for homogenous pellets necessary for optimum performance, which can limit their applicability in some situations.

During the **Fan Stoves and Fuel Preparation session**, [Clay Burns](#) represented Biolite, a U.S. company developing a range of stoves using forced air to improve the quality of combustion. These stoves are particularly innovative because they harness energy from the fire itself to generate electricity to power a fan which drives air into the combustion chamber. Test results on the rocket-gasifier hybrid stoves are extremely encouraging, with a 91 percent reduction in CO and a 94 percent reduction in PM. These are welcome results in light of the "50/90" objective: 50 percent reduction in fuel use, 90 percent reduction in pollutants. The thermoelectric units actually produce an excess of power and there is the potential to use this to power small lights, or to recharge mobile phones. Plans are in place to pilot the stoves in India. [Sanu Kaji Shrestha](#) from the Foundation for Sustainable Technologies (FoST) wrapped up this session with a summary of an initiative in Nepal in which household biomass waste is made into briquettes for use as a household fuel. This addresses both some of the solid waste management challenges in the country, as well as energy needs. FoST, which trains people to make briquettes based on local materials, has designed a portable briquette press and is piloting ways to further reduce production costs.

The **Charcoal session** began with an introduction to the Charcoal Project by its director, [Kim Chaix](#). The Project focuses on conservation through energy sustainability, finding uses for agricultural waste, and understanding how charcoal fits into the energy landscape. Charcoal can be a

### The future of charcoal-making

- Charcoal kilns that produce electricity from the heat process.
- Potential for carbon financing
- Distributed energy for micro-grids in rural areas

The diagram illustrates a process for generating electricity from biomass. It shows a 'Boiler' at the bottom where 'Wood Waste' is fed in. The boiler produces 'Steam' and 'Water'. The 'Steam' is directed to a 'Turbine' which is connected to a 'Generator' that produces 'Electricity'. The 'Water' is recycled back into the boiler. Below the boiler, 'Ash to Landfill' is shown as a byproduct.

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cleaner fuel than wood in terms of toxic emissions, but is often produced inefficiently, with 100kg of wood yielding as little as 10kg of charcoal. If burned under perfect conditions, charcoal produces no methane and can play a key role in the trade-off between the need for energy and reducing environmental impact. It is often seen as an upward move on the energy ladder. Charcoal kilns exist that offer more efficient combustion and that cut production time from three

to just one day. [Christian L'Orange](#) from Colorado State University (CSU) went on to present a study on the use of charcoal in water boiling tests (WBT). This extensive study (cumulatively boiling 1000 litres of water!) revealed that the size and quantity of charcoal pieces affect the performance of stoves, and thereby points to a need to standardize the size and quantity of charcoal for WBT tests.

## Open Space

Twice during the Forum participants were invited to convene sessions on topics they wanted addressed, including questions they needed answered, offers and stories they wanted to share, and requests they wanted to make to others.

The following topics were discussed during Open Space sessions:

- Bridging the Gap Between the Field and Lab Through Performance Mapping
- Biomass Stove Research Plan
- Innovative Tools and Resources
- Keeping Stoves Simple and Cheap
- Burning Issues with Fuel Briquettes
- Solar + Your Technology Working Together
- Advancing Women's Entrepreneurship Around Clean Stoves
- Socio-cultural Interpretation and Cook Stove Adoption
- Ethanol - \$.15/day and 98% Pollution-free
- TLUD Gasifier Issue and Projects
- Alternative Stove Materials
- Engaging Policy Makers
- Monitoring Stoves with Mobile Phones
- African Alliance for Clean Cooking
- New Groundbreaking Carbon Finance Initiative
- How to Measure Sustainability
- Use of Gender Analytic Tools
- Enabling Environmental Policy and Governance Studies
- Onsite Bio-monitoring from Cook Stoves
- What's Needed for a Perfect Stove
- Adoption and Impact Assessments Development of



## Indicators

- Alcohol Fuel Stove Demonstration
- Rotary Funding
- Institutional Solar Cooking with Indoor Kitchens
- Recipe for Pumice Rock
- Results from RESPIRE
- Gasifier Stove Camps Worldwide



## Thursday: SENCICO Field Trip

A small number of the Forum participants set off Thursday morning for a field trip to SENCICO, an organization under the Peruvian Ministerio de Vivienda, Construcción y Saneamiento (Ministry of Housing, Construction and Sanitation). SENCICO stands for Servicio Nacional de Capacitación para la Industria de la Construcción (freely translated as the “National Training Service for the Construction Industry”). It is an institute involved in training, consultancy and certification for the building industry in Peru.

Upon arrival, the group of 18 people – consisting mainly of PCIA partners involved in stove testing – was welcomed by Arq. Otilio Fernando Chaparro Tejada, “Presidente” of SENCICO, and his staff. After a short introduction to the organization by Mr. Chaparro in SENCICO’s “stove showroom,” the visitors were shown a number of stoves that have been certified by SENCICO for use in Peru. In total, 22 stove models of various manufacturers and promoting organizations have been certified. The government of Peru is enforcing a standard on cook stoves specifying maximum emission of CO and PM<sub>2.5</sub>, maximum boiling time for a specific quantity of water, the amount of energy required to boil it and a safety checklist. The different stove types have to be tested and certified by SENCICO before they can be disseminated, promoted and distributed in the Peruvian market.

For the testing of stoves, SENCICO has built a specifically designed and designated laboratory in cooperation with GIZ/EnDev Peru. The testing lab is modeled and constructed after a typical local Peruvian kitchen, thus simulating the situation in which women and children are preparing and cooking meals. The Aprovecho portable emissions

monitoring system (PEMS) is being used to measure CO and PM emissions from the stove to determine the indoor air pollution inside the room. SENCICO staff demonstrated how they conduct a range of tests and showed the visitors the various protocols being followed. Among the testing procedure is a 10-point safety test, where the stove is investigated for sharp edges, which are potential safety hazards. Also measuring the surface temperatures at various specified locations on the stove and chimney is part of the safety test to determine where the stove user or other persons in the kitchen might possibly hurt themselves.

There was an abundance of interactions and conversations between the SENCICO employees, Peruvian GIZ staff and visitors; the group discussed stove testing and design in great detail. The visitors from five continents (South America, North America, Asia, Africa and Europe) were pleasantly impressed with the high standard of work and quality of facilities at SENCICO, which serve as an example to others. The networking, knowledge sharing and cross pollination between stove testers from all over the world exemplified what the PCIA Forum strives to achieve. After the visit to SENCICO, the participants joined with SENCICO staff for lunch at El Olympico, a local restaurant. Together, they enjoyed a great meal of Peruvian seafood dishes, strengthening the contacts made and starting a worldwide network of testing institutes.

## High Andes Field Trip

Bright and early on Thursday morning, eight mini-buses packed full of Forum participants ventured up into the high Andes (approximately 3,000 meters above sea level) to visit the project sites of the First Lady Pilar Nores’ organization, through the SEMBRANDO program, in the towns of San



José de los Chorrillos, Orcocoto and Lanchi. Despite the occasional bus malfunction, tingling arms and legs from altitude medication and a wrong turn or two, everyone made it safely to and from the project areas and were able to visit the field sites to get a first-hand look at the Peruvian National Improved Stove Program they had been learning about in previous Forum sessions.

SEMBRANDO focuses its work on highland communities, and provides a holistic approach to the provision of kitchen services. Improved stoves are accompanied by hand washing stations (with purified, boiled water and soap), kitchen beautification contests, and promoters who are on hand to explain and monitor program activities in each area. Accompanied by medical students from Cayetano University who volunteered as translators, Forum participants were given the opportunity to enter homes where SEMBRANDO has installed improved stoves. In each home, they were greeted by families (who even served the occasional cup of hot apple tea!) and were encouraged to ask questions on a range of topics including cooking habits, fuel use patterns, and specific changes the families had noticed before and after the installation of their new stove. First Lady Pilar Nores was onsite at Lanchi to welcome participants and explain more about her organization's programs.

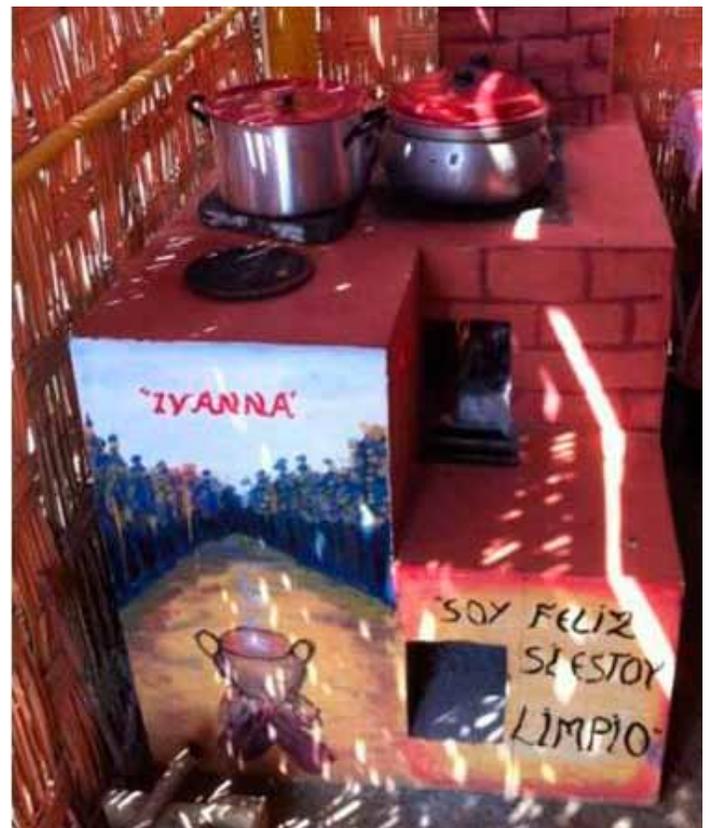
PCIA extends a heartfelt thank you to the staff from SEMBRANDO and GIZ Peru for organizing the excursion, as well as our Cayetano University doctors, who volunteered their time to help with the field trips. And a special thank you to the Peruvian national police escort truck who found and rescued broken down bus number 7 and helped deliver them safely to Lanchi!



### Pachacamac Field Trip

A group of participants visited the communities of Santa Rosa de Malpso y Cardal en Pachacamac, where families had received improved stoves in the last year, thanks to GIZ/EnDev, the Peruvian government and Sembrando programs.

Families in these communities were better-off than ones in more remote communities that GIZ usually works in, but program staff took advantage of the proximity of the communities to the government's stove testing lab operated



*Improved stove in a home in Santa Rosa de Malpso.*

by the National Training Service for the Construction Industry (SENCICO) and monitored the stoves in action over time. All of the families reported being very happy with their new stoves, and the abandoned 3-stone fire pits were visible in many yards. Some of the families had some experience with LPG, but ultimately found it too expensive and the logistics of refilling their canisters too cumbersome. Two stove types were present in Santa Rosa — a sunken pot (2-pot) version installed by GIZ and a griddle (plancha) version, installed by SEMBRANDO. Families liked both styles, with parents of young children appreciating that it was harder for the pots to be tipped over or pulled off the sunken pot stove, and others preferring the “plancha” because the pot bottoms stayed clean. Many families painted or otherwise decorated their stoves with ornate detail; they were clearly a source of pride in the household.

In addition to the home visits, participants on this field trip also visited archeological ruins at the Ceremonial Center of Pachacamac and the Pachacamac Site Museum, one of the most important centers of Peruvian archeology. The Pachacamac Site Museum, which is part of the National Museums System of the National Institute of Culture, aims to integrate the archaeological site with the community by highlighting local cultural heritage. Its main rooms display artistic Pachacamac samples, including ceramics and textiles. It also has a temporary exhibition hall in which all the heritage assets of the area influenced by the Ceremonial Center, along the entire lower and middle valley of the Lurín River, are presented.



*Pachacamac field trip participants engage in a networking activity.*

The group stopped for lunch at a slow-cooking restaurant, where the food had been baked underground for three hours prior to their arrival. They also played games and Suman Dhakal of Winrock International in Nepal won a free bottle of wine for tossing a large metal coin into the mouth of small metal frog!

The Ceremonial Center of Pachacamac was dedicated to the most important deity of the coast of Peru, with initial occupations and construction of the first temples beginning around 200 BC. When the Incas reached the valley (1450-1532 AD), following many other cultures in between, they adapting existing buildings to their needs and built the Temple of the Sun, which participants visited, among others.

## Friday: Manufacturing Approaches to Enhance Stove Performance

Participant momentum continued to grow as Friday’s proceedings commenced. We began the morning by drilling down from broader Forum focuses to more specific case-study discussions on stove manufacturing and commercialization strategies.

[Nancy Hughes](#) from StoveTeam International implored manufacturers to utilize local factories, emphasizing the advantages of having continuous stove supplies locally available with the social benefit of employing local labor. Studying how Nancy’s approach can be scaled

and applied to other projects may yield new techniques for manufacturers. Highlighting the role that two-way communication and organized monitoring play in the manufacturing process, [Elder Mendoza](#) of Proyecto Mirador stated that design corrections come from frequent interactions with stove beneficiaries. One interesting tip, which has helped fuel his organization’s success, is knowing the schedule of the families you work with. Too often, time and resources are wasted because project administrators show up for a visit only to find the users not at home. The successes of Proyecto Mirador teach us that the road to earning returns on a carbon credit project is “long, but worth it.”

## Lessons Learned

- New factory owners may not understand basic business principles
- StoveTeam provides business assistance and computer models
- Stoves and factories are adapted to each area
- Dr. Larry Winiarski provides design assistance

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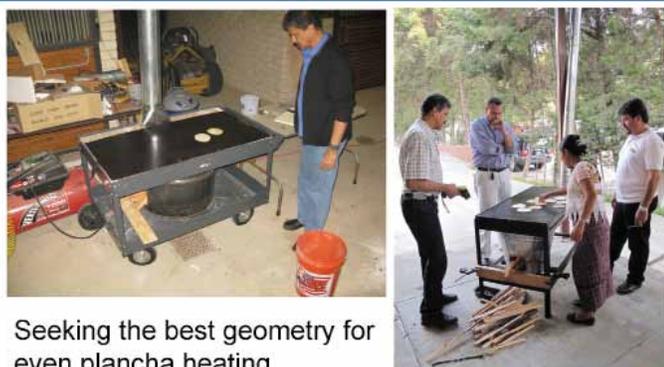
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*Nancy Hughes describes important lessons learned in scaling up production and the benefits of employing local labor.*

Focusing on The Paradigm Project's work in Kenya, [Johanna Matocha](#) shared her focus on maintaining customer trust for sustained relationships in commercial stove projects. She reported great successes from incorporating best practices from inside and outside the industry including customer support, international development and supply chain operations. One highlight was Paradigm's innovative model of offering a suite of stove products – both imported manufactured stoves and locally-produced stoves – in order to set high standards and meet demand. Other innovative ideas included developing multiple manufacturing partners for componentry in order to increase manufacturing scalability and offering a discount on second stove purchases if the first stove is brought back for recycling.

## Institutional Stoves

### ONIL Institutional Plancha Stove



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*Richard Grinnell highlights important lessons learned for institutional stove programs.*

Turning the page to the status of institutional stoves in commercial markets, presenters [Richard Grinnell](#) from Helps International and [Peter Scott](#) from Burn Design Lab led discussions on lessons learned from the implementation and design of institutional stove projects. Both presenters highlighted that due to its high efficiency and low cost in institutional stove settings, wood is the best (and most developed) fuel option. Richard, reporting on his rollout of institutional stoves throughout Guatemala, emphasized the importance of being flexible and adapting technology to users (not the other way around). He also stressed the importance of capitalizing on parent and volunteer exposure to institutional stoves in schools to get them excited about adopting fuel-efficient household stoves in their homes.

While both presenters also touched on the successes of pre-assembled approaches for improved cook stove standardization, Peter led a more technical walkthrough of design practices and current trends in institutional cook stoves. An evangelist for practical applications of clean combustion technologies, Scott argued that institutional stoves offer better profit margins and higher impact – with potential fuel savings at an average of \$25,000 a year – than household stoves and that, by shifting more focus to institutional stoves, manufacturers can realize more profit. With an eye toward marketing as well as design, Peter also argued that, while more expensive, institutional stoves should be portable (not fixed) since it will lead to a more “brandable” and “commercializeable” product.

### Important Aspects of Commercialization: Microfinance, Marketing, Distribution

How can stove programs scale? What hurdles do growing programs face and how can these challenges be overcome? Friday's morning commercialization session sought to answer these questions by focusing on building markets for clean and efficient cook stoves. Four presentations on commercialization of stove projects from Ghana, Nepal, Kenya and China demonstrated successes using flexible payment methods, carbon credits or straight sales without subsidies:

- [Suraj Ologburo](#), the Managing Director of Toyola Energy Limited in Ghana, discussed strategies for creating demand and supporting commercial markets. He stressed that his biggest hurdles are raising awareness with consumers, obtaining project investment and acquiring

business development services. The project has been quite successful over the last three years with partners E+Co and E+Carbon developing one of the first carbon credit projects utilizing cookstoves. To date, Toyola has distributed 108,000 stoves, reducing 145,000 tons of carbon dioxide (CO<sub>2</sub>) with 172 stove producers and 352 sales people.

- [Suman Dhakal](#) from Winrock International in Nepal is planning to scale through a multipronged approach. The organization sells stoves through traditional sales, as well as through subsidies and microfinance, but wants to expand their network by working closely with 400 microfinance institutions in the area. Government support and the carbon market will help the stove program grow and maintain financial strength.
- [Anna Ingwe-Musungu](#) from GIZ in Kenya manages a stove project that pursues straight, for-profit sales, to keep on solid footing. Raising awareness of benefits for end-users as well as manufacturers is the key ingredient for scaling this project. With just 1.3 million Euros from funders, the program has distributed 1.1 million stoves and provided 1,700 jobs over the last five years.
- [Liu Guangqing](#) from the China Association of Rural Energy Industry (CAREI) presented on their proof-of-concept carbon credit project in rural China that placed 14,000 stoves in homes from 2009 - 2010, in partnership with U.S. EPA, Impact Carbon and Berkeley Air Monitoring Group. The stoves cost over \$100, but are subsidized with carbon credits and government support. The organization is now pushing for additional government support for a 40 million stove project, but says that monitoring for carbon credit projects can be quite difficult; the organization is also looking for a monitoring partner.

On the whole, various sales approaches were presented, each offering a successful opportunity for scaling commercial stove projects. Raising awareness among stakeholders was mentioned by several presenters as well as the need to establish partnerships and funding for project development or growth.

### Concurrent Session: Global Action Planning

During the Forum, participants engaged in generative conversations to help inform the nine key Global Alliance for Clean Cookstoves work group areas. Discussions focused on the following question:

- *What are your best ideas for informing the Global Alliance in this thematic area and with a focus on gender considerations?*

- Carbon Finance - Evan Haigler
- Climate Research - Peter DeCarlo
- Finance - Simon Bishop
- Health – Nigel Bruce
- Humanitarian - Vahid Jahangiri
- Monitoring and Evaluation - Verena Brinkmann
- Reaching Consumers - Richard Grinnell
- Standards and Testing - Tami Bond
- Technologies and Fuels - Mouhsine Serrar

Below are the outcomes of some of these working group discussions.

**The Carbon Finance working group** discussed the idea of standardizing certain tools and variables, such as the non-renewable biomass (NRB) factor and fuel consumption patterns for stove projects as a way of lowering project costs. They also brainstormed the challenges involved in doing so, such as choosing default values that were accurate but not very conservative so that a project developer would not want to use them. In addition, the challenge of sacrificing project accuracy for standardization was discussed, citing the example that the default Emissions Factors (EFs) in Gold Standard stove methodology are not realistic to the specific performance of each stove model as there is enormous variation in emissions according to the stove design and how it is used. Other topics of discussion included the pros and cons of the different field tests available to determine stove performance as well as the pros and cons of different project models such as giving stoves to the end-user free of charge versus market-based distribution. It was suggested that while both models have tradeoffs, free distribution may be counterproductive to human development by creating outcomes such as dependency on aid, local market disruption, lack of ownership and an unsustainable supply chain. Working group participants also discussed the need to develop a mechanism to make carbon finance more readily available at the early stage of a project, stating that a typical challenge that project developers face early on is access to adequate investments.



*Forum attendees engage in small group discussions to advance the work of the Global Alliance.*

**The Finance working group** discussed ways in which the Global Alliance for Clean Cookstoves could help increase financing opportunities for clean cook stove organizations. Some ideas for funding opportunities that the group brainstormed included:

- Grants and commercial investments;
- Technology development funding to invest in potential game-changing technologies;
- Technology transfer funding to help spread best practices across the sector;
- Start-up funding to invest in high-risk innovation along the value-chain that is in the early stages;
- Scale-up funding to help already successful stove businesses go to scale faster; and
- Funding to help build capacity wherever it is required along the value-chain.

The working group also discussed linking the scale-up funding to a “Stove Academy” as a way to spread best practices; this is a concept that GERES is already developing and looking for funding opportunities. The group then brainstormed ways in which the Global Alliance could provide information that will help attract investors by giving credibility to the sector, which included publishing an annual “State of the Sector” report, providing open-source statistics on the GACC website on topics such as current consumer behavior, triggers and barriers, and market data and mapping existing finance models used in the sector. Lastly, the working group suggested that the GACC could act as a link between stove businesses and investors through providing opportunities such as investor forums or trade shows for both groups to meet.

### **The Monitoring and Evaluation working group**

discussed some of the various needs for successful monitoring and evaluating clean indoor air projects, which include the need for a common definition for measuring adoption and impacts using standardized indicators. This need was followed up with an offer by Karin Troncoso, a consultant to the World Bank, to carry out perception studies.

Additional opportunities for the GACC to support included, standardized monitoring protocols for program evaluation that are also flexible enough to be adopted by any cook stove project, as well as standard reporting metrics and standard monitoring methods. The issue of accurately counting the number of stoves installed so that double-counting does not take place was also discussed. The suggestions were provided to avoid double-counting:

- Giving serial numbers to each stove (which HELPS does in Guatemala);
- Providing a website for results reporting that is transparent; and
- Tracking each stove through Global Positioning System (GPS).

Another important issue that was discussed was how to integrate monitoring and evaluation into other sectors as well as developing and implementing it jointly with public agencies and national partners to reduce costs. A general request to all participants that came out of this discussion was for tools that have provided good results, such as example questionnaires and focus groups discussions.



*Attendees strategize effective ways to link current PCIA activities with the Global Alliance's future work.*

Partners with successful examples of questionnaires and focus groups discussions can be send them to [chart@unfoundation.org](mailto:chart@unfoundation.org).

**The Technologies and Fuels working group** formulated their discussion around the question “What is your single most important technical research and development need?” Discussions took place in the following subgroup areas: technology, production and distribution of fuels, product development and special applications. Prominent needs identified included:

- Fundamental research on refractory ceramics and recipes for artisanal production;
- Portable biogas digesters;
- A pre-heating system for plant-oil stoves; and
- Integrated water heating for hot water and space heating.

## Development of Stove Performance Standards

Although there is currently no universal standard for cook stove performance, there is agreement on the need for performance parameters on stove efficiency, fuel use, safety and usability, emissions, quality and durability. PCIA and GACC partners are exploring a framework for ranking stove performance that would create a tiered ranking for stoves based on performance across the above parameters. The U.S. EPA, the United Nations Foundation and Shell Foundation are working with the American National Standards Institute (ANSI) to establish these standards. The afternoon sessions explored stove impact and monitoring protocols for health and environmental impacts of stove programs.

## Lima Consensus on Stove Performance Rating

Another significant outcome of the Forum included the “[Lima Consensus](#),” an agreement to establish an interim rating system for the evaluation of cookstove models “that reflects the varying tiers of performance in the areas of fuel efficiency, indoor air quality, emissions of particulate matter and carbon monoxide, and safety.” This agreement is an important step along the path toward developing voluntary global cookstove standards.



*Tami Bond announces the an interim evaluation rating system, the “Lima Consensus.”*

The “Consensus” was developed by members of the Global Alliance Standards and Technology Working Group, led by Tami Bond and Morgan DeFoort, and other stove testing leaders at the Forum who worked tirelessly around the margins of the Forum to recognize the areas of consensus among the standards and testing stakeholders gathered at the PCIA Forum. The group also recognized some of the challenges to address to make cookstove evaluation measures increasingly meaningful and useful. This document also clearly acknowledged that more work is required before a comprehensive, consensus and achievable global standard can be introduced.

Areas of resolution identified in the consensus include the adoption of a temporary rating system with varying tiers of performance for fuel efficiency, indoor air quality, emissions of particulate matter (PM), carbon monoxide (CO) and safety, each ranked separately, that would represent a desired sequence of evolution within the stove industry. The consensus also identifies the Water Boiling Test (WBT 4.0) as the interim protocol for emission and efficiency ratings as well as the use of the Iowa State or Peru/Bolivia Safety Rating protocols for safety ratings. A methodology was identified for rating of indoor air pollution. An agreement was made to translate ratings into percentage reductions by defining characteristics of a standard baseline fire. Minimum equipment and methodologies requirements were identified for certified testing of emissions and performance.

The signers of the Consensus resolved to develop a long-term test protocol and standard that builds on the interim protocols. Long-term objectives are listed in the document.



*Participants get hands on experience through stove performance demonstrations.*

The Consensus is contingent upon the identification of funds to support “regional knowledge and testing centers” with equipment grants and training support, the creation of ongoing support mechanisms to develop and retain qualified personnel at the regional knowledge and testing centers, the creation of a fund for testing stoves, identification of funds to support research required to develop a long-term standard, and the need to identify and support experts who will work towards harmonizing standards through interaction between the Global Alliance, national governments, and other stakeholders.

The next step in moving forward is to gather existing data of current performance of stoves throughout the world. Aprovecho, Colorado State University, and EPA will start this process by pooling results from their testing, and we will be contacting all PCIA Partners to request that they forward their results as well. We will disseminate graphs showing existing data for stove performance parameters, and we will ask Partners to help define the following stove performance tiers, as defined in the Lima Consensus.

<b>Tier 0</b>	Typical, Unimproved
<b>Tier 1</b>	Measureable Improvement using Minimum Best Practice
<b>Tier 2</b>	Substantial Improvement Over Minimum Best Practice
<b>Tier 3</b>	Stretch Goals which achieve Significant, Measurable Health and/or Environmental Goals

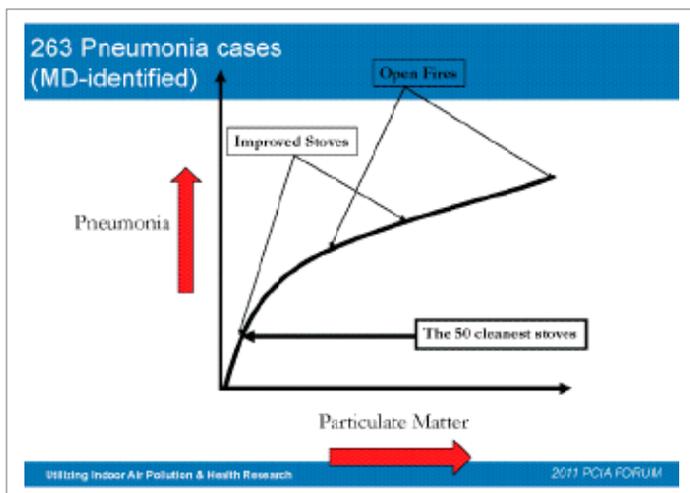
When finalized, the rating system will be fuel and stove neutral, simply rating stove/fuels by a number of criteria that will enable our community to have a better understanding of the performance of existing stove models and drive innovation to improve stove performance. To read the Lima Consensus, and learn a little more about it, please go to: [http://www.pciaonline.org/files/Saturday\\_Lima\\_Consensus.pdf](http://www.pciaonline.org/files/Saturday_Lima_Consensus.pdf)

### Using Research to Develop Compelling Health Messages

Moderator Dr. Yvonne Njage from The Fogarty International Center, National Institutes of Health opened the Developing Health Messages session. She framed the discussion by explaining, “it’s hard to distill a Lancet paper and make a message for rural women cooking on three-stone fires,” and called on the PCIA community to work together to develop messages.

[Dr. Lisa Thompson](#), Assistant Professor from the University of California, San Francisco, spoke about research she did when she was obtaining her PhD at UC Berkeley. She worked on the RESPIRE project in Guatemala (Kirk Smith, Principal Investigator, Nigel Bruce, Co-PI), which was the first randomized stove intervention trial. The primary goal was to establish a causal relationship between exposure to particulate matter and child pneumonia. The key research question was, “How much can child pneumonia be reduced by an improved cook stove?” The RESPIRE researchers did personal and area measurements of indoor air pollutants (IAP) for women and children, and the project provided weekly stove maintenance. They observed the following results:

- A 61 percent reduction in personal IAP measurements among mothers;
- A 52 percent reduction among children;
- An IAP reduction in the kitchen by 90 percent; and
- A 50 percent reduction in IAP reduced childhood pneumonia by 26 to 44 percent.



[Dr. Nigel Bruce](#) from the University of Liverpool and consultant to the UN World Health Organization framed two important questions:

- What does health research tell us about how clean cookstoves need to be?
- How do we incorporate this knowledge into policy and practice?

The answer to the question of what happens to disease risk as exposure is reduced is similar to a concave curve (i.e., disease risk decreases a little with a modest intervention and the reduction occurs much faster with larger interventions). Bruce's key take-away was low or very low exposure is needed to get major health benefits.

[Michelle Bashin](#) from the Public Health Institute presented on a CDC case study in rural, Western Kenya. During the 18 month project period, 1,124 vendors installed stoves in 757 households. The first phase of the project showed that cost was the largest barrier to adoption and health was not a motivating factor in stove adoption, nor was maternal education. The stove project was part of a larger integrated intervention, which demonstrated that households adopting other health measures, such as improved hand washing methods, and those that had higher rates of using clean water were more likely to adopt and consistently use improved stoves. Cooking demonstrations and facilitated discussion worked well, and including men in promotional efforts was helpful.

[Jay Graham](#), an Environmental Health Advisor at USAID and part of USAID's WASHplus program, shared insights gained from the WASH Sector that are applicable to the clean indoor air sector. The water sanitation field had many high-level initiatives, starting in 1980s, which was the UN-declared

water decade; \$10 billion was invested per year. High-level lessons learned included:

- Communities are active participants, not passive beneficiaries;
- Women are central players – they respond to management and community involvement more than men;
- Hardware solutions are often easier to solve than software solutions;
- It's not about the hardware – it's about institutional capacity, financing and engaging the community;
- Sometimes it is necessary to move people gradually to better technologies; and
- Government coordination is integral to setting benchmarks for performance against which progress can be tracked and to provide the scale of funding and resources needed to make large-scale impacts on health and livelihood through cookstove programs.

### Monitoring & Evaluating the Impact of Your Intervention(s)

During the Monitoring and Evaluation session, [Naima von Ritter Figueres](#) of Helps International discussed research of a project promoting the use of Onil stoves in Guatemala, which she conducted from May to August 2010. She used a variety of methods – oral surveys and focus groups – to characterize the use of the stoves. The research indicated high use of the Onil stoves on a daily basis – 86 percent of participating households. The research showed differences in use regionally and showed that households were often using parallel cooking methods. About one-fifth of homes altered the stove to make it more user-friendly, which potentially affected its efficiency. Naima characterized "Intact Adoption" and went over the key lessons learned that highlighted the need to:

1. Involve women;
2. Have a champion inside the community;
3. Account for spatial heating from the stove; and
4. Make the stove more comfortable with an attachable table.

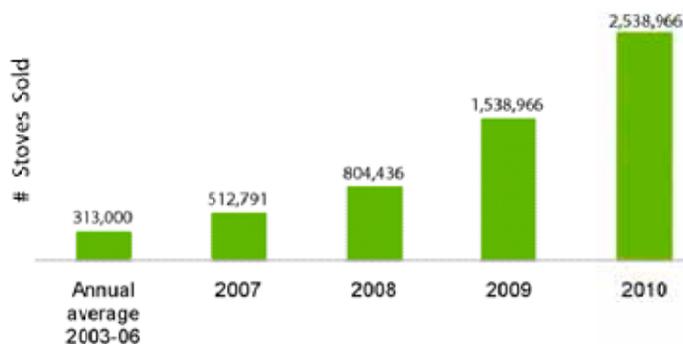
[Renata Everett Valladares](#) of Instituto Perene discussed a carbon financed project in Northeast Brazil involving 6,000 fuel-efficient stoves and households. She discussed the strategies of the project and highlighted the need to partner with experienced carbon finance groups, and use

internationally recognized standards. In their case, they partnered with Ambiental PV to develop the carbon finance component of their corporate social responsibility project. Valladares highlighted the need for rigorous monitoring and discussed the information that had to be collected in the program. She also noted the challenges to accessing carbon finance, especially given that this was the first project in Brazil. Additionally, there was a need to ensure that the stoves will operate for the entire crediting period, estimated at seven years.

## Sharing 2010 Results

As of Friday, March 25, 91 organizations from a wide range of regions had reported their [2010 program results](#). Priorities of the reporting organizations were evenly distributed among health, livelihoods and environment. Just over half of the reporting organizations sell or manufacture stoves. Stove testing continues to increase and there's been a tremendous growth in sales – 2.5 million stoves were sold in 2010. Learn more about these exciting 2010 PCIA results in the upcoming Bulletin 28.

## Stove Sales are Soaring!



Please submit upcoming events or other program highlights for Bulletin 28 to [Moderator@PCIAonline.org](mailto:Moderator@PCIAonline.org) by **June 15, 2011**.

## Saturday: Understanding the Carbon Market

Saturday's Carbon Finance sessions started off with an overview of the carbon market, with presentations given by Matt Evans and Evan Haigler of Impact Carbon. [Matt Evans](#) discussed the compliance and voluntary markets, as well as the program development process and timeline (i.e., the role of stakeholders and time commitment involved). He also explained some of the costs and risks involved in entering a carbon finance program – including monetary investments ranging from US \$20,000 to \$200,000, the uncertainty of returns, and the need to assess these costs and risks before deciding which projects to pursue. [Evan Haigler](#) began his presentation with a clear statement that the Global Alliance for Clean Cookstove's goal of 100 million clean stoves by 2020 would mean US \$2.5 billion in carbon finance. This is assuming 10 million additional improved stoves in use each year at a price of US \$10 per ton and .5 tons per stove. In order to achieve this goal, the Alliance – particularly the working group on carbon finance – will have to play an important role in ensuring global access to carbon finance, the appropriate monitoring and data collection, as well as changing the focus to marketing, distribution and usage.

Following this overview, participants were given the opportunity to hear from [Massamba Thioye](#) from the United Nations Framework Convention on Climate Change (UNFCCC) and [Ivan Hernandez](#) from the Gold Standard Foundation. As the Manager of the Standard Setting Unit at the UNFCCC, Massamba Thioye was able to provide an inside perspective on changes being made to clarify the process, including rules for additionality and defining eligibility, for Programme of Activities (PoAs). He encouraged the group to get creative in thinking about PoAs; one example he provided was having the Alliance get involved in a PoA for Africa that could have an unlimited number of CDM Project Activities included over a longer timeframe. Ivan Hernandez provided a step-by-step overview of the Gold Standard Project Cycle from pre-evaluation all the way to the certification and issuance of credits.

Keeping this background in mind, participants then heard more detail on individual cases from other PCIA Partners involved in carbon finance through CDM, Gold Standard, Voluntary markets and PoAs. The first case presented was GERES Cambodia. [Iwan Baskoro](#) presented on their

successful commercialization of ICS through a business model of supporting private microenterprises, backed up by quality control checks, regular testing of stoves and continuous organizational development. His advice to other PCIA Partners was to focus on the quality of the carbon credits; think big, keep a business focus and build alliances. The next case was presented by [Luis de la Torre](#), from REPSOL in Peru, a company that developed a PoA for fuel switching from heavy fuel to LPG in industrial facilities, with the potential for stoves as well.

[Erik Wurster](#) then spoke about E+Co's project in Mali, a Voluntary Gold Standard effort with charcoal stoves at 40 percent increase in efficiency, and the experience of Toyola in Ghana, which were the second and third Gold Standard registered projects after Ugastove. His lessons learned included getting stoves in the field early, and he urged consideration of a rolling credit facility. The final case was the Qori Q'oncha improved cook stove diffusion program in Peru, a PoA under the Gold Standard, presented by [Arthur Laurent](#) of Microsol. Their program allows for various stove

models for maximized social impact, and fuel use reduction and stove use are tracked by continuous monitoring and field visits. He stressed the need for customization and adaptation, in addition to capacity building and sustainability (i.e., proper maintenance and replacement strategies for long-term use by beneficiaries).

Armed with this knowledge on the process background and individual cases of their peers, participants split into breakout groups ranging from those just getting started to more advanced, based on their self-identified levels of understanding, and areas where they felt the need for more information.

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### Concurrent Session: Moving Forward On Carbon Finance

Three concurrent sessions were held on accessing carbon finance, broken down by the experience level of participants. The purpose of the Getting Started session was to offer an overview of the carbon finance industry, discuss a few issues about the Gold Standard, and open the floor for discussion. [Erik Wurster](#) of E+Co began with the differences in dynamic between the voluntary market with Voluntary Emissions Reductions (VERs, specifically under the Gold Standard) and compliance markets with Certified Emissions Reductions (CERs, under the Kyoto Protocol's CDM): voluntary market contracts are strictly bilateral agreements (between two parties under no formal carbon exchange), therefore the market is not as transparent as the compliance market. Also, voluntary credits are not tied to market indexes, thus they are less liquid (credits cannot be bought and sold easily). He believes this may be slowly changing.

[Luis De La Torre](#) talked about the Gold Standard (voluntary market certification, GS) and emphasized that GS credits demand a premium price because the procedure for reductions is very structured; the underlying project has a "real, permanent and measurable" effect and shows a tangible benefit under conservative assumptions and estimates. The project designer is responsible for finding buyers, and the money helps for the permanence of the project (money for monitoring). He finished by clarifying that the baseline is not a "status quo" but a reasonable projection of the future without the project.

One participant asked why replacing three-stone fires with stoves was easier than charcoal fires with LPG under CDM, and the panel explained there is no CDM methodology for

### Ask the Experts - Select Q&A from the Carbon Finance Sessions:

#### 1. What defines stoves for carbon finance?

- Evan Haigler: Fuel savings, but we need to consider how to incentivize health emissions reductions, so we need standards for all criteria.

#### 2. Why is there so little carbon asset development in Africa?

- Evan Haigler: There is a need to simplify the process and make carbon finance more accessible.
- Erik Wurster: This could be changed by the growing investor interest in Africa.

#### 3. Do you have any examples of failed stove carbon finance projects?

- Iwan Baskoro: The ICS for small-scale industry was too small in volume and M&E was hard, so carbon revenue was not worth it.

#### 4. How should carbon finance be spent?

- Arthur Laurent: There are many models and it depends on risk profile of each partner.
- Erik Wurster: It is important to cover costs first and not be too prescriptive.

replacing charcoal with LPG, and it is difficult to propose a new methodology. The GS would not accept this case because the replacement energy is still non-renewable, but may soon allow for fuel switching if some renewables are present. Luis responded to a question regarding payment for credits before the project has begun is not common, and Eric explained this was due to high risk in that stage of the project. A question was asked regarding credits based on supply increases of a renewable energy, which is not possible under CDM since baselines are based on demand, not supply. In response to a question about the price of CERs and VERs after Kyoto, Eric responded that the EU will buy CERs in, but not after, 2020 from LDCs only, and speculated that price divergence would continue, since demand will outstrip supply for CERs into the future. A participant asked if concurrent payments for ecosystem services could be incorporated in the credit, which it cannot, but serves as a “co-benefit” for VER projects. A final question on credits for microscale projects (less than 5,000 tons) revealed that they have a standard price of \$5,000 for an initial valuation and \$2,000 for periodic evaluations, and they typically demand a market premium because of their many benefits; by assumption LDCs don’t need to prove additionality, making these projects “easier” to finance.

The Advanced Carbon Finance session was chaired by Matt Evans from Impact Carbon and included discussions about the potential of CDM programme of activities (PoAs), issues around the use of default emissions factors in CDM, and the potential for increased public scrutiny of cook stove carbon projects. There is an interest in PoAs as a framework that can lower the transaction costs associated with accessing the global carbon markets. Representing the CDM, Massamba Thiye added that he is open to feedback on simplification of PoAs.

Michael Johnson from Berkeley Air Monitoring Group raised the issue that the reliance on default emissions factors in the Voluntary Gold Standard Methodology can, under some circumstances, reward stoves that increase IAP. Jacob Moss added that there is a potential for the Global Alliance to fund field testing towards developing emissions factors for stove-fuel combinations. He asked the attendees to consider whether this would be a good idea to do.

Several participants noted that as global cookstove carbon finance volume increases, there will be a corresponding increase in public scrutiny of projects and methodologies. While simplification of the carbon process is important for



*Panelists describe how to effectively access the carbon markets.*

promoting access and reducing costs, it will eventually hurt the field if rigorous standards aren’t maintained. This is especially true as PoAs begin to provide the infrastructure for new projects to come online quickly. The PCIA Partners’ strong interest suggests that the stove carbon field will grow rapidly, so issues around efficiency and offset quality will likely be important to watch in the future.

## Regional Sessions

On the last day of the Forum, participants had the opportunity to gather with fellow participants working in their region to use all Forum resources, expertise and networks to design an action plan to get breakthrough results in their work, their region and in our collective community of practice.

### **The Latin America regional action planning**

**group** discussed the resources their organizations have collectively as a region, including financial resources such as microfinance and savings institutions, public private partnerships, international cooperation, government funding and legal resources as well as institutional resources such as SENCICO, the Instituto de Altura, and Universidad Cayetano Heredia in Peru and Zamorano University in Honduras. Regional opportunities were also identified, such as the ability to create networks around specific themes as well as getting access to an Energy Social Network to collaborate with others in the field. Other opportunities discussed included sharing the experiences countries have had working with government and making use of climate change funds. The group also developed specific actions that they are committed to carrying out, including: issuing a Latin American newsletter and developing guidance and

protocols for clean indoor air projects as well as their big and exciting plans to build a Latin American Regional Alliance.

The **Africa regional action planning group** identified a concrete action item during their group discussion to create an African Alliance that will make carbon finance information and programs available for multi-technology clean cook stove solutions in every country that will represent and address gender-related concerns and needs. The needs of the region to advance clean indoor air programs were discussed, including the need for regional groups to form a better communication network so that they can stay in touch with and support one another's programs. Faustina Boakye of Gender and Energy Network of Ghana stressed the need for greater emphasis on gender issues and offered to provide information on gender-related issues. Additional requests included help in Nigeria to scale up stove sales and to involve the government in environmental conservation programs, as well as the need for a program that presents combined multi-technology solutions marrying LPG, solar and biomass. The group then discussed offers that individuals could bring to the table to help achieve their action plan; these included offers to attend one another's programs and workshops. Other opportunities that were brought to the group's attention included regional collaborations and workshops that are in the works, such as the Ethanol Production and Use Initiative that Project Gaia is putting together in Ethiopia in conjunction with UNHCR, and a Biomass Stove Introduction Workshop in Zambia in 2011.

The prime objective of the African Alliance will be to bring the Global Alliance for Clean Cookstoves (GACC) initiatives and ideals closer to the target group in order to make them more effective. The African Alliance will also create a platform for involvement of regional leaders across Africa towards the achievement of the Global Alliance's 100 million by 2020 goal.

The African Alliance for Clean Cooking will:

- Create a regional platform for identification and better organization of country programs relevant to the GACC;
- Initiate high-level engagement with relevant authorities on enactment and implementation of appropriate policies on clean cookstoves across Africa; and
- Serve as a two-way link between the Global Alliance and the policy implementers across the continent.

The **Asia regional action planning group** discussed the resources and opportunities of their region and developed big plans to have a regional meeting within the next six months, such as an Energy Forum or training. The group also presented the idea that the next PCIA Forum be held in Asia. The resources identified by the group included different stove varieties, technologies and fuel types, best practices (including implementation and examples of successful carbon finance projects), the IAP testing centers that are available in India, Cambodia, Bangladesh and China, two large stove manufacturers, microfinance organizations, and the HEDON network. Some of the opportunities that the group identified included technical experts for CDM and Carbon Finance programs, a way to share technical expertise and services, as well as a way to make requests for services regionally, the integration of sectors, and further engagement of government and policy makers. Like the other two regions, Asia also identified the opportunity for a Regional Alliance as part of the Global Alliance for Clean Cookstoves.

PCIA is pleased to announce that on April 25th, the China Alliance for Clean Stoves (CACS) was formally established in Beijing with approval of Ministry of Agriculture. Over 300 people from government, People's Congress, enterprises, universities and research institutions attended the inaugural ceremony.

### 2011 Forum Wrap-up

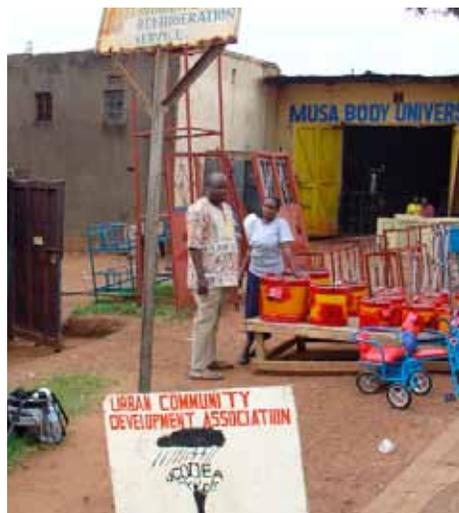
The 2011 Forum was by every measure a phenomenal success. Attendees gained a wealth of new technical knowledge, coupled with hands-on practical actions they could take to improve their program. Through innovative, interactive sessions and networking opportunities, stove program leaders from across the globe demonstrated their unwavering commitment to improving the lives and livelihood of millions of men, women and children in every corner of our world. The power of our partnership was evident in our actions and our results and we look forward to seeing this vital work advance through the Global Alliance for Clean Cookstoves in the coming years.



### In Memoriam: Kawere Muhammad



The household energy and health community lost a great friend and colleague with the sudden death of Ugastove CEO Kawere Muhammad on May 23, 2011 due to a heart attack. Kawere was a quiet but enthusiastic leader who accomplished tremendous success in Uganda and was a role model for many around the world, especially for his achievements in pioneering carbon credits for stoves. His funeral was on May 24th in Kampala; in attendance were many of Uganda’s current stove producers who had been mentored by Kawere. In them, and through Ugastove, Kawere has left a legacy that will continue to touch the lives of thousands of people in Uganda and all of us in the global stove community. Those interested in making a donation in Kawere’s memory are encouraged to check Ugastove’s website (<http://www.ugastove.com>) in the coming weeks for details; donations will go directly to Kawere’s family, and will help support education costs for his five children ages 6-19. Our thoughts and prayers are with Kawere’s family, as well as everyone at Ugastove.



The 5th Biennial Partnership for Clean Indoor Air Forum planners gratefully acknowledge the support of the following organizations for making this Forum possible.

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