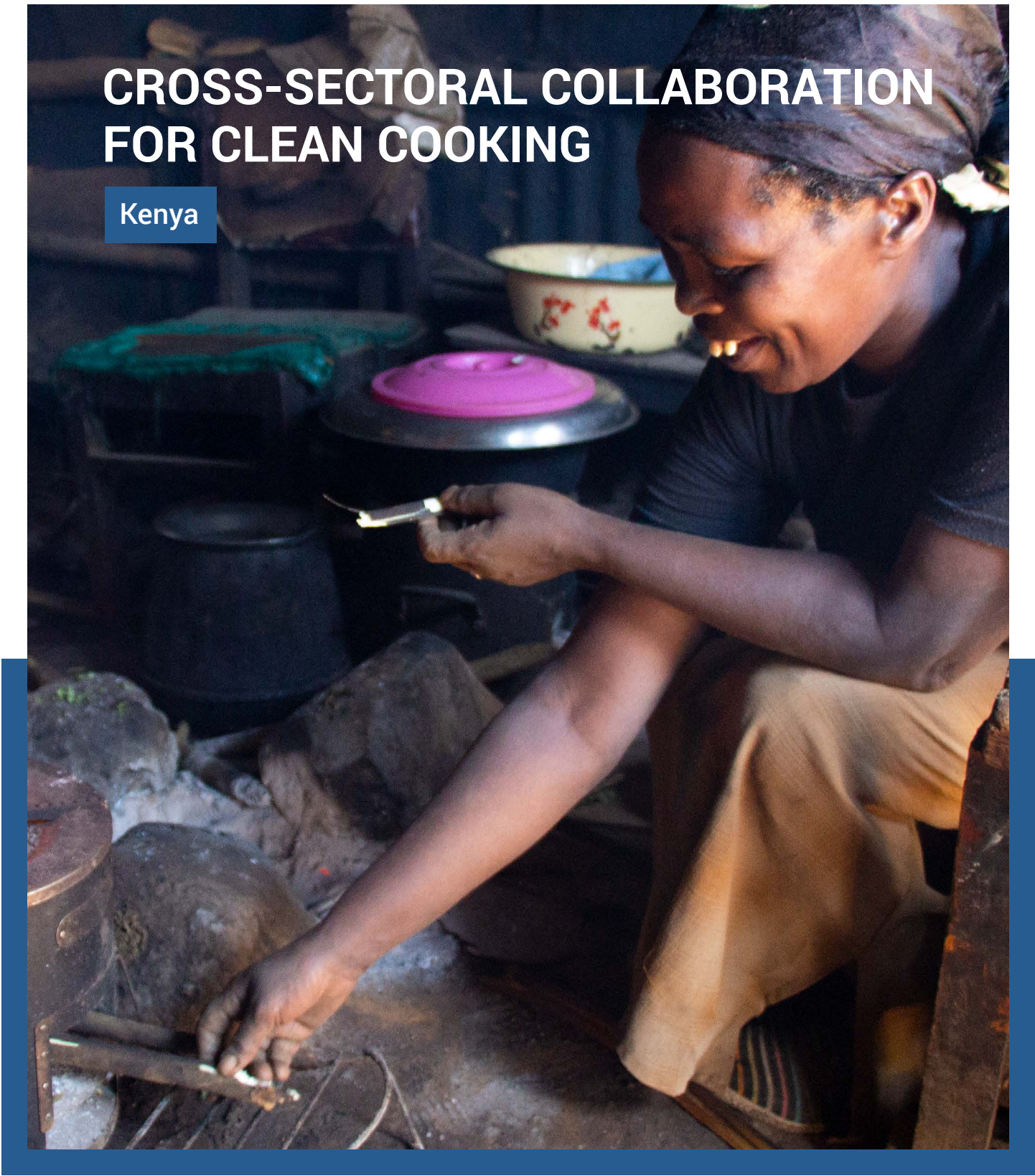


CROSS-SECTORAL COLLABORATION FOR CLEAN COOKING

Kenya



CLEAN
COOKING
ALLIANCE



BRIDGECOLLABORATIVE

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Image 2. Charcoal for sale in a market in Kenya.

» INTRODUCTION AND OBJECTIVES

The government of Kenya is dedicated to transitioning the country to cleaner, more modern stoves and fuels, and has a national goal of clean cooking for all by 2030 (Sustainable Energy for All, 2016). Even before this goal was set, the government and its partners undertook multiple clean cooking interventions, including those analyzed on this report. Examining these efforts can provide insight and guidance for future interventions.

This report analyzes two national clean cooking interventions, the Developing Energy Enterprises Project (DEEP) and the Africa Biogas Partnership Programme (ABPP), to assess if they utilized cross-sectoral collaboration, increased access to clean cooking, and achieved co-benefits, such as reducing burden of disease, climate-warming emissions, forest degradation, drudgery of fuel collection and cooking, and household fuel expenditures.

Clean cooking interventions are strengthened when multiple types of stakeholders (e.g., govern-

ment agencies, multilateral organizations, implementing organizations, consumer representatives, and entrepreneurs) and sectors (e.g., health, climate, and environment) are engaged. This report is part of a larger package that includes a similar report for Nepal; recommendations for cross-sectoral collaboration; and a generalized results chain that visualizes the potential positive and negative impacts of clean cooking.

While the case studies are country-specific, they provide broader learnings that can be applied to other contexts. This package is a resource for implementors, policymakers, and other stakeholders working collaboratively to create sustainable clean cooking interventions.

The overview and recommendations, and Nepal report, are available at:

nicholasinstitute.duke.edu/project/bridge-collaborative/publications

» COUNTRY BACKGROUND

Kenya is an East African country bordered by Ethiopia, Somalia, South Sudan, Tanzania, and Uganda. The population is 48 million, 27 percent of whom live in urban areas (United Nations, 2018). Eighty-seven percent of Kenya's population, 43 million people, depend on polluting open fires or inefficient stoves for their household cooking needs (World Health Organization, 2016b; United Nations, 2017).

Yale's Environmental Performance Index places Kenya at 130 out of 180 countries for household solid fuel use. For overall air quality, Kenya ranked 112 out of 180 (Yale University, 2018). Household air pollution (HAP) from cooking contributes to childhood pneumonia, chronic obstructive pulmonary disease, ischemic heart disease, stroke, and lung cancer (World Health Organization, 2018). Some 15,000 Kenyan people die prematurely every year from illnesses attributable to HAP (World Health Organization, 2016a). Women and children are often the main food-preparers and fuel-gatherers (Clough, 2012).

Historically, clean cooking interventions in Kenya have primarily been partnerships between international development agencies and non-governmental organizations (NGOs) that supported local artisans who made and distributed cookstoves (Johnson et al., 2015). The Kenya Ceramic Jiko (KCJ) cookstove, promoted by

the Ministry of Energy in the 1980s, was one of the largest improved biomass cookstove interventions in Africa. The KCJ is still widely used and often considered the baseline cookstove in Kenya where four million households own them (Johnson et al., 2015; World Bank Group, 2014).

The clean cooking sector in Kenya is transitioning to support more formal enterprises. In 2012, representatives from government, academia, the private sector, donor agencies, and NGOs joined together to form the Clean Cooking Association of Kenya (CCAK). CCAK facilitates the adoption of clean cookstoves and fuels by coordinating the sector, engaging the government to advocate for an enabling environment, raising public awareness, and building the capacity of manufacturers and enterprises (Clean Cooking Alliance, 2017).

Kenya has a goal of universal clean cooking by 2030 (Sustainable Energy for All, 2016). Clean cooking is part of the climate mitigation strategy in Kenya's nationally determined contribution under the Paris Agreement, and it is also included in the National Climate Action Plan 2018–2022 (Ministry of Environment and Forestry, 2017; Government of Kenya, 2018).



Image 3. A community demonstration promoting a cookstove in Kenya.

» ANALYSIS OF CLEAN COOKING PROGRAMS

This report describes the Developing Energy Enterprises Project (DEEP) and the Africa Biogas Partnership Programme (ABPP). These interventions were selected based on the availability of evaluation data, the importance of interventions in-country, and advice from expert stakeholders in-country. Both were launched in multiple sub-Saharan African countries, but we focus on the interventions' activities and results in Kenya. It is important to note that while cross-sectoral engagement and impacts were not always a primary goal of these interventions, this report focuses on these areas to inform future efforts.

3.1 DEVELOPING ENERGY ENTERPRISES PROJECT (2008–2013)

3.1.1 OVERVIEW

Started in 2008, DEEP was a five-year intervention to increase access to energy products and services and to support employment in the energy sector in Kenya, Tanzania, and Uganda. DEEP promoted the development of a sustainable and widespread industry of micro- and small-sized clean cooking enterprises through capacity building, policy engagement, financing for entrepreneurs, and supporting market linkages (World Bank Group,

2014). It was funded by the European Union and the Ministry of Foreign Affairs of the Netherlands and had a budget of EUR 4 million. DEEP was housed in the Global Village Energy Partnership, which is now Energy 4 Impact (World Bank Group, 2014).

Both formal and informal businesses were included in DEEP. Participating entrepreneurs received technical and business development training, including assistance creating basic business plans and accessing loans. In addition to training, group networking and marketing activities supported idea-sharing and learning about new technologies, and fostered collaboration among enterprises at different stages of the value chain. In addition, technical and business mentors provided one-to-one support to each entrepreneur (Clough, 2012).

DEEP was initially implemented without technical or quality product standards for its participants' cookstoves. The performance of stoves therefore varied greatly between producers, and some sub-standard products were marketed. An internal review of DEEP found that some producers compromised on quality and preferred to sell stoves with shorter lifespans, expecting customers to make replacement purchases. To address this, DEEP promoted quality standards. By 2012, some entrepreneurs voluntarily sought product certification through the Kenyan Bureau of Standards (Restio Energy, 2013; Clough, 2012).

3.1.2 RESULTS

As of June 2012, the technology businesses promoted under DEEP included improved biomass cookstoves (43 percent), solar photovoltaics (27 percent), household biogas systems (14 percent), and biomass briquetting (10 percent). DEEP

entrepreneurs primarily promoted wood and charcoal stoves, but other types were also produced (Clough, 2012). By the end of the program, DEEP had supported 206 energy businesses in Kenya, which employed 808 people and reached almost 250,000 households with their products. About 75 percent of all products sold were for cooking (Restio Energy, 2013). Finally, although not originally an objective of the program, DEEP furthered women's economic empowerment; nearly 70 percent of the cookstove businesses they supported in Kenya were female-led (Clough, 2012).

A 2015 study across all DEEP countries assessed the survival and growth of informal sector energy businesses. Of DEEP participants, 79 percent were still operating three years after the program ended. Half of the entrepreneurs who were still active were earning income exclusively from their energy business. Thus, DEEP continues to make an impact after the program formally ended.

3.1.3 STRENGTHS AND WEAKNESSES

DEEP successfully engaged both formal and informal businesses. Learnings from the formal businesses contributed to the participants' ability to access loans, legally register businesses, use technical standards, build confidence in their businesses, involve multiple actors across the value chain, and train and retain personnel. Learnings from the informal businesses contributed to the ability to reduce underemployment, use community values and labor, manufacture goods locally, maintain low overheads, and use low-tech approaches where appropriate (Restio Energy, 2013). This highlights a key benefit of collaboration, leveraging the strengths and expertise of different types of stakeholders to increase the overall value of the program.



Image 4. A Kenyan mother and child near their biomass cookstove.

However, the program's success was limited. DEEP had two objectives—to increase energy access and to support energy employment. As the focus was primarily on supporting entrepreneurs, end-user beneficiaries were not incorporated into the planning or implementation process. Customers were surveyed, but primarily on their satisfaction with purchased products.

Limiting the scope to an almost exclusive focus on energy entrepreneurs limited the potential program benefits. Energy access and clean cooking are critical development goals because they

affect health, the climate, the environment, gender equality, and livelihoods. As these impacts were not fully considered, and as customers were not a significant part of monitoring and evaluation, the extent to which the program benefited end-users is unclear. A more robust program design would have included stronger engagement of end-users and greater emphasis on impacts beyond cursory energy access. Finally, this narrow focus limited activities to address supply-side barriers. Other significant challenges to scaling clean cooking also limited the potential benefits to health, the climate, the environment, gender equality, and livelihoods.

3.2 AFRICA BIOGAS PARTNERSHIP PROGRAMME (2009–ONGOING)

3.2.1 OVERVIEW

Started in 2009, ABPP is an active biogas promotion program in Kenya, as well as Burkina Faso, Ethiopia, Tanzania, and Uganda. It supports domestic biogas as a local, sustainable energy source, with the goal of developing a commercially viable and market-oriented biogas sector (World Bank Group, 2014). ABPP is also designed to improve health, reduce deforestation, improve livelihoods, and improve agricultural productivity (by using bio-slurry, a biogas production waste product, as a fertilizer). It was established in 2009 with funding from the Ministry of Foreign Affairs of the Netherlands, as a partnership between the governments of the five countries, the Netherlands Development Organisation (SNV), and Hivos (Africa Biogas Partnership Programme, 2019; Clemens, Bailis, Nyambane, & Ndung'u, 2018).

In Kenya, the program is led by the Ministry of Energy and Petroleum with representatives from financial institutions, biogas businesses, training institutions, and research institutions. ABPP conducts several activities, many of which have been modified over the course of the program:

- » **Consumer financing.** A subsidy was initially provided to end-users that was reduced and ultimately replaced with access to credit.
- » **Business incentives.** Financial incentives are given to biogas businesses, microfinance institutions (MFIs), and agricultural cooperatives to provide after-sales service, credit and marketing.

- » **Manufacturing incentive.** Tax exemptions are available to import raw materials and biogas system components.
- » **Technical training.** Training initially focused on teaching masons to install biogas systems, but was expanded to include construction and entrepreneurship training.
- » **Operational training.** End-users are given training on the use and maintenance of the digesters.
- » **Customer support.** After feedback from end-users, call centers were introduced to facilitate after-sales service and repairs (Clemens, Bailis, Nyambane, & Ndung'u, 2018; World Bank Group, 2019).

These activities were designed to increase the number of biogas digesters, strengthen institutions, and optimize co-benefits.

3.2.2 RESULTS

As of May 2019, an estimated 21,000 biogas systems have been constructed. As of 2018, 72 percent of systems constructed during the first five years of the project were operational and 90 percent of those constructed between 2014 and 2017 were operational (World Bank Group, 2019).

Reported benefits from a 2017 survey of end-users include:

- » Reduced eye-problems and respiratory systems for 80 percent of respondents;
- » Reduced fuel consumption or expenditures for 84 percent of respondents;
- » Reduced time or effort compared to obtaining woodfuel for 54 percent of respondents; and
- » Improved crop yields for 84 percent of respondents (Clemens, Bailis, Nyambane, & Ndung'u, 2018).

In addition to these self-reported benefits, fuel consumption assessments conducted between 2014 and 2016 found an average annual reduction of up to three tonnes of wood used in households with biogas systems compared to similar households without them (Clemens, Bailis, Nyambane, & Ndung'u, 2018).

3.2.3 STRENGTHS AND WEAKNESSES

ABPP evolved over the life of the program. The shift from subsidies for end-users to financial incentives for lending institutions demonstrates that long-term sustainability is a key consideration within the program. As co-benefits for health, the climate, and the environment were identified as goals at the beginning, they were built into the program design and monitored. Consistent use is critical to achieve these outcomes. When early feedback indicated that some biogas systems were not operational, customer-support and after-sales services were increased. This responsiveness is also indicative of robust monitoring and evaluation, as the program was modified based on feedback.

While ABPP has been successful in some aspects, there are opportunities for improvement. The biogas market in Kenya remains nascent. An evaluation from Clemens et al. identified limited policy support and government engagement as a cause of this slow development. For example, the tax exemption for raw materials is contingent upon importing higher volumes of goods (preventing smaller businesses from taking advantage of it), and the process for obtaining the exemption is unclear to entrepreneurs (Clemens, Bailis, Nyambane, & Ndung'u, 2018). This example highlights the importance of not just partnering with a range of stakeholders, but also actively engaging them throughout program design and implementation.

While the emphasis on long-term sustainability is important, some of the program shifts may have come too early. Credit was intended to replace subsidies, but was limited in scope. This shift in financing has slowed the uptake of biogas systems (Clemens, Bailis, Nyambane, & Ndung'u, 2018). Program modifications can have multiple effects. While these changes did shift responsibility from the public sector to the private sector, they also limited the end-users' access to the biogas systems. The potential impact of program design choices should be considered for each stakeholder group.



Image 5. Biogas systems, like the Kenyan one pictured here, require waste from cattle to produce energy.

» LIMITATIONS AND CONCLUSION

Kenya has been a leader in the clean cooking market since the 1980s, and the government is dedicated to providing cleaner, more modern cooking technologies and fuels. With the support of many international development partners, NGOs, and other governments, Kenya is progressing toward its national goal of clean cooking for all by 2030 (Sustainable Energy for All, 2016). Although DEEP and ABPP supported the development of a viable clean cooking market, additional work is needed to achieve this goal. Lessons from these two interventions include the need to support sustained use of stoves and fuels, meaningfully engage with all key stakeholders during both design and implementation, thoughtful consid-

eration of potential co-benefits, and robust monitoring and evaluation.

There are two key limitations to this report. Available data may not have fully captured the co-benefits achieved by these interventions. This sample of two interventions may not be representative of all clean cooking programs implemented in Kenya.

Nonetheless, the detailed description of the goals and achievements of DEEP and ABPP may be useful for policymakers and other relevant stakeholders when crafting future clean cooking interventions.

» REFERENCES

- Africa Biogas Partnership Programme. (2019). About Us. (ABPP) Retrieved from africabiogas.org/about-us/
- Clean Cooking Alliance. (2017, January 30). Partner Spotlight: Clean Cookstoves Association of Kenya. (Clean Cooking Alliance) Retrieved from cleancookingalliance.org/about/news/01-30-2017-partner-spotlight-clean-cookstoves-association-of-kenya.html
- Clemens, H., Bailis, R., Nyambane, A., & Ndung'u, V. (2018). Africa Biogas Partnership Program: A review of clean cooking. *Energy for Sustainable Development*, 46, 23-31. doi.org/10.1016/j.esd.2018.05.012
- Clough, L. (2012). The Improved Cookstove Sector in East Africa: Experience from the Developing Energy Enterprise Programme (DEEP). Retrieved from energy4impact.org/sites/default/files/deep_cookstoves_report_lq_for_web.pdf
- Government of Kenya. (2018). National Climate Change Action Plan (Kenya): 2018-2022. Retrieved from lse.ac.uk/GranthamInstitute/law/national-climate-change-action-plan-2018-2022-nccap/
- Johnson, O., Wanjiru, H., Muhoza, C., Lambe, F., Jürisoo, M., Amatayakul, W., & Chenevoy, A. (2015). From Theory to Practice of Change: Lessons from SNV's Improved Cookstoves and Fuel Projects in Cambodia, Kenya, Nepal and Rwanda. Retrieved from sei.org/mediamanager/documents/Publications/SEI-WP-2015-09-SNV-cookstove-market-transformation.pdf
- Ministry of Environment and Forestry. (2017). Nationally Determined Contribution Sector Analysis Report 2017: Evidence Base for Updating the Kenya National Climate Change Action Plan. Retrieved from starckplus.com/documents/ta/ndc/NDC%20Sector%20Analysis%20Report%202017.pdf
- Restio Energy. (2013). Final Report: Terminal Evaluation of the Developing Energy Enterprises Project in East Africa. Retrieved from energy4impact.org/file/1711/download?token=A0oR2szT
- Sustainable Energy for All. (2016). Kenya Action Agenda. Retrieved from se4all-africa.org/fileadmin/uploads/se4all/Documents/Country_AAs/Kenya_SE4ALL_AA_January_2016.pdf
- United Nations. (2017). World Population Prospects: The 2017 Revision. Department of Economic and Social Affairs, Population Division. New York City: United Nations. Retrieved from Department of Economic and Social Affairs, Population Division: population.un.org/wpp/Publications/

- United Nations. (2018). The World Urbanization Prospects 2018. Department of Economic and Social Affairs, Population Division. New York City: United Nations. Retrieved from United Nations Department of Economic and Social Affairs, Population Division: population.un.org/wup/Publications/
- World Bank Group. (2014). Clean and Improved Cooking in Sub-Saharan Africa. Retrieved from documents.worldbank.org/curated/en/164241468178757464/Clean-and-improved-cooking-in-Sub-Saharan-Africa-a-landscape-report
- World Bank Group. (2019). The Power of Dung: Lessons Learned from On-farm Biogas Programs in Africa. Retrieved from documents.worldbank.org/curated/en/468451557843529960/pdf/The-Power-of-Dung-Lessons-Learned-from-On-Farm-Biogas-Programs-in-Africa.pdf
- World Health Organization. (2016a). Global Health Observatory Data Repository. Retrieved from apps.who.int/gho/data/node.main.BODHOUSEHOLDAIRDTHS?lang=en
- World Health Organization. (2016b). Percentage of the Population Using Clean and Polluting Fuels and Technologies for Cooking. Retrieved from apps.who.int/gho/data/node.main.134
- World Health Organization. (2018). World Health Organization Fact Sheet. Retrieved from Household Air Pollution and Health: who.int/en/news-room/fact-sheets/detail/household-air-pollution-and-health
- Yale University. (2018). 2018 Environmental Performance Index: Air Quality. Retrieved from epi.envirocenter.yale.edu/2018-epi-report/air-quality



Image 6. A variety of biomass cookstoves on display in Kenya.

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The Clean Cooking Alliance works with a global network of partners to build an inclusive industry that makes clean cooking accessible to the three billion people who live each day without it. Established in 2010, the Alliance is driving consumer demand, mobilizing investment to build a pipeline of scalable businesses, and fostering an enabling environment that allows the sector to thrive. Clean cooking transforms lives by improving health, protecting the climate and the environment, empowering women, and helping families save time and money. Learn more at [CleanCookingAlliance.org](https://www.CleanCookingAlliance.org).



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