SPECIAL FEATURE SEAR

ENERGY ACCESS AND GENDER

GETTING THE RIGHT BALANCE

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SEAR

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INTRODUCTION

More than 1.1 billion people globally lack access to electricity, and 2.9 billion lack access to clean cooking fuels. Why does gender matter in access to energy services? One focus of the gender, energy, and poverty narrative has been that since women play a significant role in energy systems as part of their subsistence and productive tasks, they are disproportionately affected by energy shortages. In recent years however, there is a growing awareness that energy, as a critical enabler to development, can also play a transformative role in the lives of men and women by enhancing their productivity and effectiveness at home and at work. For example, when women gain physical access to a connection and make use of energy services, the poverty reduction impacts are multiple, on health, income generation, and family. At the same time, there is evidence that going beyond their traditional role as "users" and "beneficiaries," women have started playing a role in expanding energy access—thereby becoming part of the solution to expand energy access for all.

Men and women differ in the purposes for which they need and use energy and in their levels of access. Ensuring equitable development outcomes of energy interventions necessitates factoring in these differences. This paper explores the linkages between gender, energy, and poverty and the empirical evidence on these linkages—with an emphasis on electricity and cooking energy. It also reviews global experience on what strategies and approaches have been employed to integrate a gender perspective in energy, what results have been achieved, and good practices and lessons learned. Unfortunately, most energy access projects and programs continue to deal with gender issues on a piecemeal basis and do not mainstream gender systematically in project frameworks, and for monitoring results and impacts. Thus, the key challenge now is to use both the lessons learned from the past and new evidence to increase energy access for both men and women.

THE CASE FOR A GENDER PERSPECTIVE ON ENERGY ACCESS

In developing countries, the links between energy access and impacts on poverty reduction can materialize in three ways—all of which involve women in a different way than men.

First, women with energy access hold a special role in poverty reduction. Where physical energy access is translated into actual use of energy services, it can help reduce poverty by: (i) saving time (by substituting for manual labor) and enhancing convenience and comfort; (ii) reducing the use of polluting energy forms such as woodfuel and kerosene; (iii) creating opportunities for new options for income generation and for enhancing existing ones;(iv) building social capital in education and health, a precondition for women's empowerment; and (v) providing access to information and entertainment. Since women are the primary users and often producers of energy, interventions that do not reach women or meet their needs adequately risk ignoring a key section of the population—in turn, reducing the odds of the technologies being adopted and used (Cecelski, 2000, GACC 2014, ENERGIA, 2011).

But even where energy supply infrastructure is physically available, the poor and women are often hindered in their use by lack of finance, appliances, information, and training or education. In addition, institutional structures are often skewed toward men, and in many households, men have a stronger decision-making role. Thus, a gender "neutral" approach that overlooks these differences could have unintended differential impacts and benefits for men and women, and may inadvertently end up perpetrating gender inequalities. For example, obtaining subsidized electricity connection or liquefied petroleum gas (LPG) registration may require a bank account and extensive paperwork, which places women and their enterprises (which are mostly informal) at a disadvantage.

Second, women with energy access can mean more connections and usage. Targeting women as a specific and distinct target group for energy services offers a way to expand the customer base. In Botswana, an Energy Department survey showed that female-headed households connected to the grid at only half the rate of male-headed households, a significant statistic considering that 52 percent of all rural households in Botswana are female-headed (ENERGIA, 2011). Household appliances (such as stoves) should be designed in collaboration with the end user to increase the likelihood of their being accepted and used by women. In Kenya, a study on improved cookstoves reveals that customers that purchased a cookstove from a woman (rather than a man) were more likely to report that they not only used it all of the time but also felt it was better overall than their traditional stove and safe and easy to use (GACC 2015a).

Third, women in energy jobs can improve the workings of the energy supply chain. Two reasons to support women participating in energy supply chains are to: (i) encourage gender equality in employment, and (ii) improve the effectiveness of the energy supply chain. This chain provides job opportunities for the poor (including women) at different levels and steps—ranging from policy development and enterprise operation to infrastructure development and sales of energy services. Since energy sector employment is currently male dominated, opening up the sector to women in non-traditional jobs would increase their chances of income generation and empowerment. The World Bank's World Development Report 2012 on gender reports that female employment in the electricity, gas and steam, and water sectors is half the level of male employment (WDR, 2012). Further women, who are part of social networks that differ from those of men, have access to hard-to-reach households that might want to buy household energy devices (GACC, 2014).

THE GENDER, ENERGY, POVERTY NEXUS

Over the past decade, a great deal of empirical evidence has been gathered to buttress the case for ensuring that women have the same access to energy services as men. The ripple effects for individuals, the family, communities, and even the country are many and important. However, the gender energy gap that is related to women's roles and responsibilities in cooking continues to increase.The latest reports on Sustainable Development Goal 7, which calls for universal access to modern energy services, shows that while progress to reach the electricity target is largely on track, the population lacking access to clean cooking energy is increasing, as it is lagging behind population growth.

Saving time and reducing drudgery

Modern energy services help women save time by substituting for manual labor and reducing workloads. Fetching fuel, fodder, and water for homes, and manual grinding or pounding of grains or tubers as food preparation are heavy tasks that demand an inordinate amount of time and effort.

- Studies in Africa indicate that the weight of average firewood head-loads is typically well above 25 kilograms (or about 55 pounds) (Matinga 2010).
- Time spent on fuelwood collection depends on region, season, and wood availability, but typical numbers are 4–10 hours per week or 1–2 hours on average per day (Matinga 2010, Charmes in Kohlin 2011).
- Data sets from five African countries showed that fuelwood collection can be the "assigned" role of men or of women, the ratio of time spent by women to men being 4:1 in Benin and 1:2 in Madagascar (Charmes, in Kohlin et al 2011).
- In rural Gujarat, India, women spend up to 40 percent of their waking time on collecting fuel or cooking (SEWA, 2014, cited in World LP Gas Association, 2014).
- In resource scarce areas like Eastern Zimbabwe, collecting water can take over 10 hours per week (Mehretu and Mutambira, 1992 in WDR, 2012).
- Women spend at least twice as much time as men on domestic work, and when all work—paid and unpaid—is considered, work longer hours than men (UNDESA, Duflo, 2012). They have a long working day, between 11 and 14 hours, compared with around 10 for men (Biran, 2004, ENERGIA, 2006, Barnes and Sen, 2004, Massé and Samaranayake, 2002).

Releasing women's time is a prerequisite for them to invest in education, their agency, and life choices, along with freeing them up to seize economic opportunities and participate in economic, political, and social life (WDR, 2012). One way to do this is with improved cooking devices, and LPG stoves, which can mean less fuel collection and shorter cooking times. Moreover, studies from India suggest that these savings can be even greater for cooking (up to one to one and a half hours per day) than for fuel collection (about 15 minutes per day) (World LP Gas Association, 2014). A second way is with modern water pumps. In Zanzibar, electrified water-pumping to central places in villages has helped women save three hours a day (Winther, 2008). And less time spent on water collection can significantly boost school enrollment for boys and girls in countries where substantial gender gaps exist (Koolwal and van de Walle, 2010). A third way is with small-scale mills—in Mali, women reported saving two and a half hours a day on processing grains (Porcaro and Takada 2005).

Improving health

Better energy services can reduce indoor air pollution and enable other health benefits for women and children. In 2012, 4.3 million deaths (mainly women and children) were caused by household air pollution from fumes from biomass based fuels, accounting for 7.7 percent of global mortality,[1] and in 2000, indoor air pollution was ranked as the fourth leading cause of premature death in developing countries (Smith et al, 2005). Today, in many regions (such as South Asia and parts of Sub-Saharan Africa), it has become the most important risk factor for ill health—higher than risk factors such as unsafe water and sanitation. Mortality from indoor air pollution exposure in Sub-Saharan

Africa already exceeds tuberculosis, is roughly on par with malaria, and could approach the level of HIV/AIDS by 2030 (World Bank, 2012 and Smith et al., 2013, cited in AFREA, forthcoming).

What can be done? Studies show that improved or advanced cookstoves can offer higher levels of performance in terms of efficiency, pollution control, and safety. The World Health Organization (WHO) suggests that investing in clean fuels and improved stoves would repay itself many times over in less ill-health and more economic benefits (WHO, 2006, cited in WLPGA 2014).

Currently, 58 percent of health care facilities in Sub-Saharan African countries have no electricity, but multi-sectoral approaches that integrate energy delivery with other development priorities are showing promise. In northern Mozambique, VidaGas' supply of LPG to health clinics has contributed to a 36 percent increase in the number of children immunized in participating districts (Sprague, 2007).

Improving education

Electrification offers significant benefits, many of which are especially relevant for women and children. Lighting enables greater flexibility in the organization of work patterns (Barkat et al 2002, Laksono 2003, Winther 2008), which has a large impact when time is scarce, as it is for women in most developing countries. It also enables children to study. Lewis (2013) found that one of the long-run impacts of household modernization (including electrification) is increased investment in children—and when targeted toward daughters is associated with long-term increases in female employment. In Brazil, the electrification experience shows that girls in rural areas with access to electricity are 59 percent more likely to complete primary education by the time they are 18 years old than those without (Deloitte, 2014). In Bangladesh, women's literacy was found to be more than 20 percent higher in electrified households in Bangladesh (Barkat et al., 2002).

Boosting income

Energy access plays a critical role in diversifying women's livelihoods through productive uses that increase incomes and reduce poverty. The potential impact of greater energy access on income generation are high, as products or services can be improved, processes made more efficient (saving time), costs of operation reduced, and working conditions improved.

Once an enterprise has access to modern energy, the benefits depend on a range of factors including whether new customers or markets can be found. In certain sectors, modern energy services provide new opportunities for income generation (like cooling and freezing in food processing and milling). In others, improved or additional services are enabled (like locking and embroidery instead of only stitching in tailoring businesses). Communication with customers and suppliers by telephone and sometimes computer may support or even be a condition for operation of an enterprise. At times, the main benefit may not be directly related to providing new or improved products or services, but rather comfort or flexibility of opening hours thanks to electric lights, fans, or heaters.

Although energy services for income generation may appear gender neutral, the reality is that female entrepreneurs face more barriers to access to energy than men. In many societies, women's mobility is restricted, forcing them to locate their enterprises at home (GACC, 2014, IMF, 2013). While this helps them to combine household chores and income generation, they are often at a distance from drop-off points for diesel and LPG or petrol stations, and less likely to be electrified. Plus the impact of energy services on productivity depends highly on the size and saturation of the local market, and the skills and social network of the entrepreneur to extend markets (Kooijman 2008 and 2012), in which energy services in communication can play a supporting role. An example of this is solar drying of fruit in Uganda, where women found export outlets through the internet.

Offering social benefits

When a woman is given an opportunity to earn an income, it helps in many other areas of her life. Studies show that women reinvest 90 percent of their income in their families and communities, while men reinvest only 30 to 40 percent; thus the implications for economically empowering women can reach far beyond the individual (Borges, 2007). Women are also more likely than men to invest a large proportion of their household income in the education of their children, including that of girls (Lewis, 2013; IMF, 2013). According to the ILO, women's work, both paid and unpaid, may be the single most important poverty-reducing factor in developing economies.

SOLUTIONS IN SCALING UP ENERGY ACCESS: WHAT STRATEGIES HAVE BEEN ADOPTED?

In recent years, the linkages between energy access and gender have encouraged practitioners to incorporate gender-related actions into operations. Methodologies and good practices are emerging, in three key areas: (i) "engendering" energy projects, programs, and policies through gender mainstreaming; (ii) empowering women to contribute directly toward expanding energy access as energy entrepreneurs; and (iii) financial inclusion, pricing, and subsidies.

"Engendering" energy projects, programs, and policies through gender mainstreaming

Gender mainstreaming ensures that women as well as men participate and benefit from energy access, both as household consumers and as entrepreneurs. Gender mainstreaming can be defined as "the process of assessing the implications for women and men of any planned action, including legislation, policies or programs, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, and monitoring and evaluation of policies and programs in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated."[2] The process—referred to as "engendering"—ensures that the different roles, access, and control over resources by women and men are

accounted for in project and policy design so that total benefits can be maximized and gender equality is advanced.

Over the past decade, several organizations have taken this approach with energy programs and policies, for example, ENERGIA, Global Alliance for Clean Cookstoves, Asian Development Bank, and ECOWAS. Since 2007, ENERGIA supported more than 35 medium/large scale energy access projects in Africa and Asia to mainstream gender. In addition, it is currently working with 3,750 women-led micro and small entrepreneurs in 7 countries, who have sold energy technologies to 1.8 million people. The AFREA Gender and Energy Program of ESMAP piloted gender activities in 6 countries (Senegal, Benin, Mali, Kenya, Tanzania, and Zambia). And the Global Alliance on Clean Cookstoves has been supporting its grantees under the Spark Fund[3] to integrate and mainstream gender within their companies and operations.

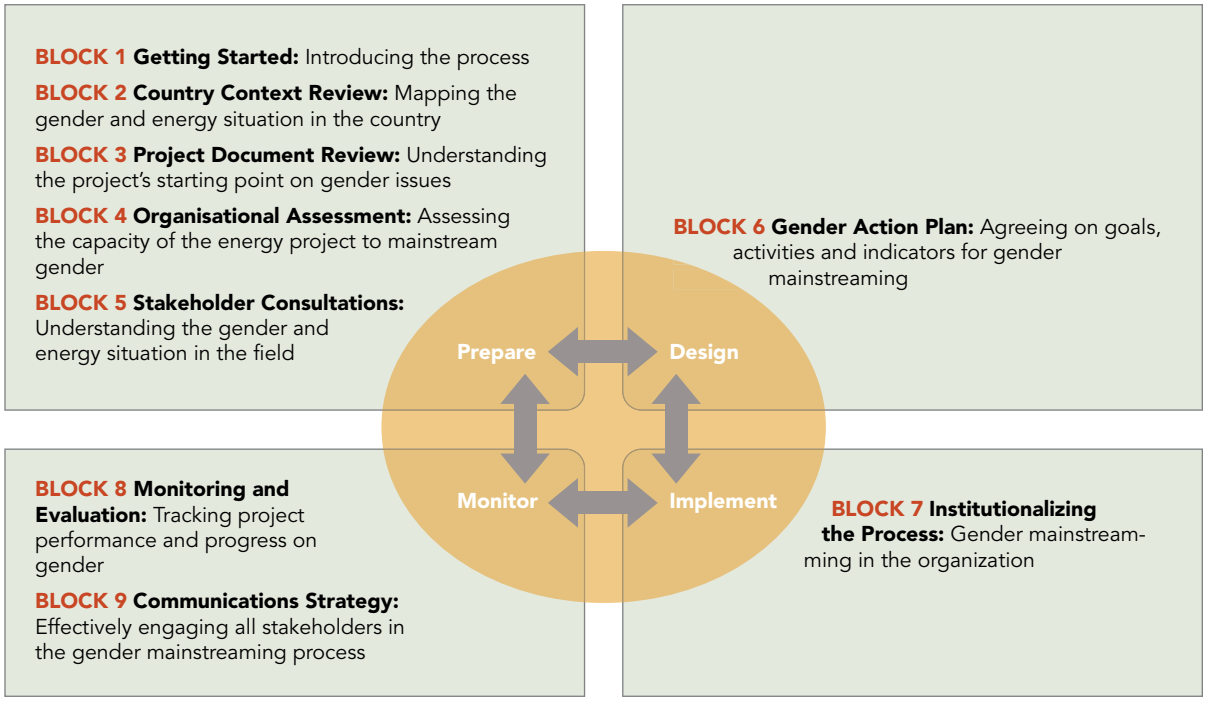
The gender mainstreaming process is a step by step methodology, using gender analysis throughout the project cycle (UNDP, 2004; ENERGIA, 2011; World Bank, 2013). It involves several elements:

- Gender assessments/scoping studies that identify key gender issues, risks, constraints, and opportunities associated with a proposed energy sector initiative, with results included in the programming cycle to increase accountability for results.
- Gender organizational analysis of institutional partners to develop and implement gender action plans and to measure gender-related organizational change. Gender strategies and action plans (such as preparing monitoring and evaluation plans with key gender-sensitive performance indicators).
- Gender training and coaching programs customized to the program context.
- Gender audit/review of energy sector policies and programs

Energia visualizes the mainstreaming approach as consisting of four stages (preparing, designing, implementing, and monitoring) and seven blocks (from getting started to institutionalizing the process), as show in figure 1. Each step builds on and reinforces the previous ones but can also be carried out as a separate activity. For example, a project already in the implementation stage can be "retrofitted" to make the ongoing activities more gender-responsive by using the tools suggested in Block 3. Similarly, a project planning an end-of-project evaluation can use Block 8 to mainstream gender into its terms of reference for evaluation.

In large-scale energy infrastructure projects, such as hydropower development, environmental and social impact assessments (ESIAs) have typically failed to identify gender issues. When gender mainstreaming has been incorporated through the ESIAs, the approach informs the planning process by detailing how men and women perceive proposed interventions and the features they would like in technologies(ENERGIA, 2014). Such information is especially relevant for large-scale energy infrastructure and extractive industries that can have deep impacts on the communities involved.

FIGURE 1: Stages in mainstreaming gender concerns in energy projects



Source: Cecelski and Dutta, *Mainstreaming Gender in Energy Projects: A Practical Handbook*, ENERGIA, 2011)

A good example of gender mainstreaming is the Lao Rural Electrification Program. Between 1995 and 2010, this program increased electricity access across the country from 16 percent to 71 percent, but there were large urban-rural disparities, as well as gender disparities. The key issue, as shown by a 2004 social impact survey, was that in electrified villages, 20–40 percent of the households (especially those living below the poverty line or headed by females) would not connect to the grid because they could not afford the connection charges of $80–100. In 2008 the Power to the Poor (P2P) scheme was launched, implemented by Electricité du Laos (EDL), to get these households connected. It is a targeted, subsidized affordable, and sustainable financing mechanism for connection and indoor wiring for the poorest rural households– specifically designed with a gender focus. The monthly payments for credit and electricity consumption are designed to be about the same as the cost for lighting by candles, diesel lamps, or car batteries prior to electrification. The pilot results show that the program increased connection rates for female-headed households from 63 percent to 90 percent, while the overall connection rate increased from 78 percent to 95 percent (ESMAP 2015, Carlsson Rex and Jie Tang). The program is now being expanded throughout the country.

Similarly, at the household level, there are many good examples of mainstreaming gender concerns in energy projects, especially in clean cooking. The Global Alliance on Clean Cookstoves has compiled good practices that help to increase the number of women engaged in market activities and to address gender issues that prevent the adoption of clean cooking solutions. (A summary of good practices/specific gender focused activities that have been mainstreamed into electrification and in household energy projects is included in the Appendix.)

Gender audits/ reviews of national energy sector policies

ENERGIA has been using gender audits as a tool to identify and analyze factors that hinder efforts to mainstream gender in energy policy. Gender audits have been conducted in several countries, including Botswana, Kenya, Ghana, Nigeria, Nepal, India, Zambia, and Senegal. The approach used is a participatory one led by a national team of experts. The gender audits provide in-depth analysis of energy planning, budgets; the institutional capacity of ministries to implement gender-mainstreaming strategies; and the links between gender, energy, and the national objectives for poverty reduction strategies.

The audits identify specific ways in which gender issues are, or are not, addressed, and critical gender gaps in existing national energy policy formulation and implementation. Validation workshops help to reach consensus and ownership of the audit findings within the energy ministries—and offer a forum to discuss recommendations and agree on actions with specific targets and time frames. The final reports produced from the gender audits are considered semi-official documents.[4]

In countries where gender audits were undertaken, they were seen to enhance the organization's capacity to examine its activities from a gender perspective and promote gender equality; to build organizational ownership for gender equality initiatives; and to sharpen organizational learning on gender. Moreover, in some countries where gender audits were implemented, changes in energy policies have been witnessed.

In Kenya, the 2007 audit of energy policy and related projects and programs,[5] contributed to: (i) sensitizing and influencing key decision makers from the Kenya Ministry of Energy and Petroleum, Kenya Power, SCODE, and Practical Action Eastern Africa to adopt gender approaches in their planning; (ii) arranging a follow-up gender organizational assessment of Kenya Power so that the company's gender policy and strategy could be endorsed;, (iii) influencing the planning of the SE4All Action Agenda and Investment Prospectus; and (iv) securing funding (by the EU and Hivos) of the improved cookstoves programs for household and institution (implemented by SCODE). In addition, although the 2004 energy policy had scant reference to gender mainstreaming, the revised policy in 2011 incorporated gender issues.

In Botswana, a gender audit[6] of the energy sector showed that, although there was a common understanding of the different roles of women and men, the knowledge of the relationship between gender, energy, and poverty was still limited. Based on the outcome of the audit and subsequent training initiatives, awareness about the importance of the gender-energy nexus has increased within the government and the Botswana Power Corporation (BPC)—which recently started a gender mainstreaming programme for rural electrification. The audit also led to a pilot project for collecting gender-disaggregated data and strengthening gender expertise in the country's energy sector, and the Ministry of Energy carried out a survey on demand-side management in which questions were asked on energy use in households according to gender.

In Zambia, a gender audit[7] of the National Energy Policy culminated in the Zambia Gender and Energy Mainstreaming Strategy (2011–2013). As a result, the Zambia Electricity Supply Corporation Limited (ZESCO) is implementing the Increased Access to Electricity Service (IAES) Project—which enables women to be more effective economic agents, using rights-based development approaches that focus on greater economic opportunities and the freedom to work in security and dignity.

In Senegal, staff members of ministries that participated in gender audits mainstreamed gender into their own program—as occurred with GiZ PERACOD (Promote Rural Electrification and a Sustainable Supply of Domestic Fuel). The audit also facilitated the financing of the evaluation of the inclusion of gender in the Rural Electrification Program (ASER) by the World Bank as part of the AFREA program.

ENGAGING WOMEN AND THEIR NETWORKS TO DELIVER ENERGY PRODUCTS AND SERVICE

The second group of good practices for scaling up involves ways to get energy services out to difficult-to-reach households at scale, with a focus on engaging women-centric sales force—and there is growing evidence that women can play a critical role in the promotion, sales, servicing

and financing of household energy devices (see Box 1) (Kohlin et al, 2011; Smith and Dutta 2011; Cecelski, 2000; Batliwalla and Reddy, 1996; Dutta, 2005, cited in GACC 2015a). Worldwide, a large number of women are engaged in small and medium-sized enterprises (SMEs). According to ILO statistics on non-agricultural employment from 40 countries, there are 375 million people in informal employment (29 percent women and 71 percent men). Of these, 156 million are self-employed in informal industries (34 percent women and 66 percent men). Despite lack of data for the informal sector and lack of clarity on the definition of the term informal, it is clear that the number of informal sector workers is high, involving a large number of women (ILO, 2015). At the same time, women play a central role as primary cooks and household energy managers, which provides a ready springboard for selling energy products and services.

All of the scaling-up initiatives work on a two-pronged strategy: (i) popularization of clean energy; and (ii) empowering women entrepreneurs to educate people in their communities on the benefits of using clean energy products—and make them customers. Three notable initiatives include:

- ENERGIA's WE programme (2014–2017) is aimed at scaling up proven business models that will strengthen the capacity of 3,000 women-led MSEs (micro and small enterprises) to deliver energy products and services to more than 2 million consumers.
- wPOWER, an initiative of the U.S. Department of State with USAID, works through partners in India, East Africa, and Nigeria, to empower more than 8,000 female entrepreneurs to provide clean energy access to more than 3.5 million people (Koclar and Bonnie Carlson).
- Women's Empowerment Fund of the Global Alliance for Clean Cookstoves, a grant facility, is designed to scale up effective business models and approaches for empowering women energy entrepreneurs in the clean cooking sector.

Some experiences in working with women in energy are summarized below.

Business models used range from consignment arrangement,[8] to entrepreneurs being linked to micro financing institutions (possibly through use of loan guarantee funds, which lowers the risk for the financing institutions), to women individually or in groups taking on manufacturing or assembling devices, to women's networks raising awareness of issues like pricing and safety. A common element in the models is to educate the purported beneficiaries on the technology, its use, and maintenance, along with facilitating the lowering of the purchase cost of the devices. Many of these initiatives primarily aim at empowering women entrepreneurs, and receive significant external support; an important question that needs to be examined is under what conditions they are (or should be) financially sustainable and scalable.

As of now, systematic and large-scale data on income increases experienced by women entrepreneurs is still being collected, but early results look promising. In India, Swayam Shikshan Prayog (SSP), a wPOWER partner, is working with women entrepreneurs, who have, over two years, increased their incomes by 33 percent. Another wPOWER and ENERGIA partner, Solar Sister, established in 2010, works with more than 2,000 women entrepreneurs in Uganda, Nigeria, and Tanzania, and has reached clean energy to 549,865 people. Solar Sister equips women to build their own technology driven businesses and provides a holistic package of inputs (including business and technical training, a quality brand, access to world class products and service, marketing support, and ongoing coaching). A study conducted by ICRW (ICRW, 2012) showed that the Solar Sister Entrepreneurs earn an average of $48 a month. Additionally, women reported indirect economic benefits. For example, as users of solar lanterns, they can save about 30 percent of fuel expenses on kerosene. And since they spend less time collecting firewood and have light at night, they have more time to engage in income-generating activities.

The experience of the different organizations working with women entrepreneurs is highlighting several elements that are common to the core business model:

Recruit-train-mentor. Women typically start with small energy businesses, but with consistent support and mentoring, many go on to become social leaders in their communities. The process starts with a very careful selection process, clearly identifying the barriers each of them faces and systematically addressing them. A common thread in all interventions is continuous mentoring to support business development to the entrepreneurs. It is necessary to take the support package right to the door of the entrepreneur, work around their domestic chores, and demystify "business" when working with women. Energy 4 Impact

BOX 1

Women and Cookstoves Sales

Since women are the primary users of cookstoves, they are in a position to drive demand and catalyze more consistent and sustained use and adoption. A recent survey in Kenya shows that women-led sales of improved cookstoves offers additional benefits for adoption and customer satisfaction (GACC 2015a): women outsold men by a margin of nearly 3:1, and when women sold to other women, consumers reported greater satisfaction with the cookstove, better knowledge of cookstove benefits, and more regular use.

TABLE 1 How women in energy make a difference

ORGANIZATION	SCALE OF INTERVENTION
Energy 4 Impact	About 3.2 million reached through 640 women entrepreneurs in East and West Africa
Practical Action East Africa	Annual dissemination of about 10,000 stoves in Kenya
EcoFuel Africa	About 1,250 women engaged in producing char and green charcoal briquettes
Kopernik Solutions	About 235,000 people reached through clean energy and water solutions. Working with 3,000 women entrepreneurs in Indonesia.
Sakhi Unique Rural Enterprise (SURE)	A network of more than 550 women entrepreneurs (Sakhis) trained; have sold about 86,000 clean cookstoves in India
Grameen Shakti	Sold over 1 million solar home systems and 600,000 improved cookstoves so far in Bangladesh. The network of 11,000 trained technicians and engineers includes a network of 3,500 women renewable energy technicians.
GERES	Over 3 million improved cookstoves sold in Cambodia since 2003. Out of these, 450,000 are of Neang Kongrey Stove (NKS) type, these are sold in rural Cambodia. About 8,000 NKS are disseminated each month, with women as stove builders
SEWA	Disseminated clean cook stoves and solar lights to 200,000 of its members in India

Senegal provides a range of advisory services to MSEs (covering strategic planning, investments, operations/logistics, financial planning and analysis, marketing and sales and project development, and training).

Address financing barriers. While a robust product is central to the model, so is ensuring that the consumer is able to afford the product, and at the same time, the entrepreneur has access to funds to meet both investment and recurring costs. Kopernik addresses the "initial investment barrier" faced by women entrepreneurs by providing initial inventory on consignment, a starter kit of sales and marketing materials, and mentoring (see Box 2). Energy 4 Impact Senegal, along with its partner SEM (social and ecological management) Fund, tries to bridge the financing gap by facilitating access to capital by linking with local financial institutions, supporting their lending to the MSEs by a partial risk guarantee and training.

Build on a local network of trust. In introducing new technology, gaining the trust of local communities—especially in remote villages where the social fabric is cohesive—has been found to be an important entry point. Building on this social dynamic, it is vital to work closely with individuals, organization, and networks that enjoy local trust (like community-based organizations, cooperatives, savings and loans groups, schools, churches, and local government representatives). CRT/N Nepal works with electricity user cooperatives; and GERES in Cambodia works with wives of village officials, female leaders, and female heads of Village Development Committees (see Box 2)(GACC, 2014).

Be flexible to accommodate women's multiple responsibilities. Given women's multiple responsibilities and varied roles that they need to perform, business models that allow for flexibility work well. Since the women producers are able to produce the cookstoves at their homes, they can complete their household responsibilities while also producing the cookstoves. Additionally, because they are also using the NKS in their own homes, the time saved in firewood collection allows additional time for other pursuits, including cookstove production. This is also appreciated by the Solar Sisters who are able to sell solar products when they go to the weekly markets to sell other products like agricultural produce and fruits. When women work in groups, they are able to cover for each other if one of them is called away, for example, to nurse a sick family member.

FINANCIAL INCLUSION, PRICING AND SUBSIDIES

The third group of good practices for scaling up involve helping women, who represent a significant part of the market for energy products, buy energy appliances. One challenge is matching energy technologies with ability to pay. Another is the fact that women-owned businesses and female energy entrepreneurs lack access to credit (IFC, 2012)—a key reason being that they do not have the same rights as men to assets and land that can be used as collateral to obtain loans. The Global Findex, a comprehensive database measuring how people save, borrow, and manage risk in 148 countries, reveals that in developing economies, women are 20 percent less likely than men to have an account at a formal financial institution and 17 percent less likely to have borrowed formally in the past year(-Demirguc-Kunt, 2015). In some countries, less than 5 percent of women have bank accounts. However, the problem is not only that women entrepreneurs are less likely to have taken a loan but also that the terms of borrowing are often less favorable for women; for example, they face higher interest rates, are required to collateralize a higher share of the loan, and are only offered shorter-term loans.

Good practices in financing for increasing access to energy use for household purposes

One way to expand affordable energy access to women is by targeting subsidies (and information about them) to

BOX 2

Reaching the last mile in the Indonesian islands

Kopernik is a nonprofit organization that delivers simple, affordable technology products to people in poor and often remote communities. It has been working with Indonesian women since 2011 to expand access to solar lamps, solar home systems, clean cookstoves, and water filters. Kopernik's Wonder Women initiative empowers women to sell these technologies in their villages, boosting their income and expanding energy access. The women receive business training, technologies on consignment, and a starter kit of sales and marketing material. As they sell technologies they repay the cost price to Kopernik, which is reinvested in more stock.

Under the ENERGIA supported Wonder Women programme, more than 300 women in four provinces have participated in the program to date, connecting clean energy technologies with 176,140 people. In a country like Indonesia—where more than 80 million people live without reliable access to electricity, and more than 100 million people still cook over three-stone fires—business models such as these could be game changing.

female-headed households and to women-owned businesses. Still, there is limited evidence of subsidies making a real difference to poor women. In fact, a recent study of fossil-fuel subsidy reform in India by the Global Subsidies Initiative of the International Institute for Sustainable Development (Merill, 2014) shows that fossil fuel subsidies have historically provided little benefit for rural women, which is why it recommends using cash transfers instead. But when cash transfers to replace fuel subsidies were piloted in India, women were at a disadvantage due to being unbanked, and hence unable to access the transfers. Thus, the government's current strategy to expand banking to the poorest may provide a solution.

At the same time, enterprises are also exploring innovative consumer finance mechanisms to expand their markets: these include micro-consignment, revolving loan funds, and flexible repayment plans. Organizations are also educating banks about the market opportunities and the specific needs of women borrowers, as well as working through existing women's saving and loan groups such as Savings and Credit Cooperatives (SACCos).

Examples of good practices of gender-equitable financial inclusion enabling women consumers to access energy include:

Targeted subsidy. In Nepal, the Renewable Energy Subsidy Policy of 2013 has specific subsidies targeted to women and socially excluded groups, both at the household and community level, for solar thermal, biogas, and metallic cookstoves. For biogas, women own 23 percent of biogas plants installed and 11 construction companies out of 107. Women's cooperatives provide 36 percent of biogas "credit plus" services. And the program collaborates with 92 micro financing institutes that are operated by women (ENERGIA/ADB, 2015).

Conditional cash transfer. In Brazil, 98 percent of households (including 93 percent of rural) have access to LPG thanks to a government policy that promotes developing an LPG delivery infrastructure in all regions, including by subsidizing LPG users. This program is part of the Bolsa Familia, by far the largest conditional cash transfer program in the developing world (IEA, 2006).

Targeted credit. In Haiti, Switch SA is tackling the low-income market by offering credit for stoves and low-cost refills. Kalinda Magloire, Chair of Switch, notes that although few people have the luxury to make a large sum cash purchase, some households might still be able to afford these products by paying in installments (over 10 months), drawing on the savings made by switching from charcoal to LPG ($0.50/day) (Magloire, 2014).

Targeted credit guarantees. In India, SEWA partnered with IFC in 2012 to provide loans to members to purchase clean energy products. IFC provides a partial credit guarantee for the $4 million loan provided by India's ICICI Bank to SEWA's Grassroots Trading Network for women, backed by risk-sharing agreements with a number of donors and financing agencies. The IFC guarantee eases the banker's perceived risk of lending to female borrowers who likely lack formal credit histories and collateral.

Savings and credit groups. In India, Jagriti (a community non-profit in Himachal Pradesh) has organized women's savings and credit groups and launched a clean fuels program to help women save enough time to participate in development activities. Group purchases of orders of LPG fuel and improved cooking technologies help 1,400 women in 130 groups afford modern energy. Flexible payment plans with small monthly installments over six months make this affordable. As a result, women have been able to save up to six hours per day—and of the 53 women who initially bought LPG and improved cooking devices, 41 have engaged in additional income generating activities.

Good practices in financing female energy entrepreneurs

Commercial banks often perceive women's businesses to be riskier, higher cost, or lower return. Microfinance has partly compensated for women's low access to formal finance; however, as women entrepreneurs grow, they need financial products and services that go beyond microcredit. Women's access to finance beyond microfinance is increasingly supported by development partners. The IFC has identified a number of successful examples of

financial institutions pro-actively (and profitably) engaging with women entrepreneurs as clients (IFC, 2012). Similar successful examples need to be documented for women energy entrepreneurs, as models for the energy sector. "Too often financial institutions in less developed and less competitive markets do not know enough about the market opportunities that low-income clients and women entrepreneurs could present to them" (IFC, 2012).

Good practices of gender-equitable financial inclusion in the energy sector enabling female entrepreneurs, including both productive uses of energy and energy businesses, include:

In Indonesia, Kopernik uses philanthropic money from individual donor and corporate grants to finance the upfront costs of products, shipping, and marketing to entrepreneurs as part of a consignment model. The products are sold to communities at as close to retail price as possible (no price subsidies), but revenues are reinvested in the purchase and delivery of additional products. Installment payments are allowed, and existing platforms are identified and tapped into.

In East Africa, CARE's wPOWER program works through 10,000 existing Village Savings and Loan Associations (VLSAs) with over 1 million members. The program uses training (in Kenya, Rwanda, and Tanzania), access to quality products, and microfinance to empower female village agents to establish micro-enterprises in the clean energy sector.

In Ghana, the African Rural Energy Enterprise Development Program (AREED), launched in 2000,has supported women entrepreneurs—who now run two of the leading LPG retail businesses in Accra and Kumasi, with total loans of more than half a million dollars. Lambark Gas sells over 2.5 million KG of LPG each year, and M38 sells 0.45 million kg. M3 was turned down by a bank before receiving the AREED loan.

In Uganda, Eco-Fuel Africa, a for-profit social enterprise, produces and sells green charcoal—including a credit scheme that enables 260 marginalized women to become micro-entrepreneurs. The women are encouraged to use mobile phone-based payment methods. And farmers (1,000 women out of 2,500 total) are provided with kilns that are paid off in installments over 3–12 months.

CONCLUSIONS

The narrative in the gender, energy, and poverty discourse has shifted over the years from focusing on gender (in) equality (which positions women as victims of energy poverty) to gender equality and, most recently, to women being part of the solution. In the current scenario, the main trends are:

Persistent energy access gap. In spite of huge strides, this gap continues, and there is a continued struggle for energy supply to keep up with increasing population size, especially in Africa. Progress toward SDG 7 on universal access to modern energy services is inequitable: while the electricity target is largely on track, the cooking energy target has fallen behind. Electrification is staying ahead of population growth, unlike with cooking. Women carry the worst burdens of the energy access gap. More than 4 million deaths every year, mostly among women and children, are linked to fumes from fuels such as wood, animal waste, and charcoal, which are used for cooking and heating.

Gender-energy linkage being ignored. Even though it is increasingly being recognized that men and women have different energy needs, men's energy needs tend to be prioritized in energy sector interventions. Most projects and programs neither incorporate a gender perspective in the design nor systematically collect and monitor sex-disaggregated data on processes and impacts.

Case for tailor-made, context-specific, solutions. As energy access proceeds from reaching areas with higher population density and, in the case of electricity, proximity to the grid, the target population will have different characteristics (including likely higher poverty levels and more households being managed by women). Thus, the business case of energy supply will need to be tailor-made to each situation rather than extrapolated from prior experiences. And it will be increasingly important to remove regulatory and other barriers to energy access by women in their own right.

Hard-to-reach still out of reach. Women and their networks have started playing a role in extending energy services to the difficult to reach and poor customers. Several initiatives (global, regional and national) are promoting this approach, using a range of innovative strategies. But the scale achieved is, at best, a few million consumers and a few thousand women entrepreneurs, by a single organization.

Ripple effects from giving women access. When women gain access to modern energy services, they gain: their health improves, children are able to study, and opportunities to earn an income are enhanced. But there are also vital developmental benefits: when women earn an income, they use the bulk of it in ways that benefit their families, communities, and economies.

Moving forward toward a more gender-equitable energy access strategy means correcting existing imbalances and strengthening women's position. On top of the many good practices detailed in this paper, there are numerous universal strategies that lessons from the past and new evidence suggest can add new momentum to the effort (see Box 3).

BOX 3

Universal strategies to engendering energy access

- Recognize unpaid work and make it visible—so that reducing drudgery becomes a key element in poverty reduction strategies.
- Take into account the differences in needs for energy services between men and women in designing energy interventions and provide targeted support to small women's informal businesses that use energy.
- Recognize women-led energy enterprises as a central strategy for universal energy access and provide targeted support, at a large scale, to women energy entrepreneurs.
- Target awareness of subsidies, measures for access to energy supply, and energy technologies and appliances, by gender and income—and train and involve both women and men in the energy supply chain.
- Invest in energy for social infrastructure. Support holistic development initiatives in which energy supply in combination with appliances and a sustainable use structure to reach benefits can be achieved—for example, electricity supply to clinics including access to cooling and sterilization equipment

NOTES

1. http://www.who.int/gho/phe/indoor_air_pollution/en/
2. ESCAP 1997. UN Economic and Social Council. Report of the Economic and Social Council 1997.New York 1997.
3. The Spark Fund provides funding to strengthen supply and enhance demand in the cookstove and fuels sector through innovation and tailored entrepreneurial capacity development.
4. http://www.energia.org/knowledge-centre/gender-audit-reports/
5. The audit was carried out by the Ministry of Energy, the University of Nairobi, and Practical Action Eastern Africa.
6. The audit was undertaken by the Botswana Technology Centre (BTC) in consultation with the Energy Affairs Division of the Ministry of Minerals, Energy and Water Resources and other stakeholders (UNDP, 2012; Wright et al, 2009).
7. The audit was conducted by the Ministry of Mines, Energy and Water Development.
8. In consignment model, entrepreneurs receive initial inventory on consignment, and a starter kit of sales and marketing materials, so that they can start selling technology without taking on risk or debt, and earn a commission on every sale.

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ANNEX

The following are examples of good practices/specific gender focused activities, which have been compiled from ENERGIA, 2011; World Bank, 2013; GACC 2014; and ESMAP 2015:

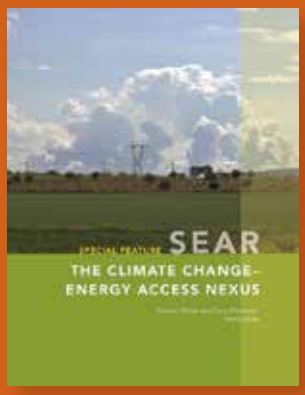
Electrification projects:

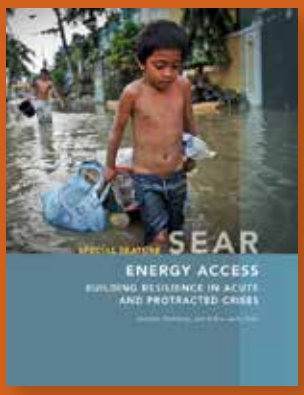
- Local women employed, individually or as part of self-help groups, as franchisees, for meter reading, bill distribution and revenue collection (Uttaranchal Power Corporation Ltd, India, Bangladesh)
- Women represented in utility committees and groups with responsibilities for governance and decision making in the utility (Kenya Power, Kenya, Bangladesh)
- Embedding gender in human resources policies and processes, including addressing sexual harassment and discrimination within Kenya Power (Kenya Power, Kenya)
- Combine provision of cooking fuels and stoves with supply of electricity (Eskom, South Africa, Botswana)
- Recruiting and training women employees (Eskom, S. Africa, REB Bangladesh, Maharashtra State Electricity Board, India)
- Women extension agents promote credit and use of household appliances (U.S. rural cooperatives)

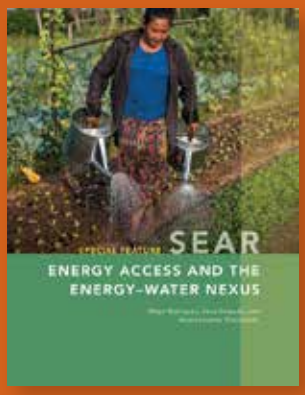
Household energy (cooking and heating) projects:

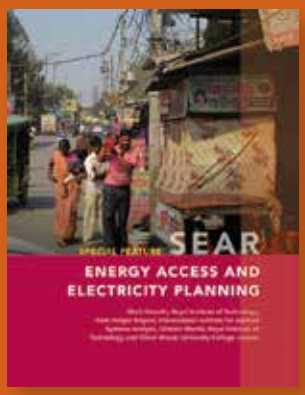
- Engage women in design and testing of energy devices (energy efficient stoves designed in consultation with women's groups by Ecozoom in Kenya, Mexico, Rwanda, and Nigeria; Potential Energy in Darfur, Sudan)
- Develop a strategy to engage men (for example, raising men's awareness of the multiple benefi¬ts of energy ef¬ficient stoves) (Jagriti in Himachal Pradesh)
- Target women and men separately in consumer campaigns and user feedback for improved cookstove markets (Practical Action, Kenya)
- Engage women in manufacture/ assembling/installation/servicing of stoves/fuels (Maasai Stoves & Solar in Kenya; Geres in Cambodia; TIDE in India; GVEP International in East Africa; SURE, India; Grameen Shakti, Bangladesh)
- Support the inclusion of women in decision-making and entrepreneurial positions of organizations in charge of forest management, biomass charcoal, and wood production/collection, conditioning, transportation. and retailing (Eco-Fuel Africa in Uganda; PROGEDE in Senegal)
- Identify and build strong local partnerships with trusted individuals and organizations; consider working with women's groups

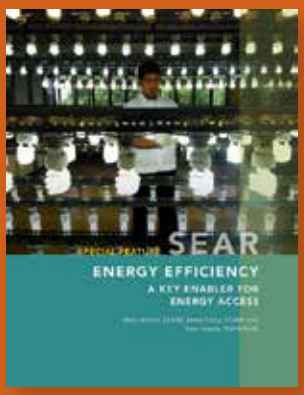
SPECIAL FEATURES

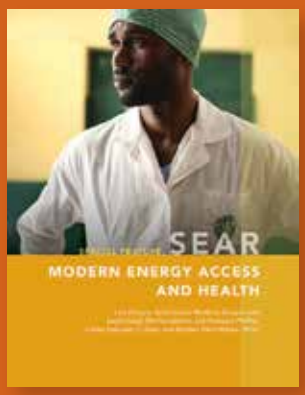


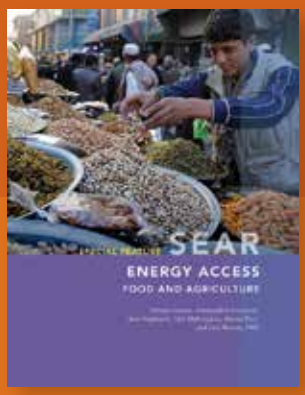












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