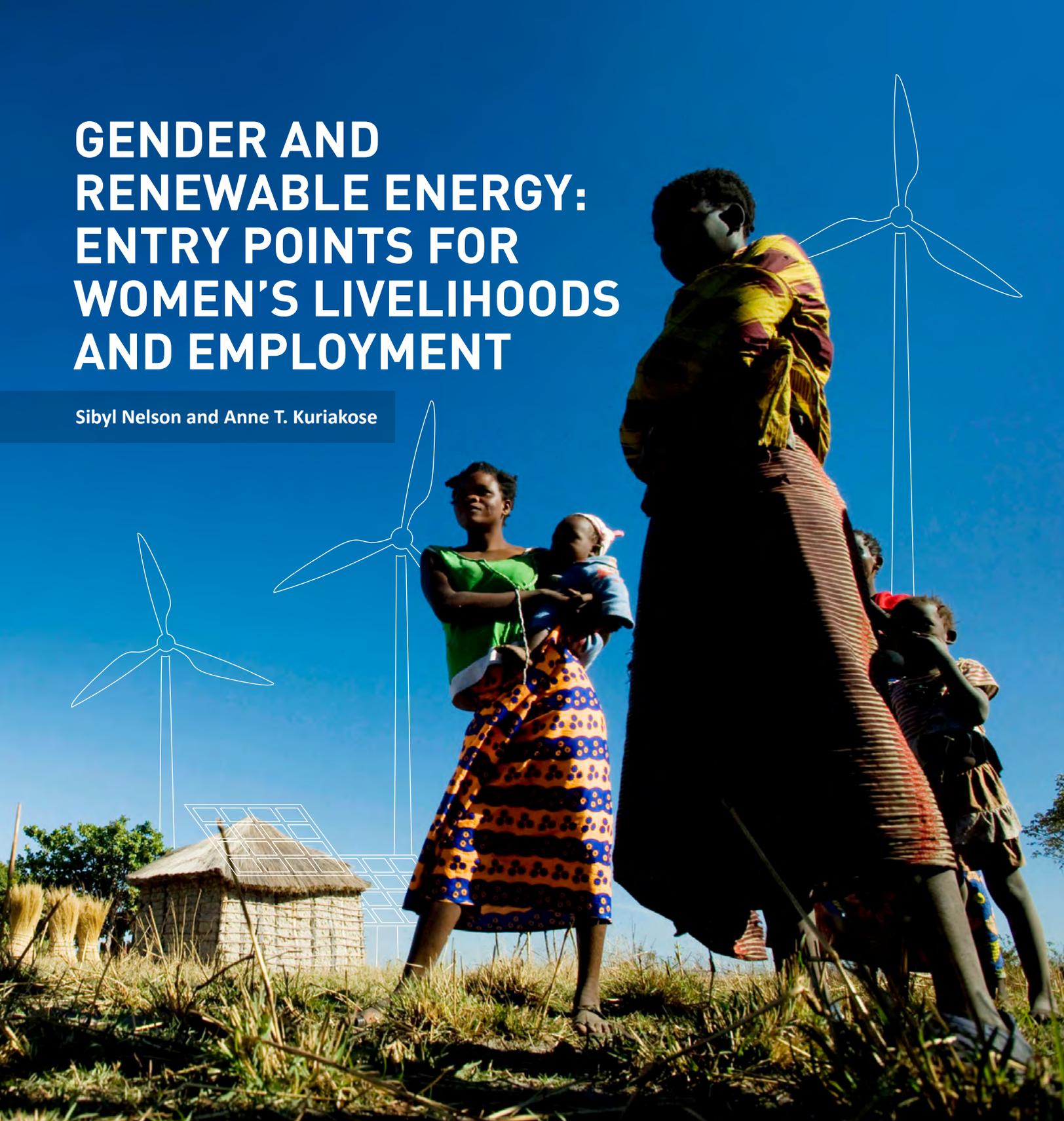


GENDER AND RENEWABLE ENERGY: ENTRY POINTS FOR WOMEN'S LIVELIHOODS AND EMPLOYMENT

Sibyl Nelson and Anne T. Kuriakose





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Sibyl Nelson and Anne T. Kuriakose¹

I. INTRODUCTION

Why gender matters in renewable energy projects

Renewable energy (RE) and energy efficiency (EE) projects can play an important role in providing access to energy for the approximately 1.2 billion people – or 17% of the population – worldwide who do not have access to electricity or liquid fuels (IEA, 2015). Shifting the energy sector mix can lead to new economic opportunities and strengthened livelihoods for women and men, as well as improved health, safety, and quality of life. As an additional key contribution, energy efficiency and renewable energy projects can contribute to the global imperative of reducing greenhouse gas emissions (ESMAP, 2013a).

While these projects have the potential for broad and far-reaching benefits, they are found to be more effective (e.g., in relation to improved technology adoption) when gender equality is taken into account (Rojas et al., 2011). To take gender into account requires identification and assessment of a project's potentially different impacts on men and women involved and ensuring equitable benefit-sharing. This requires, for example, identifying the roles women and men play and the activities in which they are involved in their households and communities in order to

pinpoint how they may be impacted by renewable energy initiatives. It also means understanding women's and men's different knowledge, experiences, needs, and interests along the renewable energy value chain (ESMAP, 2013a). Further, because not all women nor all men are the same, it is important to understand specific differences among age groups and other relevant characteristics factors, such as socioeconomic and livelihood groups; energy producer or consumer status; and type of energy use.

Perhaps less obvious to project designers and implementers – but critical nonetheless to the outcomes of a project – are the social and gender norms and relations that prescribe what women and men can and cannot do in households, communities, and in labor markets and energy value chains. These norms, which often prescribe decision-making roles around land or women's mobility, are not set in stone. They can and do change over time in response to other changes in society (e.g., economic, political, environmental). Inequitable social relations and bargaining power along gender lines can affect women's access to, adoption of, and returns from renewable technologies (Pachauri and Rao, 2013). To ensure that renewable energy interventions meet the needs of female and male household and community members, it is important to ensure equal participation of women and men in energy decision-making processes and promotion of equal opportunities to engage in the value chain as designers, laborers, and energy users (Cecelski, 2003; Skutsch, 2005). Such a gender-responsive approach is more effective from a sector standpoint, and also can help countries meet their sustainable development and human rights commitments as well.

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Why focus on women’s livelihoods and employment

Women’s economic empowerment is a key ingredient in overall development (World Bank, 2011). While men are already involved in energy projects, women are not always involved equitably. Energy sector investments can contribute direct economic benefits to women through formal sector employment and by providing them with opportunities to improve their livelihoods through small-scale enterprises, skills development, and training. Such investments can also have indirect positive effects on the education, health and nutrition of women and their households, for example through the provision of lighting and heat (ESMAP, 2013a). However, all actors along a renewable energy value chain do not automatically benefit. For example, discriminatory gender norms may limit women’s mobility and thus their ability to work outside the home or community, attend training activities, or engage in selling, installing, and maintaining renewable energies. These norms also make it less likely for women to be considered, or qualified for, the types of jobs developed through renewable energy projects (ESMAP, 2013a). On the other hand, there is potential to create and strengthen women’s livelihoods across renewable energy value chains. Such efforts can also help reinforce implementation of strong social policies (e.g., quality social welfare infrastructure and public services) in place (Baruah, 2015).

What is covered in this Note

This Note highlights key issues on women’s livelihoods and employment in the renewable energy sector, and provides practical guidance, including checklists and indicators, on integrating gender into the renewable energy project cycle. It draws on relevant literature and projects to provide an overview of the employment impact potential for women from renewable energy investments. Further, it highlights the livelihoods and productive use impacts that can be fostered indirectly through renewable energy investments, such as strengthening of women-owned firms, business skills, and linkages to productive on- and off-farm applications.

II. GENDER ISSUES IN RENEWABLE ENERGY SUB-SECTORS

Different renewable energy sub-sectors offer benefits that can be leveraged to improve the livelihoods, employment opportunities, and lives of women, their families, and communities. They also present challenges that need to be addressed to ensure women and men benefit equitably. Renewable energy value chains for large and small-scale renewable energy sub-sectors include grid and non-grid connected infrastructure. These pose different employment and livelihood options, as well as varied constraints that need to be considered to meet women and men’s needs and interests along the renewable energy value chain – from employment to consumption.

LARGE-SCALE AND GRID-CONNECTED RENEWABLE ENERGY

Much of the focus on gender in renewable energy has focused on addressing gender efforts at the household and community levels, e.g., through improving women’s access to renewable energy and clean cookstoves, as well as enhancing women’s economic benefits and entrepreneurship. Large-scale renewable energy² as a topic, conversely, has received less attention from a gender perspective than small-scale, off-grid renewable energy, and indeed still constitutes a distinct knowledge gap (Elwell et al., 2014). Nonetheless, drawing on project experience, and that of other large-scale infrastructure, we can see that renewable energies at this scale can provide particular gender-related benefits, as well as challenges. For example, large-scale renewable energy projects, including solar arrays or wind turbines, demand a great amount of land, leading to conflicting interests over ownership and land use, often governed by discriminatory gender and social norms that limit women’s ownership and access (ESMAP, 2013a; Cecelski and Dutta, 2011). Further, downstream impacts include inequitable participation between women and men in decision-making and benefits from renewable energy services (Elwell et al., 2014).

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2 Large-scale renewable energy is often defined as 10 MW or more, and grid-connected, and includes, for example offshore wind energy and large-scale solar power, geo-thermal, and hydro power.

Box 1. Improving working conditions for women, India

The India *Partial Risk Sharing Facility for Energy Efficiency (PRSF)*, with Clean Technology Fund (CTF) funding of USD 25 million, ensured that the Energy Service Companies (ESCOs) and participating host entities addressed gender-sensitive labor conditions, by (a) either giving preference to projects that improved working conditions for women or, at a minimum, disallowing projects that worsen working conditions, and (b) adopting minimum safety/labor conditions for firms to meet for their project loans to receive financing guarantees. The project induced benefit for women from the Risk Sharing Facility by including gender-sensitive eligibility criteria, making it more possible for women to access loans.

Source: World Bank, 2015a

Sector benefits

Reduced labor and time poverty facilitates women's and girls' gains in education, social capital and well-being.

As consumers, women may benefit from renewable energy in different ways, including reduced labor and time spent on activities such as woodfuel and water collection, as well as in food preparation and processing for which they are often responsible due to the gender division of labor. Connection to the energy grid can provide women and girls with more time to participate in educational activities or build social capital through greater interaction in the community and politics (Danielson, 2012). Dependable light (including street lighting) and heat from grid-connected energy can also improve the safety, health, and well-being of women and their families (e.g., reducing gender-based violence through improved street lighting; cutting indoor and outdoor air pollution through reduced use of kerosene; improving provision of clean water through boiling) (Panjanwani, 2005; ESMAP, 2013b).

Large-scale renewable energy infrastructure can provide women, as well as men, with employment opportunities.

In many areas, women are finding work in the construction, operation or maintenance of large-scale renewable energy utilities in energy generation, transmission, or distribution.

Women may also find formal or informal (intermittent or contract) employment along the energy value chain (e.g., installation; billing; meter reading; and collection). To help women enter these jobs, a number of countries are providing training, as well as supportive working environments (Pearl-Martinez, 2014). Women may also find indirect employment in allied industries and those that provide services for the energy sector, such as construction of large-scale renewable energy infrastructure, and services such as restaurants, catering for workers, health and social services, and temporary housing).

Renewable energy can provide a broader set of livelihood options.

Connecting to large-scale renewable energy infrastructure can increase livelihood options for women and men. Women may develop or strengthen agricultural production or informal home-based enterprises, which may typically involve food production, processing and catering, or sewing and clothing repairs. Improved access to light and energy may also help them start or scale up enterprises related to computers or mobile technologies, or larger-scale food processing (ESMAP, 2013a).

Sector challenges

The high cost of connection to the grid may limit poor users; in many regions, this includes female-headed households.

A case study on gender and Botswana's power corporation highlights the issue of affordability, noting that in off-grid areas, female-headed households are poorer than male-headed households, and have less access to modern energy. These households have a high demand for income-generating activities and access to affordable sources of energy, and yet the high cost of connection to the grid was a main barrier to women's improved energy access (Energia, 2011). Moreover, discriminatory gender norms inhibit women's rights to own land and other assets, making it challenging for women to access financing for renewable energy technologies that could help them start or grow an enterprise, improve their productivity, and improve the well-being of themselves and their families (UNIDO and UN Women, 2013).

New employment opportunities from renewable energy investments are not evenly distributed among women and men.

While new investment in infrastructure provides new employment opportunities, experience shows that men's labor force participation sees increases first, particularly in traditionally male-dominated occupations (e.g., construction, transport) (World Bank, 2011; ESMAP, 2013b), compared to

Box 2. Addressing the challenges of high cost connection, Lao PDR

An assessment of Lao PDR's *National Electrification Program* found that grid connection uptake rates remained disproportionately low among female-headed households. While they made up only 8% of all households, they accounted for 43% of poor households (primarily widow and divorcees). To address this challenge of low female-headed households' grid connection uptake rates, the program created a pro-poor, gender-sensitive subsidy under the *Power to the Poor (P2P)* program. The P2P shared gender-sensitive communication materials, set meeting times around women's availability, and incorporated lending approaches that met the needs of women. Connection rates among female-headed households increased from 63 to 93 percent, and were attributed to the P2P.

Source: World Bank, 2012

employment for women.³ A 2013 study stated that women accounted for only 20-24% of total jobs in the renewable energy sector (Marcos et al., 2014). Women's participation in these employment opportunities can be constrained by discriminatory gender norms and stereotypes about suitable employment for women. Women are also under-represented in attainment of the advanced degrees and technical skills needed for energy employment at higher skill levels (Marcos et al., 2014). Specific efforts are needed to address the social and institutional barriers to women's entry into 'non-traditional' employment (ESMAP, 2013b), particularly in medium and large, grid-connected renewable energies. These can include affirmative action policies, mentoring, internships, and support for women's school-to-work transition.

While increased energy efficiency and access through grid connection can provide opportunities for scaling up production by firms, women may have greater difficulty accessing the capital to do so for a number of reasons. In some areas, women's limited literacy, a gendered education

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³ This does mean though that men are more exposed to occupational hazards (ESMAP, 2013a).

gap, and lack of self-confidence can result in women's under-representation in decision-making and economic opportunities. In many areas, particularly rural areas, women may be left out of consultations if they do not speak the language of those undertaking consultations (Marcos et al., 2014). Men can often more easily access capital (e.g., by leveraging land title or other assets), compared to women who are more commonly involved in informal, small enterprises and without the land rights needed to serve as loan collateral (Cecelski, 2000). It is important to include women as well as men in consultations and assessments of affected persons in large-scale renewable energy projects, to identify specific needs and challenges, compensation requirements, and need for specific training on alternative livelihoods.

The construction and operation of large-scale renewable energy (e.g., placement of transmission lines) can lead to the displacement of communities, with impacts different for women and men. Inequitable gender norms, inheritance practices, and property laws often limit women's access to land title, e.g., they may access land through men or kinship group. If landowners are compensated for displacement, women may not directly benefit, despite their loss of livelihood (ESMAP, 2013b). Further, renewable energies requiring land such as large-scale solar arrays or wind turbines are often controlled by men more than women in countries and regions where women are deprived of land ownership (Elwell et al., 2014). Renewable energy infrastructure may also displace established biomass energy sources on which women rely for income, livelihoods, and food security (e.g., charcoal, wood, manure, plant residues). Understanding existing energy sources and women's and men's specific uses, needs, interests, and constraints is important for mitigating potentially negative impacts (Pearl-Martinez, 2014). Other compensation practices may also disadvantage women, e.g., in the case of compensation provided only for lost employment in the formal sector, compared to the informal sector where women predominate (Pearl-Martinez, 2014).

The construction and operation of large-scale renewable energy infrastructure can also have negative social and gender impacts, including gender-based violence increase. For example, households with a rise in income due to construction employment may see increased expenditures on alcohol or even family dissolution (Kuriakose and de Boer, 2015). Sexual harassment and gender-based violence can be commonplace in construction workplaces that do not have adequate policies and mechanisms to address this. Firms

Box 3. Corporate mechanisms to support non-discriminatory labor practices

Gamesa is global company working in wind-based energy. The company's Equality Plan promotes non-discriminatory hiring, equal professional development and promotion opportunities for women and men, and recognition of the need for balance between personal and work life. The plan is monitored by a Committee. Gamesa also maintains a workplace Sexual Harassment Prevention Protocol and measures to support victims in cases of gender-based violence. The company holds to the Women's Empowerment Principles which call, in part, for the abolition of discriminatory business practices in employment and occupation.

Source: Marcos et al., 2014

should be encouraged to strengthen their human resource practices to limit such negative externalities associated with construction projects and make construction and energy industry employment more attractive for women.

SMALL-SCALE AND OFF-GRID RENEWABLE ENERGY

Gender issues in renewable energy have been examined in detail at the small-scale level, where women play active roles in energy provision and consumption at household level and through community networks (UNIDO, 2014). Women have made tremendous gains in the small-scale and off-grid subsectors through employment as researchers, retailers, installers, and maintenance workers; as entrepreneurs starting and/or growing their enterprises; and as household members with improved health and quality of life for themselves and their families. However, in small-scale systems project development, men's and women's distinct roles and knowledge can still be overlooked, and numerous gender-based challenges need to be addressed.

Sector benefits

Small-scale and off-grid renewable energy value chains can provide women, as well as men, with opportunities **for employment at different points along the value chain, e.g. sales, installation, maintenance, and repairs.** Stand-alone systems of wind and solar energy can provide communities with affordable energy, promote productivity and help in creating employment by empowering enterprises for both the rural and urban poor (UNIDO, 2014). For example, in India, the *Lighting a Billion Lives* initiative (featuring solar micro grids; solar lanterns; solar home lighting systems; and cookstoves) provides opportunities for women's employment in sales, rentals, and repairs of solar lanterns (Baruah, 2015). Elsewhere, the *Lighting Ethiopia* program, with funding of USD 1.6 million from the Scaling Up Renewable Energy (SREP) program of the Climate Investment Funds (CIF), supports people to access clean, affordable, quality off-grid lighting and energy products and shows how gender-sensitive programming can help meet this objective. The program encourages women's participation in the sector, increases their access to energy to improve their livelihoods, and works with women's groups to access financing for energy products (International Finance Corporation, 2014; Chen and Kuriakose, 2015).

Women can develop enterprises that require reliable sources of energy. A reliable source of electricity has a significant impact on rural women's time use by making chores, especially cooking, more efficient; this in turn has been shown to increase women's employment by 9 percentage points (compared to no change for men) (Kohlin and Pattanayak, 2011). The contribution of energy access to reduction in women's time poverty is well-documented. Women can redirect their time to start and/or grow enterprises. A study on two programs in India, *Lighting a Billion Lives* (see above) and *Hariyali Green Energy* (focused on energy efficient stoves and solar lanterns) found that access to solar lanterns led to income-generating opportunities for women in such areas as midwifery, childcare, tutoring, home-based piecework, and food preparation for catering. Other opportunities include food processing and marketing based on improved refrigeration, as well as other small enterprises, such as livestock breeding, IT, and residential accommodation (Baruah, 2015).

Women and their families experience improved health outcomes and quality of life. The introduction of small-scale energy technologies such as solar cookers can increase

the health and quality of life of women and members of their households through improved air quality and reduced respiratory illness, among other benefits. Women may also enjoy a reduction in time use for cooking and collection of fuelwood. For example, micro hydro plants in Nepal are powering grain mills and reducing women's workload considerably, from at least two hours of grain processing (Mahat, 2004; IAEA and World Bank, 2015). Solar water pumping provides clean water and solar refrigeration for vaccines, as in Zimbabwe's Rural Sustainable Energy Project (RuSED). These pumps have supplied women, as well as men, with water for their crops and reduced the time spent collecting water by as much as 6 hours.

Mini grids are local electricity networks that harness energy from solar, wind, hydro and biomass sources. They offer electricity to millions of women and men and their families, particularly in remote regions of Sub-Saharan Africa and Asia. Mini grids are an increasingly viable option for electricity in remote areas, due to their lower costs. SREP has been financing mini-grid scale-up efforts in Kenya, Liberia, Mali, Nepal, and Tanzania, with USD 90 million allocated to date. Mini-grids offer millions of women and women's groups the opportunity to strengthen livelihoods and incomes by developing and expanding enterprises, as well as by being actively involved in their marketing, installation, and maintenance, as well as exploitation for productive uses (ESMAP, 2013a; World Bank, 2016).

Sector challenges

Discriminatory social norms and practices limit women's opportunities with regards to education, mobility, access to and control over land, and decision-making. In turn, limited education reduced women's opportunities to enter technical sector employment including renewable energy, or to operate their own energy enterprises. When women are employed in energy enterprises, social norms may confine them to more intermittent, less well-paid positions. Gender biases may also limit the inclusion of women in technology design, making systems less attuned to women's needs (Baruah 2015). Such biases can also affect the provision of information on new forms of energy or energy technologies to women (ESMAP, 2013a). Moreover, discriminatory social norms and practices on the whole can limit opportunities for different socio-economic classes and castes. For example, in India it has been difficult to rent solar cookstoves to people of certain castes due to social practices related to caste

and cooking, whereas solar lanterns have been easier to distribute (Baruah, 2015). The issue of social norms needs to be addressed to facilitate scalability of micro-initiatives for decentralized energy (Pachauri and Rao, 2013).

Access to markets, suppliers and credit facilities are often weak in rural areas, with women facing greater challenges (Pachauri and Rao 2013). For women, access to renewable energy is often constrained by affordability (Kuriakose and de Boer 2015). Further, service quality and technology choice can often limit the benefits that women might otherwise enjoy. Women's enterprises suffer when they are unable to afford the choice of technology on offer, or cannot access timely installation or maintenance. Accessing transport for renewable energy training for the installation and maintenance of small-scale off and on-grid renewable energy can be challenging for women (IEA and World Bank, 2015), particularly in rural areas where distances are great and transportation limited, and in regions where discriminatory norms and practices limit women's mobility. In addition, land tenure is often weaker for women; without this collateral for obtaining loans, women in a weaker position to form enterprises (ESMAP, 2013a).

ENERGY EFFICIENCY

Energy-efficient technologies are not gender-neutral; rather, because of women's and men's varied experiences with gender norms, institutions, their relations in households and communities, and the roles they play, their opportunities to access and benefit from these technologies differ. To a great extent, women tend to be responsible for providing energy for the household's needs (e.g., cooking; cleaning; washing; care of youth and elders; cooking) and these often tend to be met through inefficient – even toxic – fuels such as paraffin and charcoal). Enterprises such as food processing and soap-making, often undertaken by women, depend on fuels for production; gaining access to more efficient, renewable energy provides women with opportunities to improve productivity, grow their enterprises, and increase profitability. As an added benefit, improving energy efficiency can also reduce environmental degradation, as when coal is replaced with solar (UNIDO, 2014). Women demonstrate an interest in the financial part of energy efficiency and savings to their households (IEA and World Bank, 2015); this means women must be involved in decision-making in order for energy efficiency incentives and energy use alternatives to be effective (see also EBRD, 2016).

III. KEY ENTRY POINTS FOR GENDER MAINSTREAMING⁴ ALONG THE PROJECT CYCLE

There are numerous renewable energy projects that provide lessons on gender mainstreaming good practice, as well as potential pitfalls. These indicate that actions to mainstream gender should be sustained over the course of a project to achieve substantial impact. The literature suggests however that gender issues are often addressed only at entry, rather than throughout the project cycle (Schalatek and Granat, 2015). It should be noted, however, that even projects that neglect gender issues at the outset can introduce measures during the implementation phase to better target women’s and men’s needs directly. The following sections provide a summary of available guidance from the literature on gender mainstreaming across all phases of the renewable energy project cycle, including: project context; design; implementation; and monitoring and evaluation.

PROJECT CONTEXT

Policy Environment

While the focus here is on projects, **the international and national policy contexts are important factors in creating a positive enabling environment for gender-responsive work.** At the international level, the Sustainable Energy for All initiative (SE4ALL) brings together governments, businesses and civil society organizations to double the share of renewable energy in the global energy mix by 2030, among other goals (SE4All, 2016). Its accountability framework requires stakeholders to consider gender issues, which is a positive example of an international initiative catalyzing attention to gender issues in renewable energy project design (SE4All, 2013).

At the national level, most countries already have commitments in place to address gender equality, such as through international agreements (e.g. CEDAW, CSW) or via national gender policies. These can be used to demonstrate that addressing gender equality within an RE project is in line with national priorities and help spur dialogue on which gender issues to prioritize in a renewable energy project (e.g. land rights, access to information, etc.). Regulations and market reform have been shown to have a positive impact

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4 See the glossary for a definition of gender mainstreaming.

Box 4. The importance of an enabling policy context, Nigeria

The *Rural Women Energy Security (RUWES) Initiative* is “targeted towards the under-served rural woman who is usually off grid, energy poor and has the highest incidence of health related issues from harmful energy practices”. This type of project, focusing on small-scale renewable energy that can improve women’s health and families’ overall quality of life, was found to be unable to achieve these sector benefits without an appropriate enabling environment. Notably, within two years of its launch in 2013, the program concluded that for continued success “the clean cookstoves and solar market [would] require a comprehensive policy development and standardization of technologies” to help guide project activities. Further, to address weaker uptake in the introduction of new technologies, continued sensitization was needed.

Source: Federal Ministry of Environment of Nigeria, 2015

on energy access, as measured by multiple criteria that are particularly relevant for improving women’s energy access, including affordability, reliability and quality (World Bank, 2015b) The challenge is to pursue the longer-term process of developing gender-responsive policies in the energy sector to create conditions in which women’s and men’s roles and needs are addressed in pricing, affordability, targeting, use of subsidies, and quality. Gender-responsive policy-making is also needed to ensure alignment with complementary services and sectors, for example in agricultural development, to improve energy impact for both women and men (SREP 2015).

Institutional Approaches

Addressing gender inequality is not simply a technical exercise of understanding gender issues across the project cycle; it is also a **process of institutional and behavioral change in which all actors are supported to adopt gender-responsive approaches.** Three key elements are recommended to

Box 5. Investment criteria that promote gender equity, Ghana

In line with the SREP investment plan criteria that requires countries to demonstrate how the proposed plan programming will advance gender-positive outcomes, Ghana's SREP investment plan shows multiple organizational approaches towards a gender-sensitive institution. These include the hiring of a gender expert at the Renewable and Alternative Energy Directorate, as well as women-targeted consultations and communications, and use of participatory feedback mechanisms. The investment plan also includes a gender-sensitive vision, clarifying that among its outcomes that it seeks "more gender-equitable access to modern energy services and to employment opportunities in renewable energy enterprises". Finally, proper health, safety and environmental standards were put into place under the plan.

Source: SREP 2015

cultivate an institutional culture that fosters gender-responsive workings (Cecelski and Dutta, 2011):

- (1) Gender-sensitive and gender-competent staff, whose awareness of the importance of gender equality and skills in incorporating gender into their work are enhanced through capacity development;
- (2) A gender-conscious workplace, in which practical strategies that promote gender equity (i.e. equal opportunities for men and women), such as hiring policies with quotas for men and women's employment, are put in place; and
- (3) A gender-responsive strategy, in which the organization has in place the requisite elements – e.g., gender equality vision; gender-sensitive operational manuals; and database of sex-disaggregated data – to carry out or contribute to gender-responsive projects.

Global experience has also shown that alignment of gender efforts with larger national poverty and social inclusion goals and targets of a country can help spur political and agency support for gender equality activities.

PROJECT DESIGN

Identification

The beginning of the project (i.e., identification) is a critical time to explore gender issues and design a gender-responsive project. Within the broader consultations and analyses that make up 'identification', a **gender assessment should be conducted to explore the gender-related risks, opportunities, constraints, and context (including renewable energy policy) of the proposed project.**

A gender assessment for a renewable energy project incorporates basic gender analysis questions (who does what? who has what? who decides?), and wherever possible, explores why women and men do what they do as well as what their knowledge bases are, using quantitative and qualitative data (ESMAP, 2013a). In particular, a gender

Box 6. A gender assessment to improve access to finance within an energy efficiency project, Turkey

In the context of the *Turkey Residential Energy Efficiency Financing Facility*, a detailed gender analysis was carried out to understand supply and demand factors influencing household access to, and use of, finance for building-level energy efficiency improvements and home appliances. The analysis, based on a national survey and qualitative focus group discussions, found that energy efficiency knowledge, attitudes and practices vary significantly by gender. The analysis concluded with a series of recommendations on how to improve outreach to households and access to finance for the purchase of EE improvements and home appliances. It advised on improved communication approaches, and overcoming barriers to women's participation in the public sphere.

Source: EBRD and CIF, 2015.

assessment should summarize men's and women's **access to and different uses** of different energy sources; the **employment** of women and men in different roles along the value chain and their related **work loads** linked to household responsibilities; **customer concern issues** (some to be addressed by service providers) including affordability and satisfaction; and women and men's differential **knowledge** and roles in **decision-making**. The gender assessment should also include a mapping of stakeholders.

Gender-related opportunities and risks are also documented at this stage, either within the gender assessment, or within a broader risk assessment. There may be ongoing efforts to address social norms or institutions that could influence the project outcomes (e.g., local norms regarding men's and women's mobility or their land rights could be changing). There are numerous gender-related risks to consider when assessing how the energy project will be influenced by socio-economic and environmental factors in and outside the control of the project manager; these include men's and women's availability to participate in project activities and expected changes in the workload of women and men due to the project (UNIDO, 2014).

Preparation

During the preparation of the project work plan and results framework, the gender assessment is used to develop concrete actions that address the issues identified in the assessment. These actions can be framed in a **gender action plan, which may include proposed adjustments to the project based on the gender assessment, as well as activities involving project beneficiaries and institutional process issues, with related milestones in the project work plan and framework** (ESMAP, 2013a). Whenever possible, design of activities should be carried out in a participatory fashion to take into account women's and men's differentiated knowledge and attitudes, and to gain a sense of the existing capacity and barriers for implementation (UNIDO, 2014), as well as opportunities present within the community, such as existing informal communication networks that can be leveraged to share information on energy technologies or for peer learning.

To guide gender-responsive preparation, Rojas et al. (2011) suggest the following: Consider which energy service is needed (production or consumption); which technology fits the need; and how the technology might affect women's and men's labor patterns (including time use); women's

Box 7. A gender action plan within an urban power grid development project, Papua New Guinea

The *Port Moresby Power Grid Development Project*, implemented by Independent Public Business Corporation (IPBC) and PNG Power Ltd. (PPL) with a loan of USD 51.7 million from Asian Development Bank (ADB), aims to expand renewable energy generation, connect currently unserved customers and significantly improve the quality of electricity supply. The Gender Action Plan, incorporated into the project's Administration Manual, includes detailed gender action points for all of the project's outputs. The action points address issues including: women's participation in consultations; promotion of women's employment; prioritization of female-headed households for new connections to the grid; fair pay policies; equal access to training opportunities; and attention to women's needs in terms of reliability of electricity to reduce their drudgery. Two gender specialists for the project are tasked with ensuring that the action points identified in the GAP are carried out in project planning, implementation, and monitoring.

Source: ADB, 2013a

income generation, self-reliance; affordability of access; and whether women are willing or available to be trained as service providers. Bear in mind that women and men have different roles and relations, specific to their context, as well as perceptions regarding expected benefits from energy-efficient technologies (UNIDO, 2014). Consider mechanisms that have been successful in overcoming gender-based constraints to energy access, such as through tariffs, revolving funds, grants, rebases, leasing or affordable credit facilities that ensure equitable household connectivity (ADB, 2012; Cecelski, 2005; Cecelski, 2003; Parikh, 1995).

Box 8. Promoting women's participation during implementation, Guatemala

The *Productive Uses of Renewable Energy (PURE) Project*, operating from 2007-13, with funding from GEF and other donors totaling USD 22 million, aimed to promote sustainable energy as a means for community development through integrated management of renewable energy sources and their productive uses. It focused on the introduction of renewable energy technologies, particularly micro and small scale hydroelectric production, as well as demonstration initiatives for photovoltaic systems, bio-digesters, and efficient cook stoves. Initially, gender dimensions of energy use and needs were not taken into account, despite an understanding of the high illiteracy rate among women, and their responsibilities in fuelwood collection and food preparation. However, once a gender gap in women's participation in the project became apparent during implementation, the PURE project focused on promoting women's participation in decision-making and enhancing their access to project benefits. With these efforts, the project helped "remove barriers by promoting spaces for expression and strengthening women's self-esteem. Participating in capacity-building workshops with novel approaches such as Kaizen, or gaining skills generally reserved for men [such as installing and maintaining equipment], allowed women to consider how they can develop personally in the future [and] contribute in the community [for] better living conditions".

Source: Fundación Solar, Energia and IUCN, 2014.

IMPLEMENTATION

Implementation

Gender-responsive implementation involves **putting into place numerous mechanisms to ensure that the gender-responsive activities will be carried out**. This includes budgeting that includes allocations to gender-related activities and also that involves targeting of funds to women's and men's needs and interests. Any manuals that are developed to support implementation, such as training manuals or field-data collection, should include attention to gender, both in terms of process (e.g., participation of women and men end-users in project activities; women and men field staff; gender-sensitive channels for communication), and content (e.g., women's and men's employment options; access to renewable energy technologies). For projects triggering safeguards provisions, such as to mitigate the impacts of resettlement, good information provision and participation by all stakeholders is required during implementation (Namy, 2007; Nam, 2010).

Projects that have not addressed gender issues in the earlier project cycle phases can still adopt a gender-responsive approach during implementation. This is particularly warranted if a mid-term review exposes differences in men's and women's participation in or access to the benefits of the project. Even projects that are operating in communities in which gender-based differences are particularly entrenched can still find culturally-appropriate approaches, as demonstrated in the case below from Guatemala.

MONITORING & EVALUATION

Monitoring

Identifying and tracking gender-based outcomes can help projects course-correct to improve results for beneficiaries. For gender-responsive monitoring, projects **incorporate gender-sensitive indicators within the monitoring framework**. Gender-responsive indicators are used to measure progress toward gender equality by tracking changes in men's and women's resources and opportunities in the context of a

program or project⁵. Gender indicators incorporate sex-disaggregated data⁶ in order to quantify the numbers of women and men who, for example, are using a renewable energy technology. Gender-responsive indicators also go beyond counts of people alone, to capture information such as: quality of men's and women's inclusion; purpose for which energy is used and generated (e.g., addressing women's unpaid work); and who makes decisions about energy enterprises (Schalatek and Granat, 2015). See the checklist below for suggested gender-responsive indicators.

It is also possible to identify gender-related results outside of the results framework, especially in projects that do not appear to have been planned from the start in a gender-responsive way. Informal interactions with project implementing partners may very well reveal accomplishments that have not been reported or formally planned (Schalatek and Granat, 2015), yielding important lessons on practical steps that could be replicated.

Evaluation

In order **to document and learn from gender-related outcomes in the project, a concerted approach to address gender in evaluation is needed**. This includes such simple steps as ensuring that evaluators have documentation on gender-related work undertaken during the project, and more complex tasks such as gathering inputs from women and men of different socio-economic groups.

Further, evaluations should include an assessment of whether projects established and met gender targets. To evaluate whether a project has been gender-responsive, numerous criteria are possible, including: whether a gender specialist was on the team; whether a gender analysis of energy need, demand, and supply was included in the Project document; whether specific project activities targeted women; and whether gender-sensitive indicators were included in the project results framework.

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5 It is beyond this note's scope to discuss in detail formulation of indicators. You may consult additional resources on developing and measuring gender-sensitive indicators, including challenges of measuring gender equality issues, and balancing the use of quantitative and qualitative data (Bardasi and Garcia, 2016; Asian Development Bank, 2013; ESMAP, 2013a).

6 Men and women are not homogenous groupings, and as such their energy-related needs and uses may vary also according to e.g., caste, age, land-holding and other factors. Many practitioners recommend disaggregating data by age and other socio-economic variables, as well as by sex.

Box 9. Evaluating long-term project impacts on women and men, Costa Rica

The example of the *Tirrenas Morenas* wind farm, constructed in 1994 with USD 35 million in financing loans and grants, demonstrates that engaging with community members is a necessary but not sufficient element for addressing gender issues in a project, and that it will not on its own necessarily lead to long-term benefits for women and men. When an ex post evaluation of the project was conducted twenty years after the community consultation that was part of community relocation for the wind farm, women community members reflected on how they and the facilitators had not adopted a strategic approach to negotiating benefits. At the time, they focused on short-term needs like wells and schools, rather than for example demanding land rights and other resources that could be useful for future generations. It was observed that the consultation facilitators, trained as engineers, were not equipped to support the community members in negotiating with the large companies implementing the project. This is a lesson learned on the intricacies of resettlement and compensation approaches under safeguards planning: it can be used to inform future projects.

Source: Elwell et al., 2014

IV. CHECKLIST⁷ FOR GENDER MAINSTREAMING

Gender Entry Point

Project Context

Policy

Draw on international and national policies and frameworks for precedent and guidance.

- Draw upon intergovernmental initiatives, such as SE4All, and international programs, such as ESMAP's Gender program, for guidance and examples of policy and project approaches that address gender issues.
- Consult with the Ministry of Women's Affairs, gender focal points in relevant ministries, and women's organizations on existing gender equality policy in the country as well as the inclusion of gender in energy policies (including LEDS and NAMAS) to understand the precedent/baseline; include those organizations in all phases of the project.

Support a Renewable Energy (RE) policy environment that promotes gender equality.

- Contribute to the collection and analysis of sex-disaggregated data.
- Share project findings and guidance materials that may inform good practices in addressing women's and men's needs and priorities in relation to renewable energy.

Institutional Approaches

Encourage and support an institutional culture that promotes gender equality and is responsive to the differential needs and priorities of women and men:

- Assess capacities and attitudes on gender; provide training opportunities for women and men on gender
- Encourage engagement with both men and women workers, users, and customers to share knowledge and ideas. This may be through household visits or customer satisfaction surveys or other gender-sensitive methods that are appropriate for the area
- Encourage the design of a gender-sensitive enquiry and complaint mechanism to be convenient and appropriate for both women and men, reflecting differences in communications channels and literacy levels
- Suggest that renewable energy technologies and efficient energy use be promoted using a variety of communication tools to reach men, women, and youth, such as radio, SMS, and newspaper

Encourage and support the establishment of gender-responsive operations policies in the energy company partnering in the project:

- Require gender-sensitive HR policies, practices and procedures in recruitment (equal opportunity to men and women), pay (equal pay for job of equal value), working hours (flexibility to meet employees' needs, such as preference to travel during daylight or family-related commitments)

Build awareness of the importance of a gender-responsive approach to projects among institutions that support private sector investment:

- Apply a gender approach to clean energy investment tools, such as feed-in-tariffs, renewable energy auctions and competitive bidding techniques, power purchase agreements, performance metrics, private sector subsidies and other economic incentives, and credit facilities for women.
- Develop a network of stakeholders on women's advancement in clean energy, including donors, multilateral institutions, national energy institutions, industry associations, civil society, academia, private sector, investor forums, etc.

7 Note: Checklist is based on following sources: Alternative Energy Promotion Centre, 2014; UNIDO, 2014; EBRD, no date; ESMAP, 2013a; Pearl-Martinez, R., 2014.; Cecelski and Dutta, 2011; NORAD, 2010.

Design

Identification

Prepare a gender assessment to identify and analyze where gender issues are relevant to the project

- Review key literature and operational documents (e.g., Implementation Completion Report and Country Strategy) and the Country Level Gender Assessment to learn about national gender assessment and plans, better understand country and cultural context.
- Examine the different situations of men and women, their work load and roles.
- Assess potential impacts of project on men and women.

Evaluate gender-related risks of the project

- Identify men's and women's ability to participate in the project activities
- Examine whether there are barriers that must be addressed, such as land ownership for collateral for loans, before technologies can be adopted

Preparation

Develop a Gender Action Plan that identifies how the project will address gender inequalities or differential needs

- Involve women and men in project design
- Design activities, outputs, and outcomes to target the differential short- and long-term needs and priorities of men and women
- Take into account men's and women's differentiated knowledge of, access to and use of energy-efficient industrial technologies, as well as their attitudes towards the risks and benefits connected to adopting new energy-efficient technologies (e.g., time and work burdens, space heating, child safety).
- Include gender-responsive indicators, targets, and a baseline to monitor gender equality results
- Identify where and when sex-disaggregated data, including qualitative data, will be collected and used to track gender-related issues
- Identify how to address gender-based barriers, e.g. improve access to microcredit and loans for women so they can shift from micro-scale to larger businesses up the value chain (marketing efficient stoves, selling and installing solar home products, managing village-level power systems)

Implementation

Put into place mechanisms to ensure that gender-responsive activities will be carried out

- Ensure that the budget includes allocations for gender-related activities and targets women's and men's needs.
- Ensure that gender issues are addressed in training and guidance manuals used for implementation.
- Require that safeguards are designed and implemented in a participatory way.

Conduct activities in a participatory, gender-responsive manner

- Include women's/gender equality-focused groups, associations or units in partner organizations.
- Set and meet targets for women's and men's inputs, access and participation in activities (e.g., 40% of whichever sex is underrepresented).
- Ensure that women and men receive training including in business management skills
- Confront stereotypical perceptions of "women's work" and "men's work"

Improve capacity of project team to address gender issues

- Recruit a gender expert, ensure all staff have basic gender knowledge, and incorporate gender-related tasks into team members' job descriptions, as relevant.
- Promote gender balance among project personnel at both project management and field operational levels.

Monitoring & Evaluation

Monitoring

- Include gender-responsive indicators in monitoring framework
- Require the collection of sex-disaggregated data wherever relevant
- Document progress and challenges on gender mainstreaming in aide memoires and back-to-office reports
- Adjust activities if needed to reach men and women

Evaluation

Ensure a gender-responsive approach to evaluation

- Provide evaluators with documentation on gender issues.
- Evaluation should include inputs from women and men of different socio-economic groups.
- Include a feedback mechanism to link findings of evaluations, particularly mid-term evaluations, to implementers (and ideally, males and females of the target population) for corrections or modifications.
- Ensure that conclusions about “lessons learned” include findings on gender issues.

Establish criteria for a project to be considered “gender responsive”, such as:

- Gender specialist or a social specialist with gender responsibilities on the team
- Gender analysis of need, demand, and supply presented in the Project document
- Specific project activities target women
- Gender-sensitive indicators in project results framework
- Gender assessment or gender in social assessment conducted for the Project
- Consultations held with women and/ or women’s groups
- Gender equality goals mentioned as part of the objective
- Gender-specific safeguards due diligence processes identified in the project

V. SAMPLE GENDER-SENSITIVE INDICATORS FOR MEASURING RESULTS IN A RENEWABLE ENERGY INITIATIVE

Sample Output Indicators

Example Result	Gender-sensitive Indicator
Market expansion, scaling up, or improved infrastructure in the renewable energy sector	• Number/ percentage of women in decision-making bodies of RE user groups/ committees OR in energy utilities
	• Number of women accessing finance for RE enterprises (and % of total)
	• Number of women-owned RE enterprises supported with technical assistance (and % of total)
	• Number of individuals indirectly employed by firms accessing improved electricity sources, disaggregated by sex
	• Evidence of the type and amount of compensation provided, by sex, type of household head, and socio-economic group, compared with the value of assets lost due to the project.

Increased number of household connections to renewable energy grids, mini-grids, or access to RE technology

- Number and percentage of participants attending participatory planning and consultation meetings, disaggregated by sex
- Number of households receiving financing for RE connection, disaggregated by sex of head of household
- Number of households connected to RE technology, disaggregated by sex of head of household
- Number and percentage of households with subsidized electricity connections for renewable energy technologies (disaggregated by sex of head of household; socioeconomic group)

Mechanisms put in place to ensure gender is mainstreamed into project to promote equal benefits for women and men

- Project budget includes allocations related to gender mainstreaming, including hiring of gender experts, conducting gender analysis, and collecting sex-disaggregated data
- Ministry of Women’s Affairs participated in design and implementation of project.
- Procedures for responding to complaints are publicly available and accessible to women; standards for responding to complaints are implemented and monitored.
- Equal employment opportunity policy and practices are implemented for staff and contractors (core labor standards, equal pay for work of equal value, occupational health and safety, and separate sanitation facilities).

Sample Outcome Indicators

Example Result

Gender-sensitive Indicator

Increased access to clean energy / increased supply of energy

- Number of households and individuals (disaggregated by sex) with improved access to and primary use of renewable energy sources
- Number of people starting/expanding other enterprise due to adoption of RE technology, disaggregated by sex
- % of women energy users reporting improved change in access to energy services, compared to men
- Perceived change in access by women to time-saving, renewable energy technologies
- Perceived satisfaction of user, disaggregated by sex, with electricity services or renewable energy technologies⁸

⁸ User satisfaction can be measured according to reliability, affordability, convenience, efficiency; may also capture reasons for not taking up new services or technologies

Increased employment and enterprise opportunities for women and men

- Number of RE users who have participated in RE training and are adopting RE or energy efficient technology as a consequence, disaggregated by sex
- Number and percentage of individuals employed in RE firms supported by the projects, disaggregated by sex, type of job and pay rates; and proportion of women employed in unskilled, technical, management and supervisory roles
- Evidence of the type of incentives designed to recruit women, increase their capacity, and provide career development in energy sector agencies and service providers
- Number and percentage of women and men earning income as renewable energy service providers and technicians, by type of energy technology (e.g. solar, biogas)
- Evidence of the type of incentives used to encourage women's entry into the renewable energy market (e.g. finance packages, tax benefits and rebates, pilot schemes, partnerships with financial institutions, the private sector or women's associations)
- Percentage change in income received from operating RE enterprise, disaggregated by sex

Sample Impact Indicators

Example Result	Gender-sensitive Indicator
Reduced energy poverty and increased energy security	<ul style="list-style-type: none"> • RE users consider themselves better off now in terms of <i>increased access and control over income</i> than before adopting the RE technology, disaggregated by sex • RE users consider themselves better off now in terms of <i>decision-making power</i> in the household than before adopting the RE technology, disaggregated by sex • RE users consider themselves better off now in terms of <i>labor/time use</i>, e.g. time spent on unpaid domestic and care work and collection of biomass, than before adopting the RE technology, disaggregated by sex • Percentage change in expenditure on purchasing fuel for household energy needs by women • Evidence of users' satisfaction with compensation, transitional support, special assistance, and resettlement, disaggregated by sex.
Reduced incidence of respiratory disease due to renewable energy solutions	<ul style="list-style-type: none"> • Number and percentage of households using clean energy cooking facilities, by sex of head of household • Number of reported cases of respiratory disease, disaggregated by sex, age and socio-economic group

VI. KEY READINGS AND RESOURCES

Gender Data Indices

Social Institutions and Gender Index	http://www.genderindex.org/
World Bank Open Data	http://data.worldbank.org/
Human Development Index	http://hdr.undp.org/en/content/human-development-index-hdi
Gender Inequality Index	http://hdr.undp.org/en/content/gender-inequality-index-gii

Gender Assessments and Action Plans

ESMAP (Energy Sector Management Assistance Program). 2013a. *Integrating Gender Considerations into Energy Operations*. Washington, DC: World Bank.

Cecelski, E. and Dutta, S. 2011. *Mainstreaming Gender in Energy Projects: A Practical Handbook*. Practical Action and ENERGIA.

Indicators

Asian Development Bank. 2013b. *Tool Kit on Gender Equality Results and Indicators*. Mandaluyong City: ADB.

Bardasi, E. and G. Garcia. 2016. *Integrating Gender into IEG Evaluation Work*. Washington, DC: International Bank for Reconstruction and Development and The World Bank.

VII. GLOSSARY OF KEY TERMS⁹

Access and Control	Productive, reproductive and community roles require the use of resources. In general, women and men have different levels of both access (the opportunity to make use of something) to the resources needed for their work, and control (the ability to define its use and impose that definition on others) over those resources.
CEDAW	The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) is an international human rights treaty that entered into force in 1981. It focuses on three dimensions of women's discrimination: the legal status of women, women's reproductive rights, and the impact of cultural factors on gender relations. There are currently 189 States parties to the Convention; they are expected to submit a national report on the measures adopted to give effect to the provisions of the Convention every four years (OHCHR, 2016).
CSW	The Commission on the Status of Women (CSW) is the principal global intergovernmental body exclusively dedicated to the promotion of gender equality and the empowerment of women. It promotes women's rights, documents women's lives worldwide, and shapes global standards on women's empowerment and gender equality (UN Women, 2016).
Gender	Gender is more than biological differences between men and women, boys and girls. Gender defines what it means to be a man or woman, boy or girl in a given society – it carries specific roles, status and expectations within households, communities and cultures. The traits and characteristics associated with gender differ from culture to culture, may vary within cultures, and evolve over time. These differences mean that: individuals face different situations as to what economic, social and political opportunities are open and accessible to them, and what status they hold within economic, social and political institutions. (CARE, no date).

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⁹ Unless otherwise noted, source is World Bank, no date.

Gender Analysis	The methodology for collecting and processing information about gender. It provides disaggregated data by sex, and an understanding of the social construction of gender roles, how labor is divided and valued. Gender Analysis is the process of analyzing information in order to ensure development benefits and resources are effectively and equitably targeted to both women and men, and to successfully anticipate and avoid any negative impacts development interventions may have on women or on gender relations. Further, the process explores how gendered power relations give rise to discrimination, subordination and exclusion in society, particularly when overlaid across other areas of marginalization due to class, ethnicity, caste, age, disability status, sexuality, etc. (CARE, no date)
Gender Awareness	An understanding that there are socially determined differences between women and men based on learned behavior, which affects access to and control resources. This awareness needs to be applied through gender analysis into projects, programs and policies.
Gender-blind	A failure to recognize that gender is an essential determinant of social outcomes impacting on projects and policies. A gender-blind approach assumes gender is not an influencing factor in projects, programs or policy.
Gender Equality	The result of the absence of discrimination on the basis of a person's sex in opportunities and the equal allocation of resources or benefits or in access to services.
Gender Equity	Entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognizes that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes.
Gender Mainstreaming	The process of ensuring that women and men have equal access to and control over resources, development benefits and decision-making, at all stages of development process, projects, programs or policy.
Gender Needs	Leading on from the fact that women and men have differing roles based on their gender, they will also have differing gender needs. These needs can be classified as either strategic or practical needs.
Gender-responsive	The particular needs, priorities, and realities of men and women are recognized and adequately addressed in all project phases so that both men and women can equally benefit.
Gender Roles	Learned behaviors in a given society/community, or other special group, that condition which activities, tasks and responsibilities are perceived as male and female. Gender roles are affected by age, class, race, ethnicity, religion and by the geographical, economic and political environment. Changes in gender roles often occur in response to changing economic, natural or political circumstances, including development efforts. Both men and women play multiple roles in society. The gender roles of women can be identified as reproductive, productive and community managing roles, while men's are categorized as either productive or community politics.
Gender Sensitivity	Encompasses the ability to acknowledge and highlight existing gender differences, issues and inequalities and incorporate these into strategies and actions.
Gender-transformative	Approaches actively strive to examine, question, and change rigid gender norms and imbalance of power as a means of reaching outcomes (in a particular sector) as well as gender equity objectives.
Resources	Resources can be economic: such as land or equipment; political: such as representation, leadership and legal structures; social: such as child care, family planning, education; and also time—a critical but often scarce resource.
Sex	Identifies the biological differences between men and women, such as women can give birth, and men provide sperm..
Sex-disaggregated data	For a gender analysis, all data should be separated by sex (and where relevant, by other variables such as age, etc.) in order to allow differential impacts on men and women to be measured.

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