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for a sustainable future

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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO ENERGY PROGRAMME

MUTUAL BENEFITS OF SUSTAINABLE ENERGY AND

EMPOWERING WOMEN

FOR INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT



INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

“*Empowering women is empowering humanity. Gender equality and women’s empowerment is central to UNIDO’s work as it is not only a matter of human rights, but also a precondition for sustainable development and economic growth, which are drivers of poverty reduction and social integration. When women and men are more equal, economies grow faster, more people are lifted out of poverty and the overall well-being of societies is enhanced.”*

LI Yong, UNIDO Director General’s statement on International Women’s Day, 2015.

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“Everything has changed. The school and the health clinic are better than in the past.”

– Jacqueline Widjigue,
Groupement Minda,
Guelendeng, Chad.



“It’s safer for my family and community now. Before it was difficult. We couldn’t walk at night and we couldn’t go to church. Now it’s changed and we can walk whenever we want.”

– Henriette Komking,
Groupement Minda,
Guelendeng, Chad.



“We’re very lucky to have electricity. We have created jobs for women and we have ideas to generate more business.”

– Catherine Ndaokai,
Consultant, Groupement
Minda, Guelendeng, Chad.

KEY SUCCESS FACTORS FOR ENERGY PRODUCTS THAT FOSTER INCLUSIVE AND SUSTAINABLE DEVELOPMENT

- Holistic approach to renewable energy systems
- Comprehensive and inclusive local capacity building — also including creating knowledge and awareness on the energy and gender nexus
- Local engagement and ownership: inclusion of women, men and the youths
- Support of local governments
- Joint implementation: form networks and build alliances for joint implementation and advocacy support
- Accountability: establish accountability mechanisms for reporting, using sex-disaggregated data
- Self-empowerment through developing energy products that recognise, respect and use the skills and expertise of both women and men
- Social and Environmental Impact Assessments and Gender Analysis: understand the local context for energy provision and recognize that women and men have different needs and opportunities



Introduction: The energy-gender nexus

The energy and gender nexus is based on the recognition of the differentiated needs and priorities of women and men with regards to energy stemming from gendered societal and cultural roles. Without access to modern and sustainable energy services, rural women and girls in particular have to spend long and exhausting hours performing basic subsistence tasks, including the time-consuming and physically draining task of collecting biomass fuels, which constrains them from accessing educational opportunities and livelihood-enhancing options, as well as limits their options for social and political interaction. Cooking in the absence of clean fuels is particularly detrimental to the health of women and children, who are often exposed to toxic smoke from traditional cook stoves. Moreover, violence against women and girls can occur because of lack of street lighting at night or during the day in situations where resources are scarce and women are obliged to collect fuel from remote and isolated areas.

Women's energy needs can only be realized if women and their priorities receive greater visibility. UN Women believes that globally, women occupy around 19 per cent of all ministerial posts, but only 7 per cent of these are in environment, natural resources and energy, and a mere 3 per cent are in science and technology. In developed countries, ILO estimates that the share of female employees in the energy industry is only 20 per cent, mostly in non-technical fields such as administration and public relations, and worldwide, women account for only 9 per cent of the construction workforce and make up only 12 per cent of engineers. One reason for this is that fewer women than men pursue training in science, technology, engineering or mathematics. Furthermore, the development of new technologies requires start-up finance and access to credit and land, which in many developing countries women are not granted. In addition, the percentage of patents obtained is lower for women than for men. As a consequence of these imbalances, women remain marginalized from decision-making processes in which global energy issues are identified and, hence, potential solutions proposed tend to have an inadvertent male bias.

Without accepting this embeddedness of gender in the energy sector, the realization of development goals will be stalled. For example, the World Bank's World Development Report 2012 highlighted that gender equality is critical for development across all sectors. In addition, a study by McKinsey found that tackling gender inequality could add US\$ 12 trillion to world economy. The global development agenda "Transforming our world: The 2030 Agenda for sustainable development" emerged with 17 Sustainable Development Goals (SDGs), which include a goal to achieve gender equality and empower all women and girls (SDG 5), goals on sustainable energy and inclusive industrial development (SDG 7 and SDG 9 respectively) as well as gender-sensitive targets in other goals providing for stronger cross-sectoral and integrated efforts. Moreover, women's distinct roles also provide them with skills and knowledge, which make them valuable agents of environmental safeguard and a key resource for positive adaptation and mitigation of environmental damage. Thus, the empowerment of women is not only a human right but also vital to the achievement of other development goals, such as the reduction of poverty and environmental sustainability, and is therefore an important part of the inclusive and sustainable industrial development agenda. Realizing this, the United Nations Industrial Development Organization (UNIDO) has recognized that the empowerment of women and

“Gender equality matters in its own right, but it is also “smart economics” because it can enhance economic efficiency.” – International Monetary Fund.

the promotion of sustainable energy are mutually reinforcing goals. Increased access to affordable, reliable and sustainable forms of energy can reduce the burden of household chores typically assigned to women, thus allowing them to engage in productive activities leading not only to their empowerment but also to creating equality among genders. In turn, gender mainstreamed energy initiatives are more effective and more likely to achieve a sustainable impact, since understanding female energy usage facilitates more comprehensive and long-term energy solutions for inclusive growth and development. Finally, beyond recognizing specific vulnerabilities resulting from differing gender roles, women can be key agents of change for sustainable energy, as consumers, producers, intermediaries, researchers and influencers of the sustainable energy future.

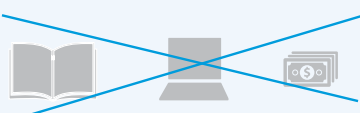
WHILE RECENT DECADES HAVE SEEN A SURGE OF FEMALE LABOUR FORCE PARTICIPATION AND EDUCATIONAL ENROLMENT, OCCUPATIONAL SEGREGATION AND INEQUALITIES ROOTED IN GENDER STEREOTYPES, PATRIARCHAL STRUCTURES AND SOCIAL NORMS REMAIN.



Out of the **781 million** adults and **126 million** youths worldwide that lack basic **literacy** skills, more than **60%** are women

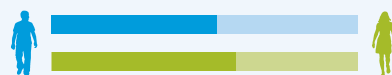
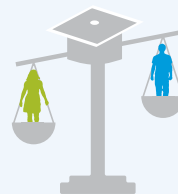


Between 2000-2010 as little as **10-15%** of female **Ministers** held portfolios in finance and trade, **7%** held portfolios in environment, natural resources and energy and **2-3%** held portfolios in science, technology and research — all important areas to sustainable development and related financing



Women in developing countries lack access to the necessary information and financial resources to adapt to the **changing climate**

Gender disparities are more prevalent in higher **educational** levels



Women have a higher chance than men of being engaged in vulnerable **employment**: approximately **two thirds** of working women in the developing world are in vulnerable jobs as self-employed or unpaid family workers



Poor people are especially vulnerable to the effects of **climate change** and the majority of the **1.5 billion** people living on **US\$ 1** a day or less are likely to be women



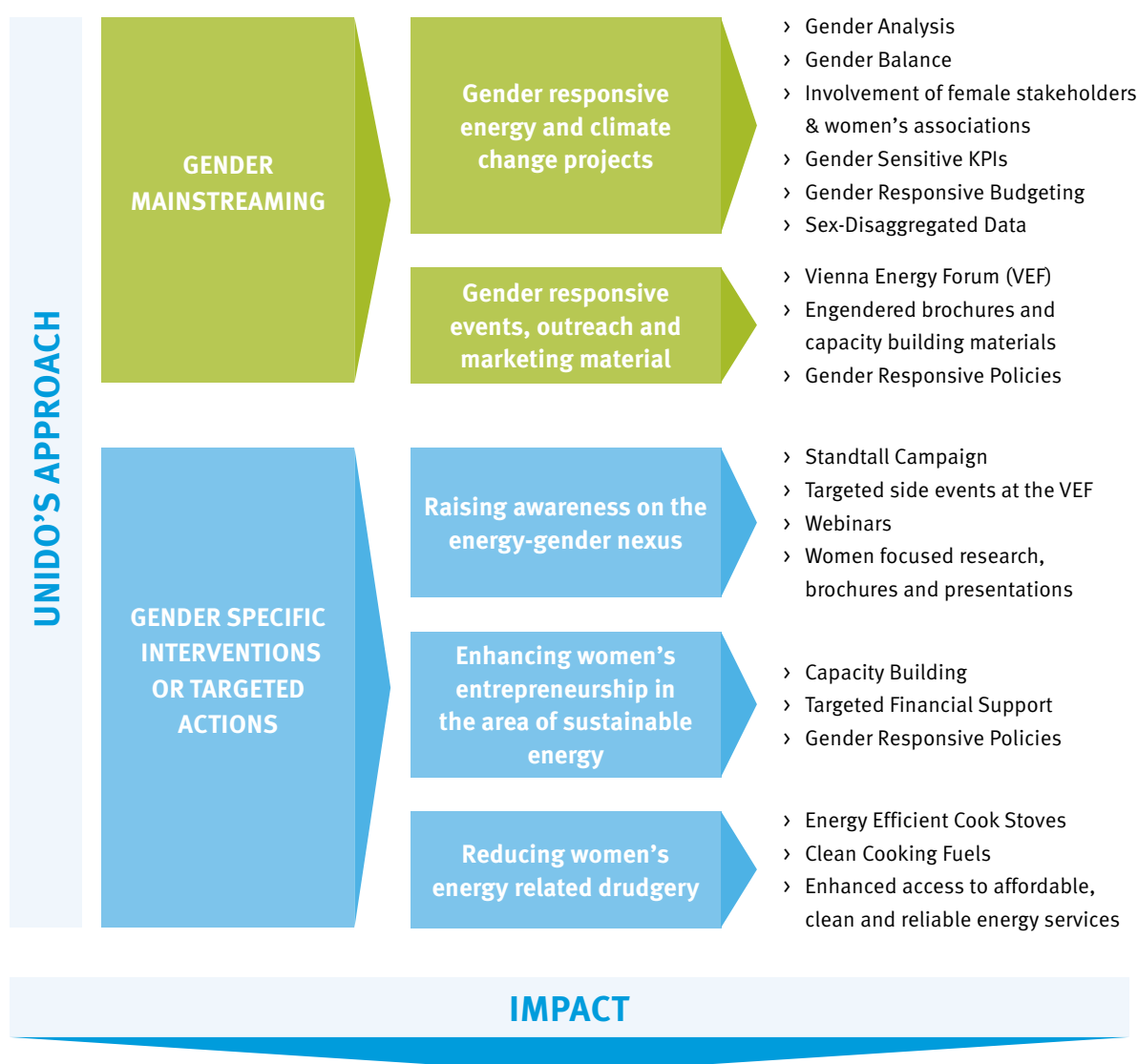
While women's **political participation** continues to increase, it is far from equal. Female members of parliament accounted for **21.8%** of all parliamentary seats in January 2014, up from **20.3%** in the previous year. In January 2014, 46 countries had more than **30%** female members of parliament in at least one chamber, up from 42 countries the previous year



Gender disparities still exist in the labour market and are particularly pronounced in **technical areas** such as in the energy industry, where women represent only **20%** of the workforce and mostly work in non-technical fields

UNIDO'S APPROACH TO GENDER EQUALITY AND WOMEN'S EMPOWERMENT IN THE AREA OF SUSTAINABLE ENERGY

To achieve maximum impact and contribute to gender equality and women's empowerment on the ground, UNIDO puts special emphasis on capturing opportunities to mainstream gender in its projects and programmes in line with its Policy on Gender Equality and the Empowerment of Women, adopted in 2009 and revised in 2015, UNIDO's Gender Equality and Empowerment of Women Strategy 2016-2019, as well as with the Lima Declaration adopted in 2013. Building on existing gender mainstreaming efforts, UNIDO has recently launched an operational-level guideline for all project stakeholders, which provides gender analysis tools and indicators for the entire project cycle. UNIDO is committed to assessing how its programmes, projects and organizational practices impact on both women and men, and takes responsibility to address identified inequalities in project design and implementation. Mainstreaming gender in sustainable energy and climate change programmes has enabled UNIDO to continue its political leadership and strengthen its comparative advantage as promoter of inclusive and sustainable industrial development.



- › Women have more time to engage in productive activities, community work and personal development or pleasure
- › Energy projects and interventions have a more sustainable impact and are more inclusive
- › Energy development is more democratic and representative of the needs and priorities of the whole population

Gender mainstreaming of global energy projects and programmes

UNIDO recognizes the importance of gender equality and the empowerment of women and is applying a twin-track approach to achieve gender equality. The Organization is mainstreaming gender throughout the cycle of its projects, addressing gender equality on the strategic and political level, but also creating projects and initiatives dedicated to empowering women and promoting gender equality.

Mainstreaming gender in regional sustainable energy centres

UNIDO launched a network of regional renewable energy and energy efficiency centres to expand sustainable energy markets and stimulate investments. To that end, centres work on mitigating existing barriers and executing activities in the areas of policy development, capacity building, knowledge management, awareness raising, as well as business and investment promotion.

Due to potential impact and leverage that these centres might have in their respective regions, they are ideal for promoting gender equality and the empowerment of women by combining forces and creating synergies.

ISLAND WOMEN OPEN NETWORK (IWON) FOR SUSTAINABLE ENERGY & CLIMATE RESILIENCE IN ISLAND NATIONS

Women across Small Island Developing States (SIDS) face similar barriers to taking advantage of sustainable energy services, investment and business opportunities. The SIDS Sustainable Energy and Climate Resilience Initiative (SIDS DOCK) in partnership with UNIDO and regional organizations is coordinating the Island Women Open Network (IWON) for Sustainable Energy & Climate Resilience in Island Nations to promote gender mainstreaming in the sustainable energy sector of SIDS in Africa, the Caribbean, the Indian Ocean and the Pacific Ocean.

Without the active participation of women it is impossible for SIDS to transition to Sustainable Energy For All and to achieve “Island Energy for Island Life 25-50-25 by 2033”, namely SIDS DOCK goals to increase energy efficiency by 25 per cent (compared to a 2005 baseline), generate at least 50 per cent of electric power from renewable sources and decrease conventional transportation fuel use by 25 per cent by 2033.

The network supports activities, projects and exchanges through a network of regional sustainable energy centres, namely the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE), the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE) and the Economic Community of West African States (ECOWAS) Centre for Renewable Energy and Energy Efficiency (ECREEE). Centres operate under the umbrella of the Caribbean Community (CARICOM), the Secretariat of the Pacific Community (SPC) and ECOWAS.

The Island Women Open Network convenes a powerful advocacy group for sustainable energy and gender issues in SIDS and provides a strong link between international agreements and concrete actions on the ground. In addition, it connects with already ongoing regional and national energy-gender programmes such as the ECOWAS Programme on Gender Mainstreaming in Energy Access (ECOW-GEN) or the gender mainstreaming programme of the Secretariat of the Pacific Community (SPC). The network is supported by the Global Forum on Sustainable Energy (GFSE), the Clinton Foundation, the Austrian Development Agency (ADA) and other partners.

PROGRAMME ON GENDER MAINSTREAMING IN ENERGY ACCESS (ECOW-GEN) IN WEST AFRICA

UNIDO is partnering with the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) in the implementation of the ECOWAS Programme on Gender Mainstreaming in Energy Access (ECOW-GEN). Framed in women's and men's unequal access to resources and energy for their livelihoods and productive uses, ECOW-GEN works to strengthen women economically by improving their access to energy for income-generating activities and by empowering them as actors in the development of renewable energy and energy efficiency markets as a means to end the region's energy crisis.



With the technical and financial support of UNIDO, ECOW-GEN has developed the following initiatives:

- ✦ **ECOWAS Women's Business Fund:** through providing grants and training activities, ECOWAS Women's Business Fund supports the establishment and expansion of women-led energy businesses. The fund is financed by the Austrian Development Agency (ADA) and the Spanish Agency for International Development Cooperation (AECID). Two projects were awarded grants to establish and scale up clean energy businesses, empower women and contribute to the economic development of their respective countries: "Promotion of Anomena improved LPG stoves as a clean energy initiative for cooking" by ANOMENA Ventures in Ghana and "Economic Empowerment of Bargny business women" by Action Solidaire International in Senegal.
- ✦ **Women's Technical Exchange Program:** a programme aimed at facilitating knowledge and technology transfer among women groups with expertise in various energy technologies.
- ✦ **Women's Economic Empowerment through Energy for Productive Uses:** the initiative supports rural women to increase their productivity in agricultural activities through the use of renewable energy and energy efficient technologies.
- ✦ **Mainstreaming gender in energy programmes and projects:** address gender inequality in energy access in West Africa through supporting the development of regional gender and energy policies, national strategies, capacity building and advocacy.
- ✦ **Youth Leadership Development in Energy:** empower young women and men in West Africa to shape and influence energy-related developments in the region by providing research grants that support the development of high-quality, relevant studies proposing solutions to topical issues.



The president of Sierra Leone, the Secretary General of the MRU, barefoot engineers, and other participants at the conference on "Women's Economic Empowerment through Energy Access in the MRU sub-region." – May 2013.



The Global Cleantech Innovation Programme (GCIIP) for SMEs

ARMENIA, INDIA, MALAYSIA, PAKISTAN, SOUTH AFRICA, THAILAND AND TURKEY

Donors and Partners: Global Environment Facility (GEF), The Cleantech Open

- Human Development Index (HDI) ranking: **Armenia 87, India 135, Malaysia 62, Pakistan 146, South Africa 118, Thailand 89 and Turkey 69 out of 187**
- Gender Inequality Index (GII) ranking: **Armenia 60, India 127, Malaysia 39, Pakistan 127, South Africa 94, Thailand 70 and Turkey 69 out of 187**
- Social Institutions and Gender Index (SIGI) ranking: **Armenia 72, India 79, Malaysia 122, Pakistan 86, South Africa 28, Thailand 37 and Turkey 35 out of 108**
- Global Gender Gap Report ranking: **Armenia 103, India 114, Malaysia 107, Pakistan 141, South Africa 18, Thailand 61 and Turkey 125 out of 142**

“This is the most active and productive project amongst all other clean energy projects, clearly very innovative and inclusive of women” – Kimberlee LeBlanc, Women Council, United States Embassy at Islamabad).

Launched by UNIDO with the support of the Global Environment Facility and in cooperation with the Cleantech Open, the Global Cleantech Innovation Programme for Small and Medium-sized Enterprises recognizes and leverages the power of entrepreneurship to address challenging environmental and economic problems. The programme identifies the most promising entrepreneurs across a country and provides them with support, training, mentoring and assessments to promote and “de-risk” their companies, while also connecting them with potential investors, customers and partners.

UNIDO has made special efforts to address gender issues and include women as entrepreneurs, trainers, mentors and judges throughout the GCIIP participating countries. National project managers were trained at UNIDO Headquarters in Vienna and provided with tools and strategies to mainstream gender in their project, and national awards were introduced for the most promising women-led teams and for technologies with the largest positive impact on women.

Results

➤ In Pakistan, events were organized at the regional level to address women’s mobility restrictions. The promotion campaign was extended to women’s organizations, universities, chambers, technical groups and associations, with exclusive seminars being offered to women. This resulted



in approximately twice as much female participation as in 2014: 17 per cent of the eligible teams were composed of women compared to 10 per cent in the previous year. Female-led semi-finalists increased from 9 per cent to 22 per cent, and female generalist and specialist mentors went from 18 to 25 per cent. In 2015, the most promising women-led team in Pakistan presented BOLT bike, a hybrid technology bicycle run by battery and human muscle power.

➤ In South Africa, a national award for the Best Woman-Led Business has also been introduced. The 2015 winner was ZingCO with its innovative battery swapping solution for electric vehicles that will promote sustainable and affordable transportation, with a particular focus on university transport solutions.

“Thanks for supporting women entrepreneurship by adding the Most Promising Women-led Team Award to the Global Cleantech Innovation Programme 2015. No other organization is supporting women in Cleantech like UNIDO in Pakistan” – Asra Naz, Team Leader of BOLT BIKE, the 2015 winner of the Best Women-led Business Award in Pakistan.

“It is not only about getting women in, it is about realizing their potential and developing their skills.” – Reuben Kadalie, National Operations Manager of the National Cleaner Production Centre, Cape Town.

Applying a gender lens to sustainable cities

For cities to be sustainable, social dimensions such as inclusiveness, cultural adequacy, fairness and gender equality are crucial, besides dimensions related to the economy, ecology, built environment and policy. UNIDO sees empowerment of women not only as a responsibility, but also foremost as an opportunity since women's economic participation and wellbeing are crucial for a society at large and "poverty incidence tends to be lower in countries with more gender equality".

Two aspects are crucial when planning and re-organizing gender-sensitive cities: safety and comfort. The safety of women has to be a priority while planning sustainable cities, as they are disproportionately subject to gender based violence and harassment, which are prevalent in cities. Furthermore, a crucial component of working adults' lives – for both men and women - is the comfort and support they can access in order to balance family and work life. Such comfort would include efficient access to employment, schools, childcare, storages, and health and, sanitary facilities. Moreover, the elimination of gender-based occupational segregation, gender gaps in payment and other forms of labour market discrimination, is also essential. Financial support for education, business and other training opportunities would also aid the economic empowerment of women, who are often disenfranchised from professional development opportunities.

Energy is as an integral part of sustainable urban planning, can help to make cities safer, improve sanitation and health and create sustainable transport and mobility concepts. Promoting the installation of lights to reduce crime against women and to provide security in public places can be helpful for creating a safer environment for women.

UNIDO's strategy for promoting gender equality and women's empowerment in the framework of ISID is to support the development of people-centred sustainable cities that are based on the principles of human rights, gender equality and wellbeing. Focus will be to promote the economic empowerment of women by supporting industries and enterprises to provide access to clean and affordable energy and related services such as water and sanitation, safe public transport, and lighting of streets. UNIDO aims to incorporate gender dimensions in urban energy projects in part by increasing women's representation, engagement and participation in decision making processes and utilizing gender expertise of women's networks and associations, NGOs and international organisations.



Safety and comfort are crucial for women to become agents for sustainable cities.

FACTS



Approximately **20%** of urban households are headed by women



Violence
Urban crime

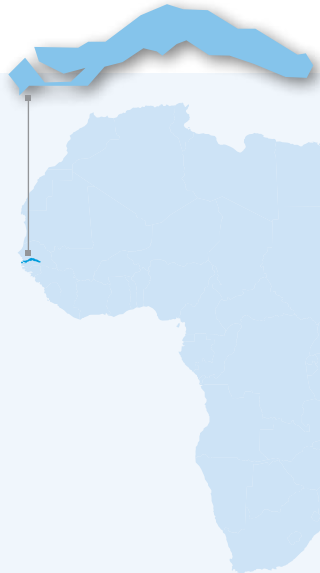
Women are twice as likely as men to be victims of violence, with violence representing at least **25-30%** of urban crime



Between 2003-2008, women represented less than **5%** of Mayors in Western Asia and the Caribbean and only **5-10%** in sub-Saharan Africa, Central and South America, South-East Asia and Eastern and Western Europe

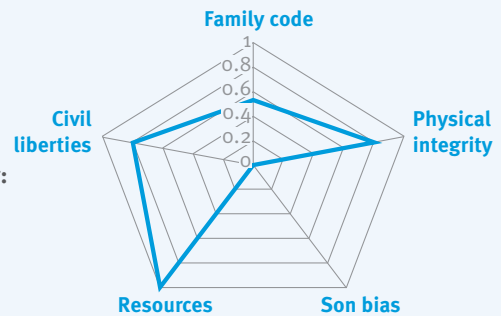
Engendering renewable energy projects

Promoting renewable energy in the productive sectors in **the Gambia**



Donors and Partners: Global Environment Facility (GEF), Gambia Renewable Energy Centre (GREC), National Environment Agency, National Water and Electricity Company, Ministry of Energy, Public Utilities Regulatory Authority, Mbolo Association

- **Human Development Index (HDI) ranking**
172 out of 187
- **Gender Inequality Index (GII) ranking**
139 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:**
106 out of 108
- **Global Gender Gap Report ranking**
not ranked



The market for renewable energy systems in Gambia is presently small, but it is growing fast. Based on the encouraging results of the GEF-funded UNIDO project focusing on mini grids for productive uses in rural areas, the new GEF project aims to increase the availability of reliable and cost-effective renewable energy services for productive uses in Gambia.



Solar PV systems power women's development of new skills at Fandema – July 2015.

The Government of Gambia is committed to seeing more women and men take up renewable energy businesses and to incentivize youth, particularly young women, to engage as entrepreneurs in the renewable energy sector. To that end, the adopted renewable energy law — developed under the GEF4 project with the support of the EU Energy Initiative Partnership Dialogue Facility (PDF) — requires that a renewable energy fund be established. To provide women and youth-led entrepreneurship projects in the renewable energy sector with grants the project will work with the Ministry of Energy and the Public Utilities Regulatory Authority to set-up, within the renewable energy fund, a component for youth and women enterprise development. Women and youth will be trained on renewable energies and entrepreneurship to support them along the entrepreneurship process. Appropriate training materials will be integrated into the curriculum of training institutions such as the Gambia Technical Training Institute, Mbolo Association Vocational Training Centre and University of The Gambia in order to support specialization in this domain at early stage.

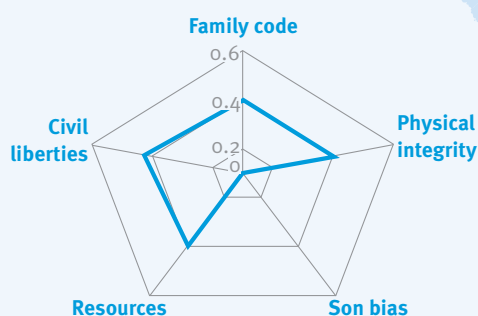
Results

- Adoption of a renewable energy law including a plan for the establishment and implementation of a youth and women renewable energy entrepreneurship fund within the renewable energy fund.
- Installation of a PV-hybrid system of 8.3kW at the Mbolo Training Centre that will be scaled-up during the GEF5 project with a grid-tied 20.7kWp PV system to power handicraft activities and the education of women and girls while providing them with possibilities to install, test and maintain the solar PV systems.

Renewable energies for productive uses and rural development in Mozambique

Donors and Partners: MDG Achievement Fund, Food and Agriculture Organization of the United Nations (FAO), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Human Settlements Programme (UN-Habitat), United Nations World Food Programme (WFP)

- **Human Development Index (HDI) ranking:**
178 out of 187
- **Gender Inequality Index (GII) ranking:**
146 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:**
47 out of 108
- **Global Gender Gap Report ranking:**
27 out of 142



The district of Chicualacuala, Mozambique suffers from significant, structural water shortage. This represents a burden especially for women and young girls since fetching water is considered their responsibility. As part of the joint United Nations programme, UNIDO designed and installed solar water pumping systems for drinking water and agricultural irrigation in five villages — Bragança, Chicualacuala, Madulo, Mepuzi and Ndombe.

In the village of Ndombe, the maintenance and repair of the photovoltaic (solar) water pumping system is managed by the community. Many women are involved in its maintenance and operation by collecting money from water users and being actively involved in community management. Benefits for women include the creation of productive activities, since the improved irrigation system allows women to sell vegetables and fruits and increase their income. The improved yield of crops also impacts diets, reducing malnutrition especially among women and children.

Alda Chaúque used to walk 17 km from her hometown of Bragança to fetch water from the river, which was often depleted. The project drilled a borehole and installed a solar water pumping system that extracts water from a depth of more than 100 metres. Today, Alda can collect water a stone-throw away from her house. Besides having cleaner water to drink and wash, she cultivates a small plot of land and grows orange trees, tomatoes and cabbage, which she can sell in the community market.

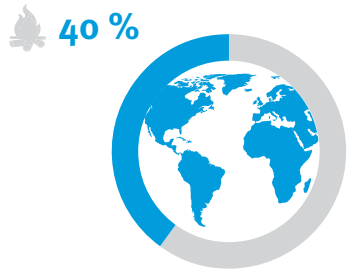


Women and children fetching water in Madulo, Mozambique
– April 2011.

Results

- ❖ Alleviation of women’s water-related drudgery through increased access to safe drinking water for more than 2,000 people in at least four communities.
- ❖ New and better sources of livelihood for women in seven vulnerable communities through enhanced water supply for agricultural irrigation and livestock.

Addressing women’s practical and productive energy needs



Three billion people, or 40 per cent of the global population, rely on traditional biomass for cooking. The rural poor — mostly women — often lack access to efficient cooking fuel, forcing women and children to spend many hours gathering fuel (up to 5 hours per day) or spend a significant portion of household income purchasing it. Women carry out 91 per cent of fuel and water collection and have an average working day of 11-14 hours, compared to 10 hours on average for men. Reducing the time spent collecting fuel and cooking enables women to spend more time pursuing income-generating or educational opportunities and leisure activities, all of which contribute to poverty alleviation.



Women are crucial to clean cooking solutions.

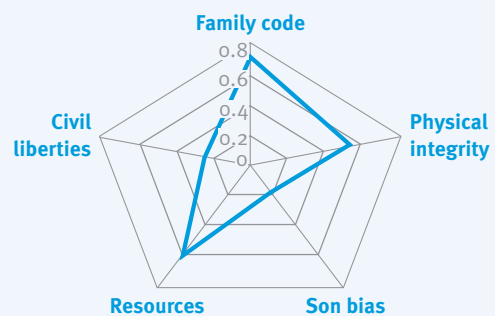
Women play a crucial role in the widespread adoption and use of clean household cooking solutions because of their central role in managing household energy and cooking. As consumers and users of cook stoves, women are a critical component of the sector’s sustainability. Women must be fully integrated into the process of designing products and solutions: without their opinions and input, products will not meet their needs and will not be sustainable.

Clean Cooking Fuel – Bioethanol Fuel – Switch Pilot Project for Zanzibar, Tanzania: Sustainable conversion of waste clean energy for greenhouse gas (GHG) emissions reduction



Donors and Partners: Country Framework support of the United Nations Development Assistance Plan (UNDAP) 2011-2015, Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Human Settlements Programme (UN-Habitat), UNIDO, United Nations World Food Programme (WFP)

- **Human Development Index (HDI) ranking:** 169 out of 187
- **Gender Inequality Index (GII) ranking:** 124 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:** 75 out of 108
- **Global Gender Gap Report ranking:** 47 out of 142



Over 85 per cent of the population in Zanzibar depends on wood and charcoal (biomass energy) as their primary source of energy, both of which have negative repercussions for women and children. UNIDO has partnered to implement a pilot initiative that uses bio-ethanol for cooking in approximately 150 households in Zanzibar to improve women’s health and their livelihoods.

A team of five female surveyors interviewed women in selected households about handling ethanol cook stoves, efficiency and fuel consumption, quality of emissions and cost comparisons between ethanol and other types of cook stoves. The response to the pilot project has been overwhelmingly positive. Women noted the ease with which they could prepare quick meals and the cleanliness of the stoves and the bio-ethanol fuel. UNIDO is now working with various partners and stakeholders to scale up these interventions elsewhere in Tanzania, as it would open up business opportunities for women to produce fuel-grade bio-ethanol, distribute and market ethanol and ethanol stoves.

Results

- Approximately 150 households in Zanzibar received bio-ethanol and stoves for cooking.
- Families reported saving 2.1 hours each day on average by switching to ethanol.

ETHANOL has many benefits over traditional biomass fuels and other clean fuels:

- Ethanol fuel and the CLEANCOOK stove eliminate household air pollution (when only a CLEANCOOK stove is used)
- Ethanol reduces the need for firewood collection, deforestation and families' reliance on dirty fuels. Families save time when using the CLEANCOOK stove and are able to dedicate more of their day to educational or economic activities
- Ethanol is unique as a renewable, clean fuel since it can be produced locally or imported and can be transported easily in liquid form. In each case, new economic opportunities are created in the distribution of fuel and stoves and farmers are given new markets



“It is a good stove, easy to use, it’s quick in cooking, no pollution of smoke like the fire woods and charcoal. You can see the kitchen walls how they were polluted by smoke from firewood and charcoal” –
Zainab Makame Hassan.
Zanzibar, 2015.



“Due to the scarcity of hardwood species suitable for charcoal production, households in Kisakasaka were no longer able to use charcoal as they once did; hence they burned wood directly”. –
UNIDO Project Manager Hillary Njau demonstrates how the stove is used, Zanzibar, in Kisakasaka, 2015.

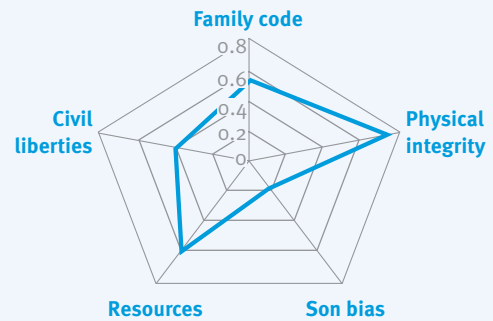


Demonstrating how to fuel a bio-ethanol cook stove canister –
Zanzibar, 2015.

Promoting energy efficiency technologies in the beer brewing sector in Burkina Faso

Donors and Partners: Global Environment Facility (GEF), Ministry of Environment and Sustainable Development

- **Human Development Index (HDI) ranking:**
181 out of 187
- **Gender Inequality Index (GII) ranking:**
133 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:**
82 out of 108
- **Global Gender Gap Report ranking:**
110 out of 142



A joyous “dolotière” female beer brewer taking part in the UNIDO energy efficiency project, Burkina Faso.

The project works with female beer brewers in Burkina Faso to promote the use of energy efficient cook stoves. A community microcredit scheme has been established to assure project sustainability as well as to respond to difficulties in accessing credits.

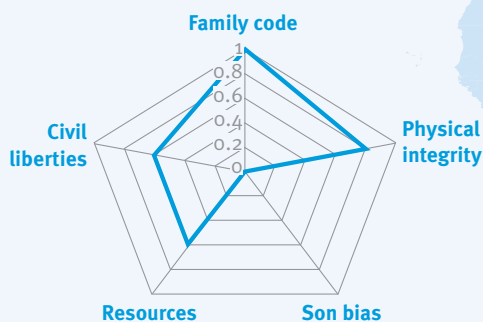
Women and girls have been trained in energy efficient cook stove manufacturing, beer quality improvement, organization and management. The project has developed four clusters composed of 28 women’s associations and has managed to diffuse more than 400 cook stoves in the villages of Ziniaré, Zorgho, Saaba and Pabré. Some 600 female entrepreneurs have been trained on improved business operation, occupational health and safety and the benefits of improved stoves. The project has helped to free up around 50 hours per month for around 1,000 women while significantly increasing their income and improving their health. It has also had a direct impact on the environment, reducing greenhouse gas emissions and causing a 40-50 per cent reduction in the consumption of firewood. Apart from creating awareness on energy utilization and health impacts the project has also created a strong market for energy efficient stoves. Finally, the association of female beer brewers has been supported in creating a nation-wide federation.

As a result of the project, Ramata and Blandine find themselves having, their family and their community and have developed an urban agriculture scheme in their backyard that provides their family with additional revenue and more nutritious food.

Promoting energy efficient cook stoves in micro and small-scale food processing industries in Chad

Donors and Partners: Global Environment Facility (GEF), Agence pour l'Énergie Domestique et l'Environnement, Fonds Spécial en faveur de l'Environnement, Shell Foundation

- **Human Development Index (HDI) ranking:**
184 out of 187
- **Gender Inequality Index (GII) ranking:**
151 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:**
104 out of 108
- **Global Gender Gap Report ranking:**
140 out of 142



Building on the experience of the project in Burkina Faso and responding to the country policy priorities, UNIDO's project in Chad aims to reduce annual carbon dioxide emissions by 12,162 tons, reduce concentrations of smoke and reduce pressure on forests and related resources. To do so the project will stimulate the local market to diffuse 1,500 energy efficient cook stoves in two traditional micro agro-food processing industries, namely: traditional sorghum based beer brewing (bili bili) done exclusively by women and meat grilling (tchélé) done exclusively by men. The intervention is working directly with different actors in the value chain of meat grilling and beer brewing including energy efficient (EE) cook stove manufacturers, distributors, beer brewers and meat grillers in the clusters of Ndjamen, Mandelia and Guelendeng. To this end, the intervention is adopting a holistic cluster approach that promotes cooperation, solidarity and cost sharing to address the financial, social and economic constraints of stakeholders. Additionally, the project builds entrepreneurs' know-how through targeted training in environmental, social, managerial and financial aspects surrounding the buying and utilization of energy efficient cook stoves. To address the lack of access to credit and encourage ownership the project is promoting a community based self-help financial mechanism.



Working conditions of female beer brewers improved due to new cook stove, Chad.

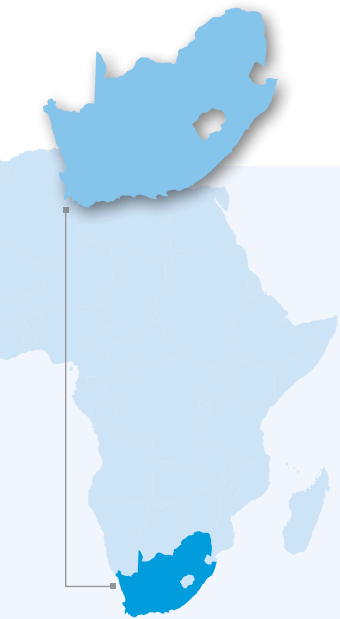
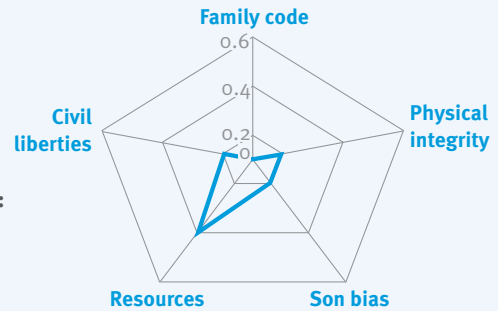
Special attention will be paid to developing joint, gender-sensitive actions between cluster actors to put in place a well-functioning assembly, production chain and distribution line of energy efficient stoves that integrates women. The project will assure that both female and male entrepreneurs in the targeted sectors are supported in running a profitable business, accessing financing and having a stronger voice and bargaining power in their communities.

Gender Mainstreaming in the energy efficiency sector

Industrial Energy Efficiency Improvement Project (SA IEE Project) in South Africa

Donors and Partners: Department of Trade and Industry, Department of Energy, Department for International Development, State Secretariat for Economic Affairs (SECO), National Cleaner Production Centre of South Africa

- **Human Development Index (HDI) ranking:**
118 out of 187
- **Gender Inequality Index (GII) ranking:**
94 out of 187
- **Social Institutions and Gender Index (SIGI) ranking:**
27 out of 108. Top performer in Sub-Saharan Africa
- **Global Gender Gap Report ranking:**
18 out of 142



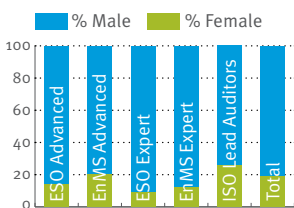
Graduation ceremony for SA IEE Project ISO 50001 Lead Auditor, South Africa, 28 August 2014.

The overall objective of the project is to support South Africa to implement its National Energy Efficiency Strategy and its National Industrial Policy Framework. To that end, its strategy involves the introduction and promotion of Energy Management Systems (EnMS) and Energy Systems Optimization (ESO) in conjunction with the introduction of International Standards Organization Energy Management Standard ISO 50001, while fostering a suitable and supporting policy and institutional environment.

Despite South Africa's extensive legislative and policy framework on gender equality and the empowerment of women, limited sensitivity to gender issues characterizes most industrial energy policies and practices. In early 2014, the project undertook a quantitative and qualitative gender assessment to generate knowledge in the gender and industrial energy efficiency sector, build the capacity of the project's national implementation partner (the National Cleaner Production Centre of South Africa) and provide guidance for corrective gender boosting measures within the project's final stage of implementation. The gender assessment was also used to design the gender mainstreaming function of the GEF-funded follow-up project to the SA IEE Project. The assessment focused on interviewing a diverse range of project stakeholders, including participants at a training course, team members at a pilot plant, counterpart officers and specialists in gender equality and the promotion of women in the engineering and industrial sector.

Results

The comprehensive gender assessment identified the following barriers for women in the energy efficiency sector: gender-based discrimination (pay gaps, a lack of promotion opportunities, assignment to lower categories of responsibility and limited possibilities to attend training); limited access to information and resources; and underrepresentation of women in top management. Based on this assessment, activities were developed to promote gender equality, such as identifying and developing female role models and mentors, which are known to help build confidence, promote networking, and improve chances of promotion. The results of the assessment also served to adjust the project's final training session to promote increased female participation through additional targeted outreach activities and the sensitization of stakeholders. In addition, the assessment has brought up the possibility of integrating gender mainstreaming into counterpart institutions and in particular at the NCCP-SA, where gender considerations were not previously a central priority.



Gender Balance of the SA IEE Project Training Programmes (as of Dec 2014).

Initiatives that build capacity and raise awareness on the energy-gender dimension

Disseminating knowledge, raising awareness and building capacity

Conferences, side events, panel discussions, campaigns and webinars are raising awareness and building capacities across partner institutions and the private sector.

VIENNA ENERGY FORUM

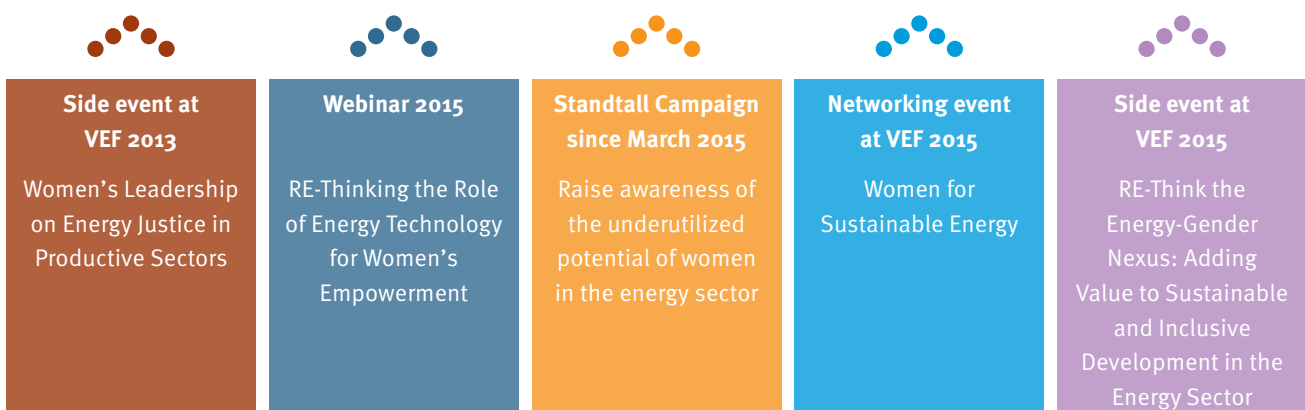
One of the key messages of the Vienna Energy Forum (VEF), held in Vienna on 18-20 June 2015, was that sustainable energy and the empowerment of women are mutually reinforcing goals that are vital to truly inclusive and sustainable development. Energy poverty has a disproportionate impact on women, who due to traditional gender roles are most affected by the widespread domestic dependence on biofuels. Given that access to sustainable energy has been shown to provide opportunities for female economic empowerment and to advance gender equality, forum panelists agreed that Sustainable Development Goals space missing in between 5, 7 and 9 on gender equality, sustainable energy and industry respectively must be tackled jointly through an integrated approach that promotes women's transformational roles in providing innovative energy solutions.

Key recommendations: In order to empower women in the energy sector, panelists recommended recognizing the need to accept different working styles — for instance, women's preference for cooperative models of working — and focus on simple innovations that are affordable, durable, easy to use and maintain, eco-friendly, money-saving and life-changing. Other recommendations included improving access to credit, helping men recognize the empowerment of women as a positive development, involving local women's groups, providing gender-disaggregated data and letting women participate in policy-making.



The networking event Women for Sustainable Energy showcased female role models in the energy sector, Vienna, June 2015.

CREATING KNOWLEDGE AND AWARENESS ON GENDER EQUALITY AND THE EMPOWERMENT OF WOMEN IN THE SPHERE OF SUSTAINABLE ENERGY



WEBINAR: RE-THINKING THE ROLE OF ENERGY TECHNOLOGY FOR WOMEN'S EMPOWERMENT



Women's potential as drivers of innovation in climate change issues is largely underutilized. This was the focus of the webinar held on 6 May 2015 by UNIDO in cooperation with the Climate Technology Centre and Network (CTCN), the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), the International Network on Gender and Sustainable Energy (ENERGIA) and hosted by Empower Women. The webinar brought together experts and entrepreneurs

in the field of sustainable energy to reflect on the role of energy technologies in empowering women. Panellists agreed that women often lack access to technologies and/or finance, as well as to information and training about appropriate technologies and their utilization. Their voices as regards energy and technology needs are rarely heard and therefore related decisions and chosen technology options are commonly gender-blind. Some of the 170 participants from over 90 countries underlined the importance of ensuring women's involvement in decision-making and the integration of gender dimensions in policy dialogues. They also addressed critical issues related to cultural barriers, education, access to finance and profitable business models.



Kopernik's Ibu Inspirasi initiative (Wonder Women Indonesia Program) is bringing low-carbon technologies to women living in remote rural communities across an archipelago of more than 17,000 islands. The initiative works with local women's groups to provide rural women with the skills and tools to become green technology agents and to sell small technologies that make a big difference. Since 2011, groups of women have sold more than 7,000 solar lanterns, water filters and fuel-efficient cook stoves in their own communities. This provides them with a source of income while replacing carbon-intensive technologies. In 2014, Monica, Kopernik's 'Ibu Inspirasi', received an award from Momentum for Change, an initiative under UNFCCC.



Wande Khunchornyakong is Chairwomen and CEO of the Solar Power Company Group (SPCG) and Managing Director of Solar Roof Company Limited. To date, SPCG is the largest solar power generation company in Thailand with solar investments attracting more than USD 800 million. By providing clean energy jobs for women, Solar Power Company Group is directly empowering the next generation of Southeast Asian businesswomen and entrepreneurs who will continue to catalyze renewable energy projects in the developing world.

Wande was a pioneer in her field and has over 30 years of experience in the solar industry. In 2013, she was named Women Entrepreneur of the Year by the Asia Pacific Entrepreneurship Awards. Nowadays, she is a figured person of the solar energy business as a producer of 36 solar farm projects, totaling capacity of 260 MW and the top of solar farm commercial scale in Thailand and ASEAN. UNFCCC has awarded her to be "Leading women-powered solar energy transformation" under the Momentum for Change, 2014 reducing 200,000 tons of CO₂.

STANDTALL CAMPAIGN

The Economic Community for West African States (ECOWAS) Centre for Renewable Energy and Energy Efficiency (ECREEE) and UNIDO are implementing a global campaign to raise awareness of the underutilized potential of women in the energy sector and the social constructions that sustain and propagate this situation. The campaign provides a platform to deliberate on the validity and impact of socio-cultural norms and perceptions that create classifications of “men’s only” and “women-appropriate” jobs in the energy sector.

The campaign is being organized to recognize that: women are under-represented in the energy sector, particularly in the technical areas; women are needed to achieve inclusive end sustainable development, since they represent 50 per cent of the population and are therefore crucial consumers of energy; women can support a transition to a sustainable energy future through innovative ideas and act as agents for change.

Since it was launched in March 2015 the campaign has reached thousands of people on Facebook and Twitter. In a second phase, launched at the VEF women’s side event in June 2015, the campaign will be scaled up internationally and co-hosted by other regional sustainable energy centres and the Island Women Open Network.



BUILDING CAPACITY ON THE ENERGY AND GENDER NEXUS AMONG UNIDO STAFF

A cycle of internal staff training events and workshops has been initiated to operationalize the Guide on Gender Mainstreaming – Energy and Climate Change Projects, raise awareness and disseminate knowledge. This has also created local spin-offs in the field.

Gender Mainstreaming Hour in Pakistan

Within the framework to achieve inclusive and sustainable industrial development and based on the revised UNIDO Policy on Gender Equality and the Empowerment of Women, projects in the energy sector in Pakistan have initiated a Gender Mainstreaming Hour. This ongoing capacity building initiative for staff and partners takes place every Friday from 09:30-10:30 a.m. to encourage a highly interactive, informal dialogue to raise awareness and mainstream gender issues in energy projects.

Hosted and chaired by different projects, each session focuses on a different theme, which range from understanding the revised gender mainstreaming policy to identifying relevant project indicators. Selected topics usually cover items on the recently published Guide on Gender Mainstreaming – Energy and Climate Change Projects. Apart from pulling internal resources, relevant external speakers are also invited to broaden the spectrum of learning. Gender Mainstreaming Hour is a team effort to highlight issues and identify solutions towards eliminating gender disparity in an interactive manner. So far, sessions have been very productive in creating a greater understanding of the issues involved in gender mainstreaming.



Pakistan Field Office discusses how gender mainstreaming can add value to their energy projects.

Definitions

Sex refers to the physical and biological characteristics that distinguish males and females.

Gender refers to the attributes and opportunities associated with being male and female and the relationships between women and men and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and learned through socialization processes, thereby making them context and time-specific, and changeable. Gender therefore determines what is expected, allowed and valued in a woman or a man in a given situation. In most societies differences between women and men can be observed in responsibilities assigned, activities undertaken, access to and control over resources, as well as decision-making opportunities.

Equality between women and men (**gender equality**) refers to the equal rights, responsibilities and opportunities of women and men and girls and boys. Equality does not suggest that women and men become “the same” but that women’s and men’s rights, responsibilities and opportunities do not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. It is therefore not a “women’s issue”. On the contrary, it concerns and should fully engage both men and women and is a precondition for and an indicator of sustainable people-centred development.

Mainstreaming a gender perspective in all types of activities (referred to as **gender mainstreaming**) is a globally accepted strategy for promoting gender equality. Mainstreaming is not an end in itself but a means towards the ultimate goal of gender equality. It involves the process of assessing the

implications for women and men of any planned action and a strategy for making those concerns and related experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally and that inequality is not perpetuated. Development of an adequate understanding of gender mainstreaming requires clarity on the related concepts of *gender* and *equality*.

Empowerment of women signifies women gaining power and control over their own lives. It involves awareness raising, building of self-confidence, expansion of choices, increased access to and control over resources and actions to transform the structures and institutions that reinforce and perpetuate gender discrimination and inequality. As empowerment should come from within — women should empower themselves — the process of empowerment is as important as the goal. Inputs to promote the empowerment of women should include women’s articulation of their needs and priorities. Moreover, women should play an active role in promoting these interests and needs. However, as empowerment of women cannot be achieved in a vacuum, men must be brought along in the process of change. Empowerment is not a zero-sum game where gains for women automatically imply losses for men and empowerment strategies do not refer to power over, or controlling forms of power. It rather suggests alternative forms of power — power to, power with and power from within — that focus on utilizing individual and collective strengths to work towards common goals without coercion or domination.

Gender parity/balance signifies equal numbers of men and women at all levels of an institution or organization, particularly at senior and decision-making levels.

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