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Gender and sustainable energy

The new Agenda for Sustainable Development, which aims to end poverty and promote well-being and prosperity while safeguarding ecological systems of the planet by 2030, has placed a much-needed emphasis on energy access and gender equality, elevating them as stand-alone sustainable development goals (SDGs). Similarly, there is now an increasing appreciation in international development discourses of the role of energy as a conduit for redressing historic gender inequities. Yet, energy poverty is still pervasive – one in five people in Africa and South Asia do not have access to electricity, and close to 3 billion people (40 percent of the global population) burn solid fuels such as wood, charcoal, animal waste or crop residues in open fires or inefficient stoves for their daily cooking and heating.[1] As we transition into the post-2015 global development agenda, serious effort is needed to move beyond understanding the importance of both energy access and gender equality to viewing both as central to questions of sustainability, efficiency and effectiveness in the energy sector.

Sustainable energy is a human development enabler

Sustainable energy is a development enabler: it would be impossible to achieve any of the SDGs without improving the quality and reach of energy services in the developing world. Besides its commonplace use for everyday household needs (such as lighting, cooking and heating), energy helps catalyse national development and advance social progress by improving health, education, access to clean water and other essential services. Because the reduction of the carbon intensity of energy is imperative in the fight against climate change, the sector also plays a central role in climate change mitigation.[2]

Recognizing the centrality of energy to sustainable development, the United Nations Secretary-General's Sustainable Energy for All (SEforAll) initiative and the 2030 Agenda for Sustainable Development aim to achieve universal access to modern energy services by 2030.[3] Thus, among the 17 SDGs is the goal of ensuring "access to affordable, reliable, and sustainable modern energy for all" (SDG 7).

Access to modern energy is also a key enabler for women's empowerment (SDG 5) – because rural women and girls are predominantly responsible for the bulk of household work, access to energy makes a significant difference to their health and well-being. While access to energy services would not necessarily guarantee gender equality, it would go a long way in relieving women and girls of the drudgery associated with their daily tasks and providing them time for income-generating opportunities and education.[4]

The role of women in sustainable energy

Women have more sustainable consumption choices[5] and, as household energy managers, tend to have a bigger say in household energy decisions. Thus, from the standpoint of consumption, the design, production, distribution and sales of sustainable energy technologies (for example, clean cooking stoves and lighting devices) would benefit from having women contribute to shaping the clean energy value chain.[6] Their position in society equips them with an understanding of the cultural and community context, which is useful for introducing behavioural change with regard to energy consumption at the household level.

The energy sector – responsible for almost two thirds of global greenhouse gas emissions (GHGs) – presents enormous challenges for the future of the planet. Residential solid fuel burning accounts for 25 percent of global black carbon emissions, with about 84 percent emanating from the global South. In South Asia alone, more than half of black carbon particles emanate from inefficient cooking, possibly contributing to the melting of Himalayan ice at high elevations, as well as having adverse environmental effects on water quality and damaging crops.[7]

In recent years there has been steady progress in the development of cleaner, more efficient energy technologies, and in the advent of new business models and offerings in energy access. Signs of success include the fact that the energy intensity of the global economy continued to drop in 2014 despite the

occurrence of economic growth of over 3 percent.[8] Further, growth in energy-sector GHG emissions will continue to slow dramatically, and hopefully reverse, if the Intended Nationally Determined Contributions (INDCs) – mitigation pledges made by member states for the 21st UNFCCC Conference of the Parties (COP 21) – are fully implemented.[9] Increased effort is still needed, however, to limit the rise in the global mean temperature to 2°C or below – women's empowerment could be a key strategy in reducing emissions from household energy use and the overall quest to decarbonize the energy sector in general.

Energy and the gender gap

Energy poverty, one aspect of broader economic poverty, has distinct gender characteristics that disproportionately affect women and girls. Women and girls are often primarily responsible for collecting fuel and water at the community level. Also, poor women tend to participate in the informal economic sector (for example, the food sector), which relies strongly on biomass as its main energy source, which, in turn, does not feature heavily in national energy policies and priorities.

Indoor pollution from the burning of solid fuels is a serious health problem for women and girls.[10] Every year, 4.3 million people – mainly women and children – die as a result of indoor air pollution.[11] In 2012 alone, 7 million people died – representing one in eight of total global deaths – because of exposure to indoor air pollution, which confirms that air pollution is now the world's largest single environmental health risk. Women are also exposed to other health risks likened to the toilsome work of energy collection. They carry greater loads compared to men, but have a lower intake of calories as most customs dictate that men receive more food and water. Women's poor nutrition vis-à-vis their workloads increases their susceptibility to anaemia and perinatal mortality, while the drudgery of energy collection could entail postnatal complications and takes a toll on women's well-being.[12]

Energy poverty affects women and girls by virtue of the toll it takes on their time, resulting in 'time poverty' (a lack of time for rest and leisure after taking into account the time spent working, whether in the labour market or at home). Women spend considerable time gathering biomass for energy. Because they undertake these activities largely on foot, climate-induced scarcity of natural resources can exacerbate their time poverty, as women are forced to travel and spend more time collecting these resources, thereby causing them to lose out on other, self-nurturing activities such as education. A study in India, Bangladesh and Nepal found that women in South Asia spend up to 20 or more hours per week in energy collection.[13] Better access to modern energy can help alleviate some of these challenges. Research in Brazil also shows that girls in rural areas with access to electricity are 59 percent more likely to complete primary education by the time they are 18 years old than those without.[14] Similarly, improved cookstoves can reduce cooking time by 50 percent and increase fuel efficiency by 30 percent – high efficiency cookstoves lead to even larger benefits in time and energy savings, hence also contributing to emissions reductions.[15] Incidentally, a preliminary analysis of mitigation pledges under the Paris Agreement shows that some 32 countries have included efficient cooking initiatives in their INDCs.[16]

In the formal sector, women generally have less access to finances and energy-related services than men. Studies from Africa, for example, show that women-headed businesses generally face more impediments than men in accessing grid electricity. Experiences in Ethiopia, Ghana, Kenya, Tanzania and Zambia suggest that women entrepreneurs also face greater discrimination than men in the form of delays in obtaining electrical connections and the expectation that they will pay bribes for these services.[17] More broadly, women are often excluded from discussions about energy plans and policies across scales, despite being primary household-energy managers, which limits their entry into the energy industry[18] and results in gender-blind energy project planning, financing, execution and implementation.[19]

Box 1 Gender facts and figures around the energy sector

- *1.1 billion people do not have access to electricity.*
- *2.9 billion people use solid fuel (wood, coal, charcoal, agricultural residues or animal waste) to cook their food and heat their homes.*
- *Solid-fuel use exacerbates income and gender inequality by forcing users, mostly poor women and children, to spend long hours collecting biomass energy and to be exposed to its grievous health effects.*
- *Data from 13 countries showed that girls in sub-Saharan African homes with polluting cookstoves spend about 18 hours a week collecting fuel or water, while boys spend 15 hours. In homes mainly using cleaner stoves and fuels, girls spend only 5 hours a week collecting fuel or water, and boys just 2 hours.*
- *Household air pollution globally leads to 4.3 million premature deaths on average each year (with 1.7 million of those in South Asia). In 2012, 7 million people died – 1 in 8 of total global deaths – because of exposure to air pollution.*
- *Fifty-eight percent of health care facilities in sub-Saharan African countries have no electricity – in 2010, there were 287,000 deaths among women due to complications from pregnancy and childbirth, many of which could have been averted if more medical facilities had access to electricity.*
- *Research from Brazil shows that rural women and men with access to energy are 10.2 percent more likely to be employed than their counterparts without access.*
- *There is a lot of potential in rural electrification by renewable technologies – 89 million people in Africa and Asia already have improved access to energy by using off-grid solar products, and there exists a $3.1 billion market opportunity for the off-grid solar industry to reach 99 million households by 2020.*

Sources: IEA/World Bank (2015); UN (2011); WHO (2016); O'Dell, K. et al. (2014); Cameron, C. et al. (2016)[20]

Towards engendering the power sector

Beyond household energy consumption, there are many examples of women as producers, technicians and entrepreneurs in sustainable energy (see Box 3: Powerful women in the power sector). However, the traditional energy sector is still one of the least gender-inclusive sectors to date. According to one estimate, women represent only 6 percent, 4 percent and less than 1 percent of the technical, decision-making and top management positions, respectively, in the energy sector.[21] For women entrepreneurs who would like to thrive within the energy industry, existing structural inequality, which manifests itself in the form of discrimination in law and practice, also poses barriers.[22] For example, a recent report by the World Bank indicates that 155 of the 173 economies it covered have at least one law impeding women's economic opportunities, including access to credit.[23]

Box 2 Women and the promise of new business models and offerings in energy access

Energy access is still a formidable concern in many developing countries, especially those in sub-Saharan Africa. With the advent of photovoltaic (PV) technologies and decrease in the cost of renewable technologies overall, there is a sense that we may be reaching a tipping point on rural electrification. For example, prices for solar photovoltaic (PV) modules since 2009 have fallen by about 80 percent (and average costs for solar and wind electricity could further decrease by 59 percent by 2025).[24] This cost decrease and these trends have provided a space for innovative business models for energy access, such as third-party ownership of solar panels and digitization of payment schemes (e.g., remote monitoring of solar panels and pay-as-you-go payment schemes). As with cell-phone usage, some companies are now offering consumers the ability to prepay for their energy, avoiding (or at least mitigating) one of the main obstacles in providing solar technology to the poor, i.e., the inability to cover the costs for services on an ongoing basis.[25]

The diffusion and increased uptake of renewable technologies, coupled with the spread of energy-efficient household practices like the use of improved cookstoves, benefits women on many levels. It reduces drudgery in energy collection, and it has the potential to promote social progress in poor communities – namely, it enables 'green job' opportunities that would allow women to work as energy managers in their communities. For example, 'Solar Sister', a women-led social enterprise, is scaling up the use of clean energy technologies with woman-centered direct sales to reduce energy poverty (through solar lights) in remote communities in rural Africa.[26]

Studies consistently confirm that women's empowerment is crucial for economic growth,[27] and, more broadly, for sustainable development.[28] Given the increasing global emphasis on energy access following the launch of the SEforAll initiative and the SDGs, many projects and programmes will continue to be rolled out in an effort to expand access to sustainable energy. This presents a unique opportunity to not only empower women to be more efficient energy managers at the household and community levels but also to be committed about expanding access to sustainable energy (including renewable energy) at school, and to enter the energy industry as workers or entrepreneurs.

Box 3 ***Powerful women in the power sector***

The Chief Executive Officer of Solar Power Company Group (SPCG) (Thailand's biggest solar power operator), Ms. Wandee Khunchornyakon, is credited for starting Thailand's pivot towards clean energy. Ms. Khunchornyakon's plans for a solar revolution in Thailand began in 2008, when the Thai Government announced its plans to reduce its emissions by 20 percent over the next 15 years and double its renewable energy production by 2040. As a woman, she overcame many obstacles to secure loans for her business plan and even had to sell her house and land for use as a collateral to secure the initial loan. In 2010, with support from the 'green' Kasikorn Bank, Ms. Khunchornyakon began with a small solar farm, producing 7.35 MW. SPCG currently operates 36 solar farms, totalling 260 megawatts (MW), lighting some 24,000 homes in Thailand. It plans to double its solar power generating capacity to 500 MW in the next three years and expand its solar farm and rooftop operations in Japan, the Philippines and Myanmar.

Sources: Adapted from Aguilar et al. (2015); TCN (2016)[29]

Key Messages

- **Access to affordable, reliable, sustainable and modern energy is a human development enabler.** Basic services such as electricity for lighting and cleaner cooking technologies are still a luxury for many rural women and men, so access to modern energy services needs to be improved. Households will experience livelihood improvements when they gain access to sustainable, clean and affordable energy. Access to modern energy services would go a long way towards alleviating the daily household burdens of the poor, especially women. Because the control of black carbon emissions in developing countries is a potentially cost-effective means of curbing GHGs, while at the same time improving the health and quality of life of those living in solid-fuel-dependent communities, it provides a win-win opportunity for tackling these interrelated development and climate challenges.

- **Gender gaps related to access to energy, finances, training, employment and entrepreneurship need to be redressed.** Policies that include both women and men in the development stage may help support more equitable access to electricity (grid and off-grid) and deliver more effective and sustainable outcomes. Therefore, more effort is needed to involve women in the design and production of locally appropriate energy technologies. Infrastructure projects designed to promote cleaner, more efficient forms of fossil fuels and renewable energy can offer new skills training and increased employment and entrepreneurship opportunities for women, as well as more equitable benefit-sharing at the community level.

- **Climate change financing geared towards the energy sector should complement broader developmental goals, including gender equality, poverty eradication and sustainable development.** Public and private mitigation financing schemes, including for those within the

INDCs, need to ensure that projects benefit poor and marginalized communities in a gender-responsive manner. At the very least, gender and social impact assessments need to be carried out during the stages of programme and project design. Where feasible, carbon-financing options should ensure more equitable benefits for men and women by helping to expand women's access to and control over energy. This includes efforts to qualify small-scale projects (such as improved stoves) for financing, and then streamlining the application process.

- **Using a gender lens approach to energy access programmes is good social policy and would enhance the effectiveness of energy policies.** Incorporating gender perspectives into energy projects, policy and planning is critical in ensuring the effectiveness not just of energy programmes and policies, but of all development activities that involve energy use.

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