

The design, planning, delivery and governance of infrastructure has to be a game changer for improving women's lives, by reducing the demands and drudgery of household and care work, increasing the productivity of their enterprises and enabling them to move into better jobs or more profitable markets. These changes, in turn, can broaden women's aspirations, break down stereotypes and catalyse positive social norm change.

Energy and reducing the demands of the care economy

There is a strong inverse relationship between the amount of time that women and girls spend on unpaid care work and their economic empowerment (Chopra, 2015). Women are most likely to bear the burdens of time and energy intensive household activities (World Bank, 2006). Research has demonstrated the economic value and importance of these efforts, even though they are normally excluded from standard national estimates of productive activity. From the economic empowerment perspective, the objective is to:

- Increase the productivity of unpaid care work (e.g. reducing drudgery of domestic labour) and reduce the risks it poses to women's health and wellbeing
- Redistribute care work between women and men, and between individuals and the state and businesses (ensuring women are not left with the entire responsibility for care)
- Enable women to have choices over how to balance unpaid care work, paid employment and leisure time

Investments in access to household fuel and electricity can increase the productivity and improve the quality of care work (Clark, 2016; Antonopoulos, 2009). Improvements in energy access significantly reduce women's time spent on domestic tasks, such as collecting fuelwood, and free up women's labour time, enabling them to undertake paid work – either inside or outside the household (Fontana and Natali, 2008). In Bangladesh, access to affordable electricity has reportedly reduced the time spent by women on household tasks by 70%.

Energy access is the single more important factor in reducing the burden of care work on women.

Access to efficient or clean energy technologies can improve women's productivity, health and safety while performing unpaid care work, alleviate time poverty and in turn enable them to engage in paid work. A study in Nicaragua showed the propensity of rural women to work outside the home increased approximately 23% due to more efficient, less time intensive home production work, following the provision of lighting and modern cooking appliances (Grogan et al, 2013). An energy awareness programme in Arusha, Tanzania, where 70% of the population lives in informal settlements on the outskirts of the city, also found that access to affordable clean energy technologies resulted in significant reductions in household expenditure and time spent cooking and collecting fuel (UN Habitat, nd).

Energy and improving female entrepreneur's productivity

Energy access can enhance businesses' productivity and income and growth potentials. Women's businesses are primarily concentrated in sectors characterised by low technological levels, low profit margins and local markets where incomes and economic growth are low (Smith, 2015). In order for small firms to make basic upgrades to their production technology, they must first have access to reliable and affordable energy. Upon receiving access, the greatest gains typically accrue to the lowest productivity businesses enabled to make this step change.

Electricity - Women home-based workers' ability to start and grow businesses is often dependent on the accessibility and affordability of electricity at home (DFID, 2016; O'Dell, 2014). The mass roll-out of electricity to rural areas in South Africa raised female entrepreneurship and informal sector employment in electrified communities by 9.5 per cent (Dinkleman, 2011). Connecting households to the electric grid enables people to buy and use mobile phones, fridges and other time saving technologies that can increase the productivity of home-based work and create wider business opportunities. Clean energy enterprises (see next section) are an important means to expand access to energy for low income workers and neighborhoods.

Informal and Formal Entrepreneurship - By increasing accessibility to water, electricity, markets, safety

and security and making markets more competitive, infrastructure expands opportunities for women in the informal economy. In the area of entrepreneurship, infrastructure can help scale women owned businesses by increasing their productivity and access to higher growth sectors. In order to upgrade production technologies, entrepreneurs must have access to reliable energy. Once electricity is made available, ICT infrastructure can provide access to finance, information and transport that enables entrepreneurs to overcome mobility constraints and tap into wider markets. Infrastructure can also provide innovative business opportunities for women, most notably those working as energy entrepreneurs and transport providers.

Energy entrepreneurship – The production and distribution of cleaner, small scale energy technologies is an emerging market that provides opportunities for women to work as sales agents, employees and entrepreneurs within their value chains. The Solar Sister Initiative in Nigeria, Tanzania, and Uganda (see Box below) has employed women as vendors to promote clean energy. Other similar initiatives in urban areas have provided employment opportunities for a number of previously unemployed women: for example in Bamako, Mali, women work in the production and marketing of solar cookers (UN Habitat, nd). As household energy managers and members of networks, women can play a key role in increasing awareness and delivery of new domestic energy products and services, particularly in hard to reach communities (Energia, 2015).

Solar Sister, Uganda, Nigeria and Tanzania – women’s enterprise and capacity building through clean energy

Solar Sister is a network of women in Uganda, Nigeria and Tanzania that reaches the most low income and remote areas with affordable solar lamps, mobile phone chargers, and fuel efficient stoves.

Solar Sister’s business model deliberately creates women-centred direct sales networks. Management staff train and recruit locally-hired Business Development Associates (BDAs) that work as Solar Sister field staff. In turn, each BDA recruits, trains, and supports a group of 1-25 self-employed Solar Sister Entrepreneurs (SSEs). In total, Solar Sister has recruited and trained 65 BDAs and over 2,000 SSEs, the majority of whom are women.

By hiring women employees and engaging with women entrepreneurs, Solar Sister provides women with their own source of income, access to new productive capital and income generating opportunities, and greater financial stability and independence.

To date, the Initiative has created micro-businesses for 171 Solar Sister entrepreneurs in Uganda, Nigeria and Tanzania, and has brought the benefits of solar power to more than 31,000 Africans. Solar Sister's goal is to make women an integral part of the clean energy value chain in Africa. By generating income for entrepreneurs and savings for her customers, every dollar invested in a Solar Sister entrepreneur generates over USD 48 in economic benefits in the first year alone. For example, a solar lantern costing USD 18 can save a customer USD 163 over a five-year period by reducing kerosene usage. Another USD 45 solar lantern plus mobile phone charger can save a customer USD 225 by reducing kerosene usage and eliminating mobile charging fees over the same period.

(Soria, L. Farley, K. and Glinski, A., 2016; UNFCCC, nd)

Further Reading

- Energia (2015) *Expanding energy access through women’s economic empowerment: ENERGIA’s WE programme, 2014 – 2017*. Available online at: <http://www.energia.org/cms/wpcontent/uploads/2015/02/ENERGIAs-WE-programme.pdf>
- O’Dell, K. et al. (2014) *Women, energy, and economic empowerment: Applying a gender lens to amplify the impact of energy access*. Deloitte University Press. http://d27n205i7rookf.cloudfront.net/wp-content/uploads/2014/09/DUP_950-Women-Energy-and-Economic-Empowerment_MASTER1.pdf
- Sankrit, R. (2011) ‘Impact of energy access on livelihoods of women home-based workers: SEWA Bharat’s intervention in Bihar, India’, in *Boiling Point*, Issue 66 <http://www.energia.org/cms/wpcontent/uploads/2016/02/DFID-Energia-Ashden-Report-Public-Summary-Feb-2015-1.pdf>
- UNFCCC (nd) A Women Powered Clean Energy Revolution. Available online: http://unfccc.int/secretariat/momentum_for_change/items/7072.php
- UN Habitat (nd) *Enhanced Energy Access for the Urban Poor: Best Practice Case Book*. Available online at: http://www.avsi-usa.org/uploads/6/7/4/2/67429199/avsi_coelba3.pdf

For more information and support in designing energy interventions to promote women’s economy empowerment please contact the ICED Facility on: