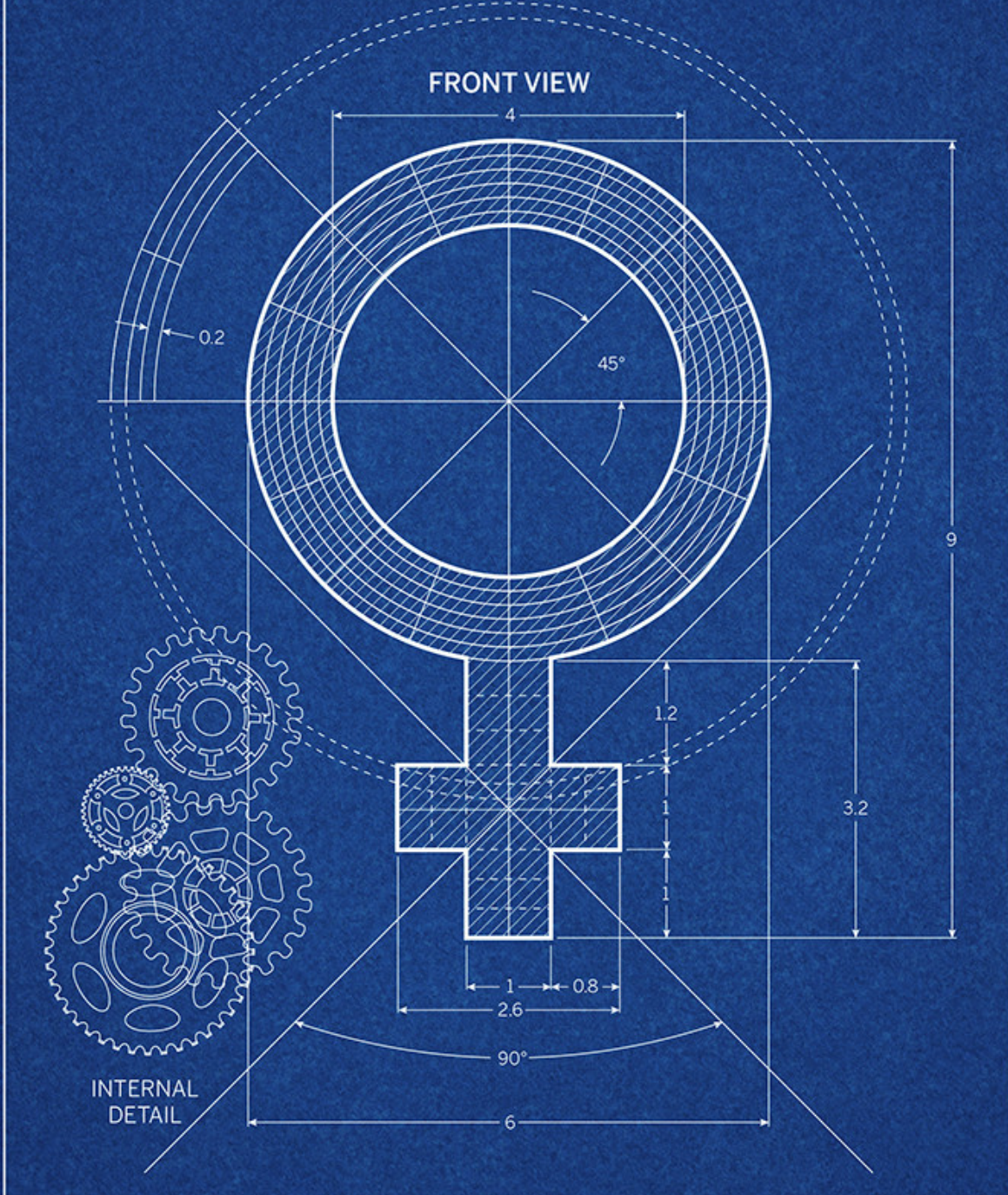


Change how we define success in development

March 18 2016, by Bipasha Baruah

WOMEN IN STEM



BY BIPASHA BARUAH

SCALE 1:10

ILLUSTRATION BY FRANK NEUFELD

Concerns about environmental sustainability and fossil fuel insecurity have convinced many countries to transition to solar, hydro, bioenergy, wind and other renewables. Since producing and distributing renewables is more labour-intensive than producing and distributing fossil fuels, this shift is creating new employment opportunities and also addressing energy poverty in remote and under-served communities.

Renewable energy employed 7.7 million people globally in 2014 – an 18 per cent increase from the previous year. Employment in the sector [is expected to continue growing in the future](#). Applying a gender lens to the enthusiasm for renewables reveals a major blind spot since women are marginalized globally in employment in the sector. Worldwide women constitute [fewer than 6 per cent of technical staff and below 1 per cent of top managers in the renewable energy](#) sector. Without appropriately targeted training, apprenticeships, employment placement, financial tools and supportive social policies, transitioning to renewables may exacerbate existing inequities and hinder human development goals.

In Organization for Economic Cooperation and Development (OECD) countries, the share of female employees in renewables has been estimated at about 20 per cent. Data from Canada, United States, Spain, Germany and Italy indicate a general trend of women being employed mostly in non-technical occupations in renewables – in sales, followed by administrative positions and finally engineers and technicians. In absolute numbers, the largest sources of [renewable energy](#) employment for women in industrialized countries are solar photovoltaic, solar heating and cooling, wind power, biomass and biofuels.

The underrepresentation of women in this sector is part of a bigger problem of the underrepresentation of women in science, technology, engineering and math (STEM) fields. There is an obvious economic benefit for women who choose to pursue these paths. While wage inequality also exists in STEM jobs, it is smaller. Women in STEM jobs earn 33 per cent more than those in non-STEM occupations. [The gender wage gap in STEM jobs is roughly 14 per cent. For non-STEM jobs, it is 21 per cent.](#)

Unlike North America and Europe, where women remain a minority in engineering programs, comparatively large numbers of middle-class women in some emerging economies – India and China, for example – study engineering. Although women continue to experience employment discrimination in various forms in such countries, recruitment, especially for entry-level positions, is not a challenge. In China, 40 per cent of engineers are women. In India, 37 per cent of electronics engineers are women. The corresponding figures for civil, computer, electrical and mechanical engineering are 20 per cent, 18 per cent, 16 per cent and 10 per cent, respectively.

In the 1980s, 58 per cent of engineers in the USSR were women, but a well-established tradition of state-enforced gender diversity disintegrated in the 1990s and 2000s with the collapse of the USSR and its industrial model. In 1998, women accounted for 43.3 per cent of engineers in Russia; in 2002, only 40.9 per cent. And the numbers have continued to decline further. The Baltic nations (Estonia, Latvia, Lithuania), formerly part of the USSR, but joined the European Union earlier in the 1990s, revealed similar patterns of comparably high, but declining, rates of participation by women in engineering and technology fields.

[The World Economic Forum \(WEF\) reports that in Estonia](#), for example, female professional and technical workers still outnumber men two to one – 68 per cent compared to 32 per cent. Estonia offers

significant tuition incentives to draw high school graduates into fields such as engineering and continues to be identified by the WEF as the country with the highest per-capita number of female engineers, even as the numbers of women joining the field have declined over the decades. Although I am not advocating a return to Soviet-style central planning, it is important to emphasize state initiatives aimed at improving representation and removing barriers for career advancement for women do work, and they can benefit the renewable energy sector in industrialized, emerging and developing economies.

Broadly speaking, the global energy workforce represents a vertically and horizontally gender-stratified labour market, with women concentrated in the lowest-paid positions, closest to the most menial and tedious components and furthest from the creative design of technology and the authority of management or policymaking. However, there are both qualitative and quantitative differences in women's employment in renewables in different contexts. Much of the expansion of [renewables](#) in the Global South has occurred because large numbers of rural, urban poor and remote communities either have no access to the grid, or unreliable access to electricity. A large volume of employment has been generated for both women and men in these contexts because organizations serving such communities (the initiatives of Solar Sister in various African countries, Barefoot College in India, Char Montaz in Bangladesh are good examples) have actively sought to use renewable energies technologies to also secure and improve livelihoods.

Such off-grid, mini-grid and stand-alone renewable energy initiatives have offered women a large volume of employment (albeit often insecure and poorly compensated), as well as opportunities to participate in decision-making. These initiatives are deployed at the local level where women are more likely to be involved in the procurement, design, installation, operation, maintenance and consumption of energy. Decision-making within bigger energy utility systems in both the Global

North and South are, by contrast, made by higher-level professional staff within the spheres of generation, transmission and distribution where women are almost always severely underrepresented.

There is tremendous additional potential to create livelihoods for women in the renewable energy sector. However, women can gain optimal traction from renewable energy initiatives only within the context of wider socially progressive policies and more transformative shifts in societal attitudes about gender roles. This is as true for developing countries and emerging economies as it is for industrialized nations. Restructuring paid employment in innovative ways – through, for example, the creation of more part-time jobs and arrangements like work-sharing – while expanding social protection and delinking it from employment status, have been suggested in some industrialized countries as a way to accomplish economic security, environmental protection and gender equity. However, without more transformative social changes in gender relations, such strategies may reinforce rather than challenge existing gender inequities both in paid employment and in unpaid domestic labour.

The growth of the renewable energy sector should benefit both women and men, but we must be proactive about enabling women to establish a stronger equity stake to compensate for historical and contemporary economic injustices and unequal outcomes. This will require more concrete and proactive actions and policies. Simply creating opportunities for training and employment in new fields. Suggesting that [women](#) are not unwelcome in them is obviously not enough.

Provided by University of Western Ontario

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