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# The Leaky Pipeline- *Women in STEM*

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# WHAT IS THE BUSINESS CASE?

## **Better financial performance**

- *Firms with more women in leadership roles often demonstrate better performance, especially during periods of economic volatility; they also show a greater ability to minimize high-risk transactions and serve markets dominated by women.*
- *A McKinsey & Company study of 345 firms across six countries in Latin America and the Caribbean (LAC) found that firms with one or more women on the executive committee had 44 percent higher returns on equity than those without women (McKinsey & Company 2013).*

## **Greater innovation**

- *A study of 4,277 companies in Spain found that companies with more women were more likely to introduce innovations in the market over a two-year period (Díaz-García, González-Moreno, and Sáez-Martínez 2013).*
- *The research also suggests that women score as well or better than men on key innovation capacities, including in taking initiative; inspiring and motivating others; and championing change (Folkman 2015).*

## **Improved employee retention**

- *McKinsey & Company found that among companies that invested in attracting, retaining, and developing female talent, 64 percent reported increased employee productivity and retention, and 57 percent reported a greater ability to attract talent (McKinsey & Company 2010).*



## **Improved service delivery**

- *A study by the Organisation for Economic Co-operation and Development (OECD) on the public sectors of 26 EU countries found that workforce diversity can improve public-service quality and efficiency gains; increase policy effectiveness; enhance social mobility; and contribute to advancing the reform agenda (OECD 2009).*

## **Safer operating environment**

- *Studies have demonstrated that female employees are often more likely to follow safety protocols, treat equipment responsibly, and safely operate equipment (IFC 2013).*

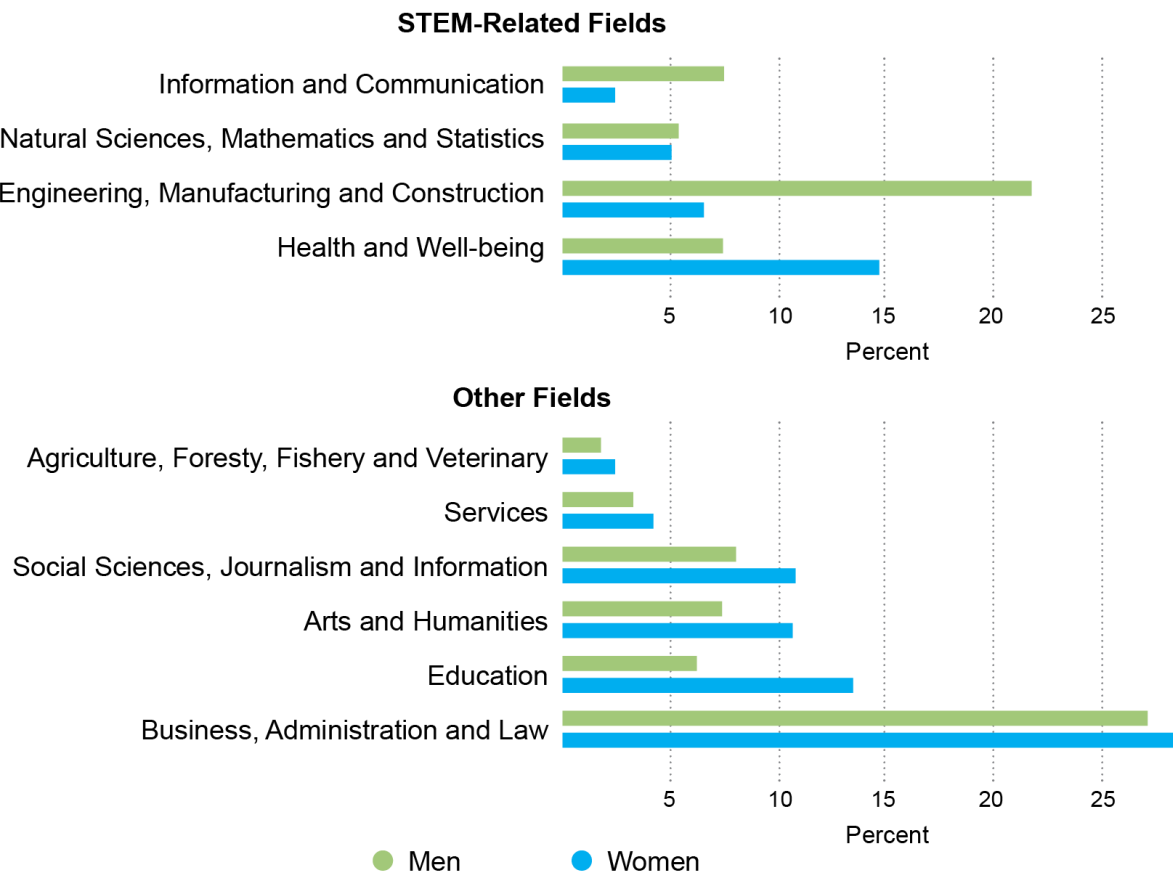
## **Better outcomes for sustainability and compliance**

- *Companies with more gender-balanced senior leadership— particularly women-owned businesses—often rank higher on key environmental, social, and governance risk management indicators (OECD 2016a).*
- *Companies with more gender-balanced senior management also tend to have greater public accountability and compliance with international conventions or national legislation (IFC 2018).*

## **Improved community relations**

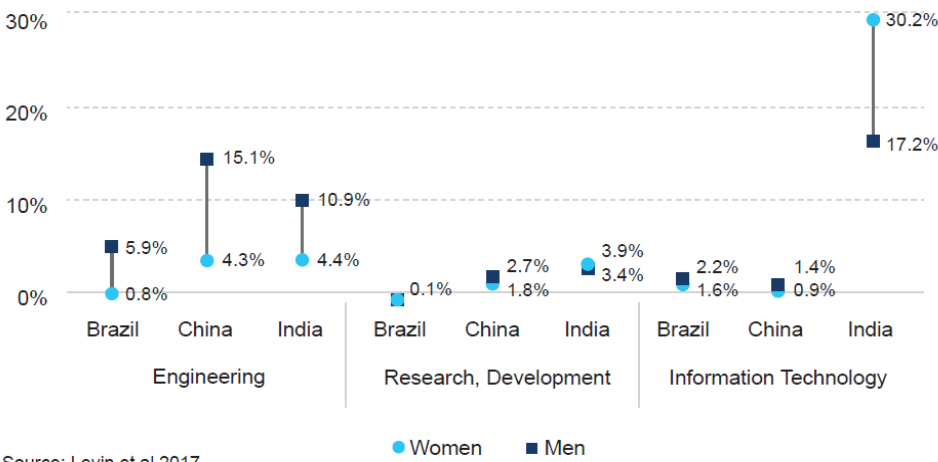
- *Gender equality in the workforce is correlated with improved community relations (Di Miceli and Donaggio 2018).*
- *A Catalyst and Harvard Business School study of Fortune 500 boardrooms found that companies with gender- inclusive teams contributed more charitable funds, on average, than companies without such teams (Soares, Marquis, 2011).*

## Distribution of Male and Female Students Enrolled in Higher Education by Field of Study



Source: UNESCO Institute for Statistics data for 2014–16 (UNESCO 2017).  
Note: 110 countries and dependent territories.

## Women’s Share of Job Family, by Country



## Women’s Percentage Share in Infrastructure Workforce, by Industry

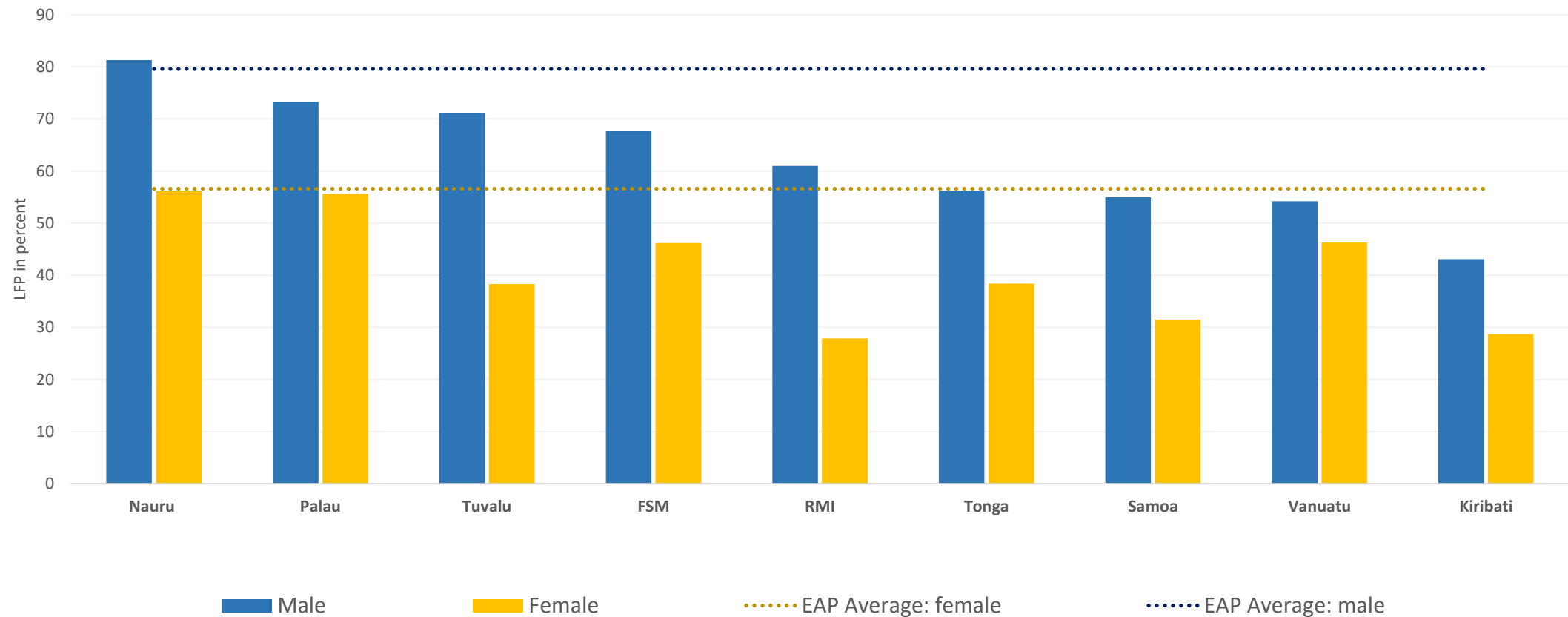
Industry Group	CEO	Board Member	Senior Role	Mid-Level Role	Junior Role	Line Role	Staff Role
Basic and Infrastructure <sup>a</sup>	2	35	9	13	22	14	20
Energy <sup>b</sup>	0	32	11	19	24	19	22
ICT <sup>c</sup>	5	19	11	21	32	23	33
Mobility <sup>d</sup>	9	17	13	21	28	25	34
Industries Overall	9	28	15	24	33	30	35

World Economic Forum 2016.

Taken from: Schomer,I; Hammond, A.Samantha.2020. Stepping Up Women’s STEM Careers in Infrastructure: An Overview of Promising Approaches (English). Washington, D.C.: World Bank Group.  
<http://documents1.worldbank.org/curated/en/192291594659003586/pdf/An-Overview-of-Promising-Approaches.pdf>

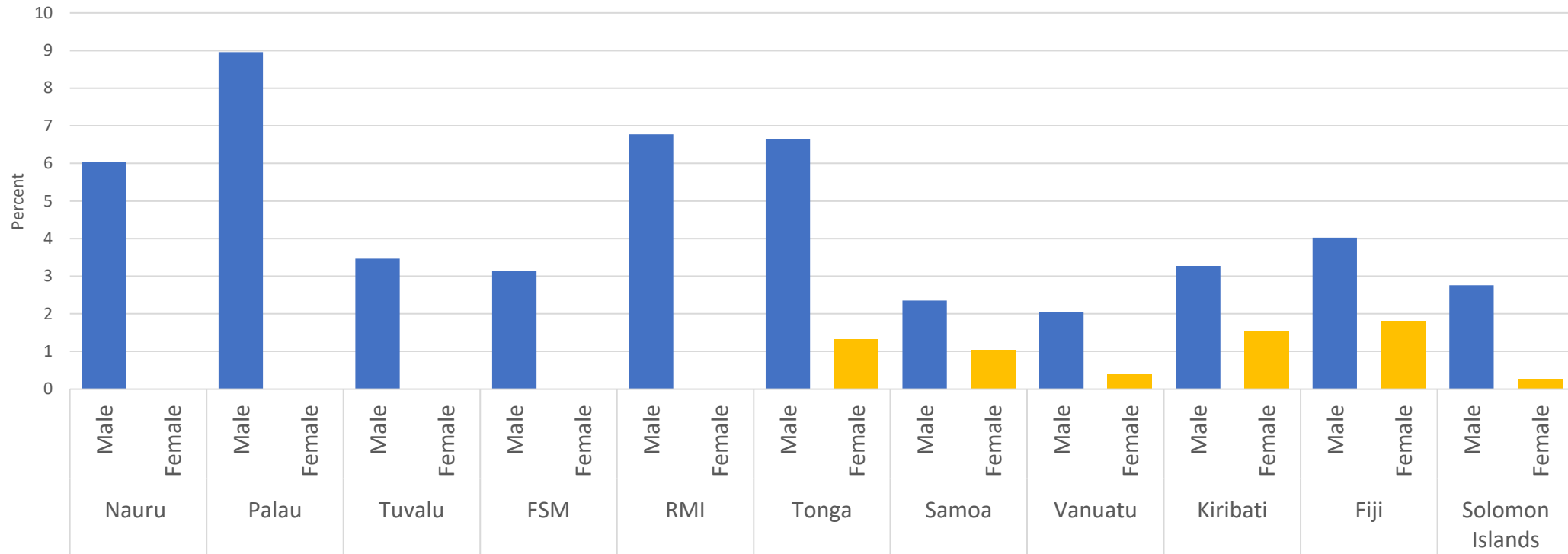


# PACIFIC - Gender Gap in Labor Force Participation (LFP)



Source: ILOSTAT latest national survey estimates

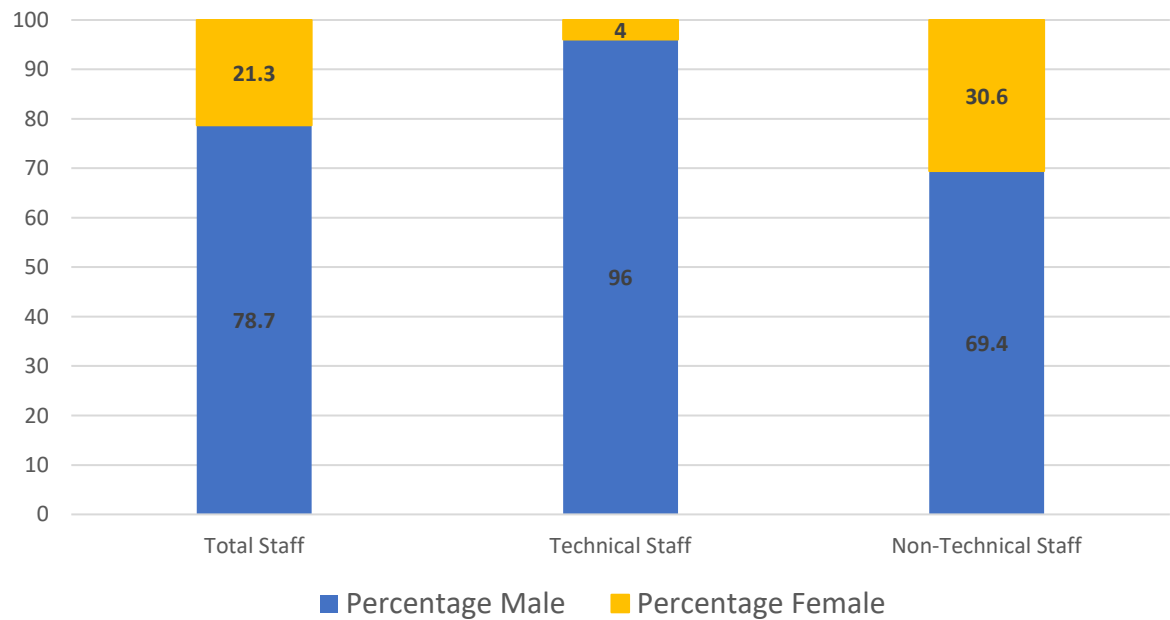
# PACIFIC - STEM Occupations as a Share of Total Employment %



*Source:* Latest national estimates from ILOSTAT. STEM occupations are defined as science and engineering professionals and associate professionals + Information and communication professionals and technicians. Zeros represent approximations (categories where there are very few observations).

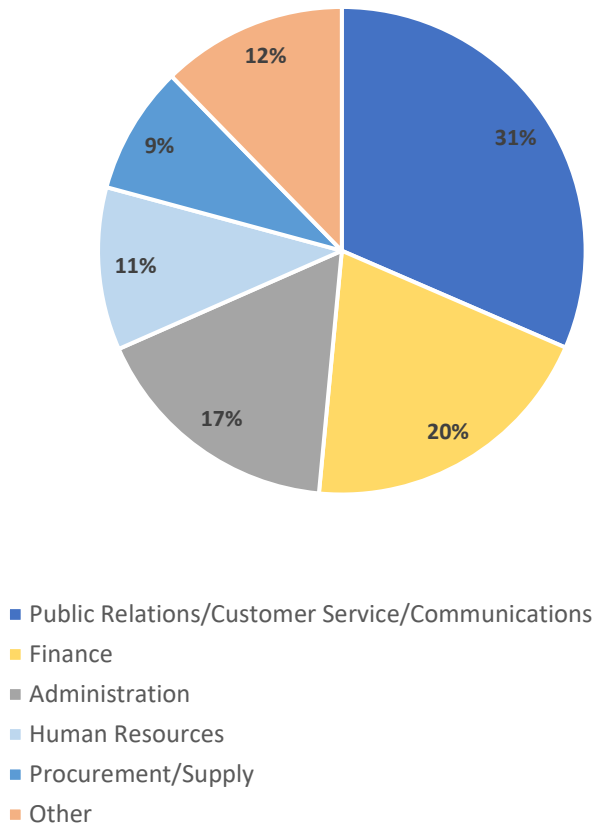


# Percentage of Workforce that is Male versus Female across PPA Members



Source: <https://www.ppa.org.fj/gender-portal/>

# Non-Technical Female Staff as a Proportionate of Total Staff by Role, PPA member utilities.



*The renewable energy sector is estimated to account for some 38 million jobs by 2030 and 43 million by 2050 under IRENA's 1.5°C compatible global pathway.*

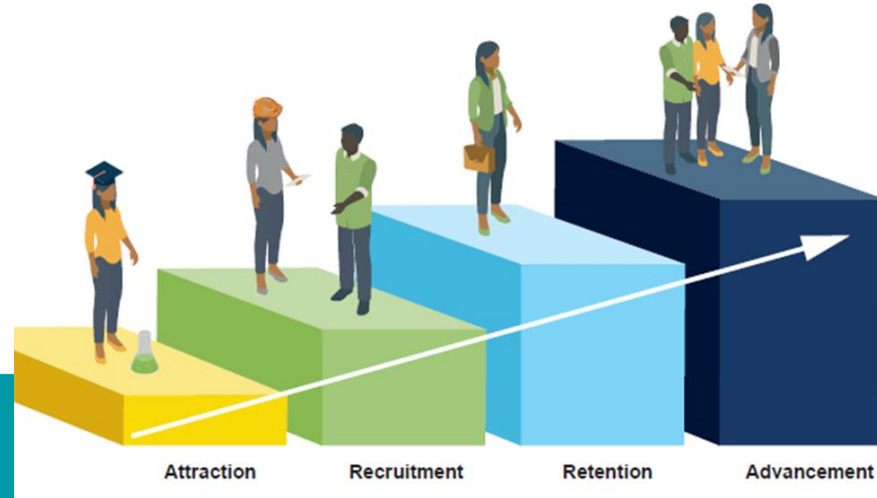
# BARRIERS ALONG THE PATHWAY-OVERVIEW

**Retention- Workplace Biases and Hostility:** A survey of more than 3,700 female engineers in the United States found that workplace climate and culture were among the most common factors for women leaving the field (Fouad and Singh 2011).

Similarly, a study of women in STEM fields found that 32 percent of women in the United States, 30 percent in China, 22 percent in Brazil, and 20 percent in India are likely to quit within the first year of being hired (Hewlett et al 2014).

In India, China, Brazil, and the United States, the vast majority of women in STEM fields report that they “love their work” (at 93 percent, 90 percent, 87 percent, and 80 percent, respectively).

Taken from: Schomer, I.; Hammond, A. Samantha. 2020. *Stepping Up Women's STEM Careers in Infrastructure: An Overview of Promising Approaches* (English). Washington, D.C.: World Bank Group.  
<http://documents1.worldbank.org/curated/en/192291594659003586/pdf/An-Overview-of-Promising-Approaches.pdf>



	Type of Barrier	Societal	Institutional	Individual
Attraction	Gender stereotypes and biases, including among educators and in educational materials	X	X	
	Lack of self-efficacy, interest, and aspirations			X
Recruitment	Legal barriers to the nature and type of work	X		
	Gender biases in the hiring process		X	
Retention	Lack of flexible work arrangements	X	X	
	Care responsibilities	X	X	
	Gender wage gaps	X	X	
	Biases in the workplace		X	
	Sexual harassment risks	X	X	
	Workplace facilities unfit for meeting the needs and occupational safety of female workers		X	
Advancement	Lack of sponsors and mentors		X	
	Limited professional networks		X	
	Few opportunities for effective training		X	
	Exclusion from opportunities for advancement and leadership		X	

Note: Not exhaustive list of barriers

# BARRIERS ALONG THE PATHWAY: ATTRACTION

**Gender Stereotypes and Biases:** Half a million Implicit Association Tests taken by individuals show 70 percent of the test takers demonstrated a tendency to associate “male” with science and “female” with liberal arts (Nosek, Smyth et al 2009).

- Data on parents’ attitudes and perceptions from a variety of countries show that parents were more likely to expect their sons rather than their daughters to work in a STEM field (OECD 2015).
- Without early support focused on STEM subjects from female teachers, female role models, and the broader learning environment, secondary-age girls are unlikely to choose nontraditional educational pathways or occupations (OECD 2015).

**Self-Efficacy, Interest, and Aspirations:** Gender differences in math and science performance have converged, or even closed, women and girls still often underestimate their capabilities due, in part, to internalized perceptions about their competence in these subjects (Brown 2010).

- Girls reported higher levels of interest in enrolling in computer science classes when the academic environment did not reinforce gender stereotypes e.g. “stereotypical” classroom included Star Wars and Star Trek items, computer parts, and video games, (Master, Sapna, and Meltzoff 2016).
- Peer relationships also affect children’s beliefs, behaviors, academic achievements, and motivation, especially during adolescence (Dasgupta and Stout 2014; Robnett 2013).





# BARRIERS ALONG THE PATHWAY: RECRUITMENT & RETENTION

**Legal Barriers:** While legal barriers to women's employment have decreased globally in recent years, many explicit industry-specific barriers remain embedded in legal codes.

**Gender Biases in the Hiring Process:** In male-dominated industries, job postings often use words that imply stereotypically "masculine" strengths and skill sets, for example, "dominant" and "competitive" (Gaucher, Friesen, and Kay 2011). In addition, the interview process may reflect both implicit and explicit biases.

**Lack of Flexible Work Arrangements:** Multiple studies have found that the main reason for women leaving their infrastructure jobs, particularly in engineering, is inflexible working hours, or a "culture of overwork" that makes it difficult to balance work and family obligations (Corbett and Hill 2015; Fouad and Singh 2011; Fouad et al 2017).

**Sexual Harassment in the Workplace:** National statistics on the prevalence of sexual harassment in the workplace sheds light on the pervasiveness of this problem.

**Failure to Meet the Needs of Female Staff:** According to the ILO, a lack of safe and accessible transportation is the greatest obstacle to women's labor force participation in low- and middle-income countries, reducing their participation probability by 16.5 percentage points (ILO 2017b).



# BARRIERS ALONG THE PATHWAY: ADVANCEMENT

**Lack of Mentors and Sponsors for Women:** A study in the United States found that 84–88 percent of women in STEM-related jobs lacked sponsors, or someone of influence to advocate for them within their organization; nearly half lacked mentors; and 25–40 percent had no role models within their institutions (Hewlett et al 2008).

**Limited Professional Networks:** Series of studies suggests that women have less access to influential individuals, and that they tend to build their networks with individuals who have a lower status than those in men's networks (Brass 1984; Burke et al 1995; Dreher and Cox 1996; Linehan and Scullion 2008; Wang 2009).

**Few Opportunities for Effective Training:** Research conducted among 5,500 female engineers found that one of the main reasons they cited for leaving their work was the lack of training and development opportunities to help them advance in their careers (Corbett and Hill 2015).

**Exclusion from Opportunities for Advancement and Leadership:** Qualities implicitly associated with leadership are often also associated with men: for example, assertiveness, aggression, and ambition (Eagly and Carli 2007; Elmuti, Jia, and Davis 2009; Ibarra, Ely, and Kolb 2013). By contrast, women are more often associated with being helpful, nurturing, or modest.

➡ Recent studies have also shown that leadership norms are changing, and women are often cited as exercising more democratic and inspirational styles of leadership, as compared to the autocratic, task-oriented, and transactional tendencies of male leaders (Eagly and Carli 2003).





# LEVELING THE PATHWAY TO EMPLOYMENT

## **Attraction:**

- Curriculum designers can also create resources that are suited to the learning styles and preferences of girls as well as boys. Research suggests that STEM curricula are more appealing to girls if they are relevant to real world situations (Baker 2013; IRIS 2012; Hulleman and Harackiewicz 2009). Dartmouth University used similar approach.
- WomEng has developed booklets aimed girls with information about educational institutions that offer engineering programs and scholarship opportunities, and answers to frequently asked questions about careers in engineering.

## **Recruitment:**

- When evaluating candidates individually, decision aids such as technical and cognitive tests, as well as structured interviews during which each candidate is asked the same questions in the same order, can help stem implicit bias.
- Profile female role models and showcase real-life examples of women in infrastructure jobs that can help counter stereotypes.
- Providing technical skills training along with job placements in nontraditional sectors can also help women access job opportunities in the energy sectors.
- Various studies have found that both quotas and targets can help to increase the share of women in leadership positions.



## **Retention:**

- Laws and policies play an important role in women's ability to enter and stay in the labor market, particularly after starting a family. United Kingdom has required companies with more than 250 employees to publish their pay gap information (IFC 2018).
- Appropriate facilities for both men and women can foster a more inclusive work environment e.g. providing adequate lighting and toilets, appropriate uniforms, and on-site health facilities with at least one female staff member.
- Engaging unions also key e.g. Électricité de France (EDF) and ENGIE have established collective agreements on gender-equality.

## **Advancement:**

- The Center for Talent Innovation found that men and women with sponsors are more likely to ask for pay raises (and get them); to join high-visibility teams; and to experience greater career satisfaction (Hewlett et al 2008).
- Standardizing job performance reviews and skills assessments might help reduce gender bias (MacKenzie, Wehrer, and Correll 2019)



# Upcoming Pacific Women's Energy Employment and Empowerment Program (PWEEEP)



*Building a data-driven and evidenced based business case for gender equality and workforce development , including economic empowerment and green jobs*



*Engaging champions and supporting advocacy on women's employment and economic empowerment*



*Building embedded multi-year programs on women's employment and economic empowerment*



*Capacity building and knowledge management*

PWEEEP and PPA Partnership

**ESMAP**  
Energy Sector Management Assistance Program

**SOCIAL SUSTAINABILITY AND INCLUSION**



# Thank You



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