



WOMEN IN SUSTAINABILITY,
ENVIRONMENT AND
RENEWABLE ENERGY

ENERGY ACCESS FOR ALL
A WISER PERSPECTIVE



An initiative by



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Building a Sustainable World through Equal Access to Clean Energy

We are living in a transformative time. Climate change and a global pandemic have created urgent and complex challenges that have in turn fueled opportunities to build a more resilient, safer, and more sustainable world. The progress has been remarkable, but it has not always benefited everyone equally.

Women often disproportionately face limited access to energy resources on all sorts of levels – from clean cooking facilities to access to energy financing – preventing them from participating in, and benefiting from, the development of the clean energy technologies and policies shaping their future.

However, recognition of the positive impact of energy access on women and all society is growing rapidly – and women are using their voices to call for action. From grassroots communities to boardrooms, women are being heard loud and clear – demonstrating the impact that empowering women has on driving more sustainable development for the benefit of all..

But it shouldn't be left to those who are without energy access to ask for support – there is much that all of us can do, as professionals, industry leaders, scientists, and engaged citizens, to address this issue. We can go further in improving women's access to energy finance and energy policies, and we can support more women-led energy entrepreneurship and female representation in energy leadership.

This white paper will help to further expand inclusive and open dialogue on women in sustainability and help to ensure that no women are left behind. Only by including and empowering women in our collective struggle to reduce the environmental impacts of human activity can we become truly sustainable.



Dr Lamya Fawwaz,
Executive Director for Brand & Strategic Initiatives at Masdar and Program Director of WiSER

Keynote Addresses



“One thing is clear is that there are trillions of dollars available to support and maintain climate, and not just climate but also nature. Because of the way we’re running this planet, because of the way international trade relations are run, which is a business, I think we have to give international businesses the opportunity to make a business or profit or economic development out of climate. International or state laws or any common agreements should be designed that anyone or any company having climate or nature activity should have a benefit. Then I can assure you that the moment the doors of climate behavior or green behavior for international business open, very quickly we will solve or at least maintain and make sustainable our environment, climate, and nature.”

His Excellency Armen Sarkissian,
Former President of Armenia



“There is no doubt that human beings are the vital element to bring about environmental change and to ensure there is a natural balance and order in our ecosystems. Humans’ relationship with the environment is one of dependence. We affect the environment and are affected by it. Here emerges the role of women in bearing the burden of managing the needs of the family. This requires mapping the consumption patterns of various natural resources at a community level and the products that vary between direct consumption such as the consumption of water and energy resources and indirect consumption of various natural resources through agricultural and industrial products. Women are the role models for future generations, establishing how to interact with the environment in a way that is responsible and sustainable.”

Her Excellency Dr Yasmine Fouad,
Minister of Environment for Egypt



“Despite making up 48 percent of the global workforce, women only account for 22 percent of the traditional workforce in energy sectors. The numbers are even lower for management levels. So how do we ensure that female representation increases in this energy transition that the world is undergoing? I’m a firm believer in the power of education. I’m also a strong advocate of girls in STEM. The more women graduate in STEM and pursue their careers in these fields, the more we can create role models, the more we can influence change from within... We have a duty of care: care for our citizens, and care for our planet. So, let’s deliver on this by ensuring affordable, clean, and efficient energy access to all, and let’s provide the right opportunities for our girls to enter in the energy sector and thrive.”

Her Excellency Dr Miriam Dalli,
Minister for Enterprise, Energy, and Sustainable Development for Malta

Introduction

Energy is a basic human need, contributing to individual and societal development through improved living standards, educational attainment, health, productivity, and economic progress. That is why access to clean energy in the form of electricity and cooking fuel is so important to human development in general – and female empowerment in particular.

Despite the criticality of fair clean energy access, worldwide roughly 759 million people lack access to electricity, and nearly three billion lack access to clean cooking energyⁱ. The burden of that energy poverty falls disproportionately on women, as they are the ones often tasked with gathering fuel material and water, cooking, and doing other manual labor in the home. The impact of exposure to fumes from unclean cooking energy contributes to the 4.3 million deaths per year – mainly of women and girls – caused by indoor air pollutionⁱⁱ.

Moreover, health emergencies like the COVID-19 pandemicⁱⁱⁱ and the disrupting effects of climate change^{iv} impact women more strongly, and their effects are worsened by inequitable energy access.

As stated by COP26 President Alok Sharma on

Gender Day at COP26. “Gender and climate are profoundly intertwined. The impact of climate change [affects] women and girls disproportionately.”

Increasing women’s access to clean energy can support broader human development and help slow the pace of climate change and reduce its impacts. Improving equitable energy access can also advance the United Nations (UN) Sustainable Development Goals (SDGs), especially SDG 5 – Gender Equality – and SDG 7 – Affordable and Clean Energy – which are inextricably linked^v.

In recognition of the critical importance of increasing women’s access to clean energy, the 2022 Women in Sustainability, Environment, and Renewable Energy (WiSER) Forum, organized as part of Abu Dhabi Sustainability Week (ADSW), was held under the theme of ‘Energy Access for All: A WiSER Perspective’.

The invite-only event brought together international experts from government, intergovernmental organizations, industry, not-for-profits, and academia, to share their insights relating to women’s clean energy access and the challenges women face in the clean energy sector. The Forum featured six high-level roundtables on the following six sub-topics:



- 1 **Women’s Access to Energy Finance**
- 2 **Developing and Actioning Energy Policy for Equitable Energy Access**
- 3 **Creating Energy Infrastructure for Equitable Energy Access**
- 4 **Women’s Inclusion in Clean Energy Development and Use**
- 5 **Supporting Women-led Energy Entrepreneurship**
- 6 **Facilitating Female Representation in Energy Leadership/Decision-Making**

This white paper aims to highlight the lessons of the 2022 WiSER Forum, framing the challenges and opportunities relating to women’s energy access, and sharing positive outcomes that can be applied by others looking to advance clean energy access for women around the world.

“
Gender and climate are profoundly intertwined. The impact of climate change [affects] women and girls disproportionately.
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COP26 President, Alok Sharma, speaking at COP26

About WiSER

WiSER is a Masdar-led impact-focused platform dedicated to inspiring women and girls to play an active role in addressing global sustainability challenges.

The WiSER platform was officially launched on the sidelines of the 70th United Nations General Assembly in September 2015. Masdar, Abu Dhabi’s renewable energy company, and the Zayed Sustainability Prize founded the platform, which is focused on three core pillars of education, engagement, and empowerment. WiSER strives to position women and girls of all nationalities as drivers of change and innovation, while ensuring that their voices are heard across the sustainability debate – whether on issues of policy, technology, or business.

Founding partners



Panel Session at ADSW Summit: The Leverage Effect of Women

A special panel session held ahead of the 2022 WiSER Forum as part of Abu Dhabi Sustainability Week (ADSW) brought together three leaders from government and industry to discuss the topic of 'Energy Access for All: The Leverage Effect of Women'.

The panel included Her Excellency Dr Miriam Dalli, Malta Minister of Energy, Enterprise, and Sustainable Development; Her Excellency Dr Nawal Al-Hosany, Permanent Representative of the UAE to the International Renewable Energy Agency (IRENA); and Frédéric Claux, Chief Executive Officer, GCC & Pakistan and EVP Thermal businesses Africa, Middle East and Asia, ENGIE, France.

The panelists highlighted the foundational role of education in guiding girls to science, technology, engineering, and mathematics (STEM) focused subjects and fields.

HE Dr Dalli said: "Education is key because it is the baseline if we really want to change things... We are still... not giving proper access to women and girls to go into STEM, for them to be really interested in technology, education, and science... We need to address girls and their parents, particularly their mothers, to encourage them to go in the [STEM] direction."



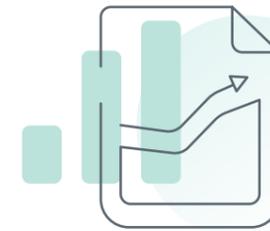
HE Dr Al-Hosany said having visible female STEM role models would encourage more women and girls to pursue careers in these fields. "How many young boys want to be footballers because of [Lionel] Messi and Cristiano Ronaldo, who are superheroes in their eyes? We need to build a similar sense of awe and mythology around women and girls in STEM fields... to highlight the trailblazing work of women leaders in energy and showcase the narratives around them."

The importance of long-term planning and collaboration was also discussed by the panelists.

HE Dr Al-Hosany credited the UAE's farsighted policies to improving female participation in STEM education and science- and technology-related fields. She said: "I am literally a product of this country. I was educated in government schools, I went to government universities, and I was sponsored by my government to do my PhD in the UK. Where I am today happened because of the UAE's focus on giving equal chances and positions to men and women."

Claux provided the industry perspective on collaboration and planning, saying: "For us, tying up with universities is very important, [to guide] internships, scholarships, and workshops for the female students to become familiar ... with the sector. Fostering gender parity requires continuous effort and is a long-term trend you need to foster and nurture."

A WiSER Perspective: WiSER Forum Roundtable Participants Share Their Insights



Clean Energy Access Finance

A key element to ensuring women's access to clean energy is the equitable provision of clean energy financing, which refers to financial instruments, services, and facilities that enable the development, investment, or purchasing of systems or technologies that allow for clean energy provision. The roundtable titled 'Women's Access to Energy Finance', moderated by Maria Charash Koundina, Finance Advisor, Viridor, brought together energy finance sector players to discuss the current challenges to equitable energy access, opportunities for improvement, and actions.

Among the obstacles identified were the pervading cultures in the clean energy and finance sectors that favor men and disadvantage women, and legal and cultural constraints that limit women's economic opportunities. In many communities, particularly in the developing world, women lack credit history or collateral to secure loans, which feeds into a larger problem of gender-biased credit scoring that reduces women's access to fair financing and lending rates.

According to the roundtable participants, improving women's access to energy finance also presents opportunities for innovation and improvement.

For instance, including gender equality in the stated objectives of energy sector development finance can ensure it is pursued and achieved, as "we get what we measure." Increasing women's representation at the top levels in clean energy finance entities can also lead to more decisions and policies that aid women's access to clean energy finance, while increasing women's involvement in decision-making can help create a "virtuous cycle" of decisions that reduce bias in fund allocation. Further down the pipeline, increasing female role models in the clean energy finance space can inspire more women to enter clean energy fields.



The roundtable attendees also shared their activities and initiatives to improve women's access to energy access. Ranjit Mene, Partner, Green Tech Investment Partners, said: "We produced a best-practice guide that all organizations within the offshore wind industry in the UK can use, looking at [women and ethnic minority-focused] engagement, attraction, recruitment, retention, leadership, and culture." He advised other organizations in the energy access space to also learn in this way from the best practices of leaders in equitable clean energy investment/financing.

Fatimah Bello, Venture Partner at Climate Impact Capital, indicated that she is personally committed to supporting female founders. "I am intentional about having a good balance of women founders in my portfolio companies; I am very keen on working on the problems that I want to see solved," she said.

Mohamed Ben Salem, Associate Director of International Affairs, Abu Dhabi Global Markets, advised those seeking finance for equitable energy projects to present the business case for their

projects, as the profitability of diversity and equity are well documented, instead of relying on the ethics or corporate social responsibility aspects of equity. "If you craft a message about the profitability of gender equality, then you have a better chance at introducing a change," he said.

A clear roadmap for planning, measuring and reporting concrete outcomes of financial instruments, services and facilities at a local level with a gender lens, will help to ensure that women are able to effectively access clean energy financing.

"I am intentional about having a good balance of women founders in my portfolio companies; I am very keen on working on the problems that I want to see solved."

- Fatimah Bello, Venture Partner at Climate Impact Capital



Clean Energy Access Policy

Policy plays a major role in shaping and guiding equitable clean energy access at every level. As clean energy access disproportionately impacts women, it is critical to incorporate a gender lens in clean energy policy development.

The roundtable titled 'Developing and Actioning Energy Policy for Equitable Energy Access' moderated by Rana Ghoneim Chief, Energy Systems and Infrastructure Division, UNIDO, explored the push and pull influences on equitable energy policy, and potential interventions.

According to the roundtable participants, creating equitable energy policy is challenging due in large part to the difficulty in creating guidelines or principles that account for the complex and unique factors that influence real-world situations. This is compounded by the fact that policymakers are often far removed from the communities they are developing policy for, resulting in an incorrect assessment of the needs, costs, benefits, and impacts of their energy policies. Even when policymakers are engaged with their target communities and their policies account for real-world stimuli, those policies can be inadequately implemented due to poor engagement with local communities and their marginalized populations, particularly women. Unequal policy can lead to vulnerable groups, including women, suffering disproportionately from the effects of climate change, resulting in greater inequality later.

The roundtable participants identified many opportunities to improve equitable clean energy policy. They advised more comprehensive policy planning, accounting for gender, environmental, and justice issues to achieve better policy uptake and policy outcomes; and factoring for financing requirements to ensure equitable clean energy policies are actualized and not shelved.



The roundtable participants shared ideas and initiatives to improve equitable clean energy policy. Daniel Kammen, Senior Advisor for Energy Innovation, USAID, explained how governmental clean energy policies should be aligned with broader shifts that integrate related sectors like education, to create the pipeline of workers needed to staff the clean energy sector. "When Morocco announced they would become a renewable energy leader, they converted their university systems to have a major focus on energy... [by doing this they] produced energy and data scientists to enable that energy transition," he said.

Delfina Godfrid, Research Coordinator at the Economics and Law of Climate Change, Master's Degree at FLACSO Argentina, urged that policy be flexible so it can adapt to diverse communities and enable local needs to be linked to the energy transition. "For example, at COP26, the president of Argentina spoke about the possibility of paying part of our International Monetary Fund debt with climate action. This implies replacing payment commitments with the decarbonization of our energy mix," she said.

Finance for energy access with a gender focus remains a small share 2-11% of total official development assistance in the energy sector^{vi}.

The Organisation for Economic Co-operation and Development (OECD) noted that only 9% of its official development assistance for women's economic empowerment was directed to the energy sector^{vii}.

Dymphna van der Lans, Chief Executive Officer, Clean Cooking Alliance, highlighted the benefit of standardizing clean energy technology quantification and labeling to support clean energy technology business planning and expansion, particularly for clean cooking. “If you don’t know what your tariff and tax regimes are going to be, it’s hard to create a solid business plan for international expansion [which is why] we’re working with the World Trade Organization to make sure [clean cooking solution labeling] is standardized and equalized,” she shared.

Connecting various policy and planning tools can enable the development of an overarching agenda where women are brought into the center of clean energy policy. Including clean energy in the nationally determined contributions (NDCs) required as part of the Paris Agreement can also ensure plans and policies are developed that are efficient and effective.

“**For example, at COP26, the president of Argentina spoke about the possibility of paying part of our International Monetary Fund debt with climate action. This implies replacing payment commitments with the decarbonization of our energy mix.**”

- Delfina Godfrid,
Research Coordinator at the Economics and Law of Climate Change,
Master’s Degree at FLACSO Argentina



Clean Energy Access Infrastructure

Infrastructure is a key component of any energy system, providing the means to generate, store, transmit, and distribute energy. In the clean energy context, infrastructure can refer to a nuclear-powered electricity grid, micro-, mini- or off-grid solutions, as well as natural gas distribution infrastructure for clean cooking. The roundtable titled ‘Creating Energy Infrastructure for Equitable Clean Energy Access’, moderated by Dr Steven Griffiths, Senior Vice President, Research and Development, Khalifa University of Science and Technology, provided a platform for representatives from government, industry, intergovernmental organizations, not-for-profits, and academia, to discuss the equitable energy infrastructure’s problems, prospects, and results.

The challenge of creating equitable energy infrastructure was viewed through two major lenses – that of the developed world and the developing world. In the developed world, a lack of education and awareness of the benefits of clean energy compared to perceived detriments often produces resistance from local communities. In the developing world, many people do not have bank accounts or national or digital identification, making it difficult to integrate them as energy customers. In both worlds, clean energy infrastructure projects are hindered by the complexity, cost, duration, and need for collaboration between industry, government, and community groups. Financing clean energy infrastructure projects in any location can be difficult due to how credit risk and financial risk are currently assessed.

According to the roundtable participants, as difficult as it can be to plan, finance, and deliver impactful and supported equitable energy infrastructure projects, the potential of such projects is great. Investing in clean energy

infrastructure and climate resilience can provide the missing impetus to global GDP growth, which has been lagging for the past decade. The ubiquity of mobile money providers in Africa, for instance, can provide an innovative tool to reach “unbanked” energy infrastructure project customers. Women can also constitute a significant lever for the acceleration of clean energy infrastructures as the main care provider and decision-maker for consumption and energy use in a family.

Additionally, the opportunities for clean energy infrastructure have been increasing, as sustainable bond issuance has been growing, reaching close to US\$1 trillion in 2021.

The roundtable participants then shared some of their lessons and efforts to achieve equitable energy infrastructure projects.

His Excellency Suhail Mohammed Al Mazrouei, UAE Minister of Energy and Infrastructure, gave the UAE’s example of how the developed world can help advance the equitable energy infrastructure projects of the developing world as part of its commitment to global sustainability. “We have allocated nearly US\$1 billion in foreign aid to support renewable energy projects in developing countries. We are very proud of that contribution, and we will continue doing that as a committed member of IRENA,” he shared.

According to Atsi Sheth, Managing Director and Head of Credit Strategy & Research, Moody’s, adapting risk assessment mechanisms and processes can better support clean energy infrastructure project investment. “Investors also want an assessment of the credit risks and benefits of clean energy projects, and we incorporate environment, social, and governance considerations into our risk assessments. In addition, we provide second party opinions on how green bonds align to sustainability principles,” she said.

Gillian-Alexandre Huart, Chief Executive Officer, ENGIE Energy Access, urged those working towards equitable energy infrastructure to capitalize on local women’s communities and networks, which can help accelerate and advance clean energy infrastructure projects.

Women are more likely to be employed in lower-paid, non-technical, administrative, and public relations positions than in technical, managerial, or policymaking positions^{viii}.

Under current policies and trends, 2.3 billion people will still lack access to clean cooking facilities in 2030^{ix}.



“The women’s community in Sub-Saharan Africa is very powerful... and [partnering with them] enables cross-community support,” he said.

“Facilitating access to off-grid renewable energy alleviates women’s time poverty, creates more economic opportunities for women to work, changes social behavior by a broader access to information and ultimately mainstreams gender in the local economic development.”

He added: “Paygo technology enables them to pay in small installments via mobile money. The use of mobile money translates to financial inclusion for these customers, e.g. women who are otherwise excluded from the financial services industry. They are now able to use mobile money for other commercial transactions beyond just repaying for their kits. Thanks to decentralized energy and productive appliances, women become active participants in the economic life and influence life-changing decisions in their communities.”

Collaboration between governments, businesses, financial donors and local stakeholders will be key in ensuring that sustainable infrastructure projects are developed in the areas where they are needed most. Initiatives such as Beyond 2020, launched by the Zayed Sustainability Prize in partnership

with several leading local and international organizations in December 2019, are successfully showcasing how vulnerable communities can be helped with their sustainability challenges through collaborative efforts by all stakeholders across the international sustainability community; with the pioneering initiative having positively impacted approximately 110,000 people during its first phase and debut year.

“**We have allocated nearly US\$1 billion in foreign aid to support renewable energy projects in developing countries. We are very proud of that contribution, and we will continue doing that as a committed member of IRENA.**”

- His Excellency Suhail Mohammed Al Mazrouei,
UAE Minister of Energy and Infrastructure



Clean Energy Access Development & Use

To achieve equitable clean energy access, women must be included in the development and use of clean energy solutions and systems. This includes integrating women in the entire clean energy ecosystem, covering research, development, maintenance, management, and financing.

The roundtable titled ‘Women’s Inclusion in Clean Energy Development and Use’, moderated by Dr Faye Al Hersh, Technology Specialist, Masdar, examined the obstacles to women’s inclusion in the development and use of clean energy, the opportunities to improve that, with constructive examples.

A major bottleneck to women’s inclusion in the clean energy sector is the insufficient pipeline of women scientists, engineers, technicians, and policymakers in the clean energy space. This may be due to a cultural belief that the technical and scientific disciplines that develop and maintain clean energy technologies are unsuitable for women. Women themselves may be discouraged from joining the clean energy sector due to insufficient provisions for off-site safety, in-office childcare, and work structures that put women who must leave work for maternity or other family considerations at a disadvantage for career progression.

The roundtable participants highlighted some measures that can improve women’s participation in the clean energy sector. Equitable HR policies like gender-equal pay, ‘return to work’ programs, on-site nurseries, female-to-female mentorship programs can attract, support, retain, and advance women in clean energy. Promoting women leaders to senior management can increase the visibility of women in the sector, provide role models to girls and women, and produce more gender-inclusive decision-making. Gathering data on

gender inclusivity in clean energy organizations that educate, hire, and advance women can help ensure progress is being made in the right direction.

The roundtable participants shared some of their activities aimed at improving female participation in the sector. To help reduce cultural and psychological bias against women in the clean energy industry, Prof. Mercedes Maroto-Valer, Director of the Research Centre for Carbon Solutions as well as the UK Industrial Decarbonisation Champion and IDRIC Director at Heriot-Watt University, is engaging in outreach. “We are producing a series of short videos titled ‘You Can’t Be What You Can’t See’, which features female role-models to bring women into STEM and shows that they are critical for our energy transition. These videos will also promote the benefits of having a diverse workforce in research and innovation, particularly in the energy sector,” she said.

Committing to organizational gender equity, including equal pay, fair interest rates, provision of facilities, product design, etc., should attract and retain women workers. Highlighting the power of such commitments, Berivan Suzgun, Head of People & Organizational Development, Diversity, ENGIE said: “We now have clear KPIs to attract women and promote them to management roles. We also have non-financial KPIs as commitments to the stakeholders.”

Working toward a greater participation of women in the clean energy space can bring numerous benefits, not least expanding the talent pool for the clean energy sector^{xii}, which the International Renewable Energy Agency (IRENA) estimates could increase from 10.3 million in 2017 to nearly 29 million in 2050 spurred by global energy transition efforts^{xiii}.



It is estimated that **US\$97 trillion** in global infrastructure investment is required by 2040 to support sustainable development ^x.

Sustainable infrastructure can influence the achievement of **92%** of targets across all 17 SDGs ^{xi}.





Clean Energy Access Entrepreneurship

A key component of sustainable and equitable development is the facilitation of women entrepreneurs. Supporting women's efforts to become clean energy entrepreneurs not only empowers them as individuals but also broadens and accelerates the pace of development. The roundtable titled 'Supporting Women-led Energy Entrepreneurship', moderated by Amandeep Bhangu, International Presenter, identified some critical challenges and opportunities for improving female entrepreneurship and revealed positive outcomes to support female entrepreneurship.

In many of the communities most in need of energy solutions – which are typically rural and underdeveloped – there is often insufficient technical training and support for women. Additionally, women are often less financially independent than men, more likely to lack, collateral, and awareness of business and banking services. This feeds into bias often faced by women entrepreneurs from bank managers, who may view women's business plans more skeptically and harshly than that of men. As a result, female clean energy entrepreneurs are often forced to be trailblazers, creating their own partnerships and networks, and setting precedent in securing financing.

While the obstacles to female entrepreneurship in energy are numerous, so too are the opportunities. When women are involved in company boards, they are 60 percent more likely to ensure consumption is more reasonable and 39 percent more likely to ensure greenhouse gases emissions are cut by their company. When women become entrepreneurs, they often become community leaders and role models, creating a snowball effect of development and empowerment. In cultures that limit interaction between

genders, women are better positioned to interact with female end-users, who are often the ones who make home consumption decisions. The need for decentralized energy in the form of microgrids and off-grid solutions in rural parts of Africa and Asia can also be an opportunity to empower women as entrepreneurs and leaders.

The roundtable participants shared some of their organizations' outcomes for improving female entrepreneurship. Dr Mona Hammami, Partner, McKinsey & Co, noted that innovations in financing have been increasing female entrepreneurs' access to funding and capital. "We've seen large development banks come up with regulatory changes with central banks to allow for wider female access to finance... We've also seen innovations in blended finance that allows for more de-risking capital interventions; rise of gendered bonds; pooled financing mechanisms; and aggregating business to create larger demand for credit and make access to finance easier," she said.

Facilitating women's clean energy entrepreneurship is also accelerating sustainable development and economic growth, leading to many ripple benefits,



according to Katherine Lucey, Founder & Chief Executive Officer, Solar Sister. "Using entrepreneurship as the leverage for energy distribution means we're not building this on philanthropy or dependent on outsiders. We're building it on the local economy and supporting the local economy, which has a regenerative effect for that community," she said.

Aisha Bukhari, Vice President, Women in Renewable Energy (WiRE), said that improving women's access to flexible development and training programs and resources can be done through "more peer-to-peer learning initiatives and networking programs, showing pathways for emerging professionals to join in technical and nontechnical areas, and highlighting women role models and their success in the industry."

There are numerous women heavily involved in innovating sustainable solutions – but the numbers still lag behind men, across the developed and developing world. Ensuring they have access to the necessary resources to start their own clean energy enterprises makes both social and economic sense and will allow for new innovations to have the widest impact possible.

Using entrepreneurship as the leverage for energy distribution means we're not building this on philanthropy or dependent on outsiders. We're building it on the local economy and supporting the local economy, which has a regenerative effect for that community.

- Katherine Lucey, Founder & Chief Executive Officer, Solar Sister

Productivity gains from narrowing gender gaps across the economy could increase GDP by 35%, according to the International Monetary Fund ^{xiv}.

A World Bank report indicates that 155 of the 173 economies assessed have at least one law impeding women's economic opportunities, including access to credit ^{xv}.



Clean Energy Access Leadership

One of the most glaring gender gaps in clean energy exists at the highest levels, where the absence of women is felt acutely in leadership and decision-making roles. The roundtable titled 'Facilitating Female Representation in Energy Leadership and Decision-Making', moderated by Wendy Lam, Program Director, Baker Hughes, gave representatives from industry, government, not-for-profit, and academia, a platform to share their thoughts on what hinders equitable clean energy leadership, and why and how it can be overcome.

As in other roundtables, the participants highlighted cultural, educational, and workplace bias as impeding women's participation in energy leadership. For instance, women often miss out on gaining the necessary training, skills and experience to move up the career ladder, and receive fewer opportunities for promotion. Women's participation in the clean energy sector also tends to come from the administrative and other less technical areas, putting them at a disadvantage when it comes to advancement into leadership.

To remedy this shortfall, companies can ensure they are providing targeted support for women from the start of their careers, so they acquire the skills and behaviors needed to reach the c-suite level. Policies within individual organizations and legislation from government can also help create the frameworks and goals needed to ensure women are given a seat at the boardroom table.

The relative newness of the clean energy sector, as compared to the traditional energy sector, also provides an opportunity for women to be integrated within the clean energy sector early on, preventing

it from becoming a 'men-only' club. Many of the organizations represented in the roundtable are already making strides in improving female representation in energy leadership.

Seza Vaziri, Global Value Stream Leader and MENAT Women's Network Leader for GE Gas Power, said: "Within GE Gas Power, there is a focus on improving those processes impacting female talent inclusion in leadership roles. For example, we are looking at succession planning process to ensure female talent are identified for leadership positions.

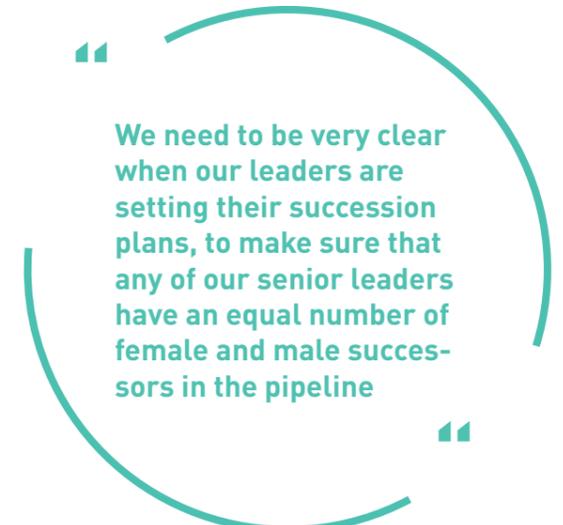
She added "We need to be very clear when our leaders are setting their succession plans, to make sure that any of our senior leaders have an equal number of female and male successors in the pipeline...

Nadja Haakansson, Managing Director, Africa, Siemens Energy, spoke about the impact of including women in senior-level interview panels to counter unconscious bias toward men. "Having balanced interview panels for senior management roles is a concrete way to negate unconscious bias or favoritism," she said

Fatema Al Nuaimi, Chief Executive Officer, ADNOC LNG, shared the impact of bold action from leadership in increasing female representation in leadership. "To introduce change we need to have a strong push from the top that is loud and clear, at ADNOC this came with the pledge made in 2016 by His Excellency Dr Sultan Al Jaber to appoint a female CEO within the ADNOC group by 2020. Today we are proud to have exceeded this pledge and have three of our ADNOC group companies led by female CEOs."

Haifa Al Kaylani, President & Founder, Arab International Women's Forum, supported gathering data on efforts and practices relating to women in leadership to provide a baseline and focal point. "Without data, there is no visibility. Without visibility, there is no interest. Policymakers in the private or public sector must have the data to be guided," she shared.

A genuine commitment by government and companies to create pathways for females to first enter the clean energy sector and then work toward attaining leadership roles will help to redress the gender imbalance at c-suite level.



We need to be very clear when our leaders are setting their succession plans, to make sure that any of our senior leaders have an equal number of female and male successors in the pipeline

- Seza Vaziri, Global Value Stream Leader and MENAT Women's Network Leader for GE Gas Power

Companies with more women board members outperform those with fewer women by

53% on return on investment,

42% on return on sales, and

66% on return on invested capital ^{xvi}.



The Sustainable Ventures Perspective



Sheikha Shamma bint Sultan bin Khalifa Al Nahyan
Chief Executive Officer, Alliances for Global Sustainability (AGS), Founder of Shamma bint Sultan Sustainability Initiatives, and Co-Founder of Aurora50, United Arab Emirates

What role or impact do you think female representation on boards can have in improving equitable clean energy access in the region and wider world?

Women play a critical role in driving sustainability across any sector, by ensuring that the voices of women are heard and the needs of women are met. Without female representation on boards and in senior management roles, it is not possible for men to be aware of or be able to gauge the extent of the unique challenges faced by women. When we look at the state of the world and the planet, our traditional modes of operation simply no longer serve to create equity. That is why we need to see change.

Firstly, for women to have improved access to improving clean energy, they must have a seat at the table. Research conducted by Kramer, Konrad and Erkut (2006) found that for women to have an impact, there should be at least three women represented in any boardroom, creating a critical mass to share their thoughts. In the UK, a 2020 report by POWERful Women and PwC stated that women occupy 21 percent of boards. As I see an increasing number of women sitting on energy boards in the region, I am confident about the new greener era we are entering.

What do you consider to be the main obstacles or challenges to increasing female representation in leadership roles and decision-making in the clean energy field?

Women in all fields face similar challenges globally. Within the energy sector, as in many other male-dominated industries, there is still a glass ceiling when it comes to the progression of women's career paths. There is also a perception that working in these sectors compromises work-life balance, particularly for mothers, due to the pressure and time commitment required. It's the responsibility of organizations and policymakers to mitigate this by ensuring that the right practices are followed in terms of encouraging flexible work hours and family-friendly measures.

Drawing from your leadership roles in green buildings, sustainability, and environmental law, what would be the single message you would share with people interested in increasing female representation in decision-making in the clean energy sector?

There are many talented women, and I am always impressed by the bright minds I come across. If they do not have experience, organizations must give them the opportunity to showcase their abilities, by supporting them in building their leadership skills and eventually giving them a seat at the table.

I would also say that this is not a shift we are likely to witness without collaboration. In order to truly increase female representation and drive the evolution of the sector, we must work together with a collective mindset and mission. Not only will this create greater opportunities across the clean energy industry, but it will greatly accelerate our progress.

The UAE has placed great emphasis on empowering its women, what lessons from the UAE do you think can prove useful to other countries looking to improve their female representation in leadership and decision-making?

The UAE has taken great strides in advancing the role of women in government positions. In March 2021, a mandate was passed by the Securities and Commodities Authority requiring more than 111 listed companies in the UAE to hire at least one woman to their boards. This level of commitment on an organizational level shows the impetus of key industry players to support the advancement of women in the energy field, which I fully support.

The private sector also has an opportunity to support women in decision-making positions. In 2020, I co-founded Aurora50, a social enterprise that works with leading Middle East organizations to accelerate gender balance in the boardroom and at a C-suite level. This includes mentorship, training and networking programs, as well as the opportunity to gain practical board experience within our partner organizations. The idea came from really understanding the inherent challenges that women face and building a program that bridges the gap.

We have received participation and support from some incredible partners from both the government and private sectors who have committed to supporting women in advancing their board careers across multiple sectors. Partners from the finance and energy sectors include Mubadala, ADNOC, Nasdaq Dubai, Dubai Financial Markets and Abu Dhabi Securities Exchange, to name a few. We look forward to continuing to grow our network, creating more opportunities across different sectors and inspiring similar initiatives in other markets.

The Engineering Consulting Perspective



Anne-Marie Choho,
Executive Vice President
of Société d'études techniques
et économiques (SETEC)

How does your sector of engineering consulting support the development of energy infrastructure for equitable energy access?

As engineers and an engineering firm, we have a double role. The first role is to try to help with decision-making. We share our knowledge with as many people as needed, especially elected officials and citizens involved in democratic processes. We explain the pros and cons of each solution, advising on the basis of each location, each issue, each challenge. Our second role is to design and deploy energy systems. We're having to reinvent our technology, and this has an influence on the balance of power production, distribution, and consumption, and has all sorts of technological implications. Our ability to adapt our profession to this new environment plays a significant role in equitable clean energy access.

What gap or need do you think should be tackled to advance the development and integration of energy infrastructure for equitable energy access?

I think the thing that will take us the longest way is education, by which I mean comprehensive understanding based on facts and data, not necessarily formal education. A lack of education prevents people, and women in particular, from thinking of the right energy solutions, from getting involved in their community, and from influencing their community toward the best solutions. For example, a woman without this education may think they should just buy a solar panel but may become discouraged when after a few years the panel stops working due to maintenance issues. Education is absolutely crucial to making informed decisions about clean energy.

The Policy Research Perspective



Dr Steven Griffiths,
Senior Vice President of Research and
Development at Khalifa University
of Science and Technology

As an expert in clean energy technologies and policy, what do you think are the main obstacles that have hindered the development of equitable clean energy access policies?

The most salient issues are cultural norms and societal views about the role of women. The barriers relate to how individual societies view women and particularly the importance they place on women being able to be in the home. The means, for instance, that access to clean cooking, where women's health is preserved and there is no risk to collecting firewood or other materials for fuel, is critical.

What are some of the shortcomings in research and policymaking for equitable energy access?

Policymakers don't typically think about cultural issues, or gender issues when they create their policies, which tend to be blanket statements considering only technology and economics. In the real world, however, those policies are impacted by cultural issues, which are further divided into gender issues. Policymakers need to do a deeper dive into social norms and cultural practices, as any technology can potentially be misused if cultural context is not considered. Similarly, policy researchers rarely think about sociology in the energy context. Many miss out on considering the potential for bias in data and the need to segregate out the different factions of people impacted by energy use.

What lessons do you think those who work in energy policy research should be mindful of in their future work to develop and deploy equitable clean energy policy?

In research that I have published, we looked at 28 countries and found dozens of case studies where it was obvious that a proposed sustainable energy solution worked in theory, however, in practice it failed because the social dynamic was not adequately considered, and some of these social dynamics were gender oriented. Those who implement clean energy policies often think that the need for a technological solution is obvious, but you can't just put a technology in people's hands and expect it to succeed if they don't want it or fully understand it. The practitioner view is that before you bring a solution to people, you need to first understand their local context, study what they do, understand their cultures and their constraints, and build their capacity to absorb the technology.

The Not-For-Profit Perspective



Joanna Osawe,
President and Chief Executive Officer
of Women in Renewable Energy (WiRE)

What are some of the challenges you've witnessed to women's inclusion in the clean energy field?

Women in Renewable Energy (WiRE) would not exist if we did not have challenges to women's inclusion in the clean energy sector. Although Canada is a global leader when it comes to diversity, equity, and inclusion, when I started WiRE some of my colleagues mocked and laughed at me. Other men were angry at me for starting WiRE, saying that I was segregating the industry. The comments I heard back then would not be made vocally today, but they are still made behind the curtain. Women need their own platform to ensure they are included. Even now, as progressive as Canada is, 99 percent of the time I am the only female at the boardroom table. I want to see more women at the executive level of the clean energy sector, not just as administrators or in HR roles.

How are you advancing your contribution to equitable clean energy access?

I was recently appointed to the Sustainable Development Advisory Council for climate change and sustainability. My goal for this role is to make sure we continue to see sustainable growth and that everyone is included in the clean energy space. For the next four years, we will be working on developing a new act that helps ensure that everybody has a voice at that table. And although I may be the one sitting on that advisory council, it is the WiRE community that I am reaching out to, to gather their insights and needs.

You've been in the energy sector for nearly 20 years. What advice do you have for women looking to join the clean energy sector?

I believe your network is your net worth. The quicker you are able to establish your network the quicker you will be able to aggregate that market intelligence and understand the complexities of this sector because it is very complicated. I also believe that women should not limit themselves or box themselves in because men do not. And I think women need to champion, empower, and motivate each other because it is already hard enough.

Conclusion & Key Findings

The 2022 WiSER Forum brought into stark focus the equitable clean energy access picture, showing it to be complex, interconnected, and multivariate.

Within the six main aspects of equitable clean energy access discussed in the six roundtables – finance, infrastructure, leadership, development, policy, and entrepreneurship – many were found to have shared challenges and opportunities.

Among the shared challenges is the gender gap in STEM-focused education for women and girls; cultural, structural, and legislative bias that disadvantages women; and an absence of programs and incentives to attract, retain, and develop women as entrepreneurs, technicians, and leaders. Several shared opportunities were also identified, including setting KPIs and targets for female participation and leadership; gathering disaggregated data on female participation; and providing mentorship and training programs to help women advance in the clean energy sector.

The roundtables also highlighted the interdependence of key components of equitable clean energy access. For instance, it was noted that women's participation in clean energy entrepreneurship cannot reasonably increase unless women's access to clean energy finance is improved. Clean energy infrastructure is not likely to become truly equitable without adding a gender lens to the clean energy policies that shape such projects. Women's representation in clean energy leadership is unlikely to increase without improving women's inclusion in clean energy development as technicians, researchers, and business leaders.

Sustainable development will not be achieved unless the obstacles and deficits that hinder women's inclusion in the clean energy sector are addressed. The findings of the WiSER Forum 2022 provide valuable insights and ideas that can enable us better to leverage the potential of women, leading to developmental, environmental, and economic benefits for all.

WiSER Annual Forum 2022

key findings

- Improve women's access to finance

Women currently face a number of obstacles when it comes to accessing clean energy finance. For instance, in many communities, particularly in the developing world, women lack credit history or collateral to secure loans, which feeds into a larger problem of gender-biased credit scoring that reduces women's access to fair financing and lending rates. In addition, finance for energy access with a gender focus remaining only a small share (2-11 percent) of total official development assistance in the energy sector ^{vi}.

Improving women's access to energy finance does present opportunities for innovation and improvement. Including gender equality in the stated objectives of energy sector development finance can ensure it is pursued and achieved, as "we get what we measure." WiSER Forum participants highlighted that increasing women's representation at the top levels in clean energy finance entities can also lead to more decisions and policies that aid women's access to clean energy finance, while increasing women's involvement in decision-making can help create a "virtuous cycle" of decisions that reduce bias in fund allocation.

- Develop gender-focused energy policy

Policy plays a major role in shaping and guiding equitable clean energy access at every level. WiSER Forum participants identified many opportunities to improve equitable clean energy policy. They advised more comprehensive policy planning, accounting for gender, environmental, and justice issues to achieve better policy uptake and policy outcomes; and factoring for financing requirements to ensure equitable clean energy policies are actualized and not shelved.

Including clean energy in the nationally determined contributions (NDCs) required as part of the Paris Agreement can also ensure plans and policies are developed that are efficient and effective. As the world seeks to find effective solutions to combat climate change, connecting various policy and planning tools can enable the development of an overarching agenda where women are brought into the center of clean energy policy.

- Support women to reach leadership roles

One of the most glaring gender gaps in clean energy exists at the highest levels, where the absence of women is felt acutely in leadership and decision-making roles. Yet research shows that companies with more women board members outperform those with fewer women by 53 percent on return on investment, 42 percent on return on sales, and 66 percent on return on invested ^{xiv}.

To remedy this shortfall, a number of participants highlighted how companies should ensure they are providing targeted support for women from the start of their careers, so they acquire the skills and behaviors needed to reach the c-suite level. Policies within individual organizations and legislation from government can also help create the frameworks and goals needed to ensure women are given a seat at the boardroom table. The relative newness of the clean energy sector, as compared to the traditional energy sector, was also viewed as providing an opportunity for women to be integrated within the clean energy sector early on, preventing it from becoming a 'men-only' club.

- Empower women to be energy entrepreneurs

There are numerous women heavily involved in innovating sustainable solutions – but the numbers still lag behind men, across the developed and developing world.

WiSER Forum participants noted that facilitating women's clean energy entrepreneurship can accelerate sustainable development and economic a, leading to many ripple benefits.

When women become entrepreneurs, they often become community leaders and role models, creating a snowball effect of development and empowerment. More programs such as the World Bank's Women Entrepreneurs Finance Initiative, which are helping women entrepreneurs across the developing world set up their own businesses by providing access to US\$354 million in funding from 14 different governments, will help to grow the number of women entrepreneurs in the clean energy space.

- Changing perceptions of women's roles

Cultural norms and bias often cast women as being solely responsible for the running of the household, which stops them from making impactful contributions in others areas to the equitable provision of clean energy.

In turn, the burden of energy poverty falls disproportionately on women, as they are the ones often tasked with gathering fuel material and water, cooking, and doing other manual labor in the home. This is particularly problematic when you consider exposure to fumes from unclean cooking energy alone contributes to the 4.3 million deaths per year – mainly of women and girls – caused by indoor air pollution.

A number of participants said that changing these perceptions will be key to ensuring women have a greater say in clean energy access. On a positive note, they gave examples of countries such as the UAE which have brought forward policies with a gender lens such as equal pay for equal work and mandating all listed companies to have at least one female director on their boards, to ensure that women have greater representation and participation in business.tivate each other wherever possible.

WiSER Annual Forum 2022

key findings

- Provide flexible working environments

The clean energy sector employs about 32 percent women, according to the IRENA. WiSER Forum participants noted women might be discouraged from joining the sector due to insufficient provisions for off-site safety, in-office childcare, and work structures that put women who must leave work for maternity or other family considerations at a disadvantage for career progression.

As a result, companies need to work hard to ensure they have in place structures such as 'return to work' programs and on-site nurseries to attract, support, retain, and advance women in clean energy. On one level, the COVID-19 pandemic has allowed companies to introduce more flexible working environments for employees including women, which could have a knock-on effect of encouraging more women into the sector.

- Greater investment in sustainable infrastructure

As difficult as it can be to plan, finance, and deliver impactful and supported equitable energy infrastructure projects in both the developed and developing world, the potential of such projects is great. Sustainable infrastructure can influence the achievement of 92 percent of targets across all 17 SDGs¹, while it is estimated that US\$97 trillion in global infrastructure investment is required by 2040 to support sustainable development², so the need is clear.

Participants highlighted that energy infrastructure projects provide an opportunity for owners and developers to capitalize on local women's communities and networks, which can help accelerate and advance clean energy infrastructure projects by gaining community buy-in. Encouragingly, the opportunities for clean energy infrastructure have been increasing, as sustainable bond issuance has been growing, reaching close to US\$1 trillion in 2021.

- Encourage women to learn STEM

Closing the gender gap in STEM-focused education will ensure that from as early age as possible females have the opportunity to participate in the clean energy space, whether that be as scientists, engineers, technicians, policymakers or entrepreneurs. Participants highlighted that the more females graduate in STEM and pursue their careers in these fields, the more role models are created, which in turn encourages more young girls to pursue STEM careers.

Moreover, with IRENA estimating that the number of jobs in renewables could increase from 10.3 million in 2017 to nearly 29 million in 2050, fueled by ongoing energy transitions, there will undoubtedly be plenty of opportunities for STEM-educated women to find employment in the renewable energy sector in the years to come.

- Going off-grid

Microgrids and off-grids can play a vital role in providing electricity to remote communities and empowering women. Such access alleviates women's time poverty and enables to women become active participants in the economic life and influence life-changing decisions in their communities. It is estimated that 111 million households can be served by microgrids in Sub Saharan Africa, Asia and island nations by 2030, according to a 2020 report by Bloomberg BNF and Sustainable Energy for All (SEforALL).

Moreover, the ubiquity of mobile money providers in these regions, gives an opportunity for 'unbanked' micro-grid customers, especially women who are typically excluded from accessing financial services, to pay for their energy in small installments, empowering them to participate in economic life and have a greater impact in their communities.

- Train to gain

A number of WiSER Forum participants highlighted how their organizations are partnering with other companies and educational institutions to provide training programs, internships, scholarship and workshops to support female students looking to pursue careers in the clean energy sector and ultimately increase their representation. At the other end of the spectrum, charities such as Light the World, which provides training for women in rural communities in Nepal to become proficient in solar energy technology, are equally important in enabling women to access clean energy as prosumers.

Coupled with the provision of training programs for women, participants noted the value of women growing their network in the clean energy sector in order to realize their ambitions. As one participant put it, "Your network is your net worth", while others said that women should champion and motivate each other wherever possible.

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