

The gender-energy nexus in fragile contexts

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This paper explores the gender-energy nexus in fragile and conflict-affected settings (FCAS), examining how energy poverty disproportionately affects women and girls and compounds existing inequalities.

It highlights how limited access to modern energy services exacerbates time poverty, health risks, exposure to gender-based violence, and barriers to economic participation, education, and leadership. Drawing on literature, case studies, and practitioner insights, the paper examines the transformative potential of gender-responsive energy interventions to improve safety, resilience, and livelihoods. It also identifies key gaps in evidence, policy, and programming, and sets out recommendations for stakeholders to support more inclusive and sustainable energy systems in FCAS.

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1. Introduction and rationale

Access to reliable and affordable energy is fundamental for development. However, worldwide [some 666 million people still lack access to electricity](#) and [2.1 billion people lack access to clean cooking facilities](#). This persistent energy poverty disproportionately impacts women and girls, as they are traditionally responsible for unpaid care and domestic work – including fuel and water collection, cooking, cleaning, and washing – which could be eased through access to modern energy technologies.

These challenges are particularly acute in fragile and conflict-affected settings (FCAS), where energy infrastructure is more limited, more vulnerable to disruption, and slower to recover following crises. According to the 2024 *Multidimensional Poverty Index*, 5.6% of people in non-conflict-affected countries are poor and lack access to electricity; this figure rises sharply to 26.9% in war-affected countries. Similarly, lack of access to clean cooking increases from 9.8% to 32.3%. In such contexts, energy poverty compounds existing inequalities and exposes women and girls to heightened health risks, time poverty, reduced economic participation, and increased exposure to violence.

Modern energy access can unlock transformative development pathways: from education and communication opportunities, to enhancing livelihoods and opening job opportunities in energy value chains. The renewable energy sector is well positioned to support gender-responsive development, with an estimated 32% women's participation in the renewable energy workforce, compared with a global average of approximately 20% in conventional energy sectors.¹

Decentralised renewable solutions are well positioned to power micro, small and medium enterprises (MSMEs), a sector where women are highly represented worldwide: [women-led MSMEs are estimated to account for around 35% of all MSMEs in developing and emerging markets](#). However, these benefits are not automatic and require efforts to challenge traditional social and cultural norms that may limit women's economic engagement, particularly in male-dominated sectors. Those efforts may need to be intensified in FCAS, where traditional roles tend to be more entrenched.

This paper focuses on FCAS, recognising that fragility and conflict are not confined to a fixed list of states but can manifest as *pockets of fragility* within otherwise stable states (see **Box 1** below). As a result, women living in fragile

¹ IRENA (2019): <https://www.irena.org/publications/2019/Jan/Renewable-energy-A-gender-perspective>

economies beyond formally designated FCAS are also disproportionately affected by inadequate access to modern energy services. In displaced and crisis-affected communities, limited energy access further constrains food security, economic activity, health outcomes, safety, and livelihood opportunities for women and girls.

Box 1: Defining fragility in this paper

This paper uses “fragile and conflict-affected settings (FCAS)” as its primary analytical frame, guided by the World Bank Fragility, Conflict and Violence (FCV) classification list. However, fragility is not confined to these categories and may also manifest as “pockets of fragility” within otherwise stable countries. In addition, part of the evidence base reviewed in this paper relates to humanitarian and displacement contexts (e.g. refugee camps), which share important and transferable lessons for FCAS – including institutional disruption, insecurity, and constrained service delivery – but are not equivalent. Where insights are drawn from these different contexts, this is explicitly indicated.

While the gender–energy nexus is widely understood and accepted globally as a result of more than three decades of international research and advocacy,² much of the existing literature draws from stable low-income countries, creating a gap in understanding how these dynamics play out within FCAS. Conversely, research in FCAS tends to highlight insecurity, displacement, and institutional collapse, but rarely with gender–energy framing.

In FCAS the gender–energy nexus is not only mutually reinforcing but also compounded by conflict and increased violence. In these volatile and uncertain contexts, women and girls bear the greatest costs of inadequate energy access, while having to navigate increased unpaid care work and financial responsibilities in contexts where their physical and mental wellbeing are consistently at risk.

Understanding this nexus in FCAS is important for several reasons:

- **Disproportionate burden:** Women in fragile states face greater risk of energy poverty due to unequal access, compounded by exposure to violence and time poverty from fuel and water collection.

² The gender-energy nexus was rarely acknowledged prior to the Fourth World Conference on Women in Beijing in 1995, with its outcome barely mentioning lack of energy access for rural women as a concern. This lack of attention to gender in the energy sector was a key factor that prompted the establishment of ENERGIA – the international network on gender and sustainable energy. Since then, ENERGIA’s advocacy work to increase women’s representation, agency, and recognition in the energy sector has evolved and proven fruitful both in terms of the impact it has created directly through research and action-advocacy and the increased number of actors now involved in advancing the gender in energy agenda. For more information: <https://energia.org/about-us/our-history/>

- **Empowerment through energy:** Reliable and sustainable energy expands women's [economic and social horizons](#) - raising employment, improving health, enhancing security and fostering participation in decision-making.
- **Systematic gaps:** Energy policy and development programming in fragile contexts typically [neglect gender dimensions](#), missing key opportunities for impact.
- **Intra-household dynamics and unintended consequences:** energy interventions that focus on supply or infrastructure often fail to address gendered constraints and can inadvertently perpetuate inequalities, while women's economic empowerment initiatives without gender-based violence (GBV) safeguards or community-norm engagement may trigger household tension or retaliation; strategic intervention sequencing is therefore critical in FCAS.

This paper draws on information gathered through a structured literature review, case study analysis, and stakeholder consultations with practitioners, researchers, and organisations working at the gender–energy–fragility nexus. Where possible, the research also incorporates grey literature, donor programme evaluations, and emerging innovations such as digital tools for energy access monitoring in FCAS, with specific attention to assessing whether these sources enable gender analysis and the collection of sex-disaggregated data.

2. State of the field: mapping the knowledge gap

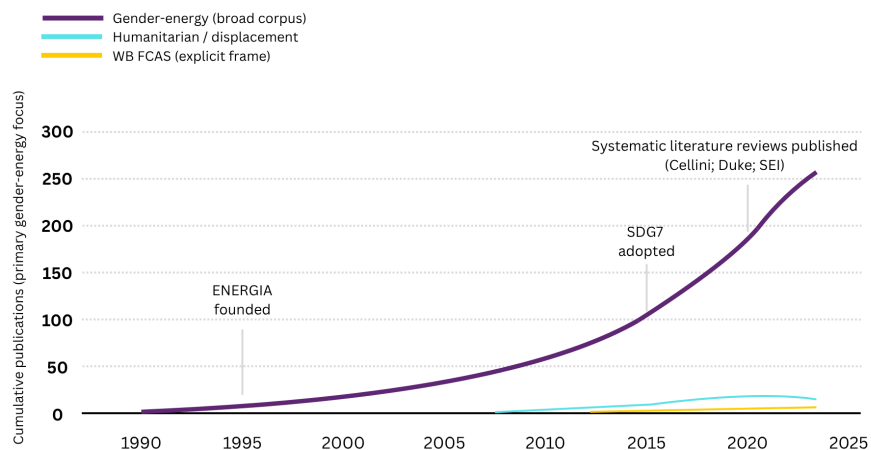
The gender–energy nexus received limited explicit attention in international policy debates prior to the mid-1990s, with only marginal recognition of women's energy access concerns in global development frameworks. This gap was first addressed systematically by Clancy et al. (2002), whose seminal paper "[The Gender–Energy–Poverty Nexus: Finding the energy to address gender concerns in development](#)" provided one of the first structured analyses linking gendered divisions of labour, intra-household decision-making, and control over resources to patterns of energy access and benefit distribution. Around the same period, interest in the gender–energy nexus also began to emerge in industrialised countries, particularly within the European Union. Subsequent work extended this foundation into the policy domain. For example, Feenstra (2002) proposed a framework for developing gender-aware energy policies, which was the basis for Prebble and Rojas' (2017) global analysis on the integration of gender equality principles in national energy policies and

regulatory frameworks, while gender audits of energy policies in Nepal, Kenya, and Senegal (Clancy and Mohlakoana, 2020) demonstrated practical approaches to “engendering” energy governance.

Since 2015, the field has expanded rapidly, driven by the momentum of SDG 7 and global energy transition agendas, as illustrated in Figure 1 below. Multiple systematic literature reviews conducted between 2020 and 2024 included Cellini et al. (2024), who identified 152 published papers in a Web of Science search, and parallel reviews by the Stockholm Environment Institute (67 papers), [Duke University’s energy access team \(154 publications\)](#), and a 2025 feminist energy transitions review (52 papers). Collectively, they point to a combined evidence base of **roughly 250 academic and policy-relevant publications** when grey literature is included.

These numbers are illustrative; this mapping draws on published systematic reviews and policy-relevant repositories rather than an exhaustive bibliometric census. The results should therefore be treated as indicative rather than definitive. In addition, the search focused on literature available in English, which may exclude relevant studies published in other languages. This body of work includes grey literature from institutions such as ENERGIA, ESMAP, IRENA, and UN Women, and encompasses electricity access, clean cooking, women in the energy workforce, and gender-responsive energy policy.

Figure 1. Growth of the gender-energy evidence base, 1990-2024



A smaller but identifiable subset of literature focuses on humanitarian and displacement contexts. **Around a dozen verified studies** directly examine the intersection of gender, energy, and humanitarian or displacement settings, with contributions from organisations such as Mercy Corps, the Women’s Refugee Commission, Chatham House’s Moving Energy Initiative, UNHCR, and Practical Action, among others. These works emphasise the risk of gender-based violence (GBV) during fuel collection, safety and lighting in displacement

settings, and emergency energy access for women and girls. Perhaps most saliently, Kasirye, Matinga and Clancy (2009), in what could possibly be the first paper to draw attention to the gender–energy nexus in fragile contexts, report findings that seem to be underplayed in later literature, including that men in displaced people camps are beaten for collecting fuelwood when trying to protect their wives and that fuel distribution by agencies leaves women vulnerable to transactional sex requests to secure their energy ration.³

While these studies centre on humanitarian and displacement settings rather than fragility dynamics per se, they offer the closest available evidence for understanding how conflict-affected conditions reshape gendered energy burdens. Humanitarian and FCAS settings share important features; insights from displacement contexts provide valuable starting points even where direct FCAS-specific evidence is limited.

2.1 The Gender–Energy–Fragility Gap

The picture changes dramatically when the lens narrows further to FCAS where fragility itself is treated as an analytical frame. Across the entire mapped corpus, only approximately **four publications** engage explicitly and systematically with the gender–energy–fragility nexus. To the best of our knowledge, the sole publication designed from the outset to address all three dimensions as a combined analytical problem is the ESMAP/World Bank (2020) report on “[Gender in energy interventions in fragile and conflict situations in the MENA region](#)” covering Iraq, Lebanon, Yemen, and the West Bank and Gaza. It is notable both for its proposed framework – which outlines how project-based energy interventions can incorporate gender equality considerations in FCAS – and for its candid recognition that “there is very little coverage of the dynamic among the three elements” in the literature.

A small number of academic papers set in FCAS-listed countries – most notably work on [electrification and gender in northeastern Afghanistan](#) – engage with gender and energy in ways that partially address fragility conditions. In most cases, however, conflict or fragility functions as a backdrop rather than as an analytical variable shaping the research design or conclusions. These studies therefore offer highly context-specific insights rather than fully transferable frameworks. They occupy an important grey zone – situated in FCAS contexts, yet not fully conceptualised as FCAS-framed gender–energy research – which is often concerned with the longer-run structural questions of post-conflict reconstruction, systems recovery, contested infrastructure and political settlement, institutional fragility in service delivery, and the risks that conflict

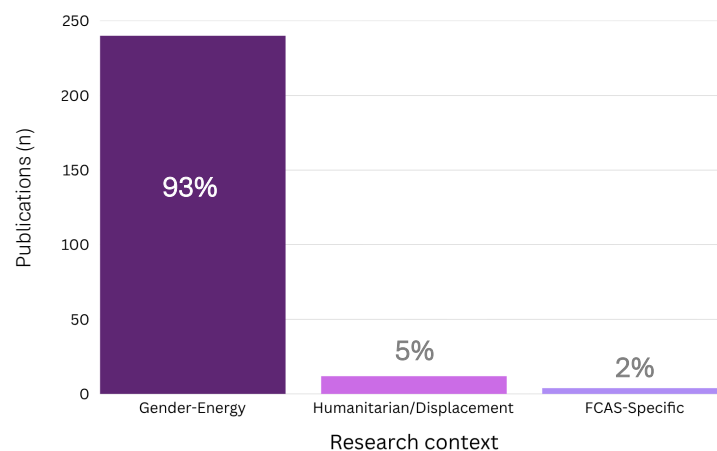
³ Kasirye, B.G.; Matinga, M. and Clancy, J. (2009). Fuel Security and Supply Dynamics in Internally Displaced Persons’ Camps of Northern Uganda, *Journal of Humanitarian Assistance*. At: <http://sites.tufts.edu/jha/archives/462>

financing and insecurity pose to energy investment. These studies are thus situated in FCAS contexts but are not always explicitly framed through a fragility lens.

Taken together, this mapping confirms that the gender–energy evidence base, while substantial in aggregate, becomes notably thin at the specific intersection of fragility, conflict, and energy — representing less than 2% of the total corpus, as can be seen in Figure 2. The practical implication is that the operational tools, guidance frameworks, and gender mainstreaming approaches developed for the broader gender–energy field have not been systematically adapted and tailored to FCAS conditions.

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Figure 2: Mapping the gender–energy landscape



Moreover, existing evidence typically falls into three separate bodies of literature, each offering only a partial perspective.

Gender–energy literature: limited attention to fragility

This body of work focuses on documenting the gender–energy nexus, understood as how gender shapes access to energy technologies, the distribution of household labour, and the benefits derived from energy access. However, these studies rarely explore how fragility exacerbates implementation challenges. Comparative reflections on how conflict, displacement, or institutional breakdown influence gender–energy dynamics are largely missing.

Gender–fragility literature: strong on GBV and gender inequality, weak on energy

Research on gender in fragile contexts provides detailed analysis of how insecurity and weak institutions compound gender inequalities. Much of this literature prioritises reducing GBV and improving women’s safety as prerequisites for economic participation and peacebuilding. Yet within this body of work, energy access is seldom considered, despite its influence on women’s time use, safety, livelihoods, and ability to engage in public life.

Energy–fragility literature: focused on response, not gender responsiveness

Studies at the intersection of energy and fragility tend to frame energy solutions as essential components of humanitarian response and reconstruction. Gender equality is typically mentioned only in passing – for example, noting women’s safety needs or the utility of street lighting – without any substantive discussion of how to design gender-responsive or gender-transformative energy interventions in FCAS.

A broader review of energy-sector gender policy literature shows that even where gender is addressed, mentions do not necessarily extend into crisis or FCAS contexts. GBV is occasionally noted, but most often in relation to biomass collection, rather than the specific risks and constraints experienced during conflict or displacement.⁴ This leaves several critical gaps unaddressed, including:

- how crisis conditions alter energy needs for women and men;
- how energy access in FCAS could support women’s empowerment, income, or leadership; and
- how energy policy reforms (e.g., tariffs, privatisation, subsidies) affect women differently during and after crisis.

Based on our literature review, we can state that the knowledge base on the gender–energy–fragility nexus is limited and highly fragmented, with most research addressing only one or two dimensions at a time. With the exception of the ESMAP MENA report, there is no integrated analytical framework or systematic evidence base to guide gender-responsive energy programming in FCAS. This knowledge gap highlights the need for more comprehensive research, comparative analysis, and policy frameworks that address how gender, energy, and fragility intersect — and how energy systems can

⁴ Prebble, M. and Rojas, A.V. (2017). Energizing Equality: The importance of integrating gender equality principles in national energy policies and frameworks. ENERGIA, IUCN, USAID. At: <https://genderandenvironment.org/report-energizing-equality-the-importance-of-integrating-gender-equality-principles-in-national-energy-policies-and-frameworks/>

contribute to gender equality in crisis-affected settings. This paper aims to address that gap.

3. Dimensions of the gender–energy nexus

3.1 Time poverty and unpaid care work

In fragile contexts, sustainable energy technologies can be a life-changer, reducing this time poverty and allowing for better development opportunities. For example, in sub-Saharan Africa it is estimated that women lose an average of 5 hours per day on fuelwood collection and cooking-related chores.⁵ When looking at the global population without access to clean cooking, it is estimated that USD 0.8 trillion are lost annually as a result of women's lost productivity due to cooking-related tasks (e.g. fuel collection, cooking, and stove cleaning).⁶ In contrast, achieving universal access to clean cooking could save women 40 hours a week on average,⁷ while achieving universal access to electricity alone could help end poverty for 185 million women by 2050.⁸

Despite these relevant development benefits, clean cooking policies remain behind in FCAS. A 2022 analysis of sub-Saharan energy policies shows that the 22 FCAS countries in the region are the poorest performers on the Regulatory Indicators for Sustainable Energy (RISE) clean cooking index, with an average score of 25 in 2019, indicating that few or no elements of a supportive policy framework have been enacted. This is almost half the score obtained by electricity access policies in the same countries, which at 41 average score for the RISE index means such frameworks have supportive elements, even if there are significant opportunities for strengthening them.⁹

These dynamics are evident in FCAS, where weak policy frameworks and persistent energy gaps deepen gender inequalities. Ethiopia provides an illustration of how time poverty and gendered energy technology gaps intersect in such contexts, as discussed in **Box 2** on the next page.

⁵ IEA (2023) A Vision for Clean Cooking Access for All: <https://iea.blob.core.windows.net/assets/75f59c60-c383-48ea-a3be-943a964232a0/AVisionforCleanCookingAccessforAll.pdf>

⁶ 2020 ESMAP and MECs, at: <https://cleancooking.org/wp-content/uploads/2021/07/598-1.pdf>

⁷ ESMAP and MECs (2020). The State of Access to Modern Energy Public Disclosure Authorised Cooking Services. At: <https://cleancooking.org/wp-content/uploads/2021/07/598-1.pdf>

⁸ UN Women (2023). Progress on the Sustainable Development Goals: The gender snapshot 2023. At: <https://www.unwomen.org/sites/default/files/2023-09/progress-on-the-sustainable-development-goals-the-gender-snapshot-2023-en.pdf>

⁹ Bellur, S ; Matthew, P. and Besnard, J. (2022) Access to Clean Cooking and Electricity: Righting the Policy Balance in Sub-Saharan Africa and Fragile Settings. Live Wire. 2022/121. ESMAP. At: <https://documents1.worldbank.org/curated/en/099843506202272145/pdf/IDU-e50ebfe9-b3aa-4b9a-b0ea-e30f2b02de84.pdf>

Box 2: Ethiopia - Gendered energy technology gaps in a context of fragility¹⁰

Ethiopia illustrates how rapid electrification and a growing portfolio of energy technologies have not yet translated into gender-equitable energy access or substantive relief from women's unpaid care and labour burdens.

Despite substantial investments in generation and grid extension, the country remains one of the most biomass-dependent globally, with over 90 percent of households using solid biomass for cooking. In urban areas, electricity access exceeds 90 percent, yet only around one in five households uses electricity as a primary cooking fuel; the majority continue to rely on firewood, crop residues and charcoal, often stacking multiple fuels. In rural areas, electricity access is far lower, more unreliable and largely limited to lighting and phone charging, with virtually no use for cooking or most productive activities.

Across rural and urban settings, women and girls shoulder the bulk of energy-related labour: collecting firewood and dung, cooking, fetching water and caring for children, often alongside substantial agricultural work. Qualitative evidence from three Ethiopian regions highlights women describing domestic work as “endless”, with fuel collection and cooking time crowding out opportunities for rest, schooling support and income-generating activities. Seasonal fuel scarcity, long collection distances and heightened smoke exposure during the rainy season exacerbate these burdens, particularly for poorer and more remote households - conditions that are often intensified in FCAS.

At the same time, access to information, finance and decision-making over energy technologies is highly gendered. Formal extension services, village-level training and market actors primarily target men, who have higher mobility, greater contact with officials and much higher rates of mobile phone ownership. Men thus tend to control information and decisions around productive energy technologies such as diesel or solar irrigation pumps, even though women provide much of the agricultural labour and water collection. Women, by contrast, are more often reached through informal channels (e.g., women's forums, health workers, religious and social gatherings) and are expected to “learn about” domestic energy solutions such as improved cookstoves independently or via health campaigns.

Quantitative evidence underscores that intra-household decision-makers - and their characteristics - strongly shape technology choices and impacts. In most Ethiopian households, women are the primary decision-makers on cookstove purchases or construction. Where the decision-maker is female, literate and closely involved in daily

¹⁰ Mekonnen, D.K. and Arega, T. (2022) Fuel and appliance adoption in Ethiopia: Heterogeneities and prioritization. SSRN Working Paper No. 4059829.

Arega, T., Yami, M., Bekele, R.D., Ringler, C. and Jeuland, M. (2023) Closing the Gendered Energy Technology Gap in Rural Ethiopia: A Qualitative Study. IFPRI Discussion Paper 02224.

cooking, households are more likely to adopt improved or self-built stoves rather than relying solely on traditional open-fire tripods. Stove stacking that includes manufactured or self-built improved stoves is associated with reduced time spent on cooking and, in many cases, fuel collection, freeing women's and girls' time for childcare, paid work and schoolwork.

Yet even where women have decision-space over domestic technologies like cookstoves or electric injera mitads (flatbread stoves), broader structural barriers limit the benefits they can realise. In urban areas, unreliable power supply, lack of private metered connections, inappropriate or cramped kitchen spaces and cultural preferences around injera baking have slowed uptake of electric cooking appliances, even among households that can afford televisions and other electric goods. In rural areas, low-voltage, intermittent electricity and the absence of affordable, context-appropriate technologies for injera baking and staple foods mean that clean cooking solutions remain largely out of reach.

The Ethiopian experience suggests **three practical lessons for FCAS**:

- i. large-scale electrification and technology rollout will not automatically benefit women unless gendered information, norms and decision-making structures are explicitly addressed; neither will these increase access to clean cooking if social and cultural norms are not addressed in electrification projects.
- ii. identifying and targeting the actual intra-household decision-makers - often women responsible for cooking - substantially increases the likelihood of improved stove adoption and associated time-use gains. In situations where senior male household members hold decision-making power, interventions and messaging should also be tailored to their motivations and priorities.
- iii. without deliberate strategies to include women in the design, financing and governance of productive energy technologies, clean energy transitions in agriculture (e.g. towards solar irrigation) risk reinforcing or even widening existing gender gaps in resources, agency and wellbeing.

Time burdens associated with other household tasks – particularly water collection for drinking and cleaning – also remain significant but are often overlooked in energy programming. Addressing these interlinked energy-water constraints, particularly where climate change is exacerbating water scarcity, is important for reducing women's overall time poverty and enabling broader welfare gains.

3.2 Safety and wellbeing

Lack of access to modern energy sources and to strong institutions can increase the incidence of gender-based violence, e.g. limiting women's and girls' mobility and safety due to poor or non-existent lighting and exposing them to violence while collecting resources (such as biomass and water). The example in **Box 3** illustrates the impact of access to clean cooking and fuels.

Box 3: Women's safety in crisis: the impact of access to clean cooking and fuels¹¹

The Global Alliance for Clean Cooking (GACC) conducted a desk review of 42 reports and evaluations on the role of access to improved cookstoves and fuels and its impact on women's protection and safety in crises. Evidence from humanitarian and displacement settings below illustrates these risks:

- In Ethiopia, 33% of refugee households reported one or more violent incidents during a period of 12 months while collecting firewood, and 13.5% experienced rape, assault, or attempted rape. (UNHCR Ethiopia, 2014)
- In Doro, South Sudan, 54% of refugee respondents reported incidents of violence against women in firewood collection places in Doro, South Sudan. In 8 out of 13 focus group discussions with adolescent girls, incidents of physical and sexual assault were reported in firewood collection places. (Danish Refugee Council, 2012)
- In Farchana refugee camp in Chad, 90% of confirmed rapes occurred when women left the camps in search of firewood. (Physicians for Human Rights, HHI, 2009)

The report also showcased how access to improved stoves and fuel had an impact in reducing exposure to GBV. For example, an evaluation of the Dadaab firewood project in Kenya found that during the days households were fully supplied with firewood there was a 45.2% decrease in rapes while collecting firewood (UNHCR, 2001). However, these figures should be treated as indicative, as sexual violence is often under-reported in crisis settings and the observed reduction reflects correlation rather than definitive causality.

Evidence from humanitarian and displacements contexts consistently highlights the importance of securing public lighting (for water points, latrines, paths, etc) to prevent and reduce GBV in refugee camps. Enhancing access to energy, including clean cooking, reduces unpaid care burden, making tasks less time consuming and more efficient; while reducing the times required for fuel and water collection reduces GBV incidences. Ensuring equitable access to energy assets within refugee households may reduce domestic conflicts and gendered power imbalances.

Financial instability due to increased energy prices or removal of subsidies can inadvertently trigger household tensions and domestic violence, while sexual exploitation may arise as a means of coercion to secure access to energy resources.¹²

¹¹ Source: <https://cleancooking.org/binary-data/ATTACHMENT/file/000/000/331-1.pdf>

¹² ESMAP (2020). Gender in Energy Interventions in Fragile and Conflict Situations in the Middle East and North Africa Region: Insights from Iraq, Lebanon, Republic of Yemen, and Gaza. At: <https://www.esmap.org/gender-in-energy-interventions-in-fragile-and-conflict-situ>

Access to resources and intra-household decision-making power

Access to energy technologies can be limited due to issues of affordability, as well as social and cultural norms. For example, although women may be in a position to decide about the allocation of family budgets, the costs of modern energy technologies, including connection costs, may exceed their daily allowances. Such budgetary decisions may require the endorsement of male family members – and in some social contexts also the approval of co-wives and mothers-in-law.¹³ In the case of female-headed households, affordability is also a major concern, as these households tend to have lower income streams than male-headed households, resulting in women investing larger proportions of their household incomes to secure energy access.¹⁴

In FCAS, where power shortages may be more frequent or even used as a tool to control disturbances, female-headed households may have less access to alternative energy sources (generators or solar lamps). This lack of access may have further implications for their safety during shut-downs, increasing incidences of GBV and restricting access to family and support systems including opportunities to report assaults when communication platforms are also down.

Economic participation, education, and skill development

Energy access is key to unleashing women's economic participation and empowerment. Studies show that after household electrification, women are 9 to 23 percentage points more likely to gain employment outside the home. When paired with the development of entrepreneurship strategies, women's economic gains can be exceptional. For example, in Malawi, the women's cooperative 'Mtende' expanded their bakery production by 400 percent,¹⁵ tested promising new business ideas in their local markets, and increased their livelihoods, in some cases by 90 percent.

Energy access opens up educational pathways particularly for girls, whose attendance is reduced by their engagement in unpaid care work. Empirical research shows that households with access to clean cooking report sending their children, including girls, to school more often than those without.¹⁶ This trend is similar to that of electrified households, where girls' school attendance is

¹³ Ochieng, C.A. et al. (2021). The forgotten half: Men's influence over cookstove adoption decisions in Northern Kenya. *Energy Research & Social Science* 74. 2021. At: <https://www.sciencedirect.com/science/article/pii/S2214629621000062>

¹⁴ ESMAP (2020). *Gender in Energy Interventions in Fragile and Conflict Situations in the Middle East and North Africa Region: Insights from Iraq, Lebanon, Republic of Yemen, and Gaza*. At: <https://www.esmap.org/gender-in-energy-interventions-in-fragile-and-conflict-situ>

¹⁵ UNDP (2025). *Funding Windows Annual Report 2024*. At: https://www.undp.org/sites/g/files/zskgke326/files/2025-7/funding_windows_annual_report_2024.pdf

¹⁶ Practical Action and GACC (2021) *Gender and Livelihoods Impacts of Clean Cookstoves in South Asia. Executive Summary*. At: <https://cleancooking.org/wp-content/uploads/2021/07/357-1.pdf>

particularly enhanced, as lighting allows them to study after household chores.¹⁷

Box 4: Measuring gendered results of solar powered livelihoods¹⁸

A field study was conducted among 30 rural women in Yemen to understand the water-energy-food nexus under pressures of climate change and conflict. According to interviewees, climate stressors such as heat waves and drought exacerbate energy poverty; 80% of respondents faced increased unpaid care work, including struggles to secure water and food, because of energy shortage (71% of respondents).

The study found that decentralised solar projects generate important benefits for women. For example, productive hours doubled from 3 to 6 hours a day and time devoted to domestic tasks decreased, with 2-3 hours saved on domestic tasks including a reduction in fuel collection time (74% of respondents). Additionally, 67% of respondents identified having better opportunities for education and work as a result of their access to solar technologies. The study calls for solar projects to be linked to women's livelihoods, water and food security, and community resilience; ensuring these include direct financing, continuous training, and policy reforms positioning women as energy leaders to enhance resilience.

3.3 Health

Reliance on traditional energy sources poses important health hazards. The use of biomass for cooking leads to respiratory diseases and accidents, disproportionately affecting women and girls. UN Women and WHO have estimated that in 2019 1.5 million women and girls died prematurely from exposure to household air pollution related to cooking fuels, making this the third-leading cause of female death.

Approximately a billion people worldwide do not have access to electrified health centres; half of sub-Saharan hospitals are not electrified. This lack of access to electricity means that basic services, such as refrigeration for medicines and vaccines, are unavailable to the populations they serve. Lack of lighting negatively affects maternal health: attendance during deliveries is particularly difficult during the evenings, often with tragic consequences for the patients.¹⁹ Electrification programmes can make a life-saving difference. For example, Solar for Health is a multi-country programme which has supported the electrification of some 1,000 health centres, including clinics, maternity

¹⁷ UNICEF (2015) Why sustainable energy matters to children: The critical importance of sustainable energy for children and future generations. At: https://www.uncclearn.org/wp-content/uploads/library/unicef_sustainable_energy_for_children_2015.pdf

¹⁸ Source: Al Sanabani, R., & Huomid, S. (2025).

¹⁹ UNICEF (2015) Why sustainable energy matters to children: The critical importance of sustainable energy for children and future generations. At: https://www.uncclearn.org/wp-content/uploads/library/unicef_sustainable_energy_for_children_2015.pdf

wards, operating rooms, medical warehouses, laboratories and storage facilities in 15 countries.²⁰ In Chad alone, the programme has electrified at least [150 health centres with a special focus on pre- and antenatal care for women, childbirth and medication storage, located in 23 rural provinces](#).

Furthermore, shifting to modern cooking technologies in health centres can have positive impacts both for those working in the kitchens – mainly women – as well as for patients. For example, Mwanamugimu Children’s Hospital in Uganda, which provides support particularly to malnourished children, has reported an increase in early discharges of about 8,000 patients annually (75% being girls) after transitioning from biomass-based to clean cooking. This shift improved both the quality of food and the regularity of scheduled meal service.²¹

3.4 Workforce

Women are under-represented across the energy sector workforce.

Participation in the formal sectors – slightly above 20% according to global estimates – is consistently under the global average for labour participation, which was [estimated at 49.1% in 2024](#). This must be addressed if the sector is to become an equal opportunity employer and tap into a significant pool of talent that is critical for the clean energy transition. The renewable energy sector seems to be making strides towards recognising women’s participation in its value chain, with women’s participation estimated at 32% for the sector, and sub-sectoral estimates ranging from [40% in the solar PV energy workforce](#), to [21% in the wind industry](#), where occupational segregation and social norms can influence participation, particularly in roles such as offshore wind operations.

Women’s participation as energy entrepreneurs and last-mile distributors has also gained important recognition and significance, with well-established players such as [ENERGIA’s Women’s Economic Empowerment Program](#), [Solar Sister](#) and [Barefoot College “Solar Mamas”](#). In spite of the income and development gains shown by women’s engagement in the energy sector, women-led energy businesses attract [less than 13% of off-grid finance](#) which presents a major barrier to scale and innovation. This reflects a broader global pattern in which women-led technology and innovation-driven businesses tend to receive significantly less investment than male- or mixed-led enterprises.

²⁰ Zimbabwe, Sudan, Zambia, South Sudan, Namibia, Liberia, Libya, Malawi, Yemen, Angola, Nepal, Uganda, Chad, and Eswatini.

²¹ Nabbale, H. (2024). Our journey on tackling the issue of deforestation through energy solutions. Accelerator Lab, UNDP Uganda. Presentation.

Box 5: Empowering women as solar technicians and community leaders in Yemen²²

Women-owned and operated 26.8-kilowatt solar microgrid launched in 2019 by Iman Hadi Al Hamali, providing electricity to 43 households by March 2021 and scaling to 10,000 people across three sites. Ten women collectively own and operate the grid, generating sufficient profit (around USD 2,070 in two years) to reinvest in battery expansion and create microfinance for community businesses. Iman Hadi Al Hamali's project shifted male community opposition to women's work; electricity bills fell 65% compared to diesel rates. Customers documented income gains: sewing machine operator moved family from hut to brick house; welder tripled daily income from USD 5 to USD 14; incense producer expanded using electric mixer.

Box 5 illustrates how women's participation as energy entrepreneurs and technicians can generate both economic and social benefits, including shifts in community perceptions of women's roles. Similar experiences have been observed in other contexts. For example, ENERGIA-supported programmes in Kenya found that women solar and biogas technicians were often preferred by communities due to perceptions of higher reliability and quality of service.

3.5 Leadership

Women's role in the sector is key to ensuring energy planning can cater to their needs, providing affordable energy solutions and efficient energy technologies. It is also essential to recognise the impacts (whether positive or negative) that transitioning from fossil-fuel-based to clean energy could have on their livelihoods. However, women hold only 11% of ministerial energy positions, limiting their input to infrastructure and policy choices that directly affect them.

Where women take leadership in energy initiatives, communities report improved access, changing social norms, and better sustainability. For example, research shows that boards having a higher percentage of women translates to larger investments in energy efficiency and renewable technologies,²³ and that parliaments with a higher number of women adopt more stringent climate change policies, resulting in lower emissions.²⁴ Women are nonetheless often excluded from decision-making, for instance when discussions are held on what investments should be made in energy services at household, community, and government levels.

²² Source: Iman, the Solar-Powered Heroine Inspiring Change in Rural Yemen | United Nations Development Programme

²³ [Report-Women_Create_Sustainable_Value.pdf](#)

²⁴ Mavisakalyan, A. and Tarverdi, Y. (2019) Gender and climate change: Do female parliamentarians make difference? *European Journal of Political Economy* Vol 56. At: <https://www.sciencedirect.com/science/article/abs/pii/S0176268017304500>

However, greater representation does not automatically translate into policies that address women's challenges, and women in leadership positions may not necessarily always prioritise the concerns of other women. Progress depends on broader institutional incentives and accountability structures. Gender equality is a shared responsibility, requiring engagement from women and men in leadership roles, as well as from other actors across the energy system. Different stakeholders may be motivated by different objectives; for example, private sector actors may prioritise business performance, yet increasing women's participation in the energy workforce and value chain can also strengthen reliability, service delivery, and market reach.

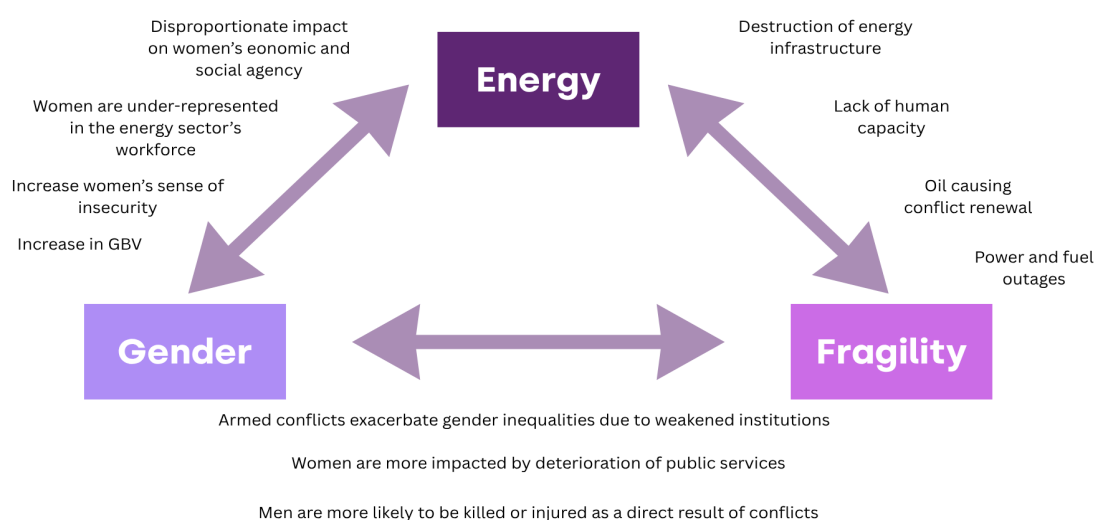
Figure 3. Dimensions of the gender–energy nexus in FCAS

Time poverty and unpaid care work Unpaid care work – fuel collection, caring for the ill, and tending to basic needs – increases in FCAS. Reduced energy access compounds this burden. • 5 hours a day lost to fuel collection (sub-Saharan Africa) • Clean cooking saves around 40 hours a week for women	Safety and wellbeing Insecurity and violence increase in FCAS, aggravated when energy is lacking: insufficient lighting, communication and fuel collection expose women and girls to harm. • 33% of refugee households in Ethiopia reported violence • 54% in Doro, South Sudan, report GBV at collection sites
Access and intra-household decisions Affordability gaps, social norms and male-controlled information channels exclude women from energy decisions. In FCAS, de-facto female headed households may increase, their reduced budgets leaving them vulnerable to energy prices. • Energy costs often exceed women's daily budgets. • In Ethiopia, men control productive energy decisions.	Economic participation and education Energy access expands women's paid work and girls' schooling by reducing the unpaid care burden and enabling safer environments with better lighting and security. • 9-23 percentage points more likely to be employed after electrification • Solar doubled productive hours for women in Yemen.
Health Energy poverty is compounded in FCAS, increasing indoor air pollution – especially for women and girls – and limiting maternal care. • 1.5million women and girls die from air pollution (2019) • Around 50% of sub-Saharan hospitals lack electricity.	Workforce and leadership Women's exclusion from energy jobs and policy limits gender-responsive design. In FCAS, haste to rebuild energy systems may further sideline women's inclusion. • Women hold around 20% of formal energy sector jobs. • Only 11% of ministerial energy positions are held by women.

4. Challenges and opportunities

FCAS settings combine insecurity, institutional weakness, and deep social inequalities in ways that render “business-as-usual” gender mainstreaming and energy programming ineffective. Energy poverty, gender inequality, and institutional fragility interact as a **“triple burden”** that reinforce each other in destructive cycles rather than breaking them. Figure 4 shows the gender–energy–fragility nexus as proposed by ESMAP (2020). In such contexts, effective interventions must move beyond technical fixes to address underlying power relations, social norms, and conflict dynamics that shape who gains, who loses, and who is put at risk.

Figure 4. Main interactions of the gender–energy–fragility nexus



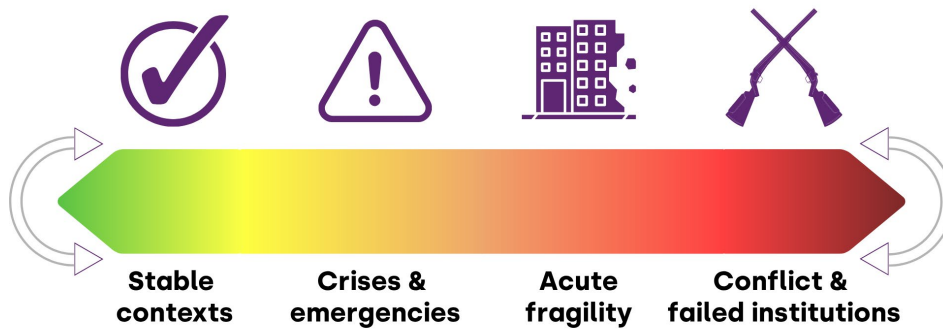
Source: ESMAP 2020.

FCAS cover a wide range of situations, which can range from crisis and humanitarian emergencies to acute contexts of fragility and conflict, where failed government institutions may also be involved in the conflict, as is illustrated in Figure 5. These characteristics compound gender inequalities and make progress in “gender-blind” sectors – such as energy – particularly difficult, given the high capital needs and long time-horizons of energy infrastructure. As a result, FCAS present uniquely challenging conditions, including the need to adapt to fluid and volatile contexts with varying degrees of insecurity, political and economic instability, and reduced institutional capacity.²⁵

²⁵ ESMAP (2020). Gender in Energy Interventions in Fragile and Conflict Situations in the Middle East and North Africa Region: Insights from Iraq, Lebanon, Republic of Yemen, and Gaza. At: <https://www.esmap.org/gender-in-energy-interventions-in-fragile-and-conflict-situ>

This section will explore the core challenges facing energy interventions in FCAS, while also highlighting the opportunities and emerging evidence on what works within these constraints.

Figure 5. The spectrum of fragility – escalating conditions compounding gender–energy challenges



Escalating conditions compounding gender–energy challenges

4.1 Universal challenges amplified

Gender inequalities in FCAS do not emerge in a vacuum. Rather, they are pre-existing disparities that become significantly intensified under conditions of conflict, displacement, and resource scarcity. In these environments, the structural drivers of gender inequality become more visible and more acute, affecting daily survival and long-term resilience.

Although gender–energy inequalities in FCAS may appear unique, the vast majority mirror universal challenges found across development contexts. What distinguishes FCAS is the degree to which these challenges are magnified. Breakdown of institutions, constrained markets, violence and insecurity, and disrupted social services exacerbate women’s limited access to resources, decision-making spaces, and technologies. As a result, women often shoulder increased responsibilities while having fewer tools to cope.

Across fragile settings, women continue to manage household-level energy needs with the least resources, the least voice, and within severely constrained environments. In a crisis, their unpaid care work - such as water and fuel collection, cooking, and caring for children, the elderly, and the sick - becomes riskier and more intense. Fuel scarcity and inadequate energy access force women and girls to travel longer distances or at unsafe times, heightening exposure to GBV and other protection concerns. These risks are not incidental: they are shaped by gender norms that limit women’s mobility and prioritise their responsibility for household survival.

In times of crisis, women are more likely to be among the first to lose their jobs and income opportunities. This heightens their vulnerability to falling into or continuing to live in poverty and, in turn, undermines their ability to sustain or attain access to modern energy sources.

Cultural norms also restrict women's ability to participate in energy and service delivery systems. Social expectations around mobility, interaction with outsiders (such as male engineers or technicians), adoption of new technologies, and participation in decision-making processes remain significant barriers even when services are available. In some contexts, however, female engineers or technicians may be able to access households where male service providers who are not family members would not be permitted to enter. These norms persist regardless of context, but in FCAS they are often reinforced as communities seek stability amid uncertainty.

Economic interventions intended to enhance resilience can unintentionally increase vulnerability when shifts in household power dynamics occur without corresponding efforts to address harmful gender norms. For example, livelihood programmes that increase women's income or visibility may trigger backlash or domestic violence in settings where masculinity is tied to economic provision. This underscores the need for programming that pairs economic empowerment with deliberate norm-change and protection strategies.

In fact, the increase in domestic and GBV in FCAS was consistently mentioned by interviewees – and literature – as among the most pressing concerns. Whether driven by mismanaged anger and frustration by male family members, attacks when collecting water and firewood, or backlash as a result of women's increased visibility or economic success, heightened risks of violence against women and girls need to be recognised. Prevention strategies should therefore be embedded in energy interventions as a prerequisite to their implementation. Male champions can also play an important role in supporting positive norm change and reducing backlash.

At the same time, crisis dynamics can create openings for women's leadership. Male outmigration — common during conflict or economic collapse — results in a rise in female-headed households. While these households often carry heavier burdens, they also provide intentional opportunities for women to assume public roles beyond traditional household management. Further, men's outmigration may create spaces for women to join the energy sector during times of conflict. In Ukraine, for example, women have increasingly taken up roles in the coal mining sector, which is key to the country's energy generation and security, in response to the deployment of men to the frontlines. When supported, these moments can serve as entry points for shifting community perceptions and redistributing decision-making power.

Box 6: When Profiling “Success” Puts Women at Risk

During our research, one of our interviewees commented about their experience working on a clean cooking project with women entrepreneurs in the Oromia region in Ethiopia. They noticed that in some cases, as women's incomes increased, they were pressured to contribute financially to armed groups. This extortion risk was an unintended and unexpected result for the project.

In order to reduce the danger to women energy entrepreneurs, the project chose not to profile women's success in communications – including those for regional or national distribution and towards donors.

What works to address these compounded challenges

It is good practice to conduct gender analysis as part of the preparation for baseline design and identification of project and policy entry points.

Recognising that women and men are not homogenous groups is essential for developing a more granular understanding of the situation, particularly the vulnerabilities that diverse social groups face. Hence, conducting gender analysis with an intersectional lens — capturing and analysing data on women, men, girls, boys, young and elderly populations, internally displaced people, widows, divorced women, and minority groups — becomes necessary to understand the complexities these groups may face in the geographic contexts where energy interventions are implemented.

Furthermore, FCAS require this analysis to be conducted in a manner that integrates a conflict analysis, identifying the different power dynamics in the communities, to ensure interventions do not further exacerbate conflicts among different factions and/or by marginalising certain groups. This means that the dynamics analysis needs to be expanded to acknowledge the drivers of conflict (e.g. climate crisis, governance failure, inequitable economic access) and where in the conflict cycle the intervention is set (i.e. prevention, conflict resolution, transition, peacebuilding). Gender specialists can draw from gender-responsive conflict analysis tools, to strengthen the gender analysis of energy projects in FCAS, enhance attention to changes in gender roles and to an increase in GBV as a result of the conflict and fragility of the location where projects are implemented.

Although not specific to FCAS, addressing cultural and social norms through sensitisation processes remains a key component for energy interventions, if they are to be successful. These exchange opportunities can be strengthened by equipping community members, women in particular, with negotiation and non-violent communication skills to reduce intra-house violence and ensure social cohesion. Engaging community leaders — including religious leaders,

clan elders, and local government officials — can reduce backlash, support uptake, and enable women's engagement in income and leadership roles.

Finally, it is important to engage women's networks and associations for advancing these sensitisation processes. In Somalia, UNDP supports 17 women's networks across 17 districts, comprising roughly 225 women leaders engaged in local governance and development. These networks are well positioned to contribute to and engage in different development initiatives, including the rollout of the national chapter of the Africa Mini-Grids Programme.

Box 7: Addressing cultural and social norms requires time and intentionality²⁶

Practical Action supports access to energy through off-grid and clean cooking solutions. In Rwanda, Practical Action is working with refugee camps, which host displaced populations from the DRC, Burundi, Sudan, Ethiopia, and other countries, many of whom arrive with restrictive gender norms that differ from Rwanda's comparatively progressive stance on gender equality. For example, GBV was often normalised within refugee communities, and early efforts to address gender equality were met with resistance, with discussions perceived as foreign or divisive.

To address this, Practical Action established gender working groups (in each camp as a core delivery mechanism. Each group comprised 15 to 18 members, ensuring representation of women and men, youth, people with disabilities, elderly individuals, and other vulnerable groups. Importantly, three influential members from surrounding host communities were included in each group to reduce tensions, promote social cohesion, and align understandings of gender equality. The groups engaged in structured discussions on household power dynamics, division of labour, income decision-making, and care responsibilities; they functioned as training-of-trainers platforms, enabling members to cascade learning into their wider communities.

Change was achieved through long-term, dialogue-based engagement rather than short-term sensitisation. Results started to become visible 18 months after implementation started; participants, particularly men who initially resisted, became advocates for gender equality. Couples increasingly engaged in joint planning for livelihoods and energy investments, demonstrating a shift towards more equitable household decision-making and improved economic wellbeing.

Addressing cultural and social norms, as well as gender biases, is key to increasing women's participation in the formal energy sector. Investing in the training and upskilling of women as technicians can be important to ensuring that centralised energy services and infrastructure continue even in times of armed conflict. It is good practice for such efforts to be anchored in a strong

²⁶ Source: Interview with Mariette Utamuvuna (Gender Advisor - Practical Action).

understanding of the sectoral context, in order to design action plans that will attract and support women in the energy sector.

For example in Ukraine, its government has commissioned a gender analysis to accompany the roll-out of its Green Energy Recovery Plan.²⁷ Beyond examining what may be considered typical themes for analysis — such as women's underrepresentation in leadership positions, gender pay gaps, STEM education, and the need for gender-sensitive policies — the report also considers the impacts of increased care responsibilities and psychological strains. These factors are treated as relevant considerations for shaping strategies to attract, retain, and grow a resilient and diverse labour force.

Meanwhile, in Somalia, the government is reviewing technical and vocational education and training (TVET) renewable energy programmes and curricula to enhance the number of qualified technicians required for decentralised energy systems, while intentionally opening these training opportunities to women. Several projects working with and around refugee camps have invested in creating skills and enabling environments for women to become solar technicians, generating alternative livelihoods for them and their families. For example, the Solar Age Project — awardee of the Gender Climate Solutions of the Women's and Gender Constituency under the UNFCCC —has supported 200 Syrian women refugees living in Turkey to become solar technicians, with 20 of them being further trained to build EFE (Energy for Everyone) solar batteries. These batteries have been designed to address the needs of refugees, integrating a flashlight for SOS signals and providing an autonomous source of energy for mobile phones. During its implementation, the programme provides childcare services as a strategy to enable women to participate in the training, and offers educational and language courses to the children.²⁸

In conflict-affected settings, GBV prevention and attention to survivors of [sexual] violence is a much-needed strategy. Projects which create safe spaces for survivors to share their experiences and receive support are more sustainable. For example, addressing GBV and women's rights was a deliberate strategy under the Women, Peace and Security project implemented in Mandelia. The project enabled access to renewable energy for both displaced and host-community women to support agroecological innovation and access. The project applied a holistic model to promote women's economic empowerment and strengthen peace. Large-scale community dialogues on gender-based violence and women's rights were rolled out as a tool for

²⁷ UNDP (2024). Gender Equality and Resilience in Ukraine's Energy Sector: Pathways to Transformative Employment and Leadership Amidst War. At: <https://www.undp.org/ukraine/publications/gender-equality-and-resilience-in-ukraines-energy-sector>

²⁸ WGC (2021). Solar Age Project: Empowering refugee women through solar engineering. At: <https://womengenderclimate.org/gjcs/solar-age-project-empowering-refugee-women-through-solar-engineering/>

supporting women's leadership, creating safe spaces for healing, reflection and collective action. These gatherings built solidarity among women from diverse backgrounds, fostering trust and unity among community members.²⁹

4.2 Access and affordability barriers

Access to affordable, reliable, and safe energy in FCAS is shaped by a combination of structural barriers that interact to disproportionately disadvantage women. These are not isolated constraints but mutually reinforcing failures that deepen gender inequality. Extreme poverty - often concentrated among female-headed households³⁰ - intersects with physical remoteness and weak or damaged infrastructure to significantly limit energy access. In many FCAS, women carry the responsibility for household energy management while having the least capacity to pay for services, travel to markets, or access information.

High transaction costs further shape energy access in FCAS. Insecurity, fragmented supply chains, challenging geographies, and weak transport and distribution networks increase the cost of delivering energy products and services. These costs are frequently passed on to end users, further widening **affordability gaps**. For women in particular, these costs are not only financial but also time-based: mobility constraints, safety concerns, and social norms can limit their ability to travel to markets, interact with service providers, or access repair and maintenance services. As a result, even where energy solutions are technically available, effective access remains constrained.³¹

The private sector, which could help expand access, is frequently reluctant to operate in insecure or low-margin environments. Unclear and lengthy licensing processes, weak institutional capacity, supply chain disruptions, uncertainty around grid extension, and last-mile distribution challenges raise project costs and operational risks, reduce profitability, and thus deter investments.³² As a result, fragile markets remain thin, underdeveloped, and poorly regulated. These conditions lead to chronic under-servicing of women, who are often the most remote and least profitable customer segment. The absence of gender-

²⁹ Global Women Peace and Security Initiative. Phase I Implementation Report (2024–2025). Chad, Mongolia and Ukraine. UNDP 2025. At: <https://www.undp.org/publications/global-women-peace-and-security-initiative>

³⁰ For example, in 2019 it was estimated that 18% of Syrian refugee households in Lebanon were female-headed. These were more likely to live in informal settlements than their male counterparts. UNHCR (2019) Vulnerability Assessment for Syrian Refugees in Lebanon. At: <https://data.unhcr.org/en/documents/details/73118>

³¹ For more on financing and de-risking tools in FCAS, read <https://www.theigc.org/publications/financing-and-de-risking-tools-and-approaches-solar-mini-grid-projects-fragile>

³² For more on the legal and regulatory challenges facing the private sector in FCAS, read <https://www.theigc.org/publications/legal-and-regulatory-framework-facilitating-enabling-environment-solar-mini-grids>

responsive product design, payment models, and consumer engagement further entrenches exclusion.

Barriers related to legal identity, financial inclusion, and rights awareness compound these challenges. In displaced or crisis-affected communities, many women lack documentation required to secure energy connections, register SIM cards for mobile payments, or access subsidies and consumer protections. Limited access to formal financial services, such as mobile money or savings groups, prevents women from purchasing energy products, paying connection fees, or joining affordability schemes. These constraints do not only hinder access; they undermine long-term sustainability by locking women out of the very systems intended to support resilience and recovery.

In practice, many households in FCAS rely on informal financial mechanisms to meet their energy needs. These include savings groups, rotating credit associations, and borrowing within social networks, which often serve as substitutes for formal banking systems. Remittances also play a critical role in financing energy access, particularly in conflict-affected contexts where diaspora flows are significant.³³ These funds are frequently used to purchase solar home systems, pay for fuel, or invest in small-scale productive energy assets. However, reliance on informal and external financing can be uneven and unpredictable, and may not be accessible to the most vulnerable groups, including women without strong social or financial networks.

What works to improve access and affordability

Addressing gendered energy barriers in FCAS requires integrated approaches that bring together gender and conflict analysis with tools to strengthen infrastructure, de-risking private sector participation, and expanding foundational enablers such as identification, financial inclusion, and rights awareness. It requires an understanding of how social and cultural norms affect women's access to finance (including mobility constraints, interaction with male non-family members, and ownership of assets such as land), and the instruments they may have access to finance their investments (e.g., digital banking solutions, remittances, etc). In tandem, projects would benefit from rolling out financial inclusion and rights awareness for communities, and women in particular, enabling them to connect to, pay for, and defend their access to energy services. If these interconnected barriers are not tackled simultaneously, women and marginalised groups will continue to be excluded from meaningful, safe, and affordable energy access.

³³ Assare, J. (2022). How diaspora investment can finance energy access in fragile settings. At: <https://www.theigc.org/blogs/escaping-fragility-trap/how-diaspora-investment-can-finance-energy-access-fragile-settings>

When the route is to engage with the private sector, it is important for the de-risking strategies to be designed with clear objectives for reaching out to women and to marginalised groups. For example, in Rwanda, Practical Action has embedded a subsidy scheme for refugees and host community members to acquire appliances – including fridges, milk-cooling machines, hairdressing equipment, etc. — as part of their productive uses of energy (PUE)³⁴ programme, which has strong gender-equality components [see **Box 6**]. Under this scheme, entrepreneurs contribute 30% of the appliance costs, while Practical Action subsidises the remaining 70%.

Meanwhile, the Energy for Development (EnDev) programme – a multi-donor partnership funded by Germany, the Netherlands, Switzerland, Norway, and the United Kingdom – has developed, through a self-learning process, a “leave no one behind” approach to its results-based finance (RBF) mechanism to ensure penetration into the hardest-to-reach segments of society. This objective is applied to RBF targeting customers³⁵ and/or companies, creating incentives for increasing the number of women customers, as well as increasing women’s participation in the energy value chain. EnDev has found that combining financial incentives with a gender equality technical assistance package proves to be an effective strategy to increase women’s employment, employee satisfaction, and employer recognition of the benefits of a more diverse and gender-inclusive workforce.³⁶

Blended finance mechanisms can also be designed to advance gender equality. This is the case of Acumen’s [Hardest to Reach \(H2R\) initiative](#), which focuses on expanding access to clean, reliable, and affordable energy in sub-Saharan Africa’s least electrified regions. Through their Catalyse and Amplify vehicles, H2R supports early-stage companies and nascent markets, and ready-to-scale companies respectively. Given H2R’s focus, its most direct leverage for gender equality is at the company level - not households or service delivery. By applying the [2X Criteria](#) to its portfolio, H2R seeks to achieve specific shares of female-founded or female-led companies in its vehicles: 30% for Catalyse and 50% for Amplify achieved at the end of these collaborations.

³⁴ Productive uses of energy (PUE) refer to the use of modern energy services to support income-generating and livelihood-enhancing activities, such as agro-processing, cold storage, services, or small-scale manufacturing.

³⁵ Defining the target customer group requires the identification of relevant socio-economic data, such as income levels, gender, refugee/IDP status, disability, etc.; which can be contrasted with reliable national public household classification systems or welfare recipients.

³⁶ GIZ (2024). RBF Projects that Leave No One Behind: A Practical Guide for Designing Inclusive Results-Based Financing (RBF) Projects. At: https://endev.info/wp-content/uploads/2024/10/241022_RBF_LNOB.pdf

Box 8: Spotlighting alternatives to enhance affordability³⁷

There are several options at hand to enhance affordability and reduce investment risks, to ensure energy access can be available to women and to marginalised groups. These can include partnering with micro-finance institutions to integrate gender lens and energy products into their investment portfolios using RBF as an incentive to target women as clients for energy services. The following cases spotlight efforts conducted in FCAS.

The **Yemen Emergency Electricity Access Project** works with local institutions to ensure women in rural and remote regions can equally participate in and benefit from energy solutions. Although the percentage of women borrowers for microfinance institutions (MFIs) was high in the country, this was not a trend that applied to rural areas. To address this disparity, as well as the general barriers women face in accessing finance, the following strategies were implemented:³⁸

1. Gender training to MFIs on benefits of banking for women and integrating a gender lens in their value proposition.
2. Tailored community outreach messaging for women about the benefits of solar products offered and engaging men through community leaders who reiterated the positive message about women's role in solar decision-making.
3. A higher financial subsidy for MFIs sales made to women customers, incentivising the supply side.
4. Circulating calls for proposals among women's organisations and cooperatives in rural and hard-to reach areas.

Meanwhile, in Uganda, **EnDev** requires companies to reach an equal share of refugee and host community participants, thereby **integrating “leave no one behind” considerations in the RBF design**. Contracts with participating companies include a clause stating that no more than 50% of products may be sold to host community households, ensuring that refugees benefit equally from the intervention. EnDev Uganda also offers **additional ‘top ups’ rewarding gender actions**. Participating companies, NGOs, or consortia qualify for an additional 10% bonus on top of the total overall incentive if:

- at least 60% of customers are women or women-led households
- at least 40% of the entity's employees in the direct management or distribution of the RBF are women, and
- if the entity dedicates resources and time to provide capacity building in gender and equality training sessions for staff.

³⁷ GIZ (2024). RBF Projects that Leave No One Behind: A Practical Guide for Designing Inclusive Results-Based Financing (RBF) Projects. At: https://endev.info/wpcontent/uploads/2024/10/241022_RBF_LNOB.pdf

³⁸ ESMAP (2020). Gender in Energy Interventions in Fragile and Conflict Situations in the Middle East and North Africa Region: Insights from Iraq, Lebanon, Republic of Yemen, and Gaza. At: <https://www.esmap.org/gender-in-energy-interventions-in-fragile-and-conflict-situ>

4.3 Implementation shortcomings and programme design

Energy initiatives in FCAS frequently fall short of achieving meaningful gender equality outcomes because they prioritise technical fixes over the enabling conditions required for sustainable and transformative change. Technology-only approaches—such as distributing solar kits, lanterns, or improved cookstoves—often appear effective in the short term but fail when deeper structural constraints and gender inequalities remain unaddressed. These gender-blind interventions result in low uptake, poor maintenance, and the rapid deterioration or abandonment of assets.

A common example is the installation of lighting in displacement camps or the distribution of solar devices without ensuring that women have the legal identity documents required for energy connections, financial inclusion tools needed to pay for services, or awareness of their rights and entitlements. In the absence of these foundational enablers, access remains temporary and unsustainable, and the burden of maintenance falls disproportionately on women who lack the resources and institutional support to keep systems functioning.

Moreover, providing access to electricity or energy-efficient devices does not automatically translate into women's economic empowerment or leadership opportunities. Many interventions overlook the interconnected factors that enable or hinder women to benefit from energy access—such as social norms restricting mobility, intra-household dynamics which limit their agency and autonomy to manage their profits, care burdens that limit time for economic activities, gaps in technical skills, and weak linkages to markets. When these elements are missing, women receive devices but not the conditions to use them to improve their livelihoods or increase their agency.

Design processes often reinforce these shortcomings. Development practice tends to emphasise consultation without shifting real decision-making power to communities, especially to women. Communities are frequently asked to validate pre-designed solutions rather than shape them from the outset, resulting in technologies and delivery models that fail to reflect actual needs or constraints. Women, in particular, are often consulted too late, excluded from technical, production, or leadership roles, and left with solutions that are ill-fitted to their daily realities. This pattern contributes to repeated cycles of interventions that are not fit for purpose. This is a missed opportunity, particularly as empirical evidence shows that women's engagement increases the efficiency and sustainability of energy interventions.

This pattern is evident in humanitarian settings, such as Cox's Bazar, Bangladesh, where international agencies and national partners have introduced e-cooking technologies for Rohingya refugees living in camps. While intended to reduce reliance on expensive LPG and biomass, early pilots

revealed that the appliances offered were unable to accommodate larger volumes of food to suit the family needs; either requiring larger or multiple e-cookers for cooking multiple meals at the same time (curry in one pot and rice in another). This technocratic approach meant that during the piloting phase of this e-cooking transition, families reverted to LPG or firewood in early morning hours, when battery storage was depleted and solar generation had not begun.³⁹ Although the pilot seems to have identified corrective measures, this initiative did not adequately take into account family needs or preferences; nor did it engage women as co-designers of solutions, before zooming into a set of technologies to be deployed.

Capacity-building efforts similarly miss the mark when they focus on generic business skills while overlooking the binding constraints that make entrepreneurship difficult or impossible for many women in FCAS such as lack of energy access, restrictions on finance, and entrenched gender norms. This creates a narrative of empowerment without the foundational conditions necessary for women to participate meaningfully in economic opportunities.

Institutional and operational limitations further hinder gender-responsive implementation. Male-dominated teams often struggle to communicate effectively with women and lack the gender awareness required to design and deliver inclusive energy services. Social and cultural norms may further impose restrictions on direct interactions with women, putting them at risk if men were to try to engage directly with them without male family members present. While workarounds, such as training trusted local women [and men] community leaders, can help bridge communication gaps, these solutions require intentional, gender-responsive redesign rather than ad-hoc adaptation.

What works to strengthen design and implementation

As mentioned in previous sections, energy projects in FCAS need to move beyond business-as-usual approaches: even when applying a gender analysis, this needs to be informed by or strengthened with conflict analysis. Therefore, including a gender specialist who can apply conflict analysis to the design and implementation of energy initiatives becomes an imperative. When possible, engaging a male gender specialist is recommended, particularly for engaging with men within the communities on norm changes. Further, the project team and partners need to undergo gender awareness training to ensure a unified approach and be better suited to overcome challenges.

In this regard, it is vital to co-design interventions with women from the early stages. In the case of FCAS, women's participation in particular can ensure that

³⁹ MECS (2025) Exploring eCooking Potential in the Rohingya Refugee Camps and host communities, Cox's Bazar, Bangladesh. At: <https://mecs.org.uk/blog/exploring-ecooking-potential-in-the-rohingya-refugee-camps-and-host-communities-coxs-bazar-bangladesh/>

interventions are designed to address their needs and safety – for example, ensuring that water pumping and connection sites are accessible and safe. This approach can also anticipate concerns the community may have about distribution capacity, implications, and power dynamics, which may trigger further conflict if not addressed during the project’s design and implementation. Gender-responsive conflict analysis methodologies have a key role to play here, and the engagement of women as mediators and community leaders can further contribute to peacebuilding efforts – again, a process which is more stable when women are engaged.⁴⁰

To build back better and enhance the resilience of communities in FCAS, it is important to build on and replicate good practices linked with women’s economic empowerment through PUE and entrepreneurship support. Typically, these initiatives are accompanied by entrepreneurship support, particularly for women, addressing: confidence-building and leadership, financial literacy, basic accounting, coaching and network building, and engagements with family and community members to address social norms and gender roles which may limit women’s participation in these initiatives.

Energy projects can implement other strategies, such as integrating local women into their fieldwork teams to facilitate interactions with local women beneficiaries, and engaging with local specialists to interact with communities directly to avoid influx of external or foreign specialists. These measures, however, need to be accompanied by a risk assessment to determine the necessary safety features that may be required to avoid putting the team, and women in particular, in harm’s way. For example, participation may require travelling some distance from the community to attend meetings or activities, which women may be reluctant to undertake due to safety concerns or family care obligations.

Similarly, projects need to design solutions that respond to mobility and safety concerns of women –such as creating women’s cooperatives or engaging women and men partners or relatives in the clean energy value chain. These measures would depend on the local context, making it imperative for the gender and conflict analysis to capture and reflect on these variables.

Noting the difficulty in access to location and the risk of disruption in monitoring visits by energy service providers, it is important to ensure users’ training methodologies reach women too, as a means to enhance the lifespan and efficient use of energy technologies.

⁴⁰ UNWomen (2025). Facts and figures: Women, peace, and security. At: <https://www.unwomen.org/en/articles/facts-and-figures/facts-and-figures-women-peace-and-security>

Box 9: HOA RISES - a regional programme in the Horn of Africa linking electricity access and gender equality ⁴¹

Health and education facilities in the borderlands of the Horn of Africa have limited access to electricity, significantly affecting the livelihoods of women, children, and other vulnerable groups. As part of its efforts to promote regional integration and cooperation, the World Bank supports the development of electricity access in the borderlands through its forthcoming HOA Regional Integration for Sustainable Energy Supply (HOA RISES) Project.

Gender inequality is high in the countries it covers: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. Women remain more vulnerable to risks owing to cultural norms and socio-economic status. Productivity gaps in agriculture and unemployment rates for women are among the highest in sub-Saharan Africa. A Gender Equality and Social Inclusion assessment was commissioned to support project preparation and prevent the exclusion of disadvantaged and vulnerable groups, such as women, persons with disabilities, internally displaced persons, and refugees, from energy access services, decision making, and project benefits.

The assessment identified recommendations to strengthen the project design and implementation, through provision of technical assistance for policy strengthening:

- the development of a national-level gender and energy policy and legal framework, to provide institutional backing for mainstreaming gender issues in the energy sector;
- engagement of men as agents of change to increase awareness of the importance of gender equality especially in community and national level service distribution;
- strengthening the capacity of national statistical offices to collect, monitor, and evaluate data related to gender equality and social inclusion in the borderlands; and
- enhancing GBV prevention and response programming in sectoral interventions.

The report further recommended the implementation of results-based financing and catalytic grants to incentivise service provision to women and other vulnerable groups in hard-to-reach communities in the borderlands, to stimulate gender-responsive supply interventions. It addressed demand-side constraints by recommending:

1. Provision of targeted financial support to women and other vulnerable groups (e.g., subsidies, access grants, vouchers, cash transfers and flexible payment models) to support purchase of energy products and services;
2. Support for income-generating activities to women and other vulnerable groups to enable them to build sustainable livelihoods;
3. Facilitation of sustainable market building and value chain development (e.g., livestock, agro-processing) for women and other vulnerable groups in the borderlands;
4. Support of consumer awareness and education programmes for men and women focusing on benefits of energy access and the energy services and products available.

⁴¹ Sources: Dave, R.; Ungari, B. and Indlicato, M. Understanding the Interaction between Gender, Energy, and Forced Displacement. Live Wire 2023/125 ESMAP. At: <https://openknowledge.worldbank.org/server/api/core/bitstreams/0518899e-e599-4087-8764-91c02fb63bf7/content>
AGET and ESMAP (2025) Inclusion and Energy Access in the Horn of Africa Borderlands. A vantage point. At: <https://www.esmap.org/Gender-Social-Inclusion-Energy-Access-HornofAfrica>

Finally, projects need to be intentional about creating spaces for women's participation and for addressing their requests. This means moving beyond seeking parity in participation but rather ensuring consultations are designed to allow for women's voices to be heard and for their concerns and solutions to be taken up during project design and/or implementation.

4.4 Data challenges: indicators and measurement

Collecting gender-responsive data for energy projects in FCAS is significantly constrained by both structural and methodological barriers. A core challenge is the absence of an internationally agreed framework for reporting gender indicators across the energy sector - including access, efficiency, and participation in renewable energy. Without standardised guidance, governments, donors, and implementing partners adopt inconsistent approaches, making it difficult to compare progress, aggregate results, or set meaningful benchmarks for gender equality.

Further, sex-disaggregated data - essential for understanding who benefits from energy services and how - remains largely absent in FCAS. Critical information on women's energy access, ownership of household energy assets, payment patterns, entrepreneurship, and the impacts of improved energy services (such as reduced care burdens, time savings, or health benefits) is rarely collected systematically. This invisibility hampers evidence-based policy design and limits the ability of energy interventions to respond to women's actual needs and constraints.

Programmes attempting to address these gaps often integrate specific indicators into their monitoring frameworks, especially around women's economic empowerment. However, several important gender outcomes - such as time poverty, health and safety impacts, and reduced exposure to gender-based violence (GBV) - are far less frequently monitored and harder to obtain. These gaps do not reflect a lack of importance but rather the complexity and resource intensity required to measure these outcomes reliably. Collecting GBV-related data is particularly sensitive, requiring strict ethical protocols and trained personnel, which are often unavailable in FCAS.⁴²

Data collection in FCAS is also constrained by limited access and security risks. External evaluators frequently cannot enter FCAS communities due to security restrictions, meaning traditional survey approaches are not always feasible. As a result, data must often be routed through local institutions, which may have limited capacity or uneven coverage. Innovative data methodologies — such as phone-based surveys, smart meters, or anonymised utility data — are

⁴² ESMAP (2020). *Gender in Energy Interventions in Fragile and Conflict Situations in the Middle East and North Africa Region: Insights from Iraq, Lebanon, Republic of Yemen, and Gaza*. At: <https://www.esmap.org/gender-in-energy-interventions-in-fragile-and-conflict-situ>

increasingly used to generate timely, granular insights where standard methods break down.⁴³ However, these approaches cannot fully replace in-person methods, especially for qualitative gender analysis. Further, these methods are highly dependent on internet access - service which may suffer interruptions particularly when disturbances or conflict arise.

Finally, national statistical systems in FCAS are often weakened by conflict and instability. National surveys may be outdated, interrupted, or geographically incomplete, while displacement and mobility rapidly render sampling frames obsolete, creating permanent data blind spots.⁴⁴ These limitations make it difficult to establish baselines, track long-term trends, or design gender-responsive national energy policies.

What works for data collection and impact measurement in FCAS

These constraints require intervention at the systemic and project levels.

At the systemic level, agreeing on a set of internationally accepted gender indicators for the energy sector would be an important incentive for governments and their institutions to review their statistical systems and harmonise data collection practices. This effort would also require alignment with international standards and good practices, in order to capture data that goes beyond counting the number of people with access to reliable, affordable, and sustainable energy. Table 1 in the Annex summarises the current proposal for international indicators put forward by the Gender and Energy Compact.

To be effective, these efforts would also require stronger inter-institutional coordination and support for National Statistical Bureaus to centralise and systematise data collection processes. Resources such as the IUCN and UNEP (2018) framework, which proposes 18 gender-environment indicators — including gender–energy indicators — can serve as useful tools for reporting progress towards the Sustainable Development Goals (SDGs).⁴⁵ In parallel, continued investment in statistical systems will be important. For example, access to technical assistance has supported the Somali National Bureau of Statistics in designing gender statistical strategies, in tandem with the development of SDG tracking platforms and the publication of environmental and energy data.

At the project level, it is necessary to ensure that monitoring and evaluation processes are designed to integrate gender-responsive indicators. This requires

⁴³ Ali, Abdilahi, Hélène Donnat Gonzalez Holguera, Miguel Fajardo-Steinhäuser, and Sanjana Srivastav. Innovative Data Solutions for Fragile and Conflict-Affected Settings. IGC Synthesis Paper, forthcoming.

⁴⁴ *Ibid.*

⁴⁵ IUCN and UNEP (2018) Gender and environment statistics: unlocking information for action and measuring the SDG. At: <https://iucn.org/resources/jointly-published/gender-and-environment-statistics-unlocking-information-action-and>

ensuring that the monitoring teams or agencies have sufficient in-house competencies and staff to conduct the data collection and analysis with a gender lens – e.g. engaging women to conduct interviews with female customers or people from different ethnic or migratory status to lead open discussion on sensitive issues, with appropriate support available where interviews may surface trauma. If the project chooses to rely on digital platforms for monitoring activities, it needs to ensure that the gender digital divide has been addressed, so that women are also able to participate in the monitoring efforts.

Box 10: EnDev Rwanda: Targeting via a vulnerability score and inclusivity-orientated verification process⁴⁶

Results-based Financing for Refugees (RBF4R) is a complementary project alongside the ongoing Renewable Energy for Refugees Phase II (RE4R II) project, funded by the Swedish International Development Cooperation Agency (SIDA). Both projects are implemented by Practical Action. The primary aim of the RBF4R project is to increase access to HTC stoves for vulnerable households living in refugee camps through a “leave no one behind” approach. The project applies a vulnerability score to determine beneficiary eligibility. This score is based on the UNHCR/WFP targeting framework for food assistance, and related data stored in the UNHCR ProGres database. It uses targeting criteria such as: households that are either female-headed, without education, or have a high number of dependents (children, older people, or people with disabilities). The project assumes that the more of the selection criteria a household meets, the more likely it is to be among the most vulnerable.

EnDev Rwanda considered the following points to increase LNOB sensitivity during the verification process:

- “Walk the talk!” Integrating inclusivity – where possible – in the verification process of the LNOB-RBF projects
- Aim to collaborate with people with disabilities and women as verification agents
- Assurance of safe spaces for verification interviews with “leave no one behind” target groups.

Some energy projects, particularly those supported by development partners, generate substantial data from baseline assessments through project implementation and closure. In such cases, local and international survey firms engaged in these projects may hold a wealth of datasets. When such data are available, and to the extent possible, governments can coordinate and partner with these companies to better align investment plans and priority areas. Strengthening mechanisms for data sharing and integration can also help align

⁴⁶ Source: GIZ (2024) https://endev.info/wpcontent/uploads/2024/10/241022_RBF_LNOB.pdf

national social inclusion policies with the activities of energy companies and projects operating within their territories.

Data collection tools need to incorporate questions that allow for the analysis of gender-relevant data such as “involvement of female/male household members in decision-making regarding product purchase or gender-related differences regarding access to finance, product usage patterns, and impacts. In refugee settings, it may include questions on potential conflicts with host communities, but also practical matters such as access to wood fuel in camp surroundings.”

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4.5 Institutional and policy readiness vs project-based approaches

Experiences across the gender–energy nexus in FCAS show that most interventions remain tied to short-term projects and pilots. Even when their duration varies, these projects operate within narrow timeframes that are fundamentally misaligned with the long-term, structural efforts required to shift social and cultural norms that underpin persistent gender inequalities. As a result, projects may achieve short-lived gains, but they rarely contribute to the deeper transformation needed for sustainable gender equality in and through energy systems.

Interviewees consistently emphasised that meaningful gender equality outcomes in FCAS require support extending well beyond the typical one-year pilot or three- to five-year project cycle. Transformative change - especially norm change - demands continuity, predictability, and the ability to adapt over time. A related challenge is the limited scope for institutional learning, as project evaluations are often conducted close to closure rather than a year or more later, when longer-term impacts and behavioural changes can be better assessed. For donors, this implies adopting new engagement models, such as flexible, decade-long support frameworks that can be iteratively adjusted during implementation. Such an approach would create the stability necessary for addressing entrenched gender inequalities and ensuring that progress is resilient in the face of ongoing fragility.

A central challenge is the tension between the urgency of rapid recovery and the slower, more complex social and gender implications of energy policies. While energy systems are often rebuilt quickly to restore basic services, insufficient attention is paid to whether communities – especially women and female-headed households – can sustain access over time. Without safeguards, shifts in market policies, tariffs, or payment models can cause

⁴⁷ GIZ (2024). RBF Projects that Leave No One Behind: A Practical Guide for Designing Inclusive Results-Based Financing (RBF) Projects. At: https://endev.info/wpcontent/uploads/2024/10/241022_RBF_LNOB.pdf

households to default, pushing them back into energy poverty just as stability returns.⁴⁸ This raises a broader policy question: should energy access be treated primarily as a commodity subject to market forces, or as an indispensable service that must be protected beyond crisis response?

An additional level of complexity can be found when dealing with displaced people outside camps, which is the vast majority: according to UNHCR [approximately 78 percent of refugees live in cities](#). Most of these individuals live in informal settlements or in rented accommodation, with varying levels of energy access. From an energy planning perspective, this means pinpointing refugees' access to energy outside refugee camps is difficult, as they blend with urban and peri-urban residents. Their influx impacts the demand on existing energy infrastructure, and requires the provision of affordable and safe access to energy; considerations which need to be taken up as part of national energy planning and policies. This situation requires policy makers and development stakeholders to widen their focus when implementing interventions which boost energy access and PUE particularly targeting women. It becomes necessary to consider the demands of the host country and its energy infrastructure as a whole, as pressure on already constrained energy systems needs to be addressed.⁴⁹

Energy policy decisions carry other gendered implications that are frequently overlooked when they lack gender analysis or participatory processes.⁵⁰ Privatisation of energy generation and distribution, for example, may improve efficiency but can also raise costs, disproportionately affecting female-headed households with lower incomes and influencing which communities are prioritised for service. Clean cooking is essential for reducing women's and girls' burden of unpaid care and exposure to health hazards, yet is often excluded from core infrastructure priorities in reconstruction, reinforcing existing gender inequalities. Likewise, workforce targets to promote women's participation in the energy sector are often sidelined, perpetuating occupational segregation and limiting women's economic opportunities.

⁴⁸ IISD et al (2016). Gender and Fossil Fuel Subsidy Reform: Current status of research. GSI Report. At: <https://www.iisd.org/system/files/publications/gender-fossil-fuel-subsidy-reform-current-status-research.pdf>

⁴⁹ Dave, R.; Ungari, B. and Indilicato, M. Understanding the Interaction between Gender, Energy, and Forced Displacement. Live Wire 2023/125 ESMAP. At: <https://openknowledge.worldbank.org/server/api/core/bitstreams/0518899e-e599-4087-8764-91c02fb63bf7/content>

⁵⁰ Musango, J.K and Chicombo, A.F.F. (2025) Facilitating gendered and socially inclusive energy transitions in sub-Saharan Africa. *Energy Research & Social Science* 127. 2025. At: <https://www.sciencedirect.com/science/article/abs/pii/S2214629625003597>

Box 11: SURE-P in Nigeria⁵¹

SURE-P's stated objectives included

- mitigating the immediate impact that the discontinuation of the petroleum subsidy would have on the population, particularly for the poor and vulnerable;
- accelerating economic transformation through investment in critical infrastructure projects; and
- laying a foundation for the successful development of a national safety net programme that is better targeted at the poor and most vulnerable on a continuous basis (Pate, 2011).

SURE-P included a strong focus on women, with a dedicated programme of intervention exclusively targeted at women, youth and vulnerable groups in rural areas. Intended as a short-term job creation measure, the Community Services Women and Youth Employment project was designed to provide opportunities for target groups to acquire skills for future employment. Efforts were made to account for women's needs through a range of measures, most notably a quota system. The government claims to have created 123,049 jobs through the scheme and to have 118,984 beneficiaries still participating, 64 per cent of whom are men and 36 per cent of whom are women (SURE-P, n.d.), although it is not clear how 'job' is defined nor the exact dates that these figures refer to.

In 2012, the Maternal and Child Health Initiative was introduced under SURE-P to reduce maternal and child mortality. In addition to upgrading health facilities and recruiting and training healthcare personnel, the initiative introduced conditional cash transfers for pregnant women who registered at a participating primary healthcare centre to receive health check-ups, and delivered and immunised their babies at the centres where they registered. Observed improvements include improved access to quality healthcare, leading to significant reductions in maternal mortality. For example, Williams (2014) reports that 'Monitoring data suggest that SURE-P MCH (Maternal and Child Health) has generated a 19 percent increase in uptake in antenatal care and a 9.5 percent increase in the utilization of SBAs (Skilled Birth Attendants) at the PHCs (Primary Healthcare Centers) in communities hosting them' (p. 27). In November 2015 it was announced that SURE-P operations would be wound down, with a probe into activities, funding and expenditure following allegations of corruption (Babalola, 2015). Ongoing governance problems in Nigeria were also cited as a reason for the failure of an earlier Petroleum Trust Fund.

These policy shortcomings are compounded by the limited participation of women in policy processes, a challenge that is even more pronounced in FCAS. Yet many societies in crisis have a strong ecosystem of international and local organisations working on gender equality, peacebuilding, and crisis response. This is particularly true for settings where sexual violence is flagrantly

⁵¹ Source: IISD et al (2016) at <https://www.iisd.org/system/files/publications/gender-fossil-fuel-subsidy-reform-current-status-research.pdf>

found and where donor agencies have clear and strong intentions to address this issue, investing in women's safety and empowerment. These organisations are often well positioned to engage power holders, including military actors or leaders of armed groups, as part of broader efforts to advance women's inclusion in peace processes.

This presents a significant opportunity: to intentionally bridge the peacebuilding and energy agendas in ways that empower women not only as project beneficiaries, but as policy actors and institutional partners. By strengthening institutions, engaging women's organisations, and embedding gender-responsive analysis within policy design, FCAS can move from fragmented project-based efforts toward coherent, long-term strategies that deliver sustainable gender equality outcomes in the energy sector.

Further, achieving gender-responsive energy access or service delivery in FCAS requires more than targeting women as beneficiaries. It demands gender-responsive institutions: those with the capacity, mandates, staffing, and accountability mechanisms to understand and address the different needs, risks, and priorities of women, men, girls, and boys. Without institutional capacity and commitment, even well-designed interventions fail to translate into meaningful change.

What works at the policy and institutional level

Policies should consider access to reliable, affordable and sustainable energy as a development priority and a rights issue, particularly in FCAS. In order to avoid enhancing inequalities and having disproportionate and unintended negative impacts on diverse social groups, particularly women, energy policies need to be informed by gender and conflict analysis. These analyses, and the policies they will inform, need to address access to electricity and clean cooking, the provision of services, such as health and education; they can intentionally address women's economic empowerment as part of economic recovery strategies linked to PUE. Furthermore, these policies can be designed to anticipate the negative impacts that changes in tariffs and/or subsidies may have on different segments of society when moving into stronger market-based approaches to the expansion of energy services.

Institutional systems and capacity need to be strengthened to address gender equality as part of policies and roll-out. Institutions can take advantage of existing gender equality tools— gender audits for the energy sector,⁵² gender equality certifications⁵³ or gender-responsive budgeting – to prepare

⁵² Clancy, J.S. and Mohlakoana, N. (2020). Gender audits: An approach to engendering energy policy in Nepal, Kenya and Senegal. *Energy Research and Social Science*. Vol. 62, 2020. At: <https://www.sciencedirect.com/science/article/pii/S2214629618310077>

⁵³ For example, UNDP has developed the Seal for Public Institutions, which can be utilised by Ministries of Energy to conduct an assessment of its policies and services and develop a plan for

governance structures to address gender equality.⁵⁴ These processes can be further enhanced through the construction of coalitions between energy institutions and gender stakeholders – including national gender machineries, gender specialists and actors engaged in Women Peace and Security, GBV prevention – to align objectives and priorities, while broadening support for implementation and increasing opportunities to sustain engagement even when conflict or disturbances arise.

Strengthening policies, institutions and coalitions develops a clearer path for investments and longer-term visioning. These elements are needed to move from fragmented, project-based approaches to longer-term, flexible support frameworks that can sustain norm-change, institutional reform and learning over time.

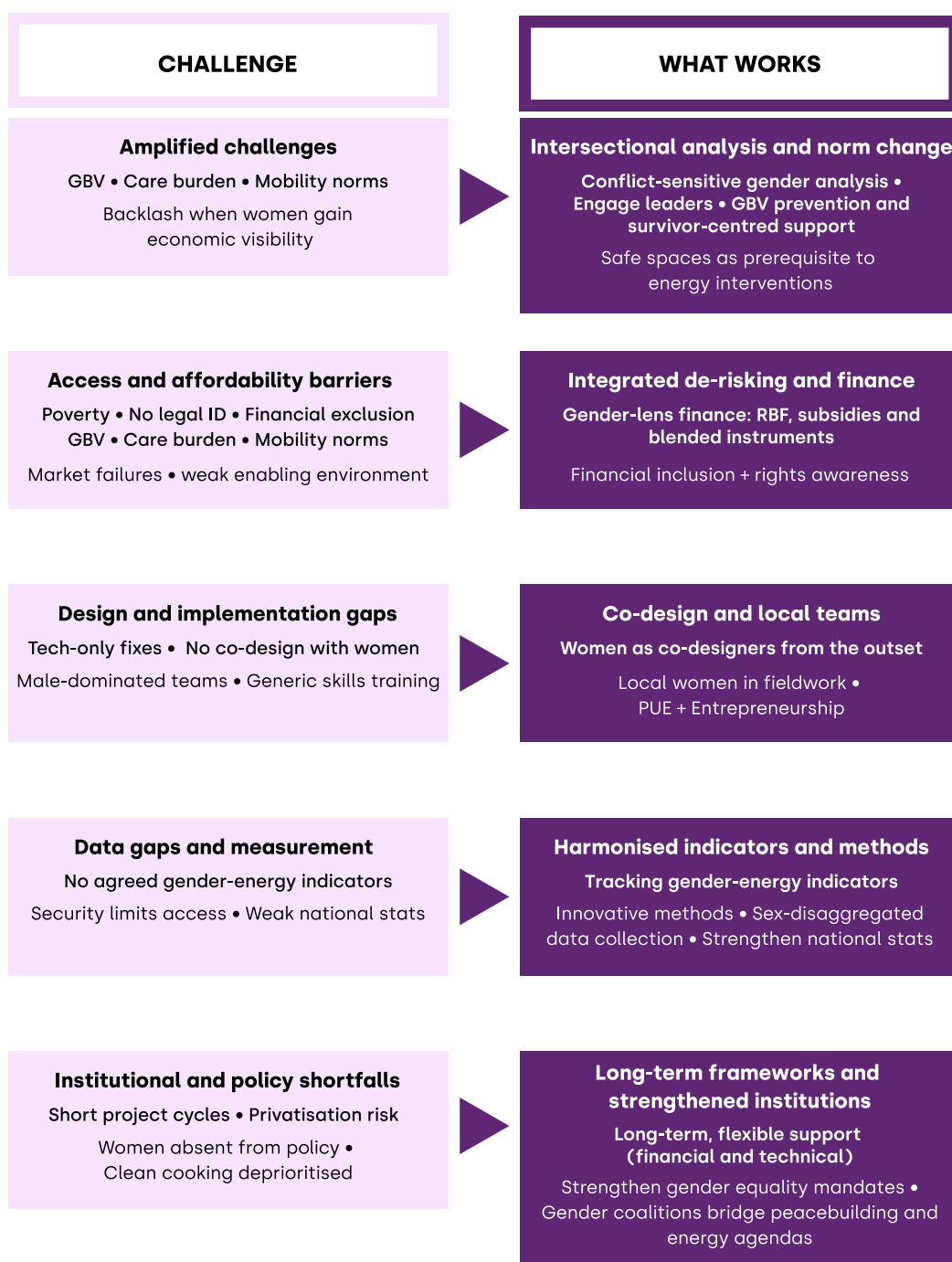
Box 12: Anchoring gender equality ambitions in institutional collaborations

In [Ethiopia](#), collaboration with government institutions and the Ministry of Water and Energy (MoWE) has led to the establishment of a Gender Energy Working Group and a review of the gender energy policy. [Policy dialogues](#) organised between 2024 and 2025 provided opportunities to discuss integrating gender strategies into energy transition policies, culminating with the establishment of a [Gender and Energy Technical Working Group \(GE-TWG\)](#). Hosted by MoWE, and co-chaired by UNDP and the [Ethiopian Women in Energy \(EWiEn\)](#), it brings together 25 entities, including governmental institutions, civil society organisations and development actors, to collaborate on advancing gender equality in the energy sector. This partnership focuses on policy development, promoting women as energy entrepreneurs, and strengthening women's leadership to accelerate clean energy access.

improvement. On-line information available at: <https://www.gendersealpublicinstitutions.org/> A similar process has been developed for private enterprises; with information available here <https://www.gendersealprivatesector.org/>

⁵⁴ UNDP (2024). Gender and Recovery Toolkit Advancing Gender Equality and Women's Empowerment in Crisis and Recovery Settings. At: <https://www.undp.org/sites/g/files/zskgke326/files/2025-09/undp-gender-and-recovery-toolkit.pdf>

Figure 6. Key challenges and opportunities



5. Pathways for impact: recommendations for working in FCAS

Addressing the energy–gender nexus in FCAS offers a strategic opportunity to reduce poverty, promote gender equality, and strengthen resilience. Realising this potential and achieving sustained impact requires addressing a series of structural constraints that cut across policy, programming, and research. These challenges are compounded in FCAS, where contexts are often fluid and evolving, making sustained action difficult.

When looking into actions in FCAS, a critical starting point is understanding the part of the spectrum or phase of fragility in which these activities are located. For example, countries or regions experiencing active conflict, where basic service provision and governance are severely disrupted, require different approaches to those in protracted crises, where institutional fragility limits reforms but energy services can still be delivered. Meanwhile, countries in transition or recovery phases may be better positioned to support more transformative gender-responsive policies, while countries in stabilisation processes may be better poised to incorporate gender equality commitments in their long-term energy planning and systems.

Recognising that gender-responsive energy intervention must be grounded in context-specific analysis - reflecting both the phase of fragility and underlying gender relations - implies the need to tailor approaches accordingly. Although there is not a single model which will work across all FCAS, there are a series of key elements which need to be taken into consideration when working in energy interventions in such contexts. A distilled list of which is outlined below.

5.1 Structural constraints and opportunities

Overcoming short-termism

Short-termism is a structural constraint in gender-responsive energy programming. Most interventions in FCAS are designed as 6 to 12-month pilots, while the underlying drivers of gender inequality – including social norms, power relations, institutional exclusion, and exposure to violence – require sustained engagement over multiple years. Evidence from this brief shows that meaningful impact, norm change, women’s leadership, and reductions in GBV risk often emerge only after 3 to 5 years, with continued reinforcement thereafter. This challenge is compounded in displacement settings, where crises are frequently protracted or multi-generational, rather than temporary.

Without long-term, flexible support, gains in access, safety, or economic participation are unlikely to be sustained.

Embedding gender-responsive conflict risk analysis

FCAS magnify the risk that well-intentioned energy interventions may trigger backlash, exacerbate tensions, or increase exposure to GBV. This creates a clear opportunity to move beyond “gender analysis” towards gender-responsive conflict and risk analysis as a core design tool. When used systematically, such analysis can guide choices around technology, delivery models, partnerships, and communications—ensuring interventions follow a “do no harm” approach while actively supporting social cohesion and women’s safety. Rather than slowing delivery, this approach improves sustainability and reduces the likelihood of project failure or harm.

Leveraging women’s economic roles as an entry point

Across the literature and consultations conducted, women’s economic empowerment consistently emerges as a pragmatic and politically feasible entry point for addressing the gender–energy nexus in FCAS. Framing energy interventions around income generation, service provision, and community benefit is often more acceptable than abstract gender equality narratives, particularly in conservative or conflict-affected contexts. Productive uses of energy, women-led enterprises, and service delivery roles allow gender equality objectives to be pursued in ways that align with household and community priorities. Over time, these economic gains can precede and enable broader shifts in voice, leadership, and decision making.

Building and resourcing local coalitions

Effective pathways for impact rarely sit within a single sector. There is a strong opportunity to strengthen coordination through local coalitions linking energy actors with women’s organisations, GBV and peacebuilding specialists, humanitarian agencies, and local authorities. These coalitions can help align energy investments with Women, Peace and Security commitments and strengthen women’s roles as decision makers, not only beneficiaries, while also engaging men as partners in advancing gender equality.

Addressing foundational enablers of access

Legal identity, financial inclusion, and awareness of rights and entitlements are foundational to meaningful energy access, particularly for women and displaced populations. Energy interventions that engage with these enablers, directly or through partnerships, are better positioned to achieve sustainable access, affordability, and productive use.

Strengthening data and learning loops

Gaps in sex-disaggregated data, GBV-related indicators, and long-term outcome tracking in FCAS limit the ability of energy interventions to adapt, manage risk, and deliver sustained impact. Strengthening adaptive data and learning loops – including iterative feedback, qualitative insights, and locally generated data – creates an opportunity to improve programme effectiveness, respond to shifting conflict dynamics, and ensure accountability to women's safety and empowerment outcomes.

5.2 Tailored recommendations by stakeholder group

Government and public institutions

- Integrate gender–energy–conflict analysis into national energy/electrification strategies. National energy strategies should explicitly address how energy access shapes gender equality during fragility and crisis and cover the impact energy policies — tariff increases or subsidies for particular technologies, for example — may have on women's livelihoods and economic empowerment.
- Strengthen inter-ministerial coordination mechanisms. Link energy, gender, humanitarian, and development ministries to ensure enhanced coordination, policy coherence, and resource alignment.
- Expand women's participation in energy governance: set targets and create safe entry points for women's leadership in energy institutions, regulatory bodies, and local decision-making structures.
- Treat energy access as both a development and a human rights enabling issue: safeguard access for women, displaced populations, and female-headed households during tariff reform, subsidy removal, or market liberalisation.
- Develop FCAS-specific energy access standards. current global standards (such as SDG 7 definitions) do not account for safety and gender dimensions in FCAS; making it necessary to develop context-specific benchmarks.

Donors and international programmes

- Adopt longer horizon, flexible funding models. Move beyond short pilot cycles toward multi-year (5+ year) adaptive programming that can support norm change, institutional learning, and sustained women's empowerment in protracted crises.

- Integrate GBV safeguards and prevention into energy programming. Require GBV risk assessments, survivor-centered referral pathways, and partnerships with Women's Peace and Security actors as standard components of energy interventions
- Enable conflict-sensitive, participatory data collection. Fund tools and capacity for communities and implementing partners to collect sex-disaggregated, conflict-sensitive data.
- Invest in women-led energy enterprises in FCAS. Allocate dedicated finance (not conventional project cycles) to women entrepreneurs, with patient capital and business development support, while avoiding visibility requirements that may expose them to security risks.
- Mainstream gender in humanitarian energy: require structured cross-sectoral collaboration across humanitarian, development, and gender actors to ensure energy interventions address protection risks, livelihoods, and longer-term recovery.

Implementing agencies and private-sector actors

- Co-design interventions with women from the outset. Apply gender-responsive conflict analysis to ensure interventions reflect women's needs, anticipate risks, and avoid exacerbating tensions.
- Pair access with enabling conditions for use and benefit. Integrate energy provision with skills training, financial literacy, market access, and norm-change engagement at household and community levels.
- Build gender capacity within delivery teams. Include gender specialists as core staff, recruit and train local women as field agents, and implement safeguarding and risk mitigation measures.
- Adopt gender-smart and "leave no one behind"-oriented business models: use targeted subsidies, RBF incentives, and service design features that explicitly reach women, refugees, and remote or low-income households.

Researchers

- Fill FCAS-specific evidence gaps: prioritise research that examines how fragility reshapes gender–energy dynamics, moving beyond access metrics to outcomes related to safety, agency, and time use.
- Develop integrated analytical frameworks: build operational tools that link gender, energy, and fragility, including guidance on sequencing interventions to avoid harm.

- Innovative data collection: combine digital tools with locally led qualitative methods, ensuring ethical safeguards when addressing sensitive issues such as GBV.

6. Conclusion

In FCAS, energy poverty and gender inequality are mutually reinforcing. Women and girls bear the greatest costs of inadequate energy access - through time poverty, health risks, exposure to violence, and limited economic opportunities - while remaining largely excluded from energy decision-making. As this paper has shown, addressing energy access in FCAS without a gender and fragility lens risks entrenching existing inequalities or generating unintended harm.

At the same time, energy interventions offer a powerful entry point for advancing women's safety, economic participation, and resilience when they are designed to be gender-responsive and conflict-sensitive. Productive uses of energy, women-led enterprises, clean cooking, and reliable electricity for essential services can deliver meaningful benefits - but only when paired with attention to social norms, GBV risks, foundational enablers of access, and long-term sustainability.

The paper highlights persistent gaps in evidence, coordination, and programming approaches. Short-term project cycles, fragmented delivery across sectors, and weak data systems continue to limit impact in FCAS, where fragility and displacement are often protracted. Moving from pilots to systems change will require longer-horizon funding, stronger cross-sectoral coordination, and adaptive learning approaches that reflect the realities of conflict and crisis. There is also scope for stronger cross-country learning through regional platforms – such as the EU or ECOWAS – which can provide spaces for sharing lessons on what works and what does not.

Ultimately, advancing the gender–energy nexus in FCAS is not only about expanding access to energy, but about shaping energy systems that are inclusive, safe, and responsive to women's needs and agency and bring benefits to all. When energy investments are aligned with gender equality and resilience objectives, they can contribute to more inclusive recovery and durable development in some of the world's most challenging contexts.

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Annex

Gender Indicators for a Just Energy Transition: a post-2030 proposal

The Gender and Energy Compact is advocating for the post-2030 commitments on energy to integrate concrete indicators that will allow for progress towards gender equality to be measured under SDG 7. Their proposal seeks to address gender gaps through four main themes: energy poverty, employment and leadership, entrepreneurship and enabling environments.

1 Energy poverty: improving women consumer's access to modern energy services that meets needs

- | | |
|-----|---|
| 1.1 | Electricity access by men and women and/or by female-headed and male-headed households |
| 1.2 | Clean cooking energy access by men and women and/or by female-headed and male-headed households |
| 1.3 | Time spent on fuel collection and cooking |
| 1.4 | Access to electrical appliances and end-uses that reduce unpaid care work |
| 1.5 | Access to educational facilities with adequate electricity/clean cooking, by male/female students and/or boy/girl schools |
| 1.6 | Mortality rate attributed to household and ambient air pollution, age-standardised, female (per 100,00 female population) (indicator SDG 3.9.1) |

2 Employment and leadership

- | | |
|-----|--|
| 2.1 | Proportion (%) of women employed in the energy value chain for (technical?) jobs, related to the energy sector |
| 2.2 | Proportion of women in managerial positions and proportion of women in senior and middle management positions in the energy sector |
| 2.3 | Proportion of women in senior political positions in relevant ministries, national energy agencies and entities |

3 Entrepreneurship

- | | |
|-----|--|
| 3.1 | Access to electricity connections, by male and female-owned businesses |
| 3.2 | Proportion of women energy entrepreneurs |
| 3.3 | Increased proportion in finance available for women-led businesses |

4	Enabling environment
4.1	Gender in national energy policies and frameworks
4.2	Tracking systems and budget allocations for gender equality

Source: [Gender and Energy Compact \(2025\)](#)