



ADDRESSING VULNERABLE GROUPS
IN THE ENERGY TRANSITION WITH
FOCUS ON WORKERS IN THE COAL
SECTOR AND WOMEN IN THE WB6

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* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

LIST OF ABBREVIATIONS

CEDAW - Convention on the Elimination of All Forms of Discrimination Against Women

CRC - Convention on the Rights of the Child

CRPD - Convention on the Rights of Persons with Disabilities

ECL - European Climate Law

EPCG - Electrical Power Company of Montenegro

EPS - Electric Power of Serbia

ESF+ - European Social Fund Plus

EU - European Union

HEAL - Health and Environment Alliance

IEA - International Energy Agency

ILO - International Labour Organization

JTM - Just Transition Mechanism

KEK - Kosovo* Energy Corporation

KESH - Power Corporation of Albania

MIE - Ministry of Infrastructure and Energy (Albania)

NECP - Economy-level Energy and Climate Plan

OSHEE - Electricity Distribution System Operator (Albania)

PPP - Public-Private Partnership

RCC - Regional Cooperation Council

RE - Renewable Energy

RES - Renewable Energy Sources

SDGs - Sustainable Development Goals

TPP - Thermal Power Plant

UNDP - United Nations Development Programme

UNFCCC - United Nations Framework Convention on Climate Change

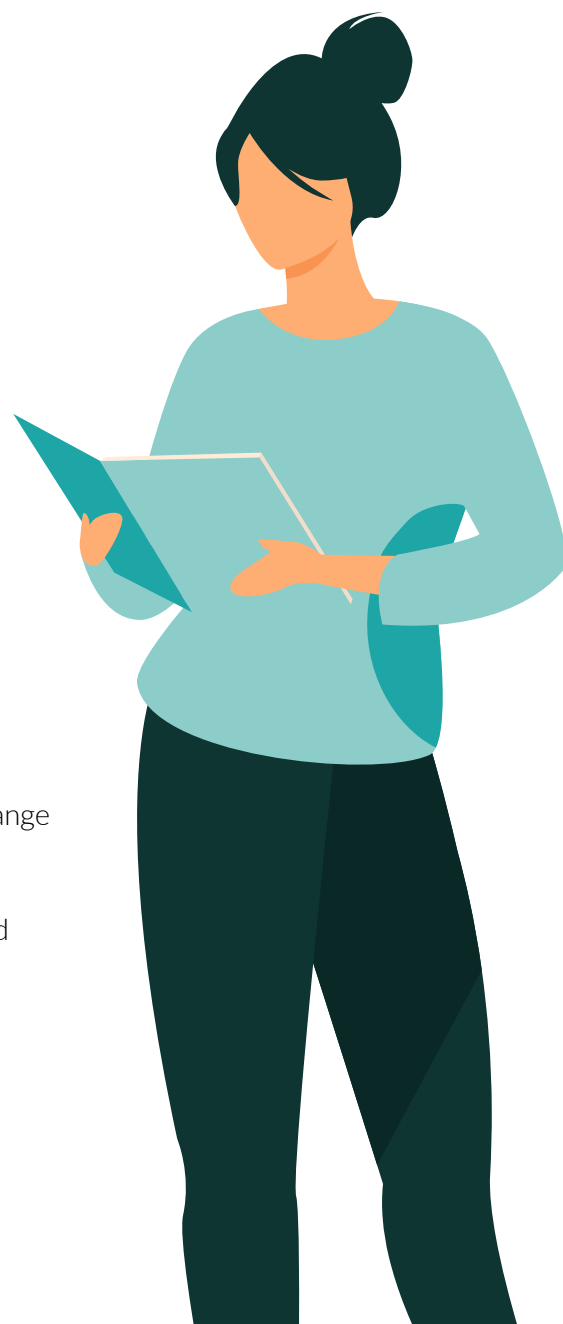
UNHCR - United Nations High Commissioner for Refugees

UNICEF - United Nations International Children's Emergency Fund

UNDRR - United Nations Office for Disaster Risk Reduction

WB6 - Western Balkans Six

WEM - With Existing Measures



PREFACE

The transition towards cleaner and more sustainable energy systems represents a necessary step for the Western Balkans Six (WB6) as the region aligns with European climate and energy policies and works towards long-term decarbonisation. However, beyond technological and regulatory changes, the energy transition also represents a profound social transformation, particularly for communities and population groups whose livelihoods and living conditions are closely linked to existing energy systems.

Evidence from the European Training Foundation points to persistent structural weaknesses in regional labour markets, including low participation in training (41% compared to the EU average of 62%), a notable skills mismatch (with 22% of workers overqualified), and limited uptake of digital and green skills. These trends create significant risks: workers in declining sectors may struggle to transition into emerging green jobs, while vulnerable groups risk being excluded from new economic opportunities.

At the same time, gender disparities remain pronounced. Women are significantly underrepresented in the energy sector, accounting for only around 27–30% of employees in electricity and gas supply across several WB6, with even lower representation in technical and leadership roles.

Against this backdrop, this Policy Brief underscores that the energy transition must be accompanied by targeted and inclusive policy measures. It highlights the need to protect vulnerable groups while enabling a just and inclusive labour market transformation. To this end, the Brief identifies three key policy priorities for governments and stakeholders across the WB6.

First, the transition requires **stronger legal and institutional frameworks to protect vulnerable groups and coal-dependent communities**. Integrating social protection measures, labour market policies and energy transition strategies will be essential to address energy poverty, support workforce transformation and ensure that communities affected by structural change are supported throughout the transition process.

Second, stronger efforts are needed to ensure **inclusive representation and participation in the energy sector**, particularly for women and other underrepresented groups. Increasing gender balance in energy institutions, regulatory bodies and renewable energy industries will not only promote fairness but also strengthen the sector's capacity to respond to the demands of the transition.

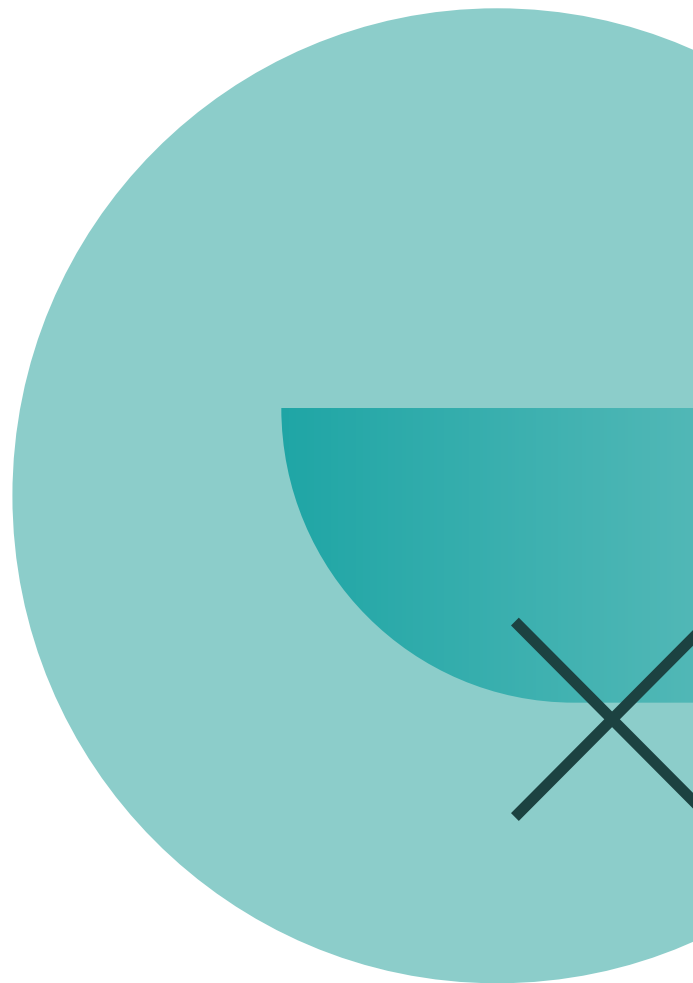


Third, **labour readiness must be placed at the centre of the transition.** Strengthening vocational education and training systems, expanding reskilling and upskilling programmes and aligning skills development with the needs of emerging green sectors will help workers and communities adapt to new economic realities.

This Policy Brief has been developed with the valuable support of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), for which the Regional Cooperation Council (RCC) expresses its appreciation. We will continue to advance regional dialogue on the implementation of the Green Agenda for the Western Balkans and its social implications.

Amer Kapetanovic

Secretary General
Regional Cooperation Council





1. INTRODUCTION

The Western Balkans Six (WB6), which are undergoing an energy transition and implementing European Union (EU) energy and climate regulations through the legally binding Energy Community Treaty, have been strategically planning to reduce fossil fuel use and increase the share of renewable energy (RE). However, their reliance on fossil fuels, combined with long-standing subsidised energy prices, presents challenges in preparing for a just energy transition towards a decarbonised, decentralised, and participatory energy system. **(1)**

The region's socio-economic structure is marked by a heavy reliance on coal and fossil fuels, which have traditionally provided employment, financial support, and social cohesion for many communities. Nevertheless, as the WB6 embrace the Green Agenda and work towards achieving carbon neutrality by 2050, the region is faced with the task of gradually eliminating these industries while being mindful of the potential impact on its current vulnerabilities.

In the WB6, several groups are particularly vulnerable. These include low-income households, the elderly, rural populations, the Roma community and workers in traditional energy sectors like coal mining. These groups already face a range of socio-economic challenges, including poverty, limited access to infrastructure and services and gender disparities. It is crucial to ensure that the energy transition is carried out in a manner that considers social inclusion and human rights to prevent further increase of existing inequities. This is essential for both environmental and economic sustainability.

In the context of energy transition, it is crucial for the WB6 to prioritise a social protection approach that is rooted in human rights. This involves giving utmost importance to safeguarding vulnerable and marginalised populations, by acknowledging and tackling the specific obstacles they encounter, and guaranteeing their access to crucial resources and opportunities. It is essential to address and overcome societal biases, especially those related to gender, that have long impeded the complete inclusion of women in the region's socio-economic progress.

The energy transition in the region is further complicated by its unique historical, political, cultural, and institutional contexts. The transition from a fossil-fuel-based economy to a RE-focused one necessitates more than just technological and regulatory adjustments. It also demands substantial endeavours in education, vocational training and social policy to safeguard against any disproportionate impact on vulnerable groups. This involves development of avenues for reskilling and upskilling, with a particular focus on the RE sector, to assist workers who have been displaced in transitioning to new positions. Additionally, it entails implementation of specific social protection measures to combat energy poverty and guarantees that all individuals can reap the advantages of this transition.

The regional project Green Agenda: Decarbonisation of the Electricity Sector in the Western Balkans is funded by the German Federal Ministry for Economic Cooperation and Development and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH over a period of 3 years between 11/2022 and 10/2025. The project generally aims to strengthen power sector key actors' confidence in the feasibility of energy transition based on renewable energies. The project aims to provide guidance to Technical and Vocational Education and Training (TVET) organisations regarding the opportunities, needs and content requirements of vocational education and training for a RE-based transition. The project is implemented within the framework of the Regional Climate Partnership between Germany and the Western Balkans.

2. VULNERABLE GROUPS IN THE WESTERN BALKANS SIX

Human rights, being inherent, inalienable, and universal, uphold human dignity. A human-rights-based approach to social protection necessitates that WB6 prioritise the protection of vulnerable and marginalised populations by addressing the unique challenges these groups face and ensuring their access to essential resources and opportunities. Vulnerability, influenced by factors such as age, gender, race, disability, socio-economic status, geographical location, or migration status, heightens the risk of harm from hazards. **(2)** During socio-economic changes like energy transition, these risks are intensified by historical, political, cultural, and institutional processes. Women, in particular, face violations of their human rights and dignity due to gender-based biases, which hinder their full integration into societal development. Addressing these specific human rights issues and overcoming deeply ingrained socio-cultural stereotypes are essential to achieving gender equality. **(3)**

In the context of energy transition, i.e. transition from fossil to the non-fossil-based and sustainable socio-economic system, it becomes paramount to safeguard the rights of the most vulnerable portions of the global society because they are already experiencing hardship and marginalisation due to various structural issues such as poverty, lack of access to basic infrastructure and health. In the case of WB6, which share a similar socio-economic and political past that accentuated heavy industry and extraction of natural resources to build up the society after the World War II, vulnerability becomes evident. The Western Balkans Six have been shaped by diverse political and cultural legacies, as well as guided by political ties between the East and West. In this context, certain features of their post-war industrial development reflected broader regional patterns, including an emphasis on self-sufficiency and the strategic role assigned to heavy industry. **(4)** The prevailing mentality was one of urbanisation, industry and raw material exhaustion, which brought employment opportunities and thus higher living standards.

In the WB6, vulnerable groups in the context of energy transition include low-income households, the elderly, rural populations, the Roma community, women and workers in traditional energy sectors like coal mining. These groups face heightened vulnerability due to their limited financial capacity to invest in energy-efficient technologies or renewable energy sources (RES), increased susceptibility to energy poverty, reduced mobility and access to information and services, and potential job losses and economic instability resulting from the shift away from fossil fuels. Socio-economic disparities and regional development imbalances worsen their vulnerability during the energy transition. The Balkan Barometer Public Opinion 2023 report shows growing empathy for vulnerable groups but highlights persistent prejudice, especially against the Roma community and refugees. **(5)** While there is strong public support for employment measures for people with disabilities, support for refugees and the Roma community remains low, emphasising the need for more effective affirmative actions to address social exclusion and ensure equitable treatment for all vulnerable populations.

The energy transition in WB6, characterised by a shift from traditional fossil fuels to RES, has significant implications for employment and job losses across the region, but to varying degrees. Montenegro faces high job loss rates, **(6)** and the transition could worsen these figures, particularly in sectors heavily reliant on fossil fuels, such as coal mining and traditional energy industries. Nevertheless, substantial job losses could be reported in the absence of strategic planning and supportive policies, deepening economic disparities and social exclusion. Effective measures, such as retraining programmes and investments in RES projects, are crucial to mitigate job losses and ensure a just transition that supports vulnerable workers and communities across the region in the energy sector. These differences highlight the varying degrees of labour market stability and economic resilience across the region.

ECONOMY	REGION
Bosnia and Herzegovina	Tuzla Canton, Central Bosnia Canton, Zenica-Doboj Canton, Ugljevik region, Gacko region
Kosovo*	Pristina region
Montenegro	Pljevlja region
North Macedonia	Bitola region, Kičevo region
Serbia	Kostolac region, Kolubara region, Obrenovac region, Pomoravlje region

Table 1. Coal regions in Western Balkans Six (7)

The WB6 have committed to achieving carbon neutrality by 2050, as stated in the Sofia Declaration. Fossil fuel combustion is a major source of emissions in the region. The European Commission's initiative Coal Regions in Transition in the Western Balkans Six and Ukraine launched in 2020 identified at least 17 regions with significant coal mining activities and coal-based energy production. **(8)** Apart from Albania, the region relies heavily on coal for electricity generation, with approximately 8.7 GW of installed thermal power plant (TPP) capacities. Coal contributes to around 40% of electricity generation in Montenegro and over 95% in Kosovo*. **(9)** In Bosnia and Herzegovina, it accounts for 60% of electricity generation, while in North Macedonia and Serbia, it reaches 37% and 70%. **(10) (11) (12)** More than 40,000 people are directly employed in coal power plants and mines in WB6, with an additional 60,000 jobs indirectly impacted. **(13)**

A distinction should be made between coal-dependent communities with a district heating system (marked with an * in Table 1) and those without such systems. In communities lacking district heating, residential heating is primarily provided through solid fuels (coal, fuel wood, waste) and light heating stoves [105], which significantly contribute to air pollution. The emissions of PM2.5 (soot, dust) from these stoves overlap with those from large combustion plants, exacerbating pollution. However, the impact is somewhat reduced in communities where district heating is available to a portion of households.

2.1 ALBANIA

Albania is quite a specific case out of all WB6. With energy production based predominantly on hydropower, with an installed capacity of 91% in 2023, and to a lesser extent on solar energy, the economy might be on a good path of implementing action plans for an equitable and clean energy transition. **(14)** However, there had been periods in the economy's history where significant mining activity was recorded to meet the needs of domestic market, i.e. growing industries of heating, steam production, electricity generation and metallurgy. **(15)** In the 1990s, a turning point era for the WB6, most of the mines in Albania were closed due to rapid political and socio-economic transformations, resulting in drastic decreases in production, investments, and income. The Electricity Distribution System Operator (OSHEE Group) and the public-owned generation company, KESH, play significant roles in maintaining and operating the distribution and generation systems.

2.1.1 Coal regions and vulnerable groups

According to the closure projects, coal reserves in Albania are about 100 million tons of usable reserves (mostly lignite) located in the following 3 main regions **(15)**:

1. Tirana area - about 86% of the reserves
2. Korça-Pogradec area - about 10% of the reserves



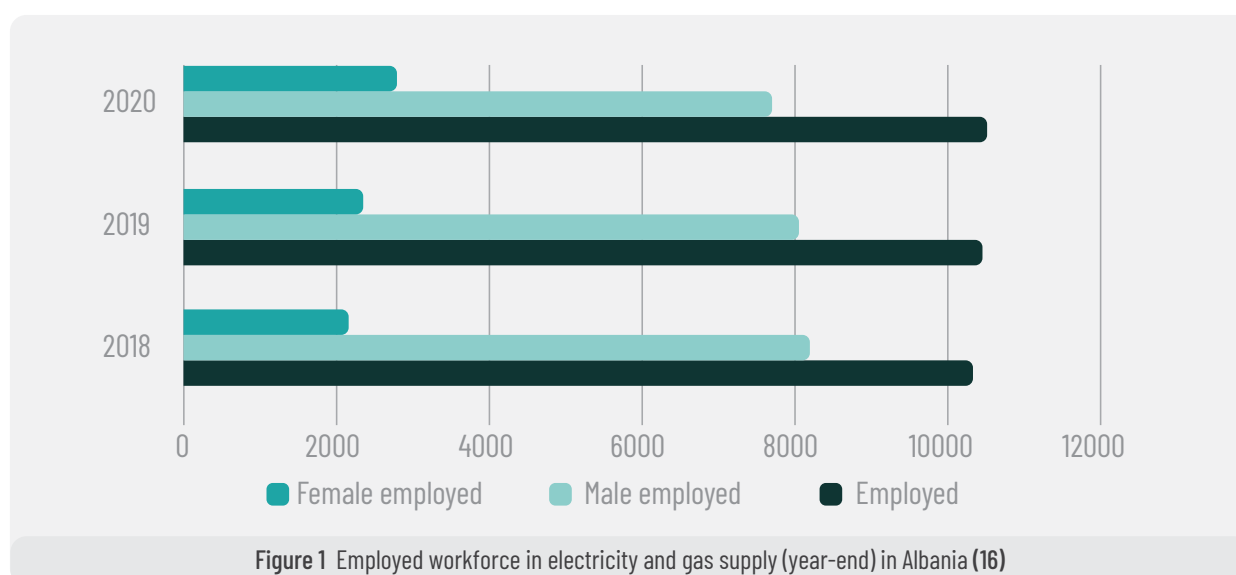
3. Memaliaj area - about 4.4% of the reserves. **(15)**

However, while hydropower remains a key strength of Albania's energy system, its predominance also presents certain vulnerabilities, particularly exposure to climate variability and droughts, which can reduce hydroelectric output, increase energy imports, and pose challenges for energy stability and security. These impacts, however, depend on site-specific factors and are typically assessed in detail through Environmental Impact Assessments of individual projects. The energy sector, while strategically important, represents a small share of overall employment, with about 10,000 people employed in this sector, predominantly men, accounting for 73% of the employees in the electricity and gas supply sectors as of 2020, with women making up only 27% of the workforce as of 2020, up from 21% in 2018. **(16)** There is a significant gender gap in employment and career progression within the energy industry wherein women face barriers including gender norms, insufficient skills, and unsupportive work environments, worsened by challenges in balancing work and family responsibilities, which interfere with their entry and advancement in the sector. According to the World Bank Gender Data from 2022 on vulnerable employment rates, i.e. the proportion of workers who are employed under insecure or precarious working conditions, the percentage among women is 49.3%, while men account for 50.2%, all of which is higher than in Europe and Central Asia. **(17)**

Vulnerability of households

In Albania, vulnerable groups face significant challenges with accessing electricity because of different social, economic and energy-related drivers. Low-income households are at risk of being disproportionately affected due to potential increases in energy prices and disruptions in energy supply, which could further burden their financial situation. Even though the phenomenon of energy poverty is not defined by any law, there are measures in place to protect vulnerable households. These include financial support to households consuming up to 200 kWh/month of electricity, protection to those consuming up to 300 kWh/month, with eligible households receiving a total of 1,288 ALL (as of 9 August, 12.84 EUR) per month if they qualify for both measures. **(7)** Additionally, the third measure supports the installation of solar thermal collectors for low-income households. Cumulatively, they aim to alleviate financial burdens and ensure access to energy for vulnerable groups.

Workers in traditional energy sectors remain largely male-dominated facing job insecurity as the transition may lead to job losses or require retraining, which might not be accessible to everyone. Reskilling is important because it provides workers in industries facing decline with the necessary training and qualifications to transition into growing sectors like renewable energy. While women constitute a significant portion of the workforce in Albania's public energy authorities, notably 63% of employees and 74% of temporary workers in the Ministry of Infrastructure and Energy (MIE), and 68% of employees in the Energy Regulatory Entity (ERE), they are still underrepresented in top-level and technical roles, with male candidates often preferred for new positions if women are already overrepresented in a job category. **(16)**



According to Expertise France’s report on gender in the energy sector in Albania, a barrier that women face entering and advancing in the energy sector is primarily societal and related to cultural norms that influence hiring practices and often lead women to self-select into roles traditionally seen as suitable for their gender. **(16)** This phenomenon can also be observed in the rest of the WB6, especially the ones sharing a similar socio-economic context. Unfortunately, for this reason, there is a significant gap in the necessary skills and awareness required for energy sector roles. Once in the workforce, women encounter an inherent ‘glass ceiling’, wherein the established gender norms and biases obstruct their path to higher positions. Balancing work and family responsibilities is a prevalent challenge, which affects women’s career advancement opportunities.

2.2 BOSNIA AND HERZEGOVINA

Energy is a key economic sector in Bosnia and Herzegovina with the potential to drive growth. The economy possesses abundant hydropower resources and coal reserves. Bosnia and Herzegovina is the major electricity exporter in the region producing more energy than its economy can absorb. According to the International Energy Agency (latest data), Bosnia and Herzegovina’s primary energy supply is composed of approximately 48% coal, 23% oil, 2.5% natural gas, and the remaining share is made up of modern renewables (hydro, wind, solar, biogas, etc.). **(18)** Bosnia and Herzegovina is currently self-sufficient in electricity and serves as a net exporter, exporting over 50% of the total production (in 2023 alone, 53% of its electricity was exported). **(19)** However, the economy is stagnating, with only a modest projected increase in energy demand. **(20)** Transitioning to RES raises concerns about higher costs for households and potential economic disruptions for industries reliant on traditional energy sources. Particularly for households, this could further exacerbate the overall state of energy poverty. To address this, a unified and systematic methodology, along with a comprehensive plan with indicators and measures, may be required to effectively assess and combat energy poverty.

2.2.1 Coal regions and vulnerable groups

In Bosnia and Herzegovina, coal mining is concentrated in two main regions: the northeast around Tuzla in the Federation of Bosnia and Herzegovina, and the Gacko and Ugljevik areas in Republika Srpska. The Kreka-Banovići coal basin near Tuzla is home to significant deposits. Public-owned Elektroprivreda Bosne i Hercegovine (EP Bosne i Hercegovine) is the owner of several mines that supply coal to the Tuzla and Kakanj power plants. Brown coal mine Banovići also contributes substantially

through its open-cast mines at Banovići. In Republika Srpska, Elektroprivreda Republike Srpske (EP Republike Srpske) owns the coal mines in the Gacko and Ugljevik areas, where the mines and thermal power plants operate as a single company. These regions are vital to Bosnia and Herzegovina's energy sector, as they provide most of the economy's electricity from lignite.

Tuzla Canton is home to more than 400,000 people, with a significant portion living near major mining areas **(21)**, and the coal mining areas of Ugljevik and Gacko combined host about 25,400 residents. **(22)** Zenica, with a population of around 110,000 as of the 2013 census, also contributes significantly to coal production through brown coal Zenica mines. Combined, these regions house roughly 600,000 people who are impacted by the economic, environmental, and social effects of coal mining, although precise figures for those directly affected would require more detailed data. The RCC report highlights that the transition to RES presents significant challenges for vulnerable groups, including people with disabilities, displaced persons, refugees, and the Roma community, who are at risk of job losses and economic hardship, emphasising the need for targeted government intervention to ensure their social inclusion and support. **(5)**

The energy transition significantly impacts vulnerable groups, particularly women and coal workers in Bosnia and Herzegovina through phenomena such as energy poverty, job losses and unequal representation and burden carrying. According to the European Commission's recommendation, **(23)** energy poverty is defined as the inability of households to access essential energy services, which in the EU is marked by spending more than 8-16% of income on electricity. In Bosnia and Herzegovina, women are especially at risk of energy poverty due to high unemployment rates and their low representation in the energy sector. This situation perpetuates their economic dependency, particularly in coal-dependent regions where many women are housewives. The lack of gender-specific indicators for energy poverty further complicates efforts to identify and address these issues effectively. Lastly, the high proportion of housewives in coal-dependent regions¹ further exacerbates their economic dependency and risk of energy poverty.

In 2021, the Regional Education and Information Centre (REIC) conducted research on the role of women in the energy sector. **(24)** The research reveals that women constitute 32% of full-time employees in Bosnia and Herzegovina's industry and construction (including the energy sector), outperforming the global average of 22% in the oil and gas industry. The report indicates that the rough ratio of women and men in the energy sector is 30:70. Despite this, some challenges persist and include limited access to employment information, continuous gender stereotypes, and imbalances in STEM (Science, Technology, Engineering, and Mathematics) fields. An interesting finding indicated possibilities for a higher engagement of women in the energy sector because more women than men complete secondary education (9.6% more) and there are non-STEM career opportunities in RES available that need to be explored. REIC has also gone further to investigate the employment structure in the most important institutions for the energy sector (power utilities, regulatory agencies and transmission company). The results show that men dominate leadership roles, making up 100% of supervisory boards in 3 out of 5 companies and comprising over 80% of management positions, while women hold only a few key roles, primarily in administration or audit committees. In total, in 2021, there were 7 women in leadership and supervisory roles out of 51 positions across the energy sector entities in Bosnia and Herzegovina.

According to data from the Agency for Statistics of Bosnia and Herzegovina, in 2022 the economy had 13 ministries overseeing environment, energy, and agriculture, but only 2 were headed by women. **(25)**

¹ 17.99% Ugljevik, 9.08% Gacko, Tuzla 11.45% Živinice 23.37%, Zenica, 16.43% Breza, 21.48% Kakanj, 22.91%, Census 2013.

The data continues to show that out of 31 sectors in these ministries, only 4 were led by women. There were 7 committees related to environment, transport, and energy, none of which had female chairs, and only 14% of their members were women. In the public energy sector, no women were directors, and only 2 out of 24 supervisory board members were women. Employment data showed that 26% of all employees worked in areas related to the environment and climate change, but only 18% of employed women were in these fields compared to 30% of men. Consequently, the data presented reveals a significant gender disparity in leadership and employment within the environment and energy sectors, with women underrepresented in key positions and roles compared to men.

When it comes to workers in the coal sector specifically, it is difficult to disaggregate or estimate data because Bosnia and Herzegovina's Entities - Federation of Bosnia and Herzegovina and Republika Srpska - maintain different operational structures. The Agency for Statistics of Bosnia and Herzegovina conveys that 15,875 people were employed in mining and quarrying in 2023. **(26)** If we assume that every second miner has a family to take care of, the indirect influence of coal mining closure and job losses will impact double or even triple the number of people given above. This might lead to economic displacement, instability and increased poverty. Many of these workers have lower levels of formal education, which complicates their ability to transition into new roles. To address this, there is a need for upskilling and reskilling programmes that equip workers with relevant skills for the RES sector and other emerging industries. Currently, while some institutions offer reskilling opportunities for roles such as solar panel installers, these are typically provided through informal courses or short-term training programmes rather than as part of formal educational curricula, including vocational training and higher education curricula. This fragmented approach limits broader access and integration into the workforce.

2.3 KOSOVO*

With the second largest lignite reserves in Europe, Kosovo*'s energy sector heavily relies on coal, which accounted for 84.4% of domestic energy production in 2023 according to IEA data. **(27)** The economy's electricity generation is almost entirely dependent on two ageing lignite plants, Kosovo* A and Kosovo* B, which contribute significantly to air pollution. **(28)** As is the case with many WB6, the energy system of Kosovo* is outdated and inadequate, which greatly impedes investment, contributes to health problems and disrupts the provision of essential services. The new energy strategy for 2022-2031 aims to phase out coal by 2050, upgrade at least three coal plants, and increase the RES share to 35% by 2031. **(29)** This strategy includes provisions for social protection, targeting vulnerable groups with subsidies for home insulation, solar panel installation, and efficient appliances. **(30)** Kosovo*'s commitment to addressing energy poverty includes reaching approximately 200,000 energy-poor households by the end of 2023, though the effectiveness of this support package has yet to be assessed. **(7)**

2.3.1 Coal regions and vulnerable groups

There are two major lignite basins: Kosovo* basin which stores around 12 billion tons of lignite and Dukagjini lignite basin, with some smaller lignite basins and one potential basin in the southern part of Kosovo*. **(31)** The Kosovo* basin covers areas around Pristina, Obiliq, Vushtrri and Mitrovica, whereas the Dukagjini basin encompasses cities such as Peja, Gjakova, and Istog. For this research, the Kosovo*, Mitrovica and Peja region will be consulted.

Kosovo*, with a population exceeding 1.5 million, faces significant socio-economic challenges, including a 10.6% unemployment rate and a 59.1% share of economically inactive individuals. **(32)** Nearly one-third of the population lives below the poverty line, and about 10% experience extreme

poverty. **(33)** Low-income households, particularly those in rural areas reliant on coal industries, women, and workers are highly susceptible to the adverse effects of energy transition. Research suggests that coal is still perceived as a valuable resource in Kosovo*, and scepticism towards RES and a lack of active engagement or support from coal workers complicate the assessment of vulnerability during the transition.

Despite Kosovo*'s leading position in supporting vulnerable groups through the energy transition, including a legal framework promoting gender equality, the effectiveness of these policies remains uncertain. Women in Kosovo* face increased economic vulnerability due to existing disparities, higher poverty rates, and underrepresentation in the energy sector. The gender pay gap is approximately 13%, with women earning around 74 cents for every euro earned by men, a disparity that is even more pronounced in male-dominated sectors like mining. **(34)** 2021 survey of Kosovo*'s Agency for Statistics indicated that just 9.7% of the nearly 9,000 workers in the electricity, gas, steam and air conditioning supply sector were women, and only 0.1 of women own businesses in the mentioned sectors. **(35)** For example, only 10% of senior positions in KEK (Kosovo* Energy Corporation) are held by women. These economic disadvantages limit women's ability to benefit from new opportunities in energy transition and invest in energy-efficient technologies. When it comes to the employment of women in Kosovo* power utility companies and bodies, the structure is as follows **(36)**:

COMPANY / BODY	EMPLOYEES BY GENDER	PERCENTAGE BY GENDER
ERO (Energy Regulatory Office)	M 20 F 8	approx. M 71.4% F 28.6%
KOSTT (Electricity Transmission, System and Market Operator of Kosovo*)	M 287 F 61	approx. M 82.5% F 17.5%
KEK (Kosovo* Energy Corporation)	M 3373 F 205	approx. M 94.27% F 5.73%
KEDS (Electricity Distribution Services in Kosovo* J.S.C)	M 1673 F 185 F in leading positions: 27	approx. M 90.1% F 9.9%
KESCO (Kosovo* Electricity Supply Company)	M 107 F 114 F in leading positions: 20	approx. M 48.4% F 51.6%

The data presented above is from 2022, and shows that men are predominantly represented in all major roles in the energy sector organisations in Kosovo*, with percentages ranging from approximately 71.4% to 94.27%, while women hold a smaller proportion of positions, except for KESCO, where gender representation is more balanced. Another group of women, namely women in rural areas or mining communities who are household carers, are at an even higher risk of experiencing the above-mentioned vulnerabilities. They are more likely to face energy poverty and bear the brunt of household energy-related responsibilities, which can be worsened during transitions. Cultural norms and gender biases also limit their access to education and training in energy fields, reducing their ability to participate in and benefit from new technologies and policies.

The coal sector in Kosovo* employs many workers, primarily through the Kosovo* Energy Corporation (KEK), which operates the Kosovo* A and Kosovo* B power plants. There are around 4,700 workers employed in the coal sector in Kosovo* whose needs need to be addressed within the transition process. **(37)** Despite health and safety risks that these workers face at the workplace, job displacement and losses emerge as potential challenges once Kosovo* starts modernising its energy infrastructure and reducing emissions, transitioning to renewable energy. In regions where the local



economy heavily relies on coal or other fossil fuels, the transition could lead to job losses and economic challenges. Supporting these communities by upskilling and reskilling opportunities and equipping them to carry on the transition to non-fossil sources is crucial to mitigate adverse impacts. In 2018, Kosovo* introduced a practice of donating coal to its workers. **(38)** The aim is to help them heat their homes during the winter months and the more frequent power cuts, a measure the government introduced to avoid spending huge amounts of money on imports. In addition, direct financial support for electricity costs is provided to two categories of vulnerable electricity consumers, namely recipients of the Social Assistance Scheme and recipients of war-related benefits. **(7)** However, these measures fall short of addressing the root causes of energy poverty and therefore do not contribute to its long-term alleviation.

The Stakeholder Workshop for the Energy Skills for the Future (ESF) Activity, part of the JETA project under the MCC-Kosovo* Compact, focused on refining the Design Report to address Kosovo*'s evolving energy sector needs by developing a skilled workforce and ensuring a more inclusive and equitable energy transition. **(39)** In addition, Kosovo*'s Energy Strategy for 2022-2031, cited as the first gender-responsive energy strategy, targets increasing the number of women in the energy sector employment structure to 11% by 2024 and at least 25% by 2031. **(35)**

2.4 MONTENEGRO

Montenegro's energy sector, serving 396,000 customers with a demand of around 3,000 GWh, is primarily driven by the public-owned Electrical Power Company of Montenegro (EPCG), which operates major coal, hydro, wind, and solar plants. **(40)** In 2022, 55% of the economy's electricity came from renewables, predominantly hydropower. **(41)** Nevertheless, challenges emerged such as public resistance to small hydropower plants, which are currently under a moratorium as per the Montenegrin Parliament's decision. These plants contributed only 3% of electricity in 2020, and there is also the issue of operation continuation of Pljevlja coal plant. Montenegro's 2030 Climate Strategy aims to enhance energy efficiency (EE), increase renewable energy, and reduce greenhouse gas emissions. **(42)** The Energy Development Strategy of Montenegro until 2030 aims to ensure a secure, competitive, and sustainable energy supply by diversifying energy sources, promoting market liberalisation, and enhancing EE while adhering to environmental protection principles. **(43)** The strategy does not explicitly mention the protection of vulnerable groups, but through the emphasis on socio-economic development and quality energy services, it indirectly supports the well-being of all consumers, including vulnerable groups.

2.4.1 Coal regions and vulnerable groups

The northernmost part of Montenegro, the Pljevlja region that hosts the Pljevlja lignite power plant, has around 24,500 inhabitants per the preliminary results of the 2023 census. **(44)** As of April 2024, the number of employees at Pljevlja coal mine and the coal-fired thermal power plant is approximately 1,400. **(45)** This figure represents a significant increase from previous years, as the workforce has doubled since 2020. This trend highlights a substantial rise in employment, attributed largely to political hiring practices and a corresponding increase in the payroll budget; nevertheless, it is not clear whether the employees are from the region or outside. **(45)** There is significant public support in Montenegro for measures to ensure social inclusion of vulnerable groups during the energy transition. Vulnerable groups are protected through a combination of targeted financial assistance, EE programmes, social tariffs, and educational services. **(46)** Specifically, low-income households and pensioners receive financial support to help with rising energy costs, while EE programmes offer funding for home upgrades and efficient appliances. Social tariffs reduce energy costs for these groups, and educational initiatives provide guidance on reducing energy consumption. When it comes to

vulnerable customers, there are two measures offered since 2019 to socially vulnerable households in the form of direct financial support for electricity expenses and prohibiting the halting of electricity supplies. **(7)** Additionally, the Energy Law prohibits suspending electricity supplies to vulnerable consumers who require health and social care. **(47)**

Women in the labour force, excluding the population under 15 years of age, have a significantly lower participation rate (40.3%) compared to men (53.7%), with notable employment gender gaps across different age groups and sectors. **(48)** Younger women face a smaller employment gap, but unemployment rates are higher for women overall, especially among the youth (15-29 age group). Despite generally having better educational qualifications, and in the absence of wage statistics structured by gender, there is an estimation that women earn approximately 86.1% of what men earn, reflecting a pronounced gender pay gap. **(48)** Additionally, a substantial portion of women work part-time, lacking the economic security of full-time positions, and are more likely to be involved in unpaid labour such as caregiving. There is clearly a need to close the gender pay gap, increase labour force participation among women, and provide greater support for balancing work and family responsibilities.

When it comes to women in energy sector specifically, the data from the 2021 Gender Equality Profile of Montenegro shows that women's representation in the energy sector varies widely across different entities. In the Ministry of Capital Investments' Directorate for Energy and Energy Efficiency, 47.82% of employees are women, though none hold managerial roles. **(49)** The same report suggests that the Energy and Water Regulatory Authority has 58.9% women employees, including a female CEO and deputy, but no women on the decision-making board. Women's representation in other energy entities, like the Montenegrin Electric Transmission System and Montenegrin Electricity Distribution System, ranges from 14.3% to 47.3%, with varying percentages in senior and middle management roles. **(49)** In the Electrical Power Company J.S.C. Nikšić (EPCG), women make up 31.1% of employees. There are 15% of women on the Board of Directors, and 22.3% of senior managerial positions belong to them. Across the sector, women are present but underrepresented in leadership positions. In Pljevlja, women make up half of the population but represent only 15.7% of employees at the coal mine and thermal power plant, highlighting limited opportunities in the male-dominated, coal-based local economy. The female employment rate in Pljevlja is just under 39.7%, below the economy-level average of 46%, and 60% of the unemployed in the municipality are women, with most concentrated in lower-paying trade and service sectors.

The energy transition in Montenegro presents significant challenges for workers in the traditional coal sector. With the transition underway, job security is unstable due to the economic instability and frequent financial difficulties faced by the coal sector, coupled with high health and safety risks. Many coal workers, earning modest salaries (an average of 662 euros whereas the Montenegro average is 1,196 euros per month), **(50)** lack the skills required for new roles in the RES sector, fearing unemployment and potential poverty. There is also scepticism among these workers about the adequacy of retraining programmes and whether new renewable energy projects can offer comparable economic benefits and job security as the coal industry. Nevertheless, there are attempts to move forward.

2.5 NORTH MACEDONIA

With its predominantly fossil fuel and hydropower-based energy mix, North Macedonia is notable in South East Europe (SEE) for its proactive approach to renewable energy. Until 2030, the economy aims to do the following: completely phase out coal, reduce CO2 emission to 82% and have 1.7GWh (cca

38%) share of renewables in final energy consumption. **(51)** The Energy and Climate Plan of North Macedonia (2020), Strategy for Energy Development until 2040 (2020), Law on Energy Efficiency, and Law on Energy collectively aim to establish a sustainable, secure, and efficient energy sector through the integration of RES, long-term strategic planning, enhanced EE, and comprehensive regulation.² Its Sustainable Development Strategy titled: Climate Change and Clean Energy adequately covers SDG 13 in the areas of mitigation, vulnerability assessments, awareness and dissemination. **(52)**

2.5.1 Coal regions and vulnerable groups

The coal regions of Bitola and Kičevo in North Macedonia are significant for their lignite coal production, which plays a crucial role in the economy's energy supply. However, these regions are also focal points for environmental and socio-economic challenges due to the impacts of coal mining and burning, prompting efforts towards energy transition and sustainable development.

While North Macedonia's strategic documents highlight a shift towards a sustainable and efficient energy sector, they fall short of detailing specific measures for protecting vulnerable groups. A truly just transition to a low-carbon economy means addressing the needs of all communities and workers affected by the shift away from fossil fuels. This involves not only focusing on future livelihoods but also engaging in dialogue, conducting needs assessments, providing requalification opportunities, and offering viable alternatives to those most impacted. By integrating these elements into the transition process, the economy can ensure that the move to RES benefits everyone, including those who are most vulnerable.

As of 2024, approximately 15,000 people are employed in the energy sector, while around 5,000 are employed in the coal sector, and most of this workforce are men. **(53)** Despite the increase of female students pursuing degrees in geology, mining, and metallurgy, by 10% between 2019 and 2021, there is no confirmed data on whether this rise in female graduates correlates with an increase in their employment in the coal sector, indicating that systemic barriers to women's participation may still exist. **(54)** Employees in the energy sector tend to have a relatively stable economic status. The average monthly net wage in North Macedonia for May 2024 was 41,252 denars (as of 9 August 2024, approximately 670 euros). **(55)** Workers in the energy sector typically earn above this average, reflecting the specialised skills and the critical nature of their work. For miners, it is a different story given the fact that in May 2024 miners in coal and lignite mines earned only 28,861 denars (approximately 468 euros). **(56)** Workers in the coal sector also face more challenging working conditions and higher health risks compared to their counterparts in the energy sector.

North Macedonia's Biennial Update Report on Climate Change from 2020 conveys that the highest number of green jobs will be in the e-WAM (with additional measures) scenario, peaking at 9,895 jobs by 2035. **(3)** The green jobs will be mostly related to EE measures, retrofitting and new building construction. In 2035, the e-WAM scenario indicates that 42% of green jobs will come from retrofitting existing buildings, 21% from passive house construction, and 8% from solar thermal collectors. **(3)** Gender analysis suggests that about 27% of these jobs could be occupied by women. Women, especially those over 65, single, or with low incomes, are more vulnerable due to socio-economic and cultural factors. **(3)** For instance, approximately 1,460 elderly women in Skopje with low incomes

² The documents collectively emphasize the transition to a sustainable and efficient energy sector, but they do not explicitly integrate detailed measures for the protection of vulnerable groups. Addressing the needs of vulnerable groups typically requires specific social policies and targeted support measures, which might be referenced indirectly through broader goals of sustainable development and energy affordability. For explicit details, a closer review of each document's provisions regarding social equity and protections would be necessary.



predominantly use firewood for heating, increasing their exposure to health risks like respiratory infections and depression. **(3)** There are persistent challenges in integrating gender-responsive strategies in institutional frameworks and legal standards, which outlines the need for continued efforts to address gender-based disparities in climate policies.

North Macedonia, with its large Roma population, could face increased employment challenges for this marginalised group during its energy transition. The Energy and Climate Plan aims to create around 10,000 green jobs through renewable energy and efficiency projects by 2030, while in the WEM (with existing measures) scenario a maximum of 5,200 jobs can be created by 2030. **(57)** To address these issues, the Just Transition Roadmap, supported by the EU and the EBRD, was adopted by the government in June 2023, and includes social protection, economic diversification, and skills development measures. **(51) (9)** It focuses on ensuring decent jobs and security for those affected by climate policies, while also offering training to help workers move into new sectors. The framework aims to protect vulnerable households from energy poverty, attract foreign investment, and improve the skills of the workforce, especially women and youth. It also supports small businesses and promotes green infrastructure projects to make regions more attractive for enterprises and young people. Key actions include ensuring decent jobs, social protection, and job security for workers impacted by climate policies, along with providing training opportunities to facilitate their transition to new employment sectors. **(51)**

2.5 SERBIA

Navigating a complex landscape of heavy reliance on coal, meeting the ambitious European integration goals and evolving environmental standards, Serbia strives to balance its energy transition. Serbia satisfies most of its electricity needs from domestic production having second largest energy intensity in the region. The economy is completely dependent on Russia for natural gas but is seeking to diversify its natural gas supply. **(58)** Electric Power of Serbia (EPS), a publicly-owned utility, is primarily responsible for energy production in the economy.

Serbia has increasingly prioritised the issue of energy poverty as a critical challenge in its energy transition, formally recognising the term in legislation and expanding protections for vulnerable consumers beyond electricity and gas to include heating. The Decree on Energy Vulnerable Customers provides aid across all three sectors and broadens eligibility, with applications managed by municipal social welfare offices. In line with the Law on Energy Efficiency and Rational Use of Energy, the Administration for Financing and Encouraging Energy Efficiency was established in 2022 to implement measures targeting energy-vulnerable households. The economy- level Energy and Climate Plan (NECP) sets a target to reduce energy poverty by 75% by 2030 (compared to 2020) and outlines specific policies, including the adoption of an action plan, regulatory support (e.g. energy cards or social tariffs), promotion of renewables and energy efficiency among vulnerable groups, improved data collection, and awareness-raising. Additionally, Serbia is drafting a Just Transition Action Plan, expected by mid-2025, to guide fair transition management and mitigate regional socio-economic impacts of the energy shift.

2.5.1 Coal regions and vulnerable groups

Serbia has a large amount of coal reserves, with 4 billion tons of proven lignite deposits predominantly located in two main coal basins, Kolubara and Kostolac. The Kolubara coal basin is located in the central

part of Serbia, near the town of Lazarevac, whereas the Kostolac coal basin is located in the eastern part of Serbia, near the town of Kostolac, which is part of the municipality of Požarevac. Kolubara provides about half of Serbia's electricity, while the Kostolac basin supplies Kostolac A and B TPPs **(59)**. Unfortunately, there is no publicly available data on the breakdown of employees in existing TPPs.

Worsened by the COVID-19 pandemic, vulnerable and marginalised groups in Serbia are facing challenges including increased poverty, limited access to social services such as healthcare, protection and assistance, and insufficient financial assistance programmes. **(60)** Women, particularly those in vulnerable households, experience increased economic insecurity and limited access to essential services. Workers in the coal sector, already struggling with the transition towards RES, face job insecurity and potential loss of livelihoods. Given the current global context of energy production and other commitments to decarbonisation, as in other EU MS, the economic strain on coal-dependent communities will commence intensifying, and adequate social protection measures are key to support workers during this transition.

Serbia's two largest open-pit mines produce significantly more coal than all other domestic mines combined, employing around 12,500 workers. **(37)** The gender gap in the sector of mining and quarrying was particularly high, reaching 87.05% in Q4 2020, compared to 81.95% in Q4 2018. Gender composition of energy workforce in Serbia follows the global pattern where a vast majority of employees in mining and quarrying are men, with only around 13% being women. **(61)** This heavy reliance on coal could have significant implications for low-income households, rural communities, those living in coal-dependent regions, and workers in traditional energy sectors. These groups could lack the resources to adapt to changes such as rising energy costs or job losses, putting them at higher risk of economic hardship. Addressing their needs would require targeted policy measures, such as financial support and job retraining programmes, as presented in the draft Just Transition Action Plan.



3. IMPACT OF THE ENERGY TRANSITION ON VULNERABLE GROUPS IN THE WESTERN BALKANS SIX

Coal mining regions in Europe and globally have experienced and will continue to experience structural change, bringing both benefits and challenges. **(63)** In the attempt to rebuild the continent after the World War II, insistence on heavy industry and opening the coal mines brought economic prosperity, but also caused environmental damage and health risks. While technological advancements have eased the work of miners and made it safer, the mining workforce has suffered reductions. This, combined with various economic shifts such as the ongoing energy transition and associated commitments, has led to rising unemployment and economic instability in the absence of early, comprehensive, and just transition strategies and action plans.

Whereas the global trend for employment in the RES sector is growing, 13.7 million in 2022, **(64)** WB6 continue to plan reliance on fossil fuel, specifically coal, promising a positive socio-economic outlook. In WB6, societal awareness of the energy transition is increasing but remains uneven across the region. The rise in environmental protests, especially prior to the COVID-19 pandemic and the rise of Fridays for Future often indicate a higher level of social awareness and engagement, and with some movements evolving into political parties with green agendas showcase the evolving environmental consciousness. **(4)** Despite this, practical involvement in the energy transition is still limited due to regulatory gaps in almost all the WB6. The region lacks adequate frameworks for prosumers and energy communities, resulting in a challenge to raise the number of prosumers compared to EU member states.

While there is noticeable progress in societal awareness and activism, systemic challenges and political priorities continue to impede more comprehensive involvement and advancement in the energy transition. Phasing out coal presents a significant societal challenge, particularly in directly impacted regions, where demographic changes and a lack of alternative employment require managing structural changes responsibly to mitigate social hardships for affected communities. **(63)** This is particularly evident in rural regions that face additional challenges such as an ageing population and emigration. Some of the ways in which the energy transition will affect the vulnerable groups in WB6 (or is already affecting) are analysed below.

The green transition is expected to have an overall positive impact on employment; however, significant differences are anticipated across sectors, regions, and skill groups. As the green and digital transitions are strongly interlinked and entail an economy-wide transformation, investments in adult learning, upskilling and reskilling will be needed in most sectors to implement green solutions. Analysis of current employment trends, including labour and skills shortages in key sectors, is unclear as there is no agreed definition of 'green jobs'. Green jobs refer to employment opportunities that contribute directly or indirectly to reducing the environmental impact of companies and the economy in general to sustainable levels. These jobs aim to maintain or restore the quality of the environment, whether in traditional sectors such as manufacturing and construction or in emerging sectors such as RES and EE.

3.1 JOB LOSSES AND ECONOMIC INSECURITY

Jobs are of great importance in any economy, especially in transitioning to a low-carbon economy. The sudden loss of a primary source of income creates financial hardships. Since most of the coal power plants and mines are already outdated and uneconomic, plans to close them have created ambivalent

social attitudes. Coal workers, influenced by the heavy coal lobby in the region, have feared losing their jobs and the economic stability the mines brought.

On the other hand, investments in renewable energy offer promising job creation potential. A report by the World Resources Institute (WRI) highlights that RES projects can create up to 1.5 times more jobs compared to fossil fuel investments. Specifically, investing in solar photovoltaic (PV) technologies leads to significantly higher job creation than equivalent spending on fossil fuels. **(65)** The report also projected that \$1 million in green investments would create more near-term jobs than the same amount invested in roads and fossil fuels. Deconstructing the coal narrative in a way that gives the ones mostly affected, workers and women, a clear image of how the future will look like in either scenario is an initial step to be taken.

No economy in SEE has an adequate transition plan with proper planning, financing, and worker inclusion in decision-making. **(59)** A just transition must address job reductions in the fossil fuel industry by offering upskilling and reskilling opportunities for coal workers, preparing them for other sectors, such as the RES. Saving jobs is often cited as a reason for new plant construction, but it is crucial to focus on sustainable and competitive **[101]** employment solutions.

Seen as a proportion of the total workforce, employment levels in the coal sector range from 0.4% in Montenegro to 1.4% in Kosovo*, 0.5% in North Macedonia, 0.6% in Serbia, and 1.3% in Bosnia and Herzegovina, while EU's largest coal sector, in Poland, constitutes 0.7% of its labour force. **(65)** Considering the so-called double exposures the mining communities face, in terms of being highly susceptible to energy poverty due to living in remote areas with poor energy infrastructure or facing general poverty due to poor and inconsistent financial flows on a monthly basis, addressing their vulnerabilities becomes a priority. The region is deep down in the process of transition, and its impact has become very visible.

Coal workers may face significant challenges in finding new employment, particularly if they lack transferable skills or if there is insufficient support for retraining. Fossil fuel-dependent WB6 will need significant efforts to retrain coal sector workers for transition into other sectors. New occupations will include wind turbine operators and solar panel installers while changing occupations will encompass roofers, HVAC technicians, and plumbers. In mono-industrial regions, unique challenges arise, such as cultural ties to coal mining and tightly knit communities. **(66)** These regions also have many informal workers, grey economy workers, and those without social benefits, who will need targeted retraining programmes and support to facilitate a smooth transition into RES professions. For women who are frequently dependent on the financial support provided by coal sector jobs, often earned by their partners, economic insecurity can be particularly severe. Women in these situations may face additional barriers such as limited access to retraining opportunities, societal expectations, and financial constraints. Moreover, their underrepresentation in decision-making processes related to the energy transition can leave them without a voice in shaping policies that affect their livelihoods.

3.2 ENERGY POVERTY

The phenomenon of energy poverty became more pronounced as a side effect of the transition to more sustainable socio-economic systems. It is very much context-dependent, which poses challenges in assessing it by using the set indicators developed by the EU. Legal frameworks in the WB6 do not explicitly define energy poverty or provide indicators for assessing it; nevertheless, they define vulnerable customers and provide measures to alleviate their issues that stem from the very transition. **(7)** Transitioning to RES and stopping the production of energy from coal will most likely increase the price of alternative fuels and pose problems for the socially disadvantaged. In Bosnia and

Herzegovina only, the share of people using solid fuels reached 91% in 2021, with the ones using solid fuel stoves amounting to 64%, which are relatively high percentages. **(67)** Low-income households, inadequate heating **[105]** and cooling systems, and high energy costs, all contribute to the vulnerabilities, and in the absence of adequate support systems, they can also increase social isolation. Energy-poor households in WB6 will face the following challenges: affordability of new technologies, access to modern energy services, and economic displacement. To retain a healthy socio-economic outlook, strategies and plans in place need to include a needs and risk assessment for the vulnerable populations in WB6. **[100]**

3.3 SKILLS MISMATCH AND LIMITED EMPLOYMENT OPPORTUNITIES

Vocational high schools that provide training in technical fields such as mining and universities that offer specialised programmes in mining and geological engineering exist in every economy of the WB6, and in Bosnia and Herzegovina, they are further promoted by foreign mining companies that put emphasis on the employment of local workforce and resources. Providing alternatives and opportunities for employment in the RES sector is essential for ensuring a just transition for workers displaced by the decline of traditional fossil fuel industries. Generally, employment in the RES sector has been on the rise, enabled by increasing investments in RES projects, supportive policy frameworks and energy strategies and plans aimed at reducing carbon emissions. **(63)** Even though RES like wind and solar require little employment during the operational period, the installation of equipment can provide significant employment. In Serbia, an apparent rise in energy jobs, particularly in wind, has been recorded with the Čibuk wind turbine, the largest in the region becoming operational.

Workers from the coal sector often possess specialised skills that are not easily transferable to the RES sector, which creates a mismatch and limits their employment opportunities. In North Macedonia, a survey found that 60% of coal workers lacked the skills necessary for jobs in the RES sectors. **(56)** Additionally, rural communities face limited opportunities in the green transition due to restricted access to education, training, infrastructure, and investments, with many engaged in agriculture and lacking access to technological advancements and reskilling opportunities. **(66)** Given that North Macedonia has the highest share of youth unemployment in the region (36.1%), **(66)** attending to the needs of youth in the energy transition process is also important.

3.4 HEALTH IMPACTS

Long-term exposure to pollutants in mining regions, particularly from coal-fired power plants, has severe health consequences. The HEAL³ report highlights that communities in these regions face increased risks of chronic respiratory diseases, cardiovascular issues, and premature deaths due to continuous exposure to fine particulate matter (PM2.5) and other pollutants. **(68)** Specifically, it is estimated that continued coal use in the Western Balkans Six could lead to thousands of additional premature deaths and significant health costs by 2050. Human Rights Watch highlights the severe health risks associated with air pollution in Bosnia and Herzegovina, particularly during the winter months. **(69)** Due to reliance on coal and wood for heating and electricity production, air pollution is among the worst in the world, with serious health consequences, including respiratory and cardiovascular issues, especially for the elderly and children. However, since 2016, investments and plans have been deployed by WB6, such as Serbia⁴ and Bosnia and Herzegovina, to install

³ Health and Environment Alliance (HEAL): a European think-tank that works on the nexus between health and environmental policy, aiming to improve public health through a healthier environment.

⁴ JSC Elektroprivreda Srbije invested €450 million in upgrades reducing major emissions, with new projects set to further improve air quality despite some limits still being exceeded.

desulfurization equipment that contributes to the reduction of emissions. Beyond the overall health impacts, the burden of pollution is not shared equally, as some groups are more exposed and therefore more vulnerable. Women, who are more exposed to indoor pollution from cooking and heating stoves [105], and children, who have higher respiratory rates and are therefore more vulnerable to both indoor and outdoor air pollution, should be considered particularly vulnerable groups. Due to their heightened exposure to health risks, these groups are also more dependent on health insurance and the income associated with (primarily male) lifetime employment in the coal industry.

3.5 STRONG MINING IDENTITY

The bond between mines and miners in the Western Balkans Six is particularly strong, which might be deeply rooted in the region's industrial history, and it also has profound implications for both the communities involved and the broader socio-economic landscape. For generations, families have worked in mines, creating a strong intergenerational bond to the profession. The mines were and still are seen as the breadwinner for the family, which means that people rely on them for economic stability. The political narratives about the importance of mines for society also add to this image. Therefore, the envisioned closures of mines not only can have a devastating effect on local economies (unemployment, social unrest, and a loss of community cohesion) but also risk stripping the miners from an identity they have built throughout the years, i.e. a collective identity of belonging centred around a mine. (72) The closure of mines in certain areas risks initiating a wave of migrations of mining communities who might face social exclusion and hardships to adapt to new lives far away from the mine and other communities with whom they shared experiences and livelihoods. This is combined with disproportional employment benefits including: above-average salaries⁵, better than-average health insurance, delivery of coal for residential heating, early retirement scheme, etc.

⁵ For example, there are reports [101] that indicate above average remuneration and revenues. In Serbia, mining sector archives wage adjusted labour productivity (in %) of 4043 versus the economy-level average of 165.2.



4. COMPARATIVE INTERNATIONAL AND EU POLICY REVIEW

Specific international documents protect vulnerable groups in the energy sector by mandating social protection systems that prioritise social inclusion and address challenges faced by these groups. ILO's Recommendation No. 202 **(73)** emphasizes the need to integrate individuals into the informal economy, ensuring they are not excluded from social protection benefits. The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) **(74)** requires gender-sensitive approaches, acknowledging women's periodic workforce participation and often lower wages, which directly impacts their access to energy resources. Similarly, the Convention on the Rights of the Child (CRC) **(75)** and the Convention on the Rights of Persons with Disabilities (CRPD) **(76)** stress child-sensitive and disability-inclusive policies, ensuring access to energy services for children and individuals with disabilities, considering their specific vulnerabilities.

The International Convention on the Protection of the Rights of All Migrant Workers and Their Families **(77)** ensures that migrant workers have equal access to energy resources. By advocating for non-discriminatory treatment and proactive measures, these documents aim to eliminate structural discrimination and ensure that marginalised groups receive equitable access to energy, thereby improving their quality of life and enabling them to participate fully in society. All of these are legally binding except ILO's Recommendation No. 202, which means that duty bearers i.e. signatories have the obligation to comply and enforce.

When it comes to the protection of rights of workers in the coal sector, the International Labour Organization's (ILO) conventions and recommendations are predominantly noted here. Namely, ILO Convention No. 176 (Safety and Health in Mines Convention) **(78)** and Recommendation No. 183 (Safety and Health in Mines Recommendation) **(79)** focus directly on mine workers' safety and health, mandating policies, reporting systems, and training. Additionally, ILO Convention No. 155 (Occupational Safety and Health Convention) **(80)** provides a general framework for occupational safety and health applicable to all sectors, including coal mining, requiring them to implement and review public safety and health policies. Furthermore, ILO Convention No. 167 (Safety and Health in Construction Convention) **(81)** covers aspects relevant to coal mining, particularly in the construction and maintenance of mine infrastructure. All of them are legally binding except for Recommendation No. 183 (Safety and Health in Mines Recommendation, 1995).

These conventions ensure comprehensive safety standards, training, and regulatory measures, promoting decent working conditions and recognising the specific hazards associated with coal mining. While ILO conventions primarily focus on safety and health in the coal sector, other international documents address the social aspects of the energy transition. The ILO's Guidelines for a Just Transition **(82)** provide a framework for protecting workers' rights and ensuring social inclusion during the shift to sustainable energy. The Paris Agreement **(83)** acknowledges the need for a just transition of the workforce, emphasizing decent work and quality jobs. In addition, the UN Sustainable Development Goals, particularly SDGs 7 and 8,⁶ advocate for inclusive economic growth and decent work in the context of transitioning to renewable energy sources.

At the EU level, the rights of vulnerable groups in the energy transition are addressed through several documents and policies. The European Pillar of Social Rights **(84)** promotes equal opportunities, fair working conditions, and social inclusion. The EU Green Deal **(85)** and its Just Transition Mechanism (JTM) should provide financial support and technical assistance to regions and workers most affected

⁶ SDG 7 – Affordable and clean energy; SDG 8 – Decent work and economic growth

by the shift to sustainable energy, including funding for reskilling and upskilling initiatives. The JTM is designed for participating economies only, but there are avenues through which the Western Balkans Six can benefit indirectly or through associated EU mechanisms, such as the IPA (Instrument for Pre-Accession Assistance) and WBIF (Western Balkans Investment Framework) that can provide financial support for WB6 and its energy transition. The WB6 region needs dedicated financial instruments to support decarbonisation and energy transition, alongside financial aid to ensure a just transition, similar to the EU's Just Transition Mechanism (JTS) for coal regions. The European Social Fund Plus (ESF+) also aids in employment, social inclusion, education, and skills development, particularly benefiting those impacted by the transition. Germany and Spain are good examples of skills development. In Germany, the so-called *Energiewende* (energy transition) implemented training and reskilling programmes to support its transition to RES, such as vocational training in RES technologies. Spain has developed a comprehensive plan that includes reskilling programmes for coal miners and workers in other high-emission sectors, preparing them for jobs in renewable energy and other sustainable industries. Erasmus+ programme is also a good starting point to consult when it comes to supporting educational exchanges and vocational training programmes focused on green skills, while the European Qualifications Framework (EQF) supports the recognition of green skills and qualifications across Europe. For example, Germany's qualifications in RE and EE reflect the integration of green competencies.

Additionally, the European Climate Law (ECL) **(86)** commits to climate neutrality by 2050 and ensures a socially fair transition that leaves no one behind. These initiatives collectively emphasise social fairness, job creation, reskilling, and financial support for vulnerable groups during the energy transition. Noteworthy to mention, the ECL, JTM and ESF+ are legally binding instruments which means that they provide an enforceable framework to protect the vulnerable groups in the context of the energy transition. While both international and EU documents aim to protect vulnerable groups, EU policies offer more detailed and enforceable measures specific to the regional context and ensure that the transition to sustainable energy is equitable and inclusive across its member states.

5. POLICY RECOMMENDATIONS

The WB6' energy sector faces substantial challenges in ensuring an equitable transition to RES, particularly for women and workers in the coal sector. The findings from previous chapters reveal deep-rooted gender disparities and a lack of comprehensive legal frameworks to protect those most at risk. As the region moves towards sustainable energy, the need emerges to develop policies that not only address these inequities but also actively promote inclusion and social justice.

Based on the desk review, regional analysis, and international practice review conducted, the following policy recommendations aim to guide the WB6 in creating a just energy transition that empowers all citizens, protects vulnerable populations, and aligns with international and EU standards. Some general recommendations include:

- Develop comprehensive and enforceable legal frameworks
- Promote gender equality
- Support vulnerable households
- Facilitate reskilling and training
- Enhance TVET systems to align with the evolving needs of the green economy
- Encourage stakeholder collaboration
- Promote inclusive decision-making
- Enhance public awareness and education
- Mobilise dedicated financial instruments—potentially supported by the EU—to advance the decarbonisation process

Although female employment in the energy sector is lower than male employment, females take a disproportional burden in domestic fuel wood (or solid fuels) use that is combined with high indoor and outdoor air pollution and significant health impacts [97]. **Policy measures to address energy efficiency [105] and (both indoor and outdoor) air pollution are likely to have a positive impact on health risks of female engagement in residential energy provision.**

5.1 ADVOCATE FOR EQUAL REPRESENTATION IN THE ENERGY SECTOR

The findings of research from previous chapters highlight significant gender disparities in the WB6 energy sector. Within a field traditionally dominated by men, women face disproportionate barriers to entry and advancement due to the combination of social, economic, and institutional factors. Deeply rooted gender norms, educational disparities and insufficient access to STEM education, and unsupportive work environments all contribute to the underrepresentation of women in this field. In Kosovo*, the gender pay gap amounts to 13%, with women earning 72 cents for every euro earned by men, while in Montenegro they earn around 86.1% of what men earn overall, with the gap being more pronounced in male-dominated industries like mining and accompanied by high unemployment rates for women. This imbalance not only creates issues like energy poverty among women, who already experience higher unemployment rates than men, but also limits the diversity of perspectives in energy policymaking and innovation. Therefore, it becomes paramount to act immediately and devise comprehensive strategies to promote equality in the energy sector.

To enhance energy sector's inclusivity, strategies for equal representation and involvement of vulnerable groups, especially women, in transitioning to RES are essential. Local authorities should lead by creating action plans aligned with economy- or entity-level strategies, focusing on the

professional and training needs of women. This includes enhancing TVET programmes to address women's roles in technical and leadership positions within the green economy, supported by improved local data collection. These efforts will reduce female unemployment, strengthen household economic stability, and contribute to a more equitable and resilient energy sector. Key stakeholders—government, energy companies, educational institutions, and NGOs—must collaborate to ensure comprehensive inclusion strategies

Unequal gender representation in the energy sector could be addressed by:

- Ensuring and conducting gender mainstreaming assessments for the energy transition framework that would involve a systematic integration of gender perspectives into all stages of policy development, implementation, and evaluation.
- Collecting, monitoring, and evaluating gender-disaggregated data in the energy sector to address the data gap and inform policy development.
- Designing policies and measures to increase the gap of women's representation in the energy workforce and engaging different stakeholders in the process.
- Implementing targeted STEM training for women in technical and leadership roles by partnering with educational institutions and international organisations to create scholarships and mentorship programmes, while also improving TVET programmes with specialised modules.
- Promoting citizen-led initiatives like energy communities and cooperatives to engage women, especially from rural and mining areas, in leadership roles by leveraging their household and farming skills, alongside raising awareness through campaigns that highlight gender diversity and challenge stereotypes.
- Establishing a task force to monitor and report on gender representation, while collecting and analysing gender-disaggregated data to assess the effectiveness of implemented policies and initiatives.

Implementation strategy:

- Collect/monitor/evaluate data on gender-aggregated level in the energy sector to bridge the identified data gap across the region and ensure policies are based on accurate and relevant information.
- Engage identified stakeholders in crafting strategies and plans for equal representation in the energy sector ensuring alignment with economy-level gender policies.
- Promote STEM careers by implementing targeted training programmes for women in technical and leadership roles within the energy sector and establishing partnerships with educational institutions and international organisations to create scholarships and mentorship programmes.
- Promote citizen-led initiatives such as energy communities and energy cooperatives as alternatives for citizen's engagement in the energy sector. Educate and build the capacity of women, especially from rural areas and mining communities, to leverage on the existent household and farming skills frameworks to engage in citizen leadership roles.
- Raise awareness about gender diversity in the energy sector, targeting both the public and private sectors. Promote the role of youth, especially young women in carrying out the campaigns. Collaborate with NGOs and media outlets to promote success stories of women in energy and to challenge stereotypes that discourage women from entering the sector.
- Improve TVET programmes by introducing specialised training modules for women in technical and leadership positions in the energy industry.



- Establish a task force on the economy level to monitor the progress of gender representation in the sector for both entities, with regular reporting and adjustments to the strategy as needed. The task force would also collect and analyse gender-disaggregated data to assess the effectiveness of implemented policies and initiatives.

5.2 IMPROVE ASSISTANCE FOR WOMEN ENTREPRENEURS IN THE RENEWABLE ENERGY SECTOR

Findings from previous sections also reveal the challenges women face in starting and growing businesses in this sector including limited access to funding, mentorship, and networking opportunities. Addressing these gaps becomes crucial in promoting gender diversity and leveraging the innovative potential of women in renewable energy. Given that women constitute 32% of full-time employees in RES in Bosnia and Herzegovina—exceeding the global average in oil and gas—there is an opportunity to further support their participation and success. An interesting fact is that women’s share in MSMEs grew from 25.8% in 2011 to 33% in 2021, yet their entrepreneurial activities are concentrated in less lucrative service sectors. In the absence of comprehensive training opportunities for women in the energy sector, addressing these barriers through targeted assistance for women entrepreneurs can help mitigate economic displacement and enhance economic stability.

The recommendation includes implementing support programmes for women entrepreneurs in the renewable energy sector. The programme should encompass financial support, mentorship, and networking opportunities tailored specifically to women who want to start a business. The goal of this initiative is to increase the participation and leadership of women in the sector, contributing to their economic resilience and supporting a more equitable transition to RES. Stakeholders include government bodies, financial institutions, industry associations, and NGOs dedicated to gender equality and economic development, the latter spearheading the implementation of the programmes and providing expert support to women.

Implementation strategy:

- Create dedicated grant and loan schemes for women-led startups and businesses in the RES sector. Collaborate with banks and investment firms to offer favourable loan conditions and investment opportunities for women entrepreneurs.
- Launch education and mentorship programmes that connect women entrepreneurs with experienced professionals in the sector. These programmes would include training sessions and workshops on business management, technical skills, and market access specifically for women.
- Promote networking and collaboration among women through facilitating networking events and industry conferences focused on women in renewable energy. This step would also necessitate partnering with industry to establish platforms for women entrepreneurs to showcase their projects and engage with potential partners.
- Set up a task force to track the implementation and impact of support programmes for women entrepreneurs in renewable energy that would also collect and analyse data on the participation and success rates of women-led businesses to refine and improve support initiatives.

5.3 STRENGTHEN LEGAL FRAMEWORKS FOR PROTECTING VULNERABLE GROUPS

The international and EU documents outlined in the policy brief represent frameworks that provide a legally binding basis for protecting vulnerable groups in the context of energy transition. By aligning policies with international and regional standards, governments can ensure that the energy transition is just, inclusive, and supportive of those most at risk of being left behind. Documents such as ILO's Recommendation No. 202, CEDAW, and the EU's European Pillar of Social Rights advocate for social protection systems that prioritise inclusion, addressing specific challenges faced by vulnerable populations, whereas ILO's Guidelines for a Just Transition and the Paris Agreement emphasise decent work, further reinforcing the need for legal protections for workers as they transition to new roles in RES. Aligning legal frameworks with the above-discussed, especially EU policies on the protection of vulnerable groups is a call to action.

WB6 should enhance legal, institutional and financial frameworks that protect vulnerable groups. Albania and Montenegro have financial support measures that protect vulnerable households in the context of electricity consumption, whereas Kosovo* stipulates the protection of vulnerable groups through its Energy Strategy for 2022-2031. North Macedonia went the furthest by introducing the Just Transition Framework aiming to protect vulnerable households from energy poverty, attract foreign investment, and improve the skills of the workforce. Law on Energy of Serbia now legally recognises energy poverty as a key challenge and expands aid for vulnerable customers across electricity, gas, and heating. The Decree on energy vulnerable customers⁷ increases eligibility for support, which is accessed through municipal social welfare offices.

WB6 have social protection measures in place that indirectly target vulnerable groups, but not in the context of energy transition per se. This poses additional challenges because no programmes or measures that directly target vulnerable groups in the context of energy transition are effective in the absence of concrete legal frameworks and strategies.

It is recommended to devise or enhance legal frameworks that provide targeted protection for vulnerable groups during the energy transition, aligning them with EU acquis and other international documents. The goal is to ensure that policies explicitly address the needs of those most at risk, including women, displaced coal workers, and energy-poor households, mitigating the socio-economic impacts identified across screening process, such as job displacement, gender pay gap, and unequal access to energy resources. By legally mandating protection, governments reduce a variety of risks identified, promote greater social cohesion and reduce resistance to change. To facilitate a seamless transition into the green economy, it is crucial to incorporate TVET programmes into existing legal frameworks. This will guarantee that individuals from vulnerable groups have access to the essential training and upskilling they might need. Policymakers would need to establish close collaboration with civil society organisations that focus on human rights, social justice, sustainable development and energy. Engaging centres for social protection to help collect, analyse and aggregate crucial data is also recommended.

Implementation strategy:

- Mobilising economy-level, international, and EU financial and technical capacities to support drafting of just energy transition framework and its implementation. In addition, additional

⁷ The Decree on energy vulnerable customer (Official Gazette of Serbia, no. 137/22, 93/23 and 116/23) introduces aid for electricity, gas and heating and envisages a significant increase in the number of customers eligible for aid. To acquire the status, one needs to submit a request to the municipality unit responsible for social welfare activities.

resources need to be allocated for gender mainstreaming the existing frameworks for climate, education and energy sectors.

- Develop and integrate specific legal provisions into existing energy and climate policies that protect vulnerable groups by ensuring equitable access to energy resources, providing financial support, and implementing social safeguards to prevent energy poverty and displacement during the transition. Include gender-specific protections and measures to prevent energy poverty.
- Collaborate with legal experts, social scientists, and affected communities in drafting legislation that reflects the unique challenges and needs of different vulnerable groups. Engage local communities to ensure their voices are heard and their needs are addressed in the legal frameworks.
- Enhance cooperation between the energy and education sectors by incorporating TVET programmes into these frameworks to offer specialised training and skill enhancement for marginalised populations, enabling them to successfully navigate and take advantage of the opportunities presented by the green economy.
- Provide training and resources to local authorities and agencies responsible for implementing these legal frameworks. Ensure they have the necessary knowledge and tools to enforce the protections.
- Establish monitoring and evaluation mechanisms to track the effectiveness of these legal protections.

Educate communities about their rights under these new legal frameworks and how to access the protections they offer.

Social and spatial mobility are crucial components of Just Transition strategies for coal-dependent regions. A key prerequisite for mobility is the improvement in real estate market value, which is closely tied to environmental factors such as air pollution, health risks, natural disaster threats (e.g. floods, erosion), biodiversity loss, and the upskilling of female population.

Addressing energy poverty—especially its gender dimensions—requires coordinated policies that focus on energy efficiency, productivity improvements, depollution, and circular economy practices. Eliminating energy poverty creates additional employment opportunities within the context of a Just Transition, and vice versa: reducing energy poverty enhances living conditions and fosters community improvements, which can ease the challenges of the transition. Women are particularly vulnerable to the effects of energy poverty due to their roles in managing solid fuel stoves, handling fuel wood, and the health impacts of indoor pollution **(97)**. As such, a comprehensive energy poverty eradication policy is inherently a gender policy that empowers women.

Gender equality and women's empowerment are fundamental goals of sustainable development. It is crucial that public policies, plans, and projects consider gender differences, as well as the distinct needs, interests, and priorities of women, ensuring their inclusion at every stage of planning, preparation, adoption, and implementation.

Coordinating policies and investments is essential to address the mismatch between TVET programmes and the evolving labour market. The GAWB provides a comprehensive coordination platform that can further support this alignment, building upon the existing frameworks set out in Energy and Climate Plans (NECPs). Highlighting education, skills development, training, and broader human development within GAWB could further enhance these efforts.

The energy transition presents diverse opportunities for women, ranging from improved access to cleaner household energy solutions, which can reduce health risks and energy poverty (as detailed in sections 3.2 and 3.4), to enhanced engagement in the renewable energy sector through entrepreneurship and business development. In this context, women may be more inclined to engage in local energy solutions, such as energy communities. Policy development should encourage gender diversity and support innovation, tapping into the potential of women in promoting household energy efficiency, renewable energy adoption, and local circular economy initiatives.

It appears that most WB6 policy and strategy documents lack a clear financial support mechanism for vulnerable groups in the coal sector, including women (100). Based on the review of key energy documents and policies, it is evident that developing financial support policies for workers in fossil fuel industries, alongside regulations addressing the social and labour market aspects of energy transition, energy poverty reduction, and protection of vulnerable groups, is essential (see chapters 3.2 and 3.4).

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