

Hidden Potential: Accelerating Inclusive Jobs *in* the Green Transition



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Foreword

Without bringing people along in the transition to low-carbon and climate-resilient economies, our ambition to create shared prosperity on a livable planet will not succeed. Inclusive and quality jobs are at the center of this. Businesses depend on healthy, productive workers, they must anticipate skill needs in evolving market and environmental contexts, and they must manage climate risks that affect smaller businesses in their supply chains in order to remain competitive.

Hidden Potential: Accelerating Inclusive Jobs in the Green Transition assesses how gender-inclusive employment measures in emerging markets and developing economies – implemented alongside climate action – can strengthen businesses and grow entire economies. We find that supporting women’s economic participation through the expansion of the care sector creates more jobs, boosts economic growth, and helps businesses address talent shortages in country-led green transitions. We also find that without enabling women’s participation, policies and investments that support low-carbon, climate-resilient pathways could inadvertently exclude women, with negative implications for local economic development and business continuity.

The private sector, which employs 90 percent of the global workforce, plays a pivotal role in shaping such inclusive employment pathways and driving quality job creation. At the same time, policymakers can create the right enabling environment and incentives that encourage companies to advance women’s participation in high-growth sectors like energy, construction, and transport – which are essential for jobs, local economic development, and climate action.

This is why – now more than ever – we need deliberate action and bold ambition. In a complex and fragile world with competing priorities, we must focus on creating and strengthening jobs and livelihoods and prioritizing areas where economic, environmental, and social objectives are mutually reinforcing. We need strong partnerships between businesses, policymakers, and investors to create holistic and innovative solutions to address the climate risks affecting businesses and workers, while also accelerating job opportunities for women.

The recommendations provided in this report are ambitious, reflecting the scale of the transformation needed to achieve inclusive outcomes in low-carbon, climate resilient economies. They were developed from expert insights and reflect best practices that we hope will encourage you – whatever your starting point – to examine your business practices, policy levers, and investment approaches. This can unlock better and more jobs, including for women, and strengthen your companies, communities, and portfolios.



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Executive Summary

The creation of quality and inclusive jobs is essential for sustainable economic development and climate action. Climate change is threatening jobs and livelihoods, particularly in emerging markets and developing economies (EMDEs), putting economic development and social inclusion at risk. At the same time, the shift to low-carbon, climate-resilient economies brings both opportunities and challenges for workers and businesses, creating new jobs and eliminating others, with distributional impacts that vary by country and population. Understanding these effects is essential for driving sustainable economic development, securing social support for green transitions, achieving national climate goals, and ensuring continuity for employers and firms. Governments and companies that consider human capital development and support their employees in green transitions can anticipate skill demands, assess social protection needs, and create the right incentives to shift workers into new sectors.

This report explores how green transition pathways can affect employment and economic development in 11 EMDEs, with a focus on gender-specific dimensions. Its

objectives are to explore two often overlooked aspects of the employment-climate change discourse. The first is the extent to which policies and investments supporting green transitions create new job opportunities and threaten existing ones, with attention to women's employment outcomes and how these shape gender gaps in the labor market. This provides a better understanding of which jobs will be in demand, and which jobs will be at risk, creating uneven opportunities. The second objective is to examine how, if women's economic participation is further enabled, countries can support economic growth and strengthen business operations. This provides important evidence that policymakers, employers, and investors can achieve mutually reinforcing economic, environmental, and social objectives by increasing women's economic participation in low-carbon, climate-resilient transitions.

This Executive Summary is organized into three condensed sections. Part 1 provides an overview of the existing literature on climate change, green transitions, and jobs, with a focus on distributional impacts. Part 2 presents findings on how policies and investments

towards green transitions affect employment outcomes for women and men, how these outcomes change when additional gender-inclusive measures are implemented, and finally, how these measures positively impact businesses and economies. Part 3 offers conclusions and recommendations.



Part 1 Review of the Literature

This literature review covers two dimensions: 1) the impacts of climate change on jobs and livelihoods, and 2) the effects of green policies and investments on jobs and livelihoods, both of which are essential for economic development and just transition. These perspectives should be considered together to understand how climate change and climate action reshape labor markets and affect economic growth, including the steep cost of inaction, as well as the potential trade-offs that come with different climate policy and investment choices. Governments and employers need to understand how changing climate conditions affect the health, safety, and productivity of their workers, particularly in sectors like agriculture, construction, and manufacturing, which are large employment drivers in Emerging Markets and Developing Economies. At the same time, they must anticipate the effects of green policies and investments on workers and jobs to maximize growth and socioeconomic development outcomes.

The consequences of climate change on jobs and livelihoods are profound, negatively affecting the productivity of workers, the economic output of entire sectors, and the infrastructure that people and businesses depend on. Changing climate conditions reduce worker productivity, particularly in sectors like agriculture and construction, where much of the workforce is exposed to rising heat. Entire sectors – especially those more exposed to climate risks like

agriculture or more dependent on healthy ecosystems like tourism – are expected to face declines in productivity. This results in immense economic losses, disrupts firm-level operations, and reduces demand for workers in these sectors. Extreme weather events also damage critical infrastructure and physical assets, causing disruptions in transport, energy, and water systems which companies and workers rely on. Small and medium enterprises, which are vital to employment and economic activity in developing economies, are especially vulnerable to climate risks due to lower financial resilience and exposure to supply chain disruptions.

These impacts are not felt equally. Workers are more at risk in poorer countries, where climate impacts are more severe, alternative livelihood-generating activities are less accessible, essential services are more constrained, and social protection systems are underdeveloped. Within these countries, specific populations are disproportionately impacted, particularly women, who are more likely to work in climate-vulnerable activities and have less access to alternative income-generating opportunities. Other groups also feel climate damages more acutely, for example: poor people who generally have fewer coping strategies, caregivers whose caregiving responsibilities can increase with new climate-related health risks, men in construction who are more exposed to heat stress, and informal workers who lack workplace protections and access to social protection systems.

Turning to the employment effects of green policies and investments, most studies project neutral or small net-positive job growth, despite losses in sectors such as coal mining. Green policies and investments have the potential to create new jobs in many sectors, including renewables, construction, manufacturing, climate-smart agriculture, re- and afforestation and aquaculture, with additional spillovers across entire economies. However, the distribution of gains and losses is uneven and depends on countries' skills base, access to materials and technologies, and reliance on fossil fuels and traditional firewood and charcoal for energy. Aggregate, country-level estimates

also obscure how jobs shift across industries, firms, and workers, leading to frictions from skills gaps, limited social protections during labor market adjustments, geographic immobility, and demographic or motivational mismatches. Finally, adaptation- and nature-related jobs—critical for developing economies—remain poorly defined and largely unmeasured in projected job estimates.

Lastly, the literature review explores gender differences in access to employment opportunities created through green policies and investments.

Women already hold fewer ‘green jobs’ than men in EMDEs due to a range of factors like skills mismatches (particularly in science, technology, engineering, and mathematics – STEM fields), restrictive social norms, and other barriers. The few studies that have projected job gains for women in green transitions suggest that they are less likely to benefit from new employment opportunities in sectors where they are historically underrepresented, like energy and construction. However, women could benefit more from ‘induced jobs’ created through increased household spending in sectors like services and agriculture, where they typically access job opportunities more easily. Still, structural barriers persist: disproportionate care responsibilities, discriminatory norms, and skills gaps continue to limit women’s ability to take up formal and higher-paying jobs, whether these are linked to green transitions or not.



Part 2 Labor Market Impacts of the Green Transition for Women and Men

The second part of this report seeks to answer three questions: 1) How do green transitions affect employment outcomes in EMDEs? 2) Can the addition of gender-inclusive measures, alongside climate action, improve job outcomes overall and for women? 3) How do

gender-inclusive measures in green transitions strengthen firms and drive economic growth?

To answer these questions, two green transition scenarios are developed: a *gender-agnostic* green transition scenario and a *gender-inclusive* green transition scenario. The *gender-agnostic* scenario assumes that countries pursue ambitious climate policies, including carbon taxes and renewable energy investment packages, but do not implement any proactive measures to support women’s employment. The gender-inclusive scenario assumes the same ambitious climate policy packages but invests carbon tax revenues into the care sector, which enables women’s broader economic participation. Both scenarios are compared against a baseline scenario for the year 2040, which assumes business-as-usual investments and development, with no ambitious climate or gender actions.

The analysis relies on MINDSET, an employment-focused multi-regional input-output model. Eleven EMDEs – Indonesia, the Philippines, Poland, Serbia, Türkiye, Peru, Egypt, Jordan, Bangladesh, Côte d’Ivoire, and South Africa – were selected with diverse income levels, economic structures, climate ambitions, and gender gaps to explore a range of possible employment and economic outcomes in green transitions.

How do green transitions affect employment outcomes in EMDEs?

Green transitions will create new jobs, but without structural change, women are less likely to benefit from new opportunities.

This question is answered through the *gender-agnostic* green transition scenario, which assumes that countries pursue ambitious climate action (mitigation-related investments and carbon pricing), but do not introduce additional gender-focused policies or investments. It explores how such green measures affect employment across various sectors, assuming the current gendered employment structures remain unchanged. Mitigation-

related investments will create demand for new workers, while recycled carbon revenues used for household income support will positively affect consumption, and in turn, increase employment.

On aggregate, the gender-agnostic scenario will add jobs in the economy, but only 31 percent of new direct jobs will be held by women, compared to 69 percent held by men. This is because most new direct jobs linked to green investments in the electricity sector will be in infrastructure-related sectors, where men are more likely to take up new roles. In this scenario women gain direct jobs in fields supporting these investments: manufacturing, retail, transport, telecommunications, and finance. However, even in these fields, new job openings can still benefit men more than women.

When the indirect employment effects of carbon pricing and recycled revenues are considered alongside direct jobs from green investments, the picture is more positive: women could hold up to 38 percent of new jobs, now making gains in agriculture, tourism, and human services, sectors where they typically find jobs more easily. Men could lose jobs in extractive sectors, like coal mining.

At the country level, results vary and reflect women's current participation in the labor market. For example, in Egypt and Jordan, where less than 20 percent of women are in the labor market, only 16 percent and 14 percent of additional jobs, respectively, are taken up by women. Countries like Serbia and Poland, where female labor force participation is higher, have better outcomes: 86 percent and 59 percent of the new jobs could go to women, respectively. Depending on the policy choice and country context, employment additions also vary by skill level. In countries like Bangladesh, Côte d'Ivoire, Jordan, the Philippines, and Türkiye, job additions in the green transition favor low-skilled, often majority-male workforces. Meanwhile, Egypt, Poland, and Serbia will have greater demand for higher-skilled workers.

Can additional gender-inclusive measures drive more job growth and improve employment outcomes for women?

Gender-inclusive measures, implemented alongside climate action, can create more jobs overall and improve employment outcomes for women in green transitions.

This question is answered through the *gender-inclusive* green transition scenario, which assumes that countries still pursue ambitious climate action, but now invest the revenues generated from the carbon tax into the care sector. Care sector investments have positive effects on women's labor force participation through two channels: 1) more workers are needed in the care sector and along care value chains, which creates new employment opportunities in areas where women typically access jobs more easily, and 2) the increased provision of care services allows women to spend more time pursuing other activities, including seeking out income-generating opportunities in the labor market.

Under the *gender-inclusive* scenario, 54 percent of new jobs now favor women on aggregate, compared to 38 percent under the gender-agnostic scenario. The investments in the care sector enable more women to enter or re-enter the labor market and, importantly, alter the *structural composition* of new jobs created under green transitions. With care provisions, women can seek out new activities, including pursuing new employment opportunities across the economy and can also gain new jobs in the expanding care sector. Like the *gender-agnostic* scenario, it is primarily men who are impacted through declines in fossil fuels under green transitions but will also benefit from new jobs in other sectors.

Even with the gender-inclusive measures, specific country characteristics influence the extent of job additions for women. For example, in Jordan and Egypt, job gains are primarily linked to the infrastructure sector, and only

42 percent and 35 percent of new jobs, respectively, will go to women. In Bangladesh and the Philippines, care investments have a significant impact on the expected job gains for women: they could hold 60 percent of new jobs in Bangladesh, and 57 percent of new jobs in the Philippines. This is due to growth in the care sector, which more readily provides job opportunities for women, while also supporting their participation in other expanding industries in green transitions.

Comparing results for low- and high-skilled female workers, the analysis shows that there are generally more high-skilled opportunities than low-skilled opportunities. Across all countries, high-skilled women gain additional jobs in green transitions with additional investments in the care sector, on average, increasing their employment by 1.3 percent. In low-skill positions, gains are smaller for women, with a 0.7 percent increase in their employment. In countries where women are less represented in the labor market, the job additions for low-skilled female workers are higher than in countries where the gaps between women's and men's employment are smaller.

How do gender-inclusive measures in the green transition strengthen firms and drive economic growth?

Investing in the care sector creates more jobs, boosts economic output, and strengthens businesses by expanding talent pools.

To answer this question, the report looks more closely at the *gender-inclusive* scenario, determining that recycling the carbon tax revenues to expand the care sector results in more jobs than under the *gender-agnostic* scenario. It also finds that in some countries, firms are likely to face tight labor markets if they only recruit male workers, with too few workers with the right skills to meet new demands—leading to talent shortages, more competition, and higher costs. By expanding the care sector to enable more women to work, and by supporting women's

participation in industries where they can gain relevant skills, companies can broaden and diversify the pool of workers they're recruiting from.

There are other benefits as well. The *gender-inclusive* scenario results in an 'Inclusion Premium': up to 0.3 percent on top of the economic growth boost expected under the *gender-agnostic* scenario.¹ This economic boost arises from higher overall job growth, which raises incomes and spending, and care sector investments which stimulate domestic activity—together driving stronger economic growth. This is alongside an overall higher employment in the *gender-inclusive* scenario: economy-level employment is up to 0.9 percent higher on top of the *gender-agnostic* scenario, due to stronger growth, a more labor-intensive and domestic supply-leaning economy.²



Part 3 Conclusions & Recommendations

Inclusive green transitions that intentionally enable economic opportunities for women can align social, environmental, and development objectives, boosting economic growth and jobs, and increasing the likelihood that national climate goals will be achieved. Green policies and investments can drive job growth in EMDEs, stimulate sustainable socioeconomic growth, and help mitigate the climate threats already affecting workers, businesses, and economies. If governments and private sector actors implement inclusive measures, they can boost jobs and increase women's economic participation, and in turn, strengthen economic and business outcomes.

Investments in the care sector are one way to unlock these outcomes in green transitions. They enable more women to work, raise the total number of jobs

¹ Sum of direct, indirect, and induced effects.

² Sum of direct, indirect, and induced effects.

in the economy, and create an ‘Inclusion Premium’ on economic growth. However, expanding the care sector is not the only lever necessary for promoting inclusive employment outcomes. Reskilling and training initiatives, efforts to address workplace discrimination and gender-based violence, and addressing restrictive social norms are also essential, particularly in expanding sectors like infrastructure and transport, where women’s employment is low. Realizing inclusive outcomes in the transition to low-carbon, climate-resilient economies will require targeted, creative, and holistic solutions by public and private actors to drive long-term change.

The following recommendations are drawn from this research and reflect insights from diverse stakeholders on emerging best practices. They are designed to advance effective solutions for a range of actors, including companies and employers, policymakers, and investors. Recommendations are organized across three dimensions most relevant to the findings of this report: 1) actions to expand the care sector to drive job growth and economic inclusion in green transitions, 2) actions to enable women’s employment beyond expanding the care sector, with a focus on the specific challenges that are unique to green transitions, and 3) broader recommendations on how to align inclusion, environmental, and employment objectives to strengthen businesses and economies.³

Companies and Employers are at the forefront of understanding evolving workforce needs, responding to green-enabling policies, implementing green projects, and driving inclusive practices to increase opportunities for women in non-traditional sectors.



<p><i>Actions to expand the care sector</i></p>	<ul style="list-style-type: none"> • Support employees with care through provision of on-site or near-site childcare centers, partnerships with local providers, and provision of subsidies or vouchers. • Implement family-friendly workplace policies like inclusive parental leave, hybrid and flexible working arrangements, and return-to-work programs for women, particularly in challenging sectors like renewable energy and low-carbon transport.
<p><i>Actions to enable women’s employment in the green transition (beyond the care sector)</i></p>	<ul style="list-style-type: none"> • Invest in targeted skill-building and training programs for women by collaborating with universities, technical institutes, and training providers to establish apprenticeships and provide on-the-job training in high-demand fields in sectors growing through green policies and investments. • Promote inclusive recruitment like setting gender targets for candidate shortlists, ensuring gender-diverse interview panels, and training recruiters and managers to recognize and reduce bias. This is essential for more traditional, but high-growth sectors like infrastructure. • Implement inclusive business practices to support and retain women employees, particularly in green and climate-related sectors where women are underrepresented and restrictive social norms are more persistent.
<p><i>Actions to align inclusion, environmental, and employment objectives</i></p>	<ul style="list-style-type: none"> • Embed inclusive workforce planning into sustainability and climate transition strategies acknowledging that workforce planning is essential for implementing corporate climate goals and executing transition plans. Firms should include a focus on women to expand the talent pool and reduce recruitment-related costs.

³ For broader recommendations on how economies and employers can address barriers to women’s workforce participation, see World Bank 2023, and for a comprehensive assessment of enabling policies for climate adaptation and mitigation see World Bank Group 2024.

Policymakers provide an enabling environment for green investments, can direct spending towards the care sector, and can incentivize employers to implement inclusive recruitment strategies and workplace policies.



<p><i>Actions to expand the care sector</i></p>	<ul style="list-style-type: none"> • Invest in the care sector as essential social infrastructure, for instance through recycled carbon revenues as modeled in this report, to boost jobs and economic growth, reduce labor market frictions, and increase women’s share of jobs in green transitions. • Incentivize employer-supported care through direct subsidies or preferential tax treatment to encourage firms to offer care services or family leave to employees in high-growth green sectors.
<p><i>Actions to enable women’s employment in the green transition (beyond the care sector)</i></p>	<ul style="list-style-type: none"> • Strengthen training and transition pathways for women to enter new jobs in green transitions by incentivizing employer partnerships with universities and training institutions through subsidies, tax breaks, or regulations that support apprenticeships and structured entry routes for female graduates. • Link inclusive recruitment to public support through tax benefits, credits, or preferential access to public contracts for firms in renewable energy, low-carbon transport, or other decarbonization sectors that meet gender diversity targets and demonstrate strong recruitment and retention of female employees.
<p><i>Actions to align inclusion, environmental, and employment objectives</i></p>	<ul style="list-style-type: none"> • Integrate inclusive human capital development into green transition planning to create the labor force necessary to design, build, and maintain projects in sectors like renewable energy and climate-resilient infrastructure, and embed a gender lens to increase job opportunities for women and reduce employment losses for men. • Align workforce development with green sector needs by strengthening feedback loops with employers and ensuring publicly funded training and reskilling programs meet evolving talent demands of green sectors. Ensure that feedback mechanisms with employers also provide visibility on gender gaps in employment pipelines to increase women’s participation. • Implement social protection measures like unemployment benefits and reskilling programs to help workers manage job losses and move into emerging fields in green transitions. Focus on the most vulnerable groups, including women, informal workers, and low-income populations.

Investors are essential for mobilizing private sector capital for climate projects, can embed inclusion into their green finance approaches, and can strengthen inclusive employment outcomes through their portfolio companies.



<p><i>Actions to expand the care sector</i></p>	<ul style="list-style-type: none"> • Work with portfolio companies and project developers to expand access to affordable and reliable care services through on-site or subsidized childcare facilities near construction sites, flexible working arrangements, partnerships with local care providers, and care allowances and stipends. • Invest in businesses with strong family-friendly policies and link financing terms or performance incentives to progress to help portfolio companies attract and retain female talent and reduce turnover.
<p><i>Actions to enable women's employment in the green transition (beyond the care sector)</i></p>	<ul style="list-style-type: none"> • Invest directly in women-led businesses that contribute to climate action, especially small and medium businesses which tend to employ more women and benefit local economies. • Invest in green businesses that demonstrate a commitment to diversifying their workforce, leadership, and supply chains, for example by applying the 2X Criteria in the investment approach to track and set targets on gender outcomes in climate portfolio companies. • Link green finance to outcomes on women's employment or upskilling and offer financial incentives for companies that set ambitious targets in their workforce or supply chains, particularly in non-traditional sectors like renewable energy, construction, and transport. • Support capacity-building in climate portfolio companies to build inclusive recruitment, retention, and leadership strategies, particularly for small and medium enterprises that may lack the capacity to design and implement gender-inclusive practices and policies.
<p><i>Actions to align inclusion, environmental, and employment objectives</i></p>	<ul style="list-style-type: none"> • Integrate gender and diversity into green finance frameworks and due diligence, ensuring that capital mobilization delivers environmental impact alongside inclusive employment and economic opportunities. • Strengthen accountability and disclosure by requiring portfolio companies to report data on how climate investments are contributing to decent and inclusive jobs or driving other outcomes that advance gender equality. • Link portfolio-wide gender performance to incentives going beyond investee-level commitments, setting gender and inclusion objectives across the entire portfolio, and tying them to financing terms.

More detailed recommendations can be found in Part 3 of the main report.



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Introduction

I. Jobs at the Center of Sustainable Growth and Green Transitions

Major technological, economic, and demographic factors are reshaping labor markets and changing the way that people work. Climate change and climate action are also playing a role, creating new jobs in some sectors and causing declines in others. Assessing the effects of climate change on the world of work and individual workers, as well as the implications of climate action on employment – including its distributional impacts – are essential for driving economic growth, achieving national climate goals, and increasing demand for and acceptance of green transitions. Engaging the private sector, which employs 90 percent of workers in emerging markets and developing economies (EMDEs) and plays a major role in reskilling and upskilling workers, is essential in this exercise.

Climate change and green transitions affect business operations and workforce planning. Governments and employers need to understand how changing climate conditions—such as heat stress, extreme weather events, and supply chain disruptions—can affect the health, safety, and productivity of their workers, particularly in sectors like agriculture, construction, and manufacturing, which are large economic and employment drivers in EMDEs. At the same time, climate policies, low-carbon technologies,

and investments in low-carbon infrastructure are shifting workforce needs across sectors, creating new roles in areas like renewable energy and sustainable agriculture, while reducing employment in fossil fuel-dependent industries. These workforce shifts bring both risks and opportunities for firms operating in these sectors, and for governments investing in lower-carbon production methods.

This report explores the employment and economic potential of country-specific green transition pathways, with a particular focus on a dimension that is often overlooked: women's employment. It aims to identify the risks that climate action poses on jobs, while also examining opportunities to create new jobs—especially for women—through inclusive measures. Part 1 provides a literature review on the intersection of jobs, climate change, and green transitions, with emphasis on distributional effects. Part 2 presents green transition scenarios that assess how green-enabling policies and green investments affect employment demand across 11 EMDEs, and how these dynamics shift for women when inclusive measures are incorporated. Part 3 synthesizes conclusions and recommendations, summarizing priority actions for companies and employers, policymakers, and investors.

Part 1

Review of the Literature



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I. Scope of the Review

A significant body of research has explored Just Transition and the intersections of climate change, climate action, and employment. A 'Just Transition' or greening the economy in a way that is fair and inclusive, has shaped much of the literature on 1) the effects of climate change on jobs and workers, and 2) the effects of green transitions on jobs and workers. While there is some research on the differentiated impacts of climate change on women and other disadvantaged groups, there has been far less focus on understanding the impact

of green-enabling policies and green investments on women's employment outcomes, or the effects of women's economic participation on supporting green and sustainable development pathways.

This literature review begins with a brief overview of Just Transition in Section II. Section III examines the impacts of climate change on workers and jobs, with a more in-depth exploration of how climate action shapes employment outcomes. Section IV investigates gender-specific dimensions, and Section V concludes.

II. Just Transition

Much of the discussion on jobs in the context of climate change and green transitions is guided by the concept of Just Transition. According to the internationally agreed guidelines for a Just Transition of the International Labour Organization (ILO), a Just Transition is defined as greening the economy in a way that is as fair and inclusive, creating decent work opportunities and leaving no one behind (2015). Historically, the term was applied narrowly to the process of supporting the people and communities directly affected by the energy transition (i.e., the decline of fossil fuel-dependent sectors), but more recently, has expanded to capture broader distributional dimensions associated with climate action policies and investments. Today, a Just Transition is recognized as a whole-of-economy approach to greening economies with the potential to generate more inclusive and decent employment and support sustainable economic growth.

Effective Just Transition strategies require coordinated action from governments and the private sector—combining policy frameworks that manage employment impacts and promote inclusive growth with business-led efforts to embed social considerations into green transition plans.

Frameworks for policymakers emphasize managing employment losses through social protection, promoting economic diversification, creating jobs in emerging sectors, and investing in education and training.⁴ These approaches also highlight the importance of social dialogue, stakeholder engagement, and adherence to

international labor and human rights standards. The role of the private sector in financing and implementing a Just Transition, including the role of Small and Medium Enterprises (SMEs), is increasingly recognized. Emerging guidance and case studies focus on how companies and investors can embed Just Transition principles into business strategies through the creation and preservation of decent jobs; upskilling and reskilling efforts to equip employees with new in-demand qualifications; community resilience-building efforts that strengthen operations against climate risks; and stakeholder engagement with governments, local communities, and suppliers to increase social support for green projects.⁵

Gender equality is increasingly acknowledged as an important component of Just Transition, but in practice, remains under-addressed in most frameworks. While a Just Transition extends to the inclusion of women and other marginalized groups, most strategies still overlook the differentiated impacts of climate change on women or examine how green policies and investments create new jobs and income-generating opportunities for them. Long-standing gender inequalities—such as occupational segregation, restrictive social norms, unequal access to training, and disproportionate caregiving responsibilities—limit women’s access to new jobs emerging in green transitions and also make them more vulnerable to the impacts of climate change. This is explored in more detail in Box 1 and in Section IV.

III. Jobs, Climate Change, and Green Transitions

In this section, two key dimensions of a just and inclusive climate transition are considered: (1) the direct impacts of climate change on jobs and workers, and (2) the effects of green policies and investments on jobs and workers. Taken together, these perspectives offer

a more comprehensive understanding of how climate change shapes labor markets—both through the cost of inaction and through the economic transformations required to address it. This report focuses largely on the second dimension but briefly addresses the first in Box 1.

⁴ For example, the [ILO’s Just Transition Guidelines](#), the [World Bank Just Transition Taxonomy](#), and the [OECD’s Policy Framework for a Just Transition](#).

⁵ For example, the World Bank’s [Just Transition Taxonomy](#) (and accompanying [list of economic activities](#)), the Principles for Responsible Investment (PRI’s) [Just Transition Investor Guide](#), Climate Action 100+ [Net Zero Company Benchmark](#), the Council for Inclusive Capitalism [Just Transition Framework for Company Action](#), and the [World Benchmarking Alliance](#).

Box 1: Climate change impacts on workers and jobs

Climate change threatens workers and jobs through multiple direct and indirect channels, including through slow-onset trends like rising temperatures and droughts, and climate shocks like floods and storms. These events reduce worker productivity, decrease the productivity of entire sectors, and damage critical services, infrastructure, and supply chains that workers and businesses rely on – amounting to huge economic costs. Poorer countries, despite contributing far fewer greenhouse gas emissions historically, face much higher vulnerability.⁶ Within these countries, the poorest and most vulnerable groups, including informal and low-skilled workers, SMEs, those living in rural locations, women, and youth are disproportionately affected. This box briefly examines climate change impacts on worker and sectoral productivity and then explores the gender dimensions of both. For a more detailed review of climate change impacts on jobs, see the recent [World Bank Group Country Climate and Development synthesis report](#).



1. **Worker Productivity.** Over 2.4 billion workers are exposed to excessive heat, especially in poorer countries, where many people work in agriculture and where a large share of jobs involve physical outdoor work (ILO 2024a; World Bank Group 2024). Even if global warming is limited to 1.5°C, the estimated financial losses from heat-related illnesses alone could be up to \$2.4 trillion by 2030 (ILO 2019a). Within countries, men in heavy manual labor, elderly individuals, migrants, and informal workers face heightened risks due to limited protections (Fatima *et al.* 2021; ILO 2024b). Beyond heat, climate-induced health threats such as respiratory illnesses and vector-borne diseases further reduce productivity, particularly in EMDEs where health services and emergency infrastructure are more constrained. Finally, extreme weather events can damage the physical infrastructure that workers rely on to get to work and access essential services that keep them healthy and productive.



2. **Sectoral Productivity.** Approximately 1.2 billion jobs depend directly on healthy ecosystems and the Earth's capacity to absorb waste and greenhouse gases—both increasingly threatened by climate change (ILO 2018a). Agriculture, forestry, fishing, and tourism rely on natural processes like seasonal weather patterns, soil renewal, and ocean biodiversity. As these services degrade, sectoral productivity declines and demand for workers falls, with disproportionate impacts in Africa, Asia, and the Pacific.⁷ Within countries, women, people living in poverty, informal workers, and indigenous communities are especially vulnerable due to their reliance on ecosystem-dependent livelihoods and limited access to protections (ILO 2018b).⁸ SMEs operating in climate-vulnerable sectors experience even greater threats to their business operations (Hampton *et al.* 2023), with fewer financial and technical resources to address risks and lower emissions (SME Climate Hub 2025). Finally, extreme weather events can also damage critical infrastructure and physical assets, disrupting business operations and supply chains (Laidlaw *et al.* 2023).



3. **Gender dimensions.** Women are typically more vulnerable to climate change due to limited access to income opportunities, less social capital and decision-making power, and fewer productive assets and services (World Bank Group 2024). Women's concentration in climate-vulnerable sectors like agriculture, fisheries, and tourism both as workers and small business owners – combined with limited access to finance, technology, and policy support – increase their vulnerability to climate change (World Bank Group 2024; FAO 2024; Mitra and Barua 2023; Shaffril *et al.* 2024; We-Fi 2024; Deininger 2023). Climate change can also exacerbate women's unpaid care responsibilities, reducing time spent on other activities, including income-generating opportunities.⁹

It's important to recognize that climate impacts vary by context. Men and boys may also experience distinct and sometimes more severe effects. Gender is one lens for assessing these impacts, but other intersecting factors—such as race, class, geographic location, and physical or mental disabilities—also shape the experience of individuals, workers, and business owners.

⁶ See for example, the [Notre Dame Global Adaptation Initiative](#) country vulnerability index and rankings.

⁷ For example, agricultural yield models project up to a 10 percent loss per degree of warming for crops like maize and soybean, with the most severe impacts expected in Africa and Central and South America (Hasegawa *et al.* 2022). Small Island Developing States (SIDS), which rely heavily on tourism and food production, have seen disaster-related damage as a percentage of GDP rise by nearly 90 percent between 2011 and 2022 (IIED 2023).

⁸ For example, FAO found that a 1°C increase in long-term average temperatures is associated with a 34 percent reduction in total income for female-headed households compared to male-headed ones (2024), and 19 percent of indigenous and tribal populations depend on forests for their livelihoods (ILO 2018a).

⁹ For example in India, more than two-thirds of all heat-related productivity losses among women stem from unpaid, domestic work (Adrienne Arsht-Rockefeller Foundation Resilience Center 2023).

Box 1 highlights the risks that climate change poses to workers and entire sectors—through heat stress, ecosystem degradation, and other impacts—which represent the most serious threats to jobs and livelihoods. At the same time, policies and investments

introduced to address climate change are also reshaping employment, creating important shifts in job opportunities and sectoral dynamics. The following section examines how the green transition is expected to transform labor markets, including aggregate job estimates and distributional impacts.

Aggregate Job Estimates in Green Transitions

Most studies conclude that the transition to low-carbon and climate-adapted economies will result in neutral or small net positive effects on total employment. Jobs will be at risk in carbon-intensive industries, while jobs will be in demand in low-carbon sectors, with specific estimates that vary based on the methodological approach.¹⁰ For example, the ILO estimates that adopting measures to limit long-term global warming to 2°C will result in approximately 0.3 percent more net jobs worldwide in 2030, when compared to a business as-usual scenario of 6°C (Montt *et al.* 2018). Under the International Energy Agency’s net-zero emissions by 2050 scenario, 17 million additional jobs are generated from clean energy technologies across sectors like low-emissions electricity, electric vehicles, end-use efficiency, grids and storage, and low-emissions fuels (2023). Under IRENA’s World Energy Transition Outlook 1.5°C scenario, renewable energy sector employment could triple from its 2021 level to about 40 million jobs worldwide by 2050 (2023).

While most direct job growth is expected in the renewables, construction, and manufacturing sectors, employment effects will be felt across the entire economy. Shifts in the energy sector have strong multiplier effects through forward and backward linkages with other economic activities, and these multipliers are greater for renewable energy than fossil fuel-based industries.¹¹ They stem from new direct and induced jobs associated with

increased economic activity resulting from energy sector investments, which can stimulate economic growth. Two million jobs could be created in the manufacturing of electric machinery for the production of electric vehicles and generation of renewable electricity alone, in addition to job growth in waste management, services, and agriculture (Montt *et al.* 2018). Access to clean energy and electricity can also improve livelihoods and create new opportunities to undertake non-farm rural economic activities, including waged employment and self-employment (Lehr 2023).

The potential for job and livelihood creation through climate adaptation is recognized, but the lack of data and standardized definitions makes it difficult to assess adaptation-related employment gains. Adaptation activities – for example in sustainable agriculture, water supply and sanitation, disaster risk management, or health services – are highly context-specific and community-based (ILO 2018b). Though adaptation investments, especially in nature-based solutions and climate-resilient infrastructure, can generate local employment,¹² these jobs are harder to quantify due to more fragmented data and limited measurement frameworks. Furthermore, because adaptation activities often involve locally led, informal work in EMDEs, they’re likely to be undercounted in formal employment estimates. This area warrants further research, as increasing adaptation finance is central to the climate response in EMDEs—not only to protect existing livelihoods, but also to support local employment opportunities, particularly for women, informal workers, and community-based actors.

¹⁰ See a detailed exploration of different methodological approaches to defining and measuring green jobs in Apostel & Barslund 2024 and a broader discussion in 'Beyond green jobs: Advancing metrics and modelling approaches for a changing labor market' (Mealy *et al.* forthcoming). Green transition scenarios also differ across the literature but typically rely on Nationally Determined Contributions (NDCs), Paris Alignment, or alternative policy or investment assumptions.

¹¹ For example, one study found that for every \$1 million invested in renewable energy, an estimated 7.49 jobs are created, compared to only 2.65 jobs from the same amount of investment in fossil fuels (Garrett-Peltier 2017).

¹² See examples and case studies in World Bank 2024, WRI 2025, ILO 2018, UNEP 2023, UNEP 2024.



Distributional Dimensions

While most studies project net job growth in the transition to low-carbon, climate-resilient economies, opportunities are uneven geographically. Only a limited number of studies have characterized – and measured – job growth in EMDEs. Whether new jobs are created locally abroad depends on whether countries have the specialized skills, materials, and technologies to service complex clean energy value chains and to what extent their economies rely on fossil-fuel based industries. Currently, EMDEs are likely to hold only a small portion of clean energy supply chains domestically, limiting the job creation potential of developing new clean infrastructure (Dobrotková *et al.* 2024). Jobs created upstream of project investments, which require highly specialized skills and technologies, are often created in few countries overseas. Select green technologies, including solar PV, rainwater harvesting, recycling, some energy efficiency technologies, and sustainable agriculture, are already mature and low cost, and in turn, can diffuse more rapidly in EMDEs. However, the employment gains of deploying these climate solutions may also be smaller (UNIDO 2020).

Job impacts from green transitions vary across emerging markets, with potential gains in some countries, but job losses in others. The ILO estimates aggregate job losses by 2030 for countries in the Middle East and limited net gains in Africa, unless there is significant change in the economic structures of these countries (Montt *et al.* 2018). A World Bank analysis of ten EMDE countries found that Egypt, India, and Pakistan could see significant job growth from transitioning to clean energy due to their ambitions for renewable energy, energy efficiency, private investment, and sustainability (Lehr & Pollitt 2024). On the other hand, Brazil, Türkiye, and Colombia are unlikely to see significant aggregate employment changes, while South Africa and Indonesia face challenges due to dependence on coal to meet their energy demands.

Country-level aggregate job estimates do not capture reallocation of jobs among industries, firms, and workers, ignoring important complexities on who new jobs will benefit. While new direct and induced jobs are often framed as 'off-setting' losses in

fossil-fuel dependent industries at the aggregate level, in reality, labor market frictions can hinder workers from transitioning out of declining sectors and into growing ones. These frictions include skill mismatches between employers and workers, spatial mismatches where jobs are not located in the same area as workers, timing mismatch between when workers are needed and when they are available, normative barriers that prevent workers from seeking

out certain types of occupations or prevent employers from hiring certain individuals, and preferences (e.g., linked to compensation) that prevent workers from moving to new sectors or occupations (Knudsen *et al.* 2025). Furthermore, transition scenarios often fail to disaggregate employment estimates by sex, hiding potential risks and opportunities for women and men in specific sectors and countries. This is examined in more detail in the next section.

IV. Gender Dimensions

The literature assessing women's access to jobs created through country-specific transition pathways suggests that women will benefit less than men, with important nuances depending on sector and country context. Studies have examined women's current representation in the sectors that are

most critical to low-carbon transitions and receiving the bulk of climate finance, as well as future job projections for women under various green transition scenarios. Barriers to increasing women's economic participation in the transition to low-carbon, climate-resilient economies are also explored.

Women's Representation in Green Transition Sectors

Women are underrepresented in the sectors deemed most critical for low-carbon transitions, facing wider and more persistent employment gaps compared to other sectors. According to the International Monetary Fund, men are better represented in 'green employment' globally, holding about two-thirds of 'green jobs', including jobs in the informal sector (Alexander *et al.* 2024).¹³ In EMDEs, 'green jobs' are a growing source of employment and can offer wage premiums, however, they represent just 4.6 percent of women's employment, compared to 16 percent for men.¹⁴ Studies tend to find that such jobs are more technical, higher-skilled, require more education, and tend to offer better quality employment—such as higher pay, full-time roles, and permanent contracts – but are also held mainly by men (Apostel & Barslund 2024). Women are better represented in sectors like sustainable agriculture, sustainable tourism, and healthcare, which

play a significant role in climate adaptation (UN Women & AfDB 2021).

Looking more closely at the energy sector, which will be a significant source of new jobs, women are underrepresented relative to men and relative to non-energy sectors. They make up 32 percent of the renewable energy workforce globally, only 28 percent in STEM jobs (IRENA 2025).¹⁵ While data in emerging markets is more limited, country-level analyses have revealed large gender gaps in renewables: women make up 11 percent of the workforce in India, hold only 25 percent of solar energy jobs in Viet Nam,¹⁶ and are underrepresented in emerging industries like green hydrogen in South Africa (Srivastava 2024; IFC 2025; IFC forthcoming). These trends are also reflected in other sectors critical to decarbonization, including transport and construction.

¹³This study uses a bottom-up approach (see Apostel & Barslund 2024), which means that green jobs are defined by their underlying set of tasks that are classified as either green (directly improves environmental sustainability or reduces GHG emissions) or non-green. An occupation is classified as green if more than five percent of its tasks weighted by the task importance are green.

¹⁴The green wage premium is about seven percent on average for men and 12 percent for women after controlling for workers' and sectoral characteristics (IMF 2024).

¹⁵IRENA has also investigated women's representation in wind energy at 21 percent (IRENA 2020), solar PV at 40 percent (IRENA 2022), and decentralized solar PV in Africa at 38 percent (IRENA 2024).

¹⁶The shares of women in high-skilled STEM occupations and medium-skilled technical occupations are much lower at five and six percent respectively (IFC 2025).

Projections for Women's Employment in Green Transitions

Job projections in green transitions show more limited opportunities for women. The sectors receiving the most climate finance like renewable energy, low-carbon transport, and buildings are also the sectors where women are least represented in employment and leadership (Deininger *et al.* 2023, CPI 2024, IEA 2025, IRENA 2025). Meanwhile, climate investment levels in agriculture, forestry, water, and wastewater – sectors with large climate mitigation and adaptation potential where women make up a larger share of the workforce – have remained low from 2018 to 2022 (UNEP 2024). As a result, job projections in green transitions show more limited opportunities for women. Recent analysis exploring climate transitions and labor demand in EMDEs found that, except for the education and health sectors, jobs-in-demand are mostly filled by male workers (Lehr & Pollitt 2024). In Sub-Saharan Africa, women are well positioned to access 'quick win' but 'low-end' jobs in sectors like agriculture, forestry, tourism, green services, waste management, and biomass energy, but less likely to benefit from new opportunities in transport, solar energy, wind energy, and construction (UN Women & AfDB 2021).

A range of barriers prevent women from accessing new opportunities in green transitions, including real and perceived skill mismatches, restrictive social norms, employer preferences for men, and women's disproportionate care responsibilities. Specialized, technical skills related to sectors like renewable energy, energy efficiency, and waste management will be more in demand, but women on average, are less likely to develop these skills in the roles they currently occupy and in some countries, face barriers in accessing training (World Bank 2025).¹⁷ Furthermore, persistent stereotypes about women in non-traditional roles still limit inclusive recruitment and hiring practices (IFC 2025). For example in wind energy, women are often perceived to possess the right skills, yet

social norms and traditional gender roles still prevent their advancement (IRENA 2020).

Other jobs, for example those in remote locations for clean infrastructure projects, are not desirable or safe for women, with heightened risks of gender-based violence (IFC 2025, IFC 2020). Finally, women continue to carry out the majority of unpaid care responsibilities, with an estimated 708 million women outside of the labor force due to care responsibilities (compared to 40 million men) (ILO 2024c). Climate change is likely to increase women's time spent on care and domestic tasks by increasing health risks for those being cared for and making the provision of care services more difficult (MacGregor *et al.* 2022a).¹⁸ This can decrease women's participation in other activities, including income-generating and formal employment opportunities.

Addressing women's underemployment in green transitions could yield economic gains, while upskilling women and implementing inclusive recruitment could help businesses fill workforce gaps. Recent analysis found that economies with a robust supply of STEM-educated workers, combined with greater gender parity, can transition faster and at a lower cost (IMF 2024). Increasing women's involvement in STEM would boost the overall supply of STEM human capital, a key resource for facilitating the green transition. In the renewable energy sector, women could help address the skills shortages faced by project developers, including insufficient or outdated expertise (Dobrotková *et al.* 2024; Nicholls 2024). However, in the absence of long-term strategies that encourage women's participation, address hiring biases, ensure safety, and address women's care responsibilities, future job opportunities enabled through climate action are likely to be more limited for women.

¹⁷ For example, women hold 32 percent of renewable energy jobs globally, but far fewer women occupy STEM-related positions and almost half are in administrative jobs (IRENA 2025).

¹⁸ For example, in Santiago, Chile, the incidence of high pollution doubles gender differences in working hours, with the hypothesis being that children are unable to go to school and must be cared for by women (Montt 2018).

V. Conclusion

Part 1 sought to provide an overview of the intersections between climate change, green transitions, and jobs, with a focus on distributional and gender-specific implications in EMDEs. While there is a robust body of research on climate change and employment, studies detailing the implications for specific countries, sectors, and individuals are more limited. The chapter introduced the concept of Just Transition to explore how jobs in demand and jobs at risk from low-carbon, climate-resilient transitions are often unevenly distributed geographically and among different workers. In-demand jobs are concentrated in high-skill, labor-intensive sectors and in geographies with existing industrial capacity, benefiting those already positioned to access them. Women are underrepresented in the sectors that are likely to expand directly from green policies and investments but could see induced job gains in sectors like education and healthcare. However, they face systemic barriers that limit their participation

in high-growth sectors like renewable energy, low-carbon transport, and construction, including skills mismatch, occupational segregation, safety concerns, and disproportionate care responsibilities.

More evidence and data are needed to understand the risks and opportunities for inclusive employment in low-carbon, climate resilient transition pathways, and to clearly articulate the business and economic benefits of engaging women in these transitions.

While there is some evidence that countries and employers can accelerate sustainable growth and green transition pathways and meet emerging workforce needs by increasing women's economic participation, the relationship is not well-understood or -articulated, particularly in EMDEs. There is limited assessment of how economies can benefit from implementing gender-inclusive measures alongside climate action, which is the focus of Part 2.



Photo: © Sarah Farhat / World Bank

Part 2

Inclusive Employment in Green Transitions



Photo: © Arne Hoel / World Bank

I. Introduction

This section of the report simulates country-led green transition scenarios to investigate the impact of different policy and investment scenarios on women's employment outcomes, job growth, and economic development. Part 1 concluded that green policies and investments could perpetuate, even widen, existing employment gaps between women and men in EMDEs. Part 2 develops two green transition scenarios – a *gender-agnostic* green transition scenario and a *gender-inclusive* green transition scenario based on carbon pricing and renewable energy investments for 11 EMDE countries, with projections for 2040. It explores how employment outcomes change if additional gender-inclusive measures – specifically, increasing the provision of care services – are implemented alongside climate action measures.

The results show that targeted investments in the care sector can improve economic, business, and women's employment outcomes in green transitions. Providing and investing in childcare and

social care, alongside policies and investments that enable the transition to low-carbon, climate-resilient economies, creates more jobs and enables more women to participate in the labor market. In some countries, this can strengthen economic outcomes and help businesses overcome recruitment challenges. In the absence of such gender-inclusive measures, climate actions implemented by companies and governments could limit the economic growth benefits of low-carbon development and reduce the share of job opportunities going to women.

Part 2 is organized as follows. Section II examines the barriers women currently face in accessing employment opportunities. Section III details the scope and methodological approach, including an overview of the 11 countries in the sample, the characteristics of the green transition scenarios, and the model and its scenario inputs. Section IV presents the results of the *gender-agnostic* green transition scenario, reporting the expected jobs in demand for women and men across sectors and countries. Section

V describes how the results change under a *gender-inclusive* green transition scenario, which enables women to work through care sector investments.

Section VI concludes and offers recommendations. Technical details about the model can be found in the Appendix.

II. The Baseline: Women at Work

Women outside the labor force represent untapped employment potential. Despite girls catching up with boys in primary and lower secondary education, a significant share of women of working age are not working, looking for a job, or pursuing training or educational opportunities, with negative implications for economic and private sector development (e.g., Ostry *et al.* 2018). Female labor force participation is 20 percentage points lower than men’s globally and has been mostly stagnant over the last three decades (Halim *et al.* 2023). North America, East Asia and Pacific, Europe, Central Asia, and Sub-Saharan Africa exhibit smaller gaps, while South Asia, the Middle East, and North Africa exhibit gaps of up to 40 percentage points. Latin America is the only region showing significant progress towards closing this gap.

Women who do participate in the labor market are concentrated in different sectors and occupations compared to men. In addition to fewer women working overall, there is a skewed distribution of the workforce across economic sectors, typically with far fewer women than men working in sectors like manufacturing, construction, and transport, and more women working in public administration and social services (Limani & Soderger 2023). Even within the same sectors, women tend to occupy more administrative and non-technical positions. This distribution is linked to a combination of constraints on women’s labor participation, such as unequal access to education, their disproportionate caregiving responsibilities, and safety concerns, and demand-side barriers like discriminatory laws, hiring practices, and workplace and cultural norms. These factors limit women’s entry and advancement in sectors with historically low female participation.

Outside of the labor market, women continue to conduct most unpaid care and domestic activities, limiting their participation in paid jobs. Figure 1 shows that women in every region in the world spend more time on unpaid domestic and care responsibilities than men, in some countries spending on average, up to 25 percent of a 24-hour day on such tasks. This distribution of unpaid care and domestic responsibilities excludes and holds back millions of women from taking up paid employment (ILO 2024c).

Figure 1: Time spent on unpaid domestic and care responsibilities



Source: World Bank’s World Development Indicators

Green transitions – including green policy measures and investments in climate mitigation and adaptation – are unlikely to help address employment gaps between women and men without additional interventions. While green investments and policies can stimulate economic growth and generate new jobs—particularly through large-scale development of green and resilient

infrastructure and labor-intensive transitions in sectors such as construction and transport—there is no guarantee that they will help close gender employment gaps. In fact, because women remain underrepresented in many of the sectors expected to benefit most from green transitions, these changes risk reinforcing or even widening existing labor market inequalities. The results presented in this report corroborate this risk.

III. Scope and Methodological Approach

Section Summary

This analysis compares two green transition scenarios—featuring carbon pricing and renewable energy investments—with a baseline scenario across **11 EMDEs** to assess **employment impacts** for women and men by 2040.

Countries were selected to reflect a wide range of income levels, energy systems, climate ambitions, and gender gaps, allowing the model to capture a variety of possible employment outcomes.

Ambitious green transition measures include significantly higher electricity sector investments compared to the baseline, which can boost employment in construction and energy-related sectors, though rising electricity prices may offset some of these gains depending on country-specific dynamics.

This section develops green transition scenarios to analyze employment impacts of green investment and policy packages on women's and men's labor market demand across 11 EMDEs.

The outcomes of the green transition scenario are compared against the outcomes of a baseline

scenario to assess the relative differences in employment outcomes for women and men across a range of countries and sectors in the year 2040. This section first describes the country selection, followed by a description of the scenarios. It then describes the model and the scenario inputs.

Country Selection

The green transition and baseline scenarios are compared for 11 countries with diverse economic, climate, and gender profiles.¹⁹ Table 1 provides an overview of income levels, the climate dimension (per

capita CO₂ emissions), the jobs dimension (female labor force participation and the share of workers unable to work due to care responsibilities), income and livelihood dimensions (the gender wage gap), and human capital

¹⁹ The countries were selected based on internal consultations and data availability.

dimensions (tertiary education gender gap). The countries included vary widely in their income levels, economic structures, and energy mixes, as well as in their national climate priorities and ambitions. They also differ in

women's current employment and education outcomes. Broad geographical coverage is essential to capture the range of possible job outcomes shaped by each country's unique context.

Table 1: Overview of selected countries

Region/ Country	Income Group	Per capita CO ₂ emissions ²⁰	fLFP, 15-24	fLFP, 15+	Not working due to care responsibilities ²¹	Wage m/f ²²	Tertiary, f-m ²³
EAST ASIA & PACIFIC (EAP)							
Indonesia	UMIC	Low	38.9%	53.2%	N/A	115.5%	9.9
Philippines	LMIC	Low	27.5%	44.9%	41.5%	88.8%	15.8
EUROPE AND CENTRAL ASIA (ECA)							
Poland	HIC	Very High	28.2%	52.0%	9.6%	102.5%	32.6
Serbia	UMIC	High	24.9%	50.2%	N/A	109.7%	28.4
Türkiye	UMIC	High	33.0%	35.8%	20.0%	106.3%	4.8
LATIN AMERICA & THE CARIBBEAN (LAC)							
Peru	UMIC	Low	57.9%	69.3%	58.7%	110.9%	5.3
MIDDLE EAST & NORTH AFRICA (MENA)							
Egypt	LMIC	Low	18.7%	18.7%	70.7%	109.0%	0.2
Jordan	LMIC	Low	12.5%	16.9%	67.0%	95.5%	13.6
SOUTH ASIA (SA)							
Bangladesh	LMIC	Very Low	26.3%	36.3%	67.9%	121.4%	-3.6
AFRICA (AFR)							
Côte d'Ivoire	LMIC	Very Low	27.1%	46.2%	35.5%	136.7%	-1.5
South Africa	UMIC	Very Low	25.0%	49.0%	58.8%	110.5%	13.9

Source: Author's compilation with data from the World Bank Gender Portal, ILO, and OWID.
Notes: fLFP= female labor force participation rate; f=female, m=male.

20 Very Low: Bottom 25% (~<1.5 metric tons), Low: 25%-50% (~1.5 - 3.5 metric tons), High: 50%-75% (~3.5 - 6.5 metric tons), Very High: 75%-90% (~6.5 - 10 metric tons), Very High: Top 10% (~>10 metric tons)

21 Share of persons outside the labor force due to care responsibilities (women). Based on Gender Equality and Non-Discrimination Indicators (GEND).

22 Average hourly earnings of employees by sex; male value divided by female value. Latest value available at the time of writing.

23 The indicator measures the percentage of persons in tertiary education compared with the respective age bracket.

Green Transition and Baseline Scenarios

This report models green transition scenarios and compares them against a baseline scenario, with results presented as relative differences between the scenarios. The baseline scenario reflects business-as-usual without climate change-related investments or policy interventions. Under the green transition scenarios, countries pursue climate policy and investment packages, comprising carbon pricing and revenue-use policies (which can include carbon taxation, certificates, as well as removal of fossil fuel subsidies), and renewable energy investments (i.e., green investments). Investments in renewable energy enable lower-carbon electricity mixes and change the cost of electricity generation. Both scenarios are defined in line with the World Bank’s Country Climate Development Reports (CCDRs) or comparable national reports.²⁴ Importantly, neither the baseline nor green transition scenarios includes the impacts of climate damages, which are expected to substantially affect workers and labor markets in the absence of climate change

mitigation (see Box 1). This also means that the benefits of climate mitigation in the results are likely undervalued.

Figure 2 shows how the policy and investment packages in the baseline and green transition scenarios differ. The baseline scenario assumes no carbon pricing beyond existing pricing schemes, while the green transition scenarios apply an economy-wide carbon price of \$80 per ton of CO₂.²⁵ Alongside investments in renewable energy, carbon pricing is an important part of the transition package, leveling the playing field for low-carbon solutions by making them more cost-competitive and encouraging investment in low-carbon innovation. Carbon taxes are also difficult to evade when applied upstream, or at the point where fossil fuels enter the economy before they are distributed or used. For the purposes of this report, carbon pricing also enables the model to assess how revenues generated from the carbon tax can be redirected to support the care sector, thereby enabling women’s participation in the labor market. This is the focus of Section V.

Figure 2: Comparison between the Baseline Scenario and Green Transition Scenarios

Baseline scenario	Green transition scenarios
 No carbon pricing other than existing	 Economy-wide \$80 USD/tCO ₂ carbon price, covering all fuel types with CO ₂ emissions
 Energy system investment in line with the BAU reference scenario in World Bank and external sources	 Energy system investments in line with low carbon scenario from World Bank and external sources
 No carbon pricing revenues	 Carbon pricing revenue recycled <ul style="list-style-type: none"> • <i>Gender-agnostic</i>-green transition scenario: Carbon pricing revenue used for household income support (Section IV) • <i>Gender-inclusive</i> green transition scenario: Carbon pricing revenue spent on care sector (Section V)
 Electricity prices according to baseline scenario in World Bank and external sources	 Electricity price changes according to net-zero scenario from World Bank and external sources

²⁴ See the Appendix for details on the scenario assumptions for each country.

²⁵ The suggested level of \$80/tCO₂ lies within the corridor concluded by the High-Level Commission on Carbon Prices (Carbon Pricing Leadership Coalition 2018).



The MINDSET Model and Scenario Inputs

The analysis relies on the MINDSET Model, an employment-climate-energy focused multi-regional input-output (MRIO) model. The model was developed with the aim of capturing climate change-related sectoral economic transformation (e.g., climate damages, mitigation, adaptation). Labor demand is captured through sector-specific labor elasticities of output. These elasticities enable the model to capture how the respective sectors react, based on empirical observations, to higher or lower demand for their production, which can also be a result of changing prices. Employment is captured on a granular sectoral level (120 sectors), and the gender distribution of employees at that level is based on data from the International Labour Organization (ILO 2025).

Inputs to the model rely on ambitious climate mitigation scenarios established by existing literature,

including the World Bank Group's CCDRs, and simulate these for the year 2040. Country differences in terms of energy mix, ambition to address climate change, and the impact of switching to renewable energy on the price of electricity are considered. These factors represent the ambition of the country-level transition plans and therefore have significant implications for the employment outcomes of the scenarios. For example, higher investment levels might boost employment in certain sectors directly (e.g., construction), while higher electricity prices might trigger broader negative employment effects across the entire economy. These scenarios also consider different energy demand levels in each country, which in addition to technological differences, produce varying investment and electricity price profiles. For country-level details of the scenarios, see the sources listed in the Appendix.

Spending on Greening the Electricity Sector

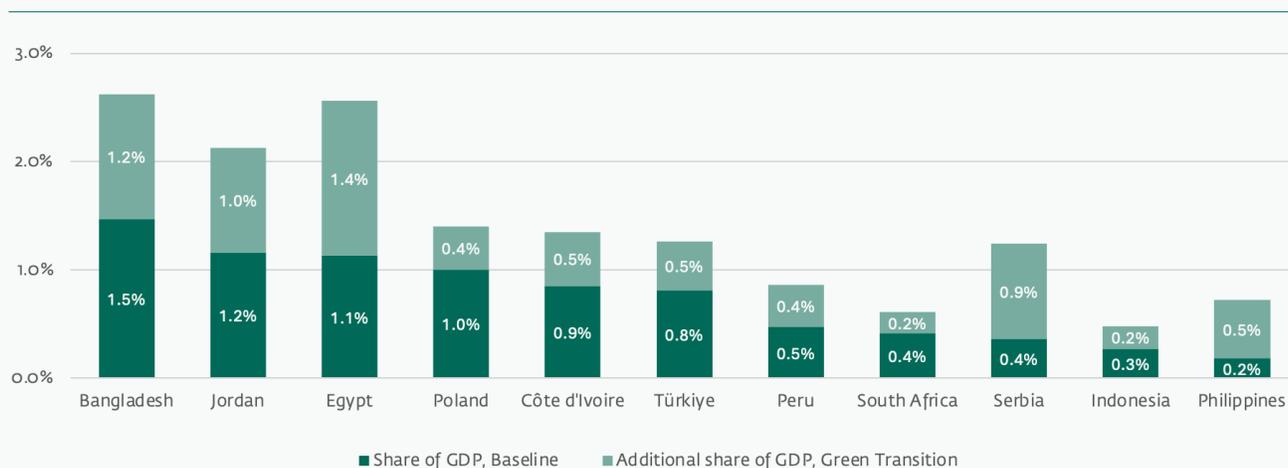
Climate mitigation investment in the scenarios primarily focuses on electricity sector investments, which are assumed to be financed by external public and private sources.^{26,27} The electricity sector globally accounts for over one-third of global CO₂ emissions, and with energy demand growing globally, decarbonization of the electricity sector is the primary focus for climate mitigation (Dhakal *et al.*, 2022). Figure 3 shows the share of gross domestic product (GDP) spent on electricity sector investment²⁸ under the baseline scenario (dark green), or assuming there are no ambitious climate policies and investments implemented by the sampled countries. This is compared with the additional spending on decarbonizing the electricity sector under the green transition scenarios (light green).

All countries increase investments in the electricity sector when they implement ambitious climate action, and in some cases, investments double or triple compared to the baseline scenario.²⁹ Increased electricity sector investments trigger employment gains in sectors that build up these new

capacities, i.e., economies will need more workers for construction and electricity generation, as well as sectors supplying inputs to these sectors. Importantly, the shift in the energy-mix – for example, from more fossil-based electricity generation to renewable energy sources – also reshapes supply chains. The more ambitious the transition is, the more the supply chain for electricity generation changes.

The green transition scenario assumes higher energy system investments than in the baseline scenario, leading to direct economic and employment gains. While this means there is no comparison to a scenario without any transition-related investments, it is important to note that the increased investment levels themselves are a product of the transition. Greater urgency to address climate risks has already catalyzed higher energy sector investments in recent years (IEA 2025), suggesting that ambitious transition policies can plausibly unlock additional capital flows.

Figure 3: Electricity sector investment as share of GDP (%)



Source: Low-carbon scenarios in the World Bank Group CDRs and external sources²⁷

²⁶ “Power sector” and electricity generation are used interchangeably in this text.

²⁷ They do not trigger crowding-out of other investments in the scenarios. See Pollitt & Mercure 2018 for a discussion.

²⁸ Electricity sector investment goes to renewable energy, the grid, and gas turbines.

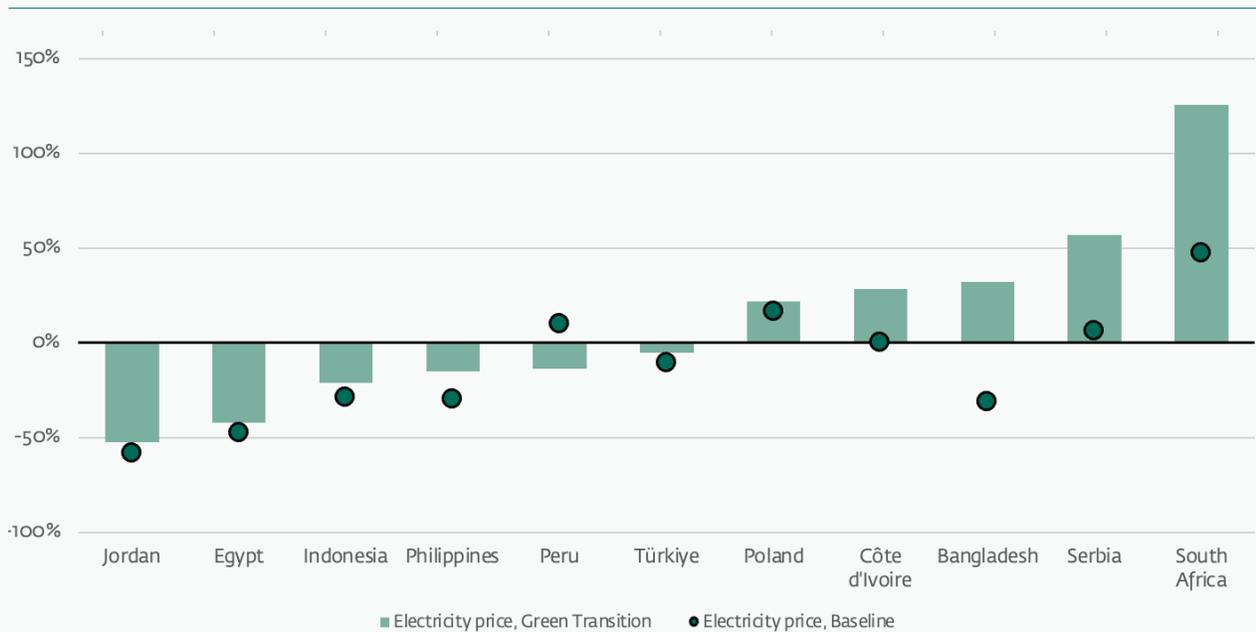
²⁹ For example, in Bangladesh climate mitigation efforts raise investments into the electricity sector from 1.5 to 2.6 percent of GDP. In Egypt and Jordan, investments also more than double, reaching 2.6 percent and 2.1 percent of GDP, respectively. In countries like Serbia and the Philippines, where baseline investments are much lower at 0.4 percent and 0.2 percent of GDP, green investments push the total investments of the electricity sector to 1.2 percent and 0.7 percent, more than tripling spend.

Electricity Prices

Electricity sector investments, combined with a carbon price under the green transition scenario, affect electricity prices.³⁰ Figure 4 shows the development of electricity prices, comparing the current levels to the estimated 2040 values for the baseline scenario and the green transition scenario. Electricity prices are higher under the green transition scenario in almost all countries compared to the baseline.³¹ These price changes are consistent with modelling results from the external sources specified in the Appendix.

Electricity price changes have multiple effects on employment. On the one hand, higher electricity prices can dampen consumption, both directly and indirectly, by raising the cost of goods and services that rely on electricity. This decline in consumption may lead to reduced production, and consequently, lower employment levels. On the other hand, the green transition scenario introduces a range of counterbalancing dynamics, such as renewable energy investments that boost employment, changes in energy supply chains, and revenue recycling. These forces interact, and the overall impact on employment will depend on how these factors play out in each country context.

Figure 4: Change in electricity prices under the baseline and green transition scenarios (% change comparing 2024 to 2040)



Source: Low-carbon scenarios in the World Bank Group CCDRs and external sources²⁷

³⁰ Many factors affect electricity prices, but the scenario keeps all structural properties constant and only reflects the direct and indirect responses to levying a carbon tax and investing in new generation capacity. Price changes are based on the country reports.

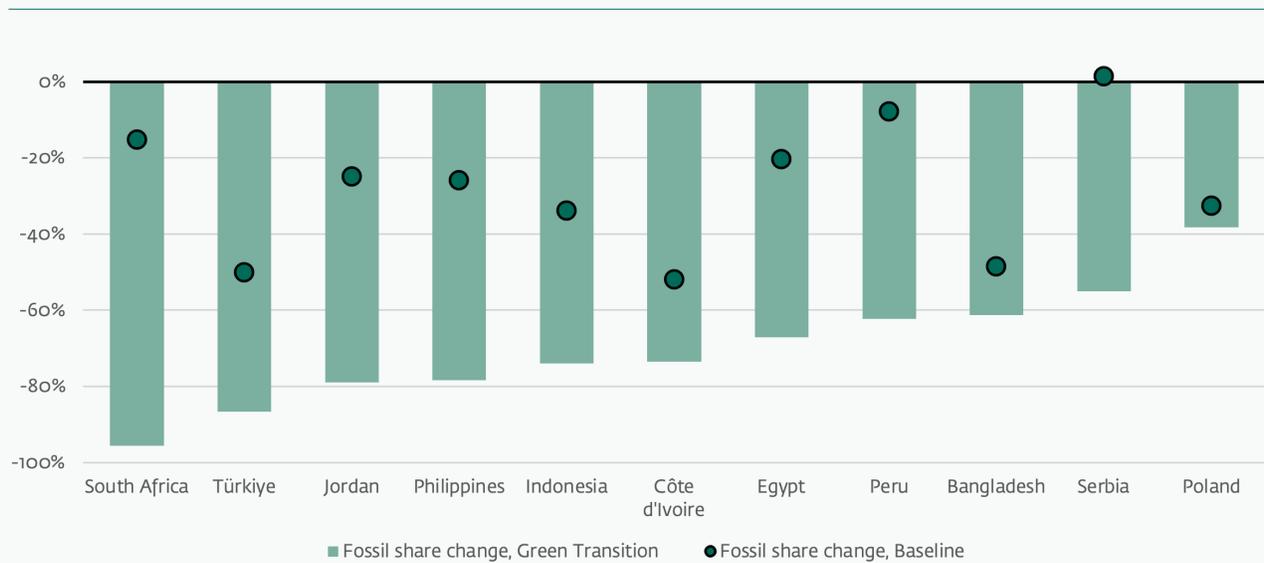
³¹ Peru is an exception to this, where the lower expected natural gas share is expected to decrease overall electricity prices (IDB 2021).

Fossil Fuel-based Generation

Almost all countries expand their renewable-based energy generation and replace or retire fossil fuel-based energy generation, even under the baseline scenario. As shown in Figure 5, the reduction of fossil fuel use in the green transition scenarios depends on each country's climate ambition and current energy mix. In South Africa, where electricity generation is highly reliant on coal, the baseline scenario results in a 15 percent reduction in fossil fuels, compared to a 90 percent

reduction under the green transition scenario. Peru and Serbia also experience large differences in fossil fuel dependence between their baseline and green transition scenarios in 2040. Conversely, countries like Poland and Côte d'Ivoire, where progress towards renewables energy is already high under the baseline scenarios, the additional reduction in fossil fuel reliance under the green transition scenarios is smaller.

Figure 5: Change in fossil-fuel based generation under baseline and green transition scenarios (% change comparing 2024 to 2040)



Source: Low-carbon scenarios in the World Bank Group CCDRs and external sources²⁷

IV. Gender-Agnostic Green Transition Scenario

Section Summary

The **gender-agnostic green transition scenario** models ambitious climate action without changes to the current gender structure of labor markets.

Green investments—particularly in the electricity sector—create new jobs, but these are disproportionately taken up by men due to existing gender gaps in infrastructure, manufacturing, and related sectors. Around **69 percent of direct jobs from green investments go to men**, and 62 percent when the employment effects of carbon pricing are included.

Country-level outcomes vary widely depending on economic structures and women's existing employment levels. For example, women gain only 14 and 16 percent of new jobs in Egypt and Jordan under the *gender-agnostic* scenario, but up to 59 and 86 percent of new jobs in Poland and Serbia.

This section presents the results of the *gender-agnostic* green transition scenario ('gender-agnostic scenario'), which assumes that countries pursue ambitious climate action without additional gender-focused measures. It explores how the green transition affects the demand for

jobs across sectors, assuming the current gender structure of the labor market remains unchanged, particularly, the number of women who seek out work. In the *gender-agnostic* scenario, carbon tax revenues are recycled into general consumption, boosting disposable income.

The Scenario: Ambitious Climate Action with Existing Gender Structures

The net employment effect of the green transition scenario depends on the interplay of multiple factors but there are two significant drivers that influence changes. The first is mitigation-related investments, in this case, investments in the electricity sector. Boosting electricity sector investments and changing the underlying supply chain by switching from fossil fuels to renewables creates demand for both capital goods and for services related to these investments, provided domestically or abroad. For example, it could create new demand for solar panels or wind turbines, as well as for engineers and construction workers installing these technologies. At the same time, there may be a loss of employment

for fossil-fuel producers, who could be located either domestically or abroad.

The second driver is the implementation of carbon pricing, which has two effects. First, it increases the cost of carbon-intensive goods and services, decreasing demand for sectors producing these. Consequently, employment in these sectors also decreases, resulting in job losses. At the same time, revenues collected from carbon pricing are recycled. Under the *gender-agnostic* scenario, governments redistribute these new revenues through cash transfers to households, boosting disposable income (see flow of the effects in Figure 6). These cash transfers increase general consumption, which stimulates production and supports jobs growth.³²

³² It is important to note that increased consumer spending is only partially used for consuming domestically produced goods and services. An increase in consumer spending will likely boost imports as well as domestic production. The ratio between the two is dependent on the country's consumption structure.

Figure 6: Flow of effects in the gender-agnostic scenario

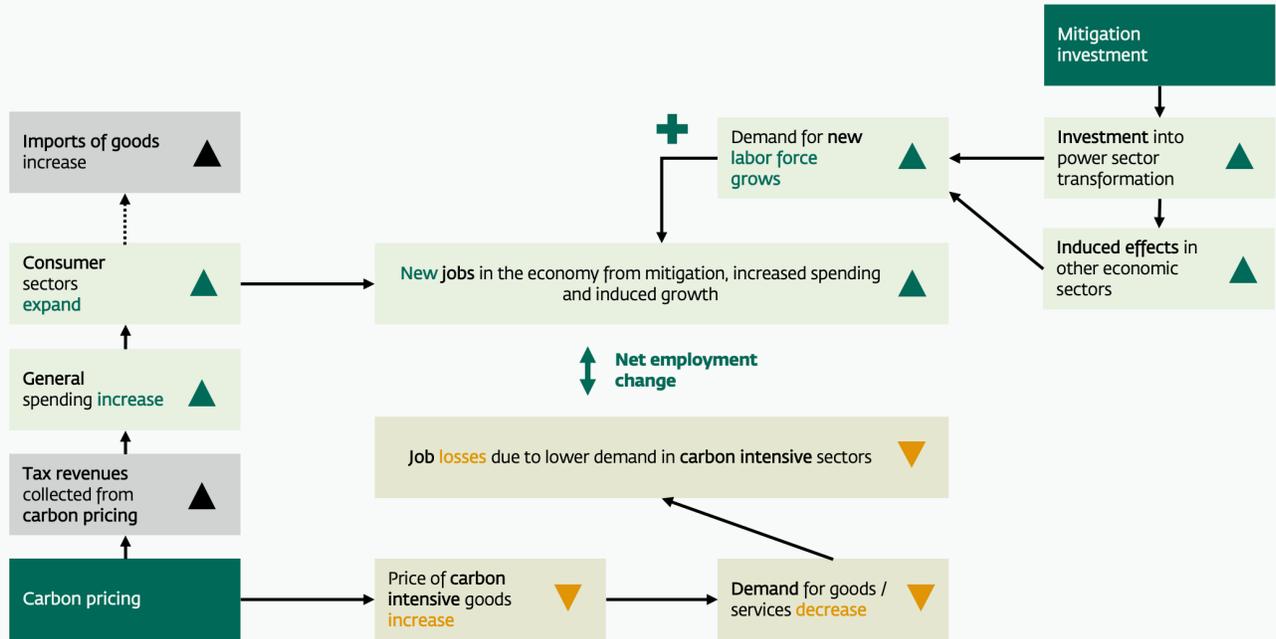


Photo: © Enrico Fabian / World Bank

Results of the Gender-Agnostic Green Transition Scenario

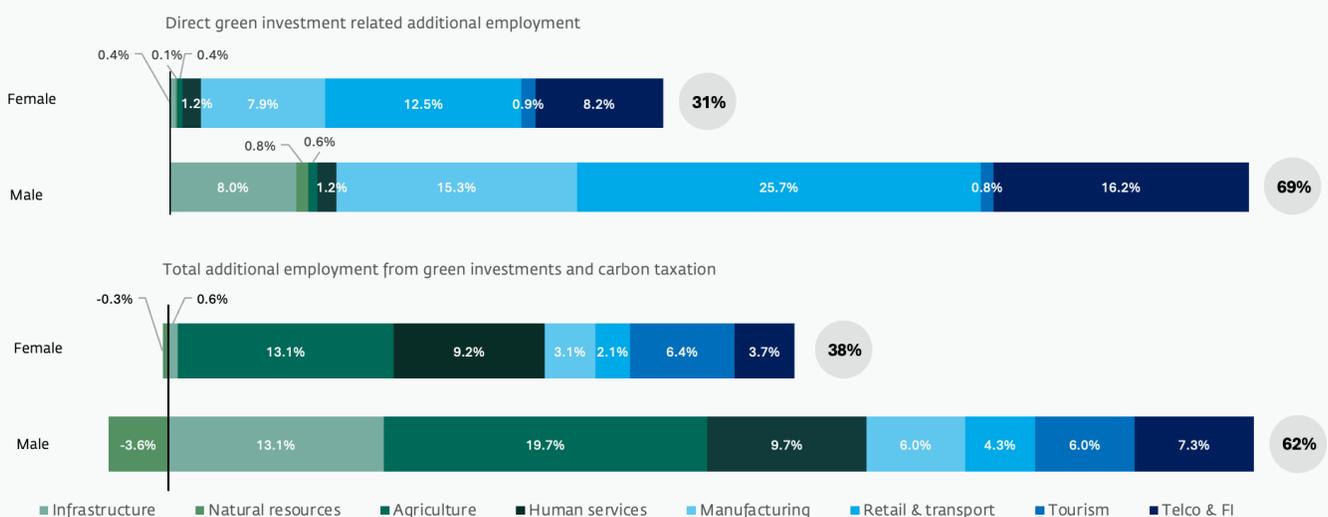
Additional Jobs by Sector

Figure 7 shows how additional labor demand – new jobs – under the *gender-agnostic* scenario is shared between women and men in the selected countries if the gendered structure of labor markets is unchanged. The top figure shows the distribution of jobs resulting from *direct effects* of the renewable energy investments, while the bottom figure includes investment and carbon pricing together and shows economy-wide new jobs. Both results are reported for 2040.

The direct jobs connected to green investments are biased towards men. Given current sectoral employment shares, men would occupy 69 percent of these new jobs, versus 31 percent held by women (top graph in Figure 7). This stems from a large employment gap between women and men in infrastructure-related jobs, including construction, as well as in other sectors impacted by renewable energy investments, including manufacturing, telecommunications, and finance. These sectors all gain more jobs, but a large share will be held by men.

Including the induced and indirect jobs linked to carbon tax and revenue-use policies improves these outcomes. The bottom graph in Figure 7 shows the distribution of new jobs from green investments *and* carbon pricing with associated revenue-use policies, demonstrating the economy-wide employment effects in response to the entire green investment and green-enabling policy package. Carbon revenues are recycled into household income support, boosting consumer spending and increasing employment in sectors like agriculture (i.e., food production), tourism, and human services. The gender gap is less pronounced under this whole-of-economy view, with men occupying approximately 62 percent of new positions, versus 38 percent held by women. This is because men now experience job declines in fossil-fuel based industries, while women gain from induced jobs in a broader range of non-infrastructure sectors, which tend to be more favorable to women. Infrastructure jobs, however, remain almost exclusively held by men.

Figure 7: Composition of additional employment for women and men under gender-agnostic scenario (% difference from baseline)



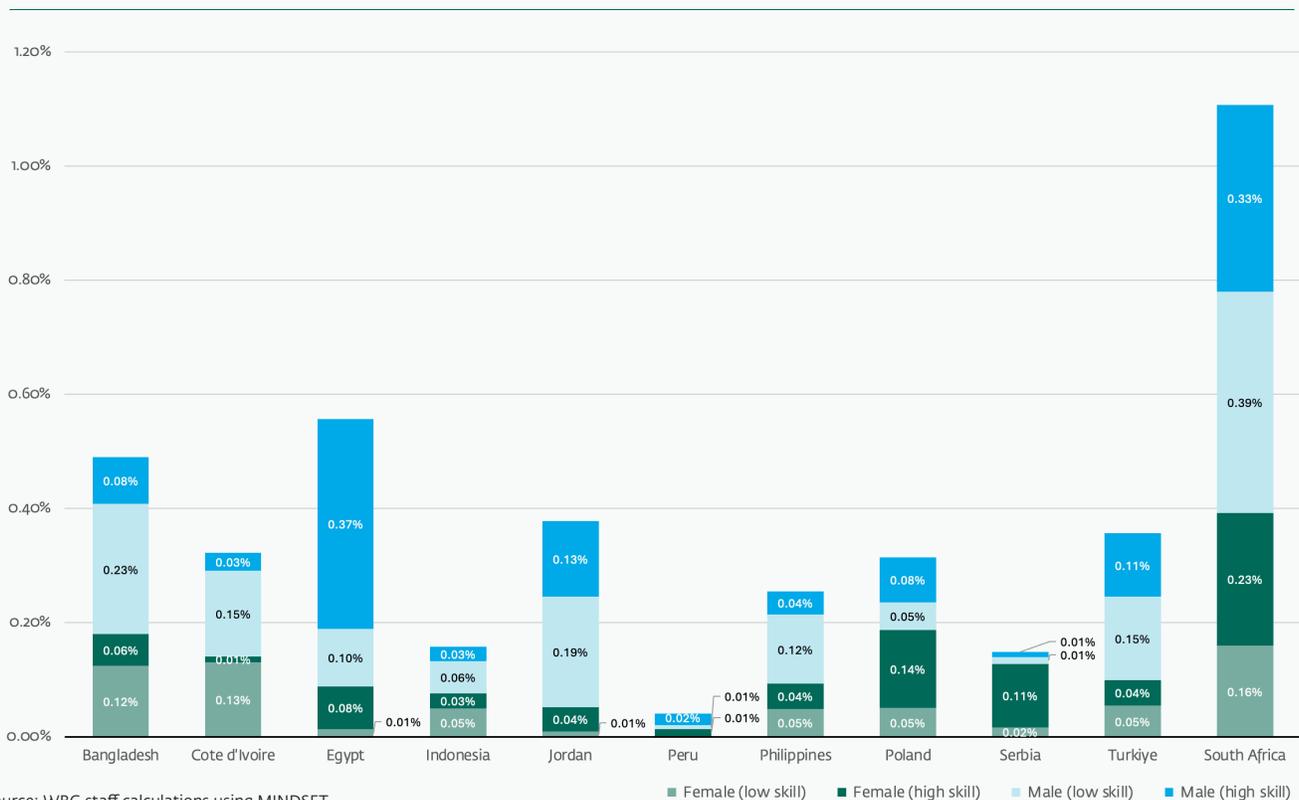
Source: WBG staff calculations using MINDSET

Additional Jobs by Country and Skill Level

On aggregate, new jobs created under the green transition scenario are mostly taken up by men, but each country varies depending on its climate ambitions and economic structure. Figure 8 shows country-level results. In countries like Egypt and Jordan, where women’s labor market participation is already low, only 16 percent and 14 percent of additional jobs respectively are expected to go to women. Serbia and Poland, where female labor participation is higher, experience employment gains that favor women: 86 percent and 59 percent of the new jobs go to women, respectively. In both countries, many new jobs are connected to a consumption boost from recycling carbon tax revenues, with sectors such as finance, human health, and hospitality recruiting a substantial number of women in the gender-agnostic scenario.

Looking more closely at the disaggregation into ‘high-skill’ and ‘low-skill’ workers under the *gender-agnostic* scenario, job additions favor low-skilled, often majority-male workforces in several countries.³³ These include Bangladesh, Côte d’Ivoire, Jordan, the Philippines, and Türkiye. Meanwhile Egypt, Poland, Serbia, and – to a lesser extent – South Africa, new job gains are primarily higher-skilled opportunities. However, these effects are also produced by limitations in the model, which assumes that the distribution of skill needs within sectors is constant – in other words, that countries with a lower-skilled workforce today also gain more lower-skilled jobs in the green transition.³⁴ Furthermore, predicted job additions do not account for the mobility barriers that workers are likely to experience in moving from one job to another (see Box 4 for further discussion on mobility constraints).

Figure 8: Employment gains under gender-agnostic scenario by country, gender, and skill level (% difference from baseline)



³³ ‘High-skill’ and ‘low-skill’ categories are model constructs (based on education levels), rather than detailed occupational skill levels.

³⁴ This is a clear limitation of the model, as it is likely that within sectors, the need for a higher-skilled workforce might increase as countries economically progress. However, this effect is currently outside of the scope of the modelling exercise.

V. Gender-Inclusive Green Transition Scenario

Section Summary

The **gender-inclusive green transition scenario** models ambitious climate action alongside investments in the care sector, which enable more women to work. These investments are financed through recycling carbon revenues.

Under this scenario, the majority of countries experience an '**Inclusion Premium**' – the total number of new jobs is boosted and economic growth increases.

The share of new jobs that favor women also increases across the sample to 54 percent, compared to 38 percent under the *gender-agnostic* scenario.

Country-level outcomes vary widely. For example, women are expected to gain 42 percent and 35 percent of new jobs in Egypt and Jordan, while in Bangladesh and the Philippines they could take up 60 and 57 percent of new jobs, respectively. Job growth for high-skilled women is generally higher than for low-skilled women.

There is a large untapped pool of educated women that could help meet growing workforce demands under the green transition scenario. Furthermore, employers in countries with a small number of high-skilled male workers (e.g., Bangladesh, Egypt, Indonesia) could reduce recruitment costs and alleviate hiring pressures by employing more women.

The results from the previous section demonstrate that employment gains in the green transition could be unequally distributed in EMDEs, with women taking up fewer jobs than men. This section seeks to answer two questions: 1) how do these outcomes change with the introduction of additional gender-inclusive measures, and 2) what are the business and economic gains from integrating an inclusion focus in low-carbon, climate-resilient transition pathways?

The results show that gender-focused measures accompanying green investments – in this case, investments in the care sector – can create more

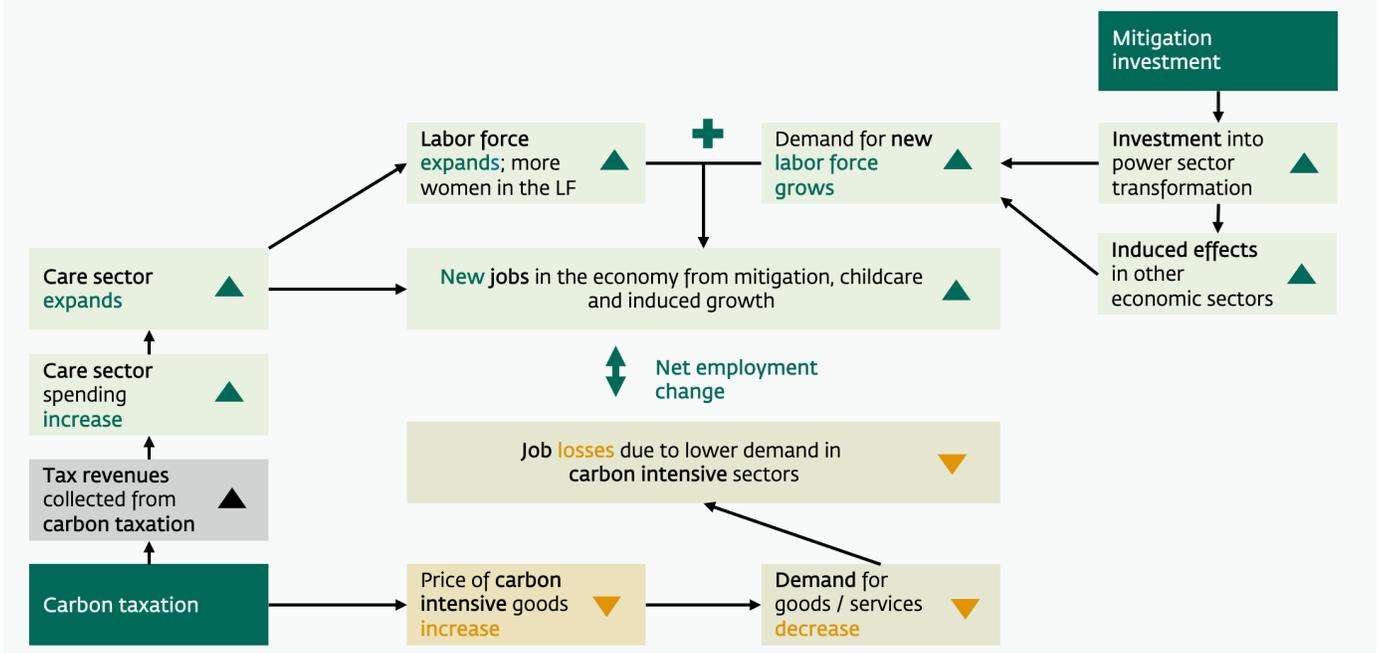
employment opportunities in green transitions and make these opportunities more accessible to women. The total number of jobs created is higher under the *gender-inclusive* scenario than under the *gender-agnostic* scenario, and most countries also benefit from an 'Inclusion Premium', with economic growth increasing by up to 0.3 percent compared to the scenario with no gender-related interventions. Furthermore, expanding the care sector enables more people—especially women—to participate in the workforce. This broadens the available talent pool, making it easier for employers to find the skills they need, reducing recruitment costs and supporting business continuity.

The Scenario: Enabling more Women to Work in Green Transitions

This section describes the *gender-inclusive* green transition scenario ('gender-inclusive scenario'), which includes additional measures that change the gendered structure of the labor market. This *gender-inclusive* scenario is almost identical to the previous scenario, but instead of recycling revenues towards household income support, the carbon pricing revenues are invested into the care sector.^{35,36} These care sector investments support publicly provided care services and care infrastructure, and include spending on childcare, pre-primary and primary education, as well as spending on residential care, including nursing facilities and social work to support elderly care. The scenario design considers both operating expenditure on these services (i.e., paying for salaries, resources) and capital expenditure to expand infrastructure (e.g., building kindergartens or elderly care facilities).

Care sector investments, in addition to carbon pricing and renewable energy investments, influence employment outcomes (see flow of effects in Figure 9). Under this scenario, the main exogenous drivers for job additions are still the carbon price increase and the investments to transform the electricity sector. However, now the revenues of the carbon tax support increased spending in the care sector, which produces important changes in the labor market (see Box 3 for discussion on the role of the private sector in the care sector). Foremost, in addition to new jobs in the value chains of renewable energy technologies, there is now higher demand for workers along care value chains. This includes new demand for teachers, assistants, nurses, social workers, and other caregivers, as well as demand for workers in related activities like transport services and catering. Spending also generates demand for new infrastructure to provide care services, including the construction of childcare centers, schools, and residential care facilities.

Figure 9: Flow of effects in the gender-inclusive scenario



35 E.g., the gender-inclusive and gender-agnostic scenarios are identical in terms of electricity sector investments (volume and financing).

36 While acknowledging that care work is often informal and unpaid, due to modelling constraints the report defines the care sector for the purposes of modelling as care services in the formal economy, encompassing sections P and Q of ISIC Rev. 4. This enables modelling that honors the specific structures of the care economy (e.g., gender ratios, supply-chain connections), even though these sectors also contain activities that go beyond the definition of the care economy.

The expansion of the care sector positively influences women's employment outcomes through two key channels.

First, women can seek out new formal employment opportunities in the expanding care sector, where they are likely to access jobs more easily.³⁷ Second, expanding the care sector can free women's time for other priorities, including returning to jobs or accessing the labor market as new employees, as self-employed workers, or as entrepreneurs. It is important to recognize that expanding the care sector does not on its own overcome other barriers to women's employment in the green transition; see Box 2 for an explanation of why the scenario uses care sector investments as the exogenous gender-inclusive intervention and the importance of addressing other barriers to women's economic participation.

The effect of an expanded care sector on women's uptake of new employment opportunities varies by country.

For example, female labor force participation increases by an estimated six percentage points in Indonesia and by eight percentage points in South Africa when access to childcare services is provided (FRAYM 2021 & FRAYM 2022). Furthermore, as women's labor force participation increases, they are expected to seek out jobs and shift the gender composition across sectors, although this process will not happen uniformly or at the same pace across all sectors. To reflect this, the analysis estimates sector-specific changes in gender composition in response to increased female labor force participation and applies these adjustments to sectoral employment projections (see Appendix for methodology).

Box 2: Care investments as gender-inclusive measure

Care sector investments were selected as the exogenous gender-inclusive measure in the *gender-inclusive* green transition scenario for the following reasons:

- 1. Expanding the care sector has significant positive effects on women's economic participation.** Unpaid care responsibilities remain one of the most significant constraints to women's paid employment, holding millions of women worldwide back from accessing and seeking out jobs (ILO 2024c).³⁸ Investments in the care sector are estimated to generate up to 299 million jobs worldwide – 78 percent for women – by 2035 (Addati *et al.* 2022), with stronger job multiplier effects than equivalent investments in other sectors (De Henau & Himmelweit 2020).
- 2. Climate change and demographic shifts are expected to increase demand for care, making care sector investments important for climate adaptation and social protection.** Climate change worsens health outcomes, increasing the need for care, and disrupts public care services, for example by damaging physical care infrastructure like clinics and hospitals (WOCAN 2025, MacGregor *et al.* 2022b). Furthermore, the rapid pace of population ageing in some countries is increasing demand for care services and social protection, straining the supply of care workers and public services (ILO 2024c).
- 3. Care occupations are typically low carbon and in turn, support climate ambitions.** Investments in the care sector produce fewer greenhouse gas emissions compared to equivalent investments in other sectors (Women's Budget Group 2020). Furthermore, jobs in health and care sectors emit significantly fewer greenhouse gasses than jobs in the manufacturing, agriculture, and oil and gas sectors (Diski 2022). In turn, channeling carbon tax revenues to expand the care sector aligns with low-carbon, climate-resilient green transition priorities.

³⁷ The model assumes that women continue to provide most of the child and social care services in the formal economy and in turn, gain most from the expansion of the care sector. Efforts should continue to promote the redistribution of unpaid care responsibilities at home and formal care occupations between women and men.

³⁸ For example, in 2023, 708 million women (aged 15 or older) were not participating in the labor force globally because of care responsibilities (compared to only 40 million men) (ILO 2024c).

- 4. Beyond employment, there are broader economic benefits of investing in the care sector.** Investments in the care sector can improve child outcomes, family welfare, business productivity, and overall economic development (Ahmed *et al.* 2023). For childcare, the return on investment is high. For example, for every \$1 invested in quality childcare, between \$3 and \$7 dollars in income are generated in Indonesia and South Africa, respectively (see FRAYM reports).

It is important to acknowledge that limited access to care services and women's disproportionate care responsibilities are not the only barriers limiting their employment in green transitions. Other factors—such as restrictive social norms, workplace discrimination, and skills mismatches in sectors with low historical representation of women—also play a role and need to be addressed in parallel to achieve the outcomes modeled in this report.³⁹ A combination of Just Transition policies, including skills development for women, social protection to support worker mobility across sectors, and social dialogue with firms, communities, and local government to challenge gender stereotypes, will be necessary. Modeling interventions that address these constraints—such as targeted upskilling for women, inclusive hiring practices, or anti-discrimination policies—should also be considered in future research (see Part 3: Conclusions and Recommendations).

A note on the model: For simplicity, only the employment effects of investing in the care sector are modeled in this report. If the additional economy-wide spillover effects were considered, the positive effects on GDP (see Figure 17) could be even higher under the *gender-inclusive* scenario.

Box 3: The role of the private sector in the care sector

While care services and social protection programs are largely publicly funded in EMDEs, the private sector, including employers and investors, can play an important role in increasing access to and affordability of high-quality care. Private sector actors can provide child and social care services and the related infrastructure, as well as develop innovative solutions to address care challenges. For example:

- 1. Firms can support childcare for their employees**, including on-site childcare centers, off- or near-site childcare centers, childcare vouchers and subsidies, back-up and sick child services, and resources and referral services to other third-party childcare providers.⁴⁰
- 2. Firms can support their employees with their care responsibilities through flexible, family-friendly policies** that encourage more balanced care responsibilities in households, for example through inclusive parental leave policies, paid parental leave, and hybrid working arrangements. Family-friendly workplace policies can enable firms to attract and retain talent, boosting productivity and profits (IFC 2017).
- 3. Investors can finance the physical infrastructure** – such as childcare centers, nursing homes, and health clinics – where care services are provided.
- 4. Investors can finance care enterprises**, including innovative technologies to help families access and navigate care.

A note on the model: The model assumes that revenues generated from the carbon tax are reinvested into the care sector, meaning its growth is driven by public expenditure. However, care sector investments and service delivery can also originate from the private sector. Mobilizing both public and private contributions is likely to enhance employment and economic outcomes across the sampled countries.

³⁹ For recent review of demand-side and supply-side barriers to gender equality in the workplace, see Kronfol *et al.* 2019. For broader labor market frictions arising in green transitions, including for women, see Knudsen *et al.* 2025.

⁴⁰ See additional recommendations for employer-supported childcare in IFC 2019.

Results of the Gender-Inclusive Green Transition Scenario

The results of the *gender-inclusive* green transition scenario are described in subsequent paragraphs, starting with how carbon pricing revenues boost activities in the care sector in each country, increasing the number of jobs created in the green transition. The report then examines how the expansion of these

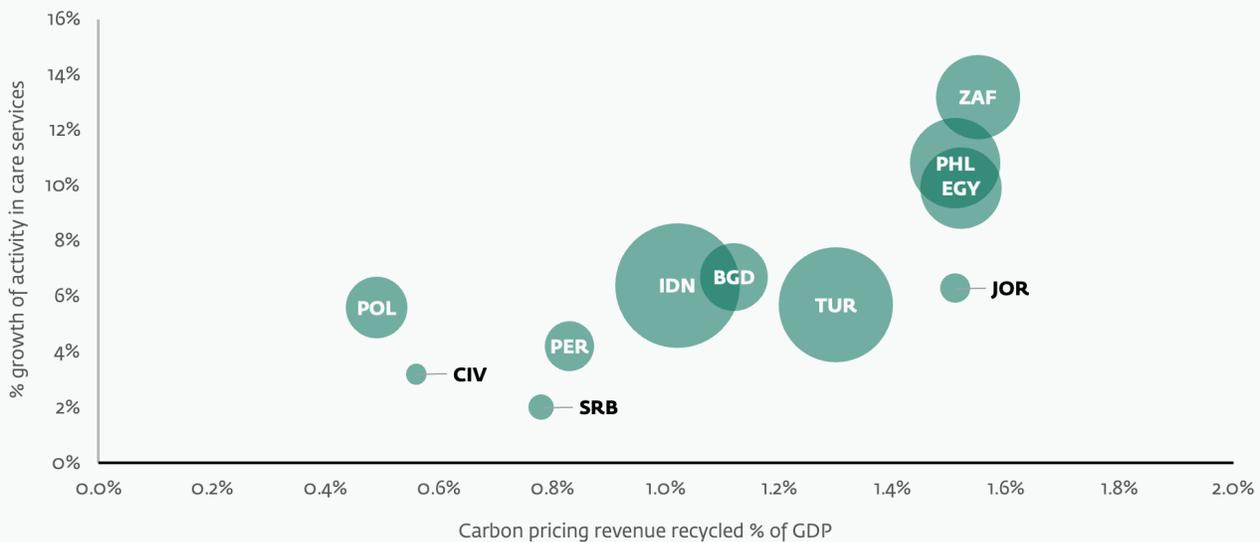
activities leads to a higher uptake of jobs by women and then discusses how the skills profiles of women entering (or re-entering) the labor market match with the skills required by these new jobs. Finally, the effects of the inclusive measures on overall economic activity (GDP) are explored.

Effects of Additional Care Investments

The effects of additional spending on the care sector from carbon pricing revenues are different for each country, depending on how much revenue they can reinvest from carbon pricing and how established their care sectors are currently. Figure 10 shows that South Africa, Egypt, and the Philippines each recycle

revenues amounting to approximately 1.5 percent of their GDP. However, this results in varying levels of growth in their care sectors. In countries with small care sectors, new investments under the *gender-inclusive* scenario have a larger impact, significantly expanding available care services.

Figure 10: Carbon pricing revenues (as shares of GDP) and growth in care sector activity in gender-inclusive scenario



Source: WBG staff calculations using MINDSET

Note: The size of the bubbles represents the volume (in USD) of the recycled revenue



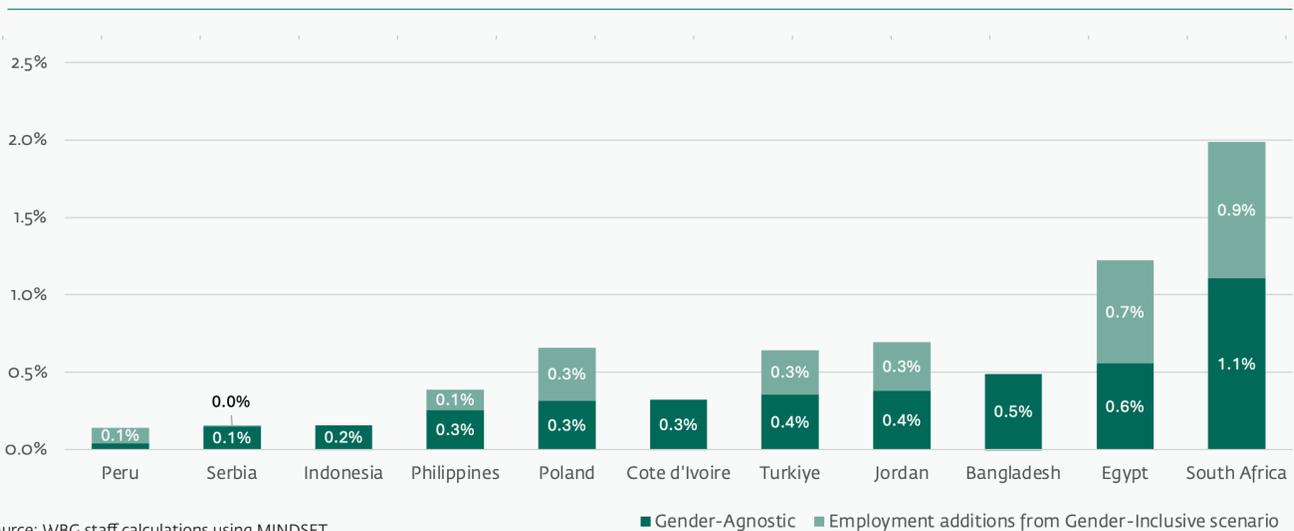
Photo: © Dominic Chavez/World Bank

Additional Jobs by Sector

In most countries, the gender-inclusive green transition scenario results in more jobs overall than the gender-agnostic scenario. Figure 11 shows the number of additional jobs created under the *gender-inclusive* scenario (shown in light green) compared to the expected employment additions under the *gender-*

agnostic scenario (shown in dark green). Economy-level employment is up to 0.9 percent higher on top of the gender-agnostic scenario, due to stronger growth, a more labor-intensive and domestic supply-leaning economy. Employment additions are particularly pronounced in South Africa, Egypt, Jordan, Poland, and Türkiye.

Figure 11: Net employment gains from the gender-inclusive scenario compared to the gender-agnostic scenario (% difference from baseline)⁴¹



⁴¹ Only employment additions are shown; only in the case of Bangladesh the *gender-inclusive* scenario results in lower net employment (0.5% vs 0.3% compared to baseline) than the *gender-agnostic* scenario.

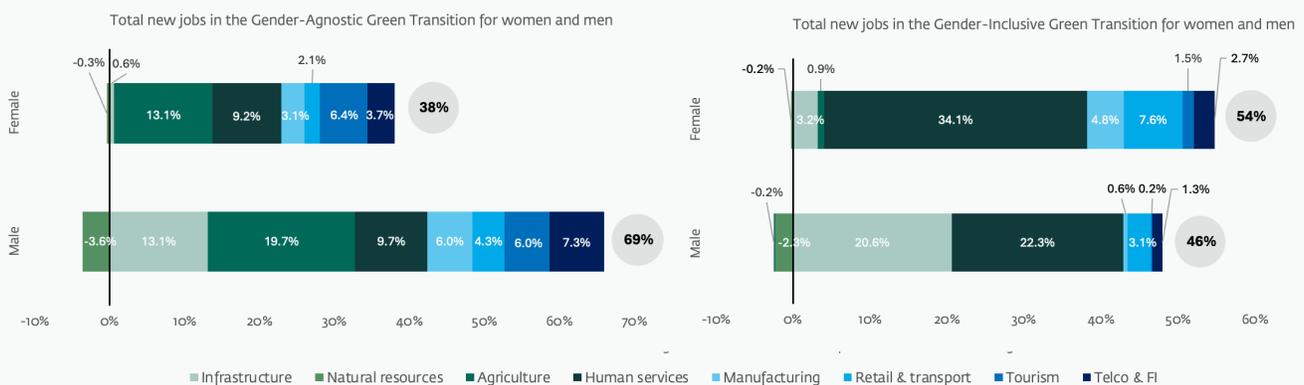
Under the gender-inclusive green transition scenario, the share of new jobs that favor women increases to 54 percent, compared to 38 percent under the gender-agnostic scenario (see Figure 12). This is because the investments in the care sector under the gender-inclusive scenario enable more women to enter or re-enter the labor market, while also altering the structural composition of new jobs created under the green transition. Expanding the care sector generates new jobs in care value chains, for example, in setting up and running facilities and services related to childcare, early education, and elderly care. Given existing patterns of skills and employment, women may be particularly well positioned to access these opportunities.⁴² At the same time, expansion of the care sector allows women to seek additional employment opportunities in other sectors where labor demand is increasing through green policy and investment packages.

Similar to the *gender-agnostic* scenario, labor demand will decrease in the fossil fuel-dependent natural resources sector, including mining and extractives, which largely affects men, who make up the majority of workers in these sectors. The construction sector, which is a

large and labor-intensive sector in most countries, expands in the green transition through investments in climate mitigation, including building new electricity generation capacities, improving the energy efficiency of the energy grid, and investing in climate-resilience infrastructure. The construction sector will also see additional labor demand from investments in care services and facilities, including the construction of new buildings to provide these services.

However, as a result of how the carbon tax revenues are recycled, there are important differences in the sectoral distribution of new jobs in the two scenarios. As Figure 12 shows, the *gender-inclusive* scenario creates more jobs that are concentrated in infrastructure and human services, with new jobs created in renewable energy infrastructure, care infrastructure (e.g., schools, kindergartens, nursing homes), and the human services to provide care support. This differs from the *gender-agnostic* scenario, where employment also increases in renewable energy infrastructure but also through 'induced jobs' in agriculture and other services, which grow from the carbon tax revenues that boost household spending.

Figure 12: Employment gains under gender-inclusive and gender-agnostic scenarios



Source: WBG staff calculations using MINDSET

⁴² Modeling the effects of investing in the care sector on women's employment may inadvertently reinforce existing gender stereotypes that associate women primarily with care work. Efforts to encourage broader participation in the care sector are important to avoid reinforcing gender stereotypes.

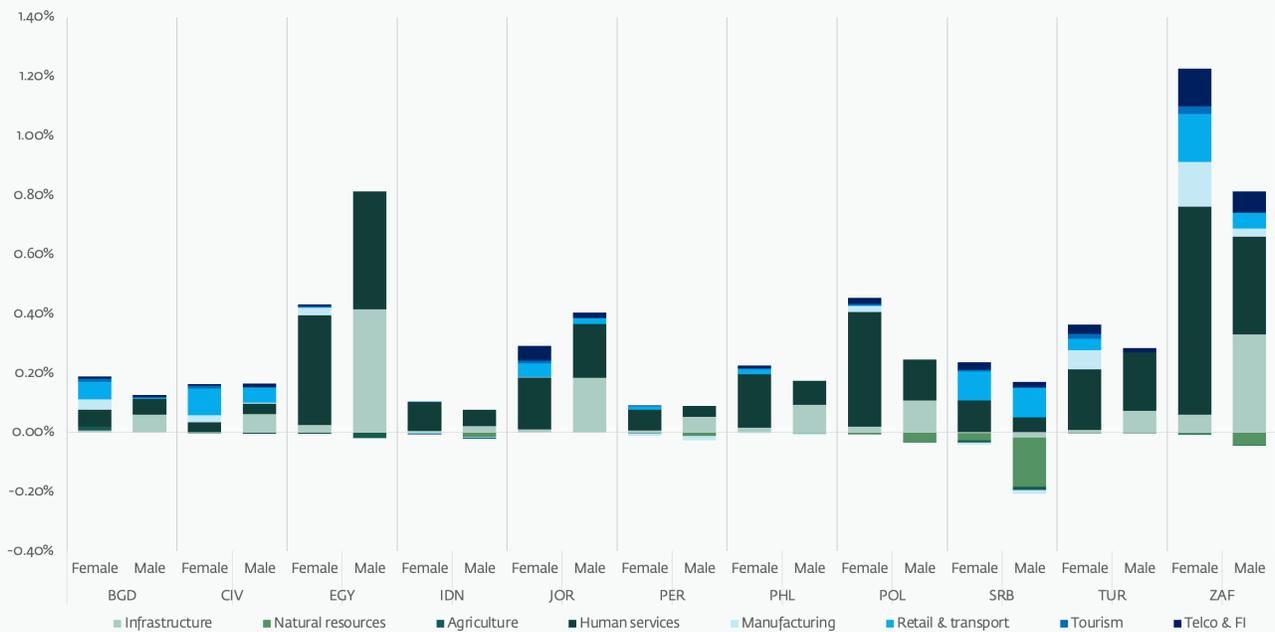
Additional Jobs by Country

The global composition of new employment additions under the gender-inclusive scenario now slightly favors women and outcomes are improved at the country level, but to varying levels. As Figure 13 shows, in several countries, employment additions still favor men, potentially widening employment-related gender gaps in green transitions, even with the additional investments to increase women’s employment. This is observed for Jordan and Egypt, where women’s labor participation rate is already low and most job growth is observed in the infrastructure sector due to energy sector investments, where jobs – at least in the short term – are less accessible to women. Nevertheless, outcomes are much stronger with inclusive

measures: women’s share of new jobs rises from 14 percent to 42 percent in Jordan and from 16 percent to 35 percent in Egypt under the *gender-inclusive* scenario.

Bangladesh and the Philippines offer a useful comparison to Egypt and Jordan. While all four countries invest similarly in electricity and collect comparable carbon revenues, Bangladesh and the Philippines have much higher female labor force participation. Gender-inclusive measures open substantial opportunities for women, with their share of new jobs rising from 37 percent to 60 percent in Bangladesh and from 36 percent to 57 percent in the Philippines under the *inclusive* scenario.

Figure 13: Employment gains under gender-inclusive scenario by country, gender, and sector (% difference from baseline)⁴³



Source: WBG staff calculations using MINDSET

⁴³ Serbia stands out in the scenario results, with a high loss of male jobs. This is driven by multiple factors. First, the baseline scenario for Serbia considers no reduction of fossil-based power generation, therefore the relative strength of mitigation is high. Second, Serbia relies on domestic lignite for energy, which means that a reduction of fossil-based energy generation will also have upstream impacts reducing linked mining in the country. Third, the mining sector is particularly male dominated in the country, with overall employment close to 90 percent male, which in turns means that the impacts on the mining sector are primarily felt by men.

Additional Jobs by Skill Level and Supply of Workers

This section explores the distribution of jobs between high-skilled and low-skilled workers under the gender-inclusive scenario. It also examines how new labor demand aligns with the available labor supply – in essence, whether there is a workforce available to meet the increased demand generated in green transitions. This section distinguishes between high- and low-skilled workers using binary categories based on formal education levels typically required for certain occupations. Individuals with basic or less than basic education are classified as *low-skilled*, while those with intermediate⁴⁴ or higher education are considered *high-skilled*.⁴⁵

Job growth for high-skilled women generally surpasses that for low-skilled women under the

gender-inclusive scenario. Figure 14 illustrates employment additions for low-skilled and high-skilled women relative to each country's female labor force participation rate (fLFP) and shows that gains for high-skilled women are generally higher. This pattern is supported by existing research which finds that jobs created in green transitions may require higher skills than traditional jobs, potentially widening inequalities between low- and high-skilled workers. However, in countries with low female employment—such as Jordan, Egypt, and Türkiye—job growth for low-skilled women is notably higher than in countries with higher female labor force participation, such as Peru and Indonesia, suggesting that there are still meaningful opportunities for women in countries where their employment is more limited.

Figure 14: Employment additions (high skill & low skill) for women in gender-inclusive scenario (% difference from baseline)



Source: WBG staff calculations using MINDSET

⁴⁴ Intermediate is defined as minimum of upper secondary education completion.

⁴⁵ These labels are used for convenience to associate certain jobs with typical education or skill levels, but the actual skill requirements within sectors and occupations are far more varied. See Part 3: Conclusions and Recommendations, where this point is explored in more detail.

High-skill Jobs

Figure 15 provides a detailed view of high-skilled workers examining: 1) the current labor force participation rate of high-skilled women and men (solid bars), 2) the share of women and men with intermediate or higher education who are currently not working or looking for work (shaded bars), and 3) new high-skilled employment additions under green transitions (diamonds). Several patterns emerge. First, while men slightly outnumber women in intermediate and advanced education across all countries, the gap is small—indicating similar levels of higher-skill attainment. However, a significantly larger proportion of high-skilled men are employed or actively seeking work compared to women, indicating that despite similar education levels, high-skilled women are underrepresented in employment. This gap is especially pronounced in Egypt, Jordan, and Bangladesh.

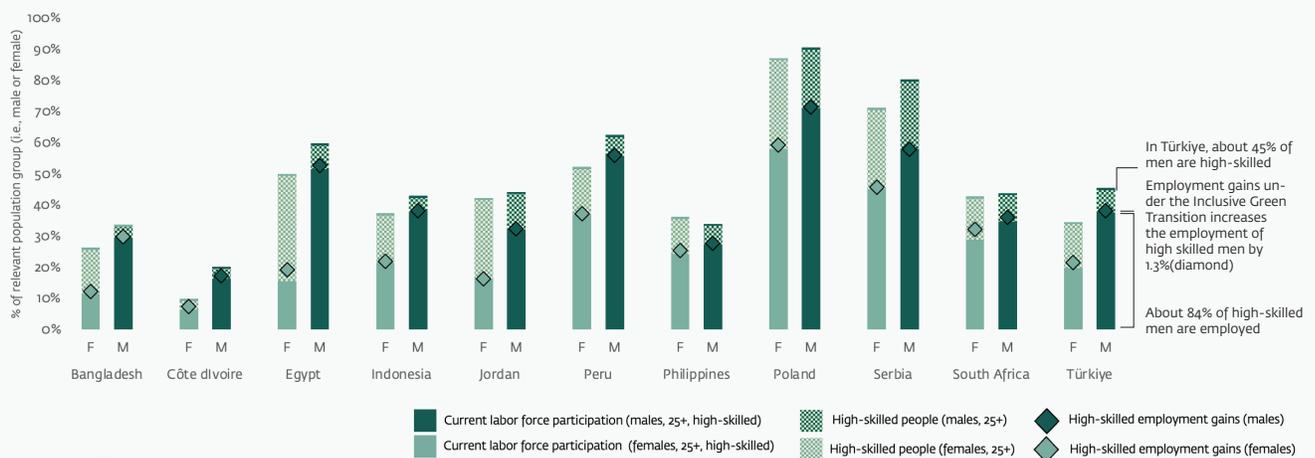
This has important implications for employers. Except for Côte d'Ivoire, most countries have a substantial pool of educated, high-skilled women who are not currently participating in the labor force. If enabled and encouraged to work, these women could help meet the growing demand for skilled workers in the green transition. The analysis is not granular enough to assess how specific skills (beyond 'high-skilled') are matched between the pool of educated women and employers, nor can it assess women's willingness to work or employers' willingness

to hire them. However, it does show that there is a large supply of skilled women who could potentially fill new roles.

Interestingly, in countries such as Bangladesh, Egypt, Indonesia, Peru, and the Philippines, the supply of high-skilled men outside the labor market is limited.⁴⁶ This scarcity increases competition among employers and drives up recruitment costs. By tapping into both male and female talent pools, companies in these economies could alleviate hiring pressures and reduce recruitment or training-related costs. In contrast, countries like Poland, Serbia, and Jordan have a more abundant supply of high-skilled male workers, facing less immediate pressure to recruit women. Côte d'Ivoire presents a unique challenge, with a tight labor market overall and shortages for both high-skilled women and men.

The gender-inclusive scenario leads to meaningful job gains for high-skilled women, increasing their employment by 1.3 percent on average across the sample. The largest gains are in Egypt (3.6 percent), South Africa (3.2 percent), and Türkiye (1.8 percent), with smaller effects in countries like Indonesia, Peru, and Serbia. Nonetheless, many high-skilled women continue to remain outside the workforce, with large gender gaps in employment persisting even with targeted investments in the care sector.

Figure 15: High-skill gender ratios and employment gains



46 Based on ILOSTAT data.

Low-skill Jobs

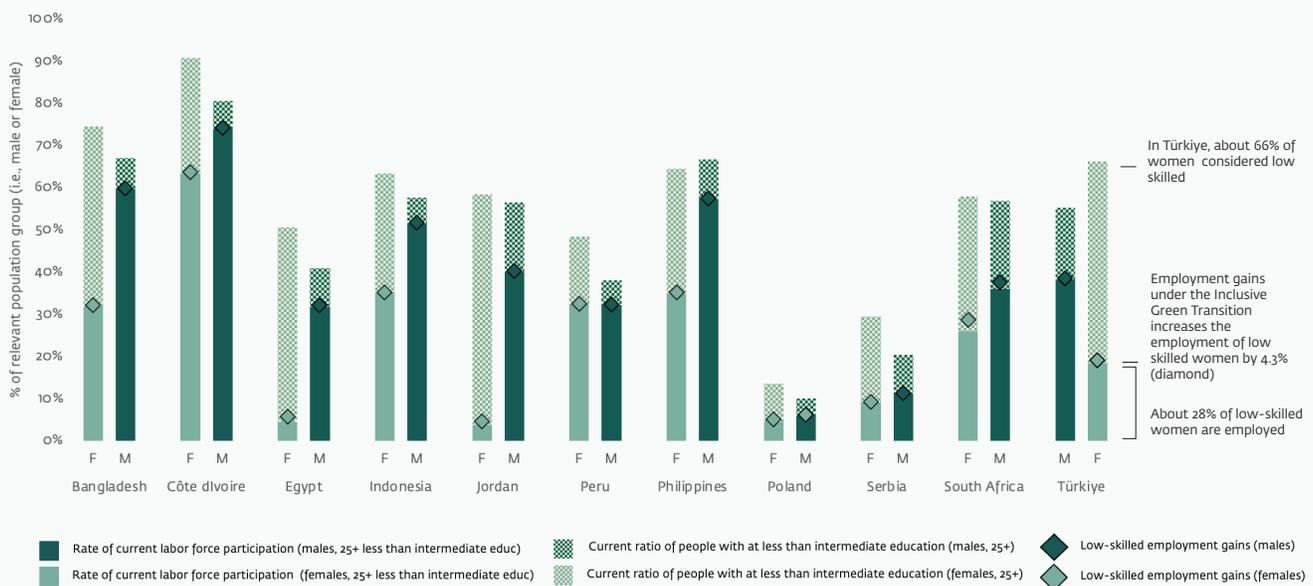
Figure 16 now examines low-skilled workers in the gender-inclusive scenario. The same data points are presented: 1) the current employment rates of low-skilled women and men (solid bars), 2) the share of women and men with less than intermediate education who are currently not working or looking for jobs (shaded bars), and 3) employment additions projected for low-skilled workers under green transitions (diamonds). Across most countries – except the Philippines – a large proportion of women with basic education are not working or looking for jobs. Additionally, low-skilled men consistently participate in the labor force at higher rates than low-skilled women, with particularly large gaps in Jordan and Egypt, where few low-skilled women are active in the formal labor market.

This points to a significant pool of low-skilled women who could potentially fill new roles emerging in the green transition. As with high-skilled workers, the analysis does not provide granular insights into how specific skill sets align with employer needs, nor does it predict whether women are willing or able to take up these

roles. Nonetheless, the data highlights substantial untapped potential among low-skilled women to fill emerging low-skill workforce needs. In countries like Indonesia, Peru, and Poland—where competition for male workers is intensifying—employers stand to benefit from expanding recruitment efforts to include women. Conversely, in South Africa, Türkiye, and Jordan, the availability of low-skilled male workers remains relatively high, with employers facing less immediate pressure to recruit women.

The gender-inclusive green transition scenario introduces new job opportunities for low-skilled women, with average employment gains of 0.7 percent. Egypt, Jordan, and South Africa show the most notable improvements, with increases of 1.2 percent, 1.0 percent, and 2.6 percent respectively. While these gains are modest, they represent meaningful steps toward expanding women’s participation in green transitions.

Figure 16: Low-skill gender ratios and employment gains



Source: WBG staff calculations using MINDSET, ILOSTAT

Box 4: Labor mobility in green transitions

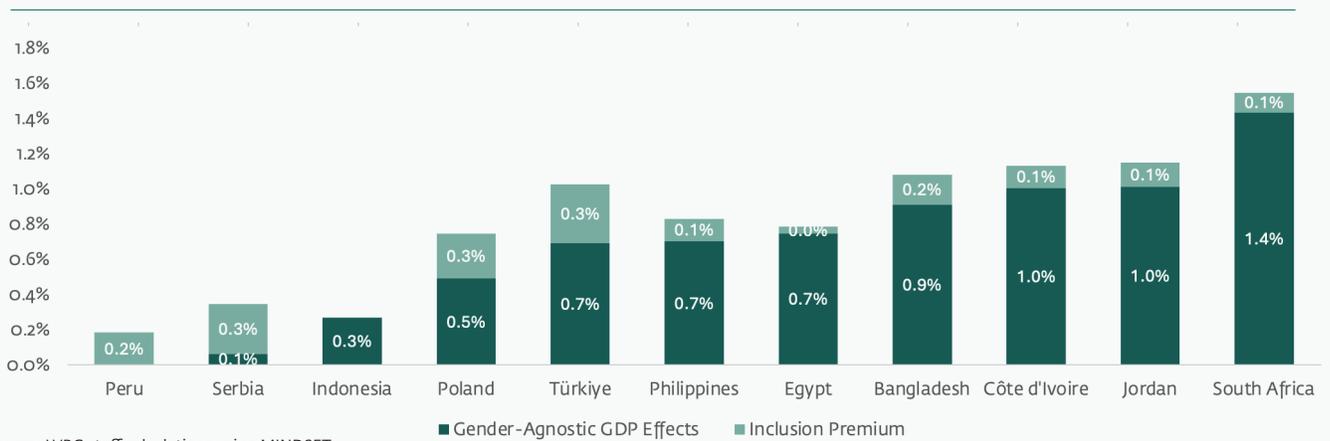
An important caveat to the preceding analysis on the availability of workers is that it does not account for how easily individuals can transition into new roles. While many women and men may have the right educational qualifications for in-demand occupations in green transitions, this does not guarantee that their individual skill profiles match employer needs. Moreover, the analysis does not capture potential demand- and supply-side mobility barriers—social, temporal, geographic, or financial—that may prevent workers from taking up available jobs and shifting into new sectors, even where demand from firms exists. These mobility challenges often differ for women: they may face barriers to accessing education and training in certain fields, are constrained by social norms around suitable occupations (especially in infrastructure and construction), and encounter hiring biases from employers. More research is needed to understand how men and women are willing and able to take up new jobs in the green transition – and how willing employers are to hire them – with a focus on the types of Just Transition policies that will enable their mobility. For a more detailed discussion on worker mobility, see Knudsen *et al.* 2025.

Impacts on Economic Activity

This final section shows that expanding the care sector and enabling women’s employment in green transitions lead to an ‘Inclusion Premium’ – a boost in economic output – of up to 0.3 percent in GDP. As shown in Figure 17, countries already boost economic growth in the *gender-agnostic* scenario (shown in dark green) by implementing ambitious climate actions, which increase economic activity and investment.⁴⁷ The gender-inclusive scenario results in

even stronger economic growth for all countries except Indonesia (shown in light green). This ‘Inclusion Premium’, although modest, adds an estimated 0.3 percent to GDP by boosting overall employment—including for women—thereby increasing disposable income and stimulating consumer spending. Additionally, investments in care-sector infrastructure significantly contribute to domestic economic activity across countries.⁴⁸

Figure 17: GDP gains under gender-inclusive and gender-agnostic scenarios (% difference from baseline)



⁴⁷ This is in line with other models, e.g., IRENA 2023.

⁴⁸ Investments generally boost GDP more than consumption, and therefore any other type of investment (not targeted towards the care sector), would have similar effects. This assumption is not challenged, but of importance is recognizing that the GDP premium is another beneficial outcome of the gender-inclusive green transition scenario.



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Part 3 Conclusions and Recommendations



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Report Summary

This paper explored an often overlooked dimension of green transition: how green investments and policies shape employment outcomes in EMDEs, with a focus on women. Understanding how labor markets evolve with climate action – including which jobs will decline, which jobs will emerge, and which skills will be in demand – is essential for governments to drive sustainable economic growth and meet national climate goals, and for employers to anticipate workforce needs and maintain business continuity. Understanding who is at risk from job declines and who is left out of emerging opportunities is important for ensuring social acceptance of climate action and can result in better outcomes for businesses and economies.

Part 1 of this report explored the literature on jobs, climate change, and green transitions. It examined the direct and indirect risks to workers from climate change and then looked at how green investments and enabling policies positively and negatively affect job outcomes. Two key takeaways emerged from the review: 1) the costs of inaction to workers and livelihoods

are significant, with people in EMDEs and vulnerable groups most affected, and 2) net jobs in green transitions are expected to be positive, but they are not equally distributed across countries and populations. Due to the sectoral composition of new jobs in green transitions, women on average are less likely to benefit from new job opportunities.

Part 2 complemented the literature by comparing the economic and employment outcomes of two green transition scenarios: a *gender-agnostic* scenario, where countries implement green transition policy and investment packages without additional gender-inclusive measures, and a *gender-inclusive* scenario, where alongside climate action, countries expand their care sectors to enable women's employment. The analysis uncovered that *gender-inclusive* green transitions create more jobs overall, lead to higher economic output, and support women's economic participation. Countries could boost their economic growth by up to 0.3 percent on top of the economic gains expected under the *gender-agnostic* scenario. In some countries, employers could mitigate hiring challenges by expanding recruitment to women.

Conclusions

- 1. Inclusive green transitions that intentionally create economic opportunities for women help align economic, environmental, and social development objectives in EMDEs.** Green-enabling policies and climate mitigation investments can boost jobs and economic growth, and if designed to increase women's employment, can enhance these outcomes.
- 2. Businesses with inclusive recruitment strategies can address emerging talent shortages.** In some countries with high competition for male workers, employers can reduce recruitment-related challenges and lower related costs by extending their recruitment efforts to include women.
- 3. Care sector investments that encourage women's employment can help redistribute the job gains under green transitions.** Supporting women's economic participation through an expanded care sector can create new jobs and enable their participation in sectors with expanding workforce needs in green transitions.
- 4. Additional measures will be required to increase women's access to new jobs.** In addition to addressing women's disproportionate
- care responsibilities, advancing women's access to jobs demanded in green transitions will require coordinated efforts in upskilling and reskilling, addressing employer discrimination and restrictive social norms in non-traditional sectors, and ensuring safety and protection from gender-based violence.
- 5. Inclusive green transitions are no silver bullet for addressing deep employment gaps between women and men.** The job gains from green transitions, while positive, are small. This means that additional policy and investment measures will be required to boost jobs and increase women's economic participation, especially in the context of overlapping technological, economic, and demographic shifts affecting labor markets globally.
- 6. Broader economic reforms and increased private sector participation will be necessary to generate inclusive employment and drive sustainable economic growth.** While the Inclusion Premium is positive, its magnitude is relatively modest, demonstrating the limitations of what gender-inclusive green transitions can deliver on their own and underlining the need for complementary reforms and investments to enable sustainable economic growth and private sector participation.

Recommendations

The following recommendations are drawn from this research and reflect insights from diverse stakeholders on emerging best practices. They are designed to help advance effective approaches across a range of actors, including companies and employers, policymakers, and investors. Recommendations are provided across three dimensions considered most relevant to the findings

of this report: 1) actions to expand the care sector to drive job growth and economic inclusion in green transitions, 2) actions to enable women's employment beyond expanding the care sector, with a focus on the specific challenges that are unique to green transitions, and 3) broader recommendations on how to align inclusion, environmental, and employment objectives to strengthen businesses and economies.⁴⁹

⁴⁹ For broader recommendations on how economies and employers can address barriers to women's workforce participation see World Bank 2023 and for a comprehensive assessment of enabling policies for climate adaptation and mitigation see World Bank Group 2024.

Companies and Employers are at the forefront of understanding evolving workforce needs, responding to green-enabling policies, implementing green projects, and adopting inclusive practices that increase opportunities for women in non-traditional sectors.



1. Actions to expand the care sector

- **Fill gaps in direct care service provision.** The private sector can help governments address gaps in care services and early education to enable more women to seek out emerging job opportunities in green transitions. Private firms can serve as direct service providers for services like childcare, pre-primary and primary education, residential care, and elderly care facilities.⁵⁰
- **Support employees with care.** Companies can also help their own employees balance their care responsibilities through on-site or near-site childcare centers, partnerships with local providers, or provision of subsidies or vouchers for employees to use care facilities. *For more recommendations on employer-supported childcare, see IFC's Private Sector [Guide](#).*
- **Implement family-friendly workplace policies.** Companies can strengthen family-friendly workplace policies, including inclusive parental leave to rebalance care responsibilities in families, hybrid and flexible work arrangements, and return-to-work programs that encourage women to return to their jobs after starting families or caring for family members.
- **Promote inclusive recruitment.** Adopt inclusive recruitment strategies that encourage women to apply and improve their chances of getting hired, particularly in high-demand sectors in green transitions, such as renewable energy and construction. This includes setting gender targets for shortlists, implementing gender-diverse interview panels, using inclusive language in job descriptions, and training recruiters and managers to recognize and reduce bias.
- **Implement inclusive business practices.** Recruiting women is only the first step—they must also feel supported, included, and safe to stay and thrive. This is especially critical in green and climate-related sectors where women are historically underrepresented and restrictive social norms are more persistent. Companies can foster retention and advancement of women by implementing gender-responsive policies such as flexible work arrangements, mentorship and sponsorship programs, clear promotion pathways, and robust anti-harassment and grievance mechanisms.

2. Actions to enable women's employment in green transitions (beyond expanding the care sector)

- **Invest in targeted skilling and training programs for women.** Employers can collaborate with universities, technical institutes, and training providers to co-develop curricula, establish apprenticeships, and provide on-the-job training in high-demand fields within green sectors that require reskilling and upskilling. Facilitating women's participation in high-demand sectors can help companies broaden their talent pipeline, reduce recruitment costs, and improve workforce diversity.

3. Actions to align inclusion, environmental, and development objectives

- **Embed inclusive workforce planning into sustainability and climate transition strategies.** To achieve corporate climate goals, companies should integrate workforce planning into their sustainability and transition strategies. This approach recognizes that a skilled and qualified workforce is essential for implementing corporate climate goals and executing transition plans. Firms should embed a focus on women's inclusion to expand the talent pool and reduce recruitment-related costs.

⁵⁰ For example, [IFC's partnership with the Commercial Bank of Ceylon and Sarvodaya](#) to establish early childhood development centers in Sri Lanka.

Policymakers provide an enabling environment for green investments, can direct spending towards the care sector, and can incentivize employers to implement inclusive recruitment strategies and workplace policies.



1. Actions to expand the care sector

- **Invest in the care sector.** Governments can reframe care provision as essential social infrastructure and invest in it, for instance through recycled carbon revenues as modeled in this report. Expanding access to affordable and quality care services can boost jobs and economic growth, reduce labor market frictions, and increase women's share of jobs in green transitions.
- **Incentivize employer-supported care.** Provide incentives like direct subsidies or preferential tax treatment to encourage firms to offer care services or family leave to employees. This can help address women's disproportionate share of care responsibilities, reducing the opportunity cost for them to enter the labor market or pursue leadership roles in green-growth sectors such as construction and infrastructure.

2. Actions to enable women's employment in green transitions (beyond expanding the care sector)

- **Strengthen training and transition pathways.** As part of green transition planning, policymakers can promote school-to-work programs and targeted upskilling and reskilling initiatives for women. Governments can incentivize employer partnerships with universities and training institutions through subsidies, tax breaks, or regulations that support apprenticeships and structured entry routes for female graduates, including women with lower levels of formal education. These efforts can also help men transition out of declining industries.
- **Link inclusive recruitment to public support.** Governments can require companies to publicly disclose the gender composition of their workforce and link participation in publicly funded training or reskilling programs to concrete commitments to hire women from those programs. They can also offer tax benefits, credits, or preferential access to public

contracts for firms in renewable energy, low-carbon transport, or other clean sectors that meet gender diversity targets and demonstrate strong recruitment and retention of female employees.

3. Actions to align inclusion, environmental, and employment objectives

- **Integrate inclusive human capital development into green transition planning.** To realize national climate ambitions and create the workforce necessary to design, build, and maintain projects in sectors like renewable energy and climate-resilient infrastructure, policymakers can embed human capital development and skill-building reforms into their green transition plans. Embedding a gender lens into human capital development can increase job opportunities for women and reduce employment losses for men.
- **Align workforce development with green sector needs.** Strengthen feedback loops with employers to ensure publicly funded education, training, and reskilling programs reflect the evolving talent demands of green sectors—such as renewables, climate-smart agriculture, and low-carbon transport. Misalignment can slow investment, delay implementation, and limit the broader economic and social benefits of green transitions. Ensure that feedback mechanisms with employers also provide visibility on gender gaps in employment pipelines to identify ways to increase women's participation.
- **Implement social protection measures to manage job losses and help workers move into new fields.** Policymakers can introduce social protection interventions—such as unemployment benefits, wage subsidies, and reskilling programs—to help workers manage job losses and move into emerging fields and livelihoods created or evolving through green transitions. These measures can cushion income loss, actively facilitate re-entry into new jobs, and are especially vital for supporting the most vulnerable groups, including informal workers, low-income populations, and women.⁵¹

⁵¹ For an extensive review of social protection, climate action, and Just Transition, see ILO's World Social Protection Report 2024–26 (2024d).

Investors are essential to mobilizing private sector capital for climate projects, embedding inclusion in their green finance approaches, and strengthening inclusive employment outcomes through their portfolio companies.



1. Actions to expand the care sector

- **Invest directly in the care sector.** Investors can support the expansion of the care sector by investing directly in care businesses and service providers like childcare centers, healthcare facilities, and eldercare and long-term care centers.⁵² Investors can also support small businesses and startups with innovative, digitally enabled care solutions.
- **Consider care provisions as part of green transition projects.** To recruit and retain more women in green infrastructure projects, investors can work with their portfolio companies and project developers to expand access to affordable and reliable care services through on-site or subsidized childcare facilities near construction sites, flexible working arrangements, partnerships with local care providers, or care allowances and stipends.
- **Invest in businesses with strong family-friendly policies.** Investors can encourage portfolio companies to adopt parental leave, flexible work, and care support measures, and link financing terms or performance incentives to progress. Companies with strong family-friendly policies are better positioned to attract and retain talent, reduce turnover, and benefit from women's increased economic participation.

2. Actions to enable women's employment in green transitions (beyond expanding the care sector)

- **Invest directly in women-led businesses that contribute to climate action.** Investors can finance women-led or owned businesses operating in sectors relevant to climate adaptation or low-carbon development. Women-led businesses, particularly small and medium enterprises, tend to employ more women and can contribute to climate innovation (We-Fi 2022; Deininger 2023).⁵³
- **Invest in green businesses demonstrating a commitment to gender and diversity.** Investors can support businesses that demonstrate a commitment to diversifying their workforce, leadership, and supply chains. For example, investors can apply the [2X Criteria](#) in their investment approach

to track, benchmark, and set targets related to women's employment in their portfolio companies.

- **Link green finance to gender outcomes.** Investors can integrate women's employment or upskilling and training targets into green investment agreements and offer financial incentives — such as lower interest rates or preferential terms — for companies that set ambitious targets in their workforce or supply chains. The size of the incentive could be linked to the ambition of the target, with larger incentives offered in challenging markets or sectors like renewable energy, construction, and transport.
- **Support capacity-building in climate portfolio companies.** Investors can provide technical assistance or facilitate access to training programs that help green companies build inclusive recruitment, retention, and leadership strategies. This is particularly valuable for start-ups and SMEs in emerging sectors that may lack internal capacity to design and implement gender-inclusive practices and policies.

3. Actions to align inclusion, environmental, and employment objectives

- **Embed gender and inclusion criteria in climate investment strategies.** Investors can integrate gender and diversity into their green finance frameworks and due diligence, ensuring that capital mobilization delivers environmental impact alongside inclusive employment and economic opportunities.
- **Strengthen accountability and disclosure.** Require portfolio companies to report gender-disaggregated employment data, track progress against inclusion targets, and disclose how climate investments are contributing to decent and equitable jobs. This builds transparency and supports investor decision-making.
- **Link portfolio-wide performance to incentives.** Go beyond project-level commitments by setting gender and inclusion objectives across the entire portfolio and tying them to financing terms, performance benchmarks, or incentive structures.

⁵² For example, IFC's [partnership with the Commercial Bank of Ceylon and Sarvodaya](#) to establish early childhood development centers in Sri Lanka.

⁵³ See IFC's [She Wins Climate](#) program supporting women-led climate startups across Asia and Eastern Europe.

Methodological Limitations and Further Research

This report relies on a *forward-looking scenario* for the year 2040 and is based on simplified assumptions about how countries will evolve. While some changes are anticipated, there is still uncertainty about how countries will respond to unforeseen conflicts, climate damages, geopolitical changes, shifts in global trade patterns, or deployment of AI and automation, which will influence employment outcomes. Furthermore, the report highlights the expansion of the care sector as the gender-inclusive investment scenario, which risks reinforcing gender stereotypes that associate women primarily with care sector jobs, and does not assess additional barriers to women's workforce participation such as skills mismatches, restrictive social norms, workplace discrimination, and gender-based violence. Finally, this report relies on simplified classifications between low-skilled and high-skilled workers and does not explore how intersectional characteristics influence the individual experiences of women and men.

More research in the following areas could respond to some of these limitations and create a stronger evidence base to encourage integrated action on economic development, gender equality, and climate change:

- 1. Gender-differentiated job outcomes of adaptation investments.** The employment potential of adaptation and nature-based solutions remains largely underexplored and poorly quantified.⁵² Given their characteristics, these solutions could generate more immediate and accessible job opportunities, particularly for women and low-skilled workers.
- 2. Employment and livelihood impacts under a “no-action” scenario.** Examining what happens in the absence of private and public investment towards mitigation and adaptation can offer a more complete picture of the job-related trade-offs and

underscore why climate action, though complex, is essential.

- 3. Skill investment needs for women in green transitions.** A detailed assessment of projected skill demands across industries, matched against the availability of these skills in local economies—and disaggregated by gender— can generate critical insights for education, training, and employment interventions as well as for reforming skill development policies. Research should also estimate the investment costs and impacts of upskilling and reskilling initiatives, including their potential to create new jobs in education for women and men.
- 4. Alternative gender-inclusive green transition scenarios.** Examining interventions like targeted training and skill-building for women, shifts in social norms, or introduction of employer incentives to encourage women's participation could produce important insights on the most effective and efficient measures to promote women's employment in green transitions.
- 5. Employment effects of greening supply chains, including for women-led SMEs.** As supply chains decarbonize, trade patterns and firm competitiveness in EMDEs will shift, with SMEs— often least prepared for external shocks—most at risk. Assessing how new sustainability standards shape labor demand and the capacity of SMEs, including those led by women, to create quality, green, and inclusive jobs is critical for guiding support and investment.
- 6. Social protection policies and private sector incentives to smooth green transitions.** Assessing the need for social protection policies and incentive schemes to protect women's livelihoods

⁵⁴ Investment needs in climate adaptation and resilience are set to rise sharply, with markets projected to grow between \$0.5 trillion and \$1.3 trillion from 2025 to 2030 (BCG 2025).

and encourage women to shift into new fields can provide insights on what types of interventions will be most critical for Just Transition.

- 7. Intersectional analysis.** Women are not a homogenous group, and green transitions affect them differently depending on factors such as income, age, rural–urban location, disability status, and ethnicity. Future research could apply an intersectional lens to better understand these dynamics.
- 8. Informal workers.** In EMDEs, four out of five new jobs for women are in the informal economy (IMF

2024). Future research should look at the large share of informal workers to assess opportunities and risks in climate-critical and transitioning sectors, such as climate-smart agriculture, plastics recycling, and conservation.

- 9. Automation and demographic shifts.** The green transition will unfold alongside rapid advances in AI, automation, and broader demographic shifts such as aging populations, all of which will reshape labor markets in EMDEs. Understanding how these forces interact can reveal both synergies and compounded risks, with employment effects likely to differ for women and men.

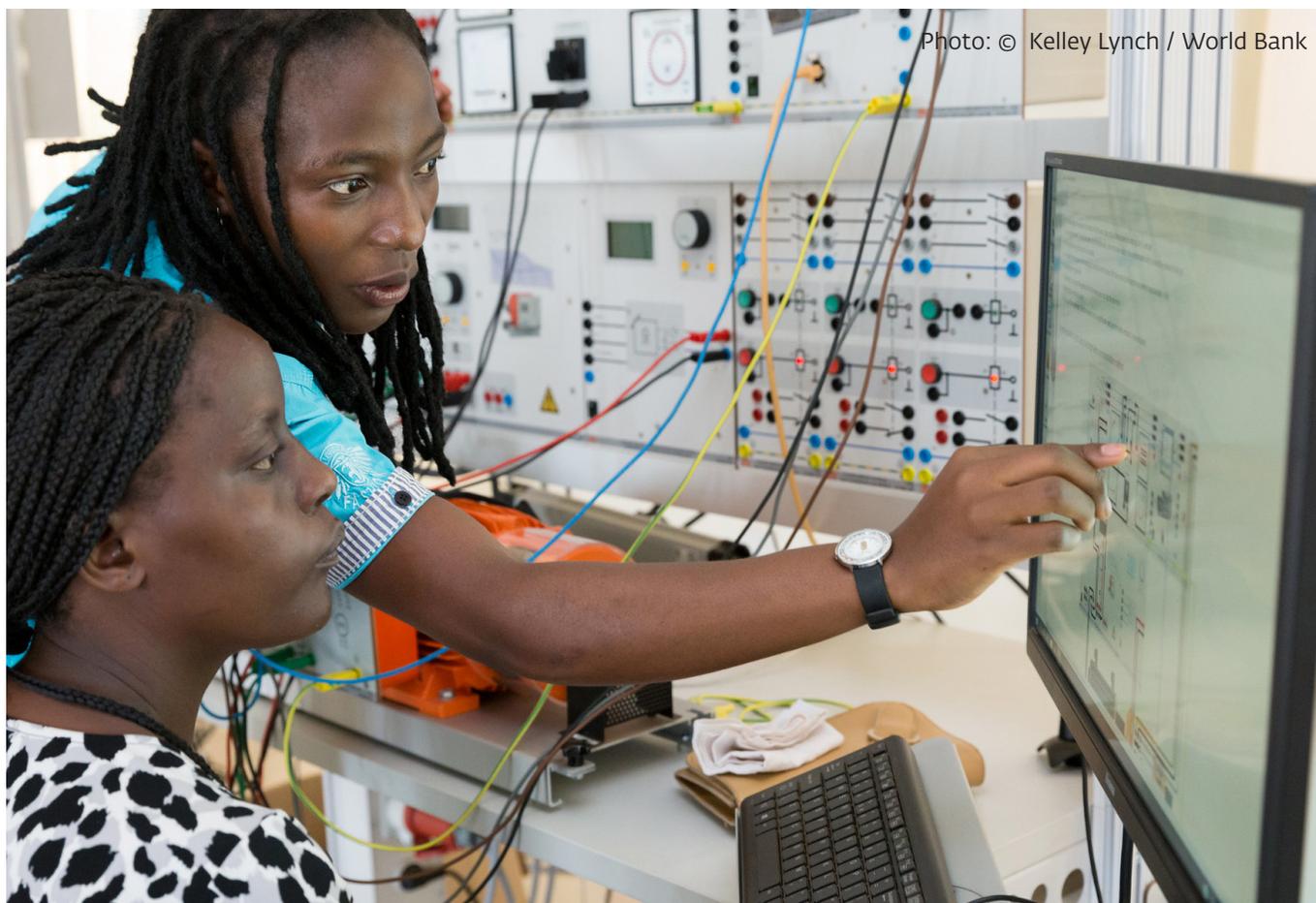


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Appendix

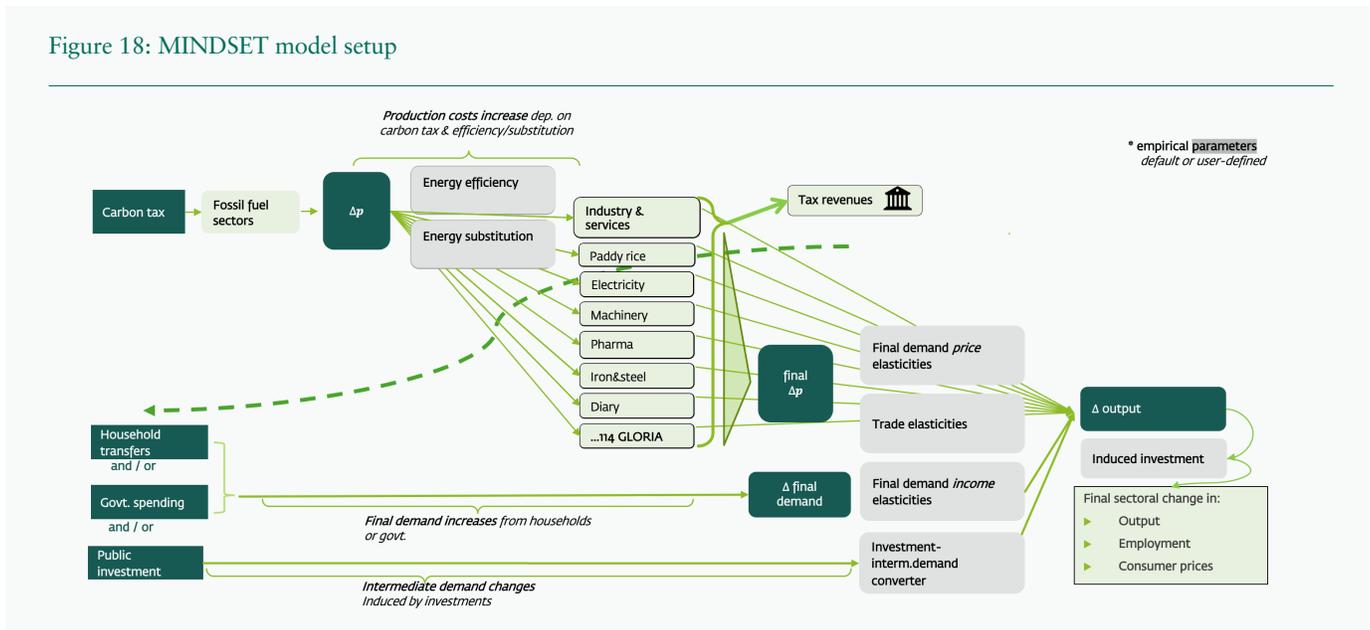
Modeling Approach

This section describes the modelling approach. The analysis relies on the MINDSET Model (version 1.0), an employment-climate-energy focused multi-regional input-output (MRIO) model. The model has been developed by the World Bank, with the aim of capturing climate change-related sectoral economic transformation (e.g., climate damages, mitigation, adaptation). The model is built around the GLORIA MRIO database ([Lenzen et al. 2017](#); [Malik et al. 2024](#)), enabling both country-specific and multi-regional analysis. The GLORIA data is complemented with data on sectoral fuel-based carbon emissions based on IEA and UN SD energy balances ([IEA 2024](#)), that enables the model to calculate price and demand effects from carbon pricing.

MINDSET translates the modelled policies into price and investment impacts, which are channeled through the MRIO structure. For example, increased investment demand for certain capital goods (i.e., demand for new solar farms) triggers not just a direct boost for sectors producing the goods (i.e., solar panel producers), but also to sectors that are supplying inputs to those industries (e.g., silicon or glass producers). Prices are passed through the system with the same logic: if a carbon price increases the price of cement, it will increase the price of construction as well (as much as construction uses cement). Crucially, the model allows fuel and trade substitution, i.e., given price and demand changes, producers can decide to switch from carbon-intensive fuels to less polluting ones (e.g., coal to electricity) or to switch from certain trade partners to others.

Labor demand is captured in the model through sector specific labor intensities of output. These intensities enable the model to capture how the respective sectors react, based on empirical observations, to higher or lower demand for their production, which can also be a result of changing prices. Employment, therefore, is captured on a granular sectoral level (120 sectors) and is linked to gender distribution of employees on this granular level based on data from ILO ([ILO 2025](#)).

Figure 18: MINDSET model setup



The model has been applied in various publications focused on employment impacts, climate policy outcomes, and climate damages. Recent examples include analyzing country-level climate impacts and mitigation strategies in Mongolia ([World Bank Group 2024b](#)), Malaysia ([World Bank and Bank Negara Malaysia 2024](#)), and Moldova ([World Bank Group 2024c](#)) analyzing labor impacts of carbon taxation and mitigation or simulating the trade effects of carbon border measures (World Bank 2024b). More details on the model can be found in Lehr & Pollitt and Lehr ([2024](#)), Dorband, and Hardadi ([2024](#)).

Inputs to the model rely on ambitious climate mitigation scenarios established by existing literature, including the World Bank's CCDRs, and simulate these for the year 2040. Country differences in terms of energy mix, ambition to address climate change, and the impact from switching to renewable energy on the price of electricity are considered. These factors represent the ambition of the country-level transition plans and therefore have quite substantial implications for the employment outcomes of the scenario. For example, higher investment levels might boost employment in certain sectors directly (e.g., construction), while higher electricity prices might trigger broader effects on the economic structure.

Overall, the model uses these scenarios, comprising investment, price (including carbon price) and energy-mix changes to simulate how the respective economies change. As a result of the simulations, it produces difference from baseline (or 'impact') results, encompassing economic (output, value added) and labor (employment) indicators.

Data Sources for Scenario Assumptions

Country	Source	Year	URL
Bangladesh	Country Climate and Development Report (CCDR)	2022	URL
Côte d'Ivoire	Country Climate and Development Report (CCDR)	2023	URL
Egypt	Country Climate and Development Report (CCDR)	2022	URL
Jordan	Country Climate and Development Report (CCDR)	2022	URL
Poland	Country Climate and Development Report (CCDR): p33; National Energy and Climate Plan (NECP): pp63-76	2024	URL1 , URL2
Türkiye	Country Climate and Development Report (CCDR)	2022	URL
Serbia	Integrated National Energy and Climate Plan (INECP): p193, p232-p239, p278	2023	URL
Indonesia	Country Climate and Development Report (CCDR); IEA: An Energy Sector Roadmap to Net Zero Emissions in Indonesia	2023, 2022	URL1 , URL2
Philippines	Philippines - Country Climate and Development Report: Background Paper PH-4 - Philippine Energy Transition: Towards a Secure, Affordable and Clean Energy Future	2023	URL
South Africa	Country Climate and Development Report (CCDR); SA Presidential Climate Commission modelling	2022, 2024	URL1 , URL2 ,
	Lehr & Pollitt modelling" on third line after SA Presidential Climate Commission modelling	2024	URL 3
Peru	Country Climate and Development Report (CCDR); IDB: Costos y beneficios de la carbono-neutralidad en Perú	2022, 2021	URL1 , URL2

Note, the focus is on the electricity sector transition, and does not include and Use, Land-Use Change, and Forestry; transport; or cooking/heating.

Sectoral Gender-Ratio Reactions to Female Labor Force Participation

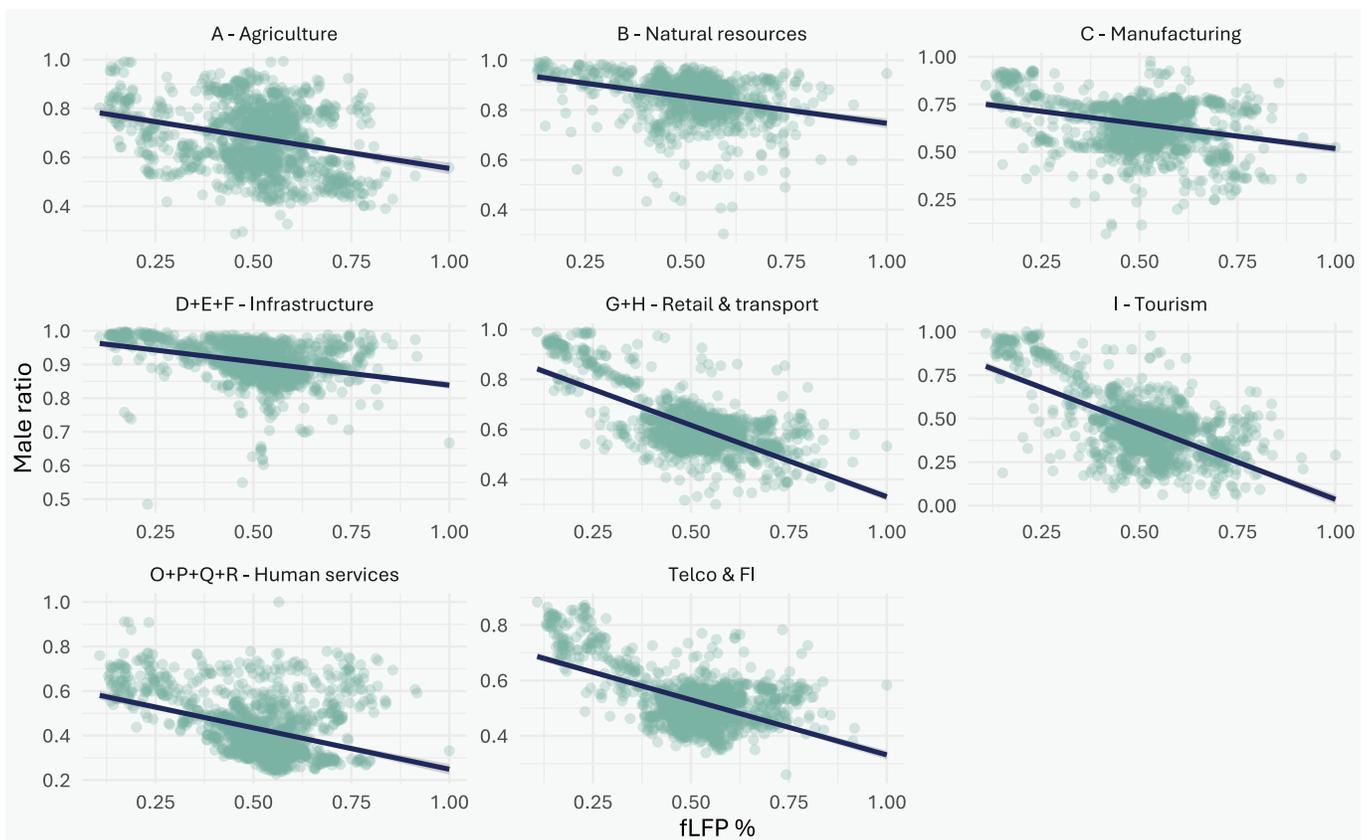
To establish a relationship between gender-ratios in the studied economic sectors and female labor force participation, the analysis estimated a behavioral parameter per sector between the ratio of men in the given sector and labor force participation of women in the economy. This estimation is based on the *Employment by sex, age and economic activity (Annual) Labor Force Statistics (LFS)* and the *Labor force participation rate by sex and age (Annual) Labour Force Statistics* series, both from the ILOSTAT database⁵³

The report aggregates the sectors in the database into the larger categories, performs light data cleaning, merges the datasets, and finally, estimates the relationship such as:

$$\log(s_{i,j,M}) = \alpha_{i,j} + \beta_i \log(LFPR_j^{female}) + \epsilon_{i,j} \quad (1)$$

where $(s_{i,j,M})$ stands for the share of males in employment for sector i in country j , $\alpha_{i,j}$ stands for the country and sector specific intercept (fixed-effect) and $(LFPR_j^{female})$ stands for female labour force participation ratio in country j .

The plots of the dataset by sector are provided below:



⁵³ ILOSTAT DATA, codes are: EMP_TEMP_SEX_AGE_ECO_NB_A and EAP_DWAP_SEX_AGE_RT_A.

The estimated relationships are as follows:

Sector	β	R_2	Obs
A - Agriculture	-0.2202	0.92	1413
B - Natural resources	-0.0071	0.57	1354
C - Manufacturing	-0.2524	0.92	1407
D+E+F - Infrastructure	-0.0329	0.77	1413
G+H - Retail & transport	-0.1189	0.95	1411
I - Tourism	-0.1971	0.92	1397
O+P+Q+R - Human services	-0.1492	0.96	1411
Telco & FI	-0.1242	0.9	1414

These log-log coefficients are applied to calculate the propensity that new jobs will go to women. It is not assumed that job losses for men reach the predicted gender ratios, but it is assumed that new jobs will go to men if the gender ratio is lower than what is predicted with the higher labor participation of women.

Country-sector specific employment results

Employment additions in the green transition scenarios (gender-agnostic and gender-inclusive) as % of baseline employment in the sector:

		Gender-agnostic		Gender-inclusive				Gender-agnostic		Gender-inclusive				Gender-agnostic		Gender-inclusive	
		Female	Male	Female	Male			Female	Male	Female	Male			Female	Male	Female	Male
Bangladesh	Agriculture	0.3%	0.3%	0.0%	0.0%	Jordan	Agriculture	0.0%	0.3%	0.0%	0.0%	Serbia	Agriculture	0.1%	0.1%	0.0%	-0.1%
	Natural resources	0.0%	0.6%	0.0%	0.7%		Natural resources	0.0%	0.7%	0.0%	0.5%		Natural resources	-2.1%	-15.7%	-2.2%	-15.5%
	Manufacturing	0.1%	0.2%	0.2%	0.0%		Manufacturing	0.0%	0.0%	0.0%	0.0%		Manufacturing	0.0%	0.0%	0.0%	-0.1%
	Infrastructure	0.0%	0.5%	0.1%	1.0%		Infrastructure	0.0%	0.8%	0.1%	1.9%		Infrastructure	-0.2%	-0.3%	0.0%	-0.2%
	Retail & transport	0.0%	0.3%	0.3%	0.0%		Retail & transport	0.0%	0.3%	0.3%	0.1%		Retail & transport	0.3%	0.5%	0.5%	0.5%
	Tourism	0.1%	0.6%	0.4%	0.1%		Tourism	0.1%	1.6%	0.2%	0.0%		Tourism	0.6%	0.6%	0.2%	0.1%
	Human services	0.3%	0.4%	0.7%	0.6%		Human services	0.1%	0.2%	0.5%	0.5%		Human services	0.1%	0.1%	0.5%	0.2%
Telco & FI	0.1%	0.7%	0.3%	0.3%	Telco & FI	0.0%	0.3%	0.3%	0.1%	Telco & FI	0.5%	0.5%	0.3%	0.2%			
Côte d'Ivoire	Agriculture	0.0%	0.1%	0.0%	0.0%	Peru	Agriculture	0.0%	0.0%	0.0%	0.0%	Türkiye	Agriculture	0.1%	0.1%	0.0%	0.0%
	Natural resources	0.0%	-0.1%	0.0%	0.0%		Natural resources	-0.2%	-0.9%	-0.1%	-1.0%		Natural resources	0.0%	0.0%	0.0%	0.1%
	Manufacturing	0.1%	0.3%	0.3%	0.0%		Manufacturing	0.0%	-0.1%	-0.1%	-0.1%		Manufacturing	0.1%	0.3%	0.3%	0.0%
	Infrastructure	0.0%	1.5%	0.0%	2.5%		Infrastructure	0.0%	0.3%	0.1%	0.8%		Infrastructure	0.0%	0.4%	0.1%	1.2%
	Retail & transport	0.2%	0.2%	0.3%	0.2%		Retail & transport	0.0%	0.0%	0.0%	0.0%		Retail & transport	0.0%	0.0%	0.2%	0.0%
	Tourism	0.6%	0.1%	0.2%	0.0%		Tourism	0.0%	0.0%	0.0%	0.0%		Tourism	0.3%	1.0%	0.3%	0.0%
	Human services	0.2%	0.2%	0.4%	0.5%		Human services	0.1%	0.1%	0.5%	0.2%		Human services	0.1%	0.2%	1.0%	0.9%
Telco & FI	0.2%	0.7%	0.2%	0.5%	Telco & FI	0.1%	0.1%	0.0%	0.0%	Telco & FI	0.2%	0.5%	0.3%	0.2%			
Egypt	Agriculture	0.1%	0.3%	0.0%	-0.1%	Philippines	Agriculture	0.1%	0.4%	0.0%	0.0%	South Africa	Agriculture	0.0%	0.0%	0.0%	0.0%
	Natural resources	0.0%	-0.8%	0.0%	-0.8%		Natural resources	-0.1%	-0.5%	0.0%	-0.5%		Natural resources	-0.2%	-1.6%	-0.2%	-1.5%
	Manufacturing	0.0%	0.2%	0.2%	0.0%		Manufacturing	0.0%	0.0%	0.0%	-0.1%		Manufacturing	0.5%	0.9%	1.2%	0.2%
	Infrastructure	0.0%	2.0%	0.2%	3.0%		Infrastructure	0.0%	0.3%	0.1%	0.8%		Infrastructure	0.2%	2.4%	0.5%	3.0%
	Retail & transport	0.0%	-0.1%	0.0%	0.0%		Retail & transport	0.0%	0.0%	0.1%	0.0%		Retail & transport	0.3%	0.5%	0.7%	0.2%
	Tourism	0.0%	1.1%	0.1%	0.0%		Tourism	0.8%	0.7%	0.1%	0.0%		Tourism	0.6%	0.4%	0.6%	0.0%
	Human services	0.3%	0.4%	1.6%	1.7%		Human services	0.1%	0.0%	1.3%	0.6%		Human services	0.4%	0.3%	2.8%	1.3%
Telco & FI	0.1%	0.3%	0.1%	0.0%	Telco & FI	0.2%	0.2%	0.1%	0.0%	Telco & FI	0.7%	1.2%	0.8%	0.5%			
Indonesia	Agriculture	0.1%	0.2%	0.0%	0.0%	Poland	Agriculture	0.1%	0.2%	0.0%	0.0%						
	Natural resources	-0.1%	-1.2%	-0.1%	-1.2%		Natural resources	-0.2%	-2.4%	-0.3%	-2.5%						
	Manufacturing	0.0%	0.0%	0.0%	0.0%		Manufacturing	0.0%	0.0%	0.1%	0.0%						
	Infrastructure	0.0%	0.1%	0.1%	0.3%		Infrastructure	0.0%	0.2%	0.2%	1.1%						
	Retail & transport	0.0%	-0.1%	0.0%	0.0%		Retail & transport	0.3%	0.2%	0.0%	0.0%						
	Tourism	0.4%	0.2%	0.0%	0.0%		Tourism	0.9%	0.5%	0.2%	0.0%						
	Human services	0.2%	0.2%	0.7%	0.4%		Human services	0.3%	0.1%	1.7%	0.6%						
Telco & FI	0.0%	0.1%	0.0%	-0.1%	Telco & FI	0.3%	0.3%	0.2%	0.0%								

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