LEADERS' SUMMARY

Jobs and Skills for the New Economy

An Action Agenda for a People-Centered Climate Transition

Lead authors: Liesbet Steer and Richard Samans
Co-authors: Teresa Labonia, Max Steventon, Ishana Sanan, Eduardo Jobim, Catlyne Haddaoui, Arya Harsono, Katie Connolly, and Eliot Metzger

SYSTEMIQ

WORLD RESOURCES INSTITUTE

Acknowledgements

Authors

Lead authors: The report was led by Liesbet Steer and Richard Samans.

Liesbet Steer leads the global work on people in the new economy for Systemiq. She was President and Chief Executive Officer (CEO) of the Education Development Center (EDC), and the Executive Director of the Global Education Commission and lead author of the flagship report The Learning Generation. She led the design and establishment of the International Finance Facility for Education (IFFEd) and is co-founder of Greater Share, a philanthropic fund in partnership with private equity funds. She serves on the Global Leadership Councils of UNICEF Generation Unlimited and the Education Outcomes Fund and chairs the Sustainable Finance Initiative of the School Meals Coalition.

Richard Samans is Senior Economic Adviser to the World Business Council for Sustainable Development (WBCSD). He was previously Director of the Research Department and G20/G7 Sherpa of the ILO; Founder and Chairman of the Climate Disclosure Standards Board; a Managing Director of the World Economic Forum (WEF); and Director-General of the Global Green Growth Institute. He currently serves also as Senior Fellow of the Geneva Graduate Institute for International and Development Studies, Nonresident Senior Fellow of the Brookings Institution, and Special Advisor to the United Nations Economist Network.

Co-authors: Teresa Labonia (Systemiq) led the writing team, including Max Steventon, Ishana Sanan, and Eduardo Jobim (Systemiq) and Catlyne Haddaoui, Arya Harsono, Katie Connolly, and Eliot Metzger (World Resources Institute; WRI).

Wider report team and inputs

The report benefited from guidance and support from Michelle Armstrong (Ares Charitable Foundation), Ingrid Gabriela Hoven and Angela Pilath (Deutsche Gesellschaft für Internationale Zusammenarbeit; GIZ), Pablo Vieira (NDC Partnership), Jeremy Oppenheim and Guido Schmidt-Traub (Systemiq), Ani Dasgupta and Craig Hansen (WRI), as well as inputs from various colleagues, including Vitor Akkerman Aronis, Christine Delivanis, Patricia Ellen, and Vinicius Nattaci (Systemiq) and Masfick Hazarika, Ashwini Hingne, Joel Jaeger, Neha Misra, Tom Pickerell, Melanie Robinson, Devashree Saha, Rebekah Shirley, Neelam Singh, Stientje van Veldhoven, and David Waskow (WRI).

The report draws upon seven country case studies commissioned by GIZ, the Asian Development Bank (ADB), and EDC. Special thanks to Sophia Palmes, Fabian Jacobs, and Christoph Büdke (GIZ) and GIZ Country Offices in Kenya, Pakistan, and Brazil; Shanti Jagannathan and Alexander Tsironis (ADB) and Melanie Sany, Milena Novy-Marx, and Philip Purnell (EDC) for leading the studies and providing wider inputs into the report. It also includes analysis of NDC data led by Amanda McKee and Sara Wolf (NDC Partnership). Contributions to data analysis and insights were also provided by the Center for Global Development (CGD) (box on workforce migration), LinkedIn (labor market data), NewClimate Institute (NCI) (box on carbon dioxide study, commissioned by GIZ and funded by the International Climate Initiative, IKI), the Sustainable Business (SB) COP30 Green Jobs & Skills Working Group (inputs on solutions), and WBCSD (box on the Business Leaders' Guide to the Just Transition). With thanks to Allen Blue, Efrem Bycer, Akash Kaura (LinkedIn), Helen Dempsey (CGD), Lotta Hambrecht, Mats Marquart, and Rory Geary (NCI), Eva Kagiri-Kalanzi and Carol Switzer (Paeradigms), and Iris van der Velden and Wouter Monsjou (WBCSD).

External review and consultations

We are grateful to our external reviewers for their feedback, including Janine Ampulire (FSD Africa), Professor Haroon Bhorat (University of Cape Town), Naureen Chaudhury (Laudes Foundation), Borhene Chakroun (UNESCO), Sarah Krasley (Cornell University), Crispian Olver (Presidential Climate Commission South Africa), Sarah Ong (Laudes Foundation), Olga Strietska (ILO), Julie Rozenberg (WRI), Kevin Watkins (London School of Economics), and Cem Yavuz (International Initiative for Impact Evaluation, 3IE).

The report also benefited from ideas, suggestions, and guidance from several organizations engaged in the various external consultations in the process of developing the report. Special thanks to country partners from Brazil, Cambodia, India, Indonesia, Egypt, Kenya, Pakistan, and the Philippines and partner organizations ADB, the African Development Bank Group, FSD Africa, the Global Energy Alliance for People and Planet, Generation, Global Optimism, the ILO, the International Renewable Energy Agency, Society of Automation (ISA), Organisation of Employers (IOE), United Nations Environment Programme, UNESCO, UNICEF Generation Unlimited, and the WEF. Thanks to Amol Mehra and Sarah Ditty (Laudes Foundation) for organizing a consultation on the findings of the report with the Donor Alliance on the Just Transition at the London Climate Week and to the Ares Charitable Foundation for hosting a Roundtable Discussion on the report at the New York Climate Week.

Finally, we are grateful to the COP29 and COP30 Presidencies and the Sustainable Business COP30 for their support for this work and for prioritizing human development as a central theme of the COP. Special thanks to Simon Stiell (United Nations Framework Convention on Climate Change), Nigar Arpadarai (COP29), Ana Toni, Alice Amorim, and Bruna Andrade (COP30), Ricardo Mussa (SB COP), and Rafael Segrera and Arthur Wong (SB COP30 Green Jobs & Skills Working Group).

Report production was managed by Sara Ascher (WRI), substantive editing by Kathleen Schalch and copy editing by Lauri Scherer.

Report citation

Steer, L., R. Samans, T. Labonia, M. Steventon, C. Haddaoui, I. Sanan, E. Jobim, A. Harsono, K. Connolly, and E. Metzger. 2025. *Jobs and Skills for the New Economy: An Action Agenda for a People-Centered Climate Transition*. London: Systemiq; Washington DC: World Resources Institute.

Supported by

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

IKI International Climate Initiative

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

NDC Partnership

Ares Charitable Foundation

Directed by

SYSTEMIQ

World Resources Institute

Selected contributions (country case studies, business guide and CO_2 studies and consultations)

ADB Asian Development Bank

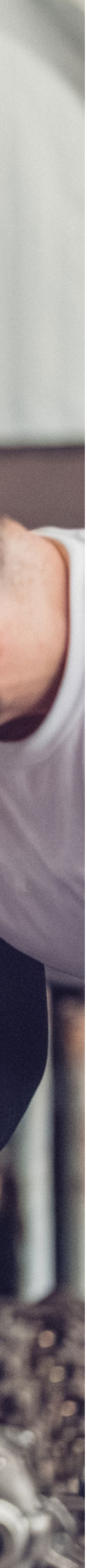
EDC.ORG

Laudes Foundation

LinkedIn

Sustainable Business COP30

WBCSD World Business Council for Sustainable Development



Foreword

The big transitions of our time, including technological disruption, demographic shifts, geopolitics and climate change, are redefining the foundations of our economies and societies. These forces are reshaping production, trade, and employment across every sector. The question before us is not whether change will come, but whether countries and businesses will seize the opportunities it brings.

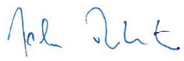
The emerging new economy offers immense promise. Investments in clean energy, resilient infrastructure and nature-based solutions could be engines of growth and competitiveness. But they will only succeed if they can be powered by skilled, flexible, and engaged workers. Too often, our strategies for economic transformation have focused on technology, infrastructure, and finance. This is overlooking one of the most critical ingredients of progress: human capital.

This report is a call to place people at the center of our collective response. It shows that investing in jobs, skills, and social equity is not only a moral imperative but an economic, societal and environmental necessity. With bold action, the transition can deliver a *triple dividend*: stronger and more resilient economies, greater social cohesion, and faster environmental progress.

As decision makers, we have a responsibility to act with urgency and intentionality. We must ensure that skills and workforce transition strategies are aligned with national economic transformation strategies and supported by real-time data where possible. We must modernize training systems, harness innovation, and enable workers to seize the opportunities of an inclusive, low-carbon economy. And we must mobilize public and private finance to recognize investment in people as investment in productivity, resilience and long-term growth.

The decisions we take in this decade will shape the trajectory of our economies and societies for generations. By putting people at the heart of the transition to a new economy, we can ensure that it becomes the defining engine of development for decades to come.

ANA TONI
COP30 CEO



JOCHEN FLASBARTH
State Secretary Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety Germany

DR. ENG. FESTUS K. NG'ENO
Principal Secretary, Ministry of Environment, Climate Change, and Forestry, Kenya

HIGHLIGHTS

- A new economy is unfolding with transformative potential for people. If managed strategically with investments in jobs, skills, and social equity at the center, the transition to a low-carbon, resilient economy could generate net employment gains—with a midpoint of 375 million jobs over the next decade—especially in energy, construction, and the nature-based economy.
- Drawing on an extensive literature review, new modeling, and country case studies, the report examines the impact of the transition on jobs, skills, and social equity and identifies solutions to secure a triple dividend for people: stronger and more resilient economies, improved social cohesion, and faster progress on environmental goals.
- Three core challenges are identified: current transition strategies fail to integrate workforce dimensions, skills systems remain outdated, and financing for people-centered investment is short-term and insufficient.
- The report proposes a practical 10-point Action Agenda structured around intentionality, innovation, and investment: mainstreaming workforce strategies; scaling flexible, tech-enabled training systems; and mobilizing finance for human capital at scale.
- It calls for global collaboration to support countries and industries in implementing the Action Agenda through shared knowledge, technical assistance, financing mechanisms, and advocacy—placing people firmly at the center of the new economy.

A new economy is unfolding, one with profound implications for people's jobs and livelihoods. Against wider trends of digitalization, demographic shifts, and geopolitics, the climate transition is an increasingly important element shaping this new economy. Yet appreciation of the impacts of the transition on people and their jobs remains limited. This hinders societal and political support for the transition but also risks missing a substantial opportunity for people moving forward. Unlike other megatrends transforming labor markets, the climate transition has clear potential to generate a substantial net increase in employment, with a midpoint estimate of 375 million additional jobs in four major sectors over the next decade. In this sense, a well-managed transition could act as a buffer against other disruptive forces, such as artificial intelligence (AI) and geoeconomic fragmentation.

To date, climate action has centered on new technologies, physical infrastructure, the finance to scale them, and on reducing risks for people through the promotion of a just transition. This report builds on those vital efforts and adds a critical missing piece by highlighting the substantial opportunities for people offered by the transition. It provides a practical agenda for how countries and industries can strengthen their investments in human capital as a strategy for economic growth and environmental progress.

If leaders pursue a people-centered transition by placing investments in jobs, skills, and social equity at the core, they stand to capture a powerful triple dividend: stronger, more resilient economies; improved social cohesion; and faster progress on environmental goals. Leaders who fail to make the required investments in the capabilities of their people and their workforce transitions will face a slower, more expensive transition to the new economy, greater social and economic disruption, weaker investor confidence, and widening inequality at a time when progress is already facing growing headwinds across all regions.

Capturing the positive synergies of a people-centered transition will require bridging communities that too often work in silos, from economics and business to climate science, education, and social policy. It will also require government and business leaders to act with clear intent to place people at the center of strategies, policies, and data; foster bold innovation in skills and workforce development programs harnessing technology; and secure sustained and diverse finance by repositioning spending on people as investment.

This report provides extensive analysis to support such a whole-of-society effort and calls on leaders to commit and contribute to a 10-point Action Agenda to secure it. The Action Agenda provides a menu of practical and ambitious actions, with the understanding that its application will differ across country and industry contexts, depending on policy readiness, institutional capacity, basic infrastructure, and access to finance. To encourage countries and industries to pursue the Action Agenda and support its application within their specific contexts, this report also calls for a major global initiative that will bring together stakeholders and platforms through shared knowledge and research, peer-to-peer learning, technical assistance, and advocacy.

About this report

This report is designed for decision-makers in government, business, and civil society who are shaping countries' transitions to a new economy. It speaks directly to heads of state and senior leaders—especially in ministries of finance, economic planning, labor, education, and environment—seeking to align macroeconomic planning, industrial and climate policy, and national competitiveness strategies with labor market policies, skills development, and social stability measures. It also addresses business leaders and industry executives navigating the transition's implications for operations, talent pipelines, and long-term competitiveness as well as nonprofits, labor unions, and academia as vital sources of expertise, advocacy, and policy implementation.

It delivers new analysis on how the transition affects people and work. The report explores how mitigation and adaptation measures shape employment (including job quality and equity), skills, and social equity, providing an integrated view of these interlinked dimensions. Drawing on a structured review of over 70 studies published between 2018 and 2025, complemented by customized modelling, the report presents fresh global estimates of job creation and loss associated with both mitigation and adaptation actions. A global perspective is paired with country-level insights through five new country case studies, illustrating how workforce transitions unfold across different economies and supply chains.

The report's distinctive contribution is threefold:

- It provides new global data and insights on the likely implications of the climate transition for people, including opportunity and risks. It addresses critical gaps in existing research, which often treats jobs, skills, and equity in isolation; focuses narrowly on specific sectors; or overlooks the role of adaptation.
- It presents new insights drawn from existing evidence and the country case studies on how countries and industries can better prioritize and invest in the social dimensions of the transition and what benefits this could generate.
- It proposes a practical Action Agenda that governments, businesses, and civil society actors can use to unlock the economic, social, and environmental gains of a people-centered transition and calls for new global effort to support them in doing so.

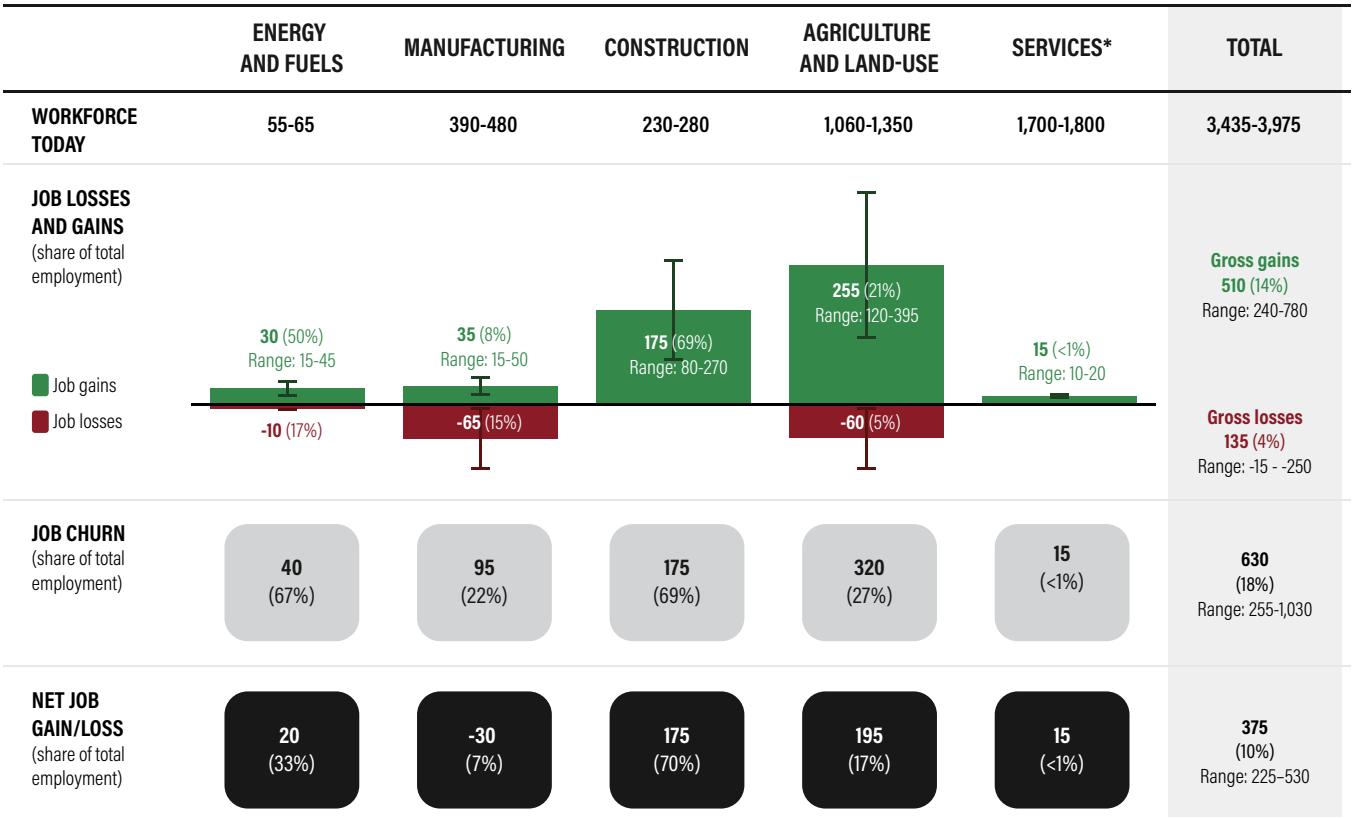
The case for action: The promise of the new economy for people

The emerging economy—driven by technological disruption, demographic shifts, geopolitics, and the climate transition—is profoundly reshaping the jobs and skills people need to thrive. The rapid advancement of digitalization and AI is transforming job requirements, automating tasks, and challenging traditional notions of work and productivity. Population growth is driving an expansion of the labor force in lower-income nations, whereas many higher-income economies and China are facing an aging and contracting workforce. Meanwhile, geopolitical shifts, including tariffs, trade fragmentation, and heightened international volatility, are creating uncertainty and affecting supply chains and labor markets. The climate transition sits at the center of these global shifts leading to job gains and losses as well as changes in existing jobs. These new realities are redefining labor markets and the competencies and capabilities people need to thrive.

The transition to a low-carbon, resilient development model stands out for its strong potential to create net employment gains, with a midpoint estimate of 375 million jobs, over the next decade (Figure ES-1). While there is significant uncertainty about the impact of geopolitical and technological shifts, estimates signal that both of these trends will likely result in net job losses in the near to medium term. By contrast, this analysis suggests that the climate transition could generate substantial net job gains, with an estimated 225–530 million jobs created over the next decade within four key sectors analyzed (energy, construction, manufacturing, and agriculture). The midpoint of these estimates—375 million jobs—is equivalent to an increase of 20 percent in jobs in those sectors or 10

FIGURE ES-1 | Job implications of the transition to a low-carbon, resilient economy

JOB GAINS AND LOSSES BY THE NEXT DECADE
in million jobs, % change relative to sector or total workforce, rounded to the nearest 0/5



Note: a. The "Services" estimate only measures the impact of adaptation due to the lack of estimates for mitigation in the literature.
Source: Authors.

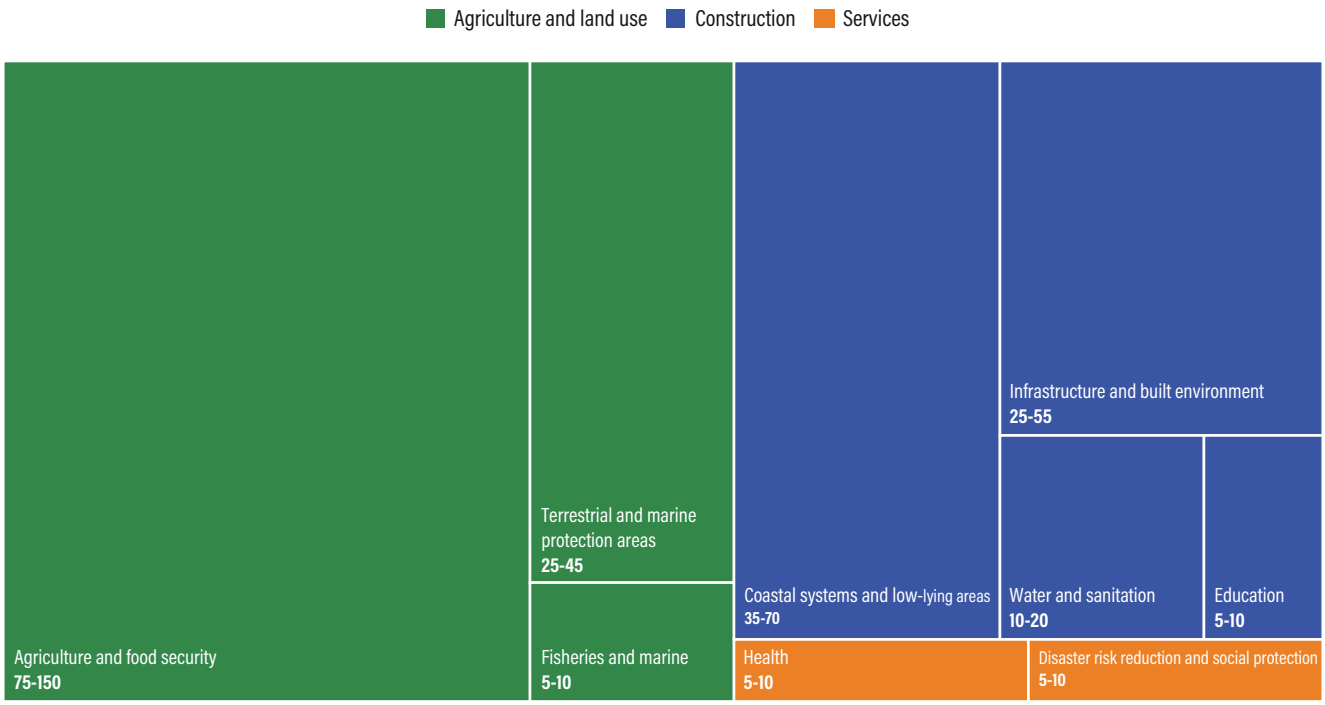
percent overall. Data gaps prevent a full estimate for the service sector, which is also likely to experience significant job impacts.

However, over the next decade this net job creation will be the result of substantial labor market churn, impacting 255 million–1 billion jobs, with a midpoint estimate of 630 million jobs. These values correspond to 15–55 percent (35 percent on average) of the workforce in nonservice sectors, or 18 percent of the total workforce. This means workers and families will face significant disruption as they navigate displacement, reskilling, and relocation. Jobs will be gained in expanding sectors, such as renewable energy, construction, recycling, and nature-based solutions. Jobs will be lost in shrinking fossil fuel–linked and other high-emission industries. Beyond shifts in sector size, millions of *existing* jobs will evolve as tasks adapt to climate goals—from farmers adjusting planting cycles to construction workers adopting sustainable building practices. This transformation will add to the churn.

Prioritizing investments in jobs, skills, and social equity could unleash powerful interlocking economic, social, and environmental benefits. Public and private support for climate-related reskilling and job transitions could help maintain or improve labor force participation and employment, thereby supporting household income, boosting consumer and investor confidence, and strengthening aggregate demand and growth. Quickly redeploying workers to higher value-added sectors of the new economy could increase productivity over time, lift incomes and living standards, enhance social and political cohesion, support climate ambition, and accelerate environmental progress.

By contrast, poorly managed and disruptive workforce transitions could slow the transition itself and carry significant economic, social, and environmental risks. These risks include higher unemployment, deeper inequality, weaker demand, and slower growth—all of which would threaten both climate and development goals. For example, labor shortages have been identified as a key barrier to ramping up low-carbon energy systems, and the number

FIGURE ES-2 | Projected job creation potential from closing the adaptation finance gap, by activity and sector (millions)



Source: Authors.

Note: Figure proportions are based on the midpoint estimates. Numbers might not match with the total due to rounding.

of workers pursuing degrees or certifications relevant for energy sector jobs, let alone renewable energy, remains insufficient to keep pace with growing demand (IEA 2024). Evidence and understanding of the environmental costs of labor market disruptions and skills mismatches are still evolving, but some evidence suggests the impacts could be significant. A new simulation study for this report finds that, if delays in skill formation are a binding constraint, even a modest shortfall of 14 percent (6 million) renewable energy workers by 2030 could lead to an additional 0.7°C of warming by 2100 compared with current national policies (Hambrecht et al. 2025).

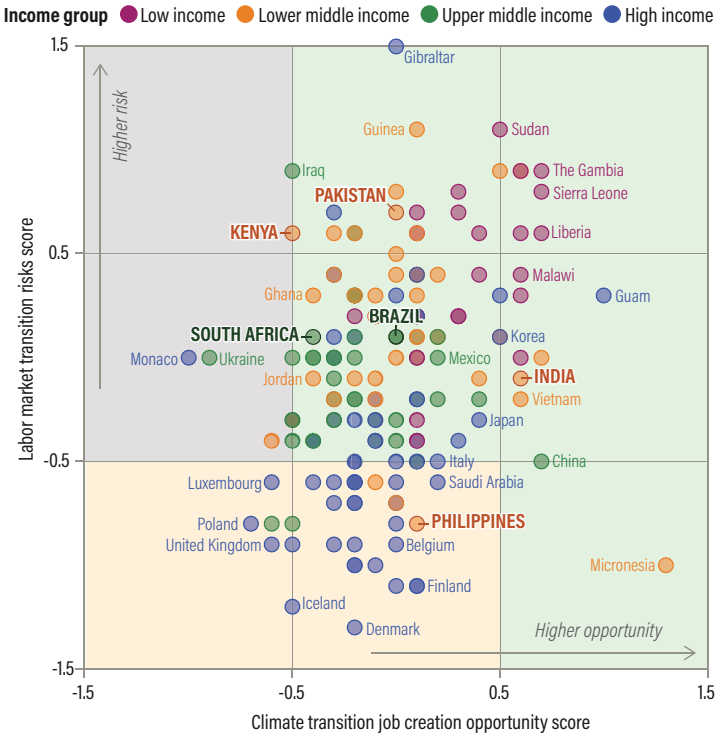
The scale of climate-related labor market opportunities and risks will vary significantly by sector, underscoring the need for tailored approaches. Existing estimates suggest large but uncertain swings in employment. Agriculture and land use could become the largest sources of new employment. Jobs will be lost due to the adoption of sustainable practices that intensify production and reduce labor needs. But the adoption of regenerative farming practices and the expansion of nature-based solutions could more than compensate, with net impacts of 115–275 million jobs, or 10–24 percent of the sector workforce (midpoint estimate of 195 million, or 17 percent of the workforce) (ILO 2018, 2020; WEF 2020). Construction may add the largest relative net gain of any sector: 80–270 million jobs (midpoint estimate of 175 million jobs), or about 30–100 percent (70 percent midpoint) increase in the workforce, driven by retrofitting and energy-efficient infrastructure (WEF 2020; C40 Cities 2025). The energy and fuels sector will see the most profound restructuring with an average 20 million net new jobs—more than 30 percent growth in the workforce—through electrification, power grid upgrades, and low-carbon fuels; however, this sector will also experience the highest churn, equivalent to 35–90 percent of the current workers as fossil fuel roles decline (IEA 2024; IRENA and ILO 2024). Manufacturing is the only sector expected to post modest net losses as reductions in primary materials and internal combustion engine vehicle production outweigh gains in recycling, battery production, and electric vehicle assembly (ILO 2018; WEF 2020). It should be noted that outcomes will be driven both by sectoral choices of decarbonization paths and by the macroeconomic conditions that shape investment flows and the labor market's capacity to adapt.

Adaptation activities are expected to be a major source of employment growth, particularly in agriculture and construction. Adaptation-related employment and skills impacts have received far less analytical attention, with most labor market studies focusing on decarbonization sectors rather than resilience-building activities (Denham et al. 2024). Yet estimates for this report suggest they could generate 190–375 million jobs (midpoint estimate of 280 million jobs) over the next decade (Figure ES-2).

This includes 75–150 million jobs created from construction investments, driven by resilient infrastructure in rural, urban, coastal, and low-lying regions. Another 105–205 million jobs could be created in the agriculture and land use sectors, driven by interventions such as crop, livestock, and fishery resilience; preservation of biodiversity hot spots; and conservation and rehabilitation of terrestrial, marine, and wetland ecosystems. These jobs would build on existing skills and capabilities across a variety of professions, including architects, engineers, agronomists, park rangers, and farm and forestry workers, to deliver climate outcomes. In addition, adaptation could spur employment from the service sector, specifically in risk management and health, to the note of 10–20 million new jobs. Investing in adaptation activities is estimated to create 15–30 times more jobs per dollar than mitigation on average, driven by their high labor intensity and the low labor productivity of developing countries, where these investments would be concentrated.

Opportunities and risks will also need to be managed across different geographies because the transition will not only create new jobs but also locate them in places different to where job losses happen. Mitigation-related jobs will cluster where countries have key natural resources (e.g., solar, wind, critical minerals, etc.) or strong industrial bases. China, for example, already dominates global solar photovoltaic production with 80 percent of output and nearly 5 million jobs, and resource-rich nations such as the Democratic Republic of the Congo, Indonesia, and Vietnam stand to gain from rising demand for critical minerals (ETC 2023). By contrast, fossil fuel exporters (e.g., Russia, Persian Gulf States) and high-emission agricultural producers (e.g., the United States, Brazil) are likely to face substantial job losses if demand for carbon-intensive products declines in alignment with the climate goals. Adaptation-driven job growth will be concentrated in climate-vulnerable regions, notably in the regions of Sub-Saharan Africa, Latin America, and East Asia. The climate transition will also reshape where jobs are located within countries. Most construction and renewable energy roles will cluster in urban and industrial hubs, whereas regenerative agriculture, nature-based solutions, and land-based adaptation work will grow mainly in rural areas. Without targeted strategies, these shifts risk deepening wealth and regional divides. There is currently no integrated framework to assess the relative labor market risks and climate-related job creation opportunities across country contexts. The report presents a proposed approach combining an assessment of labor market transition risks (including labor

FIGURE ES-3 | Labor market risks and opportunities across geographies



OPPORTUNITY	
COUNTRY	SCORE
Liberia	.70
Gambia, the	.70
China	.69
Sierra Leone	.67
Vietnam	.64
Somalia	.60
Benin	.58
India	.57
Central African Republic	.56
Malawi	.56
Eritrea	.55
Papua New G.	.55
Sudan	.55
Korea, Rep.	.50

RISK	
COUNTRY	SCORE
Sudan	1.13
Guinea	1.13
Benin	0.89
Senegal	0.89
Gambia, The	0.88
Iraq	0.78
Sierra Leone	0.78
Rwanda	0.78
Mauritania	0.78
Yemen, Rep.	0.67
Uganda	0.67
Pakistan	0.63
Somalia	0.55
Afghanistan	0.50

Countries with the highest scores for opportunities and risks. Some small island states and micronations present in the distribution were removed due to skewing.

Note: Countries in the green and yellow boxes have high climate-related job creation potential relative to their current and prospective labor market vulnerabilities in terms of unemployment, underemployment, and skills gaps. In other words, the "prize" from increasing support for climate-related skilling and workforce transitions is likely to be particularly significant in these countries, with new jobs resulting from the transition potentially more than offsetting not only climate-related job losses but also dislocation from other workforce trends and transformations.

Source: Authors.

market structure, equity, skills and preparedness and available labor pool) and opportunities across different sectors (including energy, manufacturing, construction, agriculture, and adaptation and resilience). Figure ES-3 illustrates how countries are positioned relative to these potential risks and opportunities.

The impacts of the transition on employment will encompass not only the quantity of jobs created but also their quality and access. While the transition is expected to generate significant new employment, outcomes for people will depend on whether jobs provide security, fair and competitive pay (e.g., in comparison with equivalent roles in high-carbon industries), and safe working conditions (Keese and Marcolin 2023). In high-income countries (HICs), many climate-related roles are formal, skill-intensive, and pay higher wages; in low- and middle-income countries (LMICs), they are often informal, pay lower wages, and are concentrated in sectors such as agriculture, waste, and construction. For example, most renewable energy jobs are characterized by structural informality and limited enforcement of labor standards (IRENA and ILO 2024). Access also matters; vulnerable groups such as women, youth, older workers, people with disabilities, and Indigenous Peoples face persistent barriers to access skills and secure employment. For example, globally, men hold nearly two-thirds of climate-related jobs (Alexander et al. 2024). These patterns highlight that job creation alone will not ensure inclusive labor market outcomes without targeted policies to expand access and improve job quality, in line with International Labour Organization (ILO) core labor standards.

Realizing the potential of a people-centered transition will require addressing widening skills gaps in foundational, technical, and transversal skills among the current and future workforce. More than 760 million adults aged 15 and older do not possess basic literacy and numeracy skills (World Bank and UNESCO 2023), and 70 percent of children in LMICs cannot read and understand a paragraph by age 10, placing them in learning poverty (Patrinos et al. 2024). One source estimates that 1.3 billion people have competencies that either exceed or are insufficient for the activities they perform, a number projected to rise sharply by 2030 (Hoteit et al. 2020); nearly three-quarters of youth aged 15–24 across 92 countries are off track in acquiring employment-relevant skills (UNICEF

TABLE ES-1 | Skills required for the transition to a new economy

	ENERGY & FUELS	AGRICULTURE & LAND USE	MANUFACTURING	CONSTRUCTION	SERVICES
Sector-Specific Technical Skills	Renewable energy engineering	Soil science and testing	Battery engineering	Heat pump engineering	Sustainable supply chain management
	Electrical systems maintenance	Irrigation system engineering	Circular product design	Energy-efficient building design	Green finance structuring
	Alternative fuel chemistry	Agronomy diagnostics	Material science	Sustainable urban planning	Environmental auditing
	Thermal system design	Peatland restoration	Industrial recycling optimization	Insulation retrofitting	Climate data science
	Carbon capture engineering	GIS data analytics	Process optimization	Climate-resilient engineering	Environmental management systems
Cross-Sectoral Technical Skills	Environmental regulation and compliance				
	Sustainable reporting				
	GHG accounting				
	Financial modelling				
	Life cycle assessment				
Transversal Skills	Adaptability/collaboration				
	Problem-solving				
	Technological proficiency				
	Communication				
	Leadership				

Note: GHG = greenhouse gas; GIS = geographic information system.
Source: Authors.

et al. 2022). The transition will intensify these pressures by driving demand for both new and existing skills (Table ES-1). Workers will need to acquire technical capabilities for cross-sectoral roles (e.g., sustainability accounting and reporting) as well as sector-specific ones (e.g., solar panel installation). Transversal skills, including adaptability, communication, and problem-solving, will be especially important because they will enable lifelong learning for workers, which is critical for them to adapt quickly to the evolving tasks and new technologies of the transition (Keese and Marcolin 2023). Demand for climate-related skills is already increasing faster than supply. LinkedIn analysis, which compared job postings on its site to the green skills descriptions of its members, found that green talent demand grew at 12 percent between 2023 and 2024, twice the rate of supply (LinkedIn 2024).

Thus, economies and societies stand at the threshold of a new and more intensive phase of technological, demographic, and climate shifts that are poised to upend labor markets worldwide. The stakes are too high for "business as usual," not only in environmental policy but equally in social and economic strategy. A genuinely people-centered transition must put workforce transformation at its core, turning disruption into an engine for jobs, productivity, and rising living standards while urgently mitigating the risks.

Recommendations: An Action Agenda for a people-centered transition

This report calls on leaders from governments, businesses, and civil society to lead a people-centered transition that places jobs, skills, and social equity at the core of both economic and climate decision-making. It emphasizes that investing in the capabilities and workforce transitions of people is as foundational as investing in infrastructure and technology, and it seeks to elevate these human capital considerations to a top strategic priority in the economic and climate agendas of governments, firms, and relevant international institutions.

It formulates a direct response to three interrelated challenges that must be addressed to secure a people-centered transition. First, current economic transition strategies and data systems rarely integrate workforce dimensions, leaving jobs and skills at the periphery of planning and implementation. Second, education, training, and workforce development systems remain ill-equipped to anticipate or shape demand in the emerging economy. And third, there is a chronic shortfall in long-term and coordinated financing to invest in the social dimensions of the transition.

Aligned with these challenges, the report sets out ten recommended actions (Table ES-2) for leaders in government, business, and civil society across three categories:

- **Intentionality.** Anticipate transition-related employment shifts and skills mismatches through improved labor market data, and mobilize a more integrated and better-funded policy response for skills and workforce transitions at the national and regional levels.
- **Innovation.** Test, identify, and scale a new generation of skills and workforce development programs that are fit for purpose, flexible, and offer pathways to jobs and alternative livelihoods.
- **Investment.** Recognize spending on jobs and skills as an investment and economic growth asset, increase public financing and incentives for private investment in workforce transitions in government budgets, and employ innovative finance accordingly.

TABLE ES-2 | Action Agenda for a people-centered transition

Government · Private sector · Education and training · Labor unions · NGOs and development

		ACTIONS	KEY ACTORS
INTENTIONALITY	1	Hardwire jobs and skills strategies into national and corporate transition policy and budget planning and establish mechanisms with authority to orchestrate collective action.	
	2	Establish place-based, multistakeholder workforce transition pacts to align job and skills development with regional economic and climate strategies.	
	3	Develop stronger workforce intelligence systems to anticipate the transition's impacts on jobs and skills, especially on vulnerable workers, including by expanding use of real-time data and AI.	
INNOVATION	4	Design agile, modular, and inclusive skills and workforce transition programs that leverage technology and data.	
	5	Build smart accreditation and job-matching platforms that validate formal, nonformal, and informal learning; connect workers to employers; and issue portable certifications.	
	6	Build industry-led training consortia that pool resources to codesign curricula, develop sector-specific skills, and ensure a talent pipeline responsive to employer needs.	
INVESTMENT	7	Increase public finance for skills and jobs by growing general tax revenues, treating expenditures as investment in accounting frameworks and expanding the use of targeted financing instruments (e.g., skills levies, skills bonds, and debt-for-skills swaps).	
	8	Incentivize business to invest in skills, job creation, and inclusive employment through tax credits, investment subsidies, and public procurement requirements.	
	9	Make investments in jobs and skills a priority in international climate and economic development finance.	
	10	Design flexible and long-term financing instruments that enable households to invest in skills training, entrepreneurship, and navigate workforce transitions.	

Note: AI = artificial intelligence; NGO = nongovernmental organization.

Intentionality

Skills and workforce strategies have largely been missing from national and corporate economic and climate transition planning and are addressed reactively rather than strategically. In many sectoral transition strategies—such as clean energy road maps or bioeconomy strategies—workforce requirements are underdeveloped or missing (Weishaupt 2025). Only half of the second cycle of nationally determined contributions (NDCs) reference skills or workforce strategies, and only 1 percent refer to concrete financing plans for them (ILO 2025). At the corporate level, a review of 150 emerging-market firms found most unprepared for transition risks because climate and social priorities remain siloed from core business functions (WBCSD 2025). Research also shows that only 24 percent of corporate reports put skill-building efforts in the context of corporate strategy, and those that do describe these efforts in simple, qualitative ways, typically discussing strategic priorities and referencing skill building in this context; only a handful of companies indicate that they have a structured process for forecasting skill gaps based on corporate business needs (Harnoss et al. 2023).

The absence of skills and workforce strategies is due to institutional fragmentation, lack of coordination and consultation, and poor data. The responsibility for skills and workforce issues is often split across ministries (labor, education, finance, climate, industry, and other line ministries), with limited coordination and alignment, making it difficult to integrate jobs and skills into climate and economic strategies in a coherent way. Limited stakeholder consultation poses additional problems. The impacts of the transition are highly localized, concentrated in specific industries, regions, and communities. Critical coordination between central and local governments, employers, workers organizations, and education/training providers is often lacking. At the same time, many governments lack robust and timely data on jobs, skills demand, and workforce transitions. They fail to capture regional and demographic disparities or the realities of informal workers and vulnerable populations. Diagnostic tools tend to be backward-looking, leaving policymakers with limited capacity to design proactive policies or convince finance ministries or financial officers to allocate resources. Data on public and private investments is fragmented and missing.

This report proposes the following actions to intentionally plan for a more people-centered, efficient, equitable, and opportunity-rich transition.

ACTION 1. Hardwire jobs and skills strategies into national and corporate transition policy and budget planning and establish mechanisms with authority to orchestrate collective action.

Governments should develop stronger, better-resourced jobs and skills strategies as an integral part of economic, industrial, climate, or whole-of-economy strategies. These should explicitly seek to expedite the transition of workers to jobs in expanding sectors of the economy, such as adaptation in the built environment and land use. The Philippines provides a strong example of how workforce priorities can be integrated in national climate, development, and economic planning frameworks (Kerr et al. 2025). Egypt's 2025 *Narrative for Economic Development: Reforms for Growth, Jobs & Resilience* is another more recent example of an integrated approach (MoPEDIC 2025). Broader education and lifelong learning strategies as well as labor market and social protection policies should be aligned with these strategies or, ideally, be combined in a whole-of-economy strategy. Governments should also mandate labor impact assessments in policy design, including job quality benchmarks and workforce transition metrics, helping to ensure that policies deliver tangible benefits for workers.

Institutional leadership will be needed to coordinate effectively. Such leadership could be established through a dedicated coordinating body in the prime minister's or president's office or by a designated cabinet-level lead for labor transitions. Several examples exist: the Inter-Agency Committee on Green Jobs in the Philippines, led by the Department of Labor and Employment, ensures alignment across labor, education, environment, trade, and finance ministries, while guiding the development and implementation of national green jobs policies (Kerr et al. 2025). Brazil's S-System takes a cross-ministerial approach in anticipating sector workforce disruptions, promoting upskilling, and creating green jobs as industries modernize and adopt cleaner technologies. The United Kingdom's Green Jobs Taskforce and its successor, the Green Jobs Delivery Group, is a cross-ministerial body with industry and union participation, established to align climate policy with the creation of up to 2 million green jobs by 2030 (UK Government 2020).

Businesses, too, should be proactive. Larger companies should embed the worker and community dimensions into the heart of their transition analysis and strategies, informed by clear goals and regular monitoring (WBCSD and ERM 2025). Such plans could potentially be incentiv-

ized by targeted government policies. A whole-of-company approach will require integration of people-centered considerations and social outcomes across all core business functions with support and accountability from boards and C-suites.

Finally, countries could consider forming a global compact to make workforce development a core part of global climate commitments. This could include requiring countries to set measurable targets for job creation, skills, and equity in their NDCs or adaptation plans. It could also align private investment and international finance with these goals, enabling global monitoring of employment and skills outcomes alongside emissions and adaptation targets.

ACTION 2. Establish place-based, multistakeholder workforce transition pacts to align job and skills development with regional economic and climate strategies.

Locally negotiated transition pacts are a critical tool to bring together multiple stakeholders to align climate transition goals with place-based job creation and skills development. They are typically designed at the level where change is most needed, particularly in regions reliant on high-carbon activities or with significant opportunities in the nature-based economy. Pacts should be cocreated with genuine participation from workers, labor institutions, training providers, employers, and civil society, ensuring shared ownership, private sector involvement, and realistic on-the-ground implementation. They should be linked to broader climate strategies and economic development plans to help manage the associated impacts and leverage the opportunities.

The content of each pact should be shaped through stakeholder engagement and local partnership and ideally underpinned by strong accountability mechanisms. Pacts will typically include reskilling and upskilling programs, job search and matching services, tailored support for displaced workers, and targeted programs for vulnerable groups. Pacts should have clear milestones and outcome monitoring to signal long-term intent to communities and ensure promises are delivered. They will depend on wider enabling factors, such as the degree of local government autonomy, the presence of active regional industries or clusters, and the strength (or weakness) of local institutions. The Programa de Transição Energética Justa (Just Energy Transition Program) in the state of Santa Catarina in Brazil is an example of a subnational transition pact. The effort is overseen by a council that includes representation from key stakeholders in federal, state, and local government; workers; and coal industry representatives. Work is under way to develop a just energy transition plan for the state that will be overseen by the council, informed by robust stakeholder engagement, and include recommendations to ensure that workers, local businesses, and sectors benefit from the transition (Moreira da Maia 2025).

ACTION 3. Develop stronger workforce intelligence systems to anticipate the transition's impacts on jobs and skills, especially on vulnerable workers, including by expanding use of real-time data and AI.

Multilevel predictive labor market models are indispensable for guiding workforce transition strategies. They can pinpoint emerging job opportunities, flag at-risk occupations, and specify the precise skills that need development. National workforce intelligence systems should be strengthened to support the development of dynamic forecasts of labor supply and demand in key sectors, including formal and informal employment trends and skills supply. These national systems should be complemented by subnational, regional, or sectoral information systems. Effective green workforce planning requires multilevel labor market information systems (LMISs) that link national, regional, and sectoral intelligence. A national LMIS provides high-level oversight, aligning macroeconomic and climate goals with future skills demand, and regional and sectoral systems add the local and industry-specific granularity needed to guide targeted training and policies (SB COP30 2025).

Systems should generate real-time, granular, participatory, and forward-looking data and analysis, using advanced analytics powered by AI tools where possible. Data should be disaggregated by gender, region, age, and employment status to ensure benefits and risks across workers and communities are understood and fairly distributed. Singapore's *Skills Demand for the Future Economy* reports and accompanying digital dashboards, for example, leverage years of job-posting data to forecast priority skills across sectors (Gog 2025).

These systems should also leverage bottom-up data on job quality metrics (wages, security, rights, social protection) and regular reporting from businesses on shortages and vacancies. Embedding such bottom-up intelligence enables governments and businesses to collaborate on targeted investments to close skills gaps and foster labor market resilience. For example, LinkedIn's Economic Graph Research Institute and the Data for Impact initiative

provide the public sector real-time labor market analytics to inform workforce development policy (LinkedIn 2024). Lightcast partners with subnational governments across the United States and with European institutions to provide insights on workforce and skills needs.

For low-income and conflict-affected economies, where digital and data infrastructure remain limited, global and regional initiatives will be essential to build foundational capacities and ensure that future skills intelligence systems are inclusive and globally representative. The Global Skills Tracker, for example, is an emerging platform providing data and analysis on labor markets and skills trends to support decision-making (UNESCO-UNEVOC n.d.). Other pilots, such as the World Bank's Skills Towards Employability and Productivity Survey and the World Skills Clock developed by the International Commission on Financing Global Education Opportunity, United Nations Children's Fund (UNICEF), and the World Data Lab could also be expanded to help provide insights.

Innovation

The prevailing models of skills and workforce development (including training, job placement, and worker support) are failing to deliver in a rapidly changing environment. Training systems often struggle to keep pace with the rapidly changing environment, hampered by slow curriculum updates, rigid credentialing, and a shortage of qualified instructors. They are largely supply-driven, designed with limited employer input and weak accountability for outcomes. But employers, too, frequently lack the tools, or even the clarity, to communicate what skills they truly need. There are a lack of feedback systems, such as robust labor market information and matching platforms, that enable real-time communication and joint accountability between educators and employers. The result is a mismatch: supply-driven programs and fragmented demand signals. The absence of effective and flexible systems to generate a strong pipeline of workers with a broad range of skills (including entrepreneurship) is constraining job transitions and job creation. Women, informal workers, and rural populations are particularly affected because alternative pathways to reskill and upskill disadvantaged groups are underdeveloped, and mechanisms to recognize existing knowledge remain insufficient.

The report proposes the following actions to innovatively transform skills and workforce transitions.

ACTION 4. Design agile, modular, and inclusive skills and workforce transition programs that leverage technology and data.

Agile, modular, responsive, and inclusive digital education and training systems will be critical to equip young people and workers with the broad range of skills required for the transition. This is especially important for those excluded from formal channels. Skills programs should both prepare workers for new and emerging low-carbon jobs and embed skills into existing occupations that are evolving through the transition. Scaling modular, stackable courses and microcredentials could enable workers to build skills progressively and update them as technologies and industries evolve, avoiding reliance on outdated, one-off qualifications.

Technology in various forms can help widen access and ensure retention of groups often excluded from formal training, including informal workers and vulnerable groups. Mobile-first platforms such as Kenya's Arifu are delivering digital training via SMS and WhatsApp, making learning accessible to users even without internet and help-

ing to expand access while avoiding the risk of deepening digital divides (Arifu 2021). More advanced technologies, such as AI tools, could be leveraged to generate localized, context-specific learning content or support personalized learning. By offering offline functionality, local-language content, and on-demand formats that adapt to irregular schedules, people can access the right skills at the right time while lowering delivery costs. Mobile learning platforms, localized digital content, and community-based delivery models can expand training access at low cost while also improving inclusion and reach.

Finally, complementing training with entrepreneurship support such as access to finance, mentoring and coaching, incubation or networking opportunities, and market linkages can create more inclusive pathways from learning to earning, especially for young people and where formal jobs are scarce. In Nigeria, Hello Tractor trains young entrepreneurs and farmers to operate and manage tractors, and it finances their ownership through a pay-as-you-go model (Laniyan 2025). Pakistan's Roshni Baji program provides inclusive training that empowers women to become certified electricians in a traditionally male-dominated field, offering holistic support that blends technical skill development with practical training such as motorbike riding (K-Electric n.d.).

ACTION 5. Build smart accreditation and job-matching platforms that validate formal, nonformal, and informal learning; connect workers to employers; and issue portable certifications.

Recognizing skills acquired through nonformal and informal learning (e.g., outside formal education or on the job) will be essential to unlock the full potential of people and enable smoother workforce transitions. Traditional education and credentialing systems often undervalue large pools of talent, particularly in economies where informal employment and learning dominate. Expanding accreditation models, such as the recognition of prior learning (RPL) and national qualification frameworks, could help validate competencies gained outside classrooms or through work experience, giving workers a portable, trusted currency of skills that employers recognize. For example, India's Pradhan Mantri Kaushal Vikas Yojana (Prime Minister's Skills Development Scheme) integrates RPL as a central component, enabling informal workers in construction, textiles, and other sectors to receive nationally recognized certification without retraining (Skill India 2022). Similarly, Brazil's National Service for Industrial Training (Serviço Nacional de Aprendizagem Industria; SENAI) offers RPL programs that formalize industrial skills gained through informal apprenticeships (FIEMG 2023). By giving credit for what people already know, RPL can help reduce redundant training for experienced workers (OECD 2023). It can also enhance international coordination and cross-border skill utilization because migrant workers can leverage RPL assessments to have their existing qualifications recognized in their destination country (ILO 2020).

New forms of accreditation, such as microcredentials and digital badges, are helping create a more transparent and dynamic skills marketplace. With AI-driven assessment tools, these systems could become faster, more consistent, and more scalable. A leading example is the European Digital Credentials for Learning platform, which provides a secure, verifiable digital format for microcredentials issued by educational and training institutions. These credentials can recognize formal, nonformal, and informal learning, allowing workers to carry trusted digital proof of their skills seamlessly across institutions and borders (European Commission n.d.)

Finally, smart accreditation should be paired with job-search and -matching assistance as well as career counseling to be most effective. Individualized career counseling and job-matching services can help workers find employment or reemployment aligned with their skills and goals, grounded in the local labor market (DG for Energy 2020; OECD 2025). The local government in Trenčín, Slovakia, worked with a local mining company on a program for displaced mine workers that included personalized career counseling as well as reskilling and upskilling courses linked to local labor market needs (Hambrecht et al. 2025). Online professional networking sites and digital job-matching platforms are uniquely positioned to connect skills with employment in real time. The Skill India Digital Hub, for example, connects digital credentials, apprenticeship systems, and job portals to streamline hiring for both candidates and employers (Skill India 2022). The global nonprofit Generation uses workplace simulations, soft skills, and job-matching support for first-time job seekers, achieving approximately 80 percent placement rates within 90 days (Generation n.d.). However, platforms favor learners and workers with existing digital skills.

ACTION 6. Build industry-led training consortia that pool resources to codesign curricula, develop sector-specific skills, and ensure a talent pipeline responsive to employer needs.

Training consortia will be essential for building skills pipelines aligned with industry demand. By pooling resources, firms can jointly fund accelerated training programs in specific value chains, ensuring curricula are designed and delivered with direct employer input. Such models not only reduce duplication and training costs but also create clear pathways for workers, improving job matching and workforce mobility. One example is Apprenticeship 2000 in the United States, where a consortium of advanced manufacturers established a shared training pipeline in mechatronics and precision engineering to address talent shortages (Apprenticeship 2000 n.d.).

Industry federations and confederations can amplify these efforts. They have the scale, legitimacy, and convening power to align training across firms and regions, set shared standards, and ensure programs are embedded within broader industrial strategies rather than fragmented at the firm level. In Brazil, one of the defining features of the technical and vocational education and training system is the "S-System," a network of employer-led organizations funded mainly through compulsory contributions from companies, dedicated to providing professional education, training, and social services (UNESCO 2022b).

Investment

Skills and workforce transition programs are chronically underfunded, even as demand grows in the context of the new economy. Globally, total education spending by governments, households, and donors (which includes spending on technical postsecondary and tertiary formal education) has increased more slowly than economic growth over the past decade (Tanaka et al. 2024).

Public spending remains far below what is needed for universal education, especially in lower-income countries. Achieving this goal requires an average of 8.5 percent of gross domestic product (GDP) across LICs and lower-middle-income countries (Stromquist 2017; Education Commission 2022), yet current public spending averaged just 3.8 percent in low-income countries and 3.4 percent in lower middle-income countries in 2022 (see Figure ES-4). This is equivalent to only $55 per learner in LICs compared with $8,500 in HICs (Tanaka et al. 2024). The resulting financing gap for LICs and LMICs to achieve the basic education targets of Sustainable Development Goal 4 is $97 billion annually (UNESCO 2024). Inequities worsen the challenge: students from the poorest quintile receive just 16 percent of public education funding, whereas the richest capture 28 percent (UNICEF et al. 2022).

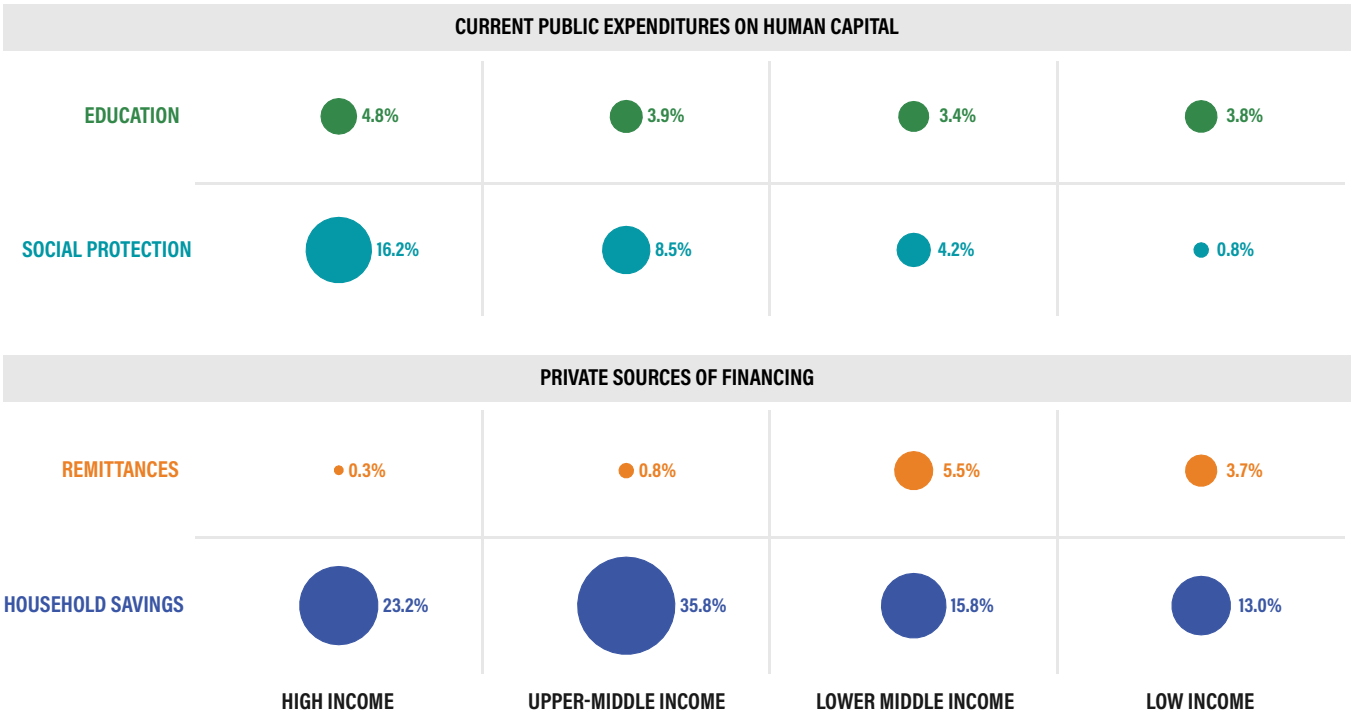
Spending on adult learning, continuing education, and lifelong learning is systematically low, fragmented across ministries, and poorly tracked. Adult learning and education expenditures accounted for less than 2 percent of total education budgets (UNESCO 2022a). Funding for active labor market policies, including training and workforce development, absorbed less than 0.1 percent of GDP in LICs and LMICs as shown in figure ES-4 (WBG 2023), and it fell from 1.32 percent of GDP in 2004 to 0.98 percent in 2020 in Organisation for Economic Co-operation and Development countries (OECD 2025). Finally, social protection mechanisms in LMICs face a financing gap of about 3.3 percent of GDP annually to achieve universal social protection, which includes labor transition support (Cattaneo et al. 2024).

Rising debt, fiscal constraints, and growing populations are further straining available resources. As governments cover nearly three-quarters of all education expenditures, spending is highly vulnerable to fiscal outlooks. In LICs, inflation and rapid population growth have diluted the impact of rising budgets with real per capita education spending stagnating (Tanaka et al. 2024). Debt burdens add further strain. Between 2021 and 2023, 22 countries spent more on debt than on education (UNCTAD 2024).

Education has also been deprioritized in aid budgets amidst falling development assistance and competing global priorities. Total aid to education has stagnated in absolute terms and declined in relative terms since 2015. It fell by 12 percent between 2023 and 2024, and even before significant reductions in US aid, it was expected to decline another 25 percent by 2027 (UNESCO 2025). Financing for jobs and skills has been virtually absent from climate finance, with less than 0.5 percent of international climate finance directed to capacity-building (Naran et al. 2024) and only about 10 percent of the developmental aid for jobs and skills being climate related in 2022 (Bomprezzi and Reinsberg 2025).

Prospects for expanding investments in human capital are constrained by current government and international debt accounting practices. Investment in human capital generates significant social (e.g., productivity gains) and private (e.g., income) returns of 10–20 percent (Psacharopoulos and Patrinos 2018; Bharti et al. 2025). Yet national accounts classify spending on human capital as recurrent *consumption* rather than *investment*. As a result, these

FIGURE ES-4 | Current expenditures in human capital and private sources of financing, as a percentage of GDP by country income group



Source: Authors, based on estimates from the World Bank DataBank (education, remittances, household savings) and International Labour Organization Social Protection Data Dashboard (social protection).

expenditures become targets for budget reductions during fiscal consolidation, and they are generally excluded from considerations for debt financing or public-private partnerships (IMF 2024). This bias fails to recognize the growth and economic return potential of human capital, which could take the form of labor productivity, increased tax revenue, reduced social spending, and—in the specific context of the transition—could increase foreign direct investment, support for high-value green industries, and carbon finance. This limits sectors from mobilizing much-needed resources.

Private investment in skills is limited by financing barriers at both firm and household levels. Smaller enterprises face particular challenges in accessing affordable, long-term credit, which could be used for workforce development. About 40 percent of micro, small, and medium enterprises in Sub-Saharan Africa cite finance as a major constraint, compared to 25 percent of larger firms (World Bank 2022). In many HICs, small and medium-sized enterprise (SME) lending has shifted toward short-term credit, reinforcing short-termism and reducing incentives to invest in training (OECD 2025). Education costs are heavily borne by families: households contribute 26 percent of total education spending in LICs, 44 percent in LMICs, and 20 percent in HICs (Tanaka et al. 2024). While interest in investing in education in LMICs is strong, few financing instruments exist to spread costs fairly or prevent households from being overburdened.

The report proposes the following actions to catalyze investment in a people-centered transition.

ACTION 7. Increase public finance for skills and jobs by growing general tax revenues, treating expenditures as investment in accounting frameworks and expanding the use of targeted financing instruments (e.g., skills levies, skills bonds, and debt-for-skills swaps).

Given governments' predominant role in financing investments in education, skills, and workforce transitions, increasing tax revenues is a critical strategy. This would create stable and dedicated funding that can withstand political and economic cycles (Paczos et al. 2023). Countries at similar development levels show vastly different tax efforts, indicating significant untapped potential.

An overall increase in tax-to-GDP ratios as recommended by the International Monetary Fund (IMF) must remain a priority for lagging countries (Gaspar et al. 2023).

Adopted in over 70 countries, skill levies have the potential to expand resources for skills and workforce development and complement general tax increase efforts in the immediate term. These are taxes or levies applied to firms, either earmarked for worker training at a national or regional scale or sometimes deductible for on-site training (UNESCO 2022a). Examples of levies from Brazil, Kenya, Singapore, and South Africa demonstrate how ring-fenced payroll-based contributions provide predictable resources. Other revenue streams, such as environmental or pollution taxes, can also increase resources while reinforcing broader climate policy goals.

At the same time, reforms to debt sustainability analyses and credit ratings are needed to recognize human capital benefits, reduce borrowing costs, and expand fiscal space. Innovative debt instruments and restructuring, such as debt-for-education or -skills swaps, social spending safeguards in debt relief, and performance-based or green-linked bonds, can further unlock investment capacity. Overall, treating human capital as an asset rather than a sunk cost would help countries to secure more sustainable financing, build resilience, and drive long-term prosperity.

ACTION 8. Incentivize business to invest in skills, job creation, and inclusive employment through tax credits, investment subsidies, and public procurement requirements.

To catalyze private investments in skills and job creation, governments could deploy fiscal and nonfiscal incentives, especially for smaller enterprises and entrepreneurs who are often unable to shoulder high up-front training costs. Tax credits and subsidies can reframe training as a strategic investment rather than a sunk cost, stabilize spending during downturns, and align employer action with national strategies. Singapore provides a strong example through its SkillsFuture program, which combined generous SME subsidies with tax deductions for larger firms, covering up to 90 percent of training costs (SkillsFuture 2024). In 2023, more than 520,000 individuals participated in SkillsFuture-supported training, and about 23,000 employers sponsored training. By substantially lowering the cost of investing in workforce development, Singapore's approach helps small and larger firms shift from short-term cost minimization toward long-term skills and innovation strategies. Other countries could adapt this model to mobilize private resources, raise training quality, and ensure both smaller and larger enterprises contribute to building skilled workforces. Sustaining large firms' investments is particularly important because their training practices shape sectoral norms, influence supply chains, and generate spillovers into local labor markets.

In addition, public procurement offers could also provide a powerful lever to influence employer behavior, representing up to 30 percent of GDP in some developing countries (UNFSS 2020). By embedding employment, training, and inclusion requirements into contracts, governments can create stable demand pipelines that encourage firms to invest in people while improving their competitiveness in bidding for public projects. This approach aligns infrastructure and social spending with long-term labor market outcomes. South Africa's renewable energy auctions show how procurement policy can institutionalize workforce development, linking contracts to apprenticeships, training opportunities, and local hiring (Montmasson-Clair and Ryan 2014).

ACTION 9. Make investments in jobs and skills a priority in international climate and economic development finance.

Workforce transition strategies should be at the heart of public and private transition strategies, and international climate and development finance should prioritize support for this. Multilateral, bilateral, and philanthropic finance providers should pool funds to support long-term technical assistance and capacity-building in support of country-led jobs and skills strategies (Action 1), aligning their investments behind these strategies.

Multilateral development banks (MDBs) will play a pivotal role. As the largest and likely fastest growing sources of climate and development finance (following the commitment at the Fourth International Conference on Financing for Development to treble lending, strengthen their balance sheets, and grow the use of guarantees), they could be central to scaling investment in workforce transitions (Latona and Jones 2025; Wells 2025). The recent increased prioritization of the jobs agenda in MDB strategies positions them well for this task. If MDBs could dedicate a share of this lending expansion to workforce and social transition measures and mainstream such investments in climate lending and country programs, they could transform fiscal outlooks, ease risks from climate and digital transitions, and position skills as a core pillar of sustainable growth. This integration could include embedding jobs and skills assessments within Country Climate and Development Reports, and requiring analytical and lending products with major

climate elements to consider and respond to jobs and skills implications. It could also include creating a presumption for planning purposes that each major climate project loan would dedicate a certain percentage (e.g., 5–10 percent) to labor market and social transition purposes related to the project, with the final amounts and purposes subject to agreement with borrowing countries per usual practice. At this time, there is no analysis of what the percentage patterns are, but that analysis can be undertaken as a first step. Similarly, national development banks could also play a stronger role, leveraging their deep local knowledge and close links to domestic industries to finance context-specific skills and job creation programs that align with national transition priorities.

Innovative instruments within the international financial architecture can complement this effort. The International Finance Facility for Education (IFFEd) could extend its portfolio guarantees to catalyze lending not only for education but also for workforce transitions (Vaughan et al. 2022). The IMF can play a vital role by recognizing human capital spending as an investment and by enabling countries to use its Resilience and Sustainability Trust (potentially expanded through new special drawing rights) to finance workforce components of climate resilience. Vertical climate funds, although smaller in scale, can play their own distinct role. The Green Climate Fund, for example, could deploy its tool kit to support jobs and skills strategies through its readiness funding, relevant pipeline development, and investments.

To maximize impact, these international public financiers should operate more coherently as a system to support workforce transitions. Building on the emerging generation of "Country Platforms" could offer a promising path forward (Robinson and Olver 2025). These platforms can bring together governments, national development banks, the private sector, and international financiers to jointly identify skills needs, policy enablers, and aligned financing. Within this framework, partners should design predictable, replicable financing structures to underpin long-term investment in human capital for the new economy. Finally, international skills development and migration partnerships could help address skills shortages in origin and host countries.

ACTION 10: Design flexible and long-term financing instruments that enable households to invest in skills training, entrepreneurship, and navigate workforce transitions.

Equitable access to education and training finance requires targeted mechanisms that ensure vulnerable households are not excluded from education and upskilling opportunities. Even where credit is available, opportunity costs, up-front fees, and weak digital infrastructure deter participation, making stipends and vouchers critical to offset costs and reduce dropout risks. Evidence from Kenya's Technical and Vocational Vouchers Program shows the transformative potential of such schemes: enrollment among disadvantaged youth rose from 4 percent in the control group to 74 percent among voucher recipients (Hicks et al. 2011). Alongside grants, concessional microfinance tailored to climate-resilient investments can empower low-income households to adopt sustainable technologies and entrepreneurial practices while building relevant skills.

Worker transitions also demand stronger support systems: unemployment benefits often cover lost income but rarely fund reskilling. Embedding education insurance or "upskilling protection" into social safety nets would shift these systems from passive compensation to proactive capacity-building.

Finally, flexible income-contingent loan schemes can expand sustainable access to skills finance. These schemes tie repayment to future earnings and activate only once incomes surpass defined thresholds. South Korea's program, managed by the Korea Student Aid Foundation, illustrates how such loans can reduce default risks and improve affordability for low-income families while mobilizing finance at scale when blended with concessional and private capital (KOSAF n.d.).

From analysis to implementation

Interest in addressing the jobs and skills dimensions of the economic and climate transitions has been growing across countries and industry. Several collaborative initiatives have emerged focused on job quality and social protection (e.g., the ILO-led Global Accelerator on Jobs and Social Protection for Just Transitions), wider equity issues related to the transition (e.g., the Equitable Transition Initiative led by the World Economic Forum), and youth training and workforce transition programs (e.g., UNICEF's Generation Unlimited, the Global Skills Academy under the Global Education Coalition established by the United Nations Educational, Scientific and Cultural Organization; UNESCO).

Current initiatives do not yet fully address the need for intentional strategies and whole-of-government approaches that proactively assess transition-related job loss risks and, importantly, the job creation opportunities of a given country. They also do not yet mobilize the necessary integrated national policy response, local multistakeholder cooperation, and international technical and financial support necessary to enable countries to fully capitalize on the climate transition's potential to be a substantial net contributor of job opportunities for people looking for more or better work.

In this context, a major collaborative global effort to support governments interested in pursuing the Action Agenda set out in this report with their stakeholders could make a major contribution. This support could include shared knowledge and research; technical assistance in policy design, program development, and resource mobilization; and national and global advocacy.

Now is the time for a decisive country- and industry-led global response that puts people at the center of the new economy.

References

Alexander, N.-R., L. Li, J. Mondragon, S. Priano, and M.M. Tavares. 2024. "The Green Future: Labor Market Implications for Men and Women." Working Paper 2024/156. Washington, DC: International Monetary Fund. https://doi.org/10.5089/9798400284007.001.

Apprenticeship 2000. n.d. "About." https://apprenticeship2000.com/zwp/. Accessed September 8, 2025.

Arifu. 2021. "Digital Training Benefits Farmers and Agricultural Institutions." https://arifu.com/digital-training-benefits-farmers-and-agricultural-institutions/.

Bharti, N.K., A. Gethin, T. Jenmana, Z. Mo, T. Piketty, and L. Yang. 2025. "Human Capital, Unequal Opportunities and Productivity Convergence: A Global Historical Perspective, 1800–2100." Working Paper 2025/15. Paris: World Inequality Lab. https://wid.world/document/human-capital-unequal-opportunities-and-productivity-convergence-a-global-historical-perspective-1800-2100-world-inequality-lab-working-paper-2025-15/.

Bomprezzi, P., and B. Reinsberg. 2025. *Tracking Trends in Official Development Assistance towards Green Employment and Skills Promotion Programmes*. Geneva: International Labour Organization. https://www.ilo.org/publications/tracking-trends-official-development-assistance-towards-green-employment.

C40 Cities, Buro Happold, and New Economics Foundation. 2025. *Building Greener Cities: Green Job Opportunities in Clean Construction*. Global Policy Report. London: C40 Cities and New Economics Foundation; Bath, UK: Buro Happold. https://www.c40.org/wp-content/uploads/2025/01/Building-greener-cities-green-job-opportunities-in-clean-construction_-Global-Report_-FINAL_28-Jan-2025.pdf.

Cattaneo, U., H. Schwarzer, S. Razavi, and A. Visentin. 2024. "Financing Gap for Universal Social Protection: Global, Regional and National Estimates and Strategies for Creating Fiscal Space." Working Paper 113. Geneva: International Labour Organization. https://www.ilo.org/sites/default/files/2024-04/wp113_web.pdf.

Denham, T., L. Rickards, and O. Ajulo. 2024. "The Jobs of Climate Adaptation." *Buildings and Cities* 5 (1): 283–99. https://doi.org/10.5334/bc.405.

DG (Directorate-General) for Energy. 2020. *Sustainable Employment and Welfare Support Toolkit: Platform for Coal Regions in Transition*. Brussels: European Commission. https://energy.ec.europa.eu/publications/sustainable-employment-and-welfare-support-toolkit-platform-coal-regions-transition_en.

Education Commission (International Commission on Financing Global Education Opportunity). 2022. *The Learning Generation: Investing in Education for a Changing World*. New York: Education Commission. https://report.educationcommission.org/report/.

ETC (Energy Transitions Commission). 2023. *Material and Resource Requirements for the Energy Transition*. London: ETC. https://www.energy-transitions.org/publications/material-and-resource-energy-transition/.

European Commission. n.d. "European Learning Model Browser." https://europa.eu/europass/elm-browser/index.html. Accessed September 3, 2025.

FIEMG (Federação das Indústrias do Estado de Minas Gerais). 2023. "Certificação de Competências Profissionais." July 18. https://www.fiemg.com.br/publicacoes-interna/certificacao-de-competencias-profissionais/.

Gaspar, V., M. Mansour, and C. Vellutini. 2023. "Countries Can Tap Tax Potential to Finance Development Goals." *IMF Blog*, September 19. https://www.imf.org/en/Blogs/Articles/2023/09/19/countries-can-tap-tax-potential-to-finance-development-goals.

Generation. n.d. "Our Impact." https://www.generation.org/impact/. Accessed May 13, 2025.

Gog, S.J. 2025. "Singapore's Data-Driven Approach to Build a Skills-First Economy." World Economic Forum, January 10. https://www.weforum.org/stories/2025/01/singapore-data-driven-approach-build-skills-first-economy/.

Hambrecht, L., M. Marquardt, and R. Geary. 2025. *The Impacts of Skills Shortages on Global Power Sector Emissions*. Bonn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit; Berlin: NewClimate Institute. https://www.international-climate-initiative.com/PUBLICATION2209-1.

Harnoss, J., T. Mondal, and J. Kugel. 2023. "Will a Green Skills Gap of 7 Million Workers Put Climate Goals at Risk?" Boston Consulting Group, September 14. https://www.bcg.com/publications/2023/will-a-green-skills-gap-put-climate-goals-at-risk.

Hicks, J.H., J. Hjort, M. Kremer, I. Mbit, J. McCasland, and E. Miguel. 2011. "Vocational Education in Kenya." Policy Brief. London: International Growth Centre, London School of Economic and Political Science. https://www.theigc.org/sites/default/files/2014/10/Hicks-Et-Al-2011-Policy-Brief.pdf.

Hoteit, L., S. Perapechka, and M. El Hachem. 2020. "Alleviating the Heavy Toll of the Global Skills Mismatch." Boston Consulting Group, December 9. https://www.bcg.com/publications/2020/alleviating-the-heavy-toll-of-the-global-skills-mismatch.

IEA (International Energy Agency). 2024. *World Energy Employment 2024*. Paris: IEA. https://www.iea.org/reports/world-energy-employment-2024.

ILO (International Labour Organization). 2015. "Good Practices and Challenges in Promoting Decent Work in Construction and Infrastructure Projects." Issue Paper. Geneva: ILO Sectoral Policies Department. https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_416378.pdf.

ILO. 2018. *The Employment Impact of Climate Change Adaptation*. Input Document for the G20 Climate Sustainability Working Group. Geneva: ILO. https://www.ilo.org/publications/employment-impact-climate-change-adaptation.

ILO. 2020. *How to Facilitate the Recognition of Skills of Migrant Workers: Guide for Employment Services Providers*. Geneva: ILO. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@migrant/documents/publication/wcms_748721.pdf.

ILO. 2025. *Mapping Just Transitions in NDCs: An Overview*. Geneva: ILO. https://www.ilo.org/sites/default/files/2025-03/Mapping%20Just%20Transition%20in%20NDCs-%20%20An%20overview_FINAL_PUBLISHED.pdf.

IMF (International Monetary Fund). 2024. "The Managing Director's Global Policy Agenda, Annual Meetings 2024: Secure a Soft Landing and Break from the Low Growth–High Debt Path." Policy Paper 2024/049. Washington, DC: IMF. https://www.imf.org/-/media/Files/Publications/PP/2024/English/PPEA2024049.ashx.

IRENA (International Renewable Energy Agency) and ILO (International Labour Organization). 2024. *Renewable Energy and Jobs: Annual Review 2024*. Abu Dhabi: IRENA; Geneva: ILO.https://www.irena.org/Publications/2024/Oct/Renewable-energy-and-jobs-Annual-review-2024.

Keese, M., and L. Marcolin, eds. 2023. "Labour and Social Policies for the Green Transition: A Conceptual Framework." Social, Employment and Migration Working Paper 295. Paris: Organisation for Economic Co-operation and Development. https://doi.org/10.1787/028ffbeb-en.

K-Electric. n.d. "Roshni Baji Programme: A Diversity Initiative Enabling Women to Rewire the System." https://ke.com.pk/roshni-baji/. Accessed July 31, 2025.

Kerr, K., M. Cunningham, M. Novy-Marx, and S. Srisawaskraisorn. 2025. *Accelerating Skills for a Green Future: A Case Study of the Philippines*. Waltham, MA: Education Development Center. https://edc.org/wp-content/uploads/2025/10/EDC-Green-Skills-Philippines-Case-Study.pdf.

KOSAF (Korea Student Aid Foundation). n.d. "Student Loans." https://www.kosaf.go.kr/eng/jsp/aid/aid03.jsp. Accessed September 8, 2025.

Laniyan, S. 2025. "Hello Tractor Is the Uber for Africa's Smallholder Farmers." Techpoint Africa, June 19. https://techpoint.africa/feature/hello-tractor-smallholder-farmers-technology/.

Latona, D., and M. Jones. 2025. "UN Bids to Salvage Global Development Summit after US Boycott." Reuters, June 27. https://www.reuters.com/sustainability/climate-energy/un-bids-salvage-global-development-summit-after-us-boycott-2025-06-27/.

LinkedIn. 2024. *UK Green Skills Report*. Sunnyvale, CA: LinkedIn Economic Graph Research Institute. https://economicgraph.linkedin.com/content/dam/me/economicgraph/en-us/global-green-skills-report/global-green-skills-report-pdf/linkedin-uk-green-skills-report.pdf.

Montmasson-Clair, G., and G. Ryan. 2014. "Lessons from South Africa's Renewable Energy Regulatory and Procurement Experience." *Journal of Economic and Financial Sciences* 7 (4): 507–26. https://doi.org/10.4102/jef.v7i4.382.

MoPEDIC (Ministry of Planning, Economic Development and International Cooperation). 2025. *Egypt's Narrative for Economic Development: Reforms for Growth, Jobs & Resilience*. Cairo: MoPEDIC. https://www.mped.gov.eg/NationalNarrative?lang=en,en,en,en,en&lang=en&lang=en.

Moreira da Maia, G. 2025. "Governo de SC assina contrato com a FGV para elaboração do Plano Estadual de Transição Energética Justa." Secretaria de Estado do Meio Ambiente e da Economia Verde, June 5. https://www.semae.sc.gov.br/governo-de-sc-assina-contrato-com-a-fgv-para-elaboracao-do-plano-estadual-de-transicao-energetica-justa/.

Naran, B., B. Buchner, M. Price, S. Stout, M. Taylor, and D. Zabeida. 2024. *Global Landscape of Climate Finance 2024: Insights for COP 29*. San Francisco: Climate Policy Initiative. https://www.climatepolicyinitiative.org/pt-br/publication/global-landscape-of-climate-finance-2024/.

OECD (Organisation for Economic Co-operation and Development). 2023. *OECD Skills Outlook 2023: Skills for a Resilient Green and Digital Transition*. Paris: OECD. https://doi.org/10.1787/27452f29-en.

OECD. 2025. "OECD Financing SMEs and Entrepreneurs Scoreboard: 2025 Highlights." SME and Entrepreneurship Paper 67. Paris: OECD. https://doi.org/10.1787/64c9063c-en.

Paczos, W., J. Sawulski, and F. Leśniewicz. 2023. "How Much Do Public and Private Sectors Invest in Physical and Human Capital? Towards a New Classification of Investments." *International Review of Economics & Finance* 88 (November): 1324–36. https://doi.org/10.1016/j.iref.2023.07.010.

Patrinos, H.A., D. Angel-Urdinola, and N. Tanaka. 2024. "How Effective Education Spending Can Reduce Poverty and Boost Earnings." *Education for Global Development* (blog), May 28. https://blogs.worldbank.org/en/education/How-effective-education-spending-can-reduce-poverty-and-boost-earnings.

Psacharopoulos, G., and H.A. Patrinos. 2018. "Returns to Investment in Education: A Decennial Review of the Global Literature." *Education Economics* 26 (5): 445–58. https://doi.org/10.1080/09645292.2018.1484426.

Robinson, M., and C. Olver. 2025. "Are 'Country Platforms' the Key to Delivering Green Growth at Scale?" World Resources Institute, February 19. https://www.wri.org/technical-perspectives/country-platforms-delivering-green-growth-scale.

SB COP30 (Sustainable Business 30th Conference of the Parties). 2025. *Green Jobs and Skills: Working Group Document*. Brasília: SB COP30 Secretariat, Brazilian National Confederation of Industry. https://sbcop30.com/documents/1301405/2506096/SBCOP_Green_Jobs_and_Skills_Document_final.pdf/79e3996c-b1c2-ae70-070f-f1469d999cb6?version=1.2&t=1760535435523&download=true.

Skill India. 2022. *Skill India Mission: Recognition of Prior Learning (RPL)*. New Delhi: Skill India, Ministry of Skill Development and Entrepreneurship, Government of India. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/apr/doc202242548301.pdf.

SkillsFuture. 2024. *Levelling-Up the Skills Ecosystem: Annual Report 2023/2024*. Singapore: Government of Singapore. https://isomer-user-content.by.gov.sg/41/9d984d83-2db1-4374-ba40-5dfde89e3656/skillsfuture-singapore-fy2023-annual-report.pdf.

Stromquist, Nelly P. 2017. "The Learning Generation: Investing in Education for a Changing World; A Report by the International Commission on Financing Global Education Opportunity." *Comparative Education Review* 61 (1): 214–17. https://doi.org/10.1086/690064.

Tanaka, N., D. Angel-Urdinola, M. Bend, Y. Hu, A. Rivera-Olvera, M. Antoninis, Y. Murakami, and S. Montoya. 2024. *Education Finance Watch 2024*. Washington, DC: World Bank Group. http://documents.worldbank.org/curated/en/099102824144527868.

UK (United Kingdom) Government. 2020. "UK Government Launches Taskforce to Support Drive for 2 Million Green Jobs by 2030." Press Release, November 12. https://www.gov.uk/government/news/uk-government-launches-taskforce-to-support-drive-for-2-million-green-jobs-by-2030.

UNCTAD (United Nations Conference on Trade and Development). 2024. *A World of Debt: A Growing Burden to Global Prosperity*. Geneva: UNCTAD. https://unctad.org/system/files/official-document/osgttinf2024d1_en.pdf.

UNESCO (United Nations Educational, Scientific and Cultural Organization). 2022a. *Global Review of Training Funds: Spotlight on Levy-Schemes in 75 Countries*. Paris: UNESCO. https://doi.org/10.54675/MPMZ1114.

UNESCO. 2022b. "Global Review of Training Funds: Brazil's S-System—the Example of the National Industrial Apprenticeship Service (Serviço Nacional de Aprendizagem Industrial–SENAI)." Country Brief. Paris: UNESCO. https://unevoc.unesco.org/countryprofiles/docs/UNESCO_Funding-of-Training_Brazil-SENAI.pdf.

UNESCO. 2024. *Global Education Monitoring Report, 2024/5: Leadership in Education—Lead for Learning*. Paris: UNESCO. https://doi.org/10.54676/EFLH5184.

UNESCO. 2025. "Aid to Education: Time for Tough Decisions." Global Education Monitoring Policy Paper 50. Paris: UNESCO. https://doi.org/10.54676/UYML4245.

UNESCO-UNEVOC (UNESCO–International Centre for Technical and Vocational Education and Training). n.d. "Global Skills Tracker." https://unevoc.unesco.org/home/Global+Skills+Tracker/lang=en/menu=Green+skills#top2. Accessed August 5, 2025.

UNFSS (United Nations Forum on Sustainability Standards). 2020. *Scaling Up Voluntary Sustainability Standards through Sustainability Public Procurement and Trade Policy: 4th Flagship Report of the United Nations Forum on Sustainability Standards (UNFSS)*. UNFSS/4/2020. Geneva: UNFSS. https://unctad.org/system/files/official-document/unfss_4th_2020_en.pdf.

UNICEF (United Nations Children's Fund), PwC, and Generation Unlimited. 2022. *The Net Zero Generation: Why the World Needs to Upskill Young People to Enable the Net Zero Transition*. New York: UNICEF and Generation Unlimited; Boston: PwC. https://www.pwc.com/gx/en/issues/upskilling/the-net-zero-generation-unicef-generation-unlimited.pdf.

Vaughan, N., P. Alba, R. Faure, and L. Steer. 2022. "The International Finance Facility: A Proposal to Optimize MDB Balance Sheets in the Short to Medium Term." Working Paper. New York: International Commission on Financing Global Education Opportunity. https://iff-education.org/wp-content/uploads/2022/11/IFF_final-Nov-23.pdf.

WBCSD (World Business Council for Sustainable Development). 2025. *Business Leaders Guide to the Just Transition*. Geneva: WBCSD and ERM.

WBG (World Bank Group). 2023. "Labor Markets." https://www.worldbank.org/en/data/datatopics/aspire/indicator/labor-markets.

WEF (World Economic Forum). 2020. *New Nature Economy Report II: The Future of Nature and Business*. Geneva: WEF. https://www.weforum.org/publications/new-nature-economy-report-ii-the-future-of-nature-and-business/.

Weishaupt, T. 2025. "Workforce Development in Low-Carbon Energy Transitions: The Case of Horizontal Governance in Schleswig-Holstein (Germany)." *Environmental Innovation and Societal Transitions* 57 (December): 101040. https://doi.org/10.1016/j.eist.2025.101040.

Wells, M. 2025. "It's Time to Finance Our Future and 'Change Course,' Guterres Tells World Leaders in Sevilla." UN News, June 30. https://news.un.org/en/story/2025/06/1165091.

World Bank. 2022. "Formal Sector Enterprise Surveys." https://www.enterprisesurveys.org/en/data/exploretopics/finance.

World Bank and UNESCO (United Nations Educational, Scientific and Cultural Organization). 2023. *Education Finance Watch 2023*. Washington, DC: World Bank; Paris: UNESCO. https://doi.org/10.54676/xton4555.

About WRI

World Resources Institute works to improve people's lives, protect and restore nature, and stabilize the climate. As an independent research organization, we leverage our data, expertise, and global reach to influence policy and catalyze change across systems like food, land and water; energy; and cities. Our 2,000+ staff work on the ground in more than a dozen focus countries and with partners in over 50 nations.

About Systemiq

Systemiq, the system-change company, was founded in 2016 to accelerate the achievement of the Sustainable Development Goals and the Paris Agreement, by transforming markets and business models in five key systems: nature and food, materials and circularity, energy, urban areas, and sustainable finance. A certified B Corp, Systemiq combines strategic advisory with high-impact, on-the-ground work, and partners with business, finance, policymakers and civil society to deliver system change. Systemiq has offices in Brazil, France, Germany, Indonesia, the Netherlands, the UK and US.

Photo Credits

Cover, iStock; Pg. 2, Shutterstock; Pg. 4, Alamy; Pg. 4, Birger Strahl; Pg. 10, iStock; Pg. 14, Alamy; Pg. 20, Shutterstock.

Each World Resources Institute report represents a timely, scholarly treatment of a subject of public concern. WRI takes responsibility for choosing the study topics and guaranteeing its authors and researchers freedom of inquiry. It also solicits and responds to the guidance of advisory panels and expert reviewers. Unless otherwise stated, however, all the interpretation and findings set forth in WRI publications are those of the authors.

Maps are for illustrative purposes and do not imply the expression of any opinion on the part of WRI, concerning the legal status of any country or territory or concerning the delimitation of frontiers or boundaries.

WORLD
RESOURCES
INSTITUTE

10 G Street, NE
Washington, DC 20002
WRI.org

Copyright 2025 World Resources Institute. This work is licensed under the Creative Commons Attribution 4.0 International License.
To view a copy of the license, visit http://creativecommons.org/licenses/by/4.0/