SKILLS FOR EMPLOYMENT
Policy Brief

International Labour Office

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SKILLS FOR A GREENER FUTURE: Challenges and enabling factors to achieve a just transition

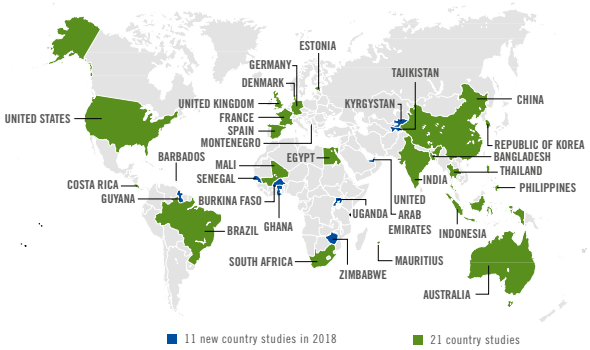
Climate change and environmental degradation reduce productivity and destroy jobs, and their effects fall disproportionately on the most vulnerable. Action to combat these processes can potentially create millions of jobs – but this requires rapid and bold measures to invest in people's capabilities to realize their full potential and contribute to the productivity of enterprises. The essential process of transition to a green economy may disrupt labour markets and will require reskilling and upskilling of workers to reduce the risk of rising unemployment, poverty and inequality. Massive investments need to be made in reskilling and upskilling to achieve the targets set by the 2015 Paris Agreement and the UN Sustainable Development Goals (SDGs) beyond 2030.

This policy brief draws the attention of policy-makers, social partners, training providers and civil society organizations in both developed and developing countries to the essential role of skills development policies in advancing the sustainable transition to a greener future.

Building on the brief *Greening the global economy: The skills challenge*, published by the ILO in 2011, it draws on the new findings published in the report Skills for a greener future (ILO, 2019c) and reviews the progress achieved since 2011. The report, based on qualitative analysis and empirical research across 32 countries and modelling in two global scenarios (*energy transition and circular economy*), draws on policy-applied research and numerous case studies of country experiences and good practice conducted in collaboration with the European Centre for the Development of Vocational Training (Cedefop) to provide new insights into likely occupational skill effects in declining and growing industries by 2030 and analyse countries' progress in policy implementation.

Evidence of good practices collected in the surveyed countries demonstrates how skills response can underpin the green transition and enable inclusive growth.

Figure 1. Countries covered in the two rounds of analysis, 2010–11 and 2018



Source: ILO, 2019b.

Changes in the global policy context for climate change and sustainable development

Since 2011 key international environmental accords have been reached: most notably, the UN 2030 Agenda for Sustainable Development and the 2015 Paris Agreement signed by the 21st Conference of the Parties (COP21) to the UN Framework Convention on Climate Change. The Paris Agreement seeks to keep the increase in global average temperature to 2°C, preferably 1.5°C, by requiring each country to state its nationally determined contribution (NDC).

The Sustainable Development Goals (SDGs) set out in the 2030 Agenda highlight the importance of skills development, decent work and climate action, and address issues of

poverty and inequality, by providing international targets to inform national policy and actions.

Box 1. What are green jobs?

"Green jobs" are decent jobs that improve efficiency in the use of energy and raw materials, limit greenhouse gas (GHG) emissions, minimize waste and pollution, protect and restore ecosystems, and support adaptation to the effects of climate change. They can be found in traditional sectors such as manufacturing or construction, or in new, emerging green sectors such as renewable energy and energy efficiency.

Source: ILO, 2016.

Why is skills development crucial to a just transition?

Changes in the Earth's climate and ecosystems are already having dramatic and negative social and economic impacts, affecting people, livelihoods, economies and ecosystems. GHG emissions and pollution have been rising, caused by economic growth patterns based on overexploitation of natural resources and fossil fuel energy generation. Global carbon dioxide emissions grew by 1.7 per cent in 2018 to a record high level. In order to minimize the severe and worsening consequences of climate change, countries have

committed to the implementation of the Paris Agreement adopted in 2015, which emphasized the importance of a just transition and decent work. Furthermore, in 2018 COP24 in Katowice, Poland, saw the adoption of the Solidarity and Just Transition Declaration, which also underlined the creation of decent work as crucial to effective, inclusive and climate-resilient development.

The availability of the right skills paves the way for a productive structural transformation towards a greener economy and decent job creation. Therefore, effective anticipation and development of skills are a key foundation for a just and inclusive transition. Skills development for green jobs also serves as a "buffer" against the effects of transitory disruptions and emerging challenges while economies are greening. The transition to a greener future is happening; but it requires a coordinated policy approach to make it just and

Table 1. Changes in skills by occupations

Skill level	Nature of change	Typical skills response	Typical skills response
Low-skilled occupations	Occupations change in a generic way, e.g. requiring increased environmental awareness or simple adaptations to work procedures	On-the-job learning or short reskilling and upskilling programmes	Refuse/waste collectors, dumpers
Medium-skilled occupations	Some new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	Short to longer upskilling and reskilling programmes; TVET courses	*New occupations:* wind turbine operators; solar panel installers *Changing occupations:* roofers; technicians in heating, ventilation and air conditioning; plumbers
High-skilled occupations	Locus of most new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	University degree; longer upskilling programmes	*New occupations:* agricultural meteorologists, climate change scientists; energy auditors, energy consultants; carbon trading analysts *Changing occupations:* building facilities managers; architects; engineers

Source: ILO, 2019b.

inclusive. The growth of green jobs continues to be driven by environmental change, government policy and regulations, and innovative green technologies which create and fuel fast-growing consumer markets for green products and services.

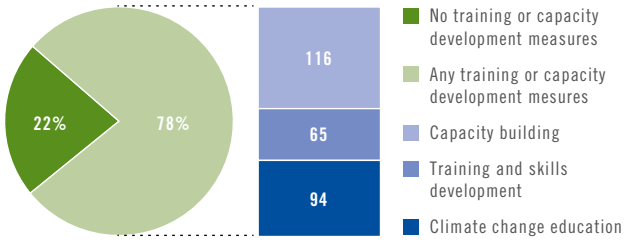
The effects of the green transition on employment are requiring the workforce in existing occupations to reskill and upskill. In lower-skilled occupations, this usually means training in environmental awareness or simple adaptations to greener work processes. More rarely, new green occupations are created, usually at higher skill levels. Development of skills for green jobs at all levels (low, medium and high) can play a key role in accelerating the response to climate change, both by helping workers to adjust rapidly in a changing world of work and by equipping them to respond to other rapid mega-trends (e.g. demographic shifts, technological transformation, migration) and thereby reducing the risks of rising unemployment, poverty and inequality.

What are the key skills challenges facing greening economies and sustainable development?

Challenge 1: Skills development measures have been underestimated in national commitments and sectoral priorities under the Paris Agreement

The green transition is conditional on countries' implementation of their commitments under the Paris Agreement. These take the form of NDCs, highlighting adaptation and mitigation measures to be taken in targeted economic sectors. Two-thirds of participating countries recognize in their NDCs the importance of capacity development. However, less than 40 per cent of NDCs include training and skills development components to support their implementation, and over 20 per cent do not plan any human capital related activities at all.

Figure 2. Share of NDCs that mentioned capacity development and skills training, and measures specified



Note: The sample consisted of 169 NDCs.
Source: Data computed from NDC Explorer, Jan. 2019. Available at: https://klimalog.die-gdi.de/ndc.
Source: ILO, 2019b.

Effectively designed NDCs need to integrate climate change literacy, skills training and capacity building at national and sectoral levels.

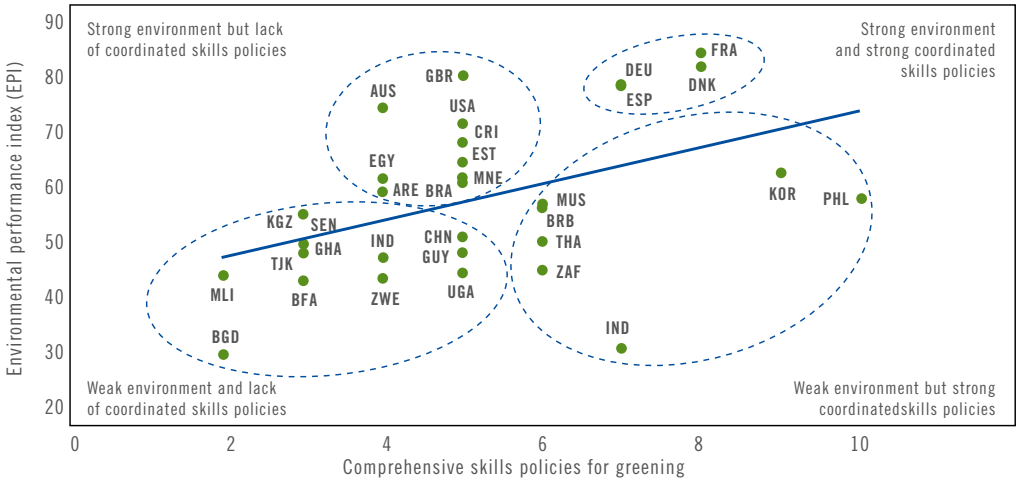
Challenge 2: Coherence between skills and environmental policies remains weak and fragmented in many countries

Weak policy coordination between government, ministries, social partners, training providers and other stakeholders remains a key obstacle to an effective and successful transition to greener production and consumption. Some progress has been made since 2011, mostly among developing countries and emerging economies. At governmental level, responsibility for the areas of policy relevant to skills for green jobs is still distributed across more than one ministry in all countries covered. While ministries responsible for environmental policy have charge of policies on topics such as climate change, disaster risk management and biodiversity, the transition to inclusive and greener economies can involve ministries for the economy, employment/labour, education, agriculture, energy, industry and trade. (Ministries responsible for education and training tend to be least involved.) Existing decision-making structures and processes do not generally deal effectively with cross-ministerial topics. Poor inter-ministerial coordination hampers the effective design, planning, implementation and evaluation of policies on skills development for green jobs and climate action.

Challenge 3: Skills gaps and shortages persist, despite positive trends and recent developments

The green transition requires massive investments in reskilling and upskilling to equip workers with the technical (specific to each occupation) and core (soft) skills required.

Figure 3. Countries grouped according to performance in environmental and skills policies



Notes: Y axis: the EPI uses the distance-to-target technique for indicator construction, which situates each country relative to targets for worst and best performance corresponding to scores of 0 and 100 respectively. X axis: the presence of comprehensive skills policies for greening was calculated on a 0–10 scale. Country codes are used as follows: Australia (AUS), Bangladesh (BGD), Barbados (BRB), Brazil (BRA), Burkina Faso (BFA), China (CHN), Costa Rica (CRI), Denmark (DNK), Egypt (EGY), Estonia (EST), France (FRA), Germany (DEU), Ghana (GHA), Guyana (GUY), India (IND), Indonesia (IDN), Republic of Korea (KOR), Kyrgyzstan (KGZ), Mali (MLI), Mauritius (MUS), Montenegro (MNE), the Philippines (PHL), Senegal (SEN), South Africa (ZAF), Spain (ESP), Tajikistan (TJK), Thailand (THA), Uganda (UGA), the United Arab Emirates (ARE), the United Kingdom (GBR), the United States (USA) and Zimbabwe (ZWE).
Source: "Skills for a greener future. Key findings". ILO. 2019b.

Skills gaps and shortages are almost inevitable whenever any new product or service appears, and the green economy is no exception. Identification and anticipation of skills needs have been gaining ground since 2011, but remain weak and insufficiently systematic to provide comprehensive information on demand and supply related to skills for green jobs.

Developing countries are especially challenged by a lack of professionals and a paucity of university graduates in general, especially those trained in science, technology, engineering and mathematics (STEM) skills. Even in high-income countries (HICs), including those with well-developed skills anticipation systems, a lack of both technical and transferable core skills remains a significant cause of recruitment problems for employers. Poorly developed skills anticipation systems limit countries' ability to identify skills gaps, and to analyse future training needs and shortages systematically and comprehensively.

One new and emerging driver of change identified is labour migration, especially in relation to poorer populations. On the one hand, this causes a "brain drain" and skills shortages in some countries (e.g. Guyana); on the other hand, climate-spurred migration among poorer populations, including indigenous peoples (e.g. in Brazil and many countries in Asia and the Pacific), creates the need for new sets of skills (including core skills) for workers in new labour markets or in search of alternative employment. The negative consequences of environmental degradation and climate change may also cause the internal or external displacement of workers, leading to increased numbers of migrants. Digitalization has been another important trend globally since 2011, highlighting the need to promote information and communications technologies (ICT) for the green economy and develop green skills within this sector to promote sustainable development (e.g. in Ghana, the Republic of Korea, Mauritius, the Philippines and Tajikistan).

Challenge 4: Green structural change varies between countries but will be profound in certain sectors

Green structural change has been shaped by both specific national contexts and differing levels of development across sectors. Environmental degradation, loss of biodiversity, desertification, rising sea levels and changing climate patterns all affect the ways we live, work and earn. Fossil fuel based industries and high carbon-emitting sectors are most likely to be affected by green structural change.

Although green jobs growth is widely forecast, countries have made variable progress since 2011. The green transition continues both to affect existing occupations and – more rarely – to create new green occupations. In HICs, the green transition features less prominently in economic and

Table 2. Nature and extent of occupational change in green restructuring

Sector	Nature and extent of occupational change to date	Examples of new and changing occupational profiles
Renewable energy 	One of the most significant sectors for development of new occupational profiles, spreading into closely related existing trades (solar energy systems installation)	**MSL:** solar photovoltaic/wind turbine/ biomass systems: installers, technicians, plant managers, quality engineers **HSL:** engineers and system designers (overlap with manufacturing)
Environmental goods and services, including water and waste management 	Significant occupational change in waste and recycling, including R&D functions to create new or improved waste management and recycling New occupations of environmental consulting and environmental auditing	**MSL:** environmental engineering technicians; soil, waste and water engineers (conservationists); environmental science and engineering technicians; health and other protection technicians **HSL:** atmospheric and space scientists; soil and water conservationists; landscape architects; environmental engineers (restoration planners, certification specialists, economists); climate change analysts; industrial ecologists; energy managers (auditors)
Construction and building services 	Mainly skills being added on to and/ or adapted by existing occupations; all main trades and professions likely to be affected in some way, and increasingly, across all countries	**MSL:** carpenters, plumbers, electricians, heating engineers, roofers, painters and decorators, plasterers, building services technicians **HSL:** facilities managers, architects, engineers, energy auditors and energy consultants (overlap with environmental goods and services)
Manufacturing 	New skills are needed related to reduction of environmental impacts and this may involve new occupations, e.g. pollution control officers Most strongly affected are manufacturers involved in design and manufacture of products for the "greenest" sectors, e.g. renewable energy and green construction	**MSL:** occupations related to reducing environmental impacts, e.g. pollution control officers, energy auditors (overlap with environmental goods and services) **HSL:** occupations related to design and production of new products and systems, e.g. product designers, production engineers
Agriculture and forestry 	Mainly skills being added on to and/ or adapted by existing occupations. Greatest occupational effects likely to be felt at higher skill levels where new occupations are in demand	**MSL:** adoption of organic farming techniques; agricultural technicians involved in crop diversification, application of improved technologies. **HSL:** soil and water conservationists; environmental restoration planners (certification specialists, economists); water resource specialists and water/ wastewater engineers' agricultural meteorologists
Transportation services 	Mostly changing existing occupations through addition of knowledge and skills, e.g. use of electric vehicles; conversion of existing vehicles to new technologies and compressed natural gas	**MSL:** occupations related to use, conversion (greening) and maintenance of existing vehicles **HSL:** R&D occupations related to design of greener transport systems, e.g. engineers, systems analysts
Tourism 	Mostly changing existing occupations through addition of knowledge and skills, e.g. eco-tourism	**MSL:** occupations related to eco-tourism
Extractive industries 	Mostly changing existing occupations through addition of knowledge and skills. Evidence of widespread effects to date lacking	**HSL:** R&D occupations related to design of greener extractive processes systems, e.g. engineers

Note: ***HSL:*** *higher skill level;* ***MSL:*** *medium skill level.*
Source: ILO, 2019b.

employment policies, owing to (a) the adaptation of existing policies and activities to achieve greater energy efficiency and create fewer negative environmental impacts; and (b) rising trends in markets for green goods. The environmental goods and services sector is now a well-developed feature in HICs. In general, green markets have been important sources of employment growth in recent years in developed economies; they are also emerging in developing economies, although the latter face particular challenges. Furthermore, there is also evidence of the ways in which economic difficulties (financial crisis or fiscal deficit) may reduce opportunities for the growth of green jobs.

In low-income countries (LICs), environment has a more direct bearing on more individuals' lives; these countries are most likely to be affected by climate change and environmental degradation, which in turn affects their growth prospects. There is also a greater reliance in LICs on agriculture and extractive industries. Many of the most important changes in skills and occupations for the green economy are taking place at higher skill levels, requiring university education. This represents a critical challenge for many LICs, where high-level skills in general tend to be in short supply.

The sector that has seen the greatest growth in employment potential is renewable energy. The environmental goods and services sector, which includes waste, energy and water management, has also developed significantly, with support from government policies and measures. In construction, employment effects are variable, depending on the degree to which the existing built environment is "greened" through retro-fitting and the rise of "green construction" and "smart cities".

The employment effects of the green transition in other sectors tend to be complex. Manufacturing, notably the automotive sector, is gradually changing its output to produce more energy-efficient products, with limited net employment gains; it is also producing green products and creating jobs in supply chains (for example in the production of wind turbines). Agriculture, though subject to significant green challenges and a very important source of employment in most developing countries, does not appear to date to have undergone significant changes in skills. The potential for green jobs in transportation and tourism is yet to be fully realized, but is attracting considerable attention in some countries in pursuit of sustainable development.

Challenge 5: Skills development programmes do not focus strongly enough on the needs of vulnerable groups

There are still not many skills development programmes particularly focused on the needs of vulnerable groups. Active labour market programmes (ALMPs) related to skills for green jobs generally target the unemployed and those in precarious labour market situations. A large share of the countries in the sample either indicated that there are no ALMPs in place targeted at developing skills for green employment (12 out of 32) or did not provide information on this topic at all (5 out of 32). Only a few examples were provided of national strategies or targeted initiatives of public employment services (PES) focused on skills for green jobs; these included ALMPs to pre-empt potential skills shortages and to support groups rendered vulnerable by the transition. These vulnerable groups in many cases include people, especially low-skilled workers, who are either already unemployed or at risk of unemployment as a result of certain jobs and industrial activities being phased out in the greening process. PES initiatives are often focused on tackling unemployment among youth, indigenous peoples, people with disabilities or migrant workers.

Even though there are indications that gender issues are being addressed in the technical and vocational education and training (TVET) sector, in order to attract more female students to science- and technology-related programmes, enrolments in universities and TVET institutions still follow traditional gender stereotypes, with more male students in STEM areas. Developing countries face greater challenges

Box 2. Renewable energy in Indonesia: Potential to be realized

Indonesia has set a target for 23 per cent of its energy to come from new and renewable energy sources by 2025. In August 2017, the state-owned electricity company signed power purchase agreements with 53 renewable energy companies. Assuming that the Government can develop 1,000MW capacity of solar energy per year, there will be 35,000 new green jobs in the industry, including the experts who conduct feasibility studies, the workers in photovoltaic (PV) and component factories, the PV engineers and designers, the PV on-grid or off-grid installers, the PV technicians who maintain the solar energy system, the energy managers, and the energy inspectors or auditors. The realization of the ambitious plan depends on factors including the availability of skills and related training programmes, and the development of capacity of the involved stakeholders.

Source: "Skills for green jobs: Indonesia", ILO, 2018.

Table 3. Incorporating skills for green jobs anticipation into pre-existing mechanisms

Type of mechanism	Description of mechanism	Country examples
National labour market information systems	One or more institutions involved in gathering and analysing quantitative and/or qualitative labour market information through employer surveys and/or expert focus groups	Predominantly UMICs and HICs, e.g. Barbados, Costa Rica, Guyana, Indonesia, Republic of Korea, Mauritius, Senegal, Spain, Tajikistan, Thailand
Sector-based anticipation mechanisms	Gathering and analysing quantitative and/or qualitative labour market information through focused (non-national) surveys or sectoral skills councils	Predominantly HICs, where institutions are more developed, e.g. Estonia, France, Republic of Korea, Mauritius, Senegal, UK
Collaboration between stakeholders on multiple levels	Partnerships among various stakeholders, ranging from employers, corporations and/ or TVET institutions/ authorities to national and local government agencies	Countries at various levels of income and development, including Barbados, Costa Rica, Estonia, France, Republic of Korea, Philippines, South Africa.

Note: UMICs = upper-middle-income countries.
Source: ILO, 2019c.

in this area owing to the lack of trained teachers (trainers) and graduates with STEM skills.

Employers' and workers' organizations have an important role to play in planning, design, implementation and evaluation of skills development and quality-based training delivery prioritizing the needs of vulnerable groups.

Challenge 6: Anticipation and monitoring of skills are ad hoc and suffer from lack of data and institutional frameworks for social dialogue

Identification and anticipation of skills needs have been gaining ground since 2011, but mechanisms to provide comprehensive information on demand and supply related to skills for green jobs are still rare. Some countries have set up a specific institutional body or systematic monitoring mechanism dedicated to identifying the skills needed for green jobs. In countries that have no system at all for monitoring skills needs (for green jobs or generally), which is the case for most LICs, such needs are usually identified on an ad hoc basis.

Systematic, innovative and institutionalized mechanisms for skills anticipation, in which the private sector is directly involved, exist in only a few countries. Most countries lack information on supply and demand. This in turn makes it difficult to develop specific skills policies, shape TVET appropriately, and adapt skills training and ALMPs to current and future demand.

The development of skills for green jobs through TVET is most often done by adding green components to existing qualifications or education programmes. Only a few countries have systems or measures in place that are fully dedicated to developing skills for green jobs.

How can countries respond effectively to climate change and also advance a just transition?

Policy message 1: Enhanced policy coherence at planning, design and implementation stages can help to propel the green transition

The policy coordination "gap" that is such a common feature at national level of the skills for green jobs landscape

Box 3. Providing a legal framework for skills and training under the Philippines' Green Jobs Act

The Philippines Green Jobs Act of 2016 is the country's first piece of legislation specifically designed to generate, sustain and incentivize "green jobs" in order to develop an environmentally friendly economy.

It promotes training for green jobs by mandating the Department of Education and the Commission on Higher Education to develop and implement curricula to support the skills and knowledge requirements of a green economy. It tasks the Technical Education and Skills Development Authority and the Professional Regulation Commission to develop training regulations and qualifications frameworks, respectively, to facilitate the certification of skilled and professional green manpower.

The National Green Jobs Human Resource Development Plan, will incorporate the Just Transition framework, including measures on education and skills development, labour market interventions, social protection, enterprise development, social dialogue, policy coherence, and financing.

Source: "Skills for green jobs: Philippines", ILO, 2018.

is sometimes offset, at least in part, by policies and plans at sectoral or subnational governmental levels. Where social partner engagement is weak, this can have negative consequences for the coordination and relevance of policies on skills for green jobs. Thus, a combination of top-down coordinated policy-making and bottom-up initiatives could provide effective and more sustainable support to the green transition.

Box 4. Examples of national coordination related to skills for green jobs

India

The Skill Council for Green Jobs (SCGJ), established in 2015, handles the Green Skill Development Programmes of India. Its objective is to identify skills needs within the green business sector, and to implement nationwide, industry-led, collaborative skills development and entrepreneur development initiatives. Its governing council includes representatives of ministries and employer bodies as well as individual employers.

Republic of Korea

The Green Growth Committee (GGC), created in 2009, includes among its members businesspeople, civil servants and representatives of government-funded think-tanks). It is responsible for establishing a five-year green growth plan and coordinating policies related to skills development formulated by various ministries (environment, trade, industry, energy, science and technology, employment, labour and education). Some 16 local government bodies have also established regional green growth plans and created regional green growth committees. The GGC also created the Green Technology Centre to analyse future possibilities for green technological development.

Source: ILO, 2019c.

Equipping workers with the right skills is an essential prerequisite of a just transition. Bringing trade unions and employers' associations into the planning, design and implementation of skills development can strongly boost the responsiveness of education and training and trigger green transformation on a larger scale. Collaborative approaches allow information on greening developments from the front line in industry, agriculture and services to inform skills development in formal TVET. Public–private partnerships can bring together public and private resources and tap businesses' practical knowledge of skills relevance and quality.

Policy message 2: Well-developed and sound national and sectoral policies enable the just transition

Planning and coordination at subnational and sectoral levels can help fill the gap in national coordination. A combination of centralized and decentralized approaches to policy coordination can best promote the transition at sectoral, local and subnational levels. Sectoral plans for skills for green jobs, supported by government taxes and incentives, are most common in those sectors directly affected by climate change and environmental depletion, such as energy, transport, construction and waste management. The private sector and trade unions play essential roles in the transition to sustainable economies.

Box 5. Institutional arrangements to anticipate skills needs for the green transition in France

The National Observatory for Jobs and Occupations of the Green Economy (Onemev), created in 2010, brings together a broad range of institutions including relevant national ministries and agencies, key public employment service organisations, the main TVET association, the national statistical institute, research bodies (including the Centre for Studies and Research on Employment and Skills), and regional employment and training observatories.

Source: ILO, 2019c.

Policy message 3: Core and transferable skills are vital to an inclusive transition for a greener future

A wide range of both technical and core skills is needed to support the green transition. ILO estimates of the impact on occupational skill needs in two global scenarios (energy transition and circular economy) reveal the core and technical skills that are potentially transferable, within occupations, from declining to growing industries; but retraining will be needed to enable workers to acquire new skills for use in the latter. Of particular importance will be core (or soft) skills, which can confer a comparative advantage as they can be transferred across occupations. Some core skills are needed by all workers, regardless of the skill level of their occupation.

Table 4. Main core skills required for green jobs, by skill level of occupation

Required across the labour force	Required in medium to high-skilled occupations
• Environmental awareness and protection; willingness and capability to learn about sustainable development	• Analytical thinking (including risk and systems analysis) to interpret and understand the need for change and the measures required
• Adaptability and transferability skills to enable workers to learn and apply the new technologies and processes required to green their jobs	• Coordination, management and business skills that can encompass holistic and interdisciplinary approaches incorporating economic, social and ecological objectives
• Teamwork skills reflecting the need for organizations to work collectively on tackling their environmental footprint	• Innovation skills to identify opportunities and create new strategies to respond to green challenges
• Resilience to see through the changes required	• Marketing skills to promote greener products and services
• Communication and negotiation skills to promote required change to colleagues and customers	• Consulting skills to advise consumers about green solutions and to spread the use of green technologies
• Entrepreneurial skills to seize the opportunities of low-carbon technologies and environmental mitigation and adaptation	• Networking, IT and language skills to perform in global markets
• Occupational safety and health (OSH)	• Strategic and leadership skills to enable policy-makers and business executives to set the right incentives and create conditions conducive to cleaner

Note: UMICs = upper-middle-income countries.
Source: ILO, 2019c.

Policy message 4: Systems for identifying and anticipating skills needs for green jobs can benefit from improved labour market information and institutionalized social dialogue

There is an urgent need for a more rigorous approach to the analysis and anticipation of demand for green job skills, with better information and data on skills and occupational needs to address the skills challenge and enable the green transition. Where systems for anticipating skill needs already exist, they can be adjusted to incorporate new requirements. In less developed countries where such frameworks do not yet exist, this need represents an opportunity to create structures such as a national human resources development council, involving Government, employers, workers and providers of training and education, to facilitate the exchange of information, and to establish industry groupings that could later be formalized as sectoral skills councils. Systematic anticipation of skills needs, career guidance and counselling initiatives through sectoral skills councils all facilitate and boost a human-centred approach to the green transition.

Box 6. Sectoral skills councils strengthen social dialogue in the just transition

Uganda has reformed its skills delivery system by establishing the Skilling Uganda Task Force. This consists of a number of sector skills councils whose purpose is to facilitate cooperation between the Government and the private sector in identifying training needs and reforming training curricula.

In Denmark, an Advisory Council for Initial Vocational Training continuously updates the competencies provided by the vocational education and training system. It works with around 50 trade committees including representatives from trade unions and employer organizations. A large number of adult labour market training programmes are offered related to energy, environment and waste management.

Source: ILO, 2019c.

Policy message 5: Training that is targeted, inclusive and prioritizes the skills needs of vulnerable groups, with well-equipped teachers, is essential to effective climate education

The availability of teachers and trainers with current knowledge on sustainable land and ecosystem management, energy efficiency and green technologies is crucial. Their role is critical in promoting environmental awareness among young people and in spreading environmental training beyond the formal education system into the adult population. The education and training of such teachers and trainers should therefore be a top priority in any skills response strategy at national, sectoral and local levels.

Box 7. Guyana creates green jobs for female workers in mangrove restoration

The Mangrove Restoration Project aims to support income-generating activity with new livelihoods that support both mangrove conservation and sustainable economic growth for the surrounding communities. So far over 900 jobs have been directly created and eight Community Mangrove Action Committees have been established in different regions, where three women's groups are involved in agro-processing and distribution of mango and tamarind achar, meat and food seasoning and pepper sauce. Also, the Rupununi Innovation Fund supports female entrepreneurship initiatives based on training incorporating local knowledge and skills in agriculture, ecology and tourism.

Source: ILO, 2019c.

While many countries aim to include disadvantaged groups in their skills development programmes for green jobs, these groups remain largely under-represented.

There is an urgent need to develop systematic training and retraining initiatives in skills for green jobs aimed at specific groups – youth, older workers, people with disabilities, indigenous people, women, migrant workers, unemployed people, informal workers and those living in rural areas.

The inclusion of women in apprenticeship and skills training for environmentally sustainable jobs is essential to overcome disparities in the labour market as well as skills shortages in certain occupations.

Incentives to increase women's participation in sectors with green growth potential, notably through technical training programmes, will achieve the double objective of solving skills shortage problems in this area while also increasing women's participation in technology-driven occupations.

Policy message 6: Skills funds and public–private partnerships could drive the sustainable development agenda beyond 2030

Skills development and training needs can also be met through collaboration between private-sector and

multinational companies and the public sector through promoting and empowering a public–private partnership (PPP) for green jobs. Private-sector engagement and involvement of workers' organizations is essential, both in establishing a sustainable and functional TVET system and in developing skills within sectors and enterprises. PPP can catalyse and boost diversified, innovative and new approaches in financing lifelong learning and provide a platform for combined contributions to support the TVET system systematically and independently.

Financial incentives are a key aspect of the operation of green markets and support other drivers of skills for green jobs. Some countries operate specific financial incentives to encourage training . Strong and inclusive public–private partnerships could be instrumental in reducing the financial constraints on effective delivery of high-quality training, as well as in generating more opportunities to formulate new, innovative and data-driven skills development policies.

Box 8. Dubai is greening existing jobs in retrofitting

The retrofitting sector in Dubai has achieved notable success in lifelong learning. The Emirates Green Building Council for Sustainable Development currently offers a series of professional training programmes. The Dubai Energy Efficiency Training Programme is targeted on facilities managers and delivers training in how small changes in the daily management of buildings can make big differences in energy consumption patterns. Energy service and energy management companies have flourished, creating green jobs in various positions (e.g. energy managers, energy auditors, retrofitting project managers, and retrofitting and solar sale professionals) to support the green building industry.

Source: "Skills for green jobs: UAE", ILO, 2018.

POLICY CHECKLIST:

- ☑ Does your country coordinate environmental policies and policies devoted to green job skills development? If yes, how are skills issues included in national environmental strategies?
- ☑ How do public employment services provide information on and access to retraining courses for green jobs?
- ☑ Is environmental awareness routinely included in general and vocational education and training?
- ☑ Are training programmes for green jobs available to, and affordable by, vulnerable groups (e.g. youth, people with disabilities, rural communities, indigenous people, women, migrants)? What are the instruments used to include vulnerable groups in the greening of the economy?
- ☑ Does your country have a policy or incentives to support female enrolment in science, engineering and other types of technical education and training?
- ☑ Do initial and continuing training programmes for teachers and trainers include components on environmental awareness, new green services and green production methods?
- ☑ Does your country have a system to identify and anticipate new skills demands? Is it used to detect skills arising as a result of greening? How is your country improving the system to capture new developments in the green economy?
- ☑ Does the system incorporate coordinating mechanisms to allow skills identification and policy coordination across greening sectors and line ministries?
- ☑ Are there financial incentives and means planned to skill current and potential workers for green jobs? Are employers and workers incentivized to contribute to training and participate in learning?

Key terms

Core skills/core employability skills: Non-vocational, non-technical skills or competencies that are needed to perform at work and in society. They apply to work generally, rather than being specific to an occupation or industry. Core employability skills include the ability to work with others and in teams; the ability to solve problems and use technology; communications skills; and learning-to-learn skills. Core skills are also called generic skills, key competencies, key skills, portable skills, soft skills and transferable skills (ILO and Cedefop, 2011).

Green transition: The process of moving towards a green and resource-efficient economy, aimed at enhancing human well-being by reducing GHGs (adapted from ILO, 2019c).

Green structural change: Massive employment shifts and transitions are generated as a result of environmental changes, involving new technologies, regulations, pricing and tariffs, creating a need to help displaced workers and those in declining sectors by facilitating their retraining and reskilling for new employment opportunities (adapted from ILO and Cedefop, 2011, p. 4).

Just Transition Framework: A policy framework adopted at the 102nd Session of the International Labour Conference in 2013, designed to serve as an integral part of the sustainable development agenda by emphasizing the need to eradicate poverty and to provide decent work for all in an inclusive society. It serves as the basis for the ILO *Guidelines for a just transition towards environmentally sustainable economies and societies for all* (ILO, 2015).

Key resources

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The ILO supports skills development to improve the employability of workers, the productivity of enterprises and the inclusiveness of economic growth.