



Advancing Green Human Capital

A FRAMEWORK FOR POLICY ANALYSIS AND GUIDANCE



 **UNEVOC**
United Nations
Educational, Scientific and
Cultural Organization
International Centre
for Technical and Vocational
Education and Training



International
Labour
Organization



Guidance on using this document

This is a publication from the Platform for Advancing Green Human Capital (PAGHC), an international arena to debate the implications of the ecological transition for the labour market, training and education policies and tap important synergies between the green economy and human capital.

This paper has been prepared with the intent to provide a set of general considerations that can help guide the process of designing and implementing such policies. This paper is an invitation addressed to all policy-makers and economic actors to gather forces around the issue of greening human capital as an intrinsic, crucial part of their efforts to set up a new development model.

The Platform for Advancing Green Human Capital invites all policy representatives and other stakeholders involved in such efforts to provide feedback on their own incremental progress within the policy framework and on the usefulness of this framework in guiding this progress.

UNESCO-UNEVOC is going to open a dedicated feedback consultation thread on the UNESCO-UNEVOC TVeT Forum starting 1st December 2017 to facilitate collecting feedback and perspectives on the framework. To take part in this consultation process, please log on to: <http://www.unevoc.unesco.org/go.php?q=e-Forum%20-%20Message%20Board>

Based on your feedback and inputs, PAGHC will be able to improve the framework and provide further tools and initiatives to serve the global momentum towards a truly inclusive, sustainable society.

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Glossary

Decent jobs: jobs that help meet the aspiration of workers, without discrimination, in terms of income, rights, voice, recognition, family stability and personal development.

Ecological transition: the process of transformation of a social and economic system towards environmental sustainability.

Green economy: an economic system that is efficient in its use of natural resources, characterized by limited polluting and resource-intensive activities, flourishing activities aiming at environmental preservation, and environmentally responsible business practices.

Green human capital: the set of green skills shown by a society's workforce.

Green jobs: jobs aiming to preserve or restore environmental quality.

Green skills: the professional knowledge, abilities, values and attitudes needed in the transition to a green economy.

Greening jobs: the process of adapting existing occupations to the needs of the green economy.

Greening skills: the process of developing new green skills in the workforce and/or adapting current skills to the needs of the green economy.

Inclusive development: a society's economic and social pathway that ensures reduction in poverty, promotes solidarity between its members and allows the participation of all its members in economic, social and decision-making processes.

Portable skills: skills that are needed in a variety of sectors and groups of occupations, facilitating professional transitions.

Professional transition: the process, for an individual, of moving from one occupation to another occupation, most of the time based on the assertion of portable skills, but also requiring retraining for the acquisition of skills adapted to the new occupation.

Sustainable development: a society's economic and social pathway that strives to meet the material and non-material needs of all its members while ensuring the preservation of natural resources so as to stay within the planetary boundaries.

TVET (technical and vocational education and training): a system of initial and continuing education and training that imparts the skills required for employment in a particular occupation, or group of related occupations.

Acronyms and abbreviations

AFD	Agence française de développement (French development agency)
Cedefop	European Centre for the Development of Vocational Training
CETVETAR	Centre for Technical and Vocational Education, Training and Research (Nigeria)
CVET	continuing vocational education and training
IDDRI	Institute for Sustainable Development and International Relations
ILO	International Labour Organization
IRENA	International Renewable Energy Agency
IVET	initial vocation education and training
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
Onemev	National Observatory of Jobs and Skills in the Green Economy (France)
PAGHC	Platform for Advancing Green Human Capital
SDG	Sustainable Development Goals
SME	small and medium-sized enterprise
TVET	technical and vocational education and training

Summary

A well-managed ecological transition can become a strong driver for job creation and social justice. The potential for new, decent jobs is huge in the shift to renewable energy, green buildings, environmental services, clean transport, organic farming and so on. On the other hand, job losses are expected, in particular in the most polluting sectors, so professional transitions must be anticipated. In addition, all economic activities and occupations are faced with changing practices and the need to adapt skills. A shortage of skills can represent a strong barrier to ecological progress, delaying technological and economic transformation. Public intervention is therefore needed to help labour markets and education and training systems adapt to the new demands of a green economy.

In every country, public and economic actors must act together to set up a roadmap for the necessary adaptation of skills to the demands of the green economy. Such processes are country-specific, because they are ideally adapted to each particular social, economic and administrative context. Still, general considerations can help guide the process of designing and implementing such policies, with the purpose of triggering, encouraging and coordinating actions from the various stakeholders involved in economic development and human capital management.

First of all, once political commitment is made to green the labour market, a critical starting point is to identify priority sectors and jobs, and current and future skill needs, based on sound labour market information and social dialogue. A second crucial focus and backbone of any policy strategy for green jobs and skills is the involvement of stakeholders such as social partners, private firms, non-governmental organizations (NGOs), education and training institutions, based on the complementarity of top-down coordinated policy-making and bottom-up sectoral and local initiatives. At a more advanced stage of policy development, a financial and regulatory framework should be set up by national and subnational governments to support investments in greening skills. Last but not least, a comprehensive model of governance must ensure that actions are coherent across sectors and across decision-making levels. This is why largely multi-actor and decentralized project governance should emerge, coexisting with the persistence of a global political vision and coordination at the national level.

Introduction: an international context for greening jobs and skills

The ecological transition is a key challenge facing the international community. The tension between increasing global demand for goods and services and rapid resource depletion can only be addressed through radical change in approaches to the production–consumption cycle. It calls for transforming our economic and institutional frameworks to enable new or adapted technologies and business models to emerge. If these changes are properly planned and managed, they could result in environmental innovation that is positive for employment, productivity and competitiveness, and can be a key factor for minimizing the cost to the economy of a shift to a more environmentally friendly model while creating opportunities for greater social justice.

In this time of major environmental crisis and high levels of unemployment, public policy has an opportunity and a responsibility to focus on the intersection of activities that may lead to both sustainable and inclusive development. If managed with clarity and determination, these policies can be a chance to build a new, solid, socio-economic model in tune with the many challenges of the twenty-first century. With the Paris Agreement on climate change, the Sustainable Development Goals (SDGs) and other major commitments, the international policy context provides an ambitious vision and a coherent framework to tackle these issues in a concerted way.

The link between education, training, social justice and environmental protection is a significant feature of the SDGs adopted by the international community in 2015. SDG 4, which is related to quality education, targets that by 2030, the world should ‘ensure that all learners acquire the knowledge and skills needed to promote sustainable development’. SDG 8, promoting inclusive and sustainable economic growth, employment and decent work for all, aims to ‘substantially reduce the proportion of youth not in employment, education or training’ by 2020. SDG 12 on responsible consumption and production includes ensuring that ‘people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature’. In addition, many of the targets detailed as part of the SDGs, for instance ‘enhancing scientific research, upgrade the technological capabilities of industrial sectors’ (SDG 9), implicitly call for a workforce with appropriate skills, and therefore for specific education and training efforts. In fact, all SDGs require individuals, whether acting as citizens or professionals, to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development¹.

The Platform for Advancing Green Human Capital (PAGHC) is an international partnership created in 2015 to provide an arena to tap important synergies between the worlds

of green economy and human capital, both vital for sustainable development. PAGHC aims to accelerate and create opportunities for a just transition for all through policy dialogues that debate the implications of the ecological transition for the labour market, training and education policies. Policy dialogues take the opportunity of international meetings, such as the 2015 United Nations Climate Change Conference of the Parties (COP21) and the Asia Clean Energy Forum, to inform people of the importance of integrating employment, training and education policies with economic policies, in order to be more efficient in the pursuit of national and international objectives for climate protection and sustainable development. The policy dialogues promoted by PAGHC address questions such as how can we raise the profile of skills to address the ecological transition? What initiatives are already being put into practice by governments, development partners, social partners and financial institutions? What guidelines can be proposed, in particular as part of the SDGs?

This paper presents a structured reflection based on successful initiatives and on the work of PAGHC partners since 2015 and other works published on this topic, with the aim to provide governments and other stakeholders around the world with a strategic framework to take up this agenda. It is intended primarily for national governments, but can also provide a basis for reflection and action to subnational institutions and all stakeholders in the fields of both education and training and sustainable development. While we focus on government’s responsibility and skill supply issues, this is not to underestimate the importance of bottom-up approaches to skill development and the need for ambitious policies to provide an enabling environment for responsible business practices, green finance, infrastructure and clean technology development.

After an illustrative reflection on the issues at stake and the role of skill development policies (**Part I**), this paper provides a guiding framework for policy development (**Part II**), together with references to other existing guides for skills and jobs in a green economy (**Part III**).

¹ That is the rationale behind UNESCO’s guide on Education for Sustainable Development Goals, targeted to education specialists and which translates each SDG into learning objectives (UNESCO, 2017).

I. Why advance green human capital?

I.1. Impacts of the ecological transition on employment

In the move towards a green economy, patterns of employment are experiencing contrasted changes both quantitatively (job creation and losses) and qualitatively (evolution of skills and job quality). Employment and the training system are affected in three ways (Cedefop, 2012):

- ✱ Structural changes lead to increases in demand for some jobs and decreases for others.
- ✱ Many existing occupations and industries will experience greening changes to tasks involved in their jobs, which will require adjustments to the current training and qualification frameworks.
- ✱ To a lesser extent, new economic activity may create new professions, a need for new skills profiles, and new qualification and training frameworks.

The International Labour Office (ILO) identified eight key economic sectors where job markets are going to face major changes (see **Table 1**).

Table 1 – Sectors most impacted by the ecological transition

Agriculture	Agriculture is the world's largest employer with more than 1 billion workers, including a large number of poor agricultural workers and subsistence farmers (mostly women). Strong investment in skills, rural infrastructure and professional organizations would enable smallholder farmers to adopt more productive and environmentally friendly farming practices, boost food security, reduce poverty and prevent rural exodus.
Forest industries	In the forestry industry, unsustainable practices have already led to job losses, sometimes on a very large scale. Sustainable forest management provides both essential environmental services and renewable raw materials to other sectors while also providing quality jobs.
Fisheries	The fisheries sector is facing a major transition challenge owing to overfishing. Of particular concern is that 95 per cent of the 45 million workers employed in fishing are poor artisanal coastal fishers in developing countries. Temporary reductions of catch are needed in many fisheries to avoid the collapse of fish stocks and to allow their recovery for sustainable food production and employment.
Energy	In the energy sector, rapid growth in renewable energy, progress in energy efficiency and better access to energy can lead to major gains in employment opportunities and income as well as significant environmental benefits. Fossil energy generation is likely to see job losses, calling for policies to ensure a just transition for workers and their communities.
Manufacturing industries	Resource-intensive manufacturing has seen a decline in employment for decades, in which the environment has been a minor factor. However, a green economy could increase demand for products from these industries, contributing to improved competitiveness while protecting employment and even creating new jobs.
Recycling	Recycling is essential for energy efficiency, avoidance of waste, safe treatment of hazardous waste and recovery of valuable materials. Employment could be significantly increased by improving recycling rates, and there is major potential to improve social inclusion and reduce poverty through formalization, as the majority of waste pickers, notably women and child labourers, are concentrated in informal employment.
Construction	High-efficiency buildings have the largest potential to reduce greenhouse gas emissions and resource use. There are also significant opportunities for employment creation in new, green buildings, and even more opportunities in retrofitting the large estate of older buildings. A successful strategy hinges on skills development and on preparation and upgrading among the small and medium-sized enterprises (SMEs) which dominate the sector.
Transport	Transport is central to the functioning of modern economies and for development, but it has also been the most rapidly growing source of greenhouse gas emissions. However, substantial gains in employment can be created by a shift to mass transportation and more energy-efficient vehicles.

Source: ILO 2012

Research underlines the potential for new jobs created in the shift to renewable energy, green buildings, environmental services, clean transport, organic farming, eco-tourism and so on. The potential for employment in clean energy in particular is enormous. The 2017 review report by the International Renewable Energy Agency (IRENA) on renewable energy and jobs estimates the global work force in renewables at 9.8 million – a figure 40 per cent higher than in 2012 (IRENA, 2017). Doubling the share of renewables in the energy mix by 2030 could increase direct and indirect employment in the sector to 24.4 million. Research also shows the quality of new renewable energy jobs to be good, with overwhelmingly permanent, full-time positions. In China, workers at wind firms had higher average annual incomes and better job security, experienced better occupational conditions and enjoyed a higher level of workplace protection measures than their counterparts in conventional power plants (ILO, 2013).

However, job losses can also be expected from the ecological transition, especially in the short term in carbon-intensive sectors, for instance as some coal mines and processing industries are closing down. Just in China, more than 1 million jobs will be suppressed.

In order to allow and maximize the positive impacts and minimize the negative impacts on employment, the issue of helping professionals to adapt to the needs of the green economy across various economic sectors must be considered. This means relevant public or private services must accompany professional transitions through retraining both workers and jobseekers. In order to inform the future of coal-producing regions, the Institute for Sustainable Development and International Relations (IDDRI) and Climate Strategies published in 2017 a report that highlights key lessons from previous coal transitions in various countries (Caldecott et al., 2017). It underlines the importance of anticipating professional transitions for the benefit of whole economies (see Box 1).

In order to allow and maximise the positive impacts and minimise the negative impacts on employment, the issue of helping professionals to adapt to the needs of the green economy across various economic sectors must be considered.

Box 1 - Lessons from previous coal transitions

A successfully managed coal-mining transition can take up to twenty-five years, in order to ensure new jobs for workers, regional economic regeneration, and company reinvestment in new business models. Given the imperative and the likelihood of a relatively fast phasedown of global coal use from the 2020s onwards, stakeholders need to begin a managed and controlled transition today. If not, they risk more serious consequences of more abrupt and unmanageable changes later on. Once they begin, coal transitions can move fast, at which point they can be impossible for governments to deal with effectively.

The example of the Limburg region in the Netherlands illustrated that **higher levels of reemployment, company reinvestment in new business models, and regional economic regeneration are possible** given time, reinvestment and sufficient social and political consensus. For instance, in that case, a transition of approximately 75,000 mining workers into alternative employment (or in some cases retirement) was achieved over a period of ten years. A significant percentage of affected workers were also able to be retrained and find new employment in the same coal-mining company, as it diversified into other activities in the region, most notably chemicals.

On the contrary, **unplanned transitions often led to multiple problems**: higher rates of long-term unemployment and 'inactive' prime-age workers unable to re-enter the labour force, higher risks of large companies going bankrupt, poorer long-term regional economic performance, lower tax revenues for local services, unpaid-for environmental remediation, and unpaid pension and/or health care programmes. For example, in the United Kingdom the lack of anticipation and active management of the removal of support for coal mining in the 1980s has meant that even thirty years later, former UK coal-mining regions have typically seen rates of unemployment between 3 and 6 per cent higher than the national average.

In addition to other non-monetary costs, such as social, environmental and human impacts, the financial costs of worker reconversion and regional economic adjustment are often much smaller than the costs of failing to implement a transition.

Source: Caldecott et al. (2017).

Besides the sectors most impacted by the ecological transition, all economic activities and occupations are part of the global movement towards a sustainable economy, and therefore are faced with changing practices and the need to develop new attitudes, knowledge and skills.

The workforce are influenced by environmental issues because of a number of factors:

- * change in the physical environment (which is already affecting the work practices and skill needs of agricultural workers, especially in arid and semi-arid regions)

- ✱ environmental policy and regulation, which is pushing industry towards greater sustainability, increasing the demand for specific skills
- ✱ green innovation, which is obliging thousands of technicians to master new ways of working
- ✱ changing consumer demand (such as the demand for organic food, which is creating entirely new industries requiring workers with specific skills) (OECD et al., 2015).

At the same time, changes in employment are not only a consequence of the transition to a green economy, but a determinant of its success, as the workforce can be a strong driver to a green economy. Conversely, a shortage of skills can represent a strong barrier to ecological progress, delaying technological and economic transformation. In its 2015 report *Aligning Policies for the Transition to a Low Carbon Economy* (OECD et al., 2015), the Organisation for Economic Co-operation and Development (OECD) and its partners suggest that the right skills are still needed to 'generate technological change for the transition and to serve the new markets spurred by climate-related policy measures', and that public intervention is needed to help labour markets and education and training systems adapt to the new demands of a low-carbon economy and to avoid gaps in skills that undermine the effectiveness of policy measures.

The need for skill development is felt at all levels of qualification. The experience of Australia with its Home Insulation Programme introduced in 2009 illustrates the problems that can arise when training provision is not up to the challenge, in this case at low levels of qualification. The programme was designed partly to generate jobs for lower-skilled workers in the housing and construction industries. At the start of the programme only supervisors were required to satisfy minimum technical competences in insulation activities. After a few months, fires were reported in the newly insulated homes, which undermined public confidence, and the programme was cancelled in February 2010. A subsequent sample of inspections revealed that nearly 30 per cent of installations had some level of deficiency. Investigation showed that low skill levels in the industry and inadequate provision of training were among the factors responsible (World Bank, 2012).

In brief, efforts in accompanying the transition of the workforce and labour markets to the green economy should be part of any policy strategy for sustainability, as they offer a triple dividend: an environmental dividend (allowing and accelerating the ecological transition), a social dividend (creating decent jobs and upgrading skills, in particular for young people, women and the low-skilled) and an economic dividend (avoiding long-term costs linked to declining economic fabric and unemployment).

I.2. The role of technical and vocational education and training (TVET)

The need to adapt jobs and workers is felt across various sectors, starting with agriculture, chemistry and the energy and building industries, where 'green jobs' are being created (for example, energy auditor) while other jobs are progressively declining or dramatically transformed (for instance, a petrochemist turning to vegetal-based chemistry), and others see minor changes in their day-to-day activities (for instance, eco-driving for couriers). This highlights the role of the education and training systems to ensure that the workforce adapts to the new demands of sustainability.

Of course, informal processes play an important part in skill development. Workers throughout the world acquire a large part of their skills through on-the-job practice and exchanges with their peers. However, informal training has a limited capacity to anticipate and stimulate all the skills needed in the context of a green economy. An institutional response in the shape of changes to formal education and training systems is needed to ensure coherent, widespread adaptation. **The role of education and training here is to raise awareness, encourage and allow ecological practices in every professional sector.**

Sustainable development needs the active participation of individuals, whether acting as citizens or professionals. This implies an increased need for environmental awareness as well as certain types of competency such as the ability to analyse complex systems across different domains (society, environment, economy) and across different scales (local to global) (PAGE, 2016). There is a decisive role for education to help citizens become eco-citizens and adaptive future professionals. Access to primary and lower secondary education is a first building block allowing the acquisition of foundation knowledge and skills. These are the skills on which individuals can build on for their future employability, including the ability to adapt to new skills and occupational requirements throughout their working lives (ILO, 2014).

TVET is another building block to development and a master key to facilitate sustainable development and corporate social responsibility, since TVET is directly linked with the labour market. TVET aims at the development of both technical skills (those required to deal with new technologies or new commercial techniques, for instance) and non-technical skills (such as the ability to foster transformation or collaboration) applied to specific professions, including the professions that are most in-demand and transformed in the context of the ecological transition. This is why TVET institutions, particularly those focused on the sectors and occupations most impacted by the ecological transition, have a central role to play.

The reality is that in many countries, TVET is viewed as a second-class system compared with university education. **Upgrading skills to meet the demands of transition to a green economy cannot be made without improving the image of TVET to make it as attractive as university.** This will need efforts to understand the dynamics at play. Stakeholders at all levels need to be made more aware of the place of TVET in this development paradigm, and skills need to be formalized through certification and qualification recognition schemes.

Efforts must be made to incorporate changes into training practices, revise training programmes and introduce new ones so as to ensure the employability of workers in a rapidly changing world. The green transition is generating far more demand for upgraded skills in established occupations than it is creating brand new occupations (ILO et al., 2013). In both cases, **as green markets evolve and mature, there is an increasing tendency for the related jobs to require more specialized and better-skilled personnel, preferably with formal qualifications.** While the initial training system has a role in bringing in a new generation of professionals well prepared for the opportunities and challenges of the twenty-first century, continuing training is essential to ensure that those already in work adjust to the rapidly evolving and urgent demands of the green economy. The timeliness or the lack thereof with which TVET systems respond to sustainability concerns and the demand for related skills can put these systems in a virtuous cycle of interaction with the labour market, or alternatively widen the disconnect between the demand for and the supply of skills.

A demand-driven approach to greening skills is therefore necessary: the needs of the economic market in terms of jobs and skills must be identified and then answered through appropriate training offers, with the final aim being to ensure the employability of professionals and future professionals in the green economy. However, despite recent changes, many employers still have a lack of knowledge on sustainability-related skills and do not explicitly demand such skills or qualifications from their employees (Strietska-Ilina et al., 2011). This is why the **TVET system should not be limited to being a mere supplier satisfying economic demands. It also has a responsibility and opportunity to help generate a new generation of workers and entrepreneurs willing and able to frame an economic model adhering to the principles of sustainable development, in a way that fits the national political orientation** (Majumdar, 2010). Moving towards sustainability while improving the quality and status of TVET requires innovative and transformational leaders in all policy, economic and educational spheres who can seize the opportunities to create a new vision for twenty-first century skills, jobs, economies and societies.

TVET system should not be limited to being a mere supplier satisfying economic demands. It also has a responsibility and opportunity to help generate a new generation of workers and entrepreneurs willing and able to frame an economic model adhering to the principles of sustainable development, in a way that fits the national political orientation.

I.3. Towards a coordinated, multi-stakeholder engagement

The creation of decent jobs and anticipation of skills in a green economy can take various forms and stem from the initiative of a large array of stakeholders, including governments, private firms, NGOs, education and training institutions and social partners. In order to move towards a collective, coherent vision of sustainable development, an enabling environment is needed in which these various initiatives and actors can flourish and collaborate. There is a responsibility of governments, not of market forces alone, to ensure a proper labour market response in order to maximize the positive impacts of green policies on employment. For these important reasons, it is important to ensure that green policies address not only the issue of hard infrastructure but also social and human capital through the development of workforce skills.

The responsibility of governments is to set up policies framed around the engagement of public, private and community-based stakeholders, including social partners, and covering both employers and workers. Three key messages summarize the pathway ahead to achieve policy coherence for skills and ecological transition:

- * the importance of interrelationships between sectors and related policies
- * the mobilization of stakeholders through staging social dialogue at national and local level
- * the need for a broad strategy going beyond training and including social policies (labour market, social protection) and environmental policies (infrastructures, green standards and so on).

These are part of the key messages from the PAGHC policy dialogues of COP21 in Paris in December 2015 (see **Box 2**).

Box 2 - Messages from the COP21 policy dialogues on advancing green human capital

Economy, investment, employment and skill development are interrelated areas.

- ✱ The investment for advancing clean energy needs to be thought through as a cross-sector issue so that our efforts maximize employment and employability.
- ✱ We need an integrated development of policies for the clean energy transition at the international, regional, national and local levels. Our mindset needs to change.

The mobilization of all the partners for the anticipation of changes is crucial.

- ✱ The anticipation of skills needed for clean energy development has to be supported by policies framed around the engagement of public-private and community-based stakeholders, including social partners – employers and workers – to take account of skills development issues.
- ✱ While national policy frameworks are critical for establishing policy coherence across ministries and agencies, their implementation at the local level by municipal and community stakeholders as well as in enterprise levels – by workers and management – is key.
- ✱ Coordination between public and private actors is necessary to achieve policy coherence and to reach common goals for clean energy.

A broad strategy to promote and manage actions towards development of strategies for greening of skills is essential to address the new climate economy.

- ✱ Educational and training curricula should be reviewed and adapted to meet skill needs to better fit labour market requirements in existing and emerging occupations.
- ✱ This could be achieved through multi-stakeholder partnerships in order to facilitate the definition of training needs, job competencies, and the design of training programmes.
- ✱ Upgrading of skills in existing occupations is needed to enable workers and enterprises to address clean energy needs. It is essential for all countries to develop and promote awareness and engagement even if their development prospects differ.

Efforts to adapt professional knowledge and skills should be made in every country and coordinated at supranational level, since the challenges we face are generalized and global in nature. For rapidly developing and least developed countries, investing in knowledge and skills is all the more crucial as this is central to seizing opportunities to develop markets for new technologies, attracting investment and creating sustainable, decent and green jobs for a growing labour force (ILO, 2014). Moreover, some countries are more vulnerable than others to the impacts of climate change and environmental degradation while they face harder social challenges and have limited capacity to undertake

ambitious policies and actions. In that context, investments in the green economy can represent a missed opportunity to provide local employment and economic wealth in developing countries, as testified by the example of wind energy development in Africa (see Box 3). It is therefore important to move forward international collaboration.

Box 3 – Boosting renewable energy in Africa: the skill challenge²

The challenge of involving the private sector is particularly important in the energy sector, particularly in Africa. Only 30% of the African population have access to electricity, 80% rely on the use of biomass for cooking (mainly firewood and coal), 600,000 children die each year from indoor smoke pollution. Still, by 2014, Africa attracted less than 10% of global investment in renewable energy (about 80 billion USD) despite a significant potential.

One explanation is the **lack of technical skills of the African workforce in the renewable energy sector, which forces companies investing in renewable energy development to import skilled labour**. The challenge for governments in Africa is to provide adequate training programmes to ensure the development of skills needed by the private sector for renewable energy development and enhance the employability of young people in that sector.

The largest wind farm in Africa is under construction in **Kenya**, with a power capacity of 300 MW and a total investment of nearly 900 million USD. About 2,500 construction workers are needed on site, and more than 200 permanent workers will be needed for operation and maintenance. The supplier and operator of the wind turbines plans to recruit as much as 80% of the wind technicians on the international labour market, because the right skills are not available locally. In **Nigeria**, a series of investment agreements have been signed totalling about 5 GW of solar energy. The largest single project, a solar power plant of 3 GW worth 5 billion USD, is expected to create 30,000 jobs. Unfortunately, no vocational training programme has been planned for the local population.

With more than 60% of the African population living in rural areas, **increasing access to energy means relying on a dynamic tissue of small and medium-sized enterprises** that are able to bring technical and social innovation, to offer products and services and to rely on economic models adapted to African rural markets. Yet, young entrepreneurs are confronted with various obstacles to create and sustain their business, like a lack of technical skills, a lack of networks, and constraints in accessing financing. Integrated green entrepreneurship programs that build on the lessons learnt from experiences in other sectors are necessary to help remove these obstacles. Support for such projects would have significantly positive impacts on young people and women in particular.

Source: AFD (2017)

Disadvantaged workers and communities will need targeted assistance to make the transition to new practices. In addition, with regard to agriculture and forestry, it is

² AFD, 2017. Annexe au cadre d'intervention transversal climat.

increasingly being recognized that indigenous peoples' traditional knowledge and practices play an important role in effective climate action and ensuring secure livelihoods. Skill shortages and non-recognition of traditional skills continue to be important challenges (ILO, 2016).

Sustainable development can only happen through a combination of bottom-up and top-down approaches. This is why integration of strategies and actions is just as decisive at the level of economic actors. **The success of green policies and the creation of green jobs will ultimately depend on the establishment of a sound enabling environment for economic actors, in particular small enterprises.** The availability of an adequate education and training offer is an intrinsic part of such enabling policies, but not the only ingredient (see Box 4).

Box 4 - Policy measures for an enabling business environment

The trend we are observing is that corporate social responsibility makes business sense. Economic actors are realizing that by improving their environmental performance, they can act as good citizens, but also actually reduce input costs and improve their image. They also see that new business opportunities and long-term job creation can arise from green activities. However, we must anticipate that for many of them, and in particular in SMEs, it is difficult to achieve the greening of production processes in the absence of investment in new technologies and in human capital development.

In addition to fostering an adaptive system for skill development, this implies targeted business information and advice on green business practices and eco-innovation as well as financial and regulatory systems that can facilitate the uptake of green technologies and responsible business practices. Three key policy areas can be identified as contributing to such an enabling environment for sustainable business and green employment (AFD, 2017):

- ✱ **Reforming environmental taxation:** The tax system has a huge influence on directing activities and therefore job creation. Globally, if taxes were imposed on carbon emissions and if the resulting revenues were used to reduce the cost of labour, then up to 14 million net jobs could be created.
- ✱ **Encouraging investment in the green economy:** Investment has been insufficient in many areas, including clean and modern energy sources, energy-efficient housing, manufacturing and transport, sustainable agriculture and rural infrastructure, and the rehabilitation of ecosystem services. Targeted programmes investing in environmental services, including public works schemes, could create numerous jobs.
- ✱ **Supporting entrepreneurship and SMEs:** The role of small and micro-firms in the transformation to a greener economy will be crucial, with SMEs providing two-thirds or even more of total employment and start-ups being an important source of innovation. Environmental regulations, research and development and public procurement must take into account the needs and limitations of small and micro-firms.

The time has come to act boldly: we need a big policy shift towards reinvesting in employment and skill development, as a means to move towards sustainability and reduce poverty. We need to emphasize an enabling environment for enterprise development, the right skills to make these enterprises productive and competitive, and a social protection system to cushion and ease the process of transition.

Despite the many examples of innovative developments in skills for the transition to green economies, countries do not systematically set an enabling policy and governance context. In many cases, change is being driven at pilot level by individual companies, teachers or TVET institutions rather than being steered by a whole-of-system policy and governance approach.

Furthermore, when governments choose to act on this issue, they are likely to put greater emphasis on policy development than on subsequent implementation and evaluation. This focus on policy and less on implementation means that well-designed policies for transition to a more sustainable development path might fail to be translated into action or reach implementation stage. In this context, to achieve large-scale impacts, it is important that countries develop appropriate national policies and governance systems for skill development and focus on 'getting things done'. To this end, greening skills requires coordination across a wide range of public policies. This includes horizontal coordination across policy domains and vertical alignment across policy levels (supranational, national, subnational and local). While there are toolkits and manuals available to 'engineer' the right approach at the level of educational institutions, there still needs to be a concerted effort to make the system work better as a whole and take a cross-policy approach.

II. Policy framework for decent jobs and skills in the green economy

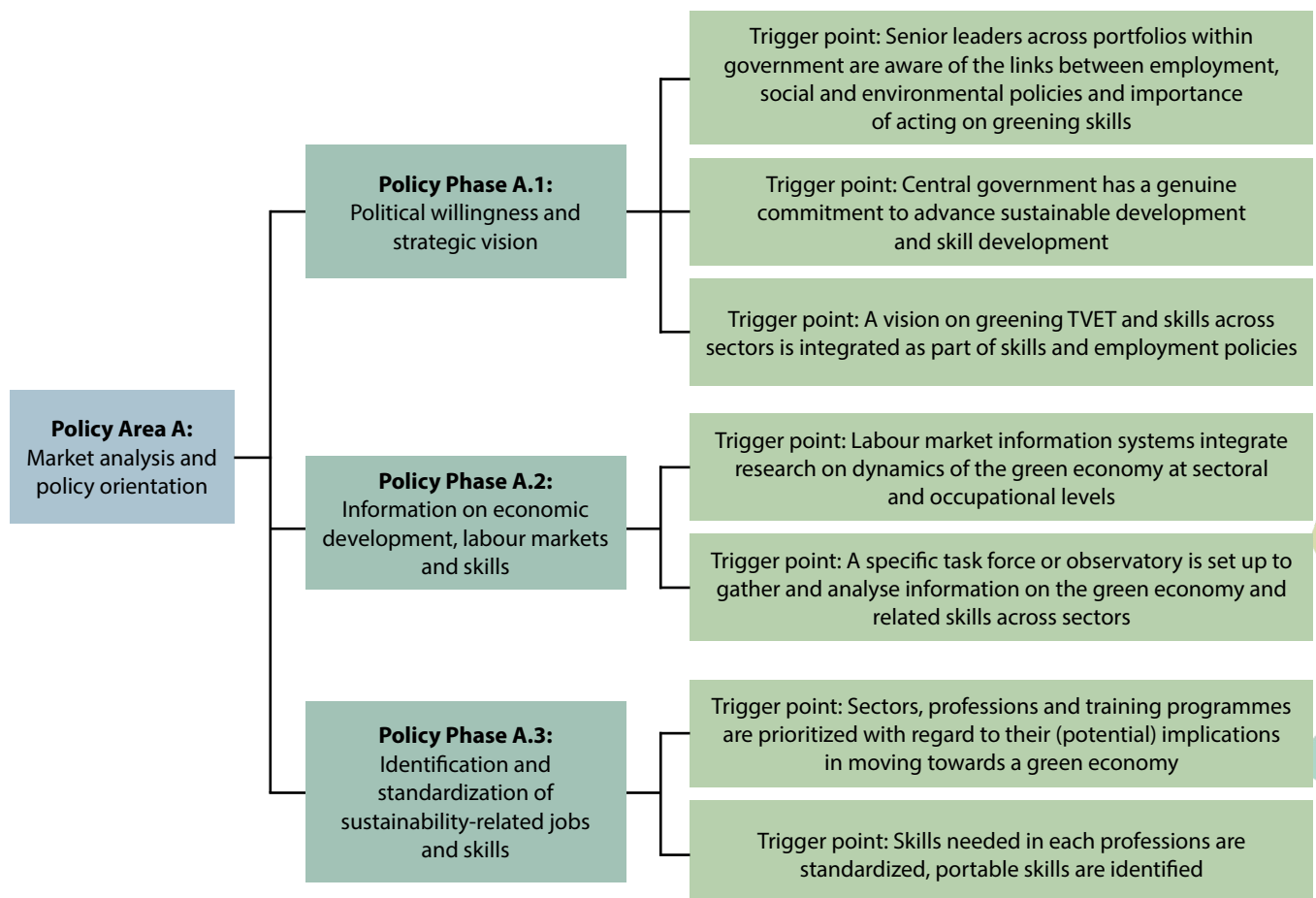
In every country, public and economic actors must act together to set up a roadmap for the necessary adaptation of skills to the demands of the green economy and sustainable development. Such processes are country-specific, because ideally they will be adapted to the social, economic and administrative context. They are nonetheless based on factors that are not easy to change, therefore any plan for skill development should be aligned with a vision to cater to ecological, social and economic transformation.

The following analysis is designed to help countries in envisaging a framework to identify the priority policy areas that can result in improving their performance in their own specific situation. The framework is intended to be used primarily by national governments, but can also provide a basis for reflection and action for subnational policy makers and institutions and all stakeholders in the fields of both education and training and sustainable development.

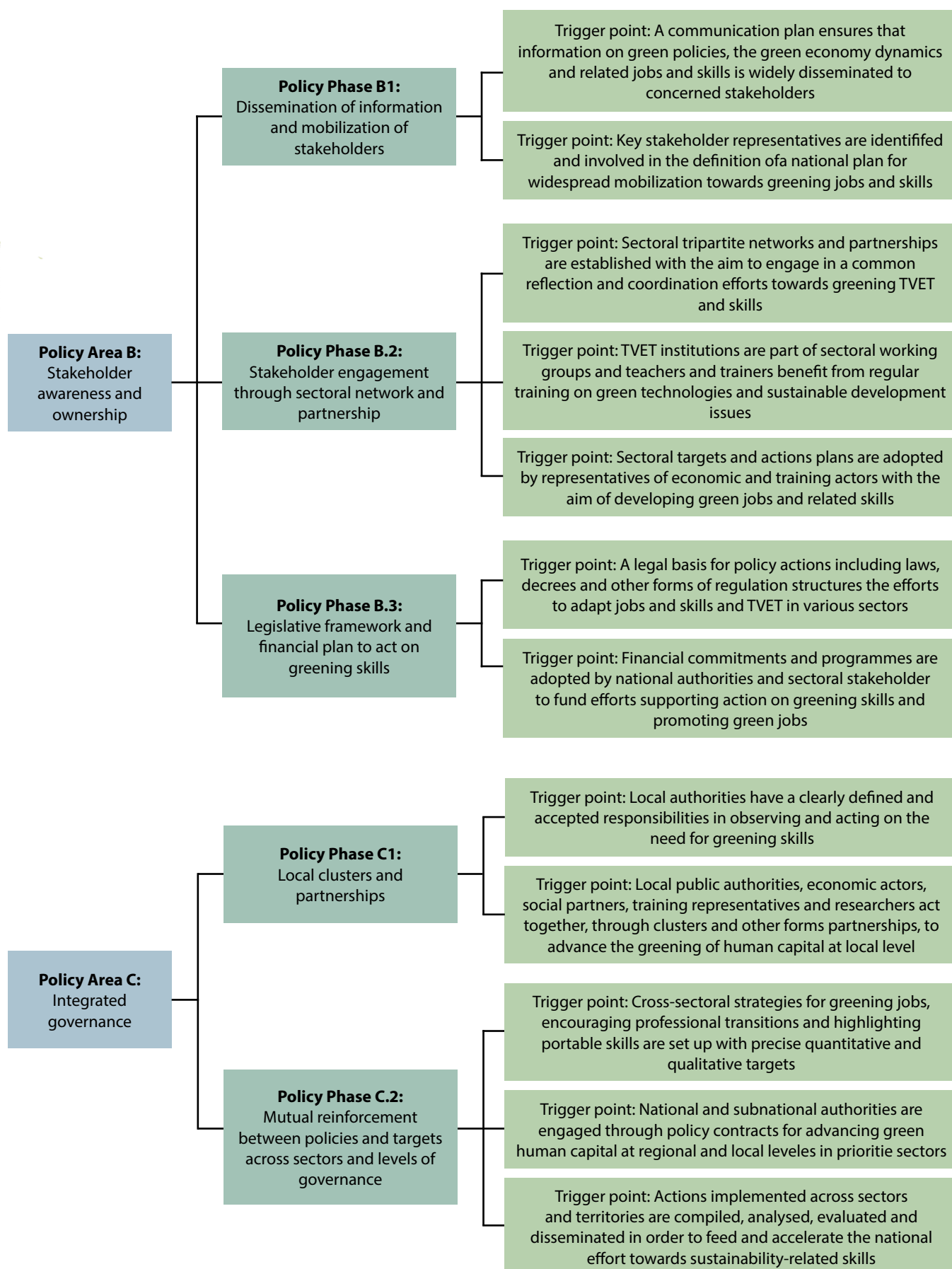
The framework presents three areas for action: A) observation and orientation, B) stakeholder awareness

and ownership, and C) integrated governance. At each level, policy topics are provided to help guide action and objectives. Trigger points are indicators that define different actions led by different policy representatives and targeted at different stakeholder groups which could be demonstrated in implementing the various policy phases.

The steps described in the following section represent a path to progress towards the integration of skills development policies into green and economic policies. The measures are proposed in a chronological order that makes policy sense. Indeed, countries that start a process for greening skills may benefit from centralized governance to analyse and understand the issues at stake, provide policy orientation (policy area A), raise awareness among all stakeholders and provide them with incentives for action (policy areas B). When the process reaches a more advanced stage, multi-stakeholder governance, extended to both the private sector and the territories (or states), is essential to enable optimal action tracks (policy area C).



However, this path to progress should not be seen as sequential since many of the measures proposed can benefit from being implemented simultaneously. Another important recommendation is that, while we focus here on skills and labour market issues, these policy considerations should be strictly and consciously associated with and complemented by similar considerations in the fields of green finance, infrastructure and technology development.



II.1. Policy area A: Market analysis and policy orientation

In the first stage of their strategy for greening skills, nations should set up a vision and directions, initiate networks of stakeholders for both intersectoral and sectoral analysis, and identify emerging skill needs. This work should be coordinated between and across ministries first at central/federal level, since central government has a key role to play in initiating a coherent national strategy that can cascade action in all sectors and at all levels of decision.

Policy phase A.1: Political willingness and strategic vision

Awareness of the links between employment, social and environmental policies among governmental policy-makers and officials, and willingness to act to foster green skills, are clear prerequisites to policy development. Based on this awareness and willingness, the ministries concerned should express clear commitments to coordinate. The government should have clarity over what it wants to achieve in the transition to a green economy, thus creating a direction and objectives for skill development. This in turn creates a stimulus for improved coordination.

- **Trigger point:** Senior leaders across portfolios in the government are aware of the links between employment, social and environmental policies, and the importance of acting on greening skills.
- **Trigger point:** Central government has a genuine commitment to advance sustainable development and skill development.
- **Trigger point:** A vision on greening TVET and skills across sectors is integrated as part of skills and employment policies.

Policy phase A.2: Information on economic development, labour markets and skills

The existence of economic intelligence is one of the building blocks of an effective TVET system, as it helps ensure that training decisions and skills acquired are relevant to the labour market. Existing institutional mechanisms such as sectoral skills councils, observatories and skills advisory groups typically provide a forum for social dialogue that involves all relevant partners. However, where existing systems for the identification of skills are organized along sectoral lines, there need to be initiatives to bridge between and across sectors – in order to capture the cross-cutting character of green economic activities (in fields such as energy management and plant-based chemistry) (ILO,

2011a). One-off surveys targeted at enterprises in a specific sector must be complemented by a more systematic approach, carried out by ad-hoc observatories or as part of existing observation mechanisms.

- **Trigger point:** Labour market information systems integrate research on the dynamics of the green economy at sectoral and occupational levels.
- **Trigger point:** A specific task force or observatory is set up to gather and analyse information on the green economy and related skills across sectors.

Policy phase A.3: Identification and standardization of sustainability-related jobs and skills

Based on green policy objectives and the results of economic analysis on evolutions in employment and skills requirements, governments, in close cooperation with other stakeholders, should identify precise needs and priorities for developing jobs and skills. Those needs and priorities should ideally be characterized both qualitatively (identification of professions and skills needed in the green economy, in particular portable skills, which allow for occupational mobility) and quantitatively (number of jobs and training programmes to be created or adapted), and coherent with sectoral and regional contexts.

- **Trigger point:** Sectors, professions and training programmes are prioritized with regard to their (potential) implications in moving towards a green economy.
- **Trigger point:** Standards are drawn up to specify the skills needed in each professions, and portable skills are identified.

Box 5 The observatory of jobs and skills in the green economy led by the French Ministry of Environment

The French Government launched in 2009 its 'national plan' for the adaptation of jobs to the green economy. The plan has been coordinated by the French Ministry in charge of the environment, and aims to accompany economic actors in anticipating skill and training needs in the transition to a green, robust and just economy. The National Observatory of Jobs and Skills in the Green Economy (Onemev) was set up in 2010 as part of that national plan. The observatory produces methods, statistics and analysis, and disseminates knowledge on jobs and skills in the green economy. It brings together representatives of the Ministry for Environment and the Ministry of Labour, the National Institute of Statistics and Economic Studies, the national employment services agency, the national agency for environment and energy management, training providers and representatives of regional observatories on employment and training.

Onemev has two main missions:

- ✱ Determining perimeters, statistical methodologies and monitoring, and analysis of the labour market, recruitment tendencies and mobility related to jobs in the green economy (based on both jobs in green sectors and green occupations across sectors).
- ✱ Identifying skills and analysing the employment–training relationship in the green economy.

Continuing the work of the observatory at the regional level is a major challenge involving regional bodies to study the adaptation of skills in the transition to a green economy.

Source: France (2016).

II.2. Policy area B: Stakeholder awareness and ownership

The process of adapting the workforce to the needs of sustainable development is in the hands of a wide array of stakeholders: public representatives from various levels of governance and policy areas, economic, social and environmental experts, market and social actors (employers, trade unions, NGOs and others), and last but not least, career guidance and TVET institutions. An important policy area is thus characterized by actions designed to ensure awareness, understanding and ownership by all stakeholders of the issues at stake and policy objectives towards green jobs and related skills. This stage includes the definition of a communication and mobilization plan. Further action to stimulate stakeholder mobilization will involve changes in the legal and regulatory frameworks and the setting-up of incentives and financial support for projects.

Policy phase B.1: Dissemination of information and mobilization of stakeholders

The availability of accurate and timely information on labour markets, employment and skill development metrics, and awareness of policy orientation on sustainable development and related skills, can act as catalysts for stakeholder collaboration and commitment on greening skills.

- **Trigger point:** A communication plan ensures that information on green policies, the green economy dynamics and related jobs and skills is widely disseminated to relevant stakeholders.
- **Trigger point:** Key stakeholder representatives are identified and involved in the definition of a national plan for widespread mobilization to ensure the greening of jobs and skills.

Policy phase B.2: Stakeholder engagement through sectoral networks and partnerships

The process of greening skills is an opportunity for a large array of stakeholders to meet and work together towards a common purpose. Sectoral governance for skill development has proved useful in engaging training institutions and employers, albeit it takes different forms in different national contexts. For instance, in several countries, tripartite sectoral skill councils play important role in anticipating skill development through social dialogue, and should be encouraged.

- **Trigger point:** Sectoral tripartite networks and partnerships are established with the aim to engage in common reflection and coordination efforts for greening TVET and skills.
- **Trigger point:** A legal basis for policy actions including laws, decrees and other forms of regulation structures the efforts to adapt jobs and skills and TVET in various sectors.
- **Trigger point:** Sectoral targets and action plans are adopted by representatives of economic and training actors with the aim of developing green jobs and related skills.

Policy phase B.3: Legislative framework and financial plan to act on greening skills

A legislative, legal and financial framework is needed to encourage, constrain and/or allow actions on greening skills and accompany professional transitions while giving specific attention to disadvantaged groups. Central authorities have a clear role to play in providing such an enabling context for stakeholders to act in coherence with national objectives for a green economy.

- **Trigger point:** A legal basis for policy actions including organic laws, decrees and other forms of regulation structures the efforts to adapt jobs and skills and TVET in various sectors.
- **Trigger point:** Financial commitments and programmes are adopted by national authorities and sectoral stakeholders to fund efforts supporting action on greening skills and promoting green jobs.

Box 6 - Greening teacher education in Nigeria

The Department of Vocational Teacher Education of the Centre for Technical and Vocational Education, Training and Research (CETVETAR) in Nigeria has reviewed and revised its teacher education curricula. They now include two mandatory face-to-face courses in the postgraduate programme: Green Technology and Skills Development, and Emerging Issues and Innovations in Technology Education, which are infused with green economy issues. These form part of the academic programme interventions.

Outreach activities of CETVETAR for TVET teachers include a series of greening TVET workshops aimed at advocating and sharing experiences on best approaches to infuse emerging greening concepts and ideas into the curriculum of TVET institutions and departments. Another intervention is on enhancing the capacity of TVET teachers in responding to emerging training needs for green skills, which will draw on a research-based exercise on the skills needs of teachers.

Source: CETVETAR 2015 contribution to UNESCO-UNEVOC (2017).

II.3. Policy area C: Integrated governance

The success of the strategy for greening skills will depend on the interactions between ministries and national and local policies and the appropriation and evaluation of strategies by actors across sectors, activities and territorial levels: local authorities, the private sector, associations, civil society organizations and communities. A largely multi-actor and decentralized project governance emerges when the level of policy maturity is advanced, coexisting with the persistence of a global political vision and coordination at the national level.

Policy phase C.1: Local clusters and partnerships

When it comes to policy implementation, the local level of governance should play the primary role. Direct dialogue between national and regional governments and social partners can be translated into action when commitments and resource allocation occur at a smaller scale and where immediate dividends are obvious for all partners involved (ILO and Cedefop, 2011). In many countries, TVET and skill development is already a prerogative of subnational authorities. Indeed, the characteristics of labour markets and economic fabrics are largely dependent on territorial contexts, where different stakeholders come into direct contact. Local partnerships are needed to work on the fit between national and local green policies and local economic dynamics, and the skills and training offer.

- **Trigger point:** Local authorities have a clearly defined and accepted responsibility in observing and acting on the need for greening skills.

- **Trigger point:** Local public authorities, economic actors, social partners, training representatives and researchers act together, through clusters and other forms of partnerships, to advance the greening of human capital at local level.

Policy phase C.2: Mutual reinforcement between policies and targets across sectors and levels of governance

It is important to consider intersectoral issues and interactions between national, subnational and local levels of government when looking at moving from policy design to policy implementation. Many new activities and jobs concerned with the green economy go beyond current sectors and traditional disciplines. In addition, depending on their size and structure of governance, many countries tend towards decentralization and devolution. Coordination across sectors and levels of governance is therefore important to ensure coherence and effectiveness of action.

- **Trigger point:** Cross-sectoral strategies for greening jobs, encouraging professional transitions and highlighting portable skills are set up with precise quantitative and qualitative targets.
- **Trigger point:** National and subnational authorities are engaged through policy contracts for advancing green human capital at regional and local levels in priority sectors.
- **Trigger point:** Actions implemented across sectors and territories are compiled, analysed, evaluated and disseminated in order to feed and accelerate the national effort to develop sustainability-related skills.

Box 7 - Decentralized training systems in Denmark

The Danish vocational education and training system has, through a series of reforms since 2000, given increasing autonomy to the local level to adapt course curricula to labour market needs through outcome and competency-based goals without detailed prescriptive curriculum requirements. In the new national structure for continuing vocational education and training provision, thirteen CVET competency centres have been formed to connect providers of CVET and basic adult education in a more transparent infrastructure. Those centres are also responsible for anticipating and monitoring skills changes at the local level. The reform has also instigated a standardization of initial vocation education and training (IVET) qualifications and CVET labour market certifications, so that CVET certifications can be integrated in IVET programmes and count towards credits in IVET.

Source: ILO and Cedefop (2011).

III. References of guides for further action

This section presents a number of useful publications that provide detailed guidelines and tools to governments, TVET institutions and other stakeholders willing to anticipate and adapt skills and accompany professional transitions towards the green economy. After a brief presentation of the contents and purpose of these guides, this section includes an extract from each of these references, selected to reflect some of the policy recommendations proposed in the above framework.

III.1. Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All (ILO, 2015b)

In October 2015, ahead of COP21, the ILO adopted new Guidelines aimed at enabling governments, workers and employers around the globe to leverage the process of structural change towards a greener, low-carbon economy, create decent jobs at a large scale and promote social protection. They call for an integrated approach to these challenges: 'given the scale and urgency of these environmental and employment challenges, it is clear that the world will have neither the resources nor the time to tackle them separately or consecutively. Tackling them jointly is not an option, but a necessity.' The Guidelines were drafted by a tripartite meeting of international experts.

The Guidelines allow the practical country-level application of a set of conclusions focused on achieving sustainable development, decent work and green jobs through the following areas:

- ✱ Policy coherence and institutional arrangements for a just transition for all
- ✱ Social dialogue and tripartism policies
- ✱ Macroeconomic and growth policies
- ✱ Industrial and sectoral policies
- ✱ Enterprise policies
- ✱ Skill development policies (see Box 8)
- ✱ Occupational safety and health policies
- ✱ Social protection policies
- ✱ Active labour market policies.

Box 8 ILO guidelines on skill development policies

Governments, in consultation with social partners, should:

- a** support the transitioning to more environmentally sustainable economies by reviewing skills development policies to ensure they support responsive training, capacity building and curricula;
- b** coordinate skills development policies and technical and vocational education and training systems with environmental policies and the greening of the economy; and consider concluding bipartite or tripartite agreements on skills' development;
- c** match supply and demand for skills through skills needs assessments, labour market information and core skills development, in collaboration with industry and training institutions;
- d** give high policy priority and allocate resources to the identification and anticipation of evolving skills needs and the review and alignment of occupational skills profiles and training programmes;
- e** encourage acquisition of both generic skills and skills in science, technology, engineering and mathematics and incorporation in curricula for basic training and lifelong learning.

Governments and social partners should:

- a** engage in social dialogue for responsive and collaborative labour market institutions and training systems, and coordinate stakeholder needs at all stages of education and skills policy development and implementation;
- b** promote equal access to opportunities for skills acquisition and recognition for all, in particular for young people, women, workers who need to be redeployed, including across borders, and for owners and workers of medium-sized, small and micro enterprises by offering specific training services, ensuring suitable timing and duration and promote supportive policies to enable individuals to balance their work, family and lifelong learning interests;
- c** promote work-related training and practical experience as part of the training process in order to increase the employability of jobseekers;
- d** formulate a holistic skills development policy to promote skills for green jobs that are coherent with environmental policies, including means for appropriate recognition through certification of skills;
- e** foster peer learning among enterprises and workers, as well as education and training in green entrepreneurship to spread sustainable practices and the use of green technologies;
- f** assist businesses, particularly MSMEs, including cooperatives, in their engagement with governments and training providers with regard to management and skills upgrading of their current workforce, anticipation of future occupational profiles and skills needs, and workers' acquisition of portable and employable skills.

Source: ILO (2015b).

III.2. Comparative Analysis of Methods of Identification of Skill Needs on the Labour Market in Transition to the Low Carbon Economy (ILO and European Union, 2011)

This study resulted from a joint European Commission/ILO project, 'Knowledge sharing in early identification of skill needs'. The project covered over thirty countries worldwide, both developed and developing. It was supported by the EU Programme for Employment and Social Solidarity – PROGRESS (2007–13). It was implemented in the framework of the Green Jobs Initiative, a partnership between the ILO, UN Environment Programme, International Trade Union Confederation (ITUC) and the International Organisation of Employers (IOE). The study draws on a background report from the Political Economy Research Institute (PERI), analysis of data availability and classifications, expert opinions and a broad literature review.

Three mutually supportive global reports were produced under this joint management agreement:

- ✱ Comparative Analysis of Methods of Identification of Skill Needs on the Labour Market in Transition to the Low Carbon Economy
- ✱ Skills and Occupational Needs in Green Building
- ✱ Skills and Occupational Needs in Renewable Energy.

The objective of the comparative analysis is to review methodologies used to assess the skills and employment effects of various dimensions of the transition to clean energy and greener economies. The focus is on both quantitative and qualitative methods. In the context of that report, 'quantitative methods' refers to methods that involve quantitative modelling, while 'qualitative methods' refers to methods such as interviews, case studies and surveys that may provide both qualitative and quantitative information. **Table 2** indicates questions that can drive the analysis of skills in the context of a low-carbon economy, and suggests appropriate types of methodology to answer those questions.

Table 2 Skill research questions and appropriate types of methodology

Level of questions	Type of question	Some key headline questions	Type of methodology	
			Whole economy	Sector
Jobs	Quantitative	How many direct jobs now and in the future?	Quantitative, Qualitative	Quantitative, Qualitative
	Quantitative	How many indirect jobs now and in the future?	Quantitative, Qualitative	Quantitative, Qualitative
	Quantitative	How many induced jobs now and in the future?	Quantitative, Qualitative	Quantitative, Qualitative
Occupations/ Skills	Qualitative	What occupations? How they should be defined? How they should be defined? Where are the boundaries between occupations?	Qualitative	Qualitative
	Quantitative	How many people in each occupation? What is the resulting demand for skills?	Quantitative, Qualitative	Quantitative, Qualitative
	Qualitative	What skills and competencies? How do these relate to occupations?	Qualitative	Qualitative
Training and Education	Qualitative	What sources of skills are available? What types of training and education are needed? How can they be provided?	Qualitative	Qualitative
	Quantitative	What is the existing stock of people with the right skills and training available to be recruited? What is the current flow of newly trained people available to be recruited? What flow will be needed in future?	Quantitative, Qualitative	Quantitative, Qualitative

Source: ILO and European Union (2011).

III.3. Anticipating Skill Needs for Green Jobs: A Practical Guide (ILO, 2015a)

This guide builds on previous research and practical application, and provides guidance on how to embark on the identification of current and anticipation of future skill needs for the green economy and green jobs. Intended primarily to assist researchers and analysts, the guide deals with qualitative and quantitative methodologies, data classifications and sources, research processes and institutional arrangements. The guide proposes methods to undertake various types of research at the whole-economy level and at sector level.

Concerning whole-economy overviews of skills for green jobs, a broad type of approach is the qualitative overviews of green jobs across the economy. Such research is designed to provide an overview of a country's (or several countries') current position on skills and training for green jobs, and on the future skill needs and training requirements. A proposed structure of these analyses is presented in brief in **Table 3**.

Table 3 – Structure of a qualitative whole-economy overview

Analysis of policy context	Key challenges and priorities for green economy <ul style="list-style-type: none"> major environmental issues which should drive the green policy response in the country and which affect the economy, employment and the labour market
	Response strategy <ul style="list-style-type: none"> general country strategy, investment plans, the adaptation and mitigation measures in response to climate change and environmental degradation
	Skills development strategy in response to greening <ul style="list-style-type: none"> skills development strategy as a part of a coherent country policy response to climate change and environmental degradation - policy coherence, complementarity, relevance and coordination
Anticipation and provision of skills	Green structural change and (re)training needs <ul style="list-style-type: none"> major employment shifts within and across sectors and economic activities necessitated by climate change and demands for greening the economy identification of skills, trades and occupation that become obsolete as
	New and changing skill needs <ul style="list-style-type: none"> skill need for newly emerging green occupations, and with new and changing skills requirements for existing occupations (skills gaps) in the context of greening the economy
Conclusions <ul style="list-style-type: none"> drawn on the basis of the whole body of research for the country study 	
Recommendations <ul style="list-style-type: none"> Recommendations for action and for further research 	

Source: ILO (2015a)

III.4. Greening the Global Economy: The Skills Challenge (ILO, 2011b)

This policy brief draws the attention of policy-makers and social partners in both developed and developing countries to the role of skill development in facilitating the transition to a greener economy and seizing the employment opportunities that the transition entails. It arises out of the above-mentioned Green Jobs Initiative. It 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) and the European Commission. Key considerations that can guide policy development towards skills for decent, green jobs are proposed in the policy brief and presented in **Box 9**.

Box 9 - Policy checklist in addressing the greening skills challenge

- 1** 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?
- 2** How are training and retraining needs anticipated and met within industries undergoing substantial green transformations?
- 3** How do public employment services provide information on and access to retraining courses for green jobs?
- 4** Is environmental awareness a routine component in general and vocational education and training?
- 5** Are training programmes for green jobs available to, and affordable by, disadvantaged youth, people with disabilities, rural communities and other vulnerable groups? What are the instruments used to include disadvantaged groups in the greening of the economy?
- 6** Does your country have a policy or incentives to support female enrolment into science, engineering and other types of technical education and training?
- 7** Do initial and continuing training programmes for teachers and trainers include components on environmental awareness, new green services and green production methods?
- 8** Does your country have a system to detect new skill demands? Is it used to detect skills arising as a result of greening? How does your country improve the system to capture new developments in the green economy?
- 9** Does the system for anticipating skill needs incorporate a coordinating mechanism to allow skills identification and information exchange across green sectors and line ministries? Is it used to identify skills for green jobs?

Source: ILO (2011b).

III.5. Meeting Skill Needs for Green Jobs: Policy Recommendations (ILO et al., 2013)

This set of policy recommendations was prepared and published in 2013 at the request of the G20 Development Working Group (DWG) under the Human Resource Development Pillar by the Inter-Agency Working Group on Greening Technical and Vocational Education and Training and Skills Development, comprising ILO, OECD, UNESCO-UNEVOC, Cedefop, the European Training Foundation and UNITAR (United Nations Institute for Training and Research). They were developed by ILO, in cooperation with and based on inputs from the OECD, UNESCO and Cedefop. These recommendations are presented here to inform and advise the G20 governments on ways of anticipating and meeting the skill needs of labour markets while pursuing sustainable development and green growth. The recommendations are summarized in **Box 10**.

Box 10 - Policy recommendations to address the challenges of meeting skill needs for green jobs

- 1** Improve policy coordination and encourage social dialogue.
- 2** Focus on the development of portable skills throughout life to encourage occupational mobility.
- 3** Encourage individuals and companies to invest in skills development for green growth.
- 4** Revise curricula to increase individuals' adaptability.
- 5** Make retraining opportunities accessible for all, and prioritize training for vulnerable and disadvantaged groups.
- 6** Strengthen career guidance on green jobs.
- 7** Enable trainers and teachers to keep skills for green jobs up to date.
- 8** Improve systems for identifying and anticipating skill needs.
- 9** Support training providers as active agents for local sustainable development.
- 10** Use indicators as tools for capacity building and policy learning in greening TVET.
- 11** Maximize the jobs potential of the transition to green growth.
- 12** Use training to improve the quality of jobs.
- 13** Include the greening of TVET in the post-2014 education and sustainable development agendas.
- 14** Foster mutual learning for greening TVET and skills development.

Source: ILO et al. (2013).

III.6. Unleashing the Potential: Transforming Technical and Vocational Education and Training (Marope et al., 2015)

Through its Education on the Move series of publications, UNESCO is seeking to make available to education specialists in-depth analyses and original thinking that can improve the relevance and efficiency of policies and programmes. As part of this series, UNESCO published in 2015 Unleashing the Potential: Transforming Technical and Vocational Education and Training (Marope et al., 2015). This book proposes a detailed analytical approach to policy-makers, educators and other stakeholders of the TVET community and beyond who are interested in using skill development as a vehicle for human progress. Table 4 is adapted from an indicative list of stakeholders who might contribute to TVET greening policies, as suggested by the book authors.

Table 4 Stakeholders in the greening skills process by specialist group

	Economic specialists	Social specialists	Environmental specialists
Public representatives	Officials from ministries of economy, planning trade, industry...	Officials from ministries of labour, social policy, education, health, gender affairs...	Officials from ministries for the environment, natural resources
Exports	Economists labour market specialists, industrial sociologist, education specialists	Sociologists development experts, human rights lawyers, gender specialists, health specialists, education specialists	Geographers, environmental scientists
Market and social partners	Employer associations, professional associations, trade unions, consumer associations, entrepreneurs	Representatives of marginalised and disadvantaged groups, informal sector associations, development NGOs, community organisations	Environmental agencies, conservation NGOs, representatives of green businesses
TVET representatives	Public and private TVET providers		

Source: Marope et al. (2015)

III.7. Facilitating Green Skills and Jobs in Developing Countries (Rademaekers et al., 2017)

Considering that green jobs and skills are emerging concepts, this study published by the French development agency aims to provide a knowledge base regarding their role in the transition to a sustainable economy in the developing country context. The study selected and analysed 10 technical and financial organisations active in the field of green economy and green jobs and skills at strategic and operational level and carried out 5 case studies on initiatives that aim to promote green jobs and skills in different regions and sectors. Based on this analysis, the study provides recommendations for better integration of green jobs and skills into policies and programmes at international, national and operation levels. Table 5 summarises the main recommendations that are developed in the study.

Table 5 – Recommendations to support green jobs and skills at different levels

Recommendations		
Adopt working definition for green jobs – specifying target sectors		
International	National	Operational
<ul style="list-style-type: none"> Frame green jobs & skills within mission & priorities of institution List instruments offered (i.e. loans, TA, grants) and how they can help Guidance on how to assess size & scope of green jobs Suggest enabling factors & support knowledge sharing 	<ul style="list-style-type: none"> THINK PLAN: Incorporate green jobs/skills in national vision DO: Align employment and education policies and initiatives with new vision - CHECK: Baseline and monitoring for green jobs & assessing impact of initiatives 	<ul style="list-style-type: none"> Identify project Formulate projects Secure commitments Planning & implementation Monitoring & reporting

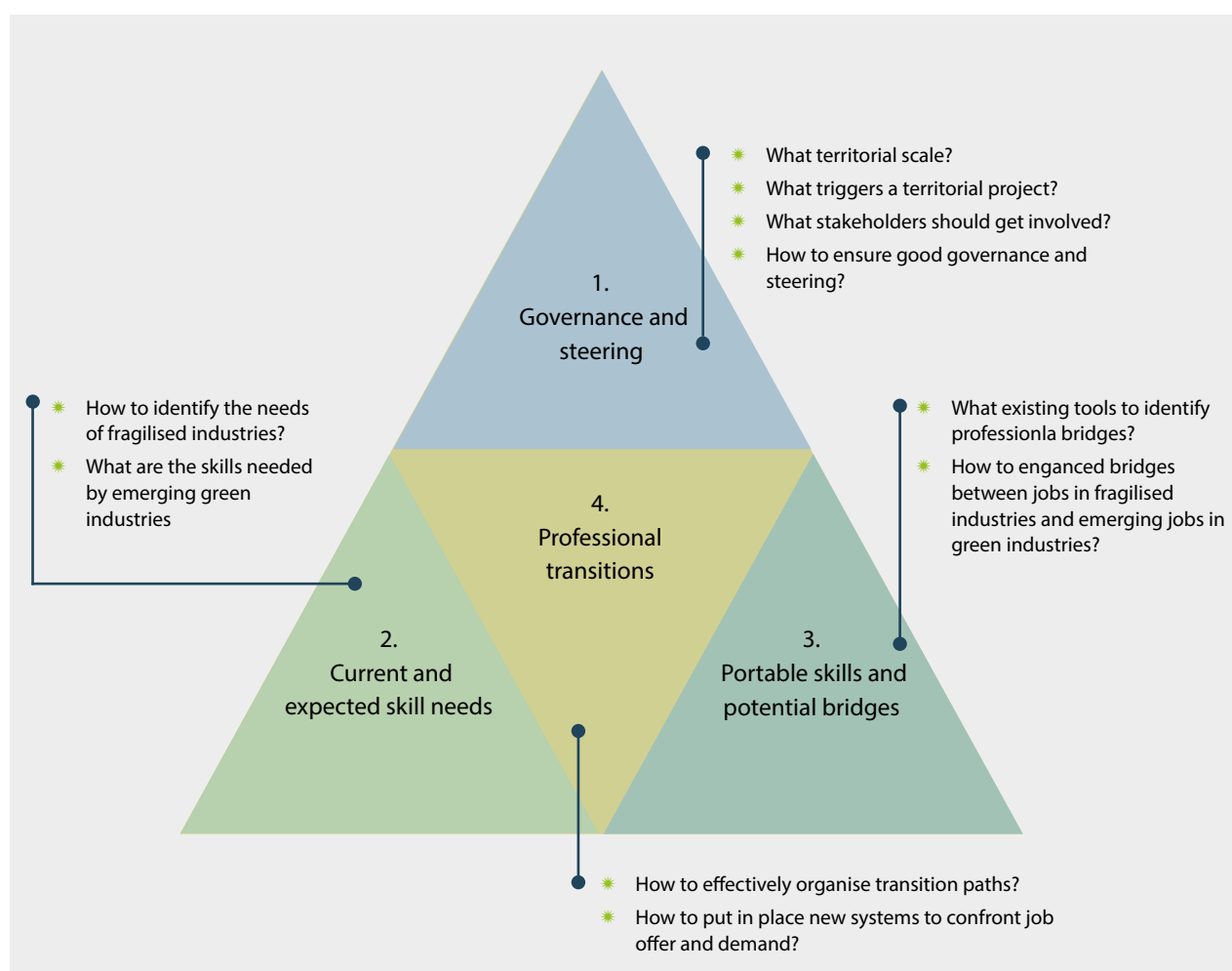
III.8. Methodological Kit for Accompanying Professional Transitions in Industrial Sectors Impacted by the Ecological and Energy Transition (France, 2016)

The French Ministries of Environment and Labour jointly developed a methodological kit (in French) for accompanying professional transitions. This tool is intended to any territorial stakeholders wishing to support and secure the professional transitions of employees or jobseekers from declining industrial sectors to jobs in ecological or clean energy activities. The kit builds on the guiding principles, practices and tools tested on a number of experimental territories in France. It provides the actors in charge of territorial economic development policies (institutions, professional branches, social partners, companies and so on) with guiding principles and tools to:

- * identify proximities of skills between jobs in industrial sectors experiencing transformational challenges, and jobs in existing or emerging green activities
- * identify and create opportunities for retraining on the basis of pools of portable skills
- * support employment and secure career paths for employees and jobseekers.

The kit is organized in four independent parts, presented in **Figure 2**, corresponding to the different components that should make up any plan to accompany professional transitions.

Figure 2 - Components of a plan to accompany professional transitions



Conclusion: an invitation to move forward

Moving towards a more sustainable development model requires a combination of drastic transformation in both hard and soft capital – technologies and infrastructures but also culture and values, behaviours and practices. While a main barrier to technological and infrastructural changes lies in the high amount of financial investment needed, changing individual and collective behaviours represents a huge challenge in terms of political sensitivity and stakeholder engagement and coordination. This challenge is ever-present when dealing with the issue of adapting the practices of economic actors in general and the behaviours and skills of workers in particular. For these reasons and because of its importance in moving towards a green, inclusive economy, the issue of adapting professional skills deserves special attention from policy-makers. A lack of attention to and investment in human capital is already proving a constraint to the green economy and its economic and social opportunities, including opportunities for decent jobs.

Most countries are engaged in setting a policy framework for greening jobs and skills, although at very different stages of development and in very different economic, social and institutional contexts. This paper is intended to provide a set of general considerations that can help guide the process of designing and implementing such policies. This paper is an invitation addressed to all policy-makers and economic actors to gather forces around the issue of greening human capital as an intrinsic, crucial part of their efforts to set up a new development model. The policy framework proposed in this paper is intended as a guiding tool for analysis of the policies developed for that purpose, and a guiding tool for action towards a coherent, ambitious plan for greening skills.

With this constructive purpose in mind, the Platform for Advancing Green Human Capital invites all policy representatives and other stakeholders involved in such efforts to provide feedback on their own incremental progress within the policy framework and on the usefulness of this framework in guiding this progress. UNESCO-UNEVOC is going to open a dedicated feedback consultation thread on the UNESCO-UNEVOC TVeT Forum³ starting **1 December 2017** to facilitate collecting feedback and perspectives on the framework. Alternatively, you can also send your feedback by email to: isabelle.richaud@developpement-durable.gouv.fr.

Based on your feedback and inputs, PAGHC will be able to improve the framework and provide further tools and initiatives to serve the global momentum towards a truly inclusive, sustainable society.

³ <http://www.unevoc.unesco.org/go.php?q=e-Forum%20-%20Message%20Board>

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