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### PROFEEDBACK POLICY BRIEF

# TOWARDS A SUSTAINABLE **FUTURE FOR YOUTH: GREEN EMPLOYMENT POLICIES** AND ENABLING DIGITAL SKILLS IN THE EU

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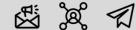
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### **Executive Summary: Towards a Sustainable Future for Youth**

The European Union is at a critical juncture, navigating a dual green and digital transition that is fundamentally reshaping its labour markets. This policy brief, "Towards a Sustainable Future for Youth," highlights the immense opportunities for inclusive and sustainable job creation for young people within this transformation, particularly in sectors such as renewable energy, sustainable agriculture, circular economy practices, building renovation, and low- carbon transport. The brief's core emphasis is on fostering green-specific skills and successfully integrating youth into the green economy, with digital skills serving as essential enabling tools rather than standalone objectives.

While the potential for green job growth is substantial – with projections indicating millions of new jobs by 2030 across the EU – the analysis reveals persistent challenges. These include uneven policy implementation across Member States, leading to disparities in access to opportunities (e.g., only 42% of youth in a global survey found accessible green jobs locally). Significant skills mismatches exist, with education systems often failing to equip young people, especially those from disadvantaged backgrounds, with the necessary skills and mindsets for the new green economy. Furthermore, structural barriers disproportionately affect marginalized youth, such as young women who report greater skill deficits and a lack of awareness regarding green opportunities. Crucially, robust policy evaluation, vital for understanding actual impact and ensuring equitable opportunities, is often hindered by a lack of universally agreed-upon definitions for 'green jobs' and sparse or contradictory empirical evidence on policy effectiveness. Therefore, these brief underscores the critical need for a more coherent framework to facilitate such evaluations by both national and international bodies, leveraging insights from existing (though fragmented) assessments to refine policy approaches.

### **Key Findings**

• **Digital Skills as Critical Enablers:** Digital competencies are recognized as foundational for environmental sustainability and engagement in the green economy, facilitating circular practices and cleaner production. The increasing

deployment of advanced digital technologies like Artificial Intelligence (AI) is crucial for efficiency and optimization in green processes.

- Need for Vocational Education and Training (VET) Alignment: There is an
  urgent need to accelerate up- and reskilling efforts, as existing VET systems
  often fall short in providing the skills demanded by the evolving green labour
  market.
- Holistic Approach to Sustainability Competencies: Beyond technical expertise, a successful green transition requires fostering a "sustainability mindset," critical thinking, and "transformative capacities" such as political agency and collective action. Transversal skills (e.g., leadership, problem-solving, communication) are vital for youth employability and adaptability in dynamic green-digital environments.

To effectively harness these opportunities and overcome existing barriers, this policy brief puts forward *four key recommendations* aimed at ensuring an inclusive and sustainable future for young people:

- 1. Integrate Green and Digital Skills Across Education: Mainstream sustainable development and green economy principles comprehensively throughout education systems, including Vocational Education and Training (VET). Curricula must be reformed to embed both green and digital skills, recognizing digital literacy as a cornerstone for environmental sustainability competence. Education should also foster essential transversal skills, a sustainability mindset, and equip youth with political agency and critical thinking to drive change.
- 2. Promote Experiential Learning and Green Entrepreneurship: Shift from traditional classroom learning to experiential opportunities such as apprenticeships, local placements, and work-based learning to provide practical experience and improve employability. Concurrently, empower young people to pursue entrepreneurship in sustainable green businesses, supported by comprehensive services, accessible financing, mentorship, and incubation initiatives.

- 3. Enhance Career Guidance and Ensure Inclusive Access: Modernized career guidance services are essential to explicitly highlight green job pathways and training opportunities, leveraging digital tools for timely labour market information. Crucially, prioritize access to upskilling and reskilling for marginalized youth—including those in rural areas, from lower socioeconomic backgrounds, and those with disabilities—through inclusive education and targeted support programs.
- 4. Strengthen Policy Coordination and Multi-Stakeholder Partnerships: Effective implementation requires improved "green" skills intelligence and anticipation for emerging green jobs, utilizing systematic surveys, enhanced employment projection models, and standardized definitions for consistent monitoring. Lastly, fostering strong, cross-sectoral partnerships involving governments, employers, VET providers, civil society, and youth organizations is paramount for designing and implementing coherent skills development strategies. This includes modernizing Public Employment Services (PES) to centralize their role in promoting green jobs and ensuring the effective implementation of initiatives such as the Reinforced Youth Guarantee to provide quality employment offers for young people.

Achieving a resilient green and digital economy, particularly for young people, thus depends on proactive, integrated, and collaborative policy actions that span education, labour markets, and social protection. This calls for a clear vision for the skills of the future and robust mechanisms to ensure equitable access and effective implementation across all Member States.

### **Introduction to the Policy Problem**

The European Union (EU) is undergoing a dual transition towards a green and digital economy, which is significantly reshaping its labour markets. The transition, rooted in the European Green Deal and aligned with the EU's Digital Decade goals, can create inclusive and sustainable job opportunities, especially for young people. However,

their ability to take part and benefit depends on equal access to both green-specific and enabling digital skills.

Green jobs, such as those in renewable energy, sustainable agriculture, circular economy practices, building renovation, and low-carbon transport, are expected to grow as EU Member States work towards achieving climate neutrality by 2050. Many of these roles necessitate not only technical knowledge in sustainability but also competencies in digital technologies, which are foundational to smart grids, precision farming, energy monitoring, and circular logistics platforms. Forecasts indicate that this green transition could lead to net job growth in the EU. This aligns with the aspirations of many young people who seek work that contributes positively to society and environmental sustainability.

While the green economy is the primary focus of this policy brief, digital competencies are considered key enablers for access and participation, especially for NEET (Not in Education, Employment, or Training) youth and those facing structural disadvantages. Education for Sustainable Development (ESD) offers a relevant framework for equipping young people with the necessary mix of technical, transversal, and ethical competencies for a green-digital transition. These competencies are vital not only for employability but also for fostering agency and empowerment among young people, enabling them to become active contributors to a sustainable society.

### **Rationale and Policy Relevance**

Achieving a just and effective green transition requires labour market strategies that are inclusive, future-oriented, and based on skills intelligence. European Commission initiatives such as the reinforced Youth Guarantee, the European Year of Skills, and funding streams under the European Social Fund Plus (ESF+) underscore the political commitment to addressing youth employability within a sustainability context. This policy brief aims to provide actionable insights to support EU and national stakeholders in designing and refining youth employment strategies that respond to

evolving skill demands in green sectors while integrating digital literacy and ESD principles.

Building upon the rationale for this policy brief and its relevance to the evolving landscape of youth employment in the EU, this research aims to delve deeper into the critical interplay between green employment policies and enabling digital skills. To effectively address the challenges and opportunities presented by the dual green and digital transition, this study will be guided by the following key research questions:

- 1. What specific green employment policies and programmes are currently being implemented across the EU to facilitate youth entry into the green labour market?
- 2. To what extent do these initiatives integrate the development of digital competencies that are instrumental for green jobs?
- 3. What barriers (e.g., skills mismatches, limited training access, socioeconomic exclusion) and facilitators (e.g., apprenticeships, career guidance, entrepreneurship support) are identified in enabling youth to access green employment?
- 4. How can ESD principles be operationalized in training programs to ensure youth not only acquire skills but also develop agency and resilience?

### Methodology

A mixed-methods approach was adopted, focusing on secondary research and comparative analysis. The policy brief drew on a range of sources, including policy documents outlining strategic frameworks and funding mechanisms for green employment; reports and databases providing statistical and forecasting data; case studies showcasing practical initiatives; and academic literature examining key themes such as skills development, digital access, and labour market transitions. These sources were used to identify policy approaches, implementation strategies, and best practices related to youth employment in the green economy.

The analysis did not involve primary data collection or formal evaluations. Instead, it aimed to map policy landscapes, identify evidence-informed trends, and highlight promising pathways for policy innovation.

### **Policy Evaluation: Methodologies and Challenges**

Achieving a just and effective green transition for youth requires robust and reliable evidence to inform policy and strategy (Bradley et al., 2025). Policy evaluation is critical for understanding the actual impact of green employment initiatives and for ensuring that opportunities are spread equitably (Bradley et al., 2025). However, the existing empirical literature on green jobs, particularly concerning the effects of clean energy policies, is often sparse and contradictory, offering limited reliable guidance for policymakers (Woods et al., 2023).

Several methodologies are employed to assess green jobs and the employment effects of related policies (Harsdorff & Phillips, 2013):

- Inventories and Surveys: These provide a straightforward way to quantify existing green jobs within specific sectors, regions, or countries, and if conducted consistently over time, can measure the extent of new employment generated by policies (Harsdorff & Phillips, 2013). Examples include Spain's 2009 assessment of over 530,000 direct green jobs (Harsdorff & Phillips, 2013), and Brazil's inventory identifying numerous jobs in renewable energy (Harsdorff & Phillips, 2013).
- Employment Factors: This method calculates the number of jobs created per unit of product or service, often used in the energy sector (e.g., jobs per megawatt of electricity generation) (Harsdorff & Phillips, 2013). Studies have shown that most renewable energy sources generally have a higher labour input per unit compared to conventional energy sources (Harsdorff & Phillips, 2013).
- Input-Output (I-O) Analysis and Social Accounting Matrices (SAMs): These are widely used empirical tools that detail economic interdependencies between sectors to estimate how changes in one sector (e.g., investment in green

services) affect employment across the economy (Harsdorff & Phillips, 2013). They are typically used for short- to medium-term projections (Harsdorff & Phillips, 2013). Examples include South Korea's "Green New Deal" predicting nearly a million new green jobs (Harsdorff & Phillips, 2013), and the EU's projection of 410,000 additional jobs if renewables provide 20% of energy consumption (Harsdorff & Phillips, 2013).

• Computable General Equilibrium (CGE) Models and System Dynamics: These models build upon I-O analysis by simulating full economy responses to changes over longer periods, capturing the dynamic and complex interactions within an entire economy (Harsdorff & Phillips, 2013). They are used to project future employment scenarios and long-term policy impacts (Harsdorff & Phillips, 2013). For instance, an OECD study using a CGE model projected significant employment shifts in solar and wind sectors by 2030 due to emissions trading (Harsdorff & Phillips, 2013), while a UNEP report predicted global employment gains of up to 238 million direct jobs in green scenarios by 2050 (Harsdorff & Phillips, 2013).

Despite these methodologies, significant challenges exist in robustly evaluating green jobs policies (Bradley et al., 2025; Harsdorff & Phillips, 2013). A fundamental issue lies in the lack of a universally agreed-upon definition for "green jobs", which hinders accurate estimation and consistent statistical monitoring across countries (Bradley et al., 2025; Harsdorff & Phillips, 2013). Different studies employ varying conceptual understandings, from broad measures encompassing many sectors to narrower definitions focused on specific clean energy industries, and these measurement choices significantly impact the reported findings (Bradley et al., 2025; Woods et al., 2023; Harsdorff & Phillips, 2013). Data quantity, quality, and consistency further constrain the application of clear statistical definitions (Harsdorff & Phillips, 2013).

Furthermore, policy evaluation must account for various employment effects, including direct, indirect, and induced jobs (Harsdorff & Phillips, 2013), as well as the net impact (considering both job creation and potential job losses in traditional sectors) (Harsdorff & Phillips, 2013). The geographic scope of the outcome measure

also influences results, with state-level measures sometimes generating smaller effects compared to municipal or regional assessments (Woods et al., 2023).

A meta-analysis of US state-level clean energy policies revealed that renewable portfolio standards (RPS) and public benefit funds are systematically associated with increases in green jobs, with effects strengthening the longer these policies are in place (Woods et al., 2023). However, the employment effects of other policy tools often remain ambiguous, highlighting a need for a more robust evidence base (Woods et al., 2023). Researchers also note concerns about endogeneity, such as reverse causation (green job growth leading to policies) or selection bias (unobserved factors motivating both) (Woods et al., 2023).

Practitioners have identified critical research gaps, including the need for better green jobs metrics; research to inform employment and skills plans; a focus on "just transition" principles to ensure no groups are left behind; and a better understanding of barriers to green jobs and the green economy (Bradley et al., 2025). There is also a call for research to dispel myths surrounding the green economy and green jobs, as some issues are currently ignored in academic literature (Bradley et al., 2025). This comprehensive view of policy evaluation, embracing its complexities and acknowledged gaps, is essential for guiding effective and equitable green employment strategies for youth.

### Summary of Findings from Key Sources

This section presents a summary of the key findings derived from the mixed-methods approach, which focused on secondary research of various EU policy documents, reports, databases, case studies, and academic literature. The aim is to map the policy landscape and identify evidence- informed trends concerning youth green employment policies and the integration of digital skills across the EU. These findings shed light on the current state of initiatives, identified barriers, and facilitators in enabling youth access to green employment, and how Education for Sustainable Development (ESD) principles are being operationalized.

Each summary below corresponds to a specific source analysed as part of this research.

#### 1. Green jobs, definitional issues, and the employment of young people

The article "Green jobs, definitional issues, and the employment of young people (Sulich et al., 2020)", analyses green job opportunities for youth in Poland, the Czech Republic, and Belgium. It highlights that the increasing emphasis on building a green economy offers excellent employment opportunities for young people seeking their first job. Approximately 15% of youth in Poland and Belgium find initial employment in this sector, though the proportion is much lower in the Czech Republic. Regions in Poland with investments in water/wastewater treatment and renewable energy are creating significant green job opportunities for youth. Belgium's growing green economy is driven by investments in renewable energy, recycling, and greenhouse gas reduction. Green jobs are viewed as a solution for youth unemployment, potentially fostering entrepreneurship. The article does not explicitly discuss the integration of digital competencies into these green employment initiatives.

Barriers identified include definitional issues that hinder accurate job estimation. The 2008–2009 economic crisis significantly impacted youth unemployment, particularly for new graduates. Young people in rural or protected areas face exclusion due to a lack of business infrastructure. A key barrier is that lack of experience often disadvantages young people in the broader job market, alongside the prevalence of temporary employment and continuous internships in some areas. Facilitators involve general policies supporting eco-innovations and green technologies, with capital cities playing a significant role in green job creation.

#### 2. OECD Skills Outlook 2023

The OECD Skills Outlook 2023 (OECD, 2023) positions the "twin green and digital transition" as Europe's core strategy for a sustainable and competitive future. The EU's Fit for 55 policy package is projected to increase overall employment, though it may reduce opportunities for blue-collar workers, necessitating adaptive skills policies. Specific initiatives involve integrating social and employment aspects into national

green transition strategies, focusing on education and training measures to address reskilling/upskilling needs. The report reviews successful skills policies from various countries empowering individuals for this transition across different life stages.

Digital competencies are essential for green jobs and the twin transition, serving as "enabling competences" that support environmental sustainability, circular economies, and cleaner production. Many green jobs require strong digital skills, with Al increasingly important for efficiency and monitoring. Key barriers include shrinking blue-collar opportunities, youth lacking foundational sustainability skills, and insufficient data on skill needs. Facilitators include targeted investments in education and training, understanding labor market impacts, and fostering attitudes and dispositions that enable youth to align with green employment opportunities. Regarding ESD principles, the report introduces "environmental sustainability competence" defined by embodying values, embracing complexity, envisioning futures, and acting for sustainability. This framework directly supports ESD by empowering youth as "agents of change". It stresses that education systems equipping young people with both skills and attitudes to manage change are crucial for the long-term sustainability of the green and digital transition.

#### 3. Green Jobs 2023

"Green Jobs 2023: Successes and Opportunities for Europe (The Greens/EFA in the European Parliament, 2023)" advocates for "greening" economies as a strategy to create high-quality green jobs and combat climate change. It projects substantial job creation, including nearly 14 million global clean energy technology jobs and 25 million new green jobs from the energy transition by 2030, with an additional 160,000 in the EU construction sector through the Renovation Wave Strategy. The Greens/EFA in the European Parliament actively promote these efforts, calling for reskilling and upskilling initiatives to facilitate worker transitions into clean industries. The Just Transition Fund is mentioned as a legal instrument supporting these changes. This publication does not explicitly detail the integration of digital competencies within green employment initiatives.

Key barriers include youth struggling to access the labour market after graduation, often encountering unpaid internships or precarious work, alongside persistent gender inequalities, with women underrepresented in technical and senior management green roles and funding disproportionately benefiting men. Facilitators involve the engagement of social partners, targeted training programs, stable policies promoting innovation and green investment, and the active role of social enterprises in providing social inclusion opportunities for vulnerable groups. The publication emphasizes "decent work" in green jobs, ensuring fair wages, social security, and upskilling or reskilling opportunities, with the European Youth Strategy and Youth Guarantee recognized as critical instruments for youth support.

In relation to Education for Sustainable Development (ESD) principles, the publication implicitly supports them by framing green jobs around sustainable development, social justice, and human well-being. It advocates for a socially just green transition that benefits marginalized populations and promotes skills for sustainable competitiveness, social fairness, and resilience. However, it does not specify pedagogical approaches to operationalize ESD principles or to build youth agency and resilience within training programs.

### 4. Young people and green skills

"Young people and green skills: Preparing for a sustainable future (Plan International, 2022)" provides insights from a global survey on youth perspectives on the green economy. It recommends actions for governments and businesses to facilitate youth entry into green jobs, including strengthening education for a just, gender-transformative transition, ensuring equal access to green job opportunities, increasing access to loans/grants for green start-ups, and providing in-work training on green skills. Promoting employment services in green sectors and offering career guidance are also deemed critical. The report broadly defines "green skills" to include generic skills and "transformative capacities," but it does not explicitly detail the integration of digital competencies as instrumental for green jobs.

Key barriers include a lack of start-up capital and skills, with young women more frequently reporting skill deficits and young men citing capital as a primary obstacle. Only 42% of respondents found accessible green jobs locally, and opportunities often necessitate relocation. Facilitators involve expanding training on green skills and climate change, increasing green job opportunities, and funding paid internships and apprenticeships. Supporting young women to access green economy work by reducing unpaid care burdens is also recommended.

Regarding ESD principles, the report directly addresses them by defining "green skills" as enabling youth to "drive transformational changes" in economies and societies, encompassing "political agency, collective action and disruptive thinking". It recommends an interdisciplinary approach to climate change education and supports initiatives that foster political agency, self-efficacy, and empowerment among young people, directly operationalizing ESD for building agency and resilience. The study explores whether youth feel adequately prepared and equipped to drive climate action, emphasizing their crucial role in shaping sustainable futures.

#### 5. EU Council Recommendation on digital skills

This document, a proposal for an EU Council Recommendation (European Commission, 2023), primarily focuses on developing digital skills across Member States. While not detailing specific green employment programs, it emphasizes the need for ambitious actions to develop skills for both the green and digital transitions. It highlights the Recovery and Resilience Facility (RRF) as a key instrument for the digital transition, incorporating curriculum reforms and upskilling/reskilling opportunities for the workforce. It also references a previous Council Recommendation on learning for the green transition and sustainable development.

The document's central theme is the crucial integration of digital competencies for a successful "twin green and digital transition". It identifies a major concern: the low level of basic digital skills and the growing demand for advanced and specialist digital skills across the EU. The proposal advocates for a comprehensive approach to digital skills development across all labour market sectors, stressing the importance of forecasting future needs and encouraging private investment in this area.

The primary barrier addressed is the significant digital skills gap across Member States. Facilitators include curriculum reforms and upskilling/reskilling opportunities through the RRF, alongside a focus on monitoring, evaluation, and peer learning to enhance the effectiveness of digital skills initiatives. The document encourages strategic approaches to address the shortage of ICT specialists.

Regarding ESD principles, the document supports learning for the green transition and sustainable development, and links digital skills to social inclusion, equal opportunities, and overall well-being, aligning with broader ESD goals. However, it does not explicitly detail how ESD principles are operationalized in training programs to foster youth agency or resilience in a pedagogical context. Its focus remains on the systemic provision and acquisition of digital skills for economic and societal readiness.

#### 6. The European Green Deal

This "European Green Deal (EGD) (European Commission, 2021)" outlines the EU's overarching strategy for a sustainable future, aiming to transform the economy, reduce emissions, and simultaneously create jobs and foster growth. While not explicitly detailing youth-specific programs, it highlights that the EGD's proposals, such as the Renovation Wave Strategy, will generate significant employment, including 160,000 additional green jobs in the construction sector by 2030. The electrification of the economy and increased use of renewable energy are also expected to boost employment. The strategy prioritizes ensuring the transition creates opportunities for all, supporting vulnerable citizens and tackling inequality. This source does not mention the integration of digital competencies.

Regarding barriers and facilitators, the publication primarily emphasizes the positive employment impacts of the EGD as a facilitator. It highlights that investments in a low-carbon economy will boost green recovery and lead to the creation of sustainable, local, and well-paid jobs across various sectors and value chains. While it implicitly acknowledges existing inequalities and energy poverty as challenges to be addressed for vulnerable groups, it does not detail specific barriers preventing youth from accessing these new opportunities.

In terms of ESD principles, the document reflects them through its commitment to climate neutrality by 2050, decoupling economic growth from resource use, and improving citizens' health and well-being for current and future generations. This demonstrates a macro-level commitment to sustainable development. However, the publication does not provide details on how ESD principles are operationalized within training programs to enhance youth agency or resilience; it is a high-level policy communication focused on economic transformation and environmental targets.

#### 7. Green Jobs for Youth: A Bold New Pact for the Future

The "Green Jobs for Youth: A Bold New Pact for the Future (United Nations, 2023)" presentation outlines an ambitious global initiative to facilitate youth entry into the green labour market. It proposes a "Pact for the future" with three core goals: accelerating the greening of 1 million existing jobs, creating 1 million new green jobs for youth (with a focus on young women), and supporting 10,000 young entrepreneurs in sustainable green businesses. The Pact is structured around "The three green E's": Employment creation, Education & green skills, and Empowerment & youth engagement. It aims to engage governments to advance green jobs and climate education policies, conduct research on youth employment needs, and provide support. This presentation does not explicitly integrate digital competencies into its proposed initiatives.

Regarding barriers and facilitators, the document primarily focuses on proposed facilitators. It highlights supporting employers and youth entrepreneurs in adopting sustainable business models that boost demand for green skills. A crucial facilitator is the role of education institutions in equipping youth with the necessary employable, technical, and core skills for green jobs. Furthermore, empowering youth to lead policy advocacy and engage in the social dimensions of the climate crisis is presented as a key mechanism. The initiative's success relies on governmental support for policies, research, and financial contributions. No specific barriers are explicitly detailed, but the proposed actions implicitly address a current deficit in green job opportunities and skills for youth.

In terms of ESD principles, the Pact directly operationalizes them through its "Empowerment & youth engagement" pillar, which positions youth as active partners and leaders in policy advocacy for addressing the "triple planetary crisis". This directly fosters youth agency and engagement in shaping sustainable futures. The focus on "education & green skills" to equip youth for the green economy further supports these principles, although it does not detail specific pedagogical methods for building resilience. The emphasis on supporting sustainable green businesses and climate education policies also aligns with ESD goals.

#### 8. Social enterprises and their ecosystems in Europe

This report, "Social enterprises and their ecosystems in Europe (European Commission: Directorate-General for Employment, Social Affairs and Inclusion et al., 2020)

," provides an overview of social enterprises, identifying them as potential actors in the green transition. While not solely focused on youth, it notes the natural linkage between social enterprises, "green policy," and environmental sustainability, aligning with UN Sustainable Development Goals. The European Commission is working on a European Action Plan for Social Economy with proposed new EU funding (ESF+, InvestEU) to support social enterprises in driving a just green transition. Specific support includes measures for Work Integration Social Enterprises (WISEs) in sectors like recycling.

Regarding ESD principles, the report indicates that youth inherently align with these values by seeking jobs with general public benefit and focusing on resource efficiency and social goals. Social enterprises are seen as having "transformational power" in achieving a "just transition" linked to SDGs. However, the document does not elaborate on how ESD principles are pedagogically operationalized within training programs to specifically foster youth agency or resilience beyond broadly equipping them for roles within these social and green enterprises.

#### 9. The green employment and skills transformation

This Cedefop report "The green employment and skills transformation (Cedefop, 2021)" analyses the employment and skills implications of the European Green Deal (EGD), projecting a positive net employment impact of approximately 2.5 million additional jobs in the EU by 2030. It forecasts employment growth in sectors directly linked to sustainability (e.g., construction, waste management, utilities, renewable energy) and supporting services (e.g., engineering, administration). Policy recommendations include accelerating up- and reskilling, providing guidance and support for occupational mobility, and developing transition-oriented skills matching approaches. VET is highlighted as crucial for facilitating just transitions.

The report strongly emphasizes the integration of digital competencies, identifying them as "game changers" alongside the green transition. It states that many green jobs will require enhanced digital skills regardless of skill level, and that digital skills enable the green transformation itself. The increasing use of AI for efficiency and digital monitoring in sectors like waste management underscores this necessity, making improving digital skills in all jobs, including low-skilled ones, a priority.

# 10. Promoting green jobs for youth through national employment policies and programmes

The ILO technical note (2019) provides global guidance relevant to the EU on facilitating youth entry into the green labour market, projecting 18 million net new green jobs globally by 2030 due to the clean energy transition. It emphasizes integrating youth-targeted green jobs into National Employment Policies (NEPs), combining macroeconomic, sectoral, and investment policies to stimulate demand with supply-side skills development. The EU Green Employment Initiative is highlighted for promoting job creation via funding access, green public procurement, and support for social enterprises. High-potential sectors include agriculture, energy, construction, and tourism, with initiatives such as "green works" creating jobs in sustainable infrastructure.

The note stresses the role of digital competencies, stating that ICT innovations can boost agriculture and youth employment by facilitating information, skills development, and market access. Young workers, being adept in technology-rich

environments, are well-positioned for green jobs. Supply-side measures include ICT-based training and access to green technology innovation centres. Barriers include lack of technical expertise in emerging sectors, limited definitions for green skills, and insufficient policies on building standards or incentives. Facilitators involve proactive skills anticipation, frameworks for skills analysis, entrepreneurship programs like ILO's Start-and-Improve-Your-Business and Green Business Option kit, and modernization of public employment services with active social partner engagement.

ESD principles are operationalized by recognizing youth aspirations for work benefiting society and sustainability. Skills development is framed as a driver of transformation fostering innovation. The Platform for Advancing Green Human Capital (PAGHC) integrates skills development into green policies. The note calls for prioritizing training for disadvantaged youth to ensure inclusive growth, linking social justice with environmental goals, emphasizing youth agency in policy dialogue, and ensuring "decent work" in green jobs, particularly in informal or hazardous occupations.

#### 11. Is the future ready for the youth?

The ILO publication Is the Future Ready for the Youth? (Chacaltana & Dasgupta, 2021) emphasizes the need for youth employment policies to adapt to rapid labor market changes. Macroeconomic policies and fiscal incentives supporting productive investment, including in the green economy, are highlighted as essential for creating quality jobs. Programs like the EU Youth Guarantee ensure timely access to employment, education, traineeships, or apprenticeships. The book underscores the critical role of digital competencies for future jobs and showcases innovative initiatives such as Laboratoria (Peru) and Simplon (France), which provide digital training to disadvantaged youth and connect them to employment opportunities. Integrating technology into public employment services is also emphasized to enhance outreach and efficiency.

Key barriers include slow policy adaptation to market shifts, over-reliance on youth to acquire skills independently, persistent youth unemployment, and education–market skill mismatches. Youth are particularly vulnerable in crises, being "first to lose work

and last to be hired." Facilitators include investing in green infrastructure, aligning education and training with labor market needs, leveraging TVET and apprenticeships, promoting work-based learning, fostering multi-stakeholder partnerships, and strengthening responsive public employment services, including career guidance and active labour market policies.

In terms of ESD principles, the book directly questions whether "the future is ready for the youth," implying a call for policies that foster youth well-being and participation in shaping their future. It acknowledges young people's mobilization for climate action as a demonstration of their agency and commitment to societal benefit. The emphasis on a "just transition" that addresses inequalities and the integration of social dialogue with youth representatives are key to fostering agency and resilience in policy design. It supports equipping youth with both technical and "life skills" to enhance employability.

#### 12. The Reinforced Youth Guarantee

The Reinforced Youth Guarantee (RYG) (European Commission, DG EMPL, n.d.) stands as a foundational commitment by all EU Member States, formally established in October 2020. Its core promise is to ensure that all young people under the age of 30 receive a high-quality offer of employment, continued education, apprenticeship, or traineeship within a period of four months of becoming unemployed or leaving formal education. The reinforcement in 2020 expanded the target group to include 15-29 year-olds, emphasizing tailored, individualized approaches. This includes providing appropriate guidance and facilitating access to crash courses or boot camps for upskilling, explicitly acknowledging and integrating opportunities arising from the accelerating digital and green transitions.

The RYG can be a powerful catalyst for structural reforms and innovation within Member States' public employment services (PES), leading to significant improvements in services for young people. Evidence indicates a major transformative effect, with substantial reductions in both the number of young people Not in

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Education, Employment, or Training (NEETs) and overall youth unemployment since the Youth Guarantee's inception in 2013. Member States are responsible for implementing the RYG based on their national plans, with substantial financial backing from the EU, primarily through the European Social Fund Plus (ESF+).

#### **Case Studies**

The following projects illustrate promising practices in facilitating youth entry into green employment, highlighting various approaches to skill development, digital integration, barrier reduction, and ESD operationalization.

#### **YENESIS**

The YENESIS (Youth Employment Network for Energy Sustainability in Islands) project (European Training Foundation, n.d.), initiated by the Cyprus Energy Agency and funded by Iceland, Liechtenstein, and Norway, directly addresses youth unemployment, particularly among NEETs (Not in Education, Employment, or Training) aged 19-30, in European islands. These regions often face unique challenges, including limited job opportunities and a cyclical lack of work experience.

YENESIS operationalizes green employment policies by providing comprehensive training in 10 subjects and 7 languages, covering areas such as energy efficiency, renewable energy, sustainable tourism, and sustainable mobility. The project integrates digital competencies by making all educational material available as a multilingual e-course for wider dissemination. While not explicitly detailing digital skills training, the e-course format itself leverages digital platforms for accessibility and learning. A key facilitator is the provision of one-month apprenticeships abroad and six-month local placements, directly tackling the barrier of limited work experience and offering valuable on-the-job training. Furthermore, YENESIS incorporates training in soft skills and entrepreneurship, which are crucial for youth in regions with seasonal unemployment peaks and for fostering self-employment. The project has successfully created 120 green jobs and supported 15 start-ups, demonstrating its effectiveness in empowering youth to access green employment and develop agency through entrepreneurial ventures.

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#### **Vienna Green Jobs Case Study**

The Vienna Green Jobs Case Study, part of the EU Horizon-funded GREAT project (GREAT Project, 2025), focused on engaging 191 students from nine Austrian schools to explore green career pathways. This initiative stands out for its innovative integration of digital competencies and ESD principles. It employed a "dilemma-based role-playing game" developed in collaboration with Serious Games Interactive, providing a dynamic digital platform for students to voice opinions on green jobs and navigate real-world career dilemmas. This game-based learning approach exemplifies how digital engagement can make policy discussions and career education more accessible and engaging for young people, particularly those who might otherwise feel disconnected from traditional policymaking processes.

The study identified key motivators and barriers for youth considering green careers, including the importance of financial security, role models, work-life balance, and job satisfaction. It also highlighted the need to address diversity and inclusion, particularly regarding gender and non- binary representation in green sectors. Policy recommendations from the study included incentivizing green careers, enhancing career education through workshops and mentorship, and promoting workplace diversity. The success of the interactive learning approach underscores the operationalization of ESD principles by fostering critical thinking, problem- solving, and agency through experiential and engaging digital methodologies.

#### 'Deaf Youth Be Green!' Project

The 'Deaf Youth Be Green!' project, an international activity by the European Union of Deaf Youth (EUDY) (European Youth Foundation, n.d.), received a grant to address the impact of climate change on the deaf community and increase green activism among deaf youth. This project directly tackles socioeconomic exclusion and limited training access by providing accessible opportunities for a marginalized group to engage in environmental work, where a lack of awareness and accessible possibilities previously existed.

The project involves a nine-day meeting of 45 deaf young people who explore climate change, serving as a capacity-building activity that equips participants with knowledge and understanding of environmental issues. While not explicitly detailing digital competencies, the project's focus on a media campaign as a follow-up activity implies the use of digital tools for broader awareness dissemination within deaf youth communities, thereby leveraging digital platforms for advocacy and engagement.

This initiative exemplifies the operationalization of ESD principles by fostering youth agency and resilience through accessible, action-oriented learning. By providing a platform for deaf youth to engage with and take action on climate change, the project empowers them to become active participants and advocates for sustainable development within their communities, directly addressing barriers to participation and promoting inclusivity in green initiatives.

#### **Discussion and Outcomes**

The analysis of the above sources reveals several key points concerning green skills, digital skills, and youth employment: Growing Integration of Green Skills into Youth-Oriented EU Policy Frameworks, with Notable Implementation Disparities.

The shift towards greener economies is unequivocally identified as a "game changer" for EU labour markets, necessitating accelerated up- and reskilling for both digital and greener jobs. The European Green Deal (EGD) marks a significant departure from past green policies due to its comprehensive nature and far-reaching impacts across all economic sectors, albeit at varying intensities. EU and national policies explicitly acknowledge the importance of integrating employment and social aspects of the green transition through education and training measures. The current EU Vocational Education and Training (VET) framework highlights that skills are fundamental drivers of this transition.

Despite this overarching commitment, implementation and visibility remain uneven across Member States. Many EU Member States exhibit "unbalanced ecosystems" where certain policy components are overemphasised while others, such as capacity building and inter- enterprise cooperation, are neglected. This imbalance can lead to

disparities in opportunities, with only 42% of young people in a global survey reporting accessible green job opportunities in their local area. Geographical variations in the EGD's impact, particularly in regions with a high concentration of traditional industries like coal mining, necessitate tailored national and regional training policies. Young women, in particular, are less aware of accessible green economy opportunities compared to young men and are more likely to identify a lack of skills as a primary barrier. This underscores a critical need for inclusive and gender-transformative educational approaches to ensure equitable access.

# Digital Skills as Essential Enabling Tools for the Green Transition, Rather Than Solely Standalone Outcomes

Digital skills are recognized as a "must" in nearly every sector of society and the economy, serving as a "cornerstone" for social inclusion, well-being, employability, productivity, and growth. They are framed as critical "enabling competences" that significantly contribute to the acquisition of environmental sustainability competence and engagement in the green economy.

The interlinkages and synergies between the green and digital transitions are explicitly emphasized, with digital technologies playing a major role in establishing circular economies and cleaner production. The demand for digital skills is increasing across all sectors and occupations, with projections showing that many green jobs will require enhanced digital proficiency compared to jobs in "brown" sectors.

Advanced digital technologies, such as DNA-based data storage and quantum computing, are identified as having significant future potential to enable green processes through increased efficiency and optimization, for instance, in developing new battery materials or more efficient carbon capture methods. The increasing deployment of Artificial Intelligence (AI) for resource efficiency and production monitoring further highlights the symbiotic relationship between digital and green skills.

#### Significant Job Potential in Key Green Sectors

The green economy is confirmed to offer "excellent employment opportunities" for young people seeking their first jobs. Projections indicate a net positive employment impact from the implementation of green policies across the European Union. For instance, the EU's Fit for 55 policy package is projected to create approximately 2.5 million additional jobs in the EU by 2030. Specific sectors with high job creation potential include:

- Energy efficiency and building renovation: Investment in energy efficiency measures is highly job-intensive, potentially creating 9-20 jobs per million invested in manufacturing and construction. The Renovation Wave Strategy alone could generate an additional 1.3–1.4 million direct local jobs and 160,000 green jobs in the EU construction sector by 2030.
- Renewable energy deployment is projected to nearly triple global jobs in the sector to around 29 million by 2050. Solar PV generates about twice as many jobs per electricity unit as coal or gas. The fast-growing Energy-as-a-Service market further supports domestic job creation.
- Circular economy and waste management: These sectors are expected to
  experience strong employment impacts due to the focus on circularity and
  increased recycling activities. The establishment of new recycling factories and
  waste management facilities will create additional elementary jobs.
- Agriculture remains a key employer, especially in Africa, with growth potential through climate-smart farming and ICT innovations. Environmental services and "green works" programs in sustainable infrastructure also generate significant job opportunities.

Green jobs can emerge in both traditional industries (e.g., manufacturing, construction) and emerging high-tech sectors (e.g., renewable energy).

# Identified Need for Enhanced Alignment Between Vocational Education and Training (VET) and Green Labour Market Demands

A significant challenge for the coming years is to accelerate up- and reskilling to ensure people possess the necessary skills for greener jobs. The shift in labour demand and the emergence of new occupations within the green transition create substantial demand for training and learning opportunities. Current education systems are often "failing to equip many youngsters, and socio-economically disadvantaged youngsters in particular," with the foundational skills and mindsets needed for employment in the new green economy.

There is a recognized mismatch between the skills provided by education and training institutions and those demanded by the labour market, with many young people feeling unqualified for green jobs despite their aspirations. This is particularly evident in the EU, where demand for high-qualification jobs is expanding while demand for medium and low- qualification jobs is contracting.

Policy changes and reforms are needed in school and VET curricula, as well as in the professional development of teachers and trainers, to effectively develop these skills. The importance of a sectoral focus in VET and skills policy is underlined, along with the need for integrated initiatives such as Active Labour Market Policies (ALMPs) to facilitate career transitions.

#### Importance of Transversal Skills for Sustainable Careers

Young people themselves prioritize the development of generic transferable skills, including leadership, analytical thinking, innovation, and information and data processing. These are crucial for navigating changing labour markets and for enabling environmental sustainability competence.

The versatility of youth in adapting to change and their capacity for creative and innovative solutions are highlighted as strengths. Work-based learning environments are effective in

helping students build the necessary skills, including soft skills, that replicate real-world work dynamics. The emphasis on "soft skills" (e.g., communication, teamwork, problem-solving, ethical reasoning) is consistent across sources, recognized as improving youth employment prospects and essential for adapting to increasingly technology-intensive working methods. These skills enable young people to thrive in dynamic environments and contribute to responsible and ethical applications of technology.

### **Policy Recommendations**

Based on the above findings, the following policy recommendations are crucial for supporting young people's engagement in the green economy. Education systems, including Vocational Education and Training (VET) institutions, should mainstream sustainable development and green economy principles, while integrating digital literacy as a core enabling competence. Non-formal learning models, such as coding bootcamps and practical workshops, can provide youth with demand-driven digital and soft skills linked directly to labor market needs. Green entrepreneurship should be supported through accessible financing, mentorship, and technical guidance, and policies should promote green public procurement and fiscal incentives for environmentally sustainable businesses.

Experiential learning opportunities, including apprenticeships, internships, and work-based learning, are critical to bridging the gap between education and employment. Young entrepreneurs and social enterprises should receive tailored business development services to establish and scale green initiatives. Policy coordination at all stages of green development strategies is necessary, including dedicated task forces and the integration of green job creation into national recovery plans, ensuring a just and inclusive transition.

Strengthening skills intelligence and career guidance is also crucial. Regular skills gap surveys, employment projections, and standardized definitions of green jobs will allow policymakers to anticipate emerging opportunities and design effective reskilling pathways. Comprehensive career guidance services, supported by digital platforms

and AI tools, should explicitly highlight green career pathways while addressing gender and socio-economic disparities. Inclusive upskilling and reskilling programs are vital to ensure equitable access for marginalized youth, enabling them to participate fully in the green economy.

Finally, multi-stakeholder partnerships should be promoted to create coherent skills ecosystems. Governments, employers, VET providers, civil society, and youth organizations must collaborate in designing and implementing skills strategies. Public Employment Services (PES) should be modernized to facilitate youth access to green jobs, ensure the effective implementation of the Youth Guarantee, and engage employers in curriculum development and work-based learning. Shared responsibility and blended financing models can help scale innovative and effective initiatives, ensuring that young people are prepared for the evolving labour market.

### **Table of Recommendations and Priorities**

Recommendation	Rationale	Stakeholders	Priority
Integrate Green and Digital Skills Throughout Education Systems	Education systems do not adequately prepare disadvantaged youth for the green economy. Digital skills are increasingly essential across sectors, especially with AI deployment for resource efficiency.	Governments: Lead curriculum reforms and invest in digital infrastructure.  VET Providers & Education Institutions: Integrate digital and green skills across subjects; provide specialist training.  Employers: Ensure training aligns with labor market needs and offer placement opportunities.  Youth: Actively acquire skills and participate.	Urgent Priority
Promote Experiential Learning and Green Entrepreneurship	Youth face barriers to labor market entry due to lack of experience. Experiential learning and support for green entrepreneurship can increase employability and address capital gaps for start-ups.	Governments: Provide financial incentives, policy support, and favourable regulatory environment. Education Institutions (including VET): Offer apprenticeships, local placements, work-based learning, and entrepreneurship courses.  Employers: Provide paid internships and work-based learning. Financial Institutions: Facilitate accessible financing, grants, and credit programs for youth-led initiatives.  Social Enterprises: Offer social inclusion opportunities alongside green employment.	Short- Term Action
Enhance Career Guidance and Ensure Inclusive Access	Only 42% of youth report access to local green jobs. Women and marginalized groups face additional barriers, including stereotypes and structural inequalities. Inclusive career guidance increases equitable access and employability.	Governments & Public Employment Services (PES): Modernize career guidance, leverage digital tools (online portals, AI job matching), implement targeted support programs, and ensure effective Youth Guarantee rollout.  Education Institutions & NGOs: Integrate green skills into curricula, launch awareness campaigns, and provide mentoring.  Employers: Collaborate on curriculum and training for labour market relevance. Youth: Benefit directly from enhanced guidance and access.	Urgent Priority
Strengthen Policy Coordination and Multi- Stakeholder Partnerships	Green employment policies are uneven across EU Member States. Lack of standard definitions hinders monitoring and evaluation. Strong multistakeholder partnerships are essential for coherent skill strategies and robust policy assessment.	Governments: Improve coordination through task forces, invest in green skills intelligence, develop standardized definitions, and promote blended green initiatives.  Research Institutions: Support projections, provide robust evidence, and define clear skills ladders.  PES: Promote green jobs, modernize services, and implement the Youth Guarantee.  Employers, Social Partners, VET Providers, Civil Society, Youth Organizations: Collaborate in designing and financing skills strategies and shaping future skill profiles.	Long-term investment

#### Conclusion

The policy brief, "Towards a Sustainable Future for Youth," primarily emphasizes the development of green-specific skills and the integration of young people into the green economy, with digital skills serving as essential enabling tools. The European Union's ongoing dual green and digital transition presents significant opportunities for job creation, particularly for youth, in sectors such as renewable energy, sustainable agriculture, circular economy practices, and building renovation. However, the analysis also reveals persistent challenges including uneven implementation of policies, disparities in access to opportunities, skills mismatches, and structural barriers for marginalized youth. These challenges are compounded by difficulties in robustly evaluating green jobs policies due to the lack of standardized definitions and often contradictory empirical findings, underscoring the urgent need for a stronger evidence base.

To effectively navigate this transformative period and ensure an inclusive and sustainable future for young people, this policy brief puts forward several key recommendations. These recommendations are formulated to directly address the identified challenges and research gaps, including those in policy evaluation and the evidence base, thereby responding to the policy brief's stated goals and sub-goals.

- Integrate Green and Digital Skills Across Education: It is crucial to mainstream sustainable development and green economy principles comprehensively throughout education systems, including Vocational Education and Training (VET). Curricula must be reformed to embed both green and digital skills, recognizing digital literacy as a cornerstone for environmental sustainability competence. Beyond technical skills, education should foster essential transversal skills, a sustainability mindset, and equip youth with political agency and critical thinking to drive change.
- Promote Experiential Learning and Green Entrepreneurship: A shift from traditional classroom learning to experiential opportunities such as apprenticeships, local placements, and work-based learning is vital to provide

practical experience and improve employability. Concurrently, young people should be empowered to pursue entrepreneurship in sustainable green businesses, supported by comprehensive services, accessible financing, mentorship, and incubation initiatives.

- Enhance Career Guidance and Ensure Inclusive Access: Modernized career guidance services are essential to explicitly highlight green job pathways and training opportunities, leveraging digital tools for timely labour market information and actively addressing gender imbalances and stereotypes in green sectors. Furthermore, prioritizing access to upskilling and reskilling for marginalized youth—including those in rural areas, from lower socio-economic backgrounds, and those with disabilities—is critical through inclusive education and targeted support programs.
- Strengthen Policy Coordination and Multi-Stakeholder Partnerships: Effective implementation requires improved "green" skills intelligence and anticipation for emerging green jobs, utilizing systematic surveys, enhanced employment projection models, and standardized definitions for consistent monitoring. Lastly, fostering strong, cross-sectoral partnerships involving governments, employers, VET providers, civil society, and youth organizations is paramount for designing and implementing coherent skills development strategies. This includes modernizing Public Employment Services (PES) to centralize their role in promoting green jobs and ensuring the effective implementation of initiatives such as the Reinforced Youth Guarantee to provide quality employment offers for young people.

Achieving a resilient green and digital economy, particularly for young people, thus depends on proactive, integrated, and collaborative policy actions that span education, labour markets, and social protection. This calls for a clear vision for the skills of the future and robust mechanisms to ensure equitable access and effective implementation across all Member States.

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