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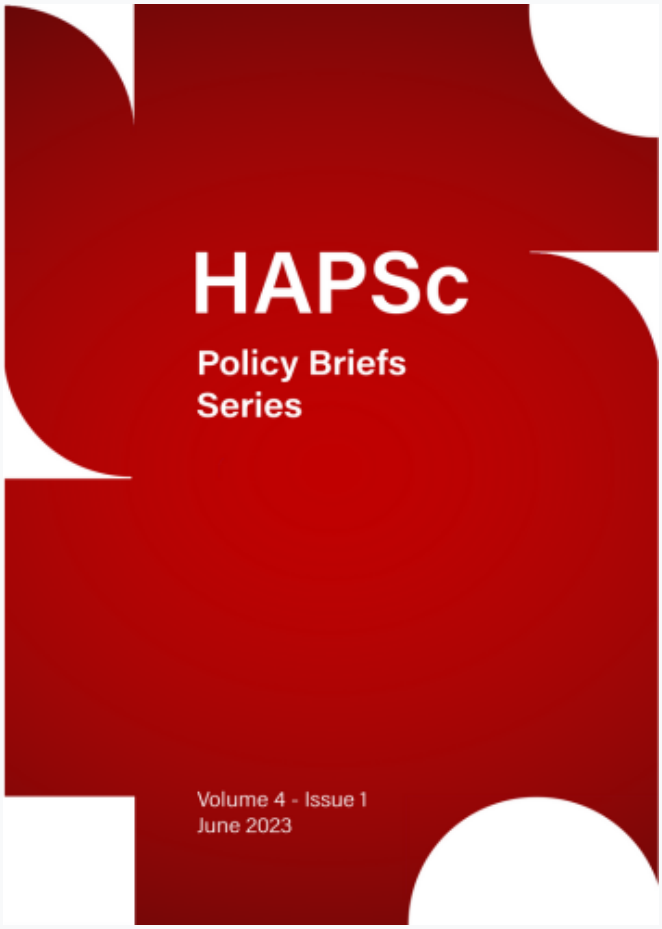

Green Skills in the European Labour Markets

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Green Skills in the European Labour Markets[1]

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Abstract

This paper aims at exploring the significance of green skills in the European labour market, highlighting their importance for workers in various occupations and fields of the European economy. The European labour market has undergone several significant changes over the past decade as a result of the increased demand for sustainable practices and the need for a green transition. New strategies and policies have lavishly evolved to address the challenges related to climate change and environmental decay. The concept of green skills has thus emerged, referring to the skills, knowledge and competences required for working in a sustainable and environmentally friendly way. In this context, this paper analyses specific aspects of the economic, environmental, and social impact of green skills from the point of view of an increasing demand for green skills in various occupations. It finally examines the benefits of having a well-trained workforce equipped with green skills as well as the level of responsiveness for certain EU member states towards the need to address existential challenges of the green transition.

Keywords: Skills, Green Skills, Labour Market, Sustainable Policies, Environment, Climate Change.

Introduction

The significance of green skills.

The European labour market is experiencing an important shift toward a greener economy due to the need to reduce greenhouse gas emissions, enhance energy efficiency and transition to renewable energy sources (European Commission, 2020a). According to the European Commission, the green economy is bound to create new employment opportunities in several sectors, specifically including those related to renewable energy sources, energy efficiency, green constructions, sustainable transport and waste management. Green skills are thus essential to ensuring that the workforce is equipped with the knowledge and skills required to work in a sustainable, environmentally friendly way (European Commission, 2020b).

One of the key benefits of green skills is related to the fact that they can strengthen economic development and create employment opportunities. Indeed, the green economy is expected to create more than 122 million of new jobs throughout Europe, particularly in the renewable energy sector:

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43 million by 2050. Furthermore, green skills can help enterprises reduce costs, improve their efficiency, enhance their competitiveness, and promote innovation and technological progress (IRENA & ILO, 2021; 2022).

Green skills are also key to mitigating the adverse effects of climate change and protecting the environment (ILO 2023). The green transition requires implementing such sustainable practices as reduced energy consumption, waste minimization, and use of renewables. Green skills are essential to the attainment of these goals, since they enable everyone to understand the environmental impact of their actions and make evidence-based decisions for a more sustainable future. Moreover, green skills can facilitate the development of new technologies and solutions that can help address environmental challenges, such as climate change and loss of biodiversity (CEDEFOP, 2012).

Clearly, the significance of green skills is not confined to economic and environmental issues. Indeed, their social impact is equally important. The green economy offers opportunities for social integration and reduced inequality, particularly in areas traditionally dependent on carbon-intensive industries. Moreover, green skills can promote social awareness and responsibility, as people become more conscious of their environmental and social impact (CEDEFOP, 2015).

Green skills are in high demand in occupations of all sorts.

Most of the skills required in various occupations depend on the nature of the job itself as well as the relevance of the occupational sector or field. Nevertheless, there are several horizontal green skills that seem to be relevant in all occupations (CEDEFOP, 2009). These are:

1. Knowledge of environmental issues: Working people should have a good understanding of environmental issues, including climate change, loss of biodiversity and exhaustion of natural resources.
2. Understanding of sustainability principles: Working people should understand sustainability principles and how these can be applied in their work.
3. Ability to use green technologies: Working people should be familiar with green technologies, such as renewable energy systems, energy efficient devices and sustainable materials.
4. Data analysis competence: Working people should be able to collect and analyse data on environmental performance and make recommendations for improvement.
5. Co-operation skills: Working people should be able to work with colleagues, stakeholders, and clients in developing sustainable solutions.

Since 2011, there were evidence (ILO & CEDEFOP, 2011) suggesting that industries would very likely be adversely affected by the green transition. To that purpose, specific examples have been

deployed to demonstrate the actual impact on employment in each industry. The evidence clearly suggested that the road to a greener economy would benefit those who would implement socially responsible structural changes but on the other hand would cause severe economic and social adjustment costs to those who would not bother to change. More than ten years later and after the 2022 energy crisis, this prediction proved true as many countries faced the challenges of energy shortages and especially those that in a timely manner did not care for sustainable policy reforms. The ILO/CEDEFOP report also focused on each industry's training needs in green skills as they proved to be highly impactful in sustainability terms (see below: Table 1).

Table 1. Impact of greening in industries and related green skills

Industry	Employment effect	Training needs
Agriculture, forestry, including food/wood processing	Some jobs lost, but organic farming is estimated to have high growth potential. Some food-processing industries are stable or gaining in employment.	Retraining for new farming practices, crop diversification and organic farming. Retraining of farmers as forestry workers Skills upgrading, sustainability skills, climatology/meteorology skills, entrepreneurial skills for farmers.
Extractive industries and fossil fuel energy generation	Stable or losing jobs; projected to lose jobs in medium to long term	Retraining (in renewable energy sources). Skills upgrading (sustainable practices, energy and resource efficiency, new green technologies, clean coal, carbon capture and storage)
Emissions-intensive manufacturing	Losing jobs	Training for specialized sustainability skills. Training for compliance with environmental regulations. Environmental impact assessment
Automotive	Affected by economic crisis; job losses; may stabilize in medium term	Skills upgrading for car mechanics, technicians, and engineers. Training on design, maintenance and recycling, fuel efficiency.
Shipbuilding	Losing jobs	Retraining for other heavy industries, including installations for off-/onshore wind turbines and wave and tidal energy.
Cement	Losing jobs	Retraining. Skills upgrading (energy efficiency).

Source: ILO & CEDEFOP 2011: 65-66

Furthermore, the overall impact of the green transition on employment is believed to be significantly positive. This is based on the fact that wide-spread production of environmentally friendly goods and

services will boost productivity in general. Moreover, green sectors tend to be more labour intensive than "traditional" fossil fuel-based industries. The ILO/CEDEFOP report once again highlights what kind of gains and benefits are associated with each industry as well as what kind of training is needed (see below: Table 2).

Table 2. Gains of greening in industries and related green skills

Industry	Employment effect	Training needs
Renewable energies: wind, wave and tidal power, solar, hydro, biomass, geothermal	Gaining, though job losses are expected in solar	Skills upgrading: energy efficient solutions, management and entrepreneurship skills, including project management skills
Green building and retrofitting	Gaining	Skills upgrading: energy efficiency, green technologies, new materials, energy auditing/certification
Telecommunications	Gaining	Skills upgrading for new green technologies (including renewable energy power generation network facilities)
Recycling and waste management	Gaining	Retraining from waste collection to recycling; skills upgrading in methane and energy recovery
Water and wastewater	Gaining	Skills upgrading: water resource management, water conservation and efficient use, wastewater treatment

Source: ILO & CEDEFOP, 2011: 75

The European Union is at the forefront of implementing sustainable policies with a view to become a climate neutral continent by 2050. All 27 EU member states committed to that purpose after the adoption the European Green Deal (European Commission 2019) which is an initial roadmap setting the key policies and measures needed to achieve the objective of tackling climate and environmental-related challenges. In this context, ambitious and interconnected policies on climate, energy, transport and taxation aimed at making the EU fit for reducing net greenhouse gas emissions by at least 55% by 2030, as compared to 1990 levels. These changes necessitate green skills which are expected to have a significant impact on overall occupational employment. Table 3 below, illustrates the forecast of employment impact by detailed occupation over the next years.

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Table 3. Employment impact by detailed occupation

Occupation	Change
Building and related trades workers, excluding electricians	+3.1%
Science and engineering associate professionals	+3.0%
Drivers and mobile plant operators	+2.1%
Business and administration associate professionals	+1.1%
Science and engineering professionals	+2.4%
Sales workers	+0.7%
Business and administration professionals	+1.2%
Labourers in mining, construction, manufacturing and transport	+1.5%
Numerical and material recording clerks	+1.1%
General and keyboard clerks	+1.2%
Metal, machinery and related trades workers	+1.0%
Electrical and electronic trades workers	+2.1%
Personal service workers	+0.6%
Production and specialised services managers	+1.6%
Customer service clerks	+1.4%
Administrative and commercial managers	+2.1%
Cleaners and helpers	+0.7%
Stationary plant and machine operators	+1.0%
Information and communications technology professionals	+1.5%
Legal, social and cultural professionals	+0.8%
Health associate professionals	+0.7%
Legal, social, cultural and related associate professionals	+0.9%
Teaching professionals	+0.4%
Health professionals	+0.6%
Chief executives, senior officials and legislators	+1.7%
Hospitality, retail and other services managers	+1.1%
Protective services workers	+0.8%
Personal care workers	+0.4%
Assemblers	+1.1%
Market-oriented skilled agricultural workers	+0.3%
Information and communications technicians	+1.2%

Food processing, wood working, garment and other craft & related trades	+0.4%
Other clerical support workers	+0.8%
Food preparation assistants	+0.8%
Agricultural, forestry and fishery labourers	+0.4%
Handicraft and printing workers	+0.4%
Market-oriented skilled forestry, fishery and hunting workers	-0.1%
Subsistence farmers, fishers, hunters and gatherers	0.0%

Source: CEDEFOP, 2021: 35

Benefits of a workforce equipped with green skills.

A trained workforce equipped with green skills has a number of benefits to offer to organisations and society at large (CEDEFOP, 2019). These benefits include:

1. *Enhanced environmental performance*: Workers with green skills can help organisations reduce their environmental impact by developing and implementing sustainable practices.
2. *Cost savings*: Sustainable practices can often lead to cost savings, including a reduced energy and resource consumption.
3. *Improved organisation reputation*: Organisations committed to sustainability can improve their reputation and attract customers that prioritize environmental issues.
4. *Job creation*: The green transition is expected to create new jobs in the sectors of renewable energy sources and sustainable transport.
5. *Economic development*: The development of the green economy can contribute to a country's overall economic development, since new businesses and industries will emerge.

Notwithstanding the benefits of green skills, there are still several challenges to address before the effective integration of green skills into the European labour market can be ensured (European Commission, 2019: 13). A key challenge is posed by the lack of awareness and understanding of green skills amongst employers and workers. A great number of businesses are not familiar with green skills and the benefits these have to offer to their activities. Similarly, a great number of workers may not be aware of the importance of green skills development and may even not be adequately motivated to develop such skills.

A further challenge is related to the need to ensure that green skills are adequately integrated into the education and training system (CEDEFOP, 2012). Despite the fact that some universities and vocational education schools have started providing courses and curricula related to sustainability

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and green skills, the availability of such courses and curricula is still limited in Europe; besides, their quality and relevance may vary significantly, which could lead to considerable mismatches between the skills employers require and those that workers actually have.

Despite the aforementioned challenges, there are also many opportunities regarding the promotion and integration of green skills into the European labour market. One such key opportunity is related to the increasing demand for sustainable practices and the green transition. This trend is expected to create new employment opportunities for green-skilled individuals. Moreover, the European Union has launched several initiatives and funding programmes to promote green skills development and support the green transition. Apart from ad hoc EU funding mechanisms promoting the green transition such as the Programme for Environment and Climate Action (LIFE) and the Just Transition Fund, the EU sets also ambitious green objectives in other tools such as the European Social Fund (ESF+) or the Recovery and Resilience Fund (RRF).

Main challenges and proposed responses regarding the integration of green skills into the European labour market

It is clear so far, that the major consequences of climate change and environmental degradation do not only harm the environment (ILO & CEDEFOP 2011, p.p.20-30). The associated negative social and economic impact is immense, posing huge and pressing challenges for policymakers. Especially, as regards employment, some of the challenges as well as its proposed responses are presented in Table 4 (see below).

Table 4. Employment challenges and proposed responses

Challenges	Proposed responses
Lack of awareness and training regarding the importance of green skills	Raise awareness amongst employers and workers and provide education and training programmes focused on green skills development.
Insufficient cooperation between industry and education	Promote stronger collaboration between industry and education and involve employers in the development of green skills courses and curricula.
Limited funding for green skills training and development	Increase funding for green skills training, including financial incentives of businesses that invest in greens skill development for their employees.
Lack of a standardised framework for green skills	Develop a standardized framework for green skills, including the establishment of a green skills accreditation system.
Limited sharing of best practices in implementing sustainable practices	Encourage sharing of best practices amongst businesses and educational institutions, including case studies and success stories.

Source: ILO/CEDEFOP, 2011: 20-30

EU initiatives for green skill promotion

There are several initiatives, currently underway in Europe, which are aimed at promoting green skills development. For instance, the European Commission's Skills Agenda (European Commission, 2020c) is focused on green skills in order to ensure that people have the skills required to thrive in a green and digital economy. The Agenda comprises measures such as the Upskilling Pathways initiative, which supports adults in acquiring new skills and qualifications, including green skills.

A flagship initiative of the European Skills Agenda is the Pact for Skills (European Commission, 2020d), which is aimed at bringing public and private organisations together and encouraging them to make concrete commitments in terms of upskilling and reskilling for adults. The Pact, brings together stakeholders from different sectors, including education, training and employment, to support the workforce's green skills development.

The European Training Foundation (ETF) also offers programmes supporting green skills development in VET institutions. The ETF Green Skills and Environmental Awareness for TVET Teachers and Trainers is aimed at providing teachers and trainers with the skills and knowledge required to be able to effectively teach green skills.

CEDEFOP has also published several reports on green skills in Europe, including Green Skills and Innovation for Inclusive Development (CEDEFOP, 2015), which stresses the need for a holistic approach to green skills development, including the participation of stakeholders from education, industry and the government.

The European Union also provides funding for green skills initiatives through the European Social Fund (ESF+). Indeed, the ESF supports projects aimed at improving education and training, including green skills training projects. Other EU funding mechanisms also support projects related to the development of green skills (see below table 5).

Moreover, a number of higher education institutions in Europe have initiated programmes and courses dedicated in the development of horizontal and vertical green skills (see below Table 6).

It is obvious by now that upskilling or reskilling in green skills is an emerging trend following the environmental and climate challenges EU countries need to face. A more detailed analysis on how specific countries try to address this issue is following.

Table 5. Funding programmes for green skills training and development in the EU

Fund/Programme	Funding body	Description-
European Social Fund (ESF+)	European Union	The ESF provides funding for a series of education and training programmes, including ones focused on green skills development. This funding may be used to support both employers and workers in acquiring and developing green skills.
Erasmus+	European Union	The Erasmus+ programme provides funding to educational institutions with a view to developing and providing educational and training curricula focusing on sustainable development and green skills.
Horizon Europe	European Union	Horizon Europe provides funding for research and innovation projects focused on sustainable development and green technologies, which can help develop and apply green skills in the labour market.
Green Deal Call	European Union	The Green Deal Call is a funding initiative that promotes sustainable development and addresses environmental challenges. It includes funding opportunities for green skills development in various sectors and industries.

Table 6. Examples of green skills courses and programmes offered by higher education institutions in Europe

Course/Degree	Educational Institution	Description
MSc Sustainable Energy Systems	University of Edinburgh, Scotland	The programme helps students gain a complete understanding of the science and engineering underlying sustainable energy systems, as well as these systems' economic, environmental and social aspects.
BSc Environmental Science	University of Copenhagen, Denmark	The programme helps students gain a wide understanding of the natural and social sciences related to the environment, as well as skills in research, analysis and problem solving.
Certificate in Sustainable Business	Imperial College Business School, England	The programme has been specifically designed for professionals that wish to gain a deeper understanding of sustainable business practices and their application in various sectors.
Master in Sustainable Development	Sciences Po, France	The programme provides students with the skills and knowledge required to address sustainable development challenges at the local, national and global levels, placing special emphasis on policy, governance and social innovation.
Green Skills for Sustainable Development	European Training Foundation	The programme aims at developing the green skills of VET teachers and trainers, with special emphasis on sustainable development in various sectors and industries.

Green skills in Europe

Denmark

Green skills, as a separate VET-related issue, continues to play a key role in Denmark's national skills agenda. However, green skills are usually seen as a process that affects several occupations and sectors and thus should be integrated into a wider range of education and training activities. The greening of skills is also a matter of changing attitudes at every level of the organisations and

institutions involved in the process. Several observers seem to feel that the "burning platform" of environmental concerns, which was high on the general political agenda a decade ago, has in recent years been somewhat overshadowed by the growing focus on the consequences of robotisation and digitisation. Some concerns have also been expressed about the successful implementation of a specific strategy focused on green skills, taking into account the lack of knowledge and weak support from teachers, students and workers.

However, since 2012, the so-called energy agreement (CEDEFOP, 2018a) has been the cornerstone of Denmark's policies aiming at mitigating climate change and supporting the transition to a greener economy. The agreement had the support by all political parties and covered the period 2012-20. The ambitious target was that the entire Danish energy supply should have been covered by renewable energy by 2050. The agreement also set more detailed targets for 2020 and specified a number of initiatives to be implemented. The agreement's targets were, thus, to reduce energy consumption by 12% by 2020, to increase the share of renewable energy sources to 35% by 2020 and cover 50% of electricity production using wind energy. The main initiatives of the agreement include the renovation of buildings in order to reduce energy consumption, a large-scale expansion of wind power, substitution of coal by biomass, a greater emphasis on energy efficiency and electricity-powered means of transport. In 2022 (CEDEFOP, 2022), the government approved more funds towards an 'increased sustainability and green transition' objective. To this end, it included special grants to support green upskilling measures offered both to unemployed and employed people as well as to implement legislative or policy initiatives related to promoting green skills.

Estonia

Estonia (CEDEFOP, 2018b) has heavily invested in reforming its skills forecasting processes in recent years, including the recently launched System of Labour Market Monitoring and Future Skills Forecasting (OSKA). This has improved stakeholder engagement and created a systematic process for skills forecasting. However, green economy, green skills and green jobs are not explicitly part of the system and are developed horizontally. In Estonia, green jobs and green skills are spread across different economic sectors and policy areas, and there is no coherent training approach or framework. Coherence between skills development policies, environmental and climate change policies has not radically improved in recent years. Therefore, there are no comprehensive and systematic linkages (e.g. objectives, activities, measures) between them. On the other hand, three different horizontal development plans have been developed so far: "Sustainable Estonia 21", the central reform programme, the competitiveness plan "Estonia 2020", and the "National Security Concept of

Estonia". Several lower-tier development plans are also in effect, taking into account the general guidelines and principles set in the higher-tier development plans. "Sustainable Estonia 21" is a horizontal national strategy for sustainable development covering the period up to 2030. Inter alia, the strategy covers the most important challenges in education and future skills. The long-term development of the natural environment is governed by the objective of "ecological balance", which is related to the rational use of natural resources towards achieving ecological balance, minimisation of pollution and conservation of biodiversity and natural areas. However, there is no specific focus on or reference to green skills or jobs.

The central reform program, the competitiveness plan "Estonia 2020" (Vabariigi Valitsus 2017), describes and formulates the most important goals and activities for improving the state's competitiveness. It also addresses the issue of labour supply. While the short-term focus is on education and increasing employment, the need to reduce youth and long-term unemployment and promote vocational retraining and skills development is also covered. Increasing the skills of workers is recognized as a key activity to achieve the goal of higher productivity but also to maintain high employment levels.

According to a recent policy paper (Keller et al. 2023) published in Estonia, green skills teaching has become imperative from general to vocational and higher education. A critical point is to educate teachers and lecturers so as to spread the knowledge, skills and attitudes that help people understand the urgency to face environmental challenges in the context of the ecological balance.

France

The National Green Economy Survey estimates green jobs created in recent years. In 2015 there were 440,000 full-time jobs classified as green, while green occupations accounted for 144,000 jobs and greening occupations accounted for nearly four million jobs (CEDEFOP, 2018c). In France, a comprehensive skills development strategy has been published since 2010, following the "Environmental Round Table", which included a mobilisation plan for green jobs as well as the National Observatory for Green Economy Jobs and Occupations. Most of the key actors involved in skills forecasting have integrated a perspective on the evolution of jobs and skills related to the green economy into their activities. Skills curricula are nowadays frequently renewed or adapted to take the green economy into account. Many diplomas now include awareness-raising or more specifically sensitisation to green issues. Some programmes have been thoroughly adapted to the techniques, knowledge and skills required by the ecological transition (or transition to the green economy/green transition).

Germany

In Germany (CEDEFOP 2018d), Vocational Education and Training (VET) for new green occupations is not as popular as VET for already established occupations. Furthermore, Continuing VET (CVET) offers are multiple in Germany, though participation is relatively low, due to weak incentives and low transparency. Targeted programmes to promote skills for green jobs are also available, including initiatives under the Global Action Program of the United Nations Educational, Scientific and Cultural Organization (UNESCO). It is to be noted that many previous green skills programmes did not seem to have a long-term impact. With few exceptions, skills for green jobs are not the main focus of ALMPs.

Nevertheless, since 2010, climate protection has been the main goal of green policies in Germany. Compared to this, the modernisation of laws governing nature protection and waste management was of secondary importance. Already in 2000, Germany introduced the Renewable Energy Sources Act (EEG) [Erneuerbare-Energien-Gesetz], which aimed at the forced expansion of renewable energy sources. Since then, the law has been amended and adapted several times, the latest amendment taking place in July 2017. One key element of the law was a technology-specific feed-in tariff assuring priority feed-in to electricity from renewable energy (RE) sources.

In recent years, there has been a dynamic increase in the share of electricity based on renewable energy sources. In this context, new instruments have been introduced, such as auction schemes for renewable energy technologies. Furthermore, as a consequence of the Fukushima accident in 2011, the government implemented policies to decarbonize the energy system. The Energiewende (Energy Turnaround; Energy Transition) was based on the following two pillars: (a) expansion of renewable energy sources in the electricity and heat market and (b) increase of energy efficiency in all parts of the economy. At the same time, the phase out of nuclear power in Germany by 2022 was set. For a period after 2011, the Energiewende was at the forefront of political dialogue in Germany before being replaced by new issues, such as migration policy. Although there is no coherent strategy targeted at the needs of a green economy, policy activities have been undertaken to address the issue of sufficient supply of required green skills at different qualification levels.

The green agenda in Germany is coordinated in a federal level by the National Sustainability Council (NSC) which has been established at the Chancellor's Office. The NSC is equipped with renowned scientists and public figures and focuses on all 17 UN Sustainability Development Goals, including Technical VET.

Spain

In Spain (CEDEFOP, 2018e), the economic crisis had a negative impact on the national dialogue on green economy mostly due to general budgetary cuts, even though this trend subsided as the economy started to recover. While there is no specific process for identifying skills related to green jobs, there are general skills forecasting schemes and a growing awareness of the importance of green jobs and greening in general. The abovementioned skills forecasting schemes include a broad institutional framework, bringing together employment and education authorities as well as social partners. The skills identified are taken into account in the provision of training through Technical Vocational Education and Training actions for employed and unemployed workers. Consequently, several changes have been observed in training provision in line with the greening of the economy. In addition, the private sector plays an important role in identifying and providing training in relation to the greening of the economy. The Spanish Ministry of the Environment has also developed several programmes aiming to shape green policies at the national level. The Spanish Plan to Promote the Environment (PIMA) in Transport provides financial incentives to reduce the environmental impact of related economic activities, e.g. waste and transport, and to promote the use of alternative energy sources. For example, it offers financial incentives to companies for the adoption of carbon footprints, promotion of energy efficiency, renewable energy sources, reduction of greenhouse gas emissions, and substitution with less environmentally harmful ones.

The Ministry of the Environment also promotes "CLIMA (Environment) Projects". The CLIMA programme subsidises projects aimed at reducing greenhouse gas emissions in "diffuse sectors" not attributable to the European regime of emissions trading (such as the transport, agriculture, construction and waste sectors).

United Kingdom

Since 2010, employment levels in low-carbon and environmental jobs in the UK have been significant and are expected to continue to grow. Policy has shifted its focus onto new environmental technologies, new ways of working and “greener consumption”.

The main legislative change relevant to the green economy was The Energy Act 2013 (TSO, 2013). The act set targets for reducing carbon emissions and directions on how to achieve them, such as: reforming the electricity market, encouraging low-carbon electricity production, ensuring security of supply, pipelines and storage, defining the role and powers of the Office for Nuclear Regulation. The aim is to address some of the challenges of climate change. Following these legislative changes, the Department of Energy and Climate Change (DECC) invested in four offshore wind projects and gave permission to build a new nuclear power station at Hinkley Point (CEDEFOP, 2018f).

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Efforts have been made to understand the size and performance of those services, products and technologies that contribute to the green economy. Research has also shown a significant increase in activities, production and employment in activities that contribute to a green, low-carbon economy. Unfortunately, there are no active national labour market programmes that focus on skills development for green jobs/green economy. However, some charities/not-for-profit organisations offer labour market programmes that create green jobs and support people to develop green skills. It is important to note that unions are playing a greater role in supporting the workforce and the transition towards a greener economy.

Conclusions

Developing green skills in a systematic and structured way is necessary to successfully facilitate the transition to a green economy and thus develop a culture of environmental protection, also providing significant social and economic advantages. Green skills are key to addressing environmental challenges, creating jobs and ensuring business competitiveness. The types of green skills required depend on the specific needs of each country, but commonalities do exist, such as renewable energy sources, sustainable agriculture, green construction, resource efficiency, environmental management and sustainable transport.

However, there are several challenges that need to be addressed to ensure the effective integration of green skills into the European labour market. By raising awareness, strengthening education, promoting cooperation between industry and education, increasing funding for green skills training, developing a standardised framework for green skills and encouraging the sharing of best practices, the European Union can help ensure that the labour market is equipped with the necessary green skills to achieve a sustainable and environmentally friendly future.

The development of green skills can be achieved through a variety of methods, including education and training, apprenticeships and work experience programmes. Businesses and government agencies can play a key role in developing green skills by offering internships and apprenticeships in green industries and providing training opportunities. The role of the state is crucial especially when it comes to coordinating the process of policies' greening. The development of a national skills strategy focusing on how to develop green skills for all is also a key element of integrating a greener approach to policies.

Several European initiatives are currently underway to promote the development of green skills, such as the European Commission's Skills Agenda for Europe, the Green Skills and Environmental

Awareness for TVET Teachers and Trainers programme of the European Training Foundation and the Pact for Skills.

Finally, as the world necessarily advances towards the goal of sustainability, it is vital for individuals, businesses and governments alike to embrace green skills and work towards attaining this goal sooner rather than later.

References

CEDEFOP (2009*). Research Paper: Future skill needs*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2012). *Green skills and environmental awareness in vocational education and training*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2012). Briefing Note: A strategy for green skills. Available at: https://www.cedefop.europa.eu/files/9067_en.pdf (Accessed: 05/05/2023).

CEDEFOP (2018a). *Skills for green jobs: an update – Denmark*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2018b). *Skills for green jobs: an update – Estonia*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2018c). *Skills for green jobs: an update – France.* Luxembourg: Publications Office of the European Union.

CEDEFOP (2018d). *Skills for green jobs: an update – Germany*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2018e). *Skills for green jobs: an update – Spain*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2018f). *Skills for green jobs: an update – United Kingdom*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2021). *The Green Employment and Skills Transformation*. Luxembourg: Publications Office of the European Union.

CEDEFOP (2022). Denmark: green transition in vocational education. Available at: https://www.cedefop.europa.eu/en/news/denmark-green-transition-vocational-education (Accessed: 05/05/2023).

CEDEFOP; OECD (2015). *Green skills and innovation for inclusive growth*. Luxembourg: Publications Office of the European Union. CEDEFOP reference series.

European Commission (2019). Communication from the Commission: The European Green Deal, Available at: https://commission.europa.eu/document/daef3e5c-a456-4fbb-a067-8f1cbe8d9c78_en (Accessed: 05/05/2023).

European Commission (2020a). Circular economy action plan (CEAP), March 2020. Available at: https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en (Accessed:. 10/05/2023).

European Commission (2020b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, March 2020. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN (Accessed: 15/05/2023).

European Commission (2020c). European Skills Agenda, DG Employment, Social Affairs & Inclusion. Available at: https://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=9723&furtherNews=yes#navItem-1 (Accessed: 15/05/2023).

European Commission (2020d). Pact for Skills, DG Employment, Social Affairs & Inclusion. Available at: https://ec.europa.eu/social/main.jsp?catId=1517&langId=en (Accessed: 15/05/2023).

International Labour Organization (2023). Green jobs. Available at: https://www.ilo.org/global/topics/green-jobs/lang--en/index.htm (Accessed: 10/05/2023).

ILO; CEDEFOP (2011). Skills for green jobs. A global view: Synthesis Report based on 21 country studies. Available atL https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_159585.pdf (Accessed: 10/05/2023).

IRENA; ILO (2021). Renewable Energy and Jobs – Annual Review 2021, International Renewable Energy Agency, International Labour Organization, Abu Dhabi, Geneva. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Oct/IRENA_RE_Jobs_2021.pdf (Accessed: 10/05/2023).

IRENA; ILO (2022). Renewable energy and jobs: Annual review 2022, International Renewable Energy Agency, Abu Dhabi and International Labour Organization, Geneva. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Sep/IRENA_Renewable_energy_and_jobs_2022.pdf?rev=7c0be3e04bfa4cddaedb4277861b1b61 (Accessed: 10/05/2023).

Keller, M., Helm, A., Toll, V., Marling, R., Post, P., Poom, A., Orru, H., Orru, K., Vihalemm, T., Kiisel, M. (2023). Climate change and Estonia: what we should know and do, Policy Paper, University of Tartu. Available at: https://reaalteadused.ut.ee/en/node/150974 (Accessed:. 03/05/2023).