CEDEFOP
European Centre
for the Development
of Vocational Training

BRIEFING NOTE

AN ALLY IN THE GREEN TRANSITION

VET, especially apprenticeship, can provide the skills needed for greening jobs– and in turn help shape them

Droughts, floods, heat, storms and fires: the perilous effects of climate change on societies and economies worldwide have been pushing decision-makers to commit to greener policies such as those resulting from the European Fit for 55 package and the UN climate change conference COP26. Now, new talent and technologies are needed to turn these commitments into practice.

The transition to a green – and more digital – economy and society will upend the job market and create new skill needs across sectors and occupations. Europe will have to invest in upskilling and reskilling its workforce. In this context, vocational education and training (VET) will play an eminent role. Apprenticeship, being closely tied to the labour market, can swiftly adapt, alleviating short-term bottlenecks and ensuring long-term worker employability.

EMPLOYMENT OPPORTUNITIES FOR ALL

Job-wise, the Green Deal is good news for the EU. Launched 2 years ago, it embodies the new EU growth strategy, setting competitive economic goals while ensuring 'a just transition [leaving] nobody behind' ([1]). A 2021 Cedefop skills forecast scenario on its impact projects employment growth by 2030 to amount to about 2.5 million additional jobs.

Unsurprisingly, the scenario foresees the strongest job growth in sectors with a high greening potential, such as water supply, waste management and construction. By the end of the decade, almost 200 000 new jobs will be created in the electricity sector alone. The close interconnections between economic activities and supply chains will also lead to indirect employment benefits; the service sector offers an example in communication and logistics. Inversely, employment will decline in 'brown' sectors ([2]). For example, phasing out coal will spur job loss in mining and force entire regions to rethink their economic models.

Job growth is expected across almost all sectors as employers turn to more sustainable business models. It will require skills at all levels, easing to some extent the labour market polarisation between jobs at the low and the high ends of the qualification scale. Better gender representation will be a driver of the green transition. The projected increase in labour market participation linked to implementing the Green Deal cannot happen without it.

WHAT SKILLS DRIVE THE GREEN TRANSITION?

Technical skills relevant to green technologies and processes are key to greening the economy. Beyond that, it is Europeans' attitudes, behaviour and civic skills that will shape the transition to greener societies ([3]). What, then, are the skills or skill sets designated as 'green'?

BOX 1. CEDEFOP DEFINITION OF GREEN SKILLS

Cedefop defines 'skills for the green transition' as abilities needed to live, work and act in economies and societies which enable and support the minimisation of the negative impact of human activity on the environment. They are transversal, comprise sustainable thinking and acting and relate to all economic sectors and occupations, not just 'green' ones.

Source: Cedefop.

([1]) Commission President Ursula von der Leyen and Vice-President Frans Timmermans addressing the press at the first presentation of the Green Deal on 11 December 2019.

([2]) See EU taxonomy for sustainable activities/finance.

([3]) This need is acknowledged in the Green Deal and the European Pact for Skills.

With no broadly accepted green skills taxonomy in place ([4]), different approaches have been used in EU Member States to define skills for the green transition ([5]). Cedefop is exploring the possibility of using data from online job advertisements feeding into its Skills OVATE tool to lay the groundwork for a classification of green skills. Real-time green skills intelligence will be crucial to understanding emerging labour market trends and clearing the way for swift adaptation of VET.

NOTHING LESS THAN A PARADIGM SHIFT

As the greening of the economy will rely on technical development and innovation, some high-skilled new occupations will be needed (such as in hydrogen-based energy production). However, although critical, they will account only for a small share of green jobs ([6]). The greening of jobs will cut across occupations and sectors, bringing about radical changes in skill needs. These, in turn, must be reflected in education and training provision at all qualification levels. VET will be crucial to providing skill sets that evolve flexibly and reflect the dynamic nature of the new green paradigm.

Many of the skills needed for the transition to green economies and societies concern the smart use of clean technologies. Digital skills have become so important that they are increasingly considered both technical and transversal, depending on how advanced they are. This is why the European Commission, in its New Skills Agenda (Action 6), labels the digital and green transitions as 'twin transitions'.

Regions and cities will act as the hubs of the green transition. Cedefop, with its current skills foresight studies on smart and green cities and on waste management, is looking into how VET can respond locally to future developments in skill needs and occupations. Preliminary findings point to the importance of digital skills in greening economies (for example ICT professionals involved in the monitoring and analysis of data in cities regarding smart and greener transportation or waste management). It is also apparent that, in practice, the digital and green transitions are truly 'twins' in every respect.

VET: BOUND FOR A SPRINT OR A MARATHON?

For both! Policies and investments under the Green Deal already affect jobs and skills. VET must offer quick fixes to accompany change as it happens: it needs to offer sprint solutions to keep up. For example, short-term VET programmes can offer workers in regions hard-hit by economic transformation flexible opportunities to upgrade their skills or acquire new ones. In this way, VET mitigates skill mismatches in times of rapid change and alleviates their social cost. Such programmes also cater for people who enter or already work in booming sectors: by offering targeted upskilling solutions, short VET tracks contribute to reducing recruitment bottlenecks.

VET not only helps workers to cope with change; tailor-made experiential, work-based learning options, including apprenticeship, can respond to local needs and address vulnerable groups (such as the unemployed, low-skilled or inactive persons, migrants, NEETs ([7]) and early school leavers).

Achieving the skills revolution in the longer term will be more like training for a marathon: VET programmes must respond to new skill needs at all levels and across sectors and occupations, while safeguarding people's employability over time. To address skill mismatches effectively and provide sustainable upskilling and reskilling pathways, VET supply must be powered by forward-looking skills intelligence providing insight into green and digital skill needs.

VET can even spur societal change by fostering innovation in green technologies, processes and products, thus deepening learners' understanding of environmental issues and ultimately strengthening their civic engagement ([8]). The emerging 'greenfluencer' movement already shows how passion for promoting sustainability can contribute to the green transformation of societies.

GREENING APPRENTICESHIP: WHAT'S NEW?

Innovative practices demonstrating how apprenticeship can adapt to the training requirements of greening jobs have been sprouting across the EU. Existing apprenticeship programmes have been adapting to green requirements while new, green programmes

([4]) ESCO, the European classification of occupations, skills and competences, has introduced a new filter allowing users to search its skills data set for green skills and knowledge concepts. All are translated into 27 languages and complemented by information on their reusability type and link with occupations. ESCO's recent report *Green skills and knowledge concepts: labelling the ESCO classification* explains the methodology used for labelling green concepts and a list of use cases.

([5]) Cedefop (2019). *Skills for green jobs: 2018 update. European synthesis report*. Luxembourg: Publications Office. Cedefop reference series No 109.

([6]) Cedefop has described such jobs (usually in R&D or engineering), as 'thyroid'. Listen to Cedefop's recent podcast on Skills for the green economy.

([7]) People who are not in education, employment or training.

([8]) VET's important role in this respect is underlined in the European Commission proposal for a Council Recommendation on learning for environmental sustainability

are being developed across sectors and occupations.

Several innovative initiatives were presented at a 2021 joint Cedefop/OECD symposium on Apprenticeship for greener economies and societies, including the examples below.

BOX 2. **GREENING APPRENTICESHIP FOR CHEMICAL OPERATORS IN BELGIUM (FL)**

In Flanders, the 1-year training leading to qualification as chemical process operator comprises an apprenticeship in a chemical company. This is combined with theoretical knowledge at school and, in the Antwerp region, with a module delivered by the technical training centre ACTA.

To anticipate upcoming government regulations mandating energy-intensive industries to cut emissions, the training centre ACTA recently redesigned the course. Introducing gamification in the learning units on the use of chemical equipment, students can explore different operation modes, provided they stick to the rule of not exceeding set CO2 emission limits. This motivates them to look for the most energy-efficient way to operate 'their' equipment. The trainers encourage learners to reflect on current procedures and come up with innovative eco-friendly proposals; this approach, in turn, has reflected back on the training centre's staff and organisation culture positively.

Source: Apprenticeships for a greener labour market. Presentation by Helena Van Langenhove (Department of Work and Social Economy, Flanders, Belgium) and Dr Frederick Van Gysegem (partner at Roland Berger) on 22 October 2021.

BOX 3. **INTEGRATING APPRENTICESHIPS IN SIEMENS' CORPORATE SUSTAINABILITY STRATEGY**

In Germany, Siemens' in-house education and training provider Professional Education oversees a methodical innovation process to promote sustainability. Analyses and discussions of external trends and internal needs feed into a learning pyramid which presents the competences required for sustainability at various levels, including apprenticeships. It provides the basis of the common competences required for apprentices, irrespective of their specific role and business unit: basic understanding, self-reflection and reflection on business functions pertaining to the ultimate targets of climate protection and sustainable development goals. Pilot projects to promote sustainability among apprentices are developed on the basis of this premise.

Source: Siemens Professional Education (SPE) goes green skills. Presentation by Barbara Ofstad and Dr Stephan Szuppa (Siemens AG) on 22 October 2021.

BOX 4. **UPDATING APPRENTICESHIP CURRICULA AND OCCUPATIONAL PROFILES IN THE CONSTRUCTION SECTOR**

In Belgium and Germany, multi-stakeholder approaches support the updating of occupational profiles, curricula and exam regulations for apprenticeship training in low-energy construction (LEC). These approaches combine a broad theoretical knowledge (e.g. of building physics and materials) with an overview of the sector; they integrate communication, coordination and teamwork skills, fostering a holistic understanding of the construction process and energy efficiency. This broad set of knowledge, skills and competences required for greening the profession is being integrated in the corresponding standards regulating apprenticeship.

Source: Vocational education and training in construction: low road or high road approaches to apprenticeship? Presentation by Prof. Linda Clarke (University of Westminster) and Prof. Christopher Winch (King's College, London) on 22 October 2021.

BOX 5. **GRÆDUCATION: GREEN APPRENTICESHIP AS A SYSTEMIC CHANGE AGENT**

In Greece, green VET modules and services have been developed under its umbrella, the binational multi-stakeholder R&D initiative Graeducation (*):

Since 2017:

- three green apprenticeship curricula at upper secondary level (EPAS) have been developed: electricians; thermal and hydraulic installation technicians; and mechatronic technicians for refrigeration technology and air-conditioning;
- post-secondary apprenticeship modules (EPAL) in other climate-relevant professions are under way;
- modern green standards and new technologies are integrated in teaching and training on topics such as solar cooling, ventilation and air-conditioning;
- a Green VET campus is currently being set up in the coal mining area of Kozani in collaboration with the Greek public employment service OAED and local stakeholders and companies.

Thanks to its innovative approach, Graeducation has been fostering change in education and training and the labour market and has contributed to establishing green apprenticeship in Greece.

(*) Initiative bringing together German and Greek education and labour market actors, i.a. the German-Greek Chamber of Industry and Commerce.

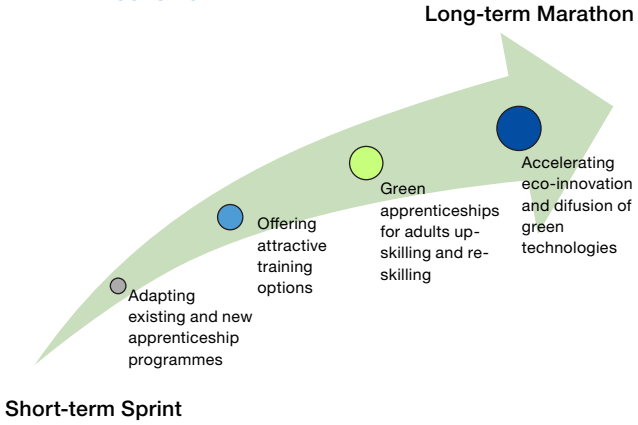
Source: Green apprenticeship as systemic change agent for green and social transition in Europe, by Silke Steinberg and Rüdiger Klatt (Research Institute for Innovative Work Design and Prevention) on 21 October 2021.

Good examples of systemic changes can also be found in Ireland and the Netherlands. Ireland intro-

duced, with its 2020 Further education and training strategy, a 'sustainable development focus' in all apprenticeship and adult learning programmes relevant to greening economic sectors, such as energy and construction. This could comprise, for example, a national roll-out of skills centres providing capabilities for nearly zero energy buildings.

In the 2019 Dutch climate technology convenant for developing VET tracks supporting the Netherlands' energy transition and progress towards a circular economy, both the building and tech industry have committed to feeding information on green skill needs into VET programme design and to providing sufficient, high-quality apprenticeship places.

FIGURE 1. **APPRENTICESHIP: A QUICK FIX AND A LONG-TERM SOLUTION**



APPRENTICESHIP AS AN AGENT OF CHANGE

With a governance platform facilitating multi-stakeholder dialogue, apprenticeship can be flexibly adapted to new skill needs, qualifications and training content. Conferring more strategic decision-making powers to social partners with these structures in place would help further reinforce this special quality of apprenticeship and could support partnerships on equal footing between education and the labour market.

Its close links to the labour market and its in-company training component enable apprentices, being directly exposed to changes as they happen at their work place, to have direct access to innovative practices and technologies.

Whether for young people in initial education, for adults in need of upskilling or reskilling, or for learners engaging in education and training at tertiary level, apprenticeship enables them to acquire skills while working, with adequate pedagogical support. The practical learning approach can, in turn, empower apprentices to suggest changes and contribute innovative ideas that help make their workplace greener.

On account of their double 'identity' as employees and learners and the frequent collaboration between VET school teachers and in-company trainers, apprentices can trigger cross-fertilisation between learning venues, relaying green innovation from schools to companies and vice versa in their daily learning and work activities.

Apprenticeships can also be used as a tool for upskilling and reskilling workers, such as supporting their transition from declining to growing sectors or occupations and so contributing to the green transformation of regions. Experts agree that work-based learning formats, as in apprenticeship, are well-suited to the needs of adult workers, sometimes even better than classroom learning formats ([9]). The fact that an apprenticeship is built on a contract and remuneration makes it an attractive option for adults who want (or need) to obtain a green qualification ([10]).

Firmly rooted in the labour market, and arguably the most hands-on and demand-led form of VET, apprenticeship has what it takes to enable and shape the green transition. To unlock its full potential in this context, policy-makers and employers could refer to the common EFQEA quality criteria for apprenticeship. These were agreed to ensure that apprenticeship offers high added value to employers (future workers with robust qualifications), apprentices (employability across sectors) and the European economy a whole: a well-trained workforce supports innovation and competitiveness in the transition to a greener and more digital world.

([9]) See Cedefop 2020 Empowering adults through upskilling and reskilling pathways and 2015 Work-based learning in CVET

([10]) See Cedefop 2019 Apprenticeship for adults: how apprenticeship can support career redirection towards green occupations.

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