ISSN: 2529-3397

CEDEFOP

Too good to waste

Tapping the potential of vocational education and training in the waste management sector

POLICY BRIEF

POLICY BACKGROUND

In this section

Reducing and making better use of waste is at the heart of the green transition

© iStock/Renata Angerami

Better and smarter waste management is key to achieving the European Green Deal (EGD) ambitions. Its main aims are to reduce the amount of waste where it is produced in the first place, and, via stimulation of innovation in recycling, to treat it effectively so that it can be reused. For many years waste management has been viewed as an end-of-pipe process, where waste is landfilled or dumped at sea.

The waste hierarchy established by the 2008 EU Waste Framework Directive (WFD) contributed to a shift in thinking. It considers waste prevention as the best waste management option, followed by reuse, recycling and other forms of recovery. Waste disposal, such as landfill, is least preferable and a 'last resort only' action. Observed trends in waste generation and prevention (Figure 1), while showing progress in waste recovery, suggest that the EU is not on track to meet the goals set in the Landfill Directive (1999), the End of life vehicles Directive (2000), the Construction and demolition and waste Directive (2008), the Waste framework Directives (2008, 2018), and other EU legislation.

Waste management (including recycling) will be increasingly important to the green transition, as nearly all activities in the sector are directly linked with environmental protection. The EGD underlines the importance of treating waste as a resource. The Circular economy action plan – one of EGD's building blocks – states that alongside waste prevention, resources used in production processes should be used and reused in the EU economy for as long as possible.

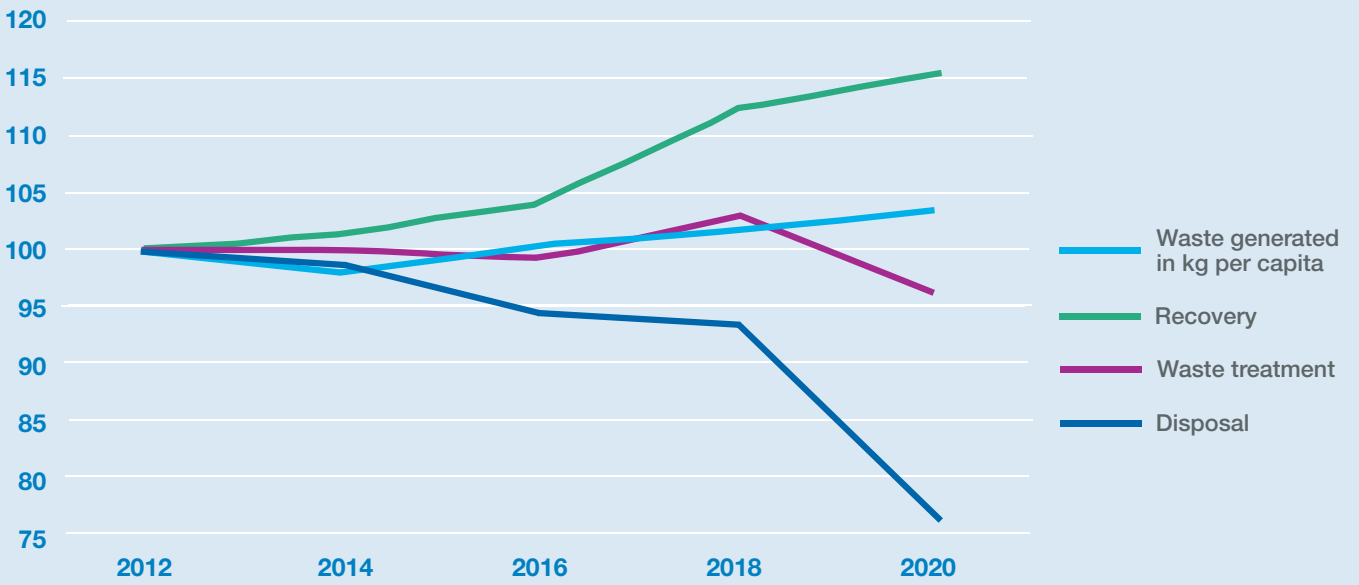
Growing at 3% to 5% per year, discarded electrical and electronic equipment is one of fastest growing waste streams in the EU. Although some countries (e.g. Denmark and Croatia) can be considered e-waste recycling leaders, in the EU as a whole on average only 38.5% of such waste is recycled (Figure 2). Along with harmful substances, e-waste contains valuable materials, which, if recovered and recycled, may be reused in the EU economy. The EU invests in research to assess how much raw material, potentially available for recovery or recycling, exists in products, extractive waste, and landfills. The proposed new Waste shipment regulation reinforces the promotion of recycling. Priority actions include facilitating waste transport so that it can be reused and recycled within the EU, and controlling waste exports and imports from the EU to third countries and vice versa.

...for long, **waste management** has been viewed as an **end-of-pipe process**, where **waste is landfilled** or **dumped at sea**...

...**waste management** is a driver of the green transition, as nearly all activities in the sector are **directly linked with environmental protection**...

...**discarded electrical and electronic equipment** is one of fastest growing **waste streams** in the EU...

Figure 1. **Waste generation and waste treatment in the EU, 2012-20 (Index 2012 = 100)**



Source: Eurostat (env_wastrt and env_wasmun).

Box 1. **What is waste management?**

The waste management sector encompasses activities linked to the collection, transport, processing, recycling, and disposal of different waste types (industrial, biological, municipal, organic, plastic, biomedical and radioactive). It includes the processes and actions involved in managing waste from the moment it is generated to its final disposal. While most activities in the sector relate to waste management and remediation, the collection of waste – which is often undertaken by the public sector – is also part of it. The increasing emphasis on developing the circular economy ([1]) justifies including repair and reuse activities in waste management. This becomes increasingly important as EGD implementation progresses and may include repair and maintenance of cars, trucks and motorcycles and repair of electric and electronic equipment and household goods. A range of waste recycling activities in the manufacturing sector also potentially falls within the scope of waste management.

Source: Cedefop.

([1]) Cedefop is running another foresight exercise to understand the implications of EGD implementation on changes in skills and vocational education and training (VET) in the circular economy. Results will be released in 2023.

The volume of environmentally significant waste is increasing

© iStock/Cylonphoto

On average, 4.8 tonnes of waste was generated per EU inhabitant in 2020. Despite the increasing potential in recovery of waste in the EU-27, the total volume of waste increased by 5% compared to 2010 ([2]). More important, environmentally significant waste (i.e. excluding major mineral wastes such as hard rocks, concrete, soils that are of less concern for the environment) increased by 7% (EEA 2021).

In 2020 the construction sector contributed 37.1% to total waste generation, followed by mining and quarrying (23.4%), manufacturing (11%), waste and water services (11%), and households (9.5%). The remaining waste was generated by other economic activities, mainly services (4.5%) and energy (2.3%) (Eurostat, 2022).

([2]) The fall in total waste observed in 2020 is most likely linked to the economic slowdown caused by the COVID-19 pandemic rather than a reduction in waste generation.

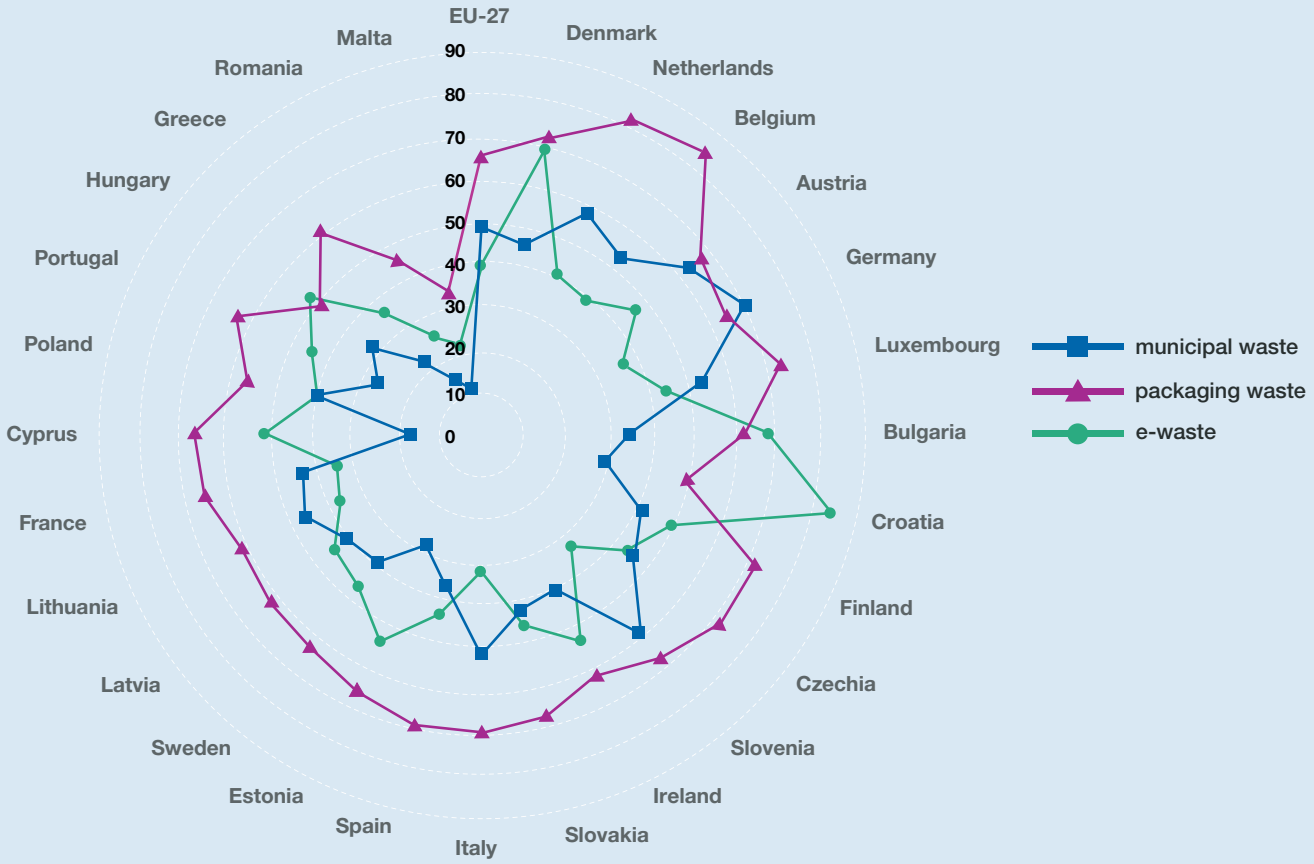
Countries have moved at different speeds when it comes to recycling waste. The recycling rates of municipal waste, for example, varied in 2020 from above 68.3% in Germany and 61.8% in Austria to below 15% in Malta and Romania. With recycling rates above 80%, Belgium and the Netherlands are plastic recycling leaders (Figure 2). Bold action is especially needed in countries lagging behind. The requirement about bio-waste treatment in the 2018 WFD implies that, by end of 2023, bio-waste must either be separated and recycled at source or collected separately and not mixed with other types of waste. As around one third of municipal waste is bio-waste and the responsibility for reducing municipal waste falls under local and regional administrations, progress could be made by using public 'green' procurement as a tool to bring about positive environmental change. Upscaling bio-waste to energy conversion demands adequate investments in infrastructure, such as anaerobic digestors, but also a skilled workforce.

...the total **volume of waste increased by 5%** compared to 2010...**environmentally significant waste** increased by **7%**...

...with recycling rates above 80%, **Belgium and the Netherlands** are **plastic recycling leaders**...

...progress could be made by using **public 'green' procurement** as a tool to bring about **positive environmental change**...

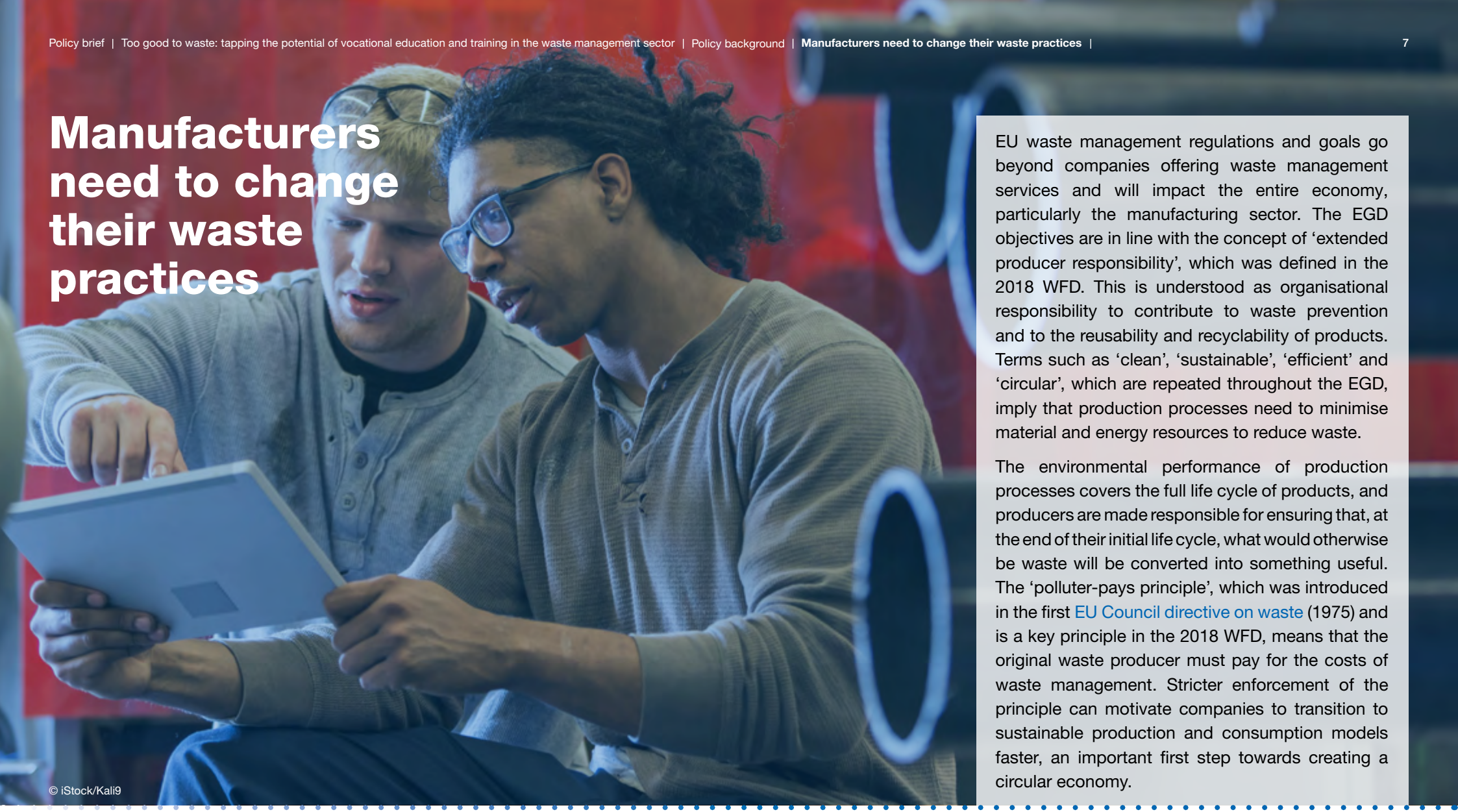
Figure 2. **Recycling rates in the EU**



NB: Countries are ranked based on the average of the three recycling indicators. Recycling rate of municipal waste [ENV_WASMUN] (2020); recycling rate of packaging waste by type of packaging [CEI_WM020] 2019; recycling rate of e-waste [CEI_WM050], 2019. The most recent data available were used for each country.

Source: Eurostat.

Manufacturers need to change their waste practices



© iStock/Kali9

EU waste management regulations and goals go beyond companies offering waste management services and will impact the entire economy, particularly the manufacturing sector. The EGD objectives are in line with the concept of 'extended producer responsibility', which was defined in the 2018 WFD. This is understood as organisational responsibility to contribute to waste prevention and to the reusability and recyclability of products. Terms such as 'clean', 'sustainable', 'efficient' and 'circular', which are repeated throughout the EGD, imply that production processes need to minimise material and energy resources to reduce waste.

The environmental performance of production processes covers the full life cycle of products, and producers are made responsible for ensuring that, at the end of their initial life cycle, what would otherwise be waste will be converted into something useful. The 'polluter-pays principle', which was introduced in the first EU Council directive on waste (1975) and is a key principle in the 2018 WFD, means that the original waste producer must pay for the costs of waste management. Stricter enforcement of the principle can motivate companies to transition to sustainable production and consumption models faster, an important first step towards creating a circular economy.

...EGD objectives are in line with '**extended producer responsibility**', which was defined in the **2018 Waste Framework Directive**...

...production processes need to **minimise material and energy resources** to reduce waste...

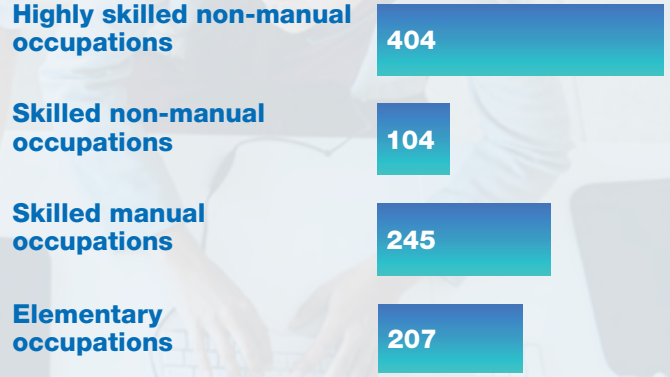
...enforcing the **'polluter pays principle'** can motivate companies to **become sustainable** faster...

Meeting EGD goals brings more employment at all skill levels

© iStock/Peopleimages

In the past two decades, employment in waste management in the EU has steadily increased. While the sewerage, waste management and remediation activities sector employed 902 000 people in 2000, this had grown to around 1.3 million in 2019. The Cedefop skill forecast (Cedefop, 2021) shows that implementing the EGD can boost employment in the water supply and waste management sector by over 63% (around 960 000 additional jobs) by 2030; this is by far the largest increase in the employment sectors analysed. Although the employment expansion is more pronounced for highly skilled non-manual occupations, increased demand is expected for workers at all skill levels (high, medium, low) (Figure 3). In the coming years, education and training for the sector need to expand across occupational categories, taking account of their characteristics and meeting learner needs.

Figure 3. **Forecast additional employment in water supply, sewerage, waste management and remediation activities resulting from EGD implementation in 2020-30 by occupation level (thousands)**



NB: Difference in employment levels between baseline and EGD skills forecast scenario.

Source: Cedefop (2021).

...the **sewerage, waste management and remediation activities** sector employed **902 000 people in 2000**, growing to around **1.3 million in 2019**...

...**Cedefop skill forecast** shows that **implementing the EGD** can **boost employment** in the water supply and waste management sector **by over 63% by 2030**...

...**increased demand** is expected for workers at all skill levels...**education and training** for the sector **need to expand** across occupational categories...

Job tasks and work organisation in waste management are changing

© iStock/Mukhina1

Shifting from waste disposal to recycling and using waste as a resource in a wide range of products and processes drives the transformation of jobs in the sector. Tasks such as garbage collection and disposal in landfills are making way for service-type roles, such as raising citizens' green awareness and recycling skills. Alongside changes in job characteristics, with the digitalisation of waste management processes, 'greening' also reshapes work organisation.

The shift from a linear to a circular economic model will inevitably continue to drive changes in skill needs. To date, future skill and training needs in the waste management sector have been little – if at all – investigated systematically. A Cedefop skills foresight study dedicated to understanding future trends and their impact on the waste management sector aimed at addressing this research gap (Box 2).

...**recycling and using waste as a resource** drives the **transformation of jobs** in the waste management sector...

...the shift to a **circular economic model** will continue to drive **changes in skill needs**...

Box 2. **Explained: Cedefop foresight on waste management**

Cedefop's foresight on waste management explored the implications of the implementation of the EGD on skills and the role of vocational education and training (VET) for jobs in the sector (*). It was part of a series of green foresight studies that also covers smart and green cities, the circular economy and agri-food. More detailed information about the waste management foresight study and a list of contributing experts is available here.

In the first online workshop experts were asked to look towards the future (2030 and 2050) and to identify the occupations/skill profiles that will enable the waste management sector to accommodate the changes the EGD requires. They also explored how VET can be leveraged in developing the identified skillsets. The results from the first workshop discussions were used to develop a two-round Delphi-style survey. The first-round questionnaire was designed to gain more insight into the issues raised in the workshop and to assess the extent to which there was consensus around them among the experts.

The results of the first round were used to design the second round, which focused on the role VET might play in meeting the skill needs identified in the first round. In the final workshop, Cedefop reported the findings from all stages of the foresight study to the experts, who discussed and validated them. Full results will be published in a Cedefop 2023 report alongside the results of the other three foresights.

(*) Spill-over effects in other sectors were not explored.
Source: Cedefop.

EVIDENCE

In this section

INVESTMENT IN WASTE MANAGEMENT

On top of EU policy developments spearheading the transition to a circular economy, Cedefop foresight experts highlighted a wide variety of drivers of change impacting the waste management sector in terms of volume and processes (Figure 4). Factors boosting employment in the sector include: increased investment in waste management, which stimulates innovativeness and more diverse approaches; new local circular economy solutions; stricter regulation; and more complex materials processing technologies (to handle the increasing diversity of waste, and ease recycling and recovering of raw materials).

The expected rise in new jobs and occupations concerns direct and indirect employment in the sector. It includes people working on developing new approaches to product design, on new services and business models, or on complex logistics issues. Experts suggested that progressing automation and digitalisation in the sector has shrunk demand for low-skilled workers in some sub-sectors, such as waste collection and waste sorting, and accelerated the integration of IT-related skills into occupational profiles.

The new and updated tasks implied by these key change drivers are expected to stimulate demand for skills at all levels. Large employment gains, particularly for highly skilled non-manual jobs, underline the shift to more managerial and service-oriented skill profiles in the sector. Experts viewed skills shortages as a major obstacle to future developments in waste management. Advances in waste management could also be hindered by constraints on public expenditure at Member State level and the cost of mainstreaming new waste management technologies. Producers' concerns about the cost-effectiveness of advancing waste management, their lack of knowledge about the application of new waste management processes in industry, and indifference to waste management on the part of consumers and households are further bottlenecks.

LOCAL CIRCULAR ECONOMY SOLUTIONS

© iStock/Tempura

MORE COMPLEX MATERIALS **PROCESSING TECHNOLOGIES**

© iStock/Chinnapong

Figure 4. **Drivers of change in the waste management sector**

POLICY AND LEGISLATION CHANGES, E.G. RECYCLING TARGETS

CONSUMPTION PATTERN CHANGES (RISE IN ECO-FRIENDLY CONSUMERS)

POLLUTION CONTROL

INCREASED COST OF RAW MATERIALS

MAINSTREAMING (IN SECTORS, SOCIETY) **THE CIRCULAR ECONOMY CONCEPT**

AUTOMATION AND DIGITALISATION (INCLUDING INCREASED USE OF SENSORS TO DETECT DIFFERENT WASTE TYPES)

IMPROVED RECYCLING TECHNOLOGY

MORE WASTE PROCESSING-BASED ENERGY PRODUCTION

ADAPTATION TO EU POLICY PRIORITIES AND TRANSPOSITION OF EU LEGISLATION

CITIZENS' AWARENESS OF AND DEMAND FOR MORE EFFICIENT AND EFFECTIVE WASTE MANAGEMENT

REDESIGN OF PRODUCTS TO REDUCE WASTE

RECYCLING AND RECOVERY OF SCARCE HIGH-VALUE MATERIALS

Transformation drives demand for advanced service-oriented skills

© iStock/Pekic

The shift from disposal of waste to recycling it for use in a wide range of products and processes translates into changes in skill needs and increases demand for more advanced, technologically driven skillsets. Reinforced by the EGD and technological developments, high-level skills will be needed, not just in the waste management sector itself but beyond: waste management practices will increasingly concern and extend across a range of sectors ([3]). While skills upgrading is the leading trend, the sectoral context in which waste is managed determines what skill needs are and will be trending.

The types of skills employers need will include 'technical'/waste management specific ones, and transversal and soft skills. Experts agreed that skills and training demand have increased over time, even in occupations traditionally regarded as 'low-skilled', requiring (almost) no training in the past. As a result, it is expected that the VET programme offer relevant to waste management, including apprenticeships, will expand.

([3]) See for example, for the hospitality/tourism sector Fifty shades greener in Ireland and the Training opportunities for employees in various sectors offered by ADEME in France.

Experts acknowledged the growing importance of service-oriented activities, such as communicating to organisations how to recycle, and educating citizens on what types of waste can be recycled and how best to do it. Demand for staff in non-manual occupations, such as sales, marketing, and customer service flourishes. As waste processing will increasingly rely on data collection (e.g. through bins with sensors), analysis and data-driven sectoral innovation, demand for data analysts, engineers, repairers, waste ambassadors, and eco-designers is expected to keep growing.

Logistics professionals will play an important role in advancing waste handling processes. Technological advancement and process innovation will make obsolete many 'traditional' waste management jobs, such as waste handling workers, landfill operatives, waste sorters, pickers, and collectors. There are new opportunities for product lifecycle evaluators and professionals who refurbish electronic equipment or upcycle textiles or other materials.

...**waste management practices** will increasingly concern and **extend across a range of sectors**...

... employers will need **'technical'/waste management specific skills**, and **transversal and soft skills**...

...**technological advancement** and process innovation will make **obsolete many 'traditional' waste management jobs**...

New tasks tend to redefine existing occupations rather than shaping new ones

© iStock/skynesher

Foresight experts viewed the transition towards a circular economy, automation, and the recovery of scarce high-value materials as key drivers for emerging occupations/jobs in the waste management sector (Figure 5). However, they stressed that changing skill needs will predominantly reflect new tasks for existing occupations rather than completely new occupations. Underlining the importance of upskilling and career training, this is a key message for VET policy-makers.

Apart from green and digital/IT skills, many experts also saw analytical and quality assurance skills as likely to become more important. Advanced and technician-level IT and engineering skills, scientific waste processing and treatment expertise, data analysis skills, and problem-solving and communication skills (to reduce waste) are expected to be in higher demand by 2030. IT, communication and data analysis skills can be considered transferable. Corroborating findings from Cedefop's foresight on smart and green cities ([4]), citizen awareness can be a game changer for implementing and mainstreaming new waste management approaches. Professionals with relevant communication skills can expect to be in high demand.

...**changing skill needs** will predominantly reflect **new tasks for existing occupations** rather than completely new occupations...

...apart from **green and digital skills**, many experts also saw **analytical and quality assurance skills** as likely to become **more important**...

([4]) Cedefop (2022). *Cities in transition: how vocational education and training can help cities become smarter and greener*. Luxembourg: Publications Office. Policy brief.

Figure 5. **Emerging occupations and jobs in the waste management sector**

- waste managers and coordinators
- waste valorisation professionals
- waste industrial mechanics
- logistics managers, data analysts
- quality assurance managers
- energy experts
- waste sorting process optimisation professionals
- strategic waste managers
- designers of industrial plants for the circular economy
- technical engineers (e.g. to design recyclable products)
- material extraction, recycling and reuse specialists/experts
- waste management trainers
- repair specialists

Manufacturers need waste management expertise and production process optimisation skills

© iStock/SeventyFour

Some experts pointed out that the increased emphasis on producer responsibilities for managing waste in legislation might push them to become waste handlers themselves. In doing so, they become responsible for thinking about the sustainability of their products – from the design phase onwards – and about waste disposal. This would imply that professions in demand in the waste management sector, such as recycle/upcycle specialists and collecting/sorting workers will also be required in manufacturing companies.

Beyond these key profiles, knowledge of concepts such as material reutilisation, waste reduction and management, recycling and reducing, and circular business models is likely to become relevant for roles in manufacturing indirectly supporting waste management, such as corporate training managers ([5]). The introduction or expansion of taxation on pollution and waste might increase the demand for staff with skills relevant to cost optimisation in production processes, such as economists.

([5]) Akyazi, T. et al. (2022).

...emphasis on **producer responsibilities for managing waste** in legislation might **push them to become waste handlers** themselves...

...**recycle/upcycle specialists and collecting/sorting workers** will also be required in manufacturing companies...

... **taxation on pollution and waste** might increase the demand for staff with **skills relevant to cost optimisation**...

More jobs, fewer candidates?

© iStock/martin-dm

While employment opportunities in the sector are expanding, candidates may consider them precarious and poorly paid ([6]) and therefore unattractive. Rooted in negative stereotypes of the sector as an employer, such perceptions pose challenges to recruiting staff and making progress towards a greener future with less waste. Cedefop foresight experts also viewed difficulties in introducing new types of training and skills as factors driving recruitment difficulties. To attract particular skill profiles (e.g. data analysts) waste management has to compete with sectors considered more attractive in terms of employment conditions. Delayed responses of curricula to technological innovation, national VET systems not fully delivering the skills the sector needs, and limited up- and reskilling opportunities for waste sector workers aggravate challenges in meeting sectoral skill needs.

Most experts agree that overcoming challenges in updating digital, data analysis, and design skills should be a priority for the sector. Such challenges were seen as linked to difficulties employers in the waste management sector face in retaining engineers, waste management officers, production line workers, logistics operatives and waste processing scientists, due to competition with other sectors for the same profiles. Demographic change and its impact on the number of young people may aggravate current skill shortages. This, in turn, can halt the scale and pace of change in the sector, jeopardising the transition towards waste-based energy production and the upscaling of recovering high-value scarce materials from waste.

Skill updates for those already employed in the sector can also prove demanding, particularly for engineers, data analysts, designers, and waste management officers. Experts pointed towards issues that are also challenging in other sectors: the rapid pace of technological change making some skills quickly obsolete and market characteristics diminishing the importance of skills investment. If a significant share of waste management organisations are active in a relatively low-value segment of the market, career development activities such as upskilling may be perceived as less important. The sheer scale and scope of the transitions in waste management also make skills updating challenging.

([6]) See OSHA (2020). *Accidents and injuries in the waste management sector*. Automation and digitalisation are expected to reduce occupational safety and health issues; for example, see OSHA (2021). *The circular economy and safety and health: possible implications for future waste sector workplaces*.

...**difficulties in introducing new types of training and skills** drive recruitment challenges...

...overcoming challenges in **updating digital, data analysis, and design skills** should be a priority for the sector...

...**demographic change** may aggravate **skill shortages** and halt the **scale and pace of change** in the sector...

Entering and progressing in waste management roles through VET

© iStock/ferrantraite

Making the transition to a circular economy and society puts waste management centre stage. High-quality initial and continuing VET is crucial to supplying the sector with the hands, brainpower, creativity and skills it needs to play its part in the green transition. As a pathway towards a wide range of waste management jobs (Figure 6), initial VET (IVET), including apprenticeships ([7]), can equip people with the skills, qualifications and work experience they need to find a job and start building a career in the sector.

All waste management workers, the unemployed, and people in transition can benefit from continuous VET (CVET) that strikes a balance between meeting employer needs, building on learners' aspirations and expanding employability. CVET should not only respond to immediate short-term skill needs, but also aim at strengthening the wider range of skills individuals (and employers) may need to respond to future challenges. Several VET programmes built around the principle of zero waste practices demonstrate the potential of IVET and CVET in delivering skills for waste management jobs (Box 3).

([7]) For example, Apprenticeship in recycling and waste management in Germany.

...**high-quality initial and continuing VET** is crucial to supplying the sector with the **hands, brainpower, creativity and skills**...

... **IVET, including apprenticeships**, can equip people with the **skills, qualifications and work experience** they need to find a job in the sector...

...several VET programmes built around the principle of zero waste practices demonstrate the **potential of IVET and CVET in delivering skills for waste management jobs**...

Figure 6. **Examples of waste management jobs accessible via IVET**

Box 3. **Examples of EU-funded VET projects for waste management**

CDWaste-ManageVET aims at developing a modern and innovative e-training VET programme in the construction sector.

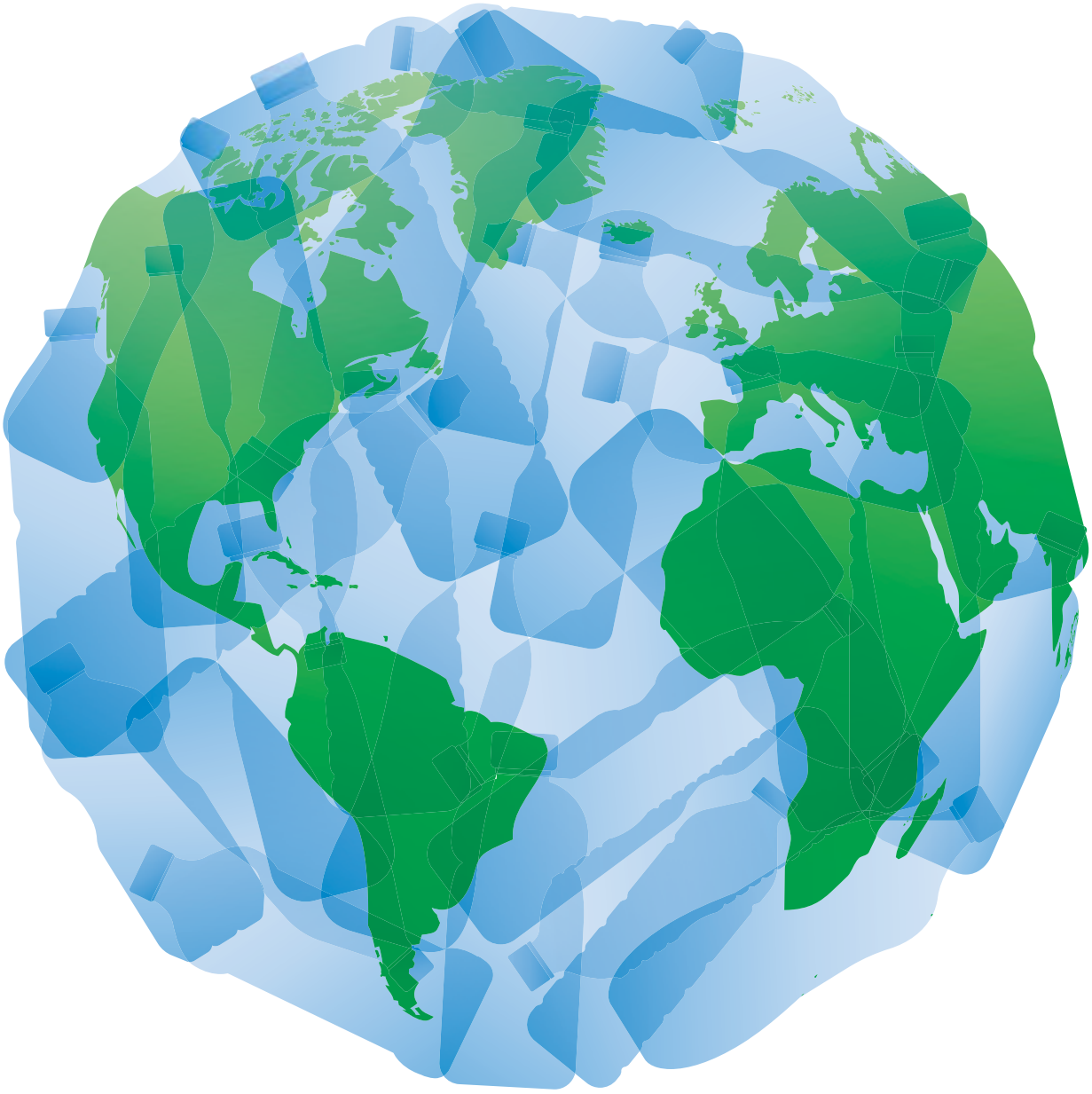
CODESMA delivered a modular VET course as an open educational resource on construction and demolition waste management.

EduZWaCE addressed VET teachers and professionals employed by waste management companies, aimed at developing a common approach to teaching about zero waste and the circular economy.

Project Zero Waste aimed at designing a curriculum for implementing waste management practices in the HoReCa industry.

WWW&CE (Management and technologies of water, wastewater, waste and circular economy) develops education and training tools for different groups of learners (e.g. IVET learners, trainers, unemployed) with sector-specific skills in environmental technologies and management.

CONCLUSIONS




© iStock/AzmanJaka

The waste management sector faces several challenges that VET and linked policies can address. As shaping and upscaling the circular economy cannot happen without the right skills, early identification of skill needs and mismatches in the waste management sector and waste management practices elsewhere should be an overarching policy priority. While not all VET and skills responses suggested by experts specifically target waste management, they can inspire targeted policy action at Member State and regional/local levels. In preparing VET systems and the current and future waste management workforce for the road ahead, the following aspects are crucial.

01 PROMOTING COMPREHENSIVE SKILLS GOVERNANCE

The current and anticipated issues, trends, and challenges waste management faces point towards the importance of systematically involving key stakeholders in the design and delivery of IVET and CVET. A collaborative approach to managing skills demand and supply helps ensure VET effectively meets the needs of employers and people working in waste management. Good practices, such as the approach followed in Sweden to developing occupational profiles – which are considered facilitators of expanding work-based learning – illustrate the potential of multi-stakeholder collaboration and the value of giving employers a central role in shaping VET ([8]).

02 GETTING EMPLOYERS ON BOARD

Employers and employer organisations may need to be encouraged or incentivised to expand training if they are to meet emerging skill needs. They need to go beyond the (mandatory) training required for regulatory compliance and adopt a more expansive skills development model in waste management roles. This will require clear communication of the benefits of training workers. The Irish Skillnet business support agency promoting enterprise-led workforce development has been effective in bringing em-

([8]) For more information, see *What skills do workers in waste management and recycling need to perform their jobs?* presentation by Thomas Nylund and Conny Larsson, 18 May 2022, NOVA Nordic conference, Reykjavik, Iceland; or the project website *NOVA-Nordic: non-formal qualifications and validation arrangements in the Nordic countries*.

...**early identification of skill needs and mismatches** affecting waste management should be an **overarching policy priority**...

...while not all **VET and skills responses** suggested by experts target waste management, they can **inspire national and regional/local policy action**...

...**employers and organisations representing them** need to adopt a **more expansive skills development model** in waste management roles...

ployers together to determine skill and training needs (thereby generating economies of scale). This helped engage SMEs in training which would otherwise lack the resources to do so. The SOLAS green skill qualifications – another Irish best practice example – can be an inspiring training format for employers to consider.

03 TAPPING THE POTENTIAL OF DYNAMIC AND MODERN VET DELIVERY

Investing in work-based learning and allowing mobility between general and vocational education pathways enrich the learning process. More agile learning contributes to developing skills waste management needs, now and in the future. The growing importance of waste management activities across sectors and the resulting staff and skill needs could be met by developing waste management modules for a wide range of VET courses and programmes that do not primarily or directly cater for the needs of the waste management sector.

© iStock/Designer

04 DEVELOPING MICROCREDENTIALS OR LEARNING CREDITS TO MEET TRAINING NEEDS

Offering modules linked to microcredentials, especially as part of CVET, can accommodate training needs linked to waste management processes. For example, an accredited module on waste management could be offered to students in education programmes that prepare them for a career as a data analyst. This makes generic data analysis skills fit for use in the waste management sector. Short courses or modules on how to treat waste sustainably can help different groups of learners (e.g. community leaders, government representatives, business managers) understand how best to apply waste management principles in their own profession. Examples include reducing the waste footprint of business and purchasing eco-innovative solutions for cities. There are promising opportunities to look further into the potential role microcredentials can play in meeting skill needs.

© iStock/sturti

05 REFLECTING LOCAL OR REGIONAL WASTE MANAGEMENT NEEDS IN CURRICULA

Tackling waste management problems in practice starts with thorough understanding of local or regional needs and challenges ([9]). Apart from differences in waste management practices between EU Member States, there is variation between and within regions in terms of the composition and treatment of waste and eco-innovation. Local and regional stakeholders are best placed to identify the most suitable solutions for setting the transformations in waste management implied by the EGD in motion. Reflecting local or regional needs in VET curricula is crucial to tackling waste management challenges. Insight into how waste management processes can be tailored to local or regional needs could help VET providers supply workforces with the necessary skills. While VET needs to be tailored so that it reflects the waste management needs of the area/local economy it serves, it should also ensure that courses and programmes equip people with transferable and adaptable skills that can be used in different contexts.

06 ENGAGING WITH CITIZENS AND RAISING AWARENESS AT GROUND LEVEL

Civil servants active in local and regional authorities are an important target group for training: they are often responsible for applying waste management practices in their job (e.g. green public procurement), and they also play an important role in improving understanding among citizens of what waste management is and how it can improve local or regional living conditions. Such awareness contributes to citizen commitment, which is crucial in making the green transition happen. Fostering understanding of the importance of new waste management practices should start at ground level, via targeted information campaigns.

07 PROMOTING CAREERS IN WASTE MANAGEMENT

Alongside general information campaigns, the wide range of career opportunities the waste management sector offers should be actively promoted among young people. Waste management organisations need to team up with VET and other education and training providers to give young people an opportunity to discover waste management: as volunteers, interns, trainees or apprentices (so they can earn while they learn). The workplace learning element is particularly important if the aim is to encourage young people to become active in waste management. Negative stereotypes that characterise waste management as being mainly about garbage collection and landfills often stand in the way of promoting the sector as dynamic, innovative, and offering good career prospects. This is why communicating the important role of waste management – and all jobs that are part of it – in the transformation to a more circular economy is essential.

([9]) See for example Eurocities (2021). *Solving the problem of waste collection and management through the Green City Accord*.

REFERENCES

[URLs accessed 28.6.2022]

Akyazi, T. et al. (2022). Identifying Future Skill Requirements of the Job Profiles for a Sustainable European Manufacturing Industry 4.0. *Recycling*, Vol. 7, No 32.

Cedefop (2021). *The green employment and skills transformation: insights from a European Green Deal skills forecast scenario*. Luxembourg: Publications Office.

Cedefop (2022). *Cities in transition: how vocational education and training can help cities become smarter and greener*. Luxembourg: Publications Office. Policy brief.

European Environment Agency (2021). *Waste generation and decoupling in Europe*. EEA indicators.

Eurostat (2022). *Waste statistics: total waste generation*. Statistics explained.

POLICY BRIEF

Too good to waste

Tapping the potential of vocational education and training in the waste management sector

Better and smarter waste management is essential to achieving European Green Deal (EGD) ambitions. Stricter regulation, increased investment, and innovation in materials processing technology and circular economy solutions boost employment and transform skill needs in the waste management sector and beyond. This policy brief reports on a Cedefop skills foresight study which looked at the occupations and skills that are central to greening waste management and the role vocational education and training (VET) can play in developing them.

Project info:
Skills and jobs for the green transition

Project contacts:
Cedefop expert, Stelina Chatzichristou
Cedefop expert, Joanna Napierala
Cedefop expert, Jasper van Loo

CEDEFOP | European Centre for the Development of Vocational Training

Europe 123, Thessaloniki (Pylea), GREECE
Postal address: Cedefop service post, 57001 Thermi, GREECE
Tel. +30 2310490111, Fax +30 2310490020, Email: info@cedefop.europa.eu

visit our portal **www.cedefop.europa.eu**

9175 EN – TI-BE-22-006-EN-N – doi: 10.2801/4348465

Publications Office of the European Union

ISBN 978-92-896-3446-5