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# *What is new in IVET?*

## *Key pointers from statistics*

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### Contents

Introduction .....	2
Key Insights .....	3
1. Is IVET an attractive learning choice? .....	5
2. Does IVET provide opportunities for further learning? .....	8
3. Is IVET international? .....	10
4. Is IVET work-based and how? .....	12
5. Is IVET less attractive for female students?.....	16
6. Which skills does IVET supply to the labour market? .....	17
7. How many recent VET graduates are employed? .....	21
8. How much is the public investment on IVET?.....	23
Annex .....	26
a) Indicators label, description, and sources .....	26
b) Additional Notes .....	27
c) Abbreviations.....	30

## Introduction

This article provides an updated and comparative statistical snapshot at EU level of Initial Vocational Education and Training (IVET). It focuses on objectives, priorities, and quantitative targets of post-2020 European VET policy cycle, which covers the period 2021 to 2025/30. The article considers levels and progress in the European Union and its Members States towards them. The data presented reflects the latest available information at the time of preparation.

In line with the International Standard Classification of Education (ISCED 2011), VET is understood and defined as education and training designed for learners to acquire the knowledge, skills, and competencies specific to particular occupations or trades (or specific classes of occupations or trades). Successful completion of vocational programmes leads to labour market-relevant qualifications acknowledged by the relevant national authorities and/or the labour market as occupationally oriented. Initial VET is understood and defined as VET undertaken before entrance into to the labour market, although in principle includes education for all age groups with programme content and qualifications that are equivalent to those of initial education. The article covers the formal component of IVET. Vocational education is distinguished from general education which is instead mainly designed to provide general knowledge, skills and competencies and often to prepare for further studies. In ISCED 2011, the distinction by orientation of education (general vs vocational) is applicable at levels 2 to 5. Data used in the article mostly refers to IVET at medium level of education, i.e. upper secondary education (ISCED level 3) and post-secondary non-tertiary education (ISCED level 4). In some cases, data at ISCED levels 3 and 4 are aggregated to compute indicators. Where relevant, indicators considered for VET are also computed and presented for education of general orientation at the same ISCED levels and under the same specifications. This is to offer contrasts and comparisons. At ISCED levels 6 to 8, the distinction between professional versus academic education is not yet supported by internationally agreed definitions, preventing the collection of comparable statistical data. More detailed information on definitions, methods, and sources for the data used in the article are in the Annex.

The article is organised in a granular way as a set of data insights. Each of them answers a specific question, relevant for policies in the area of IVET, by presenting, commenting, and analysing selected statistics and indicators. Key policy objectives, priorities and quantitative targets driving the selection of the data are drawn from the following policy documents: [Osnabrück Declaration \(2020\)](#), [Council Recommendation on Vocational Education and Training \(2020\)](#), [Council Resolution on the European](#)

[Education Area \(2021\)](#), [European Pillar of Social Rights Action Plan \(2021\)](#), [Council Recommendation 'Europe on the Move' \(2024\)](#), [European Parliament and Council Recommendation on European Quality Assurance in Vocational Education and Training \(2009\)](#).

More indicators, data and interactive charts, including EU and country specific time series, can be accessed online via Cedefop [Key indicators on vocational education and training \(VET\)](#) and its [European VET Policy Dashboard](#).

The work is part of Cedefop's continuing effort to increase availability, quality, relevance, analysis, use and dissemination of statistical information and evidence on VET and adult learning.

## Key Insights

1. **Is IVET an attractive learning choice?** In 2022, there were 8.9 million students enrolled in upper secondary vocational education, nearly half (49.0%) of all upper-secondary students in the EU. As compared to 2015, this percentage remained relatively stable (up by 0.1 percentage point), indicating that IVET remains a popular option in the EU. The number of students in upper secondary VET was also relatively stable (up by 0.2 million students). However, participation rates still vary widely across countries, ranging from over 70% to below 20%.
2. **Does IVET provide opportunities for further learning?** In the EU, 72.6% of upper secondary VET students are enrolled vocational programmes granting direct access to tertiary education (2022 data) and 38.2% of graduates from medium level vocational education participate in further education and training (2023 data for the EU as a whole). IVET is not dead-end learning pathway for students in the EU.
3. **Is IVET international?** At ISCED levels 3-4, the 2022 percentage rate of mobile IVET learners (i.e. having experienced a learning mobility abroad) is provisionally estimated at 5.1% in the EU. This still reflects effects of the COVID-19 pandemic and remains below the 2025 objective of 8%. However, it appears on the rise as compared to 2020 and 2021.
4. **Is IVET work-based and how?** In 2023 in the EU, around 64.5% of recent VET graduates have had a work experience as part of their studies of at least one month (data refer to 20-34-year-olds who obtained a vocational qualification at ISCED levels 3-4 in the last three years as their highest), this percentage is on the rise (up by 4.1 percentage points as compared to 2021). At these levels, the EU's 2025 quantitative objective of 60% is already met. However, considerable differences across member states persist, with participation rates ranging from over 90% to below 10%. Work-based learning experiences tend to be mainly but not necessarily long and

paid. In the EU overall, in 2023, 38.7% of recent VET graduates had a 'long' work experience, defined as seven months or over. Some 25.8% had a short work experience lasting one to six months. Some 41.0% of recent VET graduates had a paid work experience and 23.5% had an unpaid one. This varies considerably across Member States.

5. **Is IVET less attractive for female students?** Gender imbalances persist in IVET, with only 41.9% of female upper-secondary students enrolled in the vocational stream of education. This is the 2022 participation rate for females, relatively stable since 2015 (down by 0.5 percentage points) and well below the corresponding 2022 rate for male students (55.8%). An average gap by 14.3 percentage points is estimated for the EU as a whole. This gap, although to a varying extent, persist in almost all EU countries. Measured in terms of graduates, it is particularly evident in STEM related subjects.
6. **Which skills does IVET supply to the labour market?** In 2022, 2.2 million students graduated from upper secondary vocational education in the EU, about half of all upper secondary graduates (48.3%). Initial VET continues providing skills for the whole economy. In the EU, in 2022, 32.7% of upper secondary VET graduates obtained a qualification in subjects related to engineering, manufacturing, construction; some 17.4% graduated in business, administration and law, and a further 15.1% graduated in fields related to numerous personal services, including hair and beauty, hotel, restaurant, catering, sports, travel, tourism and leisure services. Social services for health and welfare together accounted for 12.9% all upper secondary VET graduates. Graduates in STEM related subject were around 38.7% of upper secondary VET graduates in the EU. However, only 4.8% of upper secondary VET graduates obtained a qualification in information and communication technology. Major gender imbalances still characterise graduation patterns in upper secondary VET, particularly in STEM subjects. Females are only 7.1% of all upper secondary VET graduates in engineering and engineering trades and 12.5% in ICT. The share of females exceeds 80% of upper secondary VET graduates in Health and Welfare.
7. **How many recent VET graduates are employed?** In 2023, 81.0% of recent IVET graduates were employed in the EU (i.e. 81.0% of those aged 20-34 having obtained an ISCED 3-4 vocational qualification in the past 1-3 years as their highest). The indicator went up by 3.9 percentage points as compared to 2021. At this level, the indicator is just one percentage point below the 2025 EU target of 82%. The employment rate of recent IVET graduates remains higher than the calculated rate for their counterparts having recently graduated from general education at ISCED levels 3-4 and not being in further education or training (67.6%), the difference between the two employment rates calculated using the same specifications highlight an estimated

average employment premium of 13.4 percentage points. Although at different levels, this premium is present in most but not all countries.

8. **How much is the public investment on IVET?** In 2021, in the EU, public investment in medium level IVET (ISCED 3-4) is estimated at 0.53% of GDP and is relatively stable as compared to 2015 (down by 0.02 percentage points). Considerable cross-country variability persists. The same holds when considering public investment in IVET per student enrolled. In this case, however, in most countries for which reliable comparisons can be made for the period 2015-2021, increases can be observed.

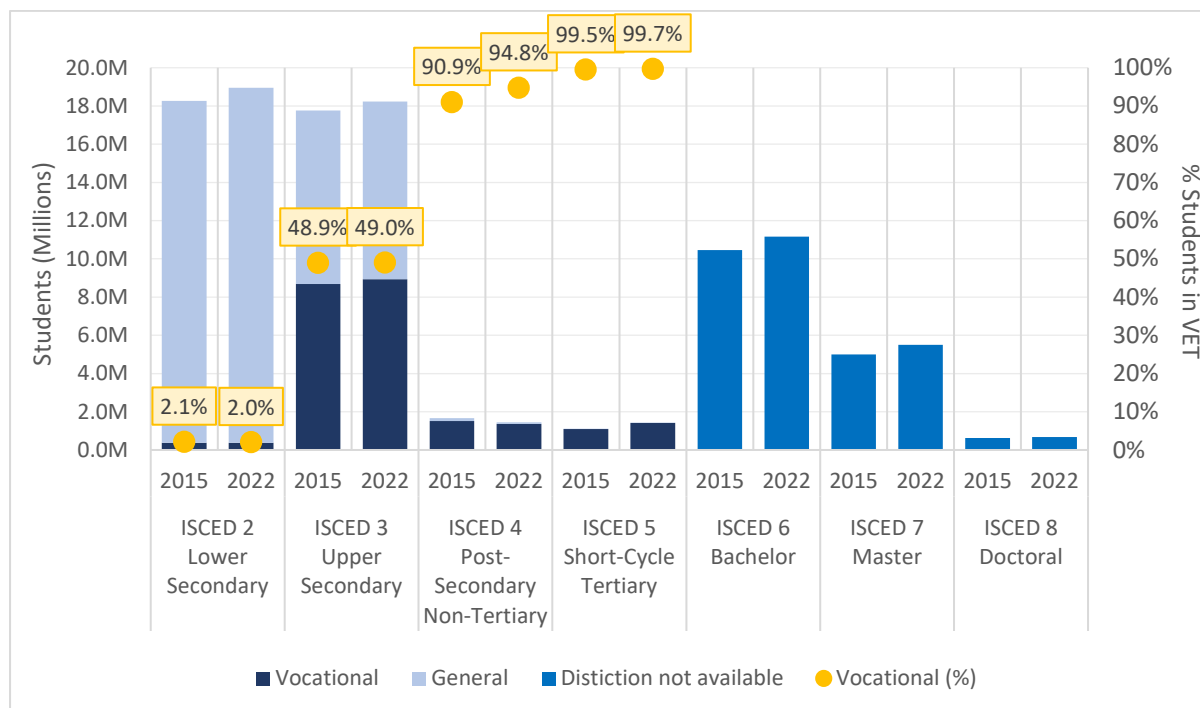
## 1. Is IVET an attractive learning choice?

European education and training policy promotes initial vocational education and training (IVET) as an attractive learning choice ([Osnabrück Declaration \(2020\)](#), [Council Recommendation on Vocational Education and Training \(2020\)](#)). Participation in initial VET can be considered a proxy measure of its attractiveness, although it does not always and necessarily reflect individual preferences for general or vocational education.

**Figure 1. a** shows the number of students enrolled in vocational programmes at various ISCED levels, in millions and as a percentage of students enrolled at the same level. Data are presented for 2015 and 2022.

Initial VET mainly starts and mainly takes place at upper secondary level of education (ISCED level 3). At this level, in 2022, there were 8.9 million IVET students in the EU, almost half of the total number of upper secondary students (49.0%). Enrolments in upper secondary VET have remained relative stable over the period 2015-2022 in the EU: at ISCED level 3, the number of VET students went up by 0.2 million and their share (as a percentage of all students enrolled in upper secondary education) went up by 0.1 percentage points.

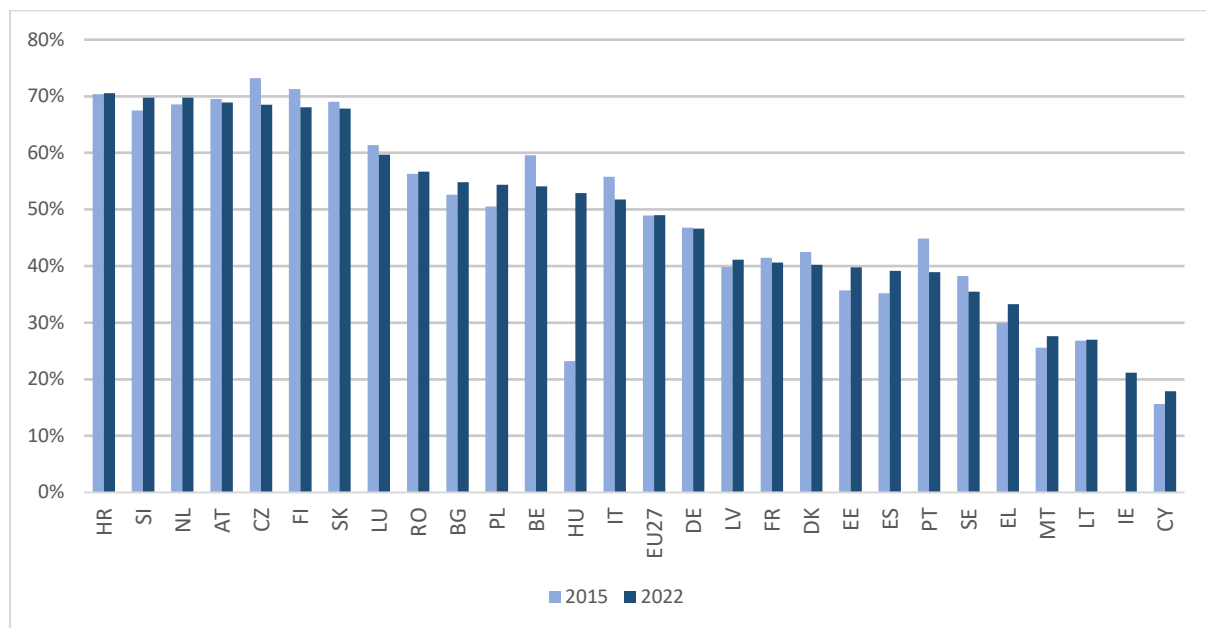
Figure 1.a - Students in VET by ISCED levels 2 to 5 (in million and as % of students in the same ISCED level), students enrolled in ISCED 6 to 8. EU. 2015 and 2022.



Source: Cedefop calculation based on Eurostat data, UOE data collection on formal education. NB: Vocational Students absolute numbers: ISCED 2: 2015 - 0.4M, 2022 - 0.4M; ISCED 3: 2015 - 8.7M, 2022 - 8.9M; ISCED 4: 2015 - 1.5M, 2022 - 1.4M; ISCED 5: 2015 - 1.1M, 2022 - 1.4M.

Considerable cross-country variability persists (Figure 1.b). The number of students in upper secondary VET as a percentage of all upper secondary students ranges from 71.5 % in Croatia to 17.9% in Cyprus. From 2015 to 2022, most countries have shown minor increases since 2015. Changes have been between +/- 5 percentage points, apart from 3 countries. Based on available data, In Hungary, an increase by 29.8 percentage points is observed (the largest change). In Portugal and Belgium there were drops by 6.0 and 5.5 percentual points, respectively. Belgium still has more than half of students enrolled in vocational programs (54.1%); it is not the same case for Portugal where only 38.9% (lower than EU27 average) attend VET at upper secondary level.

Figure 1.b - IVET students at ISCED 3 (as % of all upper secondary students). 2015 and 2022.



Source: Cedefop calculation based on Eurostat data, UOE data collection on formal education.

At ISCED level 4 (post-secondary non-tertiary level) and level 5 (short-cycle tertiary education), enrolments in VET accounts for almost all of the enrolments at the corresponding ISCED levels (more than 90%), but, in absolute terms, they are considerably fewer than the 8.3 million reported at ISCED level 3 (data are for the EU as whole). In 2022, there were 1.4 million VET students at ISCED level 4 (94.8% of all post-secondary non tertiary students) and an additional 1.4 million VET students in short-cycle tertiary education (99.7% of all students at ISCED level 5). As compared to 2015, no substantial change can be observed: IVET at ISCED level 4 showed a drop by 0.1 million enrolments as compared to 2015 (share up by 3.8 percentage points), while IVET at ISCED level 5 showed an increase by 0.3 million students (share up by 0.2 percentage points). VET programmes at ISCED levels 4 and 5 are present in most countries but enrolments still tend to be geographically concentrated. Two thirds of all post-secondary non-tertiary VET students can be found in Germany (49.0%, i.e. 0.7 million) and Poland (17.0%, i.e. 0.2 million); 77.0% of all short-cycle tertiary vocational students in the EU can be found in Spain and France over 0.5 million in each country.

The overall pattern by which, at ISCED level 4 and 5, enrolments are by far large concentrated in vocational programmes holds in almost all countries, however, based on 2022 data for ISCED level 4, in 3 countries, less than half of students were enrolled in vocational programmes: Czechia (22.7%), France (44.1%) and Malta (46.4%). At ISCED level 5, it is observable a drop since 2015, for Malta (41.4%, down from 59.9% in 2015), and for Sweden (92.3%, up from 80.5% in 2015).

In the EU, in 2022, the 1.4 million students in short cycle tertiary VET (ISCED 5) are a small proportion of all students in tertiary education, accounting for about 7.5% of the 18.5 million students at ISCED level 5 or above. This includes 11.2 million students at Bachelor level (ISCED level 6), 5.5 million students at Master level (ISCED level 7) and 0.7 million students at Doctoral level (ISCED level 8). At higher levels of tertiary education (above ISCED 5), international statistics do not distinguish between vocational and general programmes and qualifications. An internationally agreed definition supporting the distinction between academic and professional education that would enable the collection of such data is being discussed. In the EU as whole, enrolments in tertiary education grew as compared to 2015, but there is no sign that this happened at major expenses of enrolments in upper secondary VET, which shows no remarkable decrease in absolute or relative enrolments. The policy attention to IVET in the EU may have well played a role in this sense. It is important to recall that based on [Cedefop Opinion Survey on VET \(2016\)](#), IVET has a positive image as perceived by the general population in the EU, but this perception is not as positive as for education of general orientation: about two thirds of respondents (67.4%), agreed that IVET has a positive image in their country (of which 14.4% very positive and 53% fairly positive); however 73.5% of respondents agreed (31.9%) or tended to agree (41.6%) that general education has a more positive image.

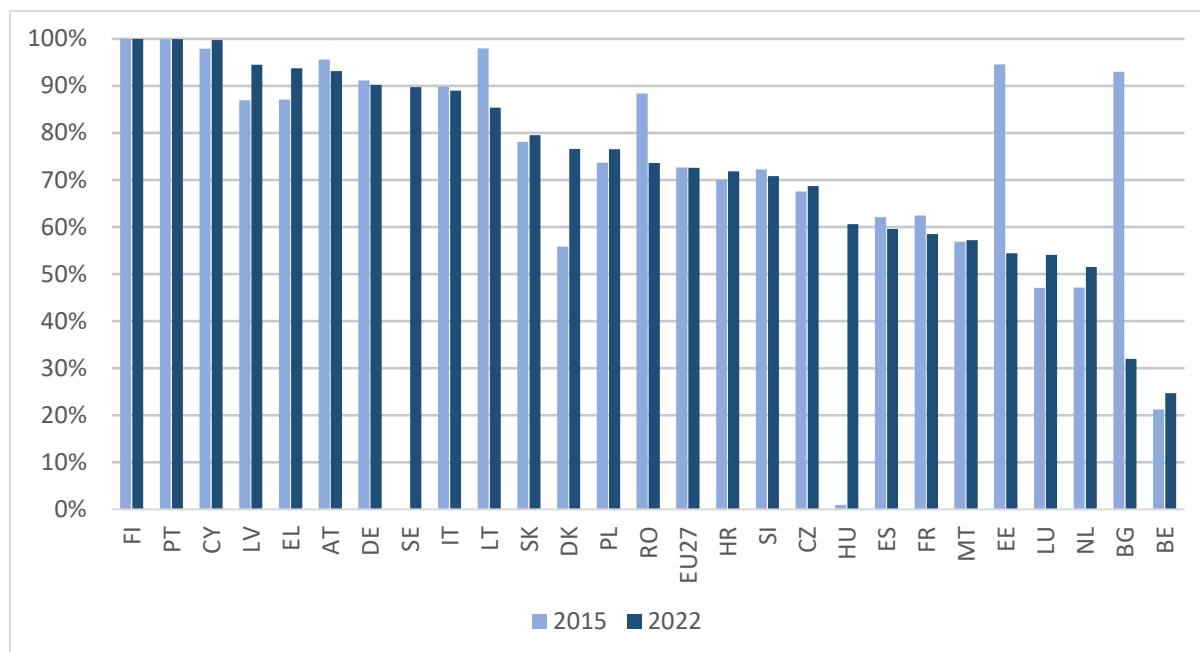
## 2. Does IVET provide opportunities for further learning?

Flexibility of learning pathways across levels and types of education and training, permeability of systems, access to further education and training are important aspects for (potential) IVET learners ([Osnabrück Declaration \(2020\)](#), [Council Recommendation on Vocational Education and Training \(2020\)](#)).

In 2022, in the EU, 72.6% of upper secondary IVET students were enrolled in programmes granting direct access to tertiary education. In almost all countries, the 2022 values are higher than 50%. Only in Belgium (24.7%) and Bulgaria (32%), the indicator is lower than that. On the other hand, in Finland, Portugal and Cyprus is close or at 100% (**Figure 2.a**).

As compared to 2015, EU average estimates did not change. In most countries, the indicator was relatively stable in the period 2015-2022. Largest positive changes are estimated for Denmark (by 20.8 percentage points) and Hungary (by almost 60 percentage points). Largest negative changes are found in Estonia (still above the EU average value) and Bulgaria (now below that).

Figure 2.a - IVET students in programs with direct access to tertiary education (as % of all upper secondary IVET students). ISCED 3. 2015 and 2022.



Source: Cedefop calculation based on Eurostat data, UOE data collection on formal education. NB: data not available for Ireland (both years) and Sweden (2015).

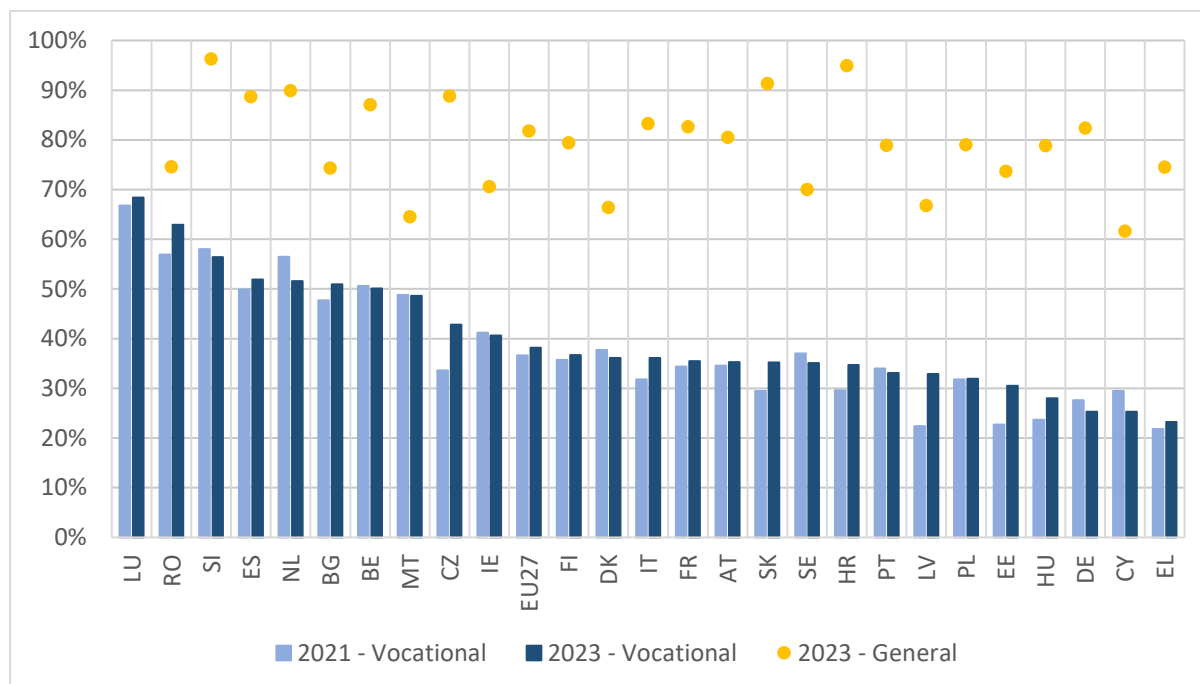
Based on LFS data, it is also possible to estimate the extent to which IVET graduates continue in further education and training and compare results over time and with those related to graduates from the general stream of education. (Figure 2.b).

In 2023, in the EU, an average 38.2% of graduates aged 18 to 24 and holding a medium level vocational qualification as their highest, said that they were in further education and training. There is considerable variation across countries. 2023 estimates are highest for Luxembourg, Romania, Slovenia, Spain, the Netherlands, Bulgaria, and Belgium (all above 50%). Lowest values are estimated for Greece, Cyprus, Germany, and Hungary (all below 30%).

As compared to 2021, the EU average value for the indicator is relatively stable. The same holds in most countries. Largest increases were found in Latvia and Czechia.

Participation in further education and training is typically and considerably lower for young graduates with a medium level vocational qualification than for their counterparts from the general stream of education, which is mainly designed and undertaken to this end (2023 EU average at 81.8%). However, that about 40% of VET graduates in the EU go on to further education and training shows that VET provides opportunities for further learning, and it is not a dead end in this sense.

Figure 2.b - Young IVET graduates in further learning education and training (% of all VET graduates). 2021 and 2023.



Source: Eurostat data, EU LFS. NB: 2021 data for *Bulgaria*, *Croatia*, *Slovakia*, and *Slovenia* is not published due to a break in time series. Data for *Lithuania* in both years is not published due to low reliability. Data for *Luxembourg* general education is not available.

### 3. Is IVET international?

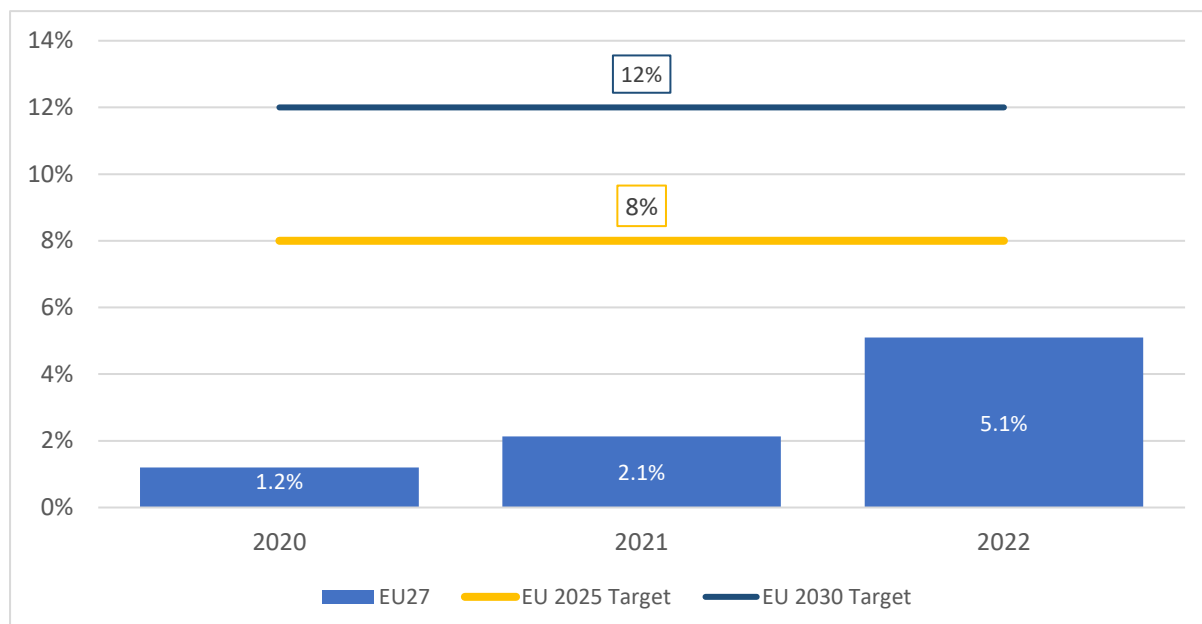
The EU promotes internationalisation of education and in particular international mobility for learning purposes, including in IVET. For IVET quantitative targets for the EU as a whole have been established. Based on the [Council Recommendation on Vocational Education and Training \(2020\)](#) 8% of IVET learners should benefit of from a learning mobility abroad by 2025. Based on [Council Recommendation 'Europe on the Move' \(2024\)](#) 12% of them should do so by 2030.

The indicator presented in **Figure 3. a** is calculated in line with agreed specifications as the percentage rate of mobile IVET learners. This is the number of mobile IVET learners in a calendar year having experienced a mobility abroad of at least 10 days, expressed in relative percentage terms as a proportion of a cohort of IVET graduates in the same year. IVET at ISCED levels 3 and 4 is considered for learners and graduates.

Data are provisional estimates still affected by the impact of the COVID-19 pandemic. Based on those, it is estimated that in 2022, 5.1% of IVET learners benefited from a learning mobility abroad, about 3 percentage points short of the corresponding 2025 target. Comparisons over time are to be interpreted with some caution, but they suggest an upward favourable trend. Due to the transition between the old and new programme, certain variables enabling country level data are absent,

therefore country level data are not published for the reference year 2022. Based on 2021 country level estimations, Latvia, Lithuania, and Cyprus were above 8%.

**Figure 3.a - IVET students who benefitted from learning mobility abroad. ISCED 3-4. EU. 2020-2022.**



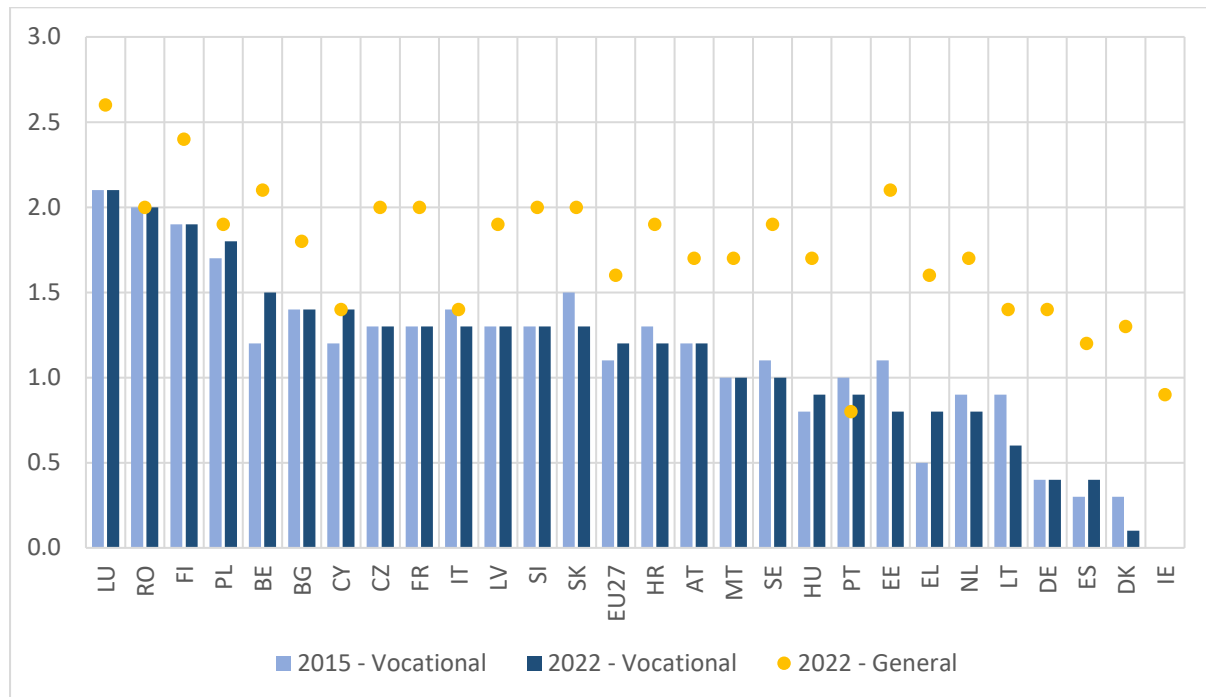
*Source: Cedefop calculation based on European Commission methodology and specifications, Erasmus+ data supplied at Cedefop request as well as Eurostat data, UOE data collection on formal education. NB: Data are provisional estimates are affected by the impact of the COVID-19 pandemic. Due to the transition between the old and new programme, certain variables enabling country level data are absent, therefore country level data are not published for the reference year 2022.*

Learning of foreign languages supports internationalisation and cross-border mobility in IVET. **Figure 3.b** shows the average number of foreign languages learned by students in upper secondary vocational education. Data are compared with those for students in upper secondary general education.

In the EU, in 2022, students in upper secondary vocational education learned an average of 1.2 foreign languages (**Figure 3.b**). Data were highest in Luxembourg and Romania (at or above 2) and lowest in Denmark, Spain, and Germany (below 0.5). As compared to 2015, the EU average value resulted relatively stable (up by 0.1 points on the indicator scale). Largest changes by 0.3 points on the indicator scale were observed in Greece and Belgium (increases) as well as in Estonia and Lithuania (drops).

Students in upper secondary vocational education tends to study fewer foreign languages than their counterparts from general education. The 2022 EU average of 1.2 for IVET students compares to 1.6 for students in general education (with a gap by 0.4 points on the indicator scale). Unfavourable gaps are found in almost all countries for which data are available. Only in Portugal, the value for general education is slightly higher than in vocational education and only in Romania and Cyprus is on par. In other countries a gap is observed. This is smallest in Italy and Poland (by 0.1 points on the indicator scale) and largest in Estonia, Germany, and Denmark (at or above 1 point).

Figure 3.b - Average number of foreign languages learned in IVET. ISCED 3. 2015 and 2022.



Source: Eurostat, UOE data collection on formal education. EU averages are Cedefop estimations based on available country data. NB: IVET data of Ireland is not available.

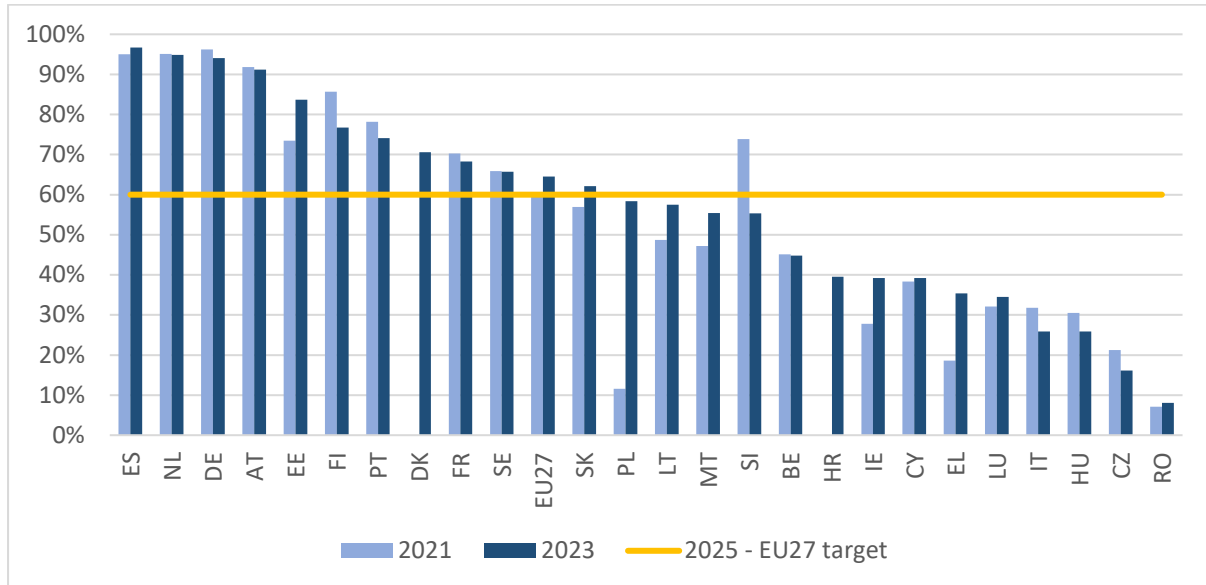
#### 4. Is IVET work-based and how?

VET equips labour force with knowledge, skills and competences that are relevant for the ever-changing labour market and has a distinctive focus and identity, playing a key role at the interface of education and training, employment, and economic policies. Apprenticeships and work-based learning embedded in a real-life work environment improve employability ([Osnabrück Declaration \(2020\)](#)). In the *2010-20 European VET policy cycle*, the *Bruges communiqué* and the *Riga conclusions* called for work-based learning to become a key feature of initial VET systems.

The [Council Recommendation on Vocational Education and Training \(2020\)](#) and the [Council Resolution on the European Education Area \(2021\)](#) continue to emphasise the importance of work-based learning in VET. They set a quantitative target for the EU overall that, by 2025, 60% of recent graduates from VET aged 20 to 34, who obtained a VET qualification at ISCED level 3-4 as their highest in the last three

years, should have experienced a (cumulative) period of at least one month of work-based learning as part of their VET studies, whether paid or not, mandatory or not in their curriculum.

**Figure 4.a - Recent IVET graduates (20-34 years old) with a work-based learning experience as part of their vocational education and training (%). 2021 and 2023.**



**Source:** Eurostat, EU LFS. The indicator covers graduates who obtained a VET qualification as their highest at ISCED 3-4 in the last 3 years. **NB:** Data for Bulgaria and Latvia and 2021 data for Denmark are not published due to low reliability. 2021 data for Croatia and Slovenia is not displayed due to a break in time series in 2023. 2021 and 2023 data for Germany, Hungary, and Cyprus; 2023 data for Finland, Poland, and Hungary; 2021 data for Ireland should be interpreted with caution as they are affected by some reliability issues.

In 2023, the EU average share of recent VET graduates having experienced work-based learning as part of their studies was estimated target at 64.5% (up by 4.1 percentage points as compared to 2021). At this level, the quantitative target is already met. Considerable cross-country variability persists. In 14 countries the share is estimated below 60% and in 9 at or below 40% (**Figure 4. a**). As compared to 2021, largest increases are observed for Poland, Greece Ireland, and Estonia (by 10 percentage points or more).

On average, periods of work experience in VET, tend to be long and paid. At EU level, in 2023 38.7% of recent VET graduates had a long work experience as part of their studies, *i.e.* seven months or more, while 25.8% had a short period of between one and six months (**Figure 4. b**). Some 41% had a paid

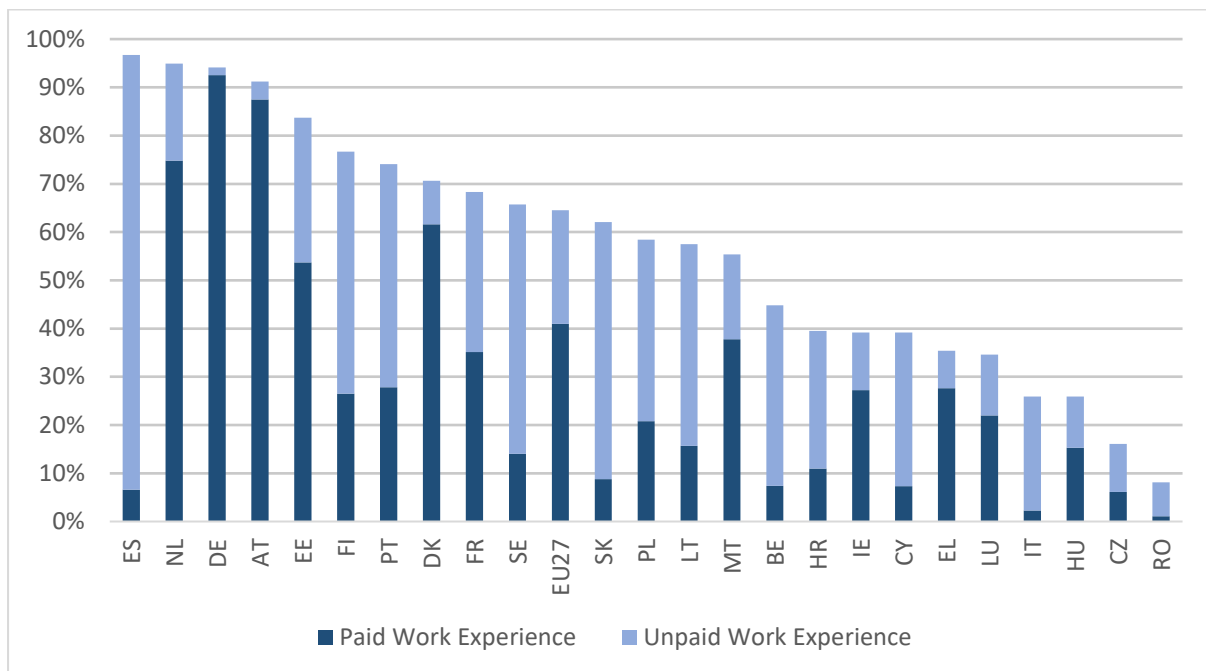
work experience, while 23.5% had an unpaid one (Figure 4. c). However, patterns considerably change across- countries.

Figure 4.b - Recent IVET graduates (20-34 years old) with a work-based learning experience as part of their vocational education and training (% of recent VET graduates) by duration of the experience. 2023.



Source: Eurostat, EU LFS. The indicator covers graduates who obtained a VET qualification as their highest at ISCED 3-4 in the last 3 years. The breakdown is distinguished by short work experience (1 to 6 months) and long work experience (7 months or over). NB: Data for Bulgaria, Latvia, and Slovenia are not displayed to low reliability. Data for Germany, Malta, Cyprus, Croatia, Lithuania, Finland, Ireland, Luxembourg, Poland, Portugal, Romania, and Hungary should be interpreted with caution as they are affected by some reliability issues.

Figure 4.c - Recent IVET graduates (20-34 years old) with a work-based learning experience as part of their vocational education and training (% of recent VET graduates), by remuneration of the experience. 2023.



Source: Eurostat, EU LFS. The indicator covers graduates who obtained a VET qualification as their highest at ISCED 3-4 in the last 3 years. The breakdown by remuneration distinguishes paid work experiences and unpaid work experiences. NB: Data

*for Bulgaria, Latvia, and Slovenia not displayed due to low reliability. Data for Germany, Ireland, Greece, Croatia, Cyprus, Lithuania, Luxembourg, Hungary, Malta, Austria, Poland, Romania, and Finland should be interpreted with caution as they are affected by some reliability issues.*

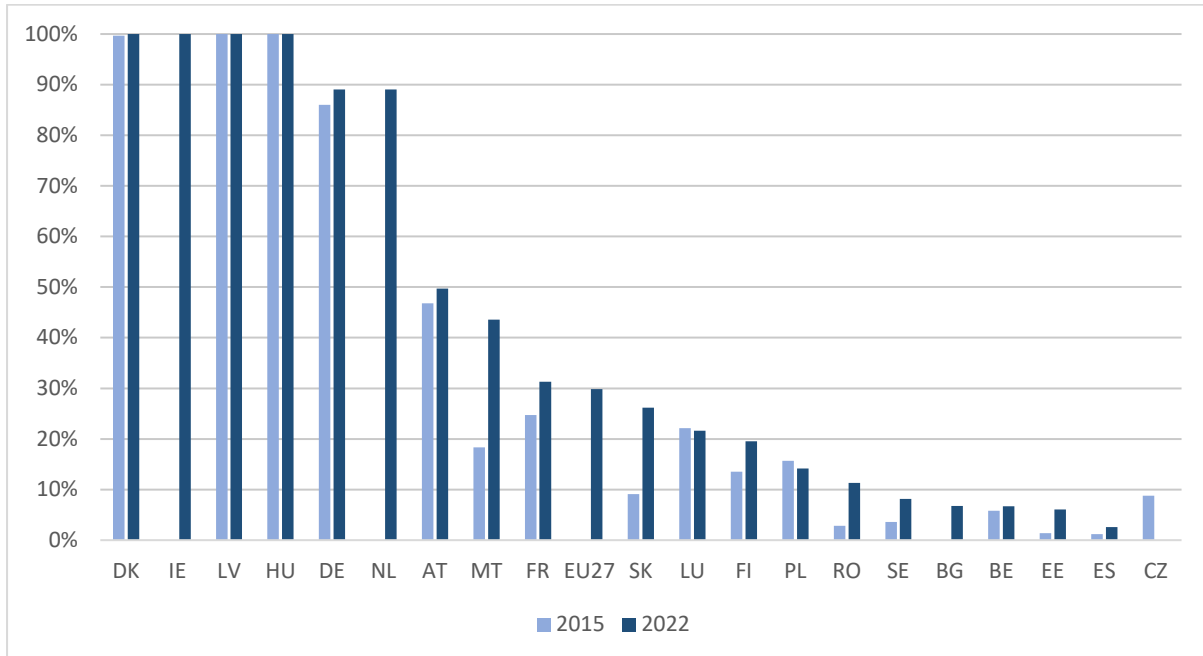
Spain shows the highest share of VET graduates with work-based learning experiences (94%): they largely go through short and unpaid experiences. On the other hand, the Netherlands, Germany, and Austria, but also Denmark, achieve high levels of the target indicator combining long and paid work-based learning experiences, reflecting well-established and attended apprenticeship schemes. Most countries where the overall target indicator is estimated below the EU target tend to have a composition of the work-based learning experiences more oriented towards short work-based learning experiences.

These findings can be complemented by how many students in initial VET are enrolled in programmes combining work- and school-based components, as opposed to vocational programmes which are solely, or mainly, school-based. The indicator is defined as the percentage of upper secondary VET students enrolled in combined work- and school-based programmes. In the UNESCO, OECD, Eurostat data collection on formal education (UOE), a vocational programme is classified as combined work- and school-based if between 25% and 90% of the curriculum is presented outside the school environment; otherwise, it is classified as school-based. This definition includes apprenticeships.

Using Eurostat data, Cedefop estimates that in the EU, in 2022, 29.8% of upper secondary VET students were enrolled in combined work- and school-based programmes (**Figure 4. d**). Although comparisons over a more extended period of time are not possible, the value is estimated relatively stable as compared to 2019 (29.4%). This suggests that the prevalence of work-based learning for the EU overall, if measured according to narrower UOE criteria, is well below the estimates from the LFS on recent VET graduates benefiting from work experience. Data on work experience refers to graduates, data on work-based learning refers to students. More importantly, work-based learning is defined more narrowly to capture apprentice type schemes in formal initial VET, which are characterised by structured, paid, mandatory and long term alternance between school and work. There are wide variations across countries in the availability of, and enrolments in, such schemes. Over the period 2015-2022, most countries, participation rates in combined work- and school- based VET have

remained stable or increased. Largest increases are observed in Malta, Slovakia, and Romania respectively about a (about 25, 17 and 9 percentage points).

**Figure 4.d - IVET students in work-school combined programs as % of all upper secondary IVET. ISCED 3. 2015 and 2022.**

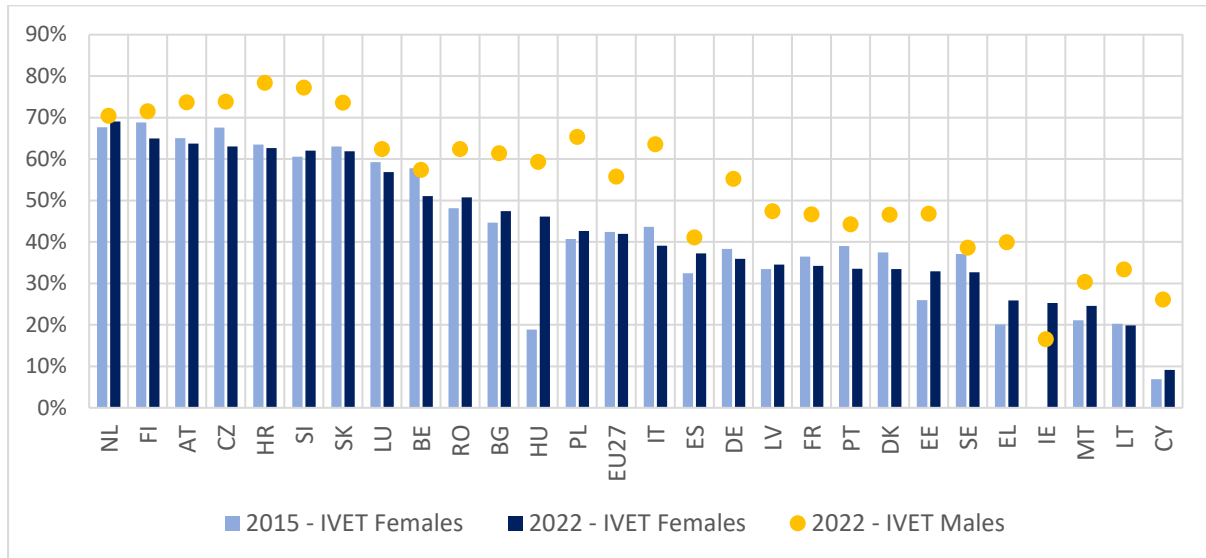


**Source:** Cedefop calculations, based on Eurostat data, UOE data collection on formal education. EU averages are Cedefop estimations based on available country data. **NB:** 2015 data for the Netherlands and the EU are not presented due to break in time series. Data for the Netherlands refer to public education only. The distinction between combined work-based and school-based and mainly school-based vocational programmes is not applicable for statistical purposes in the EU member states not displayed in the chart.

## 5. Is IVET less attractive for female students?

Gender balance in IVET is particularly important ([Council Recommendation on Vocational Education and Training \(2020\)](#); [European Parliament and Council Recommendation on European Quality Assurance in Vocational Education and Training \(2009\)](#)).

Figure 5.a - Female IVET students as % of all female upper secondary students. ISCED 3. 2015 and 2022.



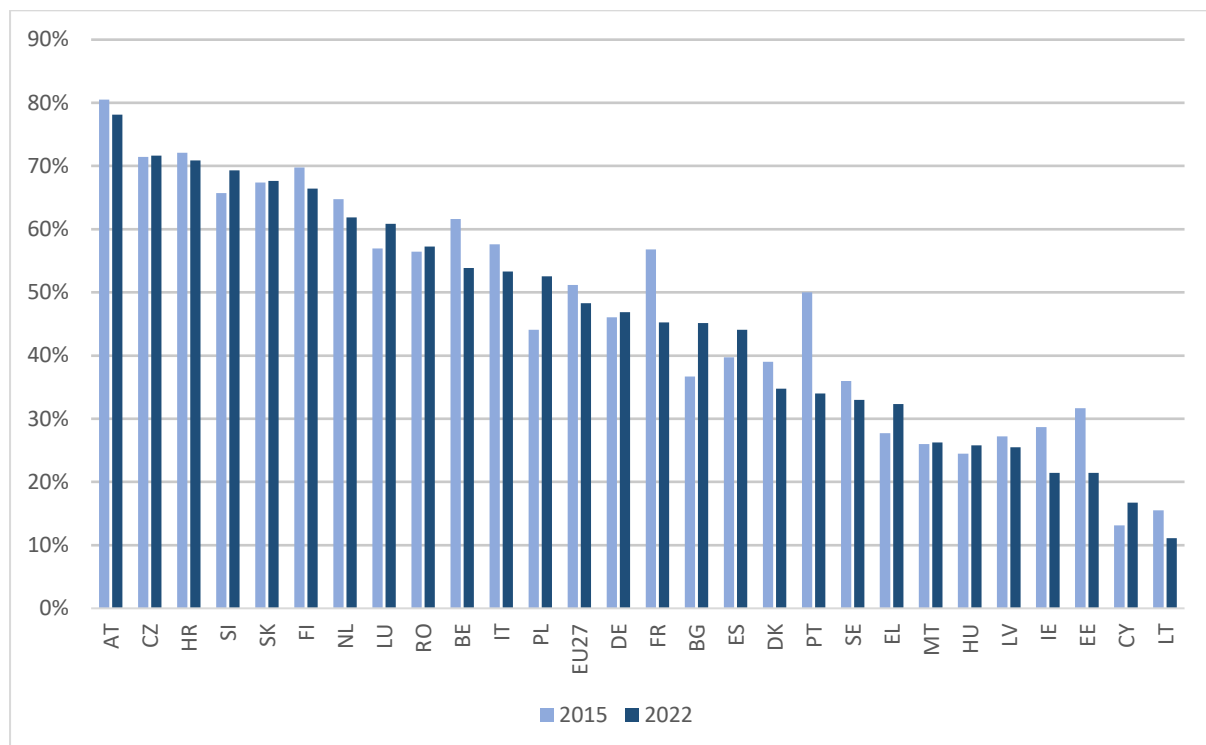
Source: Cedefop calculations, based on Eurostat data, UOE data collection on formal education. NB: 2015 data for Ireland is not available.

In 2022, 49.0% of all upper secondary students in the EU were enrolled in vocational programmes. However, participation in IVET programmes among male students (55.8%) was considerably higher than among female students (41.9%). Although at different levels, this pattern holds in most countries. Based on available data, Italy, Poland, and Germany show the largest gap by gender with participation rates resulting higher for males than for females. Ireland is the only country where the participation rate is higher for females than for males. As compared to 2015, the indicator specified for female students was relatively stable in 2022 (down by 0.5 percentage points). At country level, in most member states changes were of at most +/-5 percentage points. Based on available data, largest increases were observed in Hungary (+27.2 percentage points), Estonia (+7.0) and Greece (+5.8). Largest decreases in female participation were observed in Portugal (-5.5 percentage points) and Belgium (-6.7).

## 6. Which skills does IVET supply to the labour market?

In 2022, 2.2 million students graduated from vocational upper secondary education (48.3%, of all upper secondary graduates in the European Union). This is aligned with enrolments patterns at the same ISCED level (49.0%) and reassures that, overall, there are no major differences between enrolments and graduation patterns in VET (as percentages of the corresponding totals). As compared to 2015, a drop by 2.9 percentage points is observed in the share of upper secondary graduates from the vocational stream of education in the EU.

Figure 6.a - IVET graduates (as % of all upper secondary graduates). ISCED 3. 2015 and 2022.



Source: Cedefop calculations, based on Eurostat data, UOE data collection on formal education.

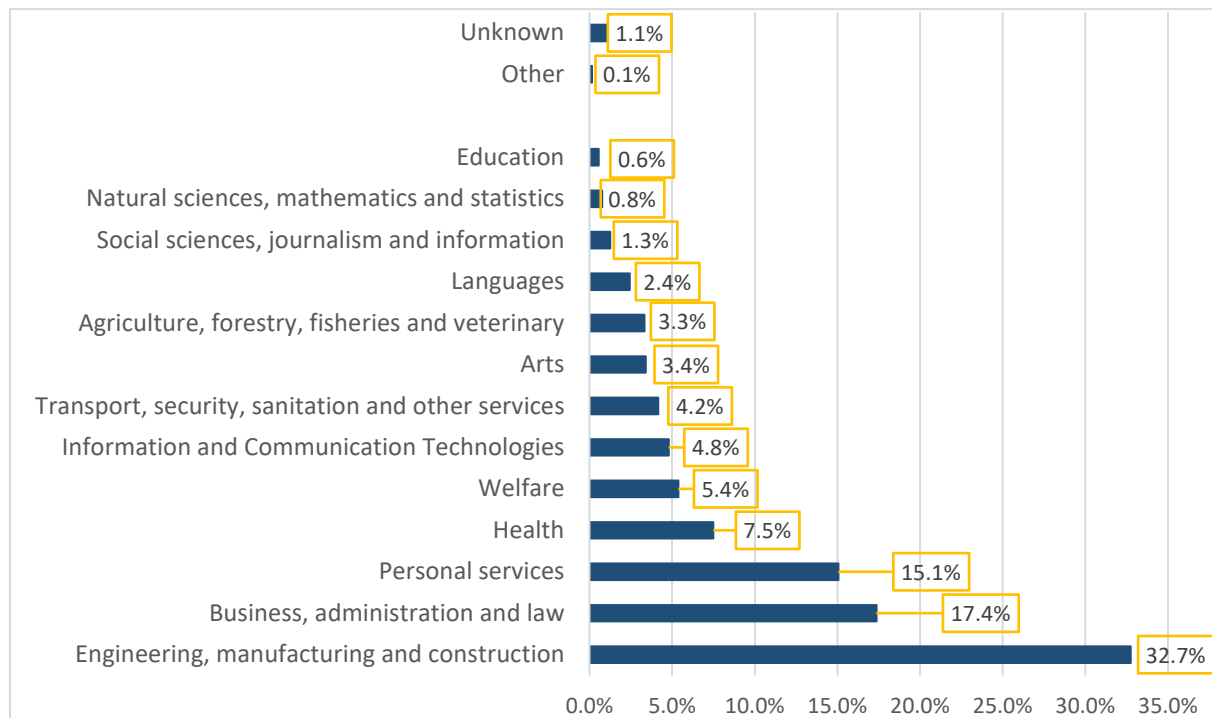
The indicator shows different dynamics over time at country level. In some Member States it went down, in others it went up. In most countries changes were contained between +/- 5 percentage points. Largest decreases (by more than 5 percentage points) were observed in Ireland (-7.2), Belgium (-7.8), Estonia (-10.2), France (-11.5) and Portugal (-16.0). On the opposite side, increases by more than 5 percentage points are observed in Bulgaria (+8.5) and Poland (+8.4), with the latter now reporting indicator values above the EU average.

Looking at the studies followed by initial VET graduates gives insights into the skills they bring into the labour market. **Figure 6. b** shows the 2022 EU level distribution of upper secondary VET graduates by field of education (as a share of the total number upper secondary VET graduates).

In the EU, in 2022, about 32.7% of all upper secondary graduates from initial VET obtained qualifications in subjects related to engineering, manufacturing and construction (**Figure 6. b**). With almost a third of the total, this is the field with the highest share of IVET graduates, followed by Business, administration, and law (17.4%). In 2022, 15.1% graduated in in fields related to personal services (including domestic services, hair and beauty services, hotel, restaurants, catering, sports, travel, and tourism and leisure). Health and Welfare together account together for 12.9% of upper secondary graduates in the EU (7.5% and 5.4% respectively). These results reflect an idea of IVET able to expand to service economy and to go beyond the only provision of skills for industry and

construction. However, only 4.8% of upper secondary VET graduates in the EU obtained a qualification in Information and Communication Technology.

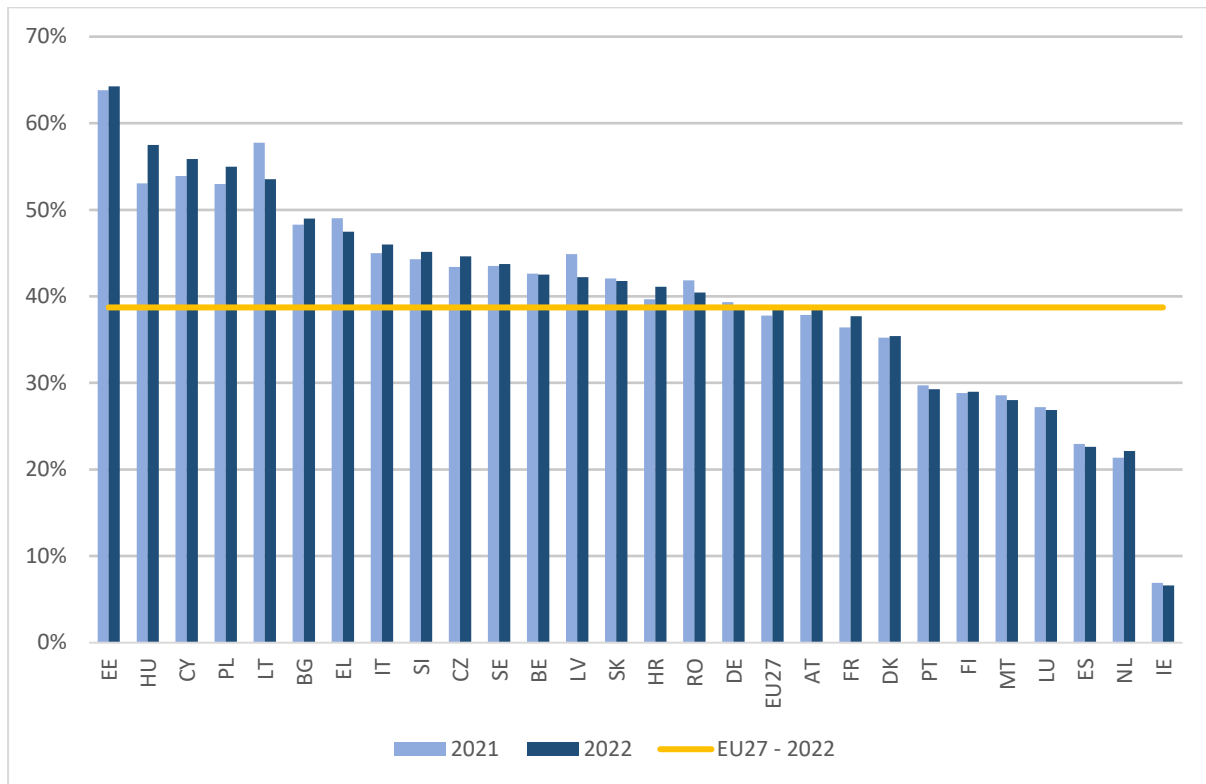
**Figure 6.b - IVET graduates by field of study (% of all upper secondary IVET graduates). ISCED 3. EU27. 2022.**



**Source:** Cedefop calculations, based on Eurostat data, UOE data collection on formal education. **NB:** ISCED-F 2013 is used to classify data by field of education. ISCED F categories at different level of detail are used to produce the chart. Arts include audio-visual and media production, fashion, interior and industrial design, fine arts, handicraft, music and performing arts. Personal services include domestic services, hair and beauty services, hotel, restaurants, catering, sports, travel, tourism, and leisure services as well as other personal services. The category transport, security, community sanitation, hygiene and occupational health and safety services is considered apart. The category "Other" in the chart includes languages and other humanities relevant for VET.

Based on 2022 data, 38.7% of initial VET students in the EU, graduated in STEM (science, technology, engineering, and maths) related subjects (**Figure 6. c**). In countries such as Estonia, Hungary, Cyprus, Poland, and Lithuania the share of upper secondary VET graduates in STEM subjects was above 50%. In others, such as Ireland, the Netherlands and Spain it was below 25%. As compared to 2021, the EU average share rose by 0.9 percentage point.

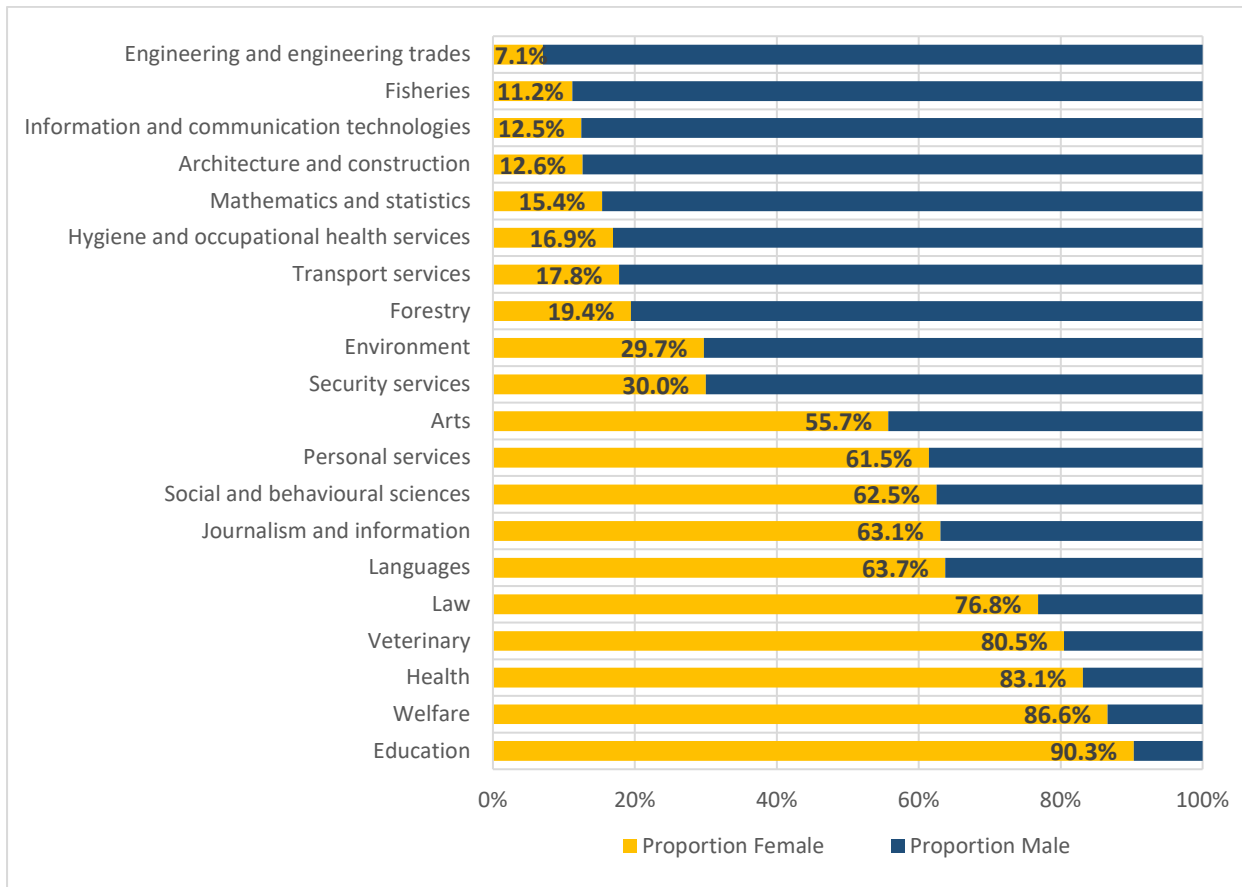
Figure 6.c - STEM graduates from upper secondary IVET (% of all VET graduates). 2021 and 2022.



Source: Cedefop calculations, based on Eurostat data, UOE data collection on formal education. The chart is based on the 2013 ISCED-F classification of fields of study. For the indicator displayed, STEM subjects are considered to be those related to natural Sciences, mathematics, statistics, information and communication technology, engineering, manufacturing, and construction.

The [Council Recommendation on Vocational Education and Training \(2020\)](#) highlights the importance of promoting gender balance in traditionally ‘male’ or ‘female’ professions and address gender related and other types of stereotypes together. **Figure 6. d** displays the 2022 EU level gender distribution of upper secondary VET graduates by selected fields of study. It shows that female graduates in STEM subjects are very few: engineering (7.1% of the total graduates in the subject), Architecture and Construction (12.6%), ICT (2.5%), Natural Science, Mathematics and Statistics (15.4%). This continues being an issue for raising attractiveness and equity in IVET. On the other hand, there are fields of VET, where graduates tend to be predominantly females such as health (83.1%), welfare (86.6%) and education (96.3%).

**Figure 6.d - Female IVET graduates in selected field of education (% of all graduates in the field). ISCED 3. EU27. 2022.**

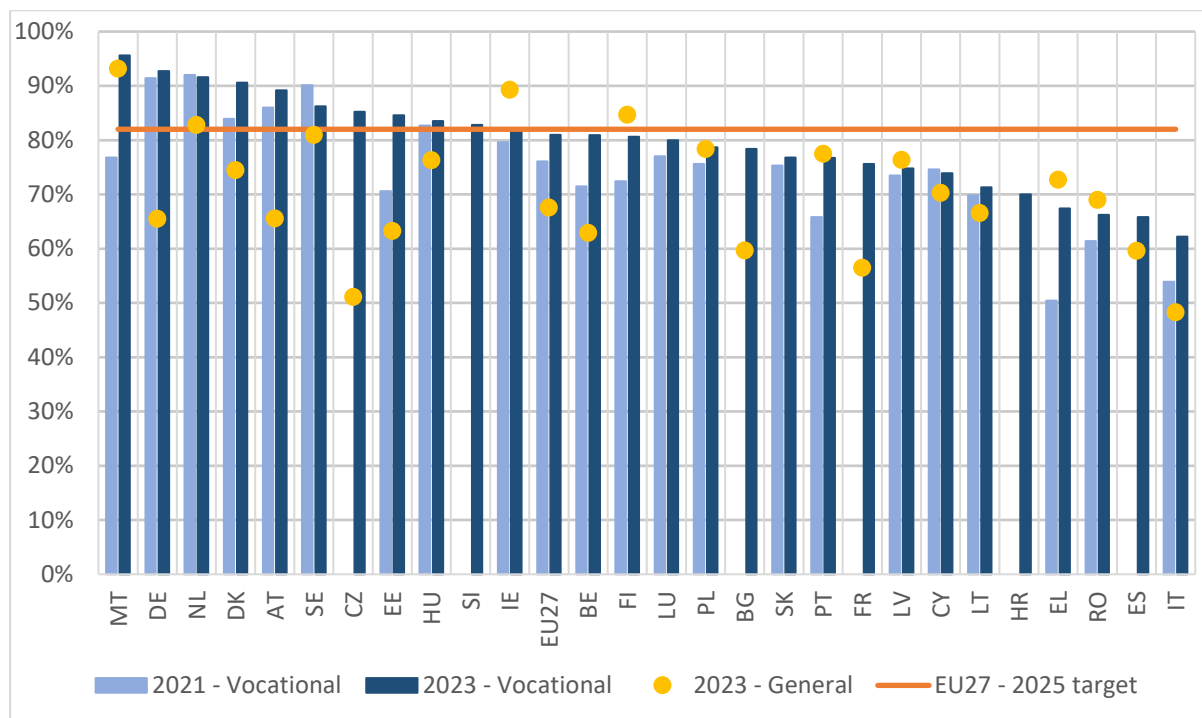


**Source:** Cedefop calculations, based on Eurostat data, UOE data collection on formal education. ISCED-F 2013 is used to classify data by field of education. Detailed fields are used to produce the chart. Detailed fields with highest and lowest proportions of female graduates are displayed (top and bottom 10 detailed fields).

## 7. How many recent VET graduates are employed?

Labour market outcomes and in particular employment rates of IVET graduates are important aspects to consider. The [Council Recommendation on Vocational Education and Training \(2020\)](#) has set a target: by 2025, in the EU, 82% of recent IVET graduate should be employed. Recent VET graduates are defined as young people aged 20 to 34, no longer in education and training, and who obtained a vocational qualification at ISCED level 3-4 as their highest educational attainment in the previous one to three years. **Figure 7.a** presents 2021 and 2023 employment rate for recent IVET graduates as defined above. It includes 2023 employment rates calculated for their counterparts having recently graduated from general education at ISCED levels 3-4. Indicators are calculated using the same specifications to allow comparisons.

Figure 7.a - Recent IVET graduates (20-34 years old) in employment (%). 2021 and 2023.



Source: Eurostat, EU LFS. NB: the indicator covers graduates at ISCED3-4 and no longer in education and training. There is no available data for general education for [Croatia](#), [Luxembourg](#), [Slovenia](#), and [Slovakia](#). In 2021 [Spain](#) and [France](#) data does not yet reflect the new EU LFS definition of employment. 2022 and 2023 data of [Latvia](#), [Cyprus](#), and [Malta](#), as well as the data for [Slovenia](#) in 2023 should be interpreted with caution as they are affected by some reliability issues. Data for [Czechia](#), [Slovenia](#), [Bulgaria](#), and [Croatia](#) in 2021 is not displayed due to break in time series.

In 2023, the EU average level of the indicator stood at 81.0% (just one point below the 2025 target). Major differences persist across EU countries. Highest employment rates for recent IVET graduates (at or above 90%) are estimated for Malta, Germany, the Netherlands, and Denmark; lowest values (below 70%) for Italy, Spain, Romania, and Greece. As compared to 2021, the EU average value for the indicator grew by 3.9 percentage points. Among countries for which data can be reliably compared over time, in the period 2021-2023, the indicator went up in almost all countries with the largest increases estimated for Greece and Estonia (by respectively about 17 and 14 percentage points). In Sweden, a drop by 3.9 percentage point is estimated.

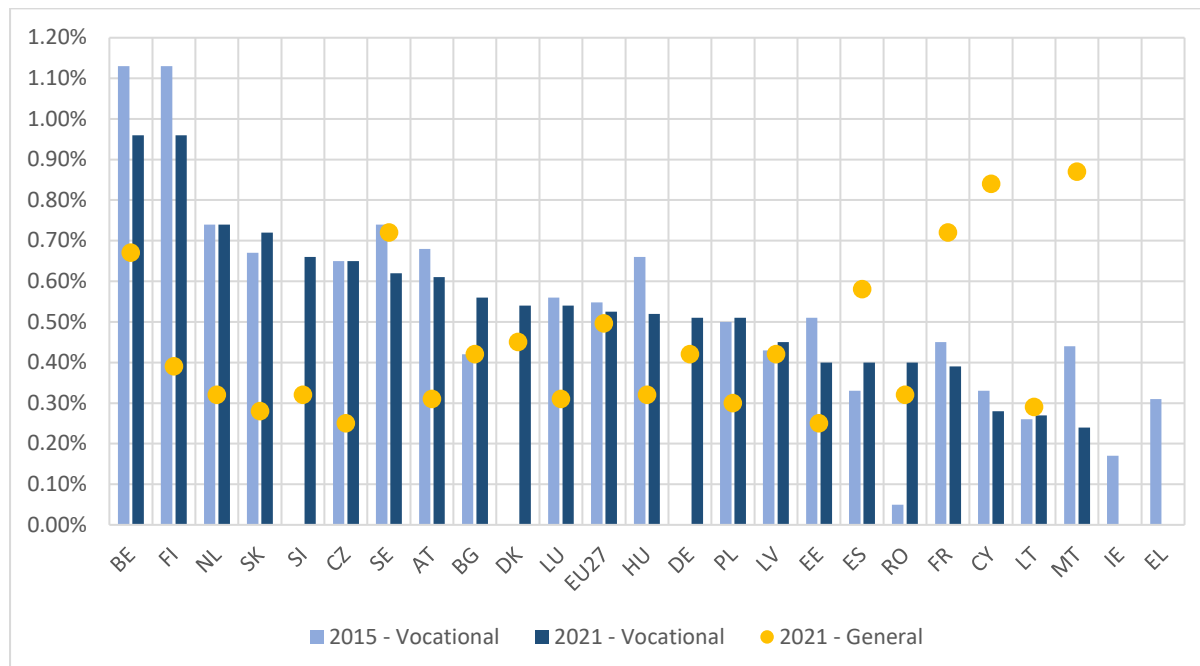
Levels and trends of employment rate for recent IVET graduates as displayed above are affected by different labour market conditions in countries. To reduce these effects, it is important to offer some comparisons with distinct levels and orientations of education. Due to sample sizes and the current specification of the indicator, proper comparison is not possible with youngsters with a low level of education having recently obtained their highest qualification. Comparisons are possible with youngsters in the same age group having recently obtained a medium level qualification (ISCED 3-4) of general orientation as their highest and not being in further education or training. In 2023, in the EU, recent IVET graduates had an employment rate 13.4 percentage points higher than their counterparts

from the general stream of education (an employment premium of 13.4 percentage points). Overall, the presence of a premium confirms and reassures that, in cases where further learning is not pursued by youngsters, entering the labour market with a vocational qualification at ISCED levels 3-4 combines with better employment prospects than doing so with a general qualification at the same ISCED levels. The presence of a premium is a first straightforward but important signal, about the labour market relevance of IVET, which does not oblige graduates entering the world of work, but it is designed to equip those who wish to do so, with knowledge, skills, competencies and qualification which are more directly or more immediately relevant to enter the labour market. This is not the case for medium level general education, which is instead often and mainly undertaken to prepare for further studies rather for entry into the world of work. Based on available data, and although of different magnitude, this premium is present in almost all EU member states. Exceptions are Ireland, Greece, Finland, and Romania, where the negative differences are not striking.

## 8. How much is the public investment on IVET?

Expenditure in IVET is a shared responsibility of public and private actors. The [Council Recommendation on Vocational Education and Training \(2020\)](#) advocates for making best use of European Union funds and stimulate further investments in vocational education and training. According to the [Osnabrück Declaration \(2020\)](#), quality and inclusive VET should provide citizens with equal training opportunities, regardless of their personal and economic background and place of residence.

**Figure 8.a** displays data on public expenditure in IVET (ISCED 3 and 4) as a percentage of Gross Domestic Product (GDP). In 2021, based on available data, public expenditure on medium level IVET is estimated to amount to an average of 0.53% of GDP across EU countries. Public expenditure varies considerably, ranging from 0.96% of GDP in Belgium and Finland to below 0.30% in Cyprus, Malta, and Lithuania. On average, public expenditure on medium level education (ISCED 3-4) was higher in VET than that in the general stream of education (an estimated difference by 0.03 percentage points for the EU). At different level of magnitude, this holds in most but not all countries for which data are available. In Spain, Romania, France, Lithuania, Malta, and Cyprus, public expenditure is higher on medium level education of general orientation. As compared to 2015, public expenditure on IVET as a share GDP showed different dynamics across countries: in some, it was stable, in others it went up or down. Most changes stood in the range of +/- 0.15 percentage points, except for increases in Romania and Malta and drops in Belgium and Finland where changes were larger than that. An average change of -0.02 percentage points is estimated as compared to 2015.

**Figure 8.a - Public expenditure (% of GDP) on IVET. ISCED 3-4. 2015 and 2021.**

**Source:** Eurostat data, UOE data collection on formal education. EU averages are Cedefop weighted estimations, based on available country data. Weights are derived from Eurostat data on national accounts (GDP at current market prices in millions of euros). **NB:** Data for Croatia, Italy and Portugal are not available, as well as 2021 data for Ireland and Greece and 2015 data for Denmark and Slovenia. Data for Germany adopt a different definition. To estimate EU averages: a) Croatia, Italy, Portugal, and Ireland were not included due to times series being fully or largely incomplete, b) data for Greece in 2021 and Denmark in 2015 were estimated based on the basis of the closest year in the year in the range 2015-2021; c) 2015, 2016 and 2017 data for Slovenia have been linearly interpolated.

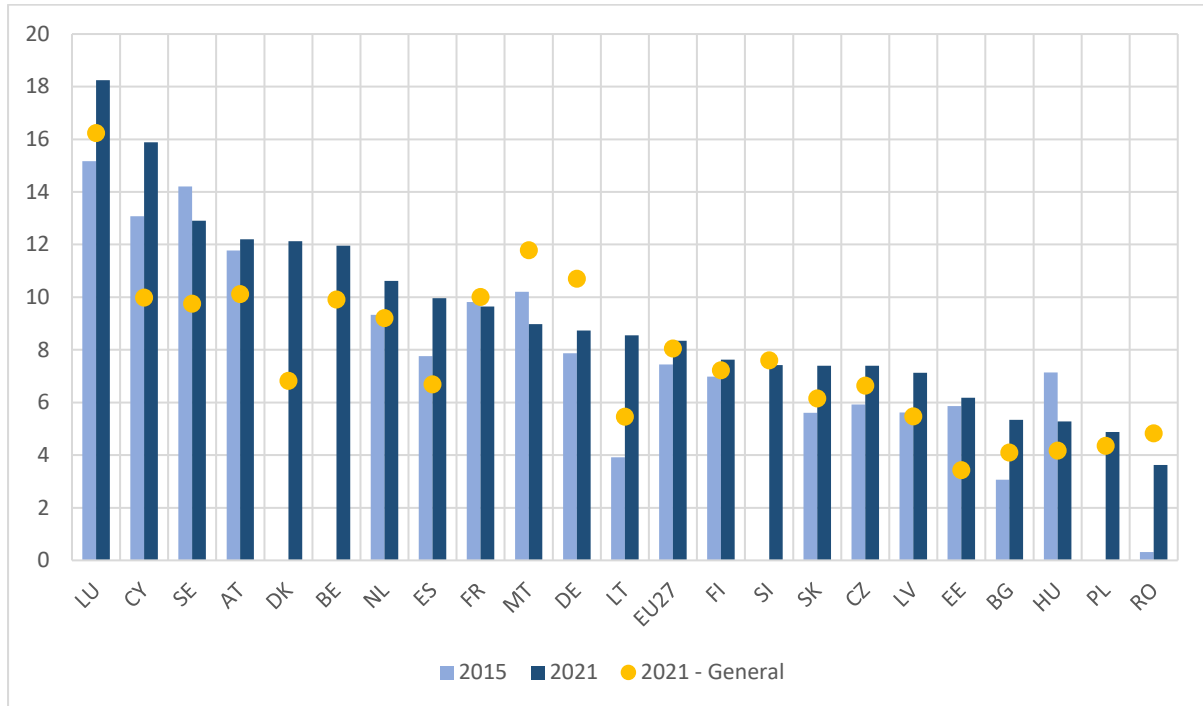
Public expenditure in IVET (ISCED 3-4) can also be made relative to the number of students enrolled (full time equivalent students) and expressed in thousands of purchasing power standards (PPS) to control for different costs of living (**Figure 8.b**)

In 2021, among countries for which data were available, highest public expenditure on IVET per student was estimated for Luxembourg, Cyprus, Sweden, Austria, Denmark and Belgium (at or above 12 thousand PPS). Lowest values were estimated for Bulgaria, Hungary, Poland and Romania (below 6 thousand). Although to a different extent, most countries spend more for vocational students than they do for their counterparts in general education. Exceptions are found in Malta, Romania, France, and Slovenia (France and Slovenia the differences between vocational and general education are not big).

In most countries for which reliable comparisons over time can be made, public expenditure on IVET per student enrolled went up in the period 2015-2021. Countries that have seen the biggest increase were Lithuania (+4.6 thousand PPS), Luxembourg (+3.1 thousand PPS), and Cyprus (+2.8 thousand

PPS). Hungary (-1.9 thousand PPS), Sweden (-1.3 thousand PPS), and Malta (-1.2 thousand PPS) recorded a drop.

**Figure 8.b - Annual public expenditure on IVET. ISCED 3-4 per student enrolled. Thousands of purchasing parity standard units (1000 PPS) per student enrolled (full time equivalent student, FTE). 2015 and 2021.**



**Source:** Eurostat data, UOE data collection on formal education. EU averages are Cedefop weighted estimations, based on available country data. Weights were derived from Eurostat data on enrolment in ISCED 3 and 4. VET programmes **NB:** Data for Croatia, Italy, and Portugal are not available, as well as 2021 data for Ireland, and Greece and 2015 data for Denmark and Slovenia. Data for Germany adopt a different definition. To estimate EU averages: a) Croatia, Italy, Portugal, and Ireland were not included due to times series being fully or largely incomplete, b) 2020 and 2021 data for Greece as well as 2015 data for Belgium and Denmark were estimated on the basis of the closest year in the range 2015-2021; c) time series for Cyprus, Czechia and Slovenia have been interpolated to fill in partial data gaps.

## Annex

## a) Indicators label, description, and sources

Indicator Label	Indicator description and source
<b>IVET students as % of all upper secondary students</b>	Number of students in upper secondary IVET (ISCED 3) as a percentage of all upper secondary students (Cedefop calculations based on Eurostat data, UOE data collection on formal education).
<b>IVET work-based students as % of all upper secondary IVET</b>	Number of students in combined work- and school-based upper secondary IVET (ISCED 3) as a percentage of all students in upper secondary IVET (Cedefop calculations based on Eurostat data, UOE data collection on formal education) (a).
<b>IVET students with direct access to tertiary education as % of all upper secondary IVET</b>	Number of students in upper secondary IVET (ISCED 3) enrolled in programmes giving direct access to tertiary education as a percentage of all students in upper secondary IVET (Cedefop calculations based on Eurostat data, UOE data collection on formal education).
<b>IVET learners who benefitted from a learning mobility abroad (%)</b>	Percentage rate of mobile IVET learners in a calendar year. This is the number of mobile IVET learners in a calendar year having experienced a mobility abroad of at least 10 days, expressed in relative percentage terms as a proportion of a cohort of IVET graduates in the same year. IVET at ISCED levels 3 and 4 is considered for learners and graduates (Cedefop calculations based on European Commission methodology, European Commission Erasmus+ data supplied at Cedefop's request as well as Eurostat data, UOE data collection on formal education. Data are provisional estimates and are affected by the impact of the COVID-19 pandemics. Due to the transition between the old and new programme, certain variables enabling country level data are absent, therefore country level data will not be published for the reference year 2022).
<b>Female IVET students as % of all female upper secondary students</b>	Number of female students in upper secondary IVET (ISCED 3) as a percentage of all female students in upper secondary education (Cedefop calculations based on Eurostat, UOE data collection on formal education).
<b>Young IVET graduates in further education and training (%)</b>	Percentage of the population aged 18-24 with a medium-level vocational qualification (ISCED 3 or 4) as their highest educational attainment who participated in formal or non-formal education and training over four weeks prior to the survey (Eurostat, LFS).

<b>IVET public expenditure (% of GDP)</b>	Annual public expenditure on vocational education at upper secondary and post-secondary level (ISCED 3 and 4) as a percentage of GDP (Eurostat, UOE data collection on formal education) (a).
<b>IVET public expenditure per student (1000 PPS units)</b>	Annual public expenditure (PPS) per student (FTE) in vocational upper secondary and post-secondary non-tertiary education (ISCED 3 and 4) in thousands of purchasing parity standard units (PPS) per student enrolled. The number of students enrolled used for the calculations is adjusted to the coverage of expenditure data and expressed in full-time equivalents (FTEs) (Eurostat, UOE data collection on formal education).
<b>Average number of foreign languages learned in IVET</b>	Average number of foreign languages learned in vocational upper secondary education (ISCED 3). (Eurostat, UOE data collection on formal education) (a).
<b>IVET graduates as % of all upper secondary graduates</b>	Number of graduates from upper secondary IVET (ISCED 3) as a percentage of all upper secondary graduates (Cedefop calculations based on Eurostat data, UOE data collection on formal education).
<b>Employment rate for recent IVET graduates (20-34 years-old) (%)</b>	Employment rate of 20-34 years-old who have obtained a medium level vocational qualification (ISCED 3 or 4) 1-3 years before the survey as their highest educational attainment and who are not in further (either formal or non-formal) education and training during the last four weeks prior to the survey (Eurostat, LFS).
<b>IVET public expenditure per student (1000 PPS units)</b>	Annual public expenditure (PPS) per student (FTE) in vocational upper secondary and post-secondary non-tertiary education (ISCED 3 and 4) in thousands of purchasing parity standard units (PPS) per student enrolled. The number of students enrolled used for the calculations is adjusted to the coverage of expenditure data and expressed in full-time equivalents (FTEs) (Eurostat, UOE data collection on formal education).

b) Additional Notes

All indicators and breakdowns in this report are subject to the specific methodology of the source from which they originate. For indicators and related breakdowns derived from the LFS and the UOE data collection on education systems, the definitions used for levels, orientations, and access to higher levels

of formal education are those agreed in ISCED 2011. By using the first digit of the classification, ISCED 2011 distinguishes and defines the following levels of education:

ISCED 2011 levels of education
Level 0 - Early childhood education
Level 1 - Primary education
Level 2 - Lower secondary education
Level 3 - Upper secondary education
Level 4 - Post-secondary non-tertiary education
Level 5 - Short-cycle tertiary education
Level 6 - Bachelor or equivalent level
Level 7 - Master or equivalent level
Level 8 - Doctor or equivalent level

In some cases, such as indicators from sample surveys (e.g. LFS), ISCED levels are aggregated to compute indicators. Aggregations used are: ISCED 0-2 (low educational attainment); ISCED 3-4 (medium educational attainment); ISCED 5-8 (tertiary educational attainment). At some ISCED levels (2 to 5), and by using the second digit of the classification, ISCED 2011 distinguishes and defines general and vocational orientation of education: At higher levels of education, ISCED 2011 does not distinguish between general and vocational education. It considers but does not yet define a distinction between academic and professional education, which is therefore not used in this report. The third digit of ISCED 2011 is used in one indicator distinguishing between upper secondary vocational programs granting or not direct access to tertiary programs at levels 5, 6 or 7.

Where relevant, indicators considered for VET are also computed and presented for education of general orientation at the same ISCED levels and under the same specifications. This is to offer contrasts and comparisons.

The data presented in the article refer to initial and formal education, including its training component. According to ISCED, 2011, formal education is education that is institutionalised, intentional and planned through public organizations and recognised private bodies, and – in their totality – constitute the formal education system of a country. Formal education programmes are thus recognised as such by the relevant national education or equivalent authorities, e.g. any other institution in cooperation with the national or sub-national education authorities. Formal education typically takes place in a system designed as a continuous educational pathway. Formal education consists mostly of initial education, i.e. of formal education of individuals before entrance into to the labour market, although in principle includes education for all age groups with programme content and qualifications that are equivalent to those of initial education. Programmes that take place partly in the workplace may also be considered formal education if they lead to a qualification that is recognised by national education authorities (or equivalent). These programmes are often provided in cooperation between educational institutions and employers (e.g. apprenticeships).

ISCED 2011 orientations of education	
<b>Vocational orientation</b>	Designed for learners to acquire the knowledge, skills, and competencies specific to a particular occupation, trade, or class of occupations or trades. Such programmes may have work-based components (e.g. apprenticeships, dual system education programmes). Successful completion of such programmes leads to labour market-relevant, vocational qualifications acknowledged as occupationally oriented by the relevant national authorities and/or the labour market.
<b>General orientation</b>	Designed to develop learners' general knowledge, skills, and competencies, as well as literacy and numeracy skills, often to prepare participants for more advanced education programmes at the same or a higher ISCED level and to lay the foundation for lifelong learning. These programmes are typically school- or college-based. General education includes education programmes that are designed to prepare participants for entry into vocational education but do not prepare for employment in a particular occupation, trade, or class of occupations or trades, nor lead directly to a labour market-relevant qualification.

## c) Abbreviations

<b>FTE</b>	Full Time Equivalent
<b>GDP</b>	Gross Domestic Product
<b>ISCED</b>	International Standard Classification of Education
<b>IVET</b>	Initial Vocational Education and Training
<b>LFS</b>	European Union Labour Force Survey
<b>STEM</b>	Science, Technology, Engineering and Mathematics
<b>UOE</b>	UNESCO OECD Eurostat joint data collection on formal education