GREEN VET CHOICES

Transnational Survey Report

Fighting climate change and fostering Innovation by increasing interest in Green VET professions trough empowering digital storytelling

Project N°2021-1-IT01-KA220-VET-000032968

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1. Introduction

"GREEN VET CHOICES - Fighting climate change and fostering innovation by increasing interest in green VET professions through empowering digital storytelling" is a KA2 Cooperation Partnership Erasmus+ project in the field of Vocational Education and Training.

Climate change concerns everyone and is a very real threat to global society, affecting millions of people and causing natural disasters all over the world. The European Union is taking a stand against climate change and for a greener future, launching several initiatives such as the European Green Deal.

The Green VET Choices project joins the fight for a healthier planet by developing and implementing an innovative learning methodology to increase green skills and raise interest in green vocational education and training.

The project involves 8 partner organisations from 6 EU countries (AT, CY, IE, IT, PT, SI) aiming at:

- Raising environmental consciousness
- Fostering interest in green VET careers: there are many innovative green professions and VET offers related to environmental issues, but the awareness of these possible and attractive career paths needs to be raised among current and potential VET learners to satisfy the labour market and societal demand of these specific professionals
- Increasing competences necessary for these professions such as green and digital skills
- Increasing the disposition for environmentally friendly lifestyles.

The project lasts 28 months, from February 2022 to May 2024 and develops the following project results:

R1 – GREEN VET CHOICES Transnational Survey Report, that is to say a transnational report discussing national environmental issues, skills necessary for contributing to a carbon-neutral future and awareness of VET professions and green industries.

R2 – Green VET Choices Virtual Portal, that is to say a portal which enables digital learning on environmental topics and inspires current and future VET learners to pursue green VET options. It trains soft, green, and digital skills relevant for contributing to a carbon-neutral future.

R3 - Green VET Choices Digital Model, that is to say a professional magazine (available as e-book and video anthology) which showcase the project's innovative methodological approach combined with successful didactic concepts (e. g. immersive storytelling, challenge-based learning) in a non-formal educational setting.

This publication constitutes the first result of the GREEN VET Choices project, the Green VET Choices Transnational Survey Report. In addition to this online publication available for free download in

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English language, there will be also a short video clip and an Executive summary available in En, De, Gr, It, PT, Si. All these products are downloadable from the project website www.greenvetchoices.eu.

The main objectives of the Green VET Choices Transnational Survey Report are:

- To investigate on innovative green jobs and green career paths in the VET field in partner countries
- To investigate on environmental challenges relevant to partner countries
- To provide data on the current situation and regional opportunities to engage with VET offers in green industries and environmental participation possibilities in partner countries
- To discuss VET learners and professional expertise and opinions concerning the environmental, green, soft, and digital skills they consider necessary for contributing to a carbon neutral future as well as their awareness of VET professions in green industries.
  At the beginning, it offers an overview of the methodology used to investigate green challenges and green skills in partner countries (through desk research and a field survey implementation in all partner countries).

Then, it provides the single National Survey Report of each partner country as well as an in-depth analysis of their common trends and similarities on green issues and challenges.

To conclude, it includes the reporting templates used to collect data and information in partner countries for the implementation of both the desk research and the field survey (see Annexes).

The findings of this Report will constitute the starting point for the project consortium to develop the next project results, and in particular to understand the necessary soft, green and digital skills useful for VET students to undertake green VET careers.

2. Methodology

The methodology used to develop the Transnational Survey Report was made up of desk research and a field survey (through a focus group discussion) implemented in each partner country.

Consorzio CO&SO (It), the leading partner for this project result, provided all the other partner organisations with some Guidelines to follow in order to carry out both the desk research and the field survey. A template to compile in order to draw the National Survey Report was also provided.

Therefore, thanks to the desk research and the field survey, each partner was able to collect the data and information needed to draw its own National Survey Report.

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3. GREEN VET CHOICES National Survey Reports

3.1. AUSTRIA

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

One of the main environmental issues in Austria is **consumption of the land, i.e. the prevalent sealing of the soil surface**. This means that large areas of the land are changed, turning natural land into areas suitable for building: clearing woodland or other forms of vegetation and changing the original soil to "sealed" areas (e.g. with concrete or tarmac) for roads, developments, constructions etc. This does not just change the landscape and consistency of the soil, but it has more far-reaching consequences: natural storage of water and CO_2 becomes impossible, flora and fauna of those areas are changed - with some species disappearing or migrating to new habitat, heat increases, air quality decreases, space that can be used for food production and recreation becomes diminished, and the overall risk of disasters such as mud slides, storm damage, and flooding increases immensely.

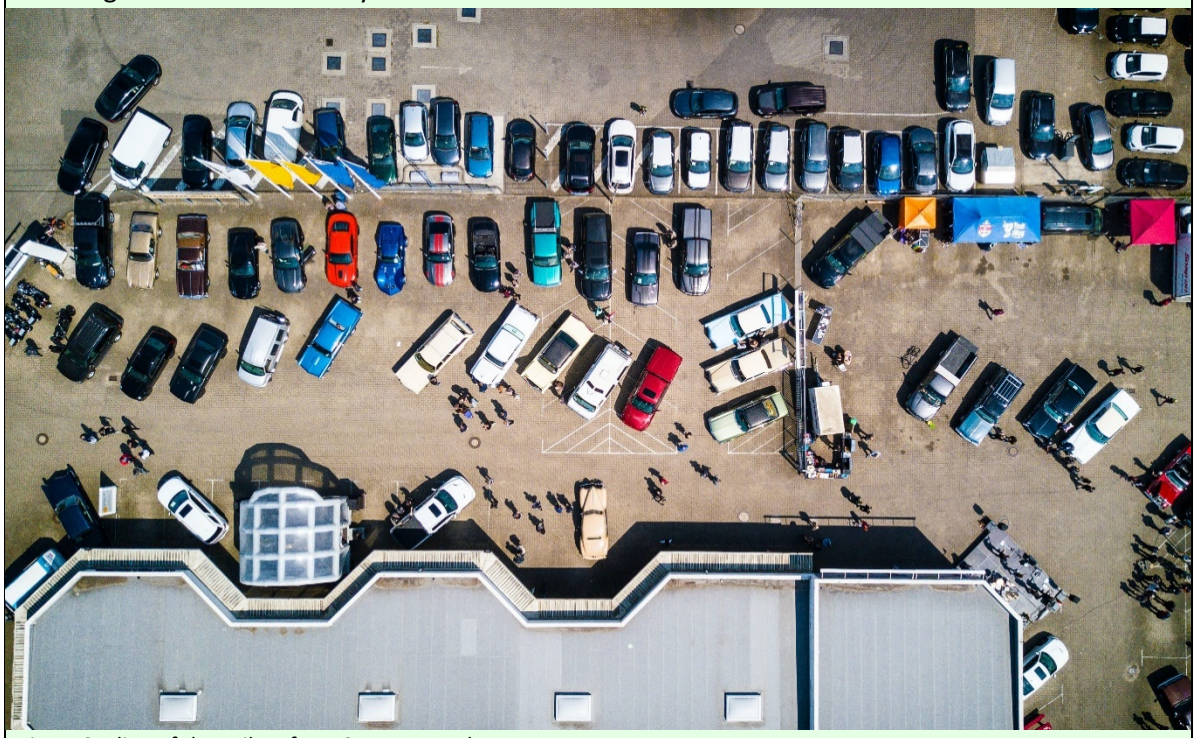

Fig. 1: Sealing of the soil surface. Source: pexels.com

Austria has the highest rate in Europe of sealed soil surface, resulting in long road systems and a very high density of supermarkets – this might be convenient for people at the first glance, but it

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comes at a very high cost for the environment and, subsequently, for people as well. While building more might be a positive thing for construction companies in the short term, it has negative consequences for human development in the long term.

The following charts (adapted from https://www.umweltbundesamt.at) shows the alarming increase of sealed surface area for the years 2010 and 2020 – while in 2010, 32% of Austria's available land was sealed, that number grew to 41% only ten years later. The chart gives a details overview of all nine Austrian federal states, showing that the area of sealed soil surface goes up

Land consumption in Austria 2010

Federal Province	Federal Province's area	Permanent settlement area[1]	Permanent settlement area per Federal Province's area	Sealed building land[2]	Vegetated building land[3]	Building land - total[4]	Area for transport purposes	Area for building and transport purposes[5]	Degree of sealing[6]	Recreational areas	Excavation areas	Other areas[7]	Land consumption[8]	Land consumption per permanent settlement area
Burgenland	3.972	2.455	61,8%	49,8	113,7	163,6	151,2	314,8	30,5%	16,5	7,9	34,0	373,2	15,2%
Carinthia	9.537	2.318	24,3%	53,6	149,8	203,3	193,3	396,6	26,3%	12,7	7,4	27,9	444,7	19,2%
Lower Austria	19.178	11.255	58,7%	218,1	460,5	678,6	625,1	1.303,7	32,1%	49,9	43,3	151,2	1.548,1	13,8%
Upper Austria	11.985	6.563	54,8%	140,5	306,4	446,8	350,3	797,1	31,4%	28,7	17,6	79,4	922,7	14,1%
Salzburg	7.154	1.431	20,0%	44,7	82,2	126,9	101,6	228,6	35,2%	17,1	6,4	32,3	284,4	19,9%
Styria	16.394	4.944	30,2%	133,9	294,3	428,2	363,8	792,0	31,3%	26,3	25,4	64,3	908,1	18,4%
Tyrol	12.648	1.497	11,8%	56,2	113,3	169,5	129,9	299,4	33,2%	16,3	6,6	24,2	346,5	23,2%
Vorarlberg	2.602	592	22,8%	22,7	56,7	79,4	42,6	122,0	28,6%	4,5	1,4	16,1	143,9	24,3%
Vienna	415	317	76,5%	60,1	77,7	137,8	56,3	194,1	43,6%	28,8	0,5	21,1	244,4	77,0%
Austria	83.884	31.373	37,4%	779,6	1.654,6	2.434,2	2.014,1	4.448,3	32,0%	200,7	116,4	450,6	5.216,0	16,6%

Areas in km²

all over the country.

Fig. 2: Land consumption in Austria, 2010.
Source:
https://www.umweltbundesamt.at/fileadmin/site/themen/boden/flaechenverbrauch_2010.pdf

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Land take in Austria 2020

umweltbunde

Federal State	Area Federal State [km²]	Population	Permanent settleable area[1]	Percentage of Permanent settlement area per area of Federal state	Building land[2]	...thereof industrial and commerce areas	Traffic and transport areas[3]	building land and traffic/transport areas[4]	Other Areas[5]	Land consumption[6]	Land consumption per permanent settlement area	Sealed area[7]	Sealing degree[8]	Sealed area in [m2] per inhabitant
Burgenland	3.965	292.966	2.434	61%	208	28	156	365	28	393	16%	149	38%	510
Carinthia	9.536	560.787	2.308	24%	287	57	210	497	29	526	23%	207	39%	368
Lower Austria	19.180	1.673.607	11.200	58%	906	185	631	1.537	119	1.656	15%	685	41%	409
Upper Austria	11.983	1.477.752	6.538	55%	631	135	361	991	61	1.053	16%	443	42%	300
Salzburg	7.155	553.930	1.427	20%	182	54	101	283	28	310	22%	136	44%	246
Styria	16.399	1.241.228	4.908	30%	592	116	360	952	62	1.013	21%	401	40%	323
Tyrol	12.648	752.262	1.487	12%	218	44	148	366	29	395	27%	170	43%	226
Vorarlberg	2.602	393.025	586	23%	114	18	50	164	10	174	30%	71	41%	180
Vienna	415	1.892.150	315	76%	159	22	62	221	28	249	79%	110	44%	58
Austria	**83.883**	**8.837.707**	**31.204**	**37%**	**3.296**	**660**	**2.079**	**5.375**	**393**	**5.768**	**18%**	**2.372**	**41%**	**268**

Areas in km²

Fig. 3 Land consumption in Austria, 2020
Source:
https://www.umweltbundesamt.at/fileadmin/site/themen/boden/flaecheninanspruchnahme_2020.pdf

Another serious environmental challenge in Austria is **air pollution**. Due to its geography and increasing traffic, there are several areas in the country that are prone to bad air quality caused by fine particles. While this is not the case for the whole country, it is especially true for the larger cities. Overall, a lot of effort has been put into increasing air quality in the last few decades, e.g. stricter regulations on emissions for industry and power plants, use of more renewable energy sources, introducing a lower speed limit on motorways on days with particularly bad air quality values, ban of Diesel vehicles without a filter. These measures already show some success, as the chart below illustrates.

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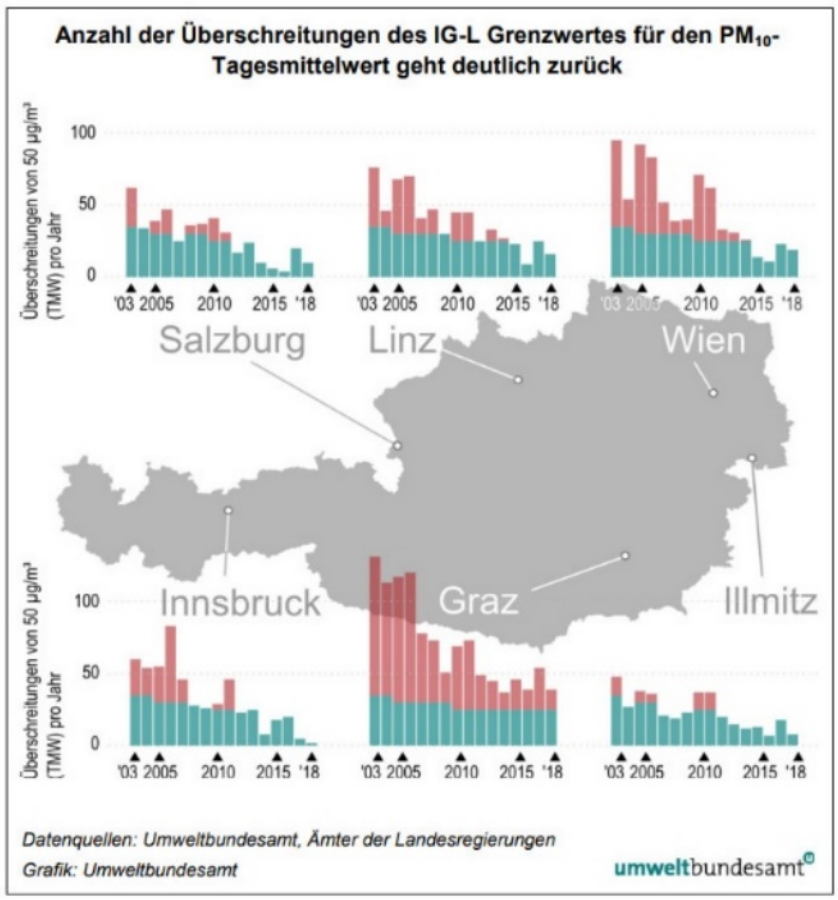

The chart looks at six different Austrian cities and indicates the number of times when air pollution was particularly high (marked in red) as well as the surpassing of the threshold value set for air pollution limits (above 50µg/m³): notably, air pollution has generally decreased over the last 20 years; however, bad air quality continues to be an issue in some regions – Graz, Austria's second largest city, being the most problematic area in this respect. A main reason for Graz' particular case and high pollution rates is its geographical location in a basin in the middle of several small mountains, which hinders the air from moving out.

Fig. 4: Air pollution in Austrian cities.
Source: https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0684.pdf

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

Giftmüllexpress ("Hazardous Waste Express")

This initiative in Graz is a very useful waste management tool which lets people dispose easily of many types of hazardous waste for free. It is part of the city holding's waste management department and helps to reduce the amount of hazardous waste which ends up in the regular waste collections. This is a great and very helpful way to keep the city clean and to contribute to more and better recycling.

The Giftmüllexpress is a modified truck that drives around all over the city and can be found at three different locations three times a week. It is open to anyone who wants to dispose of broken or outdated electronics, expired medication, used cooking oil, batteries, toxic liquids and much more – all things that cannot be left with the normal garbage and that require special recycling.

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The truck stops at well accessible locations throughout the city so that anyone who wants can go there. The dates are announced in a calendar online and in an app.
Additionally, there are also four permanent collection locations for hazardous waste in the city.
On their website, the city holding's waste management department provides clear and comprehensive instructions and explanations about the types of waste that can be collected and where and how it should be disposed of.
Contact: *https://www.holding-graz.at/en/waste/hazardous-waste-express*

Bundesheer (Austrian Army) – Disaster and emergency management
The Austrian Army is one of the main first aid providers in case of natural disasters such as mud slides, fire, floodings, extreme snowfall and more. As these events occur at an increasing rate due to extreme weather conditions caused by climate change and sealing of the soil surface, there is a growing need for rescue operations. The army has the necessary equipment, expertise, and manpower to intervene after events cause by bad weather to help those in need whenever civil protection and aid is not enough anymore. Their department of disaster and emergency management

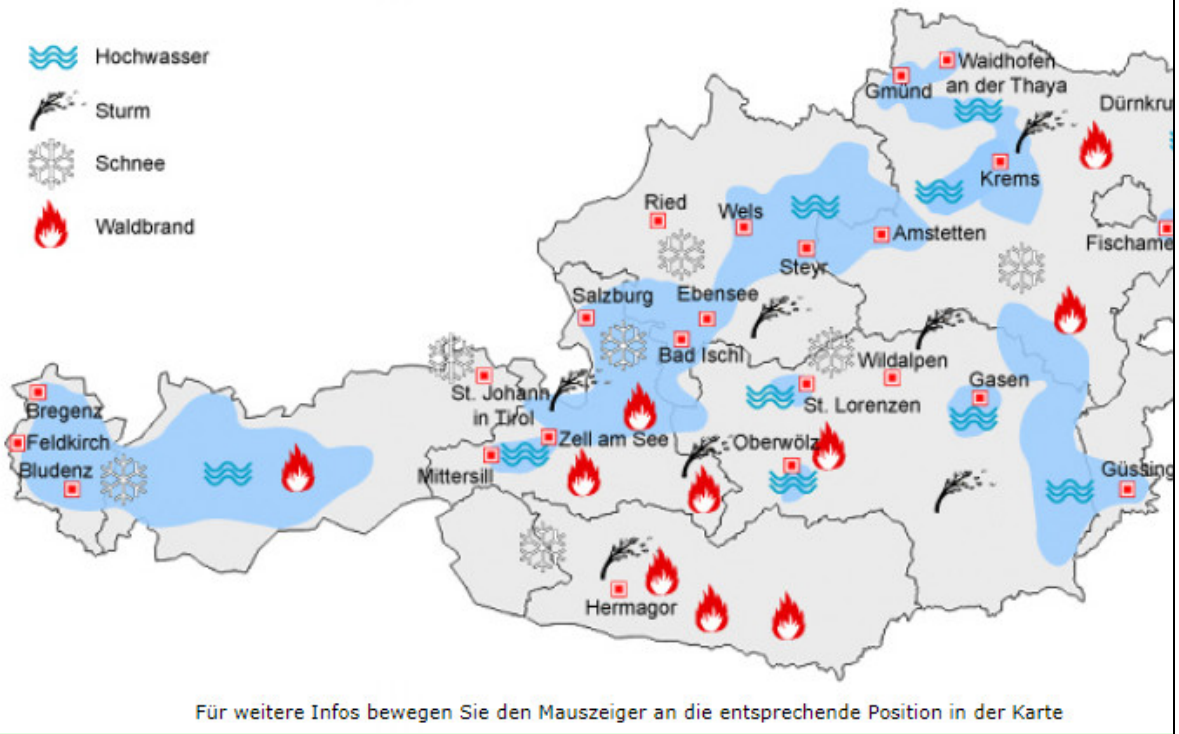

Fig. 5: Disaster management by the Austrian Army.
Source: https://www.bundesheer.at/sk/inlandseinsaetze.shtml

The image shows the army's main rescue and aid missions within Austria over the last few years and the weather conditions which caused the emergency.

Translation of keys:
Flooding
Storm
Snow
Wildfire

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Contact:
https://www.bundesheer.at/veranstaltungen/infoseiten/2610_20_virtueller_heldenplatz/katastrophenschutz.html
https://www.bundesheer.at/facts/factsheets/wannhilftdasheer.shtml

Vocational Education and Training

Briefly describe the organization of the VET system in your country.

In Austria, there is a so-called "Dual system", which is a combination of school education and on the job training in a company. A VET student's time is divided into two, more or less half and half, between being in school and working in their apprenticeship company. VET schools are different from other types of schools, as they are specialised in educating students who are apprentices in companies where they get their on-the-job training. These schools cannot be freely chosen by the students – allocation depends on the type of profession and region. School times and apprenticeship times alternate, with their duration and frequencies also depending on the school and type of profession.

Fig. 6: Mentor and apprentice in VET. Source: pexels.com

The Austrian system sees this education as a creation of value and companies regard their apprentices/VET students as valuable employees. They are not just interns, but they are, ideally, completely immersed in their training company and they also receive a salary. This salary changes over time and is increased every year during their education. The typical duration of this type of education is three years and ends with the so-called LAP ("Lehrabschlussprüfung", the final apprenticeship examination).

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Currently, there are about 200 recognised VET professions available in Austria, pooled into several groups of professions. Once a VET learner has completed their education, they have a number of options: they can start working right away (frequently they are able to stay in their apprenticeship company), they can continue their education and take various exams, for example the entrance exam for a higher education institution or an examination for the craftsman's master's certificate, or they can start their own business. (see https://www.bildungssystem.at/schule-oberstufe/berufsschule-und-lehre for more details).

Is there any specific training / training module / WBL experience on green skills?

The degree to which green skills are taught in VET schools depends on the individual setting and chosen educational path as well as on all involved institutions (schools, companies) and persons (teachers, mentors). Overall, it can be said that sustainability topics are part of teaching, and many aspects of sustainable lifestyles are included in the curricula. It can, however, be rather difficult to implement sustainability in the actual training during real life situations in the apprenticeship companies. Green skills are included in the curricula to a certain extent, but there should be a stronger focus on them overall.

Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

It is not very common that companies, who play a big role in Austrian VET education, launch any initiatives or programmes that are directed at green or environmental topics – at least not specifically to enhance a student's/an apprentice's job or training experience. VET schools, in contrast, are frequently involved in green topics in order to engage their students in this field. This being said, the degree to which green topics are included in the schools' curricula depends on regional differences and on types of professions.

One example is HAK Mürzzuschlag, an economics and commerce oriented high school, which also teaches future VET students. The school puts a clear emphasis on environmental topics, as they see it as their job to raise future leaders who will, in a few years' time, be able to make environmentally-conscious decisions in their professional life. As they focus on climate protection and stopping climate change, they are frequently involved in projects around these topics. The school is currently involved in a project which examines the power and potential of regions to successfully adapt to various consequences of climate change. In order to implement this, they organise events, for example with a well-known meteorologist, teaching their students how to counteract climate change. In another project, they involved students directly by planting trees with them locally in a forest close to the school – trees which will withstand climate change and stand for a greener and healthier future.

Is one of the following green career paths, part of the VET system in your country?

Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation

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worker, electrician, solar photovoltaic installer and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

High-skilled occupations
Engineering technologist: Engineering is a very broad field and many different professions fall into it, but generally, these professions require a university degree (mostly at a University of Applied Science), e.g. medical technologist, health assisting engineering, safety and systems engineering, electronics technician, information technology technician.
Environmental engineer: The University of Applied Science offers a BA programme for environmental engineering.
Medium skilled occupation
Most mentioned professions can be studied in as a VET programme. To become an energy auditor, a number of certifications are required, but not through a VET programme.
Low-skilled occupation
For becoming a refuse/recycling collector, no VET programme is required; however, there is a VET programme for waste management.
An overview of all groups of VET professions available in Austria can be found at https://www.bildungssystem.at/schule-oberstufe/berufsschule-und-lehre

Employment Perspectives in Green Occupations

Green jobs occupational trends.

The general trend clearly goes towards a greener future, this includes a rise of green jobs and open positions in the fields as well as more inclusion of green topics in the educational curricula. Especially young people value sustainability and want to find jobs that are meaningful and leave a positive impact on society and the environment. The numbers of people working in environmental fields in Austria has been constantly rising over the last few years:

Year	*Persons working in professions related to the environment*
2008	167.700
2017	186.009
2019	193.574

Sources:
https://www.bmk.gv.at/themen/klima_umwelt/nachhaltigkeit/green_jobs/oe_green_jobs.html
https://news.wko.at/news/wien/Green-Jobs---Zukunft-ist-schon-da-.html

Another interesting trend is “Frauen in die Technik” (Women into Technics), which offers incentives to get more women interested in technical study fields and professions. This includes a variety of special offers and benefits for them, trying to make it easier for them to combine their professional and family life. The Austrian Labour Market Service, for example, offers a special programme called FiT (“Frauen in Handwerk und Technik” – “Women in crafts and technology”) which provides information especially for women who are thinking about going into a technical field.
Regionally, there is an interesting initiative in Graz, called “Talent Centre”, which is designed to help young people find their professional path by testing and analysing their skills and talents. After going through a testing programme, they will receive a number of suggestions for various professional fields which match their interests and talents. These suggestions include not only academic careers and studies, but also a variety of VET professions, many of them from green areas.

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Findings from the FIELD SURVEY in Austria

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

The Austrian focus group was implemented online in two parts in June 2022, one with five VET professionals and one with five VET learners (3) / future learners (2) in, both sessions were held via Zoom. Before beginning the sessions, the participants were asked for their consent to participate in the discussions and to have their statements integrated into the first project result. *All participants gave their consent by a show of hands*. The sessions took about one hour each and consisted of guiding questions asked by the moderator and lively discussions evolving afterwards, in particular in the VET professionals focus group.

	VET professionals	**VET learners / future learners**	**Total**
Participants	5	5	10
Male	4	2 (1 future, 1 current)	6
Female	1	3 (1 future, 2 current)	4

The participating VET teachers all have a higher education degree, have had practical experience working in their fields and have profound teaching experience in VET schools.
Two of the VET learners are secondary school students, three of them are already in a VET programme.

All participants have had some experience with green technologies or at least green, environmentally friendly actions. The VET teachers try to include green ideas into their lessons by introducing up-to-date online content and documentaries as well as game or quiz style exercises; the VET learners have heard about green ideas and actions in their classes, albeit there is no official green focus in the VET learners' programmes' curricula.

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NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

There are various of environmental challenges in Austria, some are locally relevant, some can be all over the country.

While being a country with a large area covered by forests and natural spaces, more and more of that type of natural landscape is turned into construction land or pastures through deforestation and sealing of the soil surface. These practices cause mud slides, floodings and avalanches, frequently in areas which were not historically prone to this. The photo shows a very severe mud slight in a valley in the state of Salzburg, which destroyed infrastructure and homes.

Fig. 7: Mud slide.
Source: ORF/Gerald Gundl, taken from https://salzburg.orf.at/stories/3117287

Air pollution is another local/regional issue. Graz, Austria's second largest city, is negatively famous for having bad air quality, caused by fine particles due to high traffic volume and the city's natural basin location. During the winter months in particular, pollution through fine particles in Graz can be very high and thus poses a health risk.

Other forms of pollution, such as water pollution, have been successfully tackled over the last few decades and years, leaving Austrian rivers and lakes generally with a good water quality.

As in most other places, Austria also experiences heatwaves and subsequent draughts during the summer months, mixing with devastating storms. Temperatures have been rising over the last few years in particular, leading not only to warmer summers, but also to warmer winters and a decline in snowfall in most regions, melting glaciers and subsequent erosion. Warmer temperatures also influence biodiversity as it attracts non-native plants and animals which, in turn, frequently cause a threat to native species.

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What would in your opinion make vocational education and training systems more responsive to environmental challenges?

In order to make VET offers more responsive to environmental challenges, more hands-on training would be needed. Even though the Austrian Dual System provides practical, on the job training, more direct interaction with climate-related topics would be desirable.

Another important aspect is local specialisation and listening to local demands, as not all regions offer the same opportunities nor require the same qualifications. By listening to what is needed in a particular region, local demands can be met, and VET professionals can be educated and prepared for jobs that are really needed. Keeping this localised aspect in mind would also help to reduce migration into the bigger metropolitan areas and keep rural areas attractive as living and working environments.

Focussing on foresight is another factor that would allow higher responsiveness to environmental challenges. Looking ahead and trying to anticipate which kinds of jobs will be needed in a couple of years could solve labour shortage in general and especially shortage of skilled workers. An example for this are wind turbines and solar power, the use of which has been rising rapidly in recent decades and is likely to become even more prevalent. This means that specially educated technicians working with wind turbines will also be even more in demand than they already are.

Fig. 8: Installing solar panels. Source: pixabay.com

There also has to be a focus on internationalisation to see what other countries are doing and how countries with comparable natural conditions are handling similar issues. International networking and exchange are key in this regard, looking into the types of educational systems and offers, company policies and future perspectives.

Thinking on a more regional and national level, and in terms of the educational system in general – and the VET system in particular – it would be extremely beneficial to employ more lecturers and mentees with lots of practical experience who can convey their practical knowledge and thus make it easier for students to understand the urgencies and importance of environmental awareness in combination with actual working practices. This could, for instance, be done in the form of special lectures of workshops in VET schools which focus on one certain, current topic.

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Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

The general consensus is that the existing curricular and training programmes as well as current qualification standards for VET are not up sufficiently up to date. There needs to be a shift from traditional VET professions towards a focus on occupations and professions in the environmental, green field. The future demand for professionals working in environmentally oriented jobs will be great and as VET programmes generally take a couple of years to complete, it would be highly important to prepare for this demand before it exists and before it is too late.

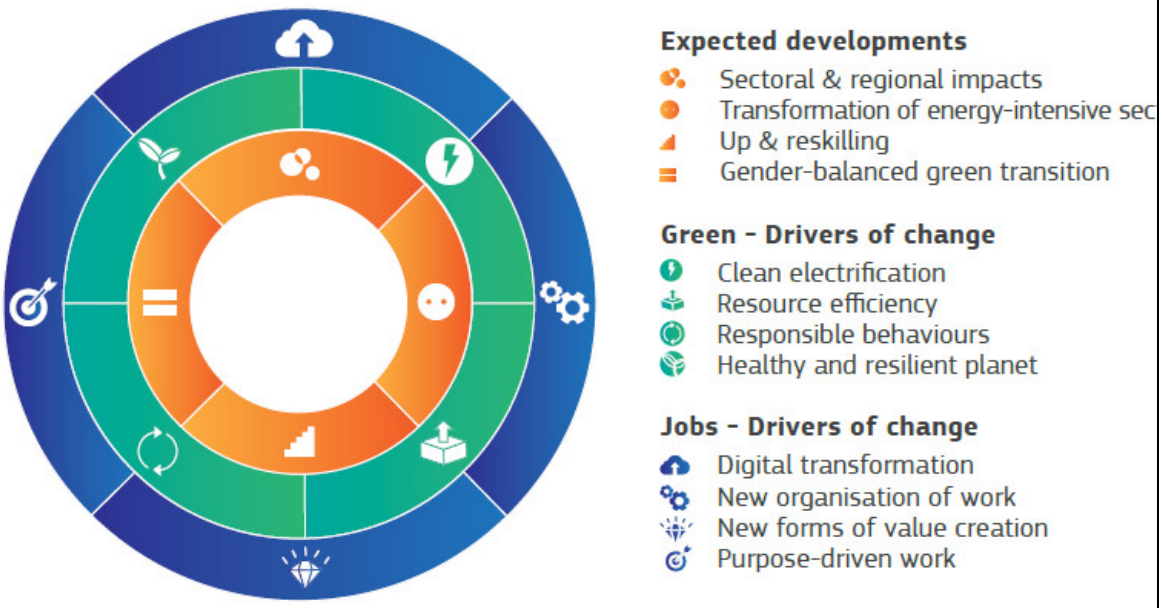

Fig. 9: Snapshot of future jobs. Source: The Future of Jobs is Green. *Competence Centre on Foresight*. 2021

Additionally, a focus on environmental topics also has to be included in curricula for existing, traditional occupations. Even though Austrian students in general enter the VET system with a rather good basic knowledge about environmentally friendly options and habits, they are not sufficiently made aware of environmental aspects in their professions or how to improve their ecological footprint in their professional work.

Austria's climate status is more or less the standard of the 1990s, which means that many things are changing and processes have to be updated. This will eventually lead to a situation in which all of a sudden, new kinds of professions, new job descriptions, a different focus, and an up-to-date educational system for VET will be required and in demand. It is crucial to act now, when there is still time to make necessary changes and adaptations.

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Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

There is already a rather good standard of knowledge in Austria about the potential and benefits of VET programmes and VET careers, however, it is far from ideal. VET is sometimes still seen as somewhat “inferior” to other educational paths, which is something that definitely has to change, especially given the high demand of persons with a VET background in future-oriented occupations.

In order to change this obsolete view of education and to attract more potential and future VET learners, there have to be more national initiatives and campaigns that are easily accessible for students as well as for teachers. One idea would be to launch a combined campaign in traditional and new media in TV on print outlets as well as on innovative social media channels, coordinated and organised by the state. This campaign should illustrate the benefits of VET programmes and the importance and advantages of VET professions in a career later on.

On a more practical and smaller level, it is important to be able to offer “goodies” to VET students to attract them to VET schools and, subsequently make them interested in entering a VET career. Schools have to be very well equipped and comply with modern standards; apprenticeship companies have to show respect and appreciation towards their apprentices. In Austria, part of this are the monthly wages that apprentices receive, just like they would if they were already fully working. It is highly important that the companies that employ VET students see the added value they get by having an apprentice in their company. Companies and students alike have to take the apprenticeship position seriously and have to treat it like they would any other position in the company.

VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

Austrian VET teachers are doing quite well when it comes to a general knowledge about environmental protection and basic environmentally oriented day-to-day activities. They are convinced that they can convey a general idea about environmental protection, environmentally friendly actions, and ideas such as recycling to their students. They are also quite confident that they have a good knowledge about environmental aspects in their own field of expertise and try to be up to date about green methods and options available in the profession.
Despite this, they would like to get more input and more well-founded background knowledge on environmental topics – and, in particular, about future trends and developments in the green sector in terms of modern jobs and newly created professional fields and niches. Additional, specialised training with enough time to get into details and discuss questions would be highly appreciated.
The Austrian VET system leaves quite a lot of freedom to the teachers and trainers in deciding what to include in their lessons, but actually changing curricula is difficult and takes a lot of time, thus, the Austrian curricula are not very flexible and not likely to keep up with the rate of speed that technology and the industry are changing.

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What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

Among the top priorities in this respect are resources – in terms of time, knowledge, and staff alike. In order to design and implement a successful curriculum that deals with environmental issues and prepares students for future jobs in a green sector, teachers would have to put in a considerable amount of time and effort – and in order to do so, they need the appropriate resources.

Professional knowledge and expertise are of utmost importance, as no one wants to complete a training which only touches on the surface and is based on vague and inexact facts, especially on a delicate field such as climate change and environmental protection. The trainers participating in the focus group would not feel confident enough to create a whole training programme by themselves, based mainly on these reasons.

This means that, in addition to pedagogical and professional expertise, an expert on environmental topics should be consulted when new programmes are developed or when curricula are updated in order to set a clear focus on environmental aspects. Nevertheless, the trainers clearly state that they want and need voice opportunity to prove their "on the job" insights in terms of needs and experience. They feel like the need to be heard and listened to in order to create the best possible experience for their students. In addition to this, there need to be appropriate tools for implementation and a good overview of requirements.

Overall, it would be ideal to have a body of professionals with a background in the respective field of the programme, in environmental topics, in future trends, and in pedagogical didactics. Combining this with enough time for research, drafting, discussion, and feedback as well as with suitable implementation tools, would lead to a successful creation of new programmes and updates to the existing curricula which would then focus on real needs and the market's demands.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

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In Austria, networking is a standard procedure: because of its Dual System for VET, educational institutions and companies of different sizes and structures work together to provide a well-founded education for VET learners. Trainers and teachers in VET schools generally have a lot of experience in their field and like to cooperate with their students' work places, even if this is not always possible for a variety of reasons. Overall, there is a strong connection and good networking between VET schools and apprenticeship companies.

Fig. 10: VET – training on the job. Source: pixabay.com

In terms of environmental education, there are some projects and special excursions focussing mainly on green topics, but in general, there could a stronger focus on environmental topics and ideas. What is definitely missing in addition to this, is a much bigger focus on future trends and future-oriented professions.

It would be good to bring new companies into the equation in order to offer more choice and be more inclusive in terms of career options; this could also be done through internships, thus raising students', mentors', and trainers' interest and awareness alike.

LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

VET learners and future VET learners have quite a high level of basic knowledge about environmental topics such as general waste management and recycling, energy saving potential in the house, the importance of an intact nature and so on. What is often missing, however, is in-depth knowledge about these topics, and, more importantly, profound knowledge and details about environmentally friendly actions in the workplace.
Schools themselves, as well as most companies, are generally rather environmentally-conscious and try to set environmentally-friendly actions, but they are not always successful with their efforts. Students detect many more things that could be optimised on a daily basis. The school of one of the participating students implemented a very interesting project: the whole school was asked to develop and present concepts for saving energy in the building and the winning team's idea was actually implemented in the school. Additionally, the team was awarded vouchers for an environmentally-friendly nature experience during the summer holidays, sponsored by the parent's association.
The participating VET learners and, in particular, the future VET learners lamented the fact that there was little information available about trendy, green future job opportunities. They would be interested in going for a "green" career, but they feel like there is not enough information available to them. They do not know their opportunities and options well enough to make an informed decision based on environmental aspects.

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Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

It was quite hard for the participants to pin down exactly what "green" skills and jobs are. Green skills in particular are difficult to explain, as they are overarching and inclusive. The participants agreed that they can be seen as being environmentally conscious (e.g. knowledge about how to separate waste or how to save energy in the house) and knowing how to implement positive climate actions. Additionally, they stated that being flexible and a "knowing how to do something" mentality can be seen as green skills. According to the UNIDO, the United Nations Industrial Development Organisation, "green skills are the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society." (https://www.unido.org/stories/what-are-green-skills)

Green jobs are a bit easier to define and the participants listed a number of professional fields that fall into that category: anything connected to renewable energy, professional waste management, product and package design, gardening and landscaping, forestry, regional cooking, ecotourism to name a few.

Most professions nowadays show a shift towards a "greener" approach in their policies, even if they are traditionally not a green business. This is done by implementing small changes such as strictly turning off lights that are not needed, using recycled paper and environmentally-friendly detergents, or banning throw-away plastic cups for their coffee break beverages – all of these actions have been implemented in the participants' training companies.

Green jobs, i.e. professions working in a green sector, have great potential for the future, as those will be the sought-after jobs in a few years' time from now. Green technologies become more relevant and are continuously more present in the world – this means that in the future, personnel will be needed who is able to operate and work these technologies.

The participating VET learners agreed that there is no future without green jobs, new greener technologies and a general green mindset. They want to learn more about the environmental sector and ways how to integrate green ideas not only in their daily lives, but in their professional work as well.

In your opinion, which are the most demanded green jobs in your region / country? Why?

The participants stated that they know about a number of green job opportunities in the region and in Austria in general. Most notably, these jobs come from the fields of landscaping, gardening, forestry, and agriculture, renewable and bio energy, bicycle technics, technical jobs in general, construction work, and tourism.

These professional fields are only a small selection of the available areas and job types. They and many others share their future-oriented characteristics and, in order to combat climate change, it will be important to pay more attention to them. It is important to say that there are many traditional VET professions that have undergone dramatic changes over the years towards a much

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greener path. It is not only new jobs directly from a new or evolving green sector that we have to pay attention to, but also the more traditional VET professions, as it is equally important to orient them towards being environmentally-conscious and acting accordingly.

If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?

For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	Not VET programme, can be achieved through certifications
Insulation worker	Well-known
Solar photovoltaic installer	Well-known, not a VET programme. Can be achieved through extra occupational trainings and certification.
Installer of electrical networks with better efficiency	Not quite clear what this refers to. Electricians are generally concerned with this issue. Well-known VET programme
Refuse / recyclable material collector	Regulated and well-known
Sheet-metal worker	Well-known and well accessible. Jobs from this area offer very good perspectives, as they have a strong union.
Mechatronic	Well-known and very popular.
Installer of air conditioning systems with low environmental impact	This belongs to the professional field of “climate technician” which does not per se focus on green contents and on a low environmental impact; however, companies nowadays pay a lot of attention to being as green as possible.
Air quality engineer	Not sure if this is a VET profession, but it is one aspect of a variety of professions.
Environmental quality certifier	This is probably part of a number of less specific VET fields, connected to the environment
Other. Please specify other professions: gardener	Well-known and accessible

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Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

Skill	1 (I am not satisfied)	2	3	4	5 (I am very satisfied)	Motivation
SOFT SKILLS:						
Decision making	-	-	2	2	1	
Risk management	1	-	1	3	-	
Time management	-	-	-	2	3	
Flexibility	-	-	4	1	-	
Adaptability	-	-	1	3	1	
Team work	-	-	-	1	4	
Problem solving	-	-	-	-	5	
Logical thinking	1	1	-	2	1	
Literacy	-	-	4	1	-	
Numeracy	-	-	1	4	-	
Communication	1	3	1	-	-	
Communication in a foreign language	-	2	1	2	-	
STEM skills	-	-	-	2	3	
DIGITAL SKILLS:						
Computer literacy	-	-	1	4	-	
Data entry	2	-	2	1	-	
Data analytics	-	1	3	1	-	
Word processing	-	-	-	-	5	
Web-based communications and research	-	-	1	4	-	
Secure information processing		4	1	-	-	
Social media management	1	3	-	-	-	

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GREEN-RELATED SOFT SKILLS:						
Recycling consciousness	-	-	-	-	5	
Critical consumer behaviour (grocery/food/clothing.)	-	-	3	2	-	
Eco friendly / green travels	-	4	1	-	-	
Environmental footprint	-	1	1	3	-	
Awareness about ecological impact of textile materials production	3	1	1	-	-	
Water consuming and consciousness	-	-	-	1	4	

Would you like that one or more of the green, soft, and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making	5	-	-
Risk management	5	-	-
Time management	3	2	-
Flexibility	1	3	1
Adaptability	1	2	2
Team work	-	2	3
Problem solving	5	-	-
Logical thinking	4	-	1
Literacy	3	2	-
Numeracy	-	4	1
Communication	2	3	-
Communication in a foreign language	5	-	-
STEM skills	3	2	-
DIGITAL SKILLS:			
Computer literacy	5	-	-
Data entry	2	1	1
Data analytics	2	1	1
Word processing	-	4	1
Web-based communications and research	1	2	2
Secure information processing	1	-	4
Social media management	1	4	-

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GREEN-RELATED SOFT SKILLS:			
Recycling consciousness	2	3	-
Critical consumer behaviour (grocery/food/clothing.)	5	-	-
Eco friendly / green travels	3	1	1
Environmental footprint	5	-	-
Awareness about ecological impact of textile materials production	3	1	1
Water consuming and consciousness	3	2	-

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3.2. CYPRUS

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Examples of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

The most important regional/national environmental challenges in Cyprus are air pollution, water management and waste management.

According to the Federation of Environmental Organisations of Cyprus the most important challenges are (a) protection and management of water resources (b) ensuring health and quality of life (c) protection and management of nature and biodiversity (d) waste management and (e) strengthening environmental governance. We should add here that air pollution is also a very serious problem-challenge to overcome.

In regard to the protection and management of water responses, European Environment Agency mentions that Cyprus is a country which is experiencing climate change, especially through extensive droughts and the associated impacts on water supply.

Waste: Due to very high consumption patterns Cyprus has one of the fastest rising waste generation rates. The environmental, health and socioeconomic impacts of the uncontrolled disposal of waste are also considerable given the size of the island. The reduction of waste generation rates and their management according to the waste hierarchy is therefore a priority.

Reducing waste generation remains a key priority for future waste management. In 2011 the per capita waste generation reached 683 kg/cap/y, one of the highest rates in EU.

Transportation: Almost 25% of emissions come from transportation in Cyprus.

In 2015, road transport emissions contributed 22% of the total national emissions excluding LULUCF (Department of Environment, 2017) the sectors to show the smallest emissions reductions between 2005 and 2019 were industrial processes and product use, and transport (0.6 % and 2.3 % respectively).

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

1.Name of the Initiative: Tiganokinisi

Leading Institution: AKTI Project and Research Centre

Contact: http://www.tiganokinisi.eu/

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Description: The Tiganokinisi is an educational environmental programme about the collection of used cooking oil. It is successfully applied in more than 400 schools in Cyprus. Through the programme, the used cooking oil (which is a waste) is transformed into biodiesel. The participating schools then receive financial aid for further environmental education and support of their facilities.

The programme started in 2011 in 10 schools (primary and high schools) and from September 2013 is implemented across all Cyprus. It is implemented under the Ministry of Education and in cooperation with the Pedagogical Institute of Cyprus, the AKTI Research Centre.

Some of the goals of the programme are:

- The education, raise of awareness and the cooperation of students, teachers, parents and of the whole society about topics of sustainable development and environmental protection.
- The transformation of used cooking oil to biodiesel
- Cooperation between schools and the communities
- The improvement of environmental status of the schools
- Promotion of corporate social responsibility and the establishment of communication networks between schools and communities
- Promote active citizenship and environmental protection
- Educate and train students and parents on how to save energy and be more energy efficient.

2. Name of the Initiative: Cyprus Circular Economy Network

Leading Institution: The Cyprus Federation of Employers & Industrialists (OEB)

Contact: https://cypruscircular.org.cy/

Description: The **Cyprus Federation of Employers & Industrialists (OEB)** took the initiative to establish the Cyprus Circular Economy Network (CCEN), the first pioneering Circular Economy Network in Cyprus. The ultimate goal of the CCEN is to enable and accelerate the transition of Cyprus economy to a circular and green economy, especially after the COVID-19 pandemic, offering its services in a multilevel stakeholder approach; businesses, academia, and public sector, contributing to the achievement of the economic and social resilience of Cyprus, for a sustainable future.

Vocational Education and Training

Briefly describe the organization of the VET system in your country.

According to CEDEFOP (https://www.cedefop.europa.eu/) which is the European Centre for the Development for the Development of Vocational Training, VET in Cyprus has these 3 main features:

- a strong cultural trend towards general secondary education followed by a demand for tertiary education qualifications;
- the enhancement of lifelong guidance and counselling services as a mean to increase VET attractiveness;

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- a shift to the learning outcomes approach (which can be considered at an early stage) followed by a strong commitment to establish their use.

In addition, CEDEFOP mentions that Cyprus has a long-standing tradition of tripartite consultation (government, trade unions and employers' organisations) and social dialogue. The social partners are involved in:

- planning in an advisory and consultative capacity.
- education reform promoted by the government.
- boards of directors of institutions dealing with human resource issues.
- Identifying education and training needs and setting priorities in education and training.

Vocational education and training in Cyprus is mainly public. Provision of secondary VET including evening technical schools, the apprenticeship system and post upper secondary VET is free of charge, while various adult vocational training programmes are offered for a limited fee.

Financial incentives for participation in adult vocational training are provided by the Human Resource Development Authority of Cyprus (HRDA), a semi-government organisation. The Human Resource Development Authority reports to the government through the competent minister who is the minister of Labour, Welfare and Social Insurance. It is governed by a 13-strong tripartite board of directors, comprising government, employer, and trade union representatives.

Funding provided by the Human Resource Development Authority has encouraged enterprises and their employees to participate in training and development activities.

Cyprus has a high level of educational attainment. There is a strong cultural trend among Cypriots in favour of general secondary education followed by higher education. The economic crisis that Cyprus faced in 2012-15, together with the efforts to increase VET attractiveness, have contributed to a significant increase in the number of students who enroll in technical schools. In 2014, VET attracted 15.1% of the upper secondary learners compared to 12.7% in 2011.

Below you can see the Vocational Education and Training System chart:

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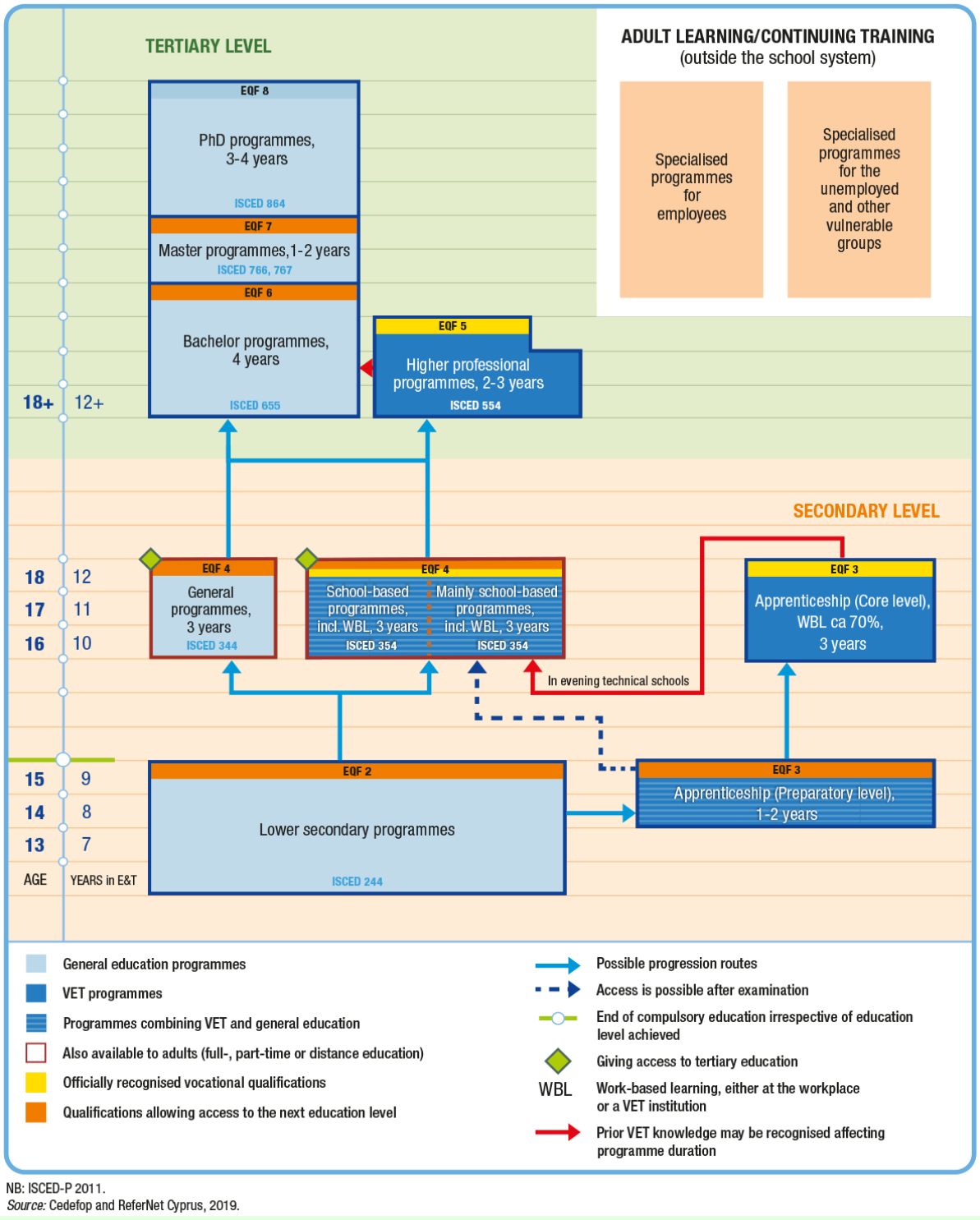

NB: ISCED-P 2011.
Source: Cedefop and ReferNet Cyprus, 2019.

Source: https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/cyprus-2019

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Is there any specific training / training module / WBL experience on green skills?

SMEm Power Efficiency

The Project "SMEm Power Efficiency" aims to empower SMEs to run energy audits and implement their proposals. According to the project website, initiative uses a holistic methodology to address different barriers based on three dimensions, i.e. Individual, Organizational and Institutional where the first concerns the design and delivery of an integrated Education & Training (E&T) programme targeting energy related SME staff, of 5 ECTS/EQF 6. At least 720 experts will be trained. The E&T programme will focus on financial and technical data required to prove that specific measures are cost-effective, while the trainees will apply their acquired knowledge to at least 160 pilot installations as practical action. This is connected with the second dimension targeting SME decision makers. In-house short trainings for decision makers of grouped SMEs according to their specificities will be delivered, during the practical action in pilots, by both partners and trainees. Such short trainings will be delivered to operational personnel as well, a total of at least 800 SME persons.

Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

1. The project WE-Qualify and the Buildup Skills initiative - «Improve Skills and Qualifications in the Building Workforce in Cyprus»

The WE-Qualify project «Improve Skills and Qualifications in the Building Workforce in Cyprus» is an EU co-funded project through the «Intelligent Energy Europe» programme under the European initiative «Build Up Skills». The initiative aimed to promote the continuing vocational education and training of workers in technical occupations in the Construction sector, as well as other relevant sectors related with the installation and maintenance of energy saving and renewable energy systems.

The following organisations participated in this initiative:

- Cyprus Energy Agency
- Cyprus Productivity Centre
- Cyprus Organisation of Standardisation
- Human Resource Development Authority of Cyprus
- Cyprus Scientific and Technical Chamber (ETEK)
- Cyprus Institute of Energy

According to the current National status quo and the «Roadmap» that has been developed within the Build Up Skills Pillar I (www.buildupskills.org.cy), a lack of a sufficient number of skilled work force for the implementation of measures relating to the construction of energy efficient buildings has been identified. Additionally, a lack of appropriate training programs for the training of the workforce has been identified. It was estimated that at least 4.500 employees need to acquire green skills in 13 different skill sets relating to the energy performance improvement of buildings by 2020.

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We-Qualify target and specific objectives

The initiative WE-Qualify aimed to assist the Construction sector in Cyprus to overcome the skills gap of the workforce relating to the construction of energy efficient buildings and to promote renewable energy technologies.

Educational training programmes for the development of the following skills were organised:

The following skills were organised in the training programmes of the initiative:

- Skill 1: Installation of thermal insulation
- Skill 2: Installation of thermopanes and exterior sunshades
- Skill 3: Installation and maintenance of biomass boilers and stoves

In addition, the initiative included:

- 5 pilot training programmes for technician
- 3 new skills
- Training of 125 technicians
- Certification of 100 technicians

2. HRDA Subsidised Training Programmes from the PV Technology Lab of FOSS Research Centre for Sustainable Energy of the University of Cyprus

The PV Technology Lab has intensified its efforts to shape the wide range of educational activities it offers. As climate change and energy security is an intergenerational and multifaceted problem, it has tailored its educational courses to meet a variety of people of different age groups, educational backgrounds, and a cross-section of topics. The PV Technology Lab currently offers, vocational training, on topics such as smart grids, renewable energy sources and nearly zero energy buildings. The PV Technology Lab provides vocational training courses to professionals on energy issues.

The courses are the following:

- PV System Designer and Installer
- Energy Storage: Diverse Role in the Modern Electricity Network
- Fundamentals of Nearly Zero Energy Buildings
- Fundamentals of Building Integrated Photovoltaics
- Commissioning tests and inspection according to EN 62446 standard

You can find more information here:

https://www.pvtechnology.ucy.ac.cy/Vocational%20Training.html

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Is one of the following green career paths, part of the VET system in your country?

Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

From the research we conducted, we have found some of the following career paths are part of the VET system in Cyprus.
High-skilled occupations: engineering technologist and environmental engineer. This high skilled career path is available in the VET system in Cyprus and due to the fact that it is highly skilled, it is required for the candidates to participate in University level classes.

Medium - Skilled occupations: *energy auditor, transport vehicle emissions inspector, Insulation worker, electrician, solar photovoltaic installer and sheet-metal worker.* These medium skilled occupations are part of the VET system in Cyprus. For example, the VET programme of the University in Cyprus -PV Technology Lab includes solar photovoltaic installer skills and energy auditor. In addition, other Institutions include career paths such as Electrician and Insulation worker.

Low-skilled occupation: refuse/recycling collector. This career path is also available in the Cypriot VET system for training.

Employment Perspectives in Green Occupations

Green jobs occupational trends.

The Human Resource Development Authority of Cyprus (HRDAC) has completed the study-report called “Identification of Green Skill needs in the Cyprus Economy 2017-2027” and it provided some very useful insights for us.
According to the report, the green economy of Cyprus consists of 30 economic sectors and 60 occupations from the whole spectrum of the Cyprus labour market, which are grouped into three main categories according to their degree of participation: Very high, high and medium degree.

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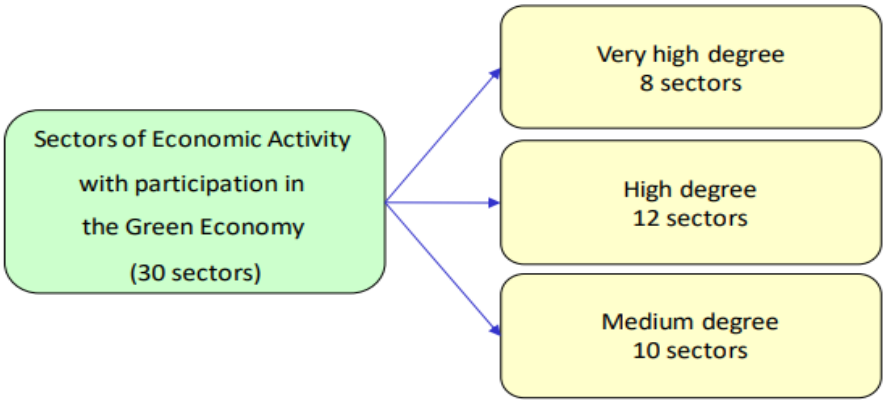
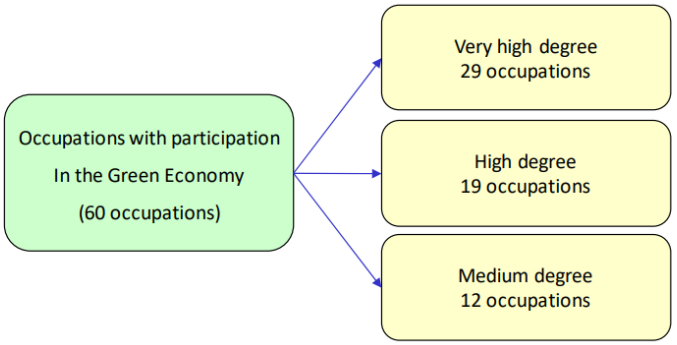


Sectors of economic activity with a very high degree of participation in the green economy
➢ Electricity and gas supply ➢ Water collection, treatment and supply ➢ Sewerage ➢ Waste collection, treatment and disposal activities ➢ Remediation activities and other waste management services ➢ Civil engineering ➢ Specialised construction activities ➢ Architectural and engineering activities



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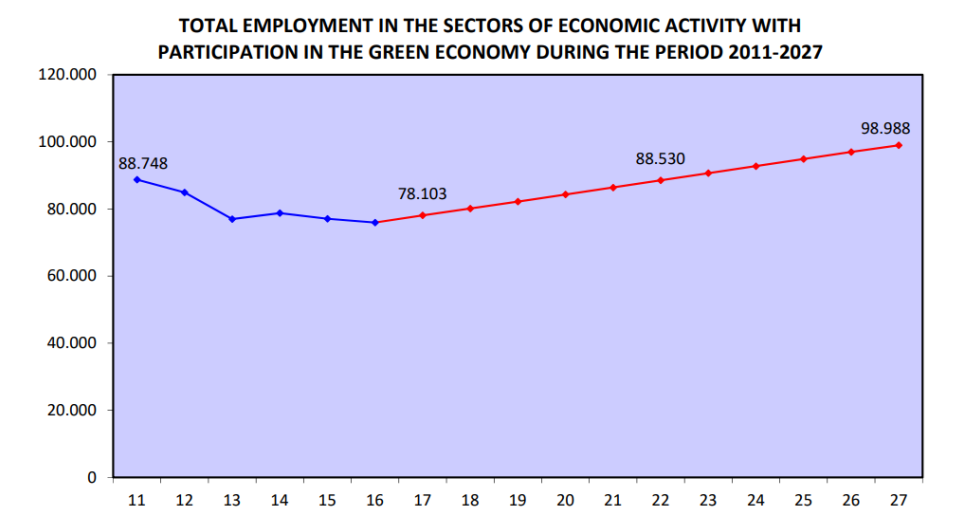
Occupations with a very high degree of participation in the green economy	
Professionals	
➢ Meteorologists	➢ Mining engineers and metallurgists
➢ Chemists	➢ Electrical engineers
➢ Geologists and geophysicists	➢ Electronics engineers
➢ Production engineers	➢ Architects
➢ Civil engineers	➢ Designers
➢ Environmental engineers	➢ Town and traffic planners
➢ Mechanical engineers	➢ Environmental and occupational health and hygiene professionals
➢ Chemical engineers	
Technicians	
➢ Chemical and physical science technicians	➢ Chemical engineering technicians
➢ Civil engineering technicians	➢ Power production plant operators
➢ Electrical engineering technicians	➢ Incinerator and water treatment plant operators
➢ Electronics engineering technicians	
➢ Mechanical engineering technicians	➢ Chemical processing plant controllers
Craft workers	
➢ Insulation workers	➢ Air conditioning and refrigeration mechanics
➢ Glaziers	
➢ Plumbers and pipe fitters	➢ Building electricians



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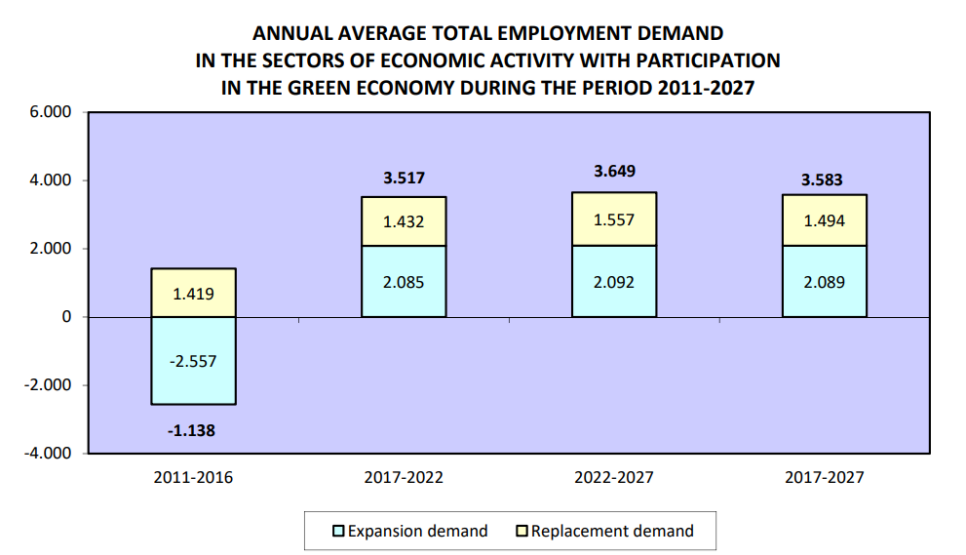

The majority of employed persons in the green economic sectors will work in the Professional, scientific and technical activities sector with their number exhibiting a significant upward trend. Over one out of three employed persons in the green economy will be employed in this sector, which also exhibits the largest annual total employment demand with 1.476 persons or 5,2% during the period 2017-2027.

Construction is the second largest green economic sector, also exhibiting a significant upward trend. The sector is gradually recovering, the forecast being that one out of five employed persons of the green economy will be working in this sector with the annual total employment demand reaching 649 persons or 3,5%.

Regarding the occupations with participation in the green economy, the majority of the employed will work in the occupational category of Technicians. Specifically, their number will increase from 20.636 persons in 2017 to 24.643 persons in 2027 (33,7% of total employment) registering an increase of 19,4%.

Equally important is the employment in the occupational category of Professionals where their number will increase from 16.957 persons in 2017 to 21.661 persons in 2027 (29,6% of total employment) exhibiting the largest percentage increase (27,7%) of the period 2017-2027.

Identification of green skill needs in Cyprus

The acquisition of the necessary knowledge and skills, by the persons employed in green occupations, is a necessary prerequisite for the achievement of the goal for transition to a green economy. Also important is for the persons to continuously upgrade and enhance the basic and specialised skills and knowledge needed in their occupation. Towards this direction, the study identifies the main thematic categories of specialised knowledge and skills of the occupations with participation in the green economy. These can be used in the design of specialised training programmes. Several of the identified green skills are new skills that relate to new green technologies, environmental legislation and environmental issues that require a high degree of specialisation. However, the majority of the identified green skills are existing skills which have to be adapted to the needs of the green economy and are considered as indispensable for the

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development of a greener economy, such as project management, strategic planning, entrepreneurial skills, processes optimisation, personnel management and quality management.

Source: https://www.hrdauth.org.cy/wps/wcm/connect/hrda/e2511d69-2b75-4622-9d36-5ea1c5277b65/SUMMAR~1.PDF?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_HHHAH9O0NGE980A7L632QJ0000-e2511d69-2b75-4622-9d36-5ea1c5277b65-ngBzz-L

Findings from the FIELD SURVEY in Cyprus

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

There were 10 participants in the focus group, 5 VET trainers and 5 VET learners as the guidelines mentioned.

All VET trainers were males and have an education level of postgraduate studies (MSc). Three of trainers have an environmental related background while the other 2 have a background in Business and Education. One of them is a trainer in a VET programme at the University of Cyprus and has experience in teaching solar panels installation and energy efficiency technologies while the other 4 are trainers in different NGOs across Cyprus and have experience mainly teaching corporate social responsibility and circular economy.

At the learners focus group, there were 4 females and 1 male. All of them holds a graduate degree (BSc) and they are interested in environmental topics such circular economy and environmental journalism. Their backgrounds are varying from, journalism, teaching, sociology, and literature. They don't have experience in green related subjects but are interested in learning more.

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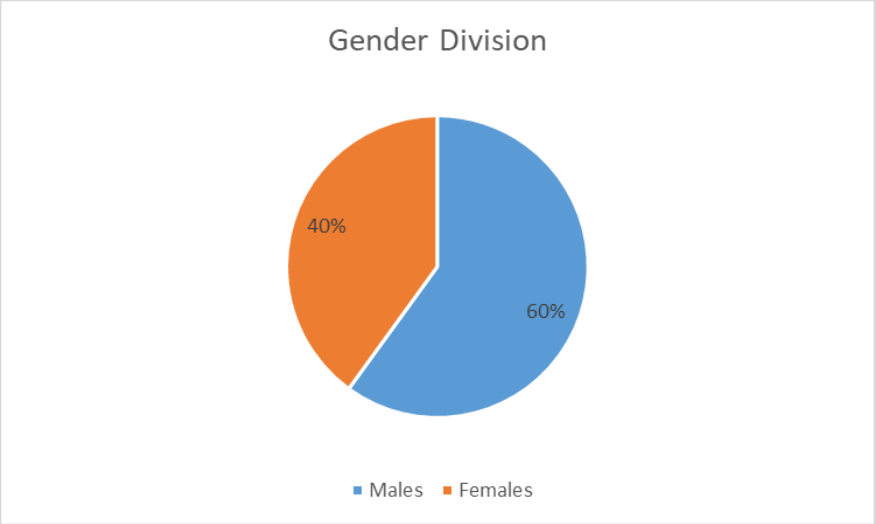
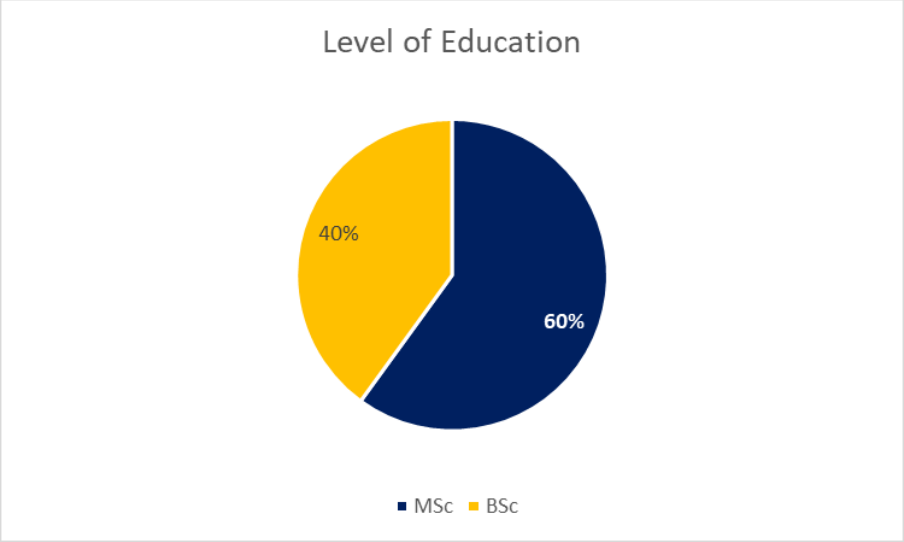
Below you can see the charts for the focus group's gender, education and professional experience.





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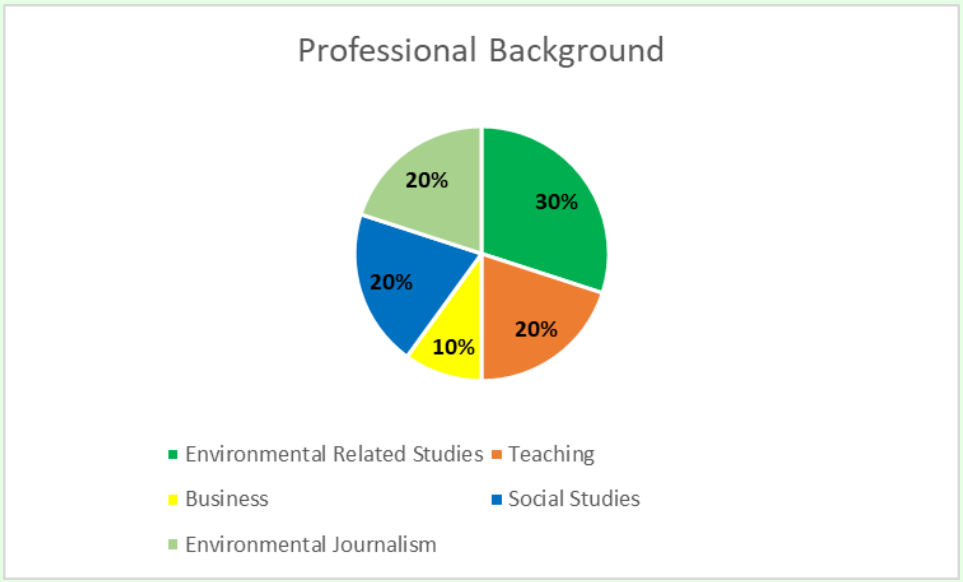

NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

According to participants, Climate Change is severely impacting the small island of Cyprus (which is located in the Eastern Mediterranean Sea), as well as the wider region. Often draught issues due to limited rainfall are observed in Cyprus, thus significantly affecting the local flora and fauna. Moreover, increased temperatures (especially during the summer) are disturbing daily life, as well as various sectors of the industry, such as agriculture, tourism, etc. Finally, other extreme weather events have also been observed in recent years, e.g. heavy rain, and hail (especially during the winter), destroying crops and private properties.

Additionally, participants mentioned other several environmental challenges in Cyprus such as:

- Lack of awareness on how to recycle - facilities.
- Older generations have less awareness about environmental issues and it's difficult to change their culture
- Transportation - limited options besides personal cars

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- Unsustainable planning of cities -
- Energy - limited capacity of renewables
- There is no serious policy by the government for tackling environmental challenges.

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

Vocational education and training systems could become more responsive to environmental challenges by primarily focusing on the particularities of each country and/or region, as differences between them regarding climate conditions, as well as the structure and magnitude of their industrial, commercial, residential, etc. sectors imply different approaches. Moreover, due to the dynamic nature of Climate Change, an equally dynamic level of organization, preparation and implementation of training is required, along with sufficient monitoring of environmental issues, in order to provide the most up to date information to the participants.

Some participants mentioned that there should be developed a Comprehensive Curriculum about environmental issues and policies by the VET system. In addition, Planning and coordination between the VET providers is very important and alignment with the international trends in environmental issues. National VET systems should set some criteria on VET providers about environmental standards during the trainings. Finally there should be priorities and certifications about reporting in Business, for example ESGs.

Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respond to the labour market demand?

The existing curricula, qualification standards and training programmes are to a very high extent up to date in these terms, but there is always a way for improvement. In addition, due to the dynamic nature of environmental issues, all the above should be part of a continuous process of update and improvement, in order to cover the rapidly changing needs of green skills. In addition, the adequate assessment of labour market demand needs is also important, so as to better link with it the curricula, qualification standards and training programmes.

Moreover, there is a need for some widely agreed standard at a country level or regional level. Other participants mentioned that some of them are up to date but some of the VETs don't adopt them. It also depends on the VET provider and its knowledge and interests in order to keep up to date the training programmes. Many participants agreed that there is a need for more coordination between VET providers.

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According to participants' views, public sector VET providers are not up to date because of bureaucracy. Although many of the public sector VET trainers have asked for up to date procedures and programmes there is inefficiency due to bureaucracy. Public sector decision making is not flexible and efficient.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think should be done to improve information and guidance on green VET opportunities.

Existing regional/national systems of information, advice and guidance could provide some additional information in order to attract even more potential learners in green career opportunities (which of course received much focus in recent years and have been increased in terms of employment opportunities). One possible solution could be the further dissemination of relevant information through the various communication channels (including social media, which have gained high power nowadays), digital platforms etc., as well as with direct collaboration with the industrial and other sectors in the form of placements for practice, etc.

There is some interest from the learners. VET providers with specific courses are providing some information regarding environmental topics. However, most VET providers don't provide enough information and sometimes it is difficult to diffuse this information. Need to make these skills more market oriented. Moreover, in Cyprus there is a basic level of infrastructure, and the cost is high for companies to adopt/follow green guides and seminars. The VETs in regard to environmental training is not very business oriented. The green skills should be adjusted to the needs of the market. The several training centres offering VET courses need more financial support and guidance. Basically, the learners need to find the courses themselves.

VET TRAINERS / PROFESSIONALS ONLY

As a VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

One participant mentioned this: I am confident that I have enough knowledge/expertise on green issues, stemming from both my academic studies, as well as my professional involvement in numerous research and other projects related to green issues in recent years. However, there is always room for improvement, as I share Solon's belief of "growing older, ever learning many things". Furthermore, the field/topic I feel more competent is the one I am mostly focused on, specifically the areas of Renewable Energy and Energy Storage, including the relevant technologies, their operational issues, etc. Finally, the area I think I would need additional training in is the one of digital technologies and their integration with the green areas, as well as how this can benefit their further penetration in the various markets.

The trainers mentioned that they need more specific technical knowledge and training.
Some of the trainers feel that they have strong knowledge on theory and practice about Circular Economy and reuse -upcycling. In overall, a wider training on environmental issues and on soft skills is needed for

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all VET trainers in Cyprus. Some trainers mentioned that they have strong knowledge on waste management and food recycling.

What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

The continuous monitoring of environmental issues, as well as the latest technology improvements in order to offer up-to-date educational material. Moreover, as a result of the COVID-19 pandemic, a shift to remote learning (mainly online, but also offline) has been observed, implying focus on mixed ways of learning nowadays (i.e. both in presence and remote), which can exploit the benefits of both particular teaching ways simultaneously. Finally, the ever-ending improvement of soft skills, along with proper organisation and appropriate equipment, are also important pillars for training programmes.

Need access to specific target groups, digital skills, up to date environmental skills, blended learning and content based on impact. It is also important to have the funding and the people (learners who are motivated). Target groups should be motivated. In addition, we need to encourage youth from schools. A career advisory on schools could help in increasing the demand for such courses.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

Unfortunately not, but this is something that we have in mind. Realizing the importance of networking and collaboration in our highly interconnected world (both in terms of people and technologies), the involvement of green entrepreneurs/industries could be beneficial for both our training programme(s) and the participants themselves, as well as the involved industries, through the linkage of education and practical experience.

Some participants mentioned that they cooperated with Chrysalis Leap and some environmental businesses. Some others mentioned that Cyprus Inno have collaborated with trainers in Entrepreneurship and social/green entrepreneurship.

LEARNERS ONLY

As a VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

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The answers of the 5 learners are presented below:

1. As a VET learner, I could be more aware about green issues and environmental awareness. I already have some knowledge but because the data are chasing all the time you have to be up to date and learn every day. I feel I need additional training in the field of permaculture.
2. Environmental awareness is to understand the fragility of our environment and the importance of its protection. As a VET learner, I feel that I have adequate knowledge regarding green issues and environmental awareness. A field and topic that I feel I can get additional training in is the loss of biodiversity and the ecosystem – why is it important and why we should give it more emphasis.
3. As a VET trainee I have enough knowledge about specific green issues, such as fast fashion, but it is not easy to find enough resources not only for reading but also for taking action. For example, which fabrics are more environmentally friendly, how we can recycle different fabrics, etc. Furthermore, I could use additional training on issues such as ocean/sea acidification, loss of biodiversity and of course fast.
4. I feel that my knowledge on green issues and environmental awareness is satisfactory enough to enable me to actively participate in events/workshops related to these topics. However, I feel that I would need additional training on the circular economy model and especially how this connects with the green issues and other environmentally related topics such as waste management etc.
5. My set of knowledge needs to expand on green audit and legislation. Both with training and with knowledge.

Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

Jobs that directly benefit the environment frequently involve renewable energy, electric transportation, energy efficiency, or environmental preservation. Today, however, every employment has the potential to become "green" as more industries make the switch to low-carbon models. A green recovery has the potential to strengthen the economy, save the environment, and energize the workforce. Green jobs are for sure the best alternative for the traditional jobs we have today. For example, if we have a mechanic engineer for the cars, this occupation can be transform to electric car engineer since everyone will have an electric car. So, if we change our habits, we can create another market for jobs and with this way we reduce the young unemployment.

1. The transition to a decarbonised economy and to a circular economy is not only essential to halting climate change, but is also a driver of economic growth with the potential to create millions of green jobs. We are talking about jobs aimed directly at protecting the environment or which seek to minimise impact on the health of the planet. In other words, environmental jobs are those aimed at protecting and promoting the environment,

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or those which consider their impact on the health of the planet at all times and endeavour to minimise it.

2. Green jobs are extremely important and we need programmes/projects and support from the government to be able to make different occupations greener or to include new green occupations in the labour market. However, it is important to be aware that some existing jobs can become greener and we need to find ways to do this. Also, any green skills can contribute not only to green jobs but also to the development of environmental awareness.

3. In my opinion, green jobs are employment positions at which you deal with topics related to the environment while green skills are skills directly connected with practices about mitigating various environmental problems and thus reducing the environmental impact. The impact of green jobs on current occupations can be seen in two different perspectives. On one hand, more and more young entrepreneurs are directed to green jobs which makes them more antagonistic, but on the other hand a lot of current occupations installed new positions internally that relate to green jobs which seems to be an improvement of current occupations. Green jobs and skills can contribute towards a greener and more modern economy as they are a key factor for the transition to a non-linear economy model and towards the reduction of negative environmental impact. By enhancing ones green skills you directly achieve higher impact at an individual level, while by supporting green jobs you can achieve a higher impact on a higher level.

4. Green skills and jobs are required to make a transition towards a greener economy and are focus in areas where it's important to minimise the environmental impact. These areas include engineering, agriculture, architecture, management and many more. As the demand for green skills and jobs increases, it will become harder to recruit the talent needed, so a lot of reskilling is required.

In your opinion, which are the most demanded green jobs in your region / country? Why?

1. In my country, I think green jobs are not so famous or on demand. However, in some cases agricultural scientist, electric car engineer, green building designer are studies that are becoming more famous and the young generation find them interesting.

2. In my opinion, in Cyprus, green jobs are not in demand and the positions that are offered are minimal. This is a sector that needs to get more attention. I am aware of positions such as Environmental Policy Officer, Environmentalists in companies etc. but I do not have in-depth knowledge regarding other green jobs.

3. I am not aware of any green jobs in Cyprus.

4. Some of the most demanded green jobs in my country are biological agriculture, up-cycling businesses, and solar-panel installations.

5. Green architecture, natural gas engineer, solar cell technician, wind turbine technician, agriculture management.

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If you would like to pursue one of the following career path (see table below), would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?
For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	Only 1 participant was familiar with this job and had some contacts.
Insulation worker	N/A
Solar photovoltaic installer	Participants are not familiar with this training path.
Installer of electrical networks with better efficiency	Participants are not familiar with this training path.
Reuse / recyclable material collector	No
Sheet-metal worker	N/A
Mechatronic	N/A
Installer of air conditioning systems with low environmental impact	N/A
Air quality engineer	N/A
Environmental quality certifier	Participants were interested but didn't know about the training path or the necessary qualification/educational required level in Cyprus.
Other. Please specify other professions	Some participants were interested in Environmental journalism

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy. Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means “I am very satisfied with the training received” and 1 means “I am not satisfied at all with the training received”. Please, motivate your choices.

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Summarise in the table below the rates received by each skill from your focus groups' participants.

Skill	1 (I am not satisfied)	2	3	4	5 (I am very satisfied)	Motivation
SOFT SKILLS:						
Decision making		1	2		2	
Risk management	1	2			2	
Time management	1		1	1	2	
Flexibility			1	2	2	
Adaptability			1	2	2	
Teamwork					5	
Problem solving			2	1	2	
Logical thinking			3		2	
Literacy			3	1	1	
Numeracy			2	3		
Communication				2	3	
Communication in a foreign language			1		4	
STEM skills		2	3			
DIGITAL SKILLS:						
Computer literacy			1	3	1	
Data entry		1		4		
Data analytics		2	1	2		
Word processing		1		3	1	
Web-based communications and research			1	2	1	
Secure information processing		1	2	2		
Social media management				3	2	
GREEN-RELATED SOFT SKILLS:						
Recycling consciousness			1	4		
Critical consumer behaviour (grocery/food/clothing..)	2		1	2		
Eco friendly / green travels	2	1		2		
Environmental footprint	2	1	1	1		
Awareness about ecological impact of textile materials production	2	1	1	1		
Water consuming and consciousness		1	3		1	

From the ratings above you can see that for the SOFT SKILLS, that the participants had mixed opinions (from Satisfied to less satisfied). Only a couple of participants mentioned that they were completely unsatisfied for Risk Management and Time Management. On the "teamwork" option, all participants (5) mentioned that they are completely satisfied and on the "Communications in a foreign language'' almost all (4) mentioned that they are completely satisfied.

On the Digital skills, as you can see ratings were mixed with most participants choosing ratings of 4 and 3 for most options.

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Finally for Green-related soft skills, the ratings of the participants were again mixed but with most participants mentioned that they were not satisfied with.

Would you like that one or more of the green, soft and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	"Yes"	"No"	"I am not sure"
SOFT SKILLS:			
Decision making	4	1	
Risk management	4	1	
Time management	3	1	1
Flexibility	3	1	1
Adaptability	3	1	1
Teamwork	2	2	1
Problem solving	5		
Logical thinking	4	1	
Literacy	4		1
Numeracy	3		2
Communication	1	2	2
Communication in a foreign language	1	2	2
STEM skills	4	1	
Other: ___			
DIGITAL SKILLS:			
Computer literacy	4		1
Data entry	5		
Data analytics	5		
Word processing	4		1
Web-based communications and research	3	1	1
Secure information processing	5		
Social media management	1	1	3
Other: ___			
GREEN-RELATED SOFT SKILLS:			
Recycling consciousness	4	1	
Critical consumer behaviour (grocery/food/clothing.)	4	1	
Eco friendly / green travels	4	1	
Environmental footprint	4	1	
Awareness about ecological impact of textile materials production	5		
Water consuming and consciousness	4	1	
Other: ___			

Following the answers from the preview question, the ratings in this section are as expected. Almost all participants mentioned that the soft skills, digital skills and green related soft skills should be trained in the Green VET Choices virtual learning portal. As you can see for some skills, the

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participants mentioned are now sure but in the majority they want those skills to be included in the training.

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3.3. IRELAND

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

Over the last decade, Ireland's environmental outcomes broadly followed its economic cycle. Major environmental pressures, such as emissions of greenhouse gases (GHGs) and air pollutants, nitrogen balance, waste generation and material consumption declined during the 2007-12 recession. Significant underinvestment in the wake of the recession affected the quality of infrastructure and slowed down environmental progress. Environmental pressures rose with the fast economic growth of 2014-19 and they are likely to intensify with population growth and increasing urban sprawl, road traffic and livestock. The positive environmental effects of the COVID-19 crisis have, as expected, been temporary.

GHG emissions rose by 3% in 2014-19. More determined action is needed to tackle emissions from buildings, transport, and agriculture (especially from ruminant livestock). Ireland committed to phase out coal and peat electricity generation in the 2020s. The share of renewables in the energy mix – especially wind power – has more than doubled since 2010. However, fossil fuels dominate, with coal, peat and oil providing about half of home heating. Ireland needs to phase out residential fossil fuel boilers more rapidly, while considering fuel-poverty risks. It should also focus support for energy efficiency on deep building renovations. The 2019 Climate Action Plan takes a major step towards bringing emissions outside the European cap-and-trade system in line with the 2030 target of -30% (compared to 2005). It would also put Ireland on the path to the net-zero emission goal by 2050. The plan's implementation requires considerable investment. Given public finance constraints, engaging the private sector is crucial to direct investment towards renewables, home retrofitting and electric vehicles (EVs), among others. Ireland needs to maintain commitment towards a "just transition" to a carbon-neutral economy. The negative net impact on employment is expected to be modest but concentrated in some areas. The government appointed a Just Transition Commissioner and launched a dedicated fund to address the short-term job losses in the Midlands associated with the peat phase-out.

In common with countries across Europe, key high-level environment and health issues in Ireland include climate change, antimicrobial resistance, chemical pollution, and air quality. According to the Irish Environmental Protection Agency, there are a number of issues that require action at national level, such as health impacts associated with localised air pollution due to solid fuel burning, ongoing reductions in the quality of our rivers and lakes due to a range of pressures including wastewater treatment and agriculture and drinking water contamination related to VTEC (Verocytotoxigenic E. coli). Some of the key challenges facing Ireland include on-site wastewater treatment systems (such as septic tanks) and urban waste-water discharges impacting on water quality and amenities; urban air quality in cities and towns; nuisance and amenity impact from noise; and radon in homes.

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According to the Environmental Protection Agency, plastic waste and the pollution of air and water are among the top environmental concerns for Irish people. Almost 80% of households cited water pollution as a very important environmental concern, according to a survey conducted by the Central Statistics Office (CSO). Coming in a close second place was plastic waste which was rated as a very important concern by 74% of people while 72% consider air pollution to be an important environmental issue. Just under three-quarters of people surveyed said they would support stricter air pollution controls on industrial and energy-production activities. These controls are considered to be the most effective means of tackling the issue while just 29% would support traffic restrictions such as congestion charges and low emission zones in polluted cities.

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

Name of Initiative: Life Emerald
Leading Institution: Environmental Protection Agency, Ireland
Website: https://www.epa.ie/environment-and-you/air/life-emerald/
Description: This 3-year project commenced in 2021 and has the following objectives: National 3-day air quality forecast, near real-time mapping of air pollutants throughout the country and creating historical maps of air pollutants. The key goal is to strengthen air quality management in Ireland to ensure effective implementation of the EU Ambient Air Quality Directives (AAQD) and to help implement the European Green Deal.

This project will greatly improve Ireland's air quality management capabilities by:

- Building upon previous and current LIFE projects (ATMOSYS, LIFE IP's Malopolska and HungAIRy) and national projects in Ireland
- Testing, and where possible, applying new methodologies currently being investigated in ongoing and proposed EU projects, e.g., new EU spatial assessment methodology of monitoring networks.
- Empowering the regional and local authorities responsible for air quality action plans, with improved innovative tools and information regarding air pollution sources and hotspots, to ensure that cost-effective measures are taken.
- Strengthening awareness-raising amongst the public, policymakers, and stakeholders regarding the sources of air pollution, the negative health effects and how effective measures can be implemented.
- Encouraging more dialogue between Irish stakeholders on the topic of air pollution, and transboundary international cooperation with neighbouring regions.

Vocational Education and Training

Briefly describe the organisation of the VET system in your country.

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Overall responsibility for education and training lies with the Department (Ministry) of Education and Skills (DES) with a number of bodies, operating under the auspices of the DES, having responsibilities for different aspects of the VET education and training system; these include, among others: (a) SOLAS, which is Ireland's Further Education and Training (FET) authority, responsible for planning, co-ordinating and funding FET in Ireland (b) Quality and Qualifications Ireland (QQI), which has responsibilities for making awards and setting standards for FET programmes and some tertiary level education programmes (outside the university sector) (c) the National Skills Council (NSC) set up in 2017 by the Department of Education and Skills to assist Ireland in anticipating and responding to skills needs across economic sectors; (d) the expert group on future skills needs, which is based in the Department of Business, Enterprise and Innovation, and advises the Irish government on current and future skills needs of the economy and on other labour market issues that impact on Ireland's enterprise and employment growth; and (e) 16 ETB training centres and schools/colleges that operate on a nationwide basis. Most vocational education and training in Ireland occur within the Further Education and Training sector as outlined above, although since 2016, a number of apprenticeship programmes have been proposed, developed and rolled out within the tertiary education system (i.e. insurance studies).

In Ireland, the FET sector is unique in that it offers every learner an opportunity and pathway to pursue education, regardless of previous levels of attainment. Serving around 200,000 unique learners each year, FET provides a continuum of learning opportunities from Level 1 to Level 6 of the National Framework of Qualifications (NFQ) focused on both core and specific skills development (vocational education), accompanied by a range of learner supports to facilitate the active inclusion of all citizens. FET also has direct links to local communities, their networks, and distinct regional enterprises, with the benefit of national support and investment. It is uniquely placed to provide opportunities to move into exciting, interesting vocations and careers within the green economy, in addition to creating pathways to pursue further green skills training within higher education. It also offers bespoke upskilling opportunities responding to the impact of social, economic, technological, and political changes on the employment market. Except for statutory apprenticeships, the maximum length of a FET course in Ireland is one year, although some provision carries a two-year option with a distinct award at the end of each year. This means learner engagement with providers tends to be shorter term and that FET can respond to the labour market quickly.

Is there any specific training / training module / WBL experience on green skills?

Significant work on designing new further education and training programmes (and adapting current ones) to meet the demands of the green economy and associated government policies has been underway in Ireland for some time. There is currently 50+ programmes being delivered by 16 Education and Training Boards (ETBs) across Ireland with a focus on green skills. A new strategic programme titled *Green Skills for FET 2021-2030* captures some of the key areas for the FET Sector in the transition to a green economy and responds to various EU and national directives. Green

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Skills for FET 2021-2030 expands upon the innovative work already being done in the FET sector, and as a collaborative effort between SOLAS, ETBI and ETBs, is concerned with 3 main objectives:

1. To create awareness of climate justice, sustainability and bioeconomic issues across FET learners, FET staff and school students
2. To train and upskill those in construction occupations in the latest green technologies.
3. To create career opportunities in the green economy for the employed, unemployed and those within vulnerable sectors.

Some of the specific training programmes include:

- Environmental sustainability for the Workplace
- Lean Practice for Sustainable Business
- Resource Efficiency in the Workplace
- The Circular Economy
- Sustainable Procurement
- Greening the Supply Chain

Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

Specifically in the Cavan Region, Cavan Institute (main provider of VET) offers the following training programmes and initatives:

1. Sustainable Energy and Construction Technology - This 1-year course is designed to equip students with the knowledge and skills associated with environmentally sustainable building and construction technology. The Sustainable Energy and Construction Technology course enables students to develop practical skills in the areas of building construction and wood fabrication.

2. Renewable Energy Technology and Control Systems (2 Year programme) course will enable students to develop an understanding of sustainability issues and renewable energy systems, to examine the role of microprocessor control in industry, and to design and build a control system which requires a number of inputs and outputs. Students will develop knowledge, skills, and competence in areas such as solar photovoltaic (PV), solar thermal and domestic wind turbine system specification and control systems used in industry.

3. Carpentry Techniques course focuses on passive house building techniques and "Nearly Zero Energy Building" (NZEB) standards, aims to produce graduates who are equipped to work in the rapidly changing landscape of today's wood construction industry. It also includes elements of industrial sustainable design.

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Is one of the following green career paths, part of the VET system in your country?

Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

According to the Irish Institute of Learning and Development, several "green jobs" have emerged Ireland such as eco-construction specialist, energy data analyst, sustainable energy engineer, green asset manager and carbon analyst. These would be regarded as new high-skilled occupations in Ireland.

Employment Perspectives in Green Occupations

Green jobs occupational trends.

Figures released by the Central Statistics Office (CSO) in June 2022 revealed that the estimated gross output of environment goods and services was €6.6 billion in 2019, with approximately 37,400 people currently employed through the green economy. Around 27,800 of these work in the industry sector of the green economy. There is no data available through the CSO as to the gender or age profile of these employees.

The shift to a net zero carbon economy over the next thirty years will lead to widespread changes in sectors and occupations, the phasing out of some jobs but also demands for new talent, skills, and capabilities, bringing with it new employment opportunities and sustainable economic growth. As a result, the key green skills in demand in Ireland are forecast as:

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- Energy and resource efficiency awareness across all occupations
- Entrepreneurial skills to meet demand for eco-friendly goods and services
- Eco-design and Innovation skills applied to processes, products, and services
- Interdisciplinary Sustainable Engineering, Science and Building skills
- Sustainable Supply Chain Management and Logistics skills
- Lean Manufacturing skills - minimising waste, improving productivity
- Commercial and Marketing skills to advise consumers on energy efficiency solutions
- Sustainable and Ethical Procurement skills
- Enterprise Carbon Monitoring and Accounting skills
- Clean Energy Research & Development skills

Findings from the FIELD SURVEY in Ireland

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

The GREEN VET CHOICES focus group was host at the offices of The Rural Hub in August 2022 with 6 participants. We have 3 VET trainers, and 3 VET learners attend the in-person focus group session. The workshop was facilitated by a staff member of The Rural Hub. We had 2 males and 4 females.

Profile of the VET Trainers: All 3 trainers are currently in-service and delivering training on a free-lance basis with Cavan Institute in the fields of business development, tourism and hospitality and youth work practices. 2 of the VET trainers had green-related subject knowledge in relation to food waste reduction, Circular Economy practices, recycling, and carbon reduction. 1 trainer was new to the topic of green skills or green-related subjects but interested in the project topic as she felt it was relevant to her training groups.

All 3 VET learners are completing their vocational training and currently on work-placements due for completed at the end of August. The learners were completing the following course: business, graphic design, and creative media. Green-related subjects were not included in their vocational courses.

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NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

Some of the key environmental challenges identified by the focus group participants included:

- Waste management and the use of landfill – there are a number of dump sites in Co. Cavan, and these were seen as problematic and not a solution in the long-term. There is no "active" strategy at regional level to reduce the amount of waste going to landfill. More needs to be done in this regard.
- Water pollution – there has been issues with agricultural waste leaking into the local rivers and lakes and killing fish stocks. Also, the lakes are used as a key amenity in the county and there are litter and rubbish challenges especially during the summer months, which end up in the rivers and lakes damaging the local biodiversity.
- Costs associated with retrofitting old housing stock, especially one-off houses in rural areas. There is a need to make houses more energy efficient and sustainable however the costs are prohibitive and the grants available are insufficient to meet the costs and therefore motivate people to make the changes
- There are skill and labour shortages especially if you are looking for assessors in terms of Energy Ratings (BERs), or installation of renewable energy heating systems.
- The take-up of green training programmes by school leavers is still relatively modest and more could be done to promote green skills as a "job for the future".

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

- Continued investment in green skills training programme – Ireland is relatively well placed in terms of VET provision, but people need to be encouraged and guided to take up these courses
- CPD training for teachers and trainers – allocation of credits under the Croke Park Agreements – to encourage teachers and trainers to improve their skills and knowledge
- Expand the Green Flag initiative from primary schools to secondary and FET schools so as to encourage young people to continue with their environmental projects and positive behaviours
- Ensure that there is some element of "green, sustainability, environmental awareness" in non-green courses such as hospitality, tourism, business development, HR management, youth & community development, etc.
- We could highlight more the work that is being done within VET providers and institutions and promote the work of VET in responding to environmental challenges.

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Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

Based on the discussions in the focus group, all participants believed that the new standards and training programmes are up to standard as they have been developed in consultation with industry, so they reflect the skills that are needed. More could be done to adapt and update existing curricula especially where the green element is currently missing. The participants all taught that green skills and technology need to be featured in all vocational training programmes as we are preparing young people for the world of work and both of these elements will be a feature of workplaces into the future.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

This was an area that all participants believed more could be done to improve the advice and guidance services for young people and jobseekers in terms of new opportunities (training and employment) within the green sector. In the focus group, we discussed how guidance services are somewhat removed from the classroom in VET schools and that this disconnect from the curricula is a disadvantage. Two different departments within ETBs are responsible for training and adult guidance and on the ground, it was felt that communication between both was lacking, meaning that guidance services do not have the benefit of knowing about industry and work-place opportunities and trends.

Suggestions on what could be done:

- Green Skills Career Events
- Meeting the “Green Employer Events” at regional level
- Behind the Scenes – TikTok video testimonials of young people working in green jobs – interviews to highlight what the work entails and its benefits
- Training for Career Advisors and Adult Guidance professionals
- Networking sessions between VET trainers, employers, and guidance professionals – identify gaps, share experiences, and support expertise development

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VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

No, all three professionals agreed that they would like more knowledge and expertise in order to support students better. They felt they understood what green skills were in general terms but when it came to industry specific skills or more high-level skills their competences were lacking. For example, one participant mentioned that they would feel comfortable facilitating lessons on how to raise awareness of sustainability or how to implement a more resource-efficient lifestyle, work practices, or activities. Another trainer also mentioned that she would be comfortable in terms of youth empowerment in terms of climate action or eco-citizenship but that would be the extent of it.

We discussed more specific green skills such as environment protection, biodiversity, waste management, green technologies such as renewable energies, sewage treatment etc. – these topics were beyond the knowledge and skill level of the participants.

What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

Some of the supports mentioned included:

- Talking and working with more experienced colleagues – peer learning
- Having access to high-quality learning materials that could be adapted locally if needed
- Understanding the needs of students and what is needed from the labour market
- Knowing how to develop learning materials that are interesting for learners – case studies, practical activities, skills demonstrations, site visits to green businesses
- Train-the-trainer programmes – hybrid format
- Seeing some of the new technologies in action – very practical learning
- Setting up a green technology lab for trainers and students

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

For all participants in the focus group, this was not an experience they had.

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LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

No, all VET learners stated that they do not have these skills. Through their vocational studies, green skills were not a feature. They would like a general understanding initially so that they are better informed and then once they had this knowledge, they could pinpoint what else was needed. At the moment, they could not offer any further insight on this question.

Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

All learners stated that they believed that green jobs were very technical and that you need to have very scientific skills for example – qualifications as an electrician (4-year apprenticeship) and that they do not know of any accessible jobs or income generating opportunities available to them locally within the green economy. This is an opportunity for the project through its outputs to highlight and showcase what is possible for this target group.

In your opinion, which are the most demanded green jobs in your region / country? Why?

The following was a list of jobs identified by the learners:

- Energy assessor
- Recycling operator
- Building green houses and buildings
- Energy conversation
- Water treatment and conservation
- Eco-tourism and managing biodiversity

If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?

For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	BER Accessors course with the ETB
Insulation worker	No
Solar photovoltaic installer	No

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Installer of electrical networks with better efficiency	Electrician apprenticeship with additional training
Refuse / recyclable material collector	On-the-job training for low-skilled operators
Sheet-metal worker	Metal work course
Mechatronic	Mechanic apprenticeship
Installer of air conditioning systems with low environmental impact	No
Air quality engineer	No
Environmental quality certifier	No
Other. Please specify other professions	N/a

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

Skill	**1** (I am not satisfied)	**2**	**3**	**4**	**5** (I am very satisfied)	**Motivation**
SOFT SKILLS:						
Decision making		1	4		1	
Risk management		6				
Time management			3	2	1	
Flexibility				6		

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Adaptability				6		
Team work					6	
Problem solving					6	
Logical thinking		1	5			
Literacy					6	
Numeracy					6	
Communication					6	
Communication in a foreign language		6				
STEM skills		6				
DIGITAL SKILLS:						
Computer literacy					6	
Data entry	1	2	3			
Data analytics	1	2	3			
Word processing					6	
Web-based communications and research					6	
Secure information processing					6	
Social media management			1	5		
GREEN-RELATED SOFT SKILLS:						
Recycling consciousness			4	2		
Critical consumer behaviour (grocery/food/clothing.)			4	2		
Eco friendly / green travels		5	1			
Environmental footprint		4	2			
Awareness about ecological impact of textile materials production	6					
Water consuming and consciousness	4			2		
Other: ___						

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Would you like that one or more of the green, soft, and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making	2	4	
Risk management	6	0	
Time management		6	
Flexibility	6		
Adaptability	6		
Team work	6		
Problem solving	6		
Logical thinking	6		
Literacy		6	
Numeracy		6	
Communication		6	
Communication in a foreign language		6	
STEM skills	6		
Other: ___			
DIGITAL SKILLS:			
Computer literacy		6	
Data entry		6	
Data analytics	6		
Word processing		6	
Web-based communications and research	6		
Secure information processing	6		
Social media management		6	
Other: ___			
GREEN-RELATED SOFT SKILLS:			
Recycling consciousness		6	
Critical consumer behaviour (grocery/food/clothing.)		6	
Eco friendly / green travels		6	
Environmental footprint	6		
Awareness about ecological impact of textile materials production	6		
Water consuming and consciousness	6		
Other: ___			

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3.4. ITALY

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumptionand waste.

Reduction of water resources, soil instability, forest fires, land consumption, desertification and loss of crop and ecosystem productivity: these are some of the several risk factors that characterize the entire Mediterranean basin. To these risks are added the additional pressures caused by the ongoing climate change that act as "amplifiers" with consequences that can be extremely negative in the coming decades if a new model of sustainable development is not pursued, capable of reducing impacts and strengthening the resilience of the territory.

The report "Risk analysis. Climate change in Italy" identifies five climate challenges (https://www.cmcc.it/wp-content/uploads/2020/09/EXECUTIVE_SUMMARY_CMCC_RISCHIO_Clima_in_Italia.pdf):

1. Climate change

In Italy climate change is linked to increases in **temperature**, changes in **rainfall** regime and increased frequency and duration of **extreme climatic phenomena**.

In these scenarios, a generalized increase of the average **temperature** can be expected up to 5 C° in 2100 compared to the beginning of the century.

Significant geographical differences in the pattern of rainfall are expected. In general, a decrease in annual values and an increase in intensity on rainy days.

However, there are significant differences in the geographical basis.

In all considered scenarios, the number of hot and dry days increase during the year.

Important changes are also expected for the **marine environment**, in particular the increase of the surface temperatures and sea level, with negative impacts on the provision of so-called coastal "ecosystem goods and services" that support entire socio-economic systems.

2. Aggregate risk for Italy

The probability of risk of **extreme events** has increased in Italy by 9% in the last twenty years.

The ability to adapt and its resilience affect the entire national territory, but the South of Italy shows a considerable number of municipalities with low levels of resilience to disasters. However, even the richest and most developed regions of the North neither are immune to the impacts of climate change, nor are prepared to deal with them.

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3. Expected risk analysis for Italy: key sectors

Urban environment

Urbanized areas will suffer severe negative impacts from climate change, especially in reference to extreme climatic phenomena (heat waves and events of intense precipitation).

They will be mainly the most vulnerable sections of the population (children, the elderly, disabled) to suffer the most negative effects.

The intense heat poses a health risk to the population.

Urban centers experience higher temperatures of up to 5-10 ºC to the surrounding rural areas. In 2019 the days of intense heat were 29 more than in the period 1961-1990. Climate projections suggest that phenomena that are exacerbated in urban realities.

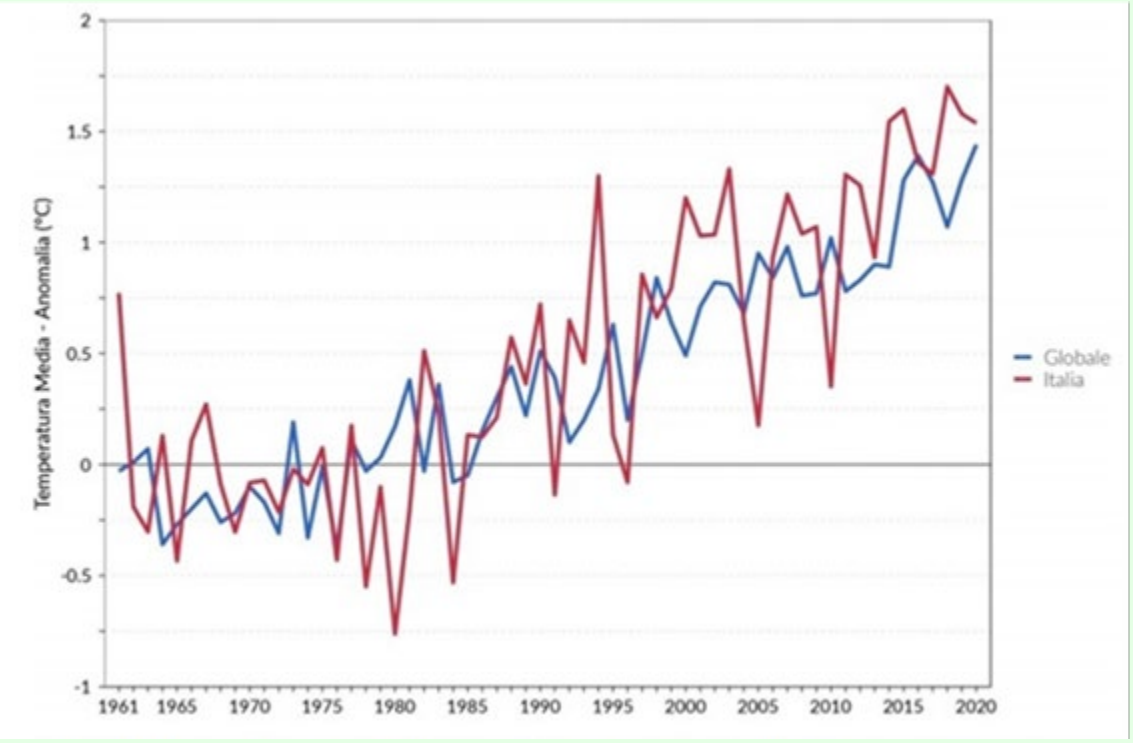

Figure 1. Series of global mean temperature anomalies on earth and in Italy, compared to normal climatological values 1961-1990.

Sources: NCDC/NOAA e ISPRA. Elaboration: ISPRA**.**

There is also a strong link between temperature rise and atmospheric pollution. The expected increase in periods of intense heat affects increase of mortality, on cases of cardiovascular and respiratory diseases.

Italian cities are also particularly exposed to the risks associated with intense rainfall and resulting from flooding.

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Risk analysis integrates climate scenario data on expected increase in the future of intense rainy events with the current situation where 91% of the Italian municipalities is at risk for landslides and floods, while over 7 million people live or work in areas defined as "high hazard".

Geo-hydrological risk

Italy is an area strongly subject to geological, hydrological, and hydraulic instability that pose a serious threat to the population.

The rise of temperature and the increase of precipitation phenomena located in space have an important role in exacerbating the risk from geo-hydrological instability throughout the territory.

Anthropogenic factors (soil consumption and waterproofing, occupation of river areas, etc.) combined with the rise in temperature and the increase in precipitation phenomena localized in space have an important role in exacerbating the risk.

Water resources

Expected climate change (prolonged periods of drought, extreme events, and changes in precipitation regime) present risks to quality and for the availability of water resources in Italy. The risks are most evident in the summer months and in semi-arid areas.
The high competition between sectors (civil consumption, agriculture, industry, energy, tourism) for water demand, especially in hot seasons, requires more programming and coordination to increase efficiency the use of resources and ensure the sustainable development of the territory.
Inadequate infrastructure (up to 50% water loss in agriculture) is an obvious vulnerability and an important factor in the management of risk.

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Figure 2. The Po River is the biggest river of Italy and runs throughout the Pianura Padana, one of the most important agricultural and industrial area of the North of Italy. The summer 2022 is for the Po River the worst crisis of the last 70 years. Since May 2022 the area has been experiencing heat waves, temperatures higher than average and absence of rainy days. The government has declared the state of emergency.

Source: https://www.valigiablu.it/crisi-climatica-fiume-po-secca/
(Retrieved on the 26/07/2022).

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Agriculture

The risk from climate change in Italy for the agricultural sector is significant for both crop and animal production.

The crops respond to the expected increase in average temperatures with variation of the duration of the growing season, the precocity of the event of the phenological phases and potential displacement of the cultivation areas to greater latitudes and altitudes where better growth and development conditions can take place.
For the future are expected in Italy decreases in productivity for crop cycling in spring-summer, especially if not watered.

There is also a possible expansion to the North of the cultivation by species such as olive trees and vines. The expected increase in extreme events may, however, limit expansion to new ranges.

The increase in temperature affects the welfare and quality of livestock raised subjected to heat stress for long periods of the year, with impact on the productivity of the sector.

Forest fires

The increased incidence of extreme climatic phenomena interacts with socio-economic changes and land use. This situation may exacerbate specific components of fire risk, with negative impacts on people, goods, and ecosystems. An increase in greenhouse gases emissions in the atmosphere is also expected with significant consequences on human health.

4. Costs, tools, and resources

The costs of the impacts of climate change in Italy increase rapidly and exponentially as the temperature increases in the different scenarios: from 0.5% of current GDP per capita, at 7-8% at the turn of the century in the worst-case scenario.

Climate change widens economic gap between richer regions and poorer regions: economic impacts tend to be higher in less developed areas.

All sectors of the Italian economy are negatively impacted by the climate change. The greatest losses are caused by the infrastructural endowment of the Country (as consequence of the intensification

the phenomena of instability), in agriculture and in the tourism sector in both summer and winter.

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Climate change will require a great deal of investment in the future and will represent for Italy an opportunity to invest in the sustainable development, recognized by the European Green Deal as the only model of development for the future.

It is the best time to ensure that new ways of doing business and new ways for a sustainable management of the territory become part of the baggage of public, local, and national enterprises, and bodies.

5. Adaptation measures

Climate change risk management requires appropriate adaptation initiatives which, in the light of the information provided by the expected climate change analyses in Italy, can be designed and implemented at all levels and in different sectors, on the path taken by some initiatives that are currently in place.

More charts on temperature change, pollution, etc. here:
https://www.istat.it/it/files/2022/03/Cambiamenti-climatici_2020.pdf
(Published on March 28, 2022)

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

Name of the initiative: Decree D. Lsg. n. 116 2020

Leading Institution: Italian Government

Eventual contacts (including website): https://www.essenziale.it/notizie/marina-forti/2022/06/29/la-seconda-vita-degli-stracci | https://www.tuttoambiente.it/news/rifiuti-tessili-obbligo-raccolta-differenziata-dal-1-01-2022/#:~:text=%E2%80%9CL'obbligo%20di%20raccogliere%20separatamente,diventer%C3%A0%20obbligatoria%20entro%20il%202025.

Description (including expected impact and impact achieved so far):

From January 2022, in Italy, the separate collection of textile fibers is compulsory, thanks to the decree D. Lsg. n. 116/2020 with which Italy has implemented a series of directives on the **circular economy**, adopted by the European Union in 2018 (According to European directives, sorting of textile waste will be mandatory by 2025). In other words, **from the beginning of 2022, in Italy, the separate collection of discarded clothes, old sheets, blankets, upholstery, or anything that is made of a textile fiber, is mandatory**. The *goal* is to reduce the environmental impact of textiles and encourage reuse and recycling, as today most of the textile waste produced in Italy ends up in landfills or incinerators as general waste.

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Expected impact: Separate collection should make it possible to **reduce the mass of textile waste that becomes undifferentiated waste**, increasing the mass that enters the reuse or recycling supply chains. Nowadays almost 6% of the mass of waste disposed of in landfills or incinerators each year is textile fiber. However, separate collection implies the ability to select, treat, reuse, recycle or properly dispose of what will be collected.

The yellow bins for the collection of clothing and other fabric scraps are already present in 70 percent of Italian municipalities, in addition to collections organized by charities. Even if Italy is early, it will take some time for all the municipalities to adapt. From the yellow bins, which are the responsibility of the municipalities, the collected waste will go first to temporary deposits and then to the companies that deal with the selection, replacing and recycling on the second-hand market. The entire sector now employs about 6,000 people throughout Italy, but huge investments are needed to reconvert the system and start a true circular economy in the textile-fashion sector. Investing in textile recycling technologies will ensure that 80% of pre- and post-consumer textile materials are managed and 75% of what is recycled would remain in the textile system while 5% would affect other industrial sectors.

Hence, it is expected that a system of guidelines on the recycling and disposing of textiles will emerge as well as a system of "extended producers' responsibility", so that the clothing industry is jointly responsible for the waste it generates.

***Impact achieved so far*:** not calculated yet.

Case study:

The industrial area of Prato, on the outskirts of Florence, is the largest textile district in Europe, where about 2,500 large and small companies produce yarns and fabrics, and another 4,000 manufacture clothes and knitwear. Many of these companies specialize precisely in transforming fabric scraps into new fiber. To learn about the textile industrial district of Prato, which is the world capital of recycled wool and on how it has been applying the principles of circular economy for decades watch the documentary "Stracci" by Tommaso Santi (https://www.straccidoc.it/).

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Vocational Education and Training

Briefly describe the organization of the VET system in your country.

VET in Italy comprises the following main features:

- education and employment ministries lay down the rules and general principles, but the regions and autonomous provinces are in charge of VET programs and apprenticeship- type schemes.
- there are three types of apprenticeship with one type (Type 2) not corresponding to any education level but leading only to occupational qualifications recognized by the labor market. In other words, apprenticeship is available at all levels and programs and is always defined as an open-ended employment contract. Type 1 apprenticeship is offered for all programs at upper secondary level and the higher technical education and training (IFTS) program. Type 3 apprenticeship (higher training/education apprenticeship) is offered in higher technical education (ITS) programs and all tertiary education level programs leading to university degrees, HTI diplomas, and doctoral degrees corresponding to the tertiary level. Type 2 apprenticeship does not correspond to any education level, diploma, or qualification, but leads to occupational qualifications recognized by the relevant national sectoral collective agreements applied in the hiring company. Type 1 and type 3 apprenticeships are associated with a formal education and training program, while Type 2 is not.
- continuing VET is mainly directed towards employed people.
- the recent adoption of the national qualifications framework (January 2018) is a catalyst for re-designing qualifications.

Distinctive features

The Italian context is characterized by the presence of multiple institutional players at national and regional levels, in addition to the relevant role of the social partners.

Title V (article 117) of the Constitution provides for ownership either by the State, the regions, or mechanisms for cooperation between the different institutions, in relation to the type of training supply:

- the State establishes general rules and determines the fundamental principles of education.
- the regions have legislative power over VET.
- education falls under the scope of concomitant legislation, except for the autonomy of education institutions.

Considering the interweaving of the different intervention areas, ministries of education and labor and the regions define formal agreements within the State-regions conference. The aim is to define matters of common interest, although at different levels of responsibility.

The implementation of Title V has not yet been completed; this increases the interweaving and the complexity of the different levels of system governance. The areas of activity which primarily apply to the jurisdiction of the education ministry and those which primarily apply to the labor

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ministry and the regions and autonomous provinces, are to be kept distinct. However, many activities and interventions require consultation between the different institutional players.

Reference should be made to the role of the social partners, who contribute to defining and creating active employment policies, especially in relation to VET (in particular lifelong training).

Source: https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/italy-2019

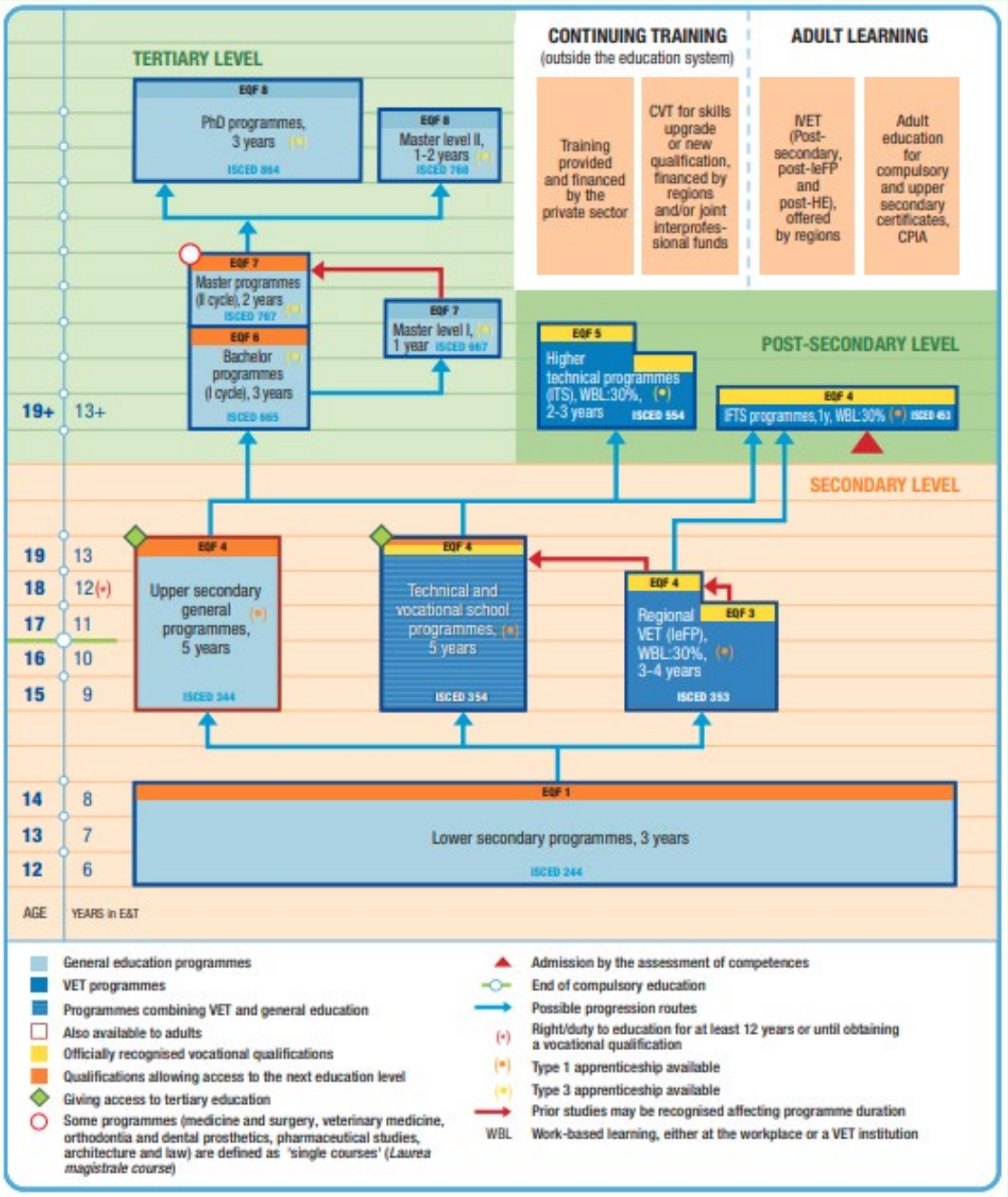

Figure 3: Graphical representation of the Italian vocational education and training system
Source: https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/italy-2019
(Retrieved on the 26/07/2022).

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The ITS - Istituti di Istruzione Superiore (*Higher Technical Institutes*)

ITS is an important innovation for the Italian training offer. The added value of ITS is the strong interaction between school and the world of work.

For this purpose, ITS offers high-level postgraduate courses that constitute a new channel of education not "academic", but parallel to university courses.

Established by DPCM of 25 January 2008, ITS is constituted in the form of Foundations involving companies, universities, schools, local authorities, research centers, professional associations, training agencies, trade associations and other associations with economic, technical, and environmental interests.

The main objectives of an ITS are:

- Realization of two-year courses designed to prepare specialized technicians able to bring technological innovation in local companies with particular reference to SMEs.
- promote the integration of education, training, and work systems.
- promoting technology transfer projects in small and medium-sized enterprises.
- promoting technical and scientific culture.
- orient young people towards the technical professions most in demand by the world of work.

ITS courses fall fully within **the system of Public Education** (see MIUR - Ministry of Education), constituting a high level of specialization after the diploma of higher education.

For further information visit the ITS System portal or Download the MIUR brochure.

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Is there any specific training / training module / WBL experience on green skills?

Progetto Green Jobs (http://www.progettogreenjobs.eu/)

Progetto Green Jobs is a project promoted by the Cariplo Foundation in 2015 as a school-work alternation tool to orientate and train VET students about the sustainability culture in the cultural, social, environmental, and professional field.

The project, in fact, aims at stimulating students and professors in the acquisition of green skills as a tool to protect the territory where they live as well as a professional opportunity.

From 2018 the program has become national thanks to the support of several ACRI Bank Foundations and has engaged more than 220 classes and 4500 students at secondary level schools in the Piemonte region and the city of Genova.

Green Jobs is carried out by Junior Achievement Italia (http://www.jaitalia.org/), a no profit organization, together with InVento Innovation Lab (https://inventolab.com/) and other regional entities.

Thanks to its innovative and concrete "learning by doing" approach the project Green Jobs allows students to: 1. Develop a green business idea coherent with the environmental challenges posed by the objectives of the Agenda ONU 2030, 2. Enhance individual and collective creativity and promote soft skills, 3. Learn about organizational and entrepreneurial management models as well as about environmental and economic sustainability, 4. Experiment by locally starting a mini green enterprise.

Fenice Green Energy Park (https://www.fondazionefenice.it/)

Fenice Green Energy Park is an embryo of Smart City created by Fondazione Fenice close to Padova where students can develop both soft and hard skills in an informal environment. The park promotes the themes of the Green Deal and New Jobs through An Academy of Higher Education that offers courses and Masters, educational courses for all age groups, a research body on cutting-edge technologies, awareness-raising services for SMEs and Third Sector Organizations. The Park has innovative demonstration applications, an Educational Hostel and Classrooms for Professional Laboratories.

The Fenice Green Park also promotes school-work alternation programs, the PCTO (Ex-Alternanza Scuola-Lavoro) (https://www.fondazionefenice.it/scuola/alternanza-scuola-lavoro/), based on training activities and company visits on the themes and trends of the economic development (e.g., Green Jobs, Green Economy, renewable energies). The so-called "learning weeks" of work-school alternation foresee company visits, case studies, lectures, practical workshops, role playing, learning by doing and orientation activities. Secondary level schools and Fondazione La Fenice can subscribe a convention and the WBL learning agreement of the student to start a certified school-work alternation course.

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There are several Modules of PCTO Alternanza Scuola-Lavoro. Each of them has a specific focus and can be carried out completely in English. For example, in the Digital Module students learn about green and blue economy, start-up and enterprise simulation, GIS and drones, robotics and automation, digital applications, FAB lab and 3D printing, Arduino and Vitruvian Game, CV creation and job-interview simulation, etc. The contents of the Module Costruzioni Ambiente e Territorio (Building Environment and Land) overlap with these but in it, students rather focus on Green Technologies (es. Green Building, Photovoltaic, demotics, energy efficiency).

Describe any initiative / programme / project undertaken in your region / country to include green /environmental awareness in VET programmes / courses.

RiGenerazione Scuola (https://www.istruzione.it/ri-generazione-scuola/index.html), in English School Regeneration, is the Plan of the Ministry of Education implementing the objectives of the 2030 UN Agenda. The Plan is designed to accompany schools in the ecological and cultural transition and implementation of education paths to sustainable development provided from the teaching of civic education. The school has the task of educating students to inhabit the world in a new and sustainable way and to make them protagonists of change, developing the *green skills*. With the term "regeneration" the idea is to overcome the concept of "resilience"; in fact, it is no longer a matter of adapting or resisting climate change, but it is time to generate a new way of living that looks "far" in time and space. The Plan aims to forge a long-term link between the different generations to teach that development is sustainable if it responds to the needs of present generations but does not compromise future generations.

The Plan aims to enhance, systematize, and implement projects and activities already in place in schools (which can be explored thanks to an **interactive map**) and offer a vast repertoire of tools and resources that schools can use to develop projects and educational activities sustainable development related. With article 10 of Legislative Decree no. 196 of 8 November 2021, the Plan becomes part of the educational offer of educational institutions. In the phase of elaboration of the Plan of the formative offer for the triennium 2022-2025 the schools will be able to insert, beginning from the month of September 2022, in the school curriculum, activities related to the themes of ecological and cultural transition linking them to the four pillars and the objectives of Regeneration.

The **objectives** of the School Regeneration Plan are social, environmental, and economic. It aims to address the issue of sustainability in a systemic key. With a holistic approach embracing all the facets schooling, it concerns not only the acquisition of knowledge, but also the behaviors that are acquired within the school environments, the quality of the buildings and spaces young people live in and the opportunities that the new living model brings with it. For this reason, the Plan is based on **four pillars**: the regeneration of knowledge, behavior (alimentation, zero-waste,

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mobility), physical and digital infrastructures and opportunities (renewal of courses) and addresses students, teachers, families, and other stakeholders.

The ecological and cultural transition is a civic path towards a new living model. It means <<Going towards>> a new model of society with new lifestyles in which human activity is in balance with nature. The school has the task of accompanying society in this path and must be able to quickly spread a new lifestyle, a new model of society that does not include waste or disposable. It must be able to provide cultural tools for the new generations to understand the new working paradigms and social contexts. Young people will have to learn to reason in terms of the entire life cycle, regenerative processes, not only critical but also systemic and long-term thinking. Young people must be taught to inhabit the world in a new way in the knowledge that there is no new world. Understand that there are new models of development that can eliminate conflicts between generations.

To reach the above-mentioned objectives, it has been set up a *Green Community* where the representatives of public administrations, cultural, scientific and research institutions, non-profit and profit organizations will support schools in the design of initiatives. Moreover, to sustain the *transition* to this new didactical model, a **sustainability-specific training for school managers and teachers** starts is provided.

The School Regeneration Plan provides schools with the following **tools** to reach the above mentioned objectives: 1) It systematizes and makes visible, also through the dedicate website, the various formative activities that are already implemented in the schools; 2) Provides educational tools to schools on sustainability education; 3) Monitor and implement civic education activities regarding environmental education; 4) Offers training tools for teachers related to the Regeneration Plan; 5) Dedicates resources to sustainability education activities; 6) Creates educational links with recognized partners through the establishment of the Green Community.
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Sources: https://www.buonenotizie.it/sostenibilita/2022/05/19/rigenerazione-scuola-la-sostenibilita-piu-vicina-ai-ragazzi/nutricati/

Is one of the following green career paths, part of the VET system in your country?

Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

To some extent all these green career paths are part of the VET system in Italy. In Italy 17 Istituti Tecnici Superiori (ITS) focus on the environment, an eco-sustainable future and energy efficiency. It is possible to become a Superior technician for energy supply and plant construction, a Superior technician for the management and verification of energy systems, or a Superior Technician for Energy Saving in Sustainable Building.

For example, since 2018 the Istituto Tecnico Superiore (ITS) **Energia e Ambiente** (https://www.its-energiaeambiente.it/it/ | https://api.cving.com/v1/deep-links/jobs-page/194/ |

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https://www.its-energiaeambiente.it/images/pdf/its_energiaeambiente_brochure.pdf) is a postgraduate institute of higher education on renewable energies sources and energy efficiency in Tuscany. As every ITS, it is constituted in the form of foundation to which, as such, different stakeholders participate (enterprises, university, public bodies, professional associations, etc.). ITS courses fall fully within the system of Public Education (see Ministry of Education), constituting a high level of specialization after the diploma of higher education.
The biennial courses combine lectures and didactical visits, lab activities, 5 months-long-internship in a company either in Italy or abroad, seminars and meetings with representatives of the energy business world.
The thematic areas are:

- electrical engineering and plant engineering.
- thermomechanical measurements.
- thermal solar energy, photovoltaics and wind-powered.
- inverters: automation and remote control.
- home automation and automation for energy saving.
- biomasses and geothermal energy.
- energy efficiency and assessment of buildings.
- energy saving.

In 2022 in Tuscany the ITS Energia e Ambiente offers three courses:

- Smart City22 to obtain the title of “Superior Technician for the Smart City: innovation, energy efficiency and sustainability”.
- Ambiente22 to obtain the title of “Superior Technician for Energy and the Environment: Resources, Reuse and Bioenergy in the Circular Economy”
- Industria@Energia 22 to obtain the title of “Superior Technician for Industry 4.0: Digital Design and Energy Sustainability of Systems, Products and Processes”.

This ITS also provides professional training courses in the energy sector for operators and employees of SMEs in Tuscany and Italy. For this reason, it carries out a continuous monitoring of technological developments in the energy sector, collecting the growth and innovation needs of companies.

ITS Energia Piemonte (https://www.its-energiapiemonte.it/) offers courses in the in the fields of **energy efficiency** and **sustainable construction.** Especially, it offers courses to become Energy Manager, Energy Plant Manager, Building Manager, Home Manager.

The ITS Energia e Ambiente as well as the ITS Energia Piemonte are part of the Associazione Rete Its Italy

Green Hub Academy

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https://greenreport.it/news/economia-ecologica/nasce-in-toscana-la-green-hub-academy-per-preparare-i-lavoratori-alla-transizione-ecologica/

https://www.greenhubacademy.it/Home/ListaCorsi?ID=4

Employment Perspectives in Green Occupations

Green jobs occupational trends.

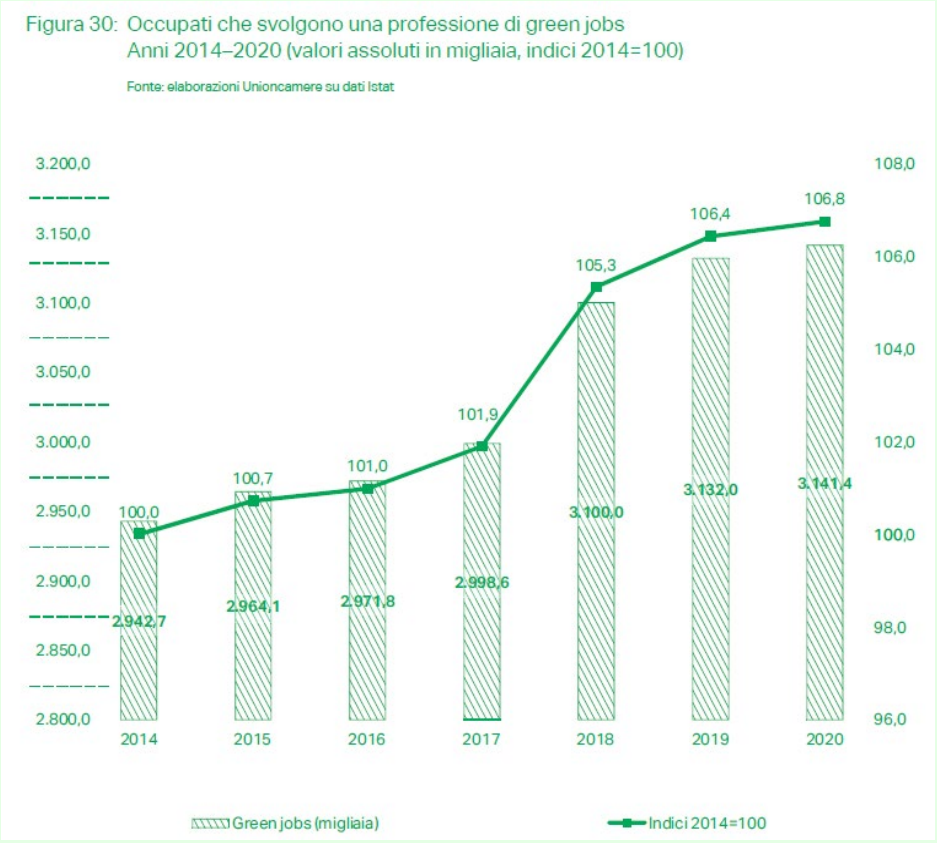

Figure 4: Employed who carry out a profession of green job. Years 2014-2020.
Source: Unioncamere elaborations on Istat data (Greenitaly Report) Variation 2020/2014 +6.8%

The total request of job in the next years will be hauled strongly from Eco-sustainability and the digital revolution. These two sectors will play an important role in the characterization of Employment needs in the various economic sectors, involving 26-29% of all workers both Public Administration and companies will need in the next five years.

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With reference to the Eco-sustainability sector, it is possible to say that for take advantage of all the opportunities offered by the dissemination of production methods that respect the environment and serve to reduce or at least optimize the use of raw materials, companies will need between 519,000 and 607,000 employees.
The supply chains of culture and education, robotics and mechatronics, logistics and mobility and energy will require in the period between 2020 and 2024 many professional figures. The great trends of changes such as digitalization and automation, climate change, globalization and the ageing of the population are ensuring that these sectors will have to organize themselves by considering the sectors most affected by these trends.

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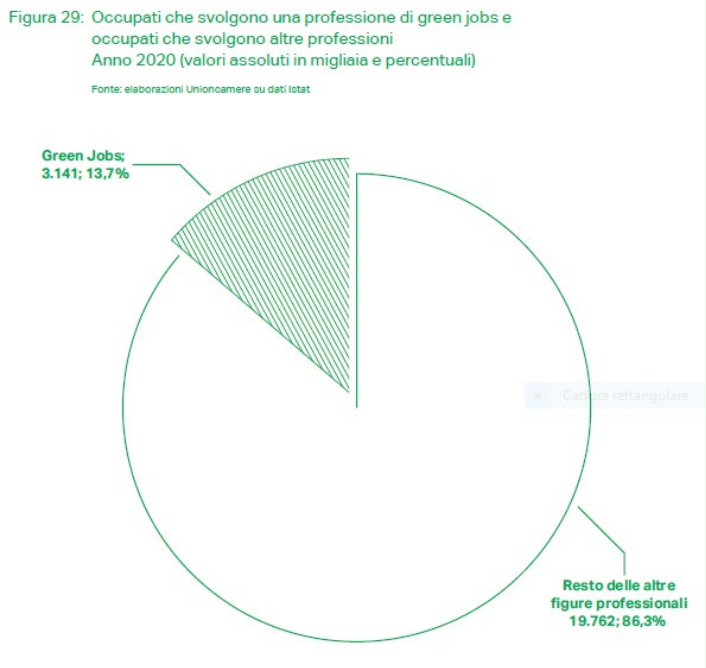

Figure 5: Employed persons engaged in a profession of green jobs and employed persons in other professions. Year 2020 (absolute values in thousands and percentages)
Source: Unioncamere elaborations on Istat data (Greenitaly Report)

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One in three hires, now, is in the green economy and the boost of green jobs keeps growing, even when the work market is weaker, as during the pandemic. It's foreseen that the need of green jobs will increase of the 38% by 2025. From the bio-mason to the eco-designer, from the farmer to the recycler, with 3.1 million green jobs employees in 2020, Italy is in the front line in the ecological transition. Moreover, green businesses face crisis better. It is undergoing a very strong shift in the work world towards new trades and professional figures as well as the revisitation skills of traditional sectors to contrast the climate change crisis.

For example, in the **construction sector**, one of the most affected by the crisis of 2008, from which it has never fully recovered, now, the green jobs have increased in a short time of 130.000 unities and will keep increasing (new professionals, new materials, etc.). The new construction industry is focused on requalification, energy saving, the recovery of abandoned urban areas and earthquake safety: all jobs that will become increasingly central as Europe sets increasing ambitious targets in cutting emissions.

A similar ratio concerns **agriculture**. Italy is the first in Europe for the number farms runed by young people and females. These enterprises make a different agriculture, much more concentrated on the quality of products and the legacies to the Italian specificities rather than on commodities like grain or soy. "Producing quality food not only generates income but also meaning: those who deal with a sophisticated production are no longer ashamed of being a farmer as they once were". And this new way of farming attracts a more dynamic and creative group of workers, such as young people and women.

If these trades are a readjusted version of pre-existing skills, other professions emerge as the green economy advances: Green builder, Responsible sales to ecological brand, Repairer of machinery and plants, Installer of more efficient power grids, Environmental informatics, Environmental marketing expert, Eco-designer, Expert in Energy Management (Energy Engineer), Certifier of environmental quality, Installer of air conditioning systems with low environmental impact.

The **eco-designer** designs products and services that are sustainable and innovative, with the goal of reducing environmental impact in terms of production, use and final disposal or, even better, of recycling and reuse. In the same vein, the **energy engineer** is increasingly valuable, as (s)he conceives and manages plants in such a way as to reduce the consumption of raw materials and energy in all sectors: industrial, civil, agricultural and transport. The focus on sustainable development has also fostered the birth of a new role, that of **environmental informatics**, which works in the development of software and applications dedicated to the environment: a field that requires specific skills that, in addition to traditional industry skills, must develop a specialized knowledge of new fields, such as that of green buildings.

The main sector of green jobs remains that of **renewable sources**, which have become the backbone of the energy paradigm of the future, involving in the forefront energy giants like Enel. The challenge of the energy transition imposes a focus on the search for professional profiles related to the three directions: renewables, electrification of consumption, digitalization of

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networks. **Renewable energy experts**, that are technicians able to develop and maintain active new plants for all renewable sources; «**business enablers**», with expertise in the field of storage and predictive maintenance, but also the **circular economy** and **marketing** to valorize a new way of doing business; «**new business solution experts**» able to interpret the data of distributed generation ensuring an increasingly innovative and digital network, including experts in **home automation**, **smart lighting** and **e-mobility**; and finally **digital specialists**, who enable this transition developing digital platform-based models, for the management of both infrastructures and sales. Another sector in great growth is that of green chemistry, for example to recycle and upcycle plastics

However, the rapidity of action required by the PNRR (Recovery Fund), and the transition requires thousands of additional green-skilled employees which today there are not. To keep up with this demand **new educational and training centers** are being developed to draw on when the flow of investments arrives.

Facts:

- In the last 5 years 441.000 companies have invested in green economy and sustainability: they are the 31.9% of industry and services companies and the 36.3% of manufacturing. They all export more.
- 11,14% of those who bet on the green, expect an increase in turnover in 2021, against a 9% of the others.
- Italy is a leader in the circular economy. In the first place, the wood supply chain: 95% of the raw material is already recycled to produce furniture panels, with a saving in CO2 consumption of almost 2 million tons/year.

Sources**:** Report Green Italy 2021 (https://www.symbola.net/approfondimento/la-carica-dei-green-jobs/); Report I lavori del futuro, aggionato al 2024 by Alteredu.

Findings from the FIELD SURVEY in Italy

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information.

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Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

The focus group took place on 06/06/2022 from 10:30 to 14:00 and was conducted face-to-face.
The group is made up of 5 teachers and 5 students.
The 5 teachers:
Prof. S.B., teacher of Industrial Automation, graduate in Electronic Engineering, 54 years old, female.
Prof. S.M., teacher of Chemical Technologies, graduate in Chemical Engineering, 33 years old, female.
Prof. A.C., Electronics Laboratory teacher, graduated in Architecture and Electrical Engineering, 45 years old, male.
Prof. G.D., Computer Science teacher, graduated in Electronic Engineering, 60 years old, male.
Prof. B.O., teacher of Organic and Analytical Chemistry, 45 years old, male.
The 5 students:
D.B., student of class V Automation, 19 years old, male.
G.L., student of class V Automation, 19 years old, male.
F.D., student of class IV Chemistry, 18 years old, male.
G.P., student of Chemistry class IV, 18 years old, male.
C.S., student of class IV Informatics, 18 years old, male.
Regarding the experiences on green technologies and green-related subject:
Collaborations with companies whose core business is related to energy efficiency, installation, monitoring and, partially, design of systems for the efficient use of energy in commercial and industrial buildings.
An interdisciplinary "simulated enterprise" project for the creation of some "Green" products, in particular creams, lipsticks and soaps, prepared from natural and biodegradable raw materials.
Collaborations with stakeholders in the promotion of green training activities aimed at the protection of human and environmental health, through experiences of School-Work Alternation and regional and national opportunities, offered by public administrations involved in environmental issues.

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NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

From the teacher's point of view

The most relevant environmental challenges, both at regional and national level, are:

- the fight against climate change
- the development of sustainable cities
- attention to a sustainable diet for both those who produce and those who consume
- an increasingly better use of energy, from renewable sources and with a reduction in waste
- reduce atmospheric pollution
- intelligent waste management
- development of alternative materials, produced from renewable raw materials, that can be easily recovered, reused, or recycled
- incentivize investments to support the production of renewable energy, from solar to geothermal, from wind to biomass, from waste recycling to hydroelectric, also promoting the use of new technologies for the capture and storage of CO2
- succeeding in combining environmental sustainability with economic sustainability
- carry out a profound cultural change and apply political strategies that know how to combine environment and development.

If not solved, these problems will not only result in damage to the environment and to people, but also be impoverishment of the social fabric.

These challenges must be assumed as a central node in order to carry out sustainable development, that cannot longer be postponed, therefore think of environmental sustainability as a resource and not as a limit to development. If not resolved, they will produce, in addition to damage to the environment and to people, even to an impoverishment of the social fabric.

The increase in the effects of anthropogenic activities on the environment represent a problem of global significance that has assumed increasing importance in recent years. The signing of treaties, such as the "Paris treaty", has meant that the intentions of various nations, including Italy, are to achieve sustainable development, were formalized in some objectives to be achieved but, at national and regional level, they are meeting many obstacles. Furthermore, the recent pandemic has seen an excessive return to single-use plastics devices, despite the commitment to reduce its production and use.

It's urgent and necessary to develop a “Green” economy without destroying, consuming and mess up the natural systems that provide us with the resources to live. The most important challenge is to rapidly reverse the economy, and the economic development, in a sustainable way, that allows us to defend the integrity of the territory and human health. The serious economic crisis due to the pandemic and the ongoing war obliges us to make a great effort and take advantage of the urgent need to make a rapid ecological conversion that has now been postponed for too long.

From the students' point of view

- planting as many trees as possible in urban areas
- reduce CO2 emissions to decrease the greenhouse effect by replacing fossil fuels with renewable forms of energy
- dispose of waste in the correct way, so as not to cause damage to the environment and to the species that are part of it and don't damage biodiversity

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• decrease food waste and try to feed in a sustainable way using and protecting the resources of our territories
• accompany large companies, which still use fossil fuels, towards renewable energy sources

The world of eco-sustainable transport is very important, because it is used every day by the entire population. This has an enormous importance in our daily lives and by making them less harmful to the environment, they can guarantee a better future.
The most important environmental challenges in Italy are:

- the ecological transition, with the achievement of the objectives set by the 2030 Agenda, including the reduction of carbon dioxide emissions. The only way to achieve this is to move from fossil energy sources to renewable energy sources
- the achievement of energy independence, avoiding dependence on other countries such as Russia and France for the import of energy and fuels
- waste management, through the strengthening of the separate collection network and the recycling and treatment plants of materials, which would greatly improve the circular economy.

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

From the teacher's point of view

It's necessary a real reflection on the most important issues concerning environmental protection, that involves students in their real and daily perception of problems, and which is not "abstract".
We should create "concrete operational" opportunities on the aspects of environmental protection, involving people who actually work in this sector.
It is imperative to address these issues from early childhood, adopting a lifelong and non-isolated learning approach to single unstructured projects.
We need to create active learning environments that engage students through real-life experiences. Furthermore, teachers must be trained to teach sustainability by promoting collaboration and synergies with the local community.
Awareness-raising and training actions are needed on environmental protection and sustainability to develop eco-compatible behaviours, recover healthy lifestyles and behavioural models protecting urban and natural environments.
Respect for the environment and new environmental challenges are crucial points that must be addressed within the study paths. Training systems will not be able to keep up with the updates if they remain isolated from what is actually happening outside. Very close collaboration, in order to implementing specific paths, between schools, local realities and sector companies is essential.
A sustainable development education is a strategic goal for our generation and for the future ones.
It's necessary to realize production choices of and development models that are fully integrated with the environment. To do this a profound social and educational change is needed, involving all the institutions but in particular the schools.

From the students' point of view

It is necessary to educate students to apply their knowledge in the sector, in order to decrease environmental pollution.

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Schools play a very important role in relation to environmental challenges, because it's easier to educate today's young people than people with an older age.
Environmental education should start as early as elementary schools, promoting a sustainable and respectful lifestyle for the planet where we live.
To date, as indicated by the Ministry, we can do an Internet search once a year, within those few hours of civic education.
Individual or group projects could be proposed with the aim of creating a series of documents related to environment and its protection and increasing, within the education systems, the number of projects aimed at raising student's awareness of environmental issues.

Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

From the teacher's point of view

In Italy there is a form of disorder, we follow only local or regional guidelines and initiatives. There is a lack of a large-scale vision of training courses, qualifications and curricula structured in such a way as to be more attractive on the job market.
The school system lacks training for the following figures: Environmental Manager, Expert in Waste Management and more. In vocational and technical education it's important to create training paths to reach the proposed figures with skills also in the regulatory and legislative field.
It would be necessary to host interventions by companies operating in the green sector, to strengthen "School-Work Alternation" activities in this direction, in such a way as to facilitate students' access to these professions.
What we are experiencing is a historical period of great changes, which occur at a very high speed. The student's outbound skills should always be up to date with the demands of the job market. Concepts such as Green Skills and Environmental Awareness, were not even addressed in education until a few years ago. It is important that teachers are also involved in training processes.
The efforts made to renew the curricula of schools, promoting student's skills and abilities on environmental issues are certainly appreciable. This clashes with very heterogeneous school realities. Some schools today accept this educational challenge, but in a situation of chronic structural precariousness, which has recently been highlighted by the current pandemic. The "study paths" need to be renewed, making them more adherent to the new scientific and technological challenges that humanity will have to face. More investments and structural reforms are needed (Italy is in fact in the last places in the EU for funds for the education system) and remind the government that science and education are fundamental tools for dealing with contemporary crises.

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From the students' point of view

In the high schools curricula there is no real training program where you can acquire real skills in the environment and eco-sustainability sector that can allow you to work in that sector once you have completed your studies. There should be a real subject concerning environmental issues, with specialized teachers. Instead, to date, the topic is addressed only during the very few hours of "civic education".

No, they are not up to date. To make them more adherent to the demand of the labour market it would be necessary to build paths that issues a formal certificate that can be included in the curriculum and provide a better image of the person that is looking for a job in the sector.

For five years, environmental education guidelines have been present in all primary and secondary schools, but certainly not enough to properly educate the mentality of the student towards a more sustainable reality. So, this educational system may be enough for now, but it needs to be strengthened, because environmental changes are ever-changing, rapidly changing.

Environmental awareness and Green skills are, but only in part, widespread within each training course. The training courses should include important insights into the skills that are most requested by companies.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

From the teacher's point of view

There is still a lot to do, talking about orientation and vocational training. The training offer must put in place useful strategies to train the new green professional figures required by the world of work. There is a need for alignment between what the job market wants and the skills that training courses provide.

Green employment necessarily runs through many sectors: renewable energy, agro-food, tourism, construction, architecture, engineering, biotechnology, transport, waste, etc.

Dialogue between the world of education and training (schools and universities) and businesses must be strengthened. This is why one of the challenges of the ecological and digital transition is to tailor the training offer also based on the new professional figures and the new skills that the future requires.

Currently, in the school, there is a poor information on the various environmental issues. Little attention and relevance are given to the technical aspects and the various job opportunities that the Green Economy can offer. It is expected that digital transformation and eco-sustainability will push together the birth and development of future labour-market. Training should focus on ICT specializations and green professionalism, as a transversal response to the employment needs of various sectors and supply chains.

Green careers represent a new frontier between job opportunities. The orientation and information provided to students to enter this emerging world are still marginal and not consolidated, also because they are new. Local realities should become an active part in building knowledge in the sector to attract students to Green Career opportunities.

In order to improve the opportunities offered by the school, in particular in the technical and professional paths, adequate investments are needed, also to adequately train teachers. It's

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necessary to create an organic system of "education in respect of the environment" which is not only implemented at a training level, but also involves the student with a holistic approach, in order to face the inevitable change in the best possible way.

From the students' point of view

To improve information, advice and guidance systems in this sector, first of all we have to encourage the growth of the green sector.
In order to attract the students into the Green career, there should be training paths with people who really work in that area so that we can really understand what is really done in that sector. Students do not have so much knowledge of the professions on the Green sector.
The subject is not given the importance it should have, especially among young people. To improve information and guidance on Green Vocational Education and Training opportunities, more meetings with students and industry professionals would be needed.
In my opinion what has been done is not enough. I personally did not know of the existence of Green study paths. It would be necessary to spread this information more and more, especially to the students attending lower and upper secondary schools, through specific and clear orientation activities.

VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

I think that my skills on Green issues are quite general and are addressed only in some parts of the program that I carry out (for example, hints on the topic of energy efficiency, photovoltaics). The subject of environmental protection is addressed only in civic education, but cooperation with people who work in this sector would be really necessary. Otherwise the risk is to remain generic and abstract.
I do not have sufficient skills due to the lack of a common strategy and a global approach to this so serious problem that require a multidisciplinary vision. The green approach can only concern all areas of training, even those apparently farthest from this problem. There is an urgent need to create a network, to create a system. To do this, teachers need to be trained to make a cultural change to learners from the earliest years of school education.
I have no knowledge and expertise in green matters. I would be interested in training aimed at identifying possible forms of environmental impact caused by ICT innovations.
As a chemistry teacher I can say that I have a training and a background that allows me to orient myself sufficiently in the field of renewable energy production and products with reduced environmental impact. In any case, technologies are constantly evolving and receiving a continuous training certainly is needed to keep up with all the news.
My training, earth sciences and biological sciences, allows me to face in a scientific and direct way the environmental problems and those inherent to human health and biodiversity protection. Respect and recognition of the value of biodiversity are a fundamental part of my training and teaching activity. My particular field of teaching (chemistry and materials) allows us to address the most significant issues relating to green chemistry and environmental issues in general. I believe that training and training update activities involving all disciplines, should be strengthened and financed in order to address these issues in an increasingly, interdisciplinary and systemic way.

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What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

I believe it is necessary to start from a specific theme to be developed in cooperation with an environmental technician to subsequently develop a program that includes not only classroom lessons, but after a short introductory part on a chosen theme, activate a discussion group with the students. Workshops and work experiences are also needed, so that students can have direct experiences. We need to start developing awareness and stimulate an authentic interest in nature. On the other hand, I believe that purely theoretical lessons are not very effective.
Launching a fact-finding survey among students, but also in their respective families, would be the first step to take to find out how much the problem is perceived. It is necessary to investigate how much sensitivity, attention, and perception of danger there is in terms of the climate and environmental emergency. A questionnaire could be the first step to start a discussion on the topic of biodiversity, renewable energy, greenhouse gases, useful to analyse the seriousness of the situation, negative behaviours and risks for the environment. We need an environmental education program that involves students, families and also communities and civil society.
It would be very useful to have guidelines to use for design training programs for raising awareness of the new challenges posed by environmental problems.
The design of a training program on environmental education, due to the complex nature of the topics covered, requires a holistic approach in dealing with the various topics, which cannot be limited to the discussion within a single discipline by a specific teacher. It should instead be the result of interdisciplinary and coordinated paths. The collaboration between teachers is therefore useful to create a complex path that can touch environmental issues from various points of view. Furthermore, it could be useful to have a system that collects the various experiences of "sustainable development", carried out in recent years at a local level by different actors.
First of all, in order to realize a training program on environmental issues, it is necessary to design a didactic action that involves all the disciplines, in order to allow students to have a unified and complete view of environmental problems. The educational project must include both specific and interdisciplinary training moments. The training proposals must be developed with the specialist support of public bodies that are in charge of environmental protection (eg ISPRA and its regional and provincial territorial agencies, Park Bodies, Managers of marine protected areas, etc.), and third sector associations operating in environmental protection. It is therefore necessary to review all the curricula, update them, innovate school laboratories, in particular those aimed at STEM disciplines, to stimulate and direct students in paths based on operational experiences.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

Networking with other stakeholders is essential, I think, to develop a Green program. My experience is limited to a collaboration, as part of the school-work alternation, with a company

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whose core business is linked to energy efficiency. In this company, which mainly deals with installations, monitoring and design of energy efficiency systems, students gain concrete experience in the sector, especially in programming and data monitoring.
Companies increasingly require competent figures regarding environmental sustainability, but they find many difficulties to create networks and systems of shared approach on these needs. I have not had the opportunity to develop collaborations with green companies and industries due, in my opinion, to a vulnerability of a "systemic approach" to the problem. Companies continue to ask for highly specialized skills and professionals linked to sustainability: they ask to be guided because they do not have a vision of how to deal with this epochal change. The training system is not yet able to respond concretely, quickly, and effectively to this mass of skills that are invoked. Networking is the best answer, but adequate skills are needed, and the educational system must develop them.
In this last school year our school won a regional call for the implementation of a PCTO (school-work alternation) project entitled "Green Chemistry" which involved the 3rd and 4th classes of Chemistry and Chemical-Biological paths. It is an interdisciplinary project which had as its guiding thread the creation of some “Green” products, such as creams, lipsticks and soaps, prepared from natural and biodegradable raw materials. The project was a real "simulated enterprise" activity for the students, because it allowed them to work on the production of a final product passing through all the phases.
Yes, I have already collaborated with other stakeholders in the promotion of green training activities aimed at the protection of human and environmental health, not only through PCTO (School-Work Alternation) experiences but also through regional and national opportunities, offered by public administrations involved in environmental issues.

LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

Young people have little expertise on environmental issues and environmental awareness. It is necessary to be more trained in the "Green" sectors.
Maybe we have a sufficient knowledge to understand the problems related to the environment, but only in a general sense. I would like to go deeply in these topics and get more detailed info to try to get solutions to solve these types of problems. It would also be very important to be informed to the various types of jobs connected to the Green environment.
In this last year we have committed more time than in previous years on the environmental issue, and this has certainly given us further awareness of the environment. One area in which I believe to need more information is the field of new eco-sustainable forms of energy because I believe they will be the basis of our lives in the near future.
As a student at a technical school specializing in "chemistry and materials", I believe I have a sufficiently in-depth knowledge on environmental issues, such as for example that referred to Green Chemistry. But we do this only during the few hours of "Civic Education".
However, I believe that these skills should be strengthened towards a specific weekly hour, exclusively dedicated to this subject, in which the various environmental objectives and solutions, not only national but also global, are studied in depth.

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Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

In my opinion, green jobs are the ones concerning the protection of the environment. If promoted, encouraged, and integrated into the modern world of work, they could contribute to a greener economy.
Green skills are all those that include the person's attitude to always seek "energy saving" and try to make a company, activity, industry ecological and sustainable. Green jobs are those professions where efforts are made to safeguard the environment and the planet by reducing waste and the pollution - mainly using renewable energy sources.
Green jobs are those professions aimed to safeguard the environment, by replacing or improving old polluting methods and processes into more modern and environmentally sustainable ones.
The most requested jobs at the moment are all those related to renewable energy sources, such as designers and installers of solar photovoltaic systems. These are works that develop eco-sustainable projects with "zero environmental impact production" and which are based on the use of renewable and clean energy.
The Green skills that companies are looking for are certainly the aptitude for energy saving and environmental sustainability. For this reason many companies are oriented towards human resources who have the ability, skills, and attention to make their business activities more environmentally friendly.

In your opinion, which are the most demanded green jobs in your region / country? Why?

The most requested green jobs, in my opinion, are relevant to energy saving and the optimization of electricity consumption. This because electricity, and energy in general, is the centre of the modern world.
In my opinion the most requested Green jobs in Italy are:

- installer/engineer of solar panels because production is increasing a lot and they are affordable and eco-sustainable
- qualified technician in the analysis of corporate pollution who studies solutions to reduce the environmental impact
- lawyer specializing in the environmental sector, due to all the new laws and regulations that have been made in recent years and finally architects who design the new buildings with eco-sustainable materials.

The most requested sectoral areas are the Public Utilities sector (energy, gas, water, environment), as well as other sectors, such as rubber-plastic, chemical-pharmaceutical, machinery and equipment manufacturing, transport, and construction.
Currently the most requested jobs in Italy and Tuscany are certainly the designers and installers of solar photovoltaic systems. This because the NRRP (National Recovery and Resilience Plan) the European community has made numerous incentives and benefits available to anyone who decides to install photovoltaic solar panels on their home or property.

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If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?

For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	1. I don't know 2. I don't have enough information to know what kind of path I should take 3. I don't know 4. See "other" 5. Probably it's necessary to get a degree in environmental engineering or earth science or energy management. Then you will need to do some type of qualification exam.
Insulation worker	1. Vocational school, electrical specialization 2. I don't have enough information to know what kind of path I should take 3. I don't know 4. See "other" 5. First of all, being a worker with two years of experience and then taking an exam to become a qualified insulation systems installer.
Solar photovoltaic installer	1. Vocational school, electrical specialization 2. I don't have enough information to know what kind of path I should take 3. I don't know 4. See "other" 5. An electrician or an electrical engineer
Installer of electrical networks with better efficiency	1. Vocational school, electrical specialization 2. I don't have enough information to know what kind of path I should take 3. I don't know 4. See "other" 5. An electrician or an electrical engineer
Refuse / recyclable material collector	1. I don't know 2. I don't have enough information to know what kind of path I should take 3. I don't know 4. See "other" 5. Any training path. In some cases, licenses for heavy/special vehicles are required.

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Sheet-metal worker	1. I don’t know 2. I don't have enough information to know what kind of path I should take 3. I don’t know 4. See “other” 5. Any training path that leads to obtaining a title of mechanical expert, mechanical engineer or in any case a title in the mechanical field.
Mechatronic	1. I don’t know 2. I don't have enough information to know what kind of path I should take 3. I don’t know 4. See “other” 5. Specific training course or engineering degree and subsequent qualification course.
Installer of air conditioning systems with low environmental impact	1. I don’t know 2. I don't have enough information to know what kind of path I should take 3. I don’t know 4. See “other” 5. Technical training course and subsequent degree, compulsory course, license exam and/or work experience.
Air quality engineer	1. I don’t know 2. I don't have enough information to know what kind of path I should take 3. I don’t know 4. See “other” 5. Degree in environmental engineering.
Environmental quality certifier	1. I don’t know 2. I don't have enough information to know what kind of path I should take 3. I don’t know 4. See “other” 5. It is necessary to obtain a degree in environmental engineering, biology, chemistry, or natural sciences and then obtain an advanced master.
Other. Please specify other professions	4. Genetic engineer: the course of study will mainly focus on the Faculty of Biological Sciences with a focus on genetic engineering.

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Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

Skill	1 (I am not satisfied)	2	3	4	5 (I am very satisfied)	Motivation
SOFT SKILLS:						
Decision making		5	5			
Risk management					10	
Time management	5		5			
Flexibility	5		5			
Adaptability	5		5			
Team work			5		5	
Problem solving			10			
Logical thinking			10			
Literacy				9	1	
Numeracy				9	1	
Communication			1	4	5	
Communication in a foreign language	1	2	3	4		
STEM skills			2	6	2	
DIGITAL SKILLS:						
Computer literacy					10	
Data entry			8	2		
Data analytics	3		2	5		
Word processing					10	
Web-based communications and research					10	
Secure information processing	3	2		5		
Social media management			5	5		

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GREEN-RELATED SOFT SKILLS:						
Recycling consciousness			2	3	5	
Critical consumer behaviour (grocery/food/clothing.)			2	8		
Eco friendly / green travels		1	2	5		2 interviewed don't know what to answer
Environmental footprint		1	2	5		2 interviewed don't know what to answer
Awareness about ecological impact of textile materials production	10					
Water consuming and consciousness			2	1	7	

Would you like that one or more of the green, soft and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making	7	3	
Risk management	0	10	
Time management	10		
Flexibility	10		
Adaptability	10		
Team work	5	5	
Problem solving	5	5	
Logical thinking	5	5	
Literacy	0	10	
Numeracy	0	10	
Communication			
Communication in a foreign language	10	0	
STEM skills	2	8	
DIGITAL SKILLS:			
Computer literacy	0	10	
Data entry	10	0	
Data analytics	10	0	
Word processing	0	10	
Web-based communications and research	0	10	
Secure information processing	10	0	
Social media management	5	5	

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GREEN-RELATED SOFT SKILLS:			
Recycling consciousness	5	5	
Critical consumer behaviour (grocery/food/clothing.)	10	0	
Eco friendly / green travels	10	0	
Environmental footprint	10	0	
Awareness about ecological impact of textile materials production	10		
Water consuming and consciousness	5	0	

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3.5. PORTUGAL

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

Through a report made by the Calouste Gulbenkian Foundation last year, we found out that the most relevant national environmental challenges in Portugal at this moment, and by that we mean the categories in which we have passed the ecological limits, are:

- **Climate changing**
- **Water pollution**
- **Fresh water consumption**
- Production and disposal of waste
- Air pollution
- Depletion of ozone layer
- Pression on ecosystems

The first 3 categories mentioned above are the ones that most concern the Foundation. According to the report: “The reason why we indicate these areas as the most worrying is because in these indicators we have verified at least one of two situations: either the indicators show a greater exceedance of the limit for the last year analysed (in the case of climate change and water pollution by phosphorus) or the indicators show a very high rate of increase (as in the case of water pollution by phosphorus and the use of fresh water).”

It was further found that older generations have higher per capita environmental impacts than younger generations with regard to factors such as water pollution and pressure on ecosystems. "The main reason for these differences in generations is due to the fact that these environmental indicators are on a downward trend today, that is, we are getting better in these indicators than we were 40 or 50 years ago. This means that the older generations had a period in their lives where the impacts of pressure on ecosystems and water pollution were high and were getting worse. Younger generations, who already live in a period where these environmental impacts are on a decreasing trend, end up having a balance less negative in these indicators", advance the study coordinators. Although there is a greater burden on older generations, all generations have crossed ecological limits. The only exception is Generation Z because they are still very young.

In view of this scenario of the various past generations having exceeded the emission limits, the study concludes that present and future generations in Portugal, in order to be sustainable, will have available a carbon emission limit 41% lower than what was observed until the 1990s. "The limit was estimated based on how much we can emit by the end of the century, in terms of greenhouse gases, ensuring that we comply with the Paris Agreement. From this emissions budget, we divide this by year to give us a budget. What happens with this value is that, whenever in a given year, we issue more than the budget for that year, we are left with less available for the

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following years. When we exceed the annual limit in a given year, this implies that we are left with a lower annual limit in the following years (to compensate for the excess in that given year). At the moment we are at a value 41% lower than we had in 1990 for this reason", conclude the study coordinators.

Source: *https://www.dn.pt/sociedade/portugal-ja-ultrapassou-o-limite-em-todas-as-categorias-ambientais-14368066.html*

In the report below from the Environment Portuguese Agency's website (Agência Portuguesa do Ambiente – APA) we can see the most important numbers related to economy and environment; transport; air and noise; water; soil and biodiversity; waste; environmental risks.

- **Economy and environment**: 12% less of environmental tax revenue compared to 2019.
- **Transport**: 32,3% less gas emission compared to 2005. 33,9% of renewable energy sources in the total of energy consumption (exceeds the target of 31% stipulated for 2020).
- **Air and Noise**: good was the predominant air qualification throughout 2020. Zero excesses to the annual limit value of NO2.
- **Water:** 99% of secure tap. Goal achieved since 2015.
- **Soil and Biodiversity**: 64,5% less visitants in the protected areas compared to 2019.
- **Waste**: 48% of waste deposited in landfill (33% in 2019) and 38% of preparation fee for reuse and recycling in 2020 (41% in2019).
- **Environmental Risks**: 180km of coastal line in erosion situation. 13km of lost territory (from 1958 to 2020). 43% of the territory in drought weak and moderate weather in September 2021.

In the figure below, we can see an evaluation of the impact that each type of industry has on the environment.

The first chart shows the evaluation's processes of the impact on the environment, carried on between the years of 2008 and 2020. Right below we can see the projects subject to environmental impact assessment by industry.

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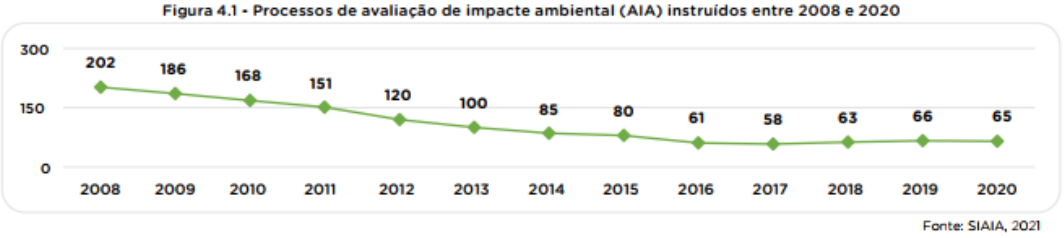
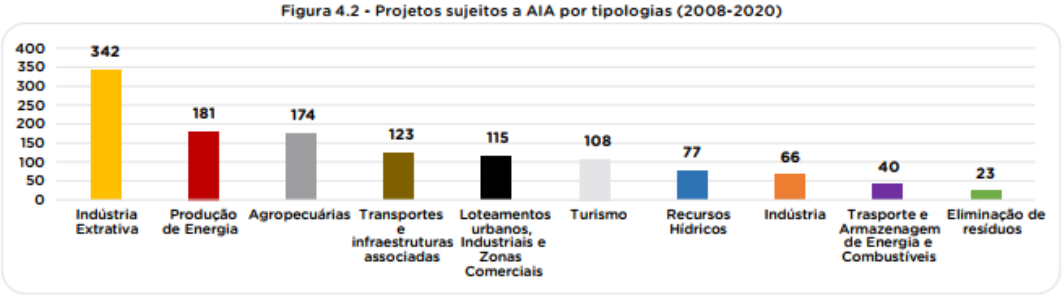
Figura 4.1 - Processos de avaliação de impacte ambiental (AIA) instruídos entre 2008 e 2020



Fonte: SIAIA, 2021

Figura 4.2 - Projetos sujeitos a AIA por tipologias (2008-2020)



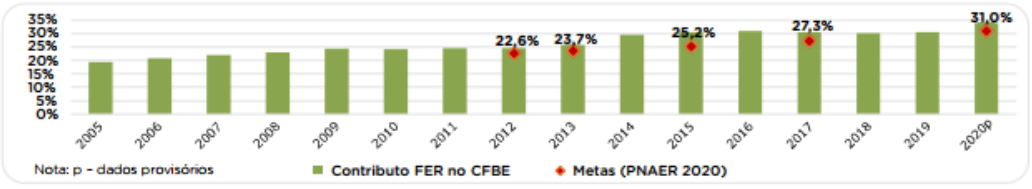
Fonte: SIAIA, 2021

- In the period under review, 2008-2020, the number of evaluation processes instructed presents a decrease, registering in this last year a total of 65;
- The vast majority of EIA processes, 94.5%, resulted in the issuance of an Impact Statement Conditional Favourable Environmental (DIA) (imposing a set of conditions to be fulfilled by the promoter of the project for the purposes of its licensing or authorization), and 5.5% resulted in a decision unfavourable.
- Projects related to the extractive industry are the ones with the greatest expression in the context of projects subject to environmental impact assessment;
- Most of the processes are presented in the execution project phase (75.3%) and about a quarter (24.7%) in the preliminary design or study phase;

When talking about energy, Portugal has reached the goals settled to the year of 2020, as we can see in the graph below.

Here we can see the evolution of the minimum trajectory of renewable energy sources (RES) in gross final energy consumption (CFBE)

Figura 7.1 - Evolução da trajetória mínima de fontes de energia renováveis (FER) no consumo final bruto de energia (CFBE)



Fonte: DGEG, 2021

In 2019, Portugal was the fourth country in the EU-28 with the highest incorporation of renewable energy in production of electricity (53.8%):

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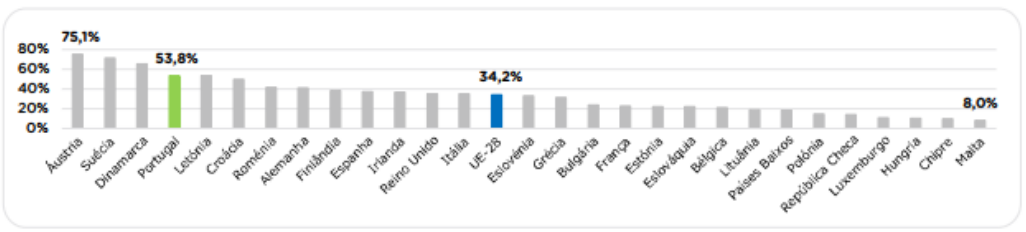
Figura 7.3 - Percentagem de incorporação de renováveis no sector da eletricidade, na UE-28, em 2019



Fonte: Eurostat, 2021

According to the National Geographic article published in October 2018, Portugal is still a behind a lot of other European countries in the way of becoming more sustainable.

By the time, it occupied the 41º place on the HDR list (38º in 2020) and in the matter of sustainable policies, Portugal occupies the 17º place.

Portugal produced 484 kg of waste in 2017, number which is above the average in Europe (483 kg). Only 38% was recycled. The European Directive stablishes that until 2020 at least 50% of waste needs to be recycled.

Also, in 2017 Portugal had the fifth largest increase in carbon dioxide (CO2) emissions from energy consumption, compared to the previous year: around 7.3%. The European Union average was an increase of 1.8%, according to Eurostat data. Portugal's CO2 emissions represent 1.5% of the EU's total emissions.

In 2016, compared to other EU countries, Portugal was the third EU country with the highest incorporation of renewable energies in the production of electricity. The production of renewable energy in Portugal represented 42% of electricity consumption and exports in 2017.

PORTUGAL'S PRIORITIES FOR 2030

Approved at the United Nations Summit on September 25, 2015, the 2030 Agenda for Sustainable Development came into force in 2016. Comprised of five thematic areas, the 5 P's – People, Planet, Prosperity, Peace, and Partnerships – with 17 Sustainable Development Goals (SDGs) spread across these themes, aim at the eradication of poverty and economic, social, and environmental development on a global scale by 2030.

Portugal accepted the challenge, and its priorities are:

- Quality Education
- Gender Equality
- Industry
- Innovation and Infrastructure
- Reducing Inequalities
- Climate Action
- Protecting Marine Life.

Some of the goals for Portugal in 2030 are to reduce CO2 emissions between 30 and 40%, compared to 2005; increase the share of renewable energies to 40% of final energy consumption;

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have 100% of water bodies classified as “Good or Superior”; or having only 2 days a year with a “poor” or “poor” Air Quality Index (IQAR).

By 2030, economic, environmental, and social measures will be implemented, within the scope of sustainable tourism and cooperation to make Portugal a more sustainable country, like the other 169 countries that have taken the challenge.

Source: https://www.natgeo.pt/meio-ambiente/2018/10/portugal-esta-no-caminho-da-sustentabilidade

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

Portugal has established a lot of initiatives to meet the 2030 agenda and the 2050 Carbon Neutrality Roadmap.

One of the most important government agencies related to the environment is APA – Agência Portuguesa do Ambiente (Environment Portuguese Agency). The Portuguese Environment Agency is a public institute integrated in the indirect administration of the State, under the supervision of the Ministry of the Environment and Climate Action and endowed with administrative and financial autonomy and its own assets.

Their mission is the integrated management of environmental and sustainability policies. They do it in articulation either with other sectorial policies, or with a wide range of partners, of which the municipalities and the Plan and Autonomous Regions of the Azores and Madeira stand out.

They work on topics such as Climate Change, Water and Coastline - in this case with decentralized management in the 5 hydrographic regions of the Continent - as well as Waste, Air, Noise, Radiological Emergencies, Environmental Impact Assessment, Circular Economy, or Environmental Education.

The APA has monitoring, planning and evaluation, licensing, and inspection powers, and is therefore the main environmental regulator in Portugal.

In 2017 the Ministries of Environment and Education created together the ENEA 2020 (Estratégia Nacional de Educação Ambiental) which means, the National Strategy of Environmental Education. It has the objective of teaching the citizens about environmental education so the country can meet its goals of the Paris Agreement and the United Nations Sustainable Development Goals - Agenda 2020.

ENEA 2020 foresees 16 measures framed by three strategic objectives: Environmental Education + Transversal, Environmental Education + Open and Environmental Education + Participated. These objectives serve three central pillars of this Government's environmental policy: decarbonizing society, making the economy circular and valuing the territory.

Among many projects that exist nowadays in a regional/national initiative, we’d like to highlight the ones carried out by The Portuguese Environmental Education Association (ASPEA), a non-

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profit Environmental Non-Governmental Organization (NGO), founded in June 1990, whose main objective is the development of Environmental Education in formal and non-formal education.

To carry out this objective, several strategies/actions are carried out by the members of its management and its partners, namely:

- an annual conference for teachers and other technicians interested in Environmental Education;
- seminars and continuous training courses for teachers and environment monitors;
- school networks, fostering national and international cooperation;
- development of pedagogical resources;
- organization of field trips and summer programs for children/youth;
- cooperation with municipalities;
- dissemination of its activities and environmental education in specialized magazines and through presentation of communication and participation in national and international conferences;
- biannual newsletter edition.

They have at the moment 4 national projects: Projeto Rios, Rede MAPeAR, Vamos cuidar do planeta! and Tá na Horta.

They have another 9 international projects going on and 13 finished. Apart from that, they offer different courses to teachers, activities in schools, workshops and seminars, expositions, etc.

ASPEA Lisboa - Sede Nacional
Address: Centro Associativo do Calhau.
Parque Florestal de Monsanto, 1500-001 Lisboa
Telephone: +351 217 724 827 / email: aspea@aspea.org

Vocational Education and Training

Briefly describe the organization of the VET system in your country.

In Portugal we have many different modalities of vocational educational and training courses. We'll divide in two main groups: professional courses for students with second level certification and vocational and training courses for adults, which has no relation to the educational system. The professional courses have a secondary education path with dual certification, which means, they'll develop social, scientific, and professional skills necessary for the exercise of a professional activity and at the same time the secondary level of education is obtained.

The professional courses with double certification are regulated by the Ministry of Education and the SNQ agency (Sistema Nacional de Qualificações), the National System of Qualifications. They can last 2 or 3 years.

The vocational and training courses for adults are focused on offering adults new skills in a specific field. They acquire these new skills to be able to (re) integrate the labour market.

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The vocational and training courses are regulated by the Ministry of Labour and the DGERT agency (Direção Geral do Emprego e Relações de Trabalho), the General Direction of Employment and Labour Relations. They don't have a specific duration; it could be 6 months or 1 year. It really depends on the field you're studying.

In Portugal, you can choose to do a professional course in a public school – especially if it's a double certification professional course – or in a private institute. When talking about the vocational and training courses for adults, usually they are carried out by a private institute. As a public institute for this kind of course there's an agency called IEFP (Institute for Employment and Vocational Training).

The IEFP is the national public employment service. Its mission is to promote the creation and quality of employment and combat unemployment, through the implementation of active employment policies, namely vocational training.

In this table we can see the number of students in each teaching modality:

Year	Teaching Modality						
	Total	Professional Technical and Tech Courses	General Education	VET Courses	Others	Learining Courses	VET for young people
2018	315 522	2 334	181 963	69 320	39 642	21 869	394
2019	314 703	2 356	185 536	68 700	36 943	20 824	344
2020	308 764	2 324	184 740	69 079	31 628	20 655	338

source: pordata (https://www.pordata.pt/DB/Portugal/Ambiente+de+Consulta/Tabela)

There's a decrease in the total number of students, probably because of Covid19. Although almost all the modalities have a lower number compared to other years, the VET courses increased. It's most likely that people searched for the jobs available during the pandemic and decided to specialize themselves through a VET course, so they could integrate the labour market again.

The general education is still the main type of education searched by people in Portugal, followed by the VET courses.

Is there any specific training / training module / WBL experience on green skills?

There are several courses and careers in areas related to the environment, sustainability, renewable energies, etc, offered by many universities in Portugal. Those are options of academic degree, master and/or PhD.
As we want to focus only on training and/or WBL, I won't mention the options of academic degrees related to green careers. We'll see the options of only trainings and/or WBL experience on green skills.

1) **Professional Courses with double certification:** profession studied and the equivalence to the 12th school year. They have a duration of 3 years and are valid for young people until 20 years old.

- Environmental Management Professional Course
- Professional Course of Photovoltaic Solar Systems Installer
- Professional Course of Renewable Energy Thermal Systems Installer

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2) Professional Courses (online or face-to-face) with certification:

- Organic and Sustainable Agriculture Course (https://www.masterd.pt/curso-agricultura-biologica-sustentavel)
- Agricultural Management (https://www.masterd.pt/curso-gestao-agricola)
- Renewable Energies (https://www.masterd.pt/curso-energias-renovaveis)
- Solar Energy (https://www.masterd.pt/curso-energia-solar)
- Transport vehicle emissions inspector (https://apps.uc.pt/courses/pt/course/4261)
- Environmental Management (https://www.ceac.pt/cursos/tecnico-gestao-ambiental/)
- Photovoltaic Solar Energy (https://www.ceac.pt/cursos/energia-solar-fotovoltaica/)

3) Short courses to adults with single certification (20-30 hours duration)

- Sustainability and Human Responsibility (https://www.iscsp.ulisboa.pt/pt/cursos/formacao-avancada-e-especializada/formacao-especializada/pos-graduacoes/curso-de-formacao-especializada-sustentabilidade-e-responsabilidade-humana)
- Environmental sustainability - Mobilize, Observe and Operate (https://www.nau.edu.pt/pt/curso/sustentabilidade-ambiental/)
- Specialization Course on Sustainability (https://www.europeia.pt/online/formacao-de-executivos/cursos-de-especializacao/sustentabilidade)
- Organic and Sustainable Agriculture course
- Energy Auditor (https://www.cenertec.pt/pt/formacoes/gestao-de-energia-e-eficiencia-energetica)
- Waste Management (https://ltm.pt/curso-formacao-gestao-de-residuos/)

4) Workshops with 1 day duration

- Circular Economy and Sustainable development of cities
- Carbon Footprint (https://learning.sgs.com/)

Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

There are a few companies that provide environmental education to teachers in general. One that we would like to highlight, especially because is offered free of any charge, is the Oeiras' Municipality Annual Program.
The municipality from the city Oeiras - in Lisbon District - provides an annual Environmental Education for Educators called PEA (Programa de Educação Ambiental).

The Environmental Education Program for Schools (PEA) is promoted annually by the municipality, in conjunction with a set of local and national partners and aims to constitute a set of transversal and multidisciplinary resources through which schools can promote education for sustainability. The activities' program is published annually to all public, private, and social solidarity teaching establishments in the Municipality, through an information

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brochure. The consultation of the schedule and the registration form for the activities is available on the Education Portal.

The PEA is also part of the Oeiras Educa Program for public schools, in the thematic area of Environment and Sustainability. Information and scheduling of these activities are available on the Oeiras Educa portal.

Is one of the following green career paths, part of the VET system in your country?
Examples:
High-skilled occupations: engineering technologist and environmental engineer.
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

Yes, as mentioned before, in Portugal we do have VET courses in the following green career paths options:

- Solar photovoltaic installer
- Energy Auditor
- Transport vehicle emissions inspector
- Insulation worker
- Electrician
- Sheet-metal worker
- Environmental engineer: we have environmental management

The courses related to engineering have academical degree and a duration of 6 semesters. There are no VET courses related to engineering.

As for recycling collector, there is no specific course for people who would like to work in the type of job. Each company give their employees the training necessary for them to be able to do their activities.

Employment Perspectives in Green Occupations

Green jobs occupational trends.

According to INE (National Institute of Statistics) in 2020, companies in the industrial sectors employed 10,858 people dedicated to environmental protection, 1,809 fewer people compared to 2019. Of these, 15.2% occupied more than half of the time of work in activities related to the environment (15.8% in 2019).

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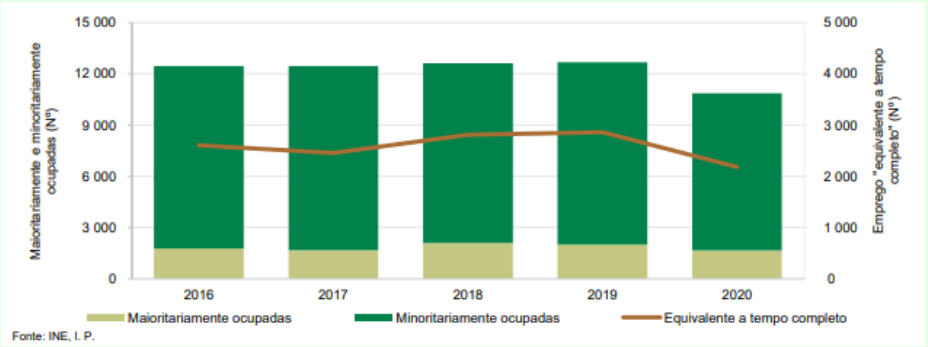
Figure: the dark green represents people who spent less time occupied with environmental activities; light green spend more time occupied and brown full-time equivalent. (2020).



The conversion from uptime to "full-time equivalent" employment reversed the trend of 2019, with a decrease of 23.7% compared to the previous year (+1.8% in 2019), from 2,861 in 2019, to 2,184 in 2020, making it the lowest result of the 2016-2020 five-year period. In 2020, 35,338 people were employed in entities producing environmental goods and services, 1,721 more employees compared to the previous year. Of these, 83.1% spent most of their time in functions in the environmental area (81.2% in the previous year).

The profile of staff working in an environment has a structure very similar to that of the year deal. Men continue to predominate in both types of occupation with, respectively, 79.1% and 64.4% of the total workforce. Almost 75% of the management positions and 80.3% of the other personnel were occupied by men, in contrast to middle and senior managers and technicians in which the difference in terms of participation female was more balanced (60.4% for men and 39.6% for women).

In structural terms, women in middle and senior management and technicians represented 29.1% of the female staff, while in males the contribution to this functional category did not exceed 13.6%. It should be noted that women directors accounted for 5.3% of the female workforce, while in male leaders, the representativeness stood at 4.8%.

The managers and middle and senior managers and technicians stood out in the "Production of electricity from wind, geothermal, solar and other origin n.e.c." with, respectively, 38.9% and 37.3% of the sector. In mention that in "Water collection and treatment" and "Production of electricity from hydro sources" about 1/3 of the staff belonged to the middle and senior managers and technician's category.

In 2020, the number of individuals working for the NGOs remained at 1,998 people. notwithstanding the pandemic situation in the country, volunteer staff grew by around 1.0% (70.8% of staff; 70.2% in 2019), while paid individuals had a decrease of 2.0%. About 72.3% of people worked part-time (71.5% last year).

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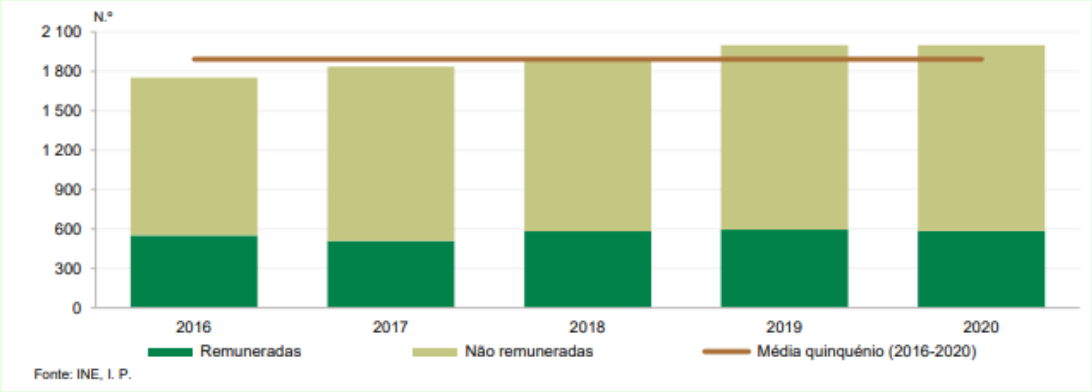
Figure: people at the service of non-governmental environmental organizations, by type of provision:



Dark green: paid; light green: unpaid; brown: five-year average.

The profile of the employee of environmental associations in 2020 was characterized by being male (50.1% of men against 49.9% of women), aged between 26 and 50 years, with higher education (bachelor's and licentiate level) and participating on a voluntary basis. from the staff paid, the majority consisted of administrative, commercial, and service employees. Women represented 54.9% of employees under the age of 25, more than half had secondary or higher education, 51.8% were volunteers and of those who received a salary, 64.8% belonged to the category “Middle and senior managers and technicians”.

Findings from the FIELD SURVEY in Portugal

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

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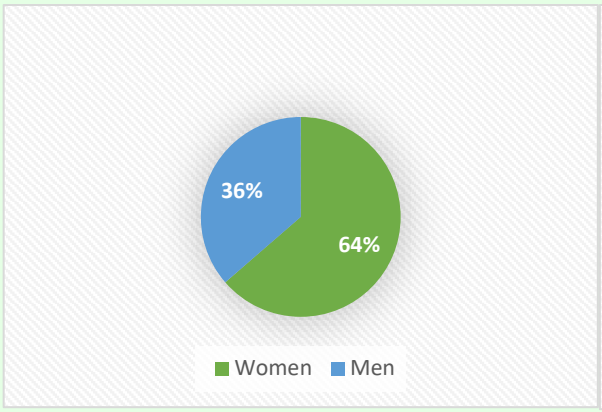
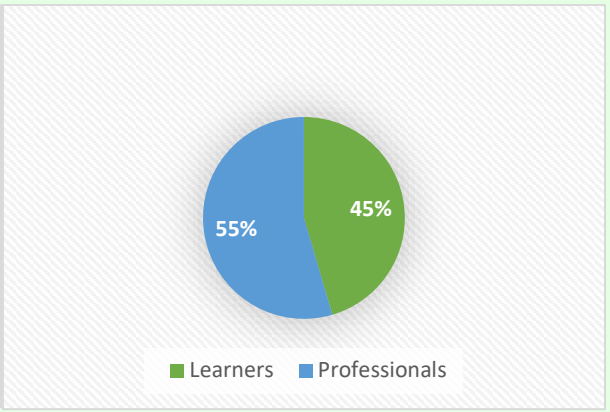
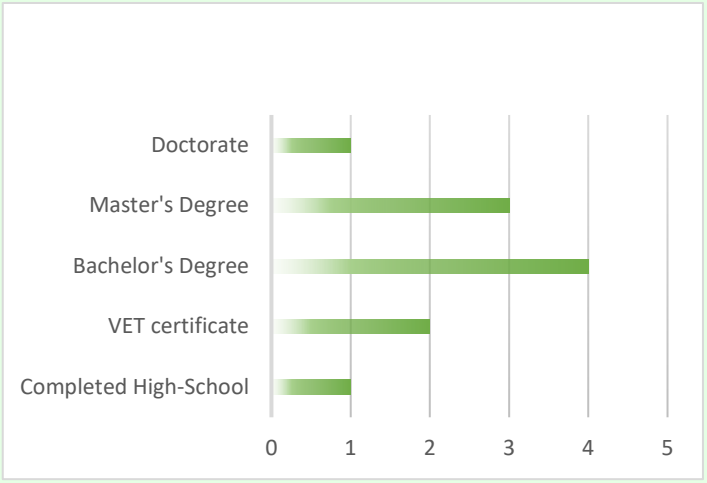
We have conducted our focus group in a hybrid way. 11 of the 15 people invited participated on the meeting. Some people participated online because they are in other parts of the country.
The focus group happened on June 29th and it last about 1 hour and a half. We can see the demographic's characteristics of the group on the charts below:







NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

Most of them think that the main challenge national challenge is the climate changing and the transition to the renewable energies.
In a regional way they agree that apart from the climate change, the production and disposal of waste is an issue that needs to be better addressed urgently. Lisbon receives more than 5 million tourists in a year and although the city has improved a lot its infrastructure when compared to 10 years ago, there are still many things to be done.

In relation to the renewable energies, the high costs of the equipment and the lack of awareness of the people are the biggest problems for the transition to happen.

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What would in your opinion make vocational education and training systems more responsive to environmental challenges?

Greater articulation with universities, research, and research laboratories in order to be more aware of these challenges and be able to train people capable to work on your solutions.

Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

In general, society has not been able to assume environmental awareness what is expected of them, and this is also reflected in the education systems. It ends up being a social problem because the resistance that still prevails discourages the new attitudes. Bet on more incisive training that can really demonstrate the needs and the benefits of social and environmental changes.

It's not the training course that needs to become more respondent, is the labour market that has to understand the need of these kind of professionals, but for that to happen, the government needs to start the process. It's a chain that begins with the country's initiatives in the field.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

Incentives/marketing are still very scarce because of the new opportunities of green careers are still not very expressive. We must value and recognize the green career and open new courses that can feed and spread the new markets.

Once again, we bring the attention to the necessity of starting the chain with the public entities. They have to start working on green initiatives which will raise the awareness and necessity of having professionals to feed the labour market with professionals who can work on those initiatives.

VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

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All of the trainers who participated in the focus group are professionals with bachelor's or a master's degree in different types of green careers, and therefore they consider themselves totally capable of teaching their students about green issues.
They feel they have the necessary knowledge that serves as a basis for decision-making in ecological terms.

There's a necessity to better understand the current scenario with concrete data and more information on the loss of biodiversity and on the widespread impact of man on level of natural ecosystems, and better understand future predictions and the impact that has on the quality of life of populations.

What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

The group think that it is important to work on group skills that can mobilize the people to implement campaigns and alerts which will motivate them to be agents of change. It is essential to achieve environmental awareness. Another important resource will be to present good examples of case study involving the various age groups, which holds all citizens accountable.

There's a need of having professionals on green skills working with marketing professionals to build campaigns mostly on social media.

In terms of equipment, it depends a lot on what kind of training is being built. There's some kind of professions that will require much more equipment than others, and it should be given to the schools by the government, or at least with some kind of discount, especially because it can be very expensive, as an incentive.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

It is essential to make known good practices and the sharing of experiences and know-how, involving reference entities that work towards sustainability. It was mentioned the ICNF, forest management entities as well as innovative research centres in wood products.

LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

The learners from the group felt that their teachers have a lot of knowledge on different topics related to the environment and the most important issues the world face today. Of course, they have a profound knowledge on the area their teaching since they're professionals with experience in those areas.

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There could be more training on how to live a “greener life” based on daily actions. The courses are always focused on a specific skill or technical knowledge, but they all should have like a basic starting module among them all, in which all students could learn things related to their ecological footprint.

Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

For them green jobs and skills are always focused on the preservation of the environment. No matter what kind of position you have, you must have the skills and know how your actions will impact the environment.
When you apply green skills in the job you have, something simple as printing less materials, you’ll have a big impact on preserving the environment. So, they contribute a lot and directly on the modern economy.

In your opinion, which are the most demanded green jobs in your region / country? Why?

The most demanded green jobs are the ones related to the manufacturing, food, or energy. The skills related to sustainability are the ones with more jobs available in those industries.
That’s mostly because people are starting to choose companies with this kind of awareness. Although the motivation is not the one it should be – which is the real worry about the environment – at least they’re beginning to have the right initiatives.

If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?

For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	There’s very little information about it. They didn’t have the knowledge of courses available.
Insulation worker	It’s only starting to appear in the labour market.
Solar photovoltaic installer	It’s growing now. There are some VET centres in Portugal that offer courses in the area.
Installer of electrical networks with better efficiency	it's still little significant in the market and known.

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Refuse / recyclable material collector	Formations much punctual and just inside of the entities directly involved. The job offers don't ask for a specific skill or course.
Sheet-metal worker	It has almost disappeared from the labour market. Very difficult to find information and/or courses available.
Mechatronic	It has a very little widespread. Only a few vet centres offer this course.
Installer of air conditioning systems with low environmental impact	No big expression. Low offer of courses. As long as the environmentally friendly options are much more expensive than the plain options, people will keep choosing the cheaper one. That impact on the labour demand, that impact on the courses offers.
Air quality engineer	Same as above.
Environmental quality certifier	Same as above.
Other. Please specify other professions	N.A.

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

Skill	1 (I am not satisfied)	2	3	4	5 (I am very satisfied)	Motivation
SOFT SKILLS:						
Decision making		4	7			There's a need of more support.
Risk management			1	9	1	Continuous update
Time management				9	2	The work asks for this type of knowledge
Flexibility			8	3		Need of a better synchronicity
Adaptability			2	7	2	Need of a daily training
Teamwork			2	7	2	It could be more fomented
Problem solving			2	6	3	Need of a daily training
Logical thinking			1	8	2	Need of a daily training

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Literacy		2	3	6		Need of a daily training
Numeracy		1	3	7		Needs more inversion
Communication			10	1		The work results are directly related to our capacity of communication both internally and externally
Communication in a foreign language			7	4		Needs to be improved, as it's becoming more important every day.
STEM skills	2	9				Needs to be improved.
DIGITAL SKILLS:						
Computer literacy	3	8				At least the basic skills everybody needs to have it.
Data entry		11				It could be easier to do it, if we have more knowledge on how to use certain tools.
Data analytics			4	6	1	Very important to carry on many tasks
Word processing			7	3	1	Important
Web-based communications and research				3	8	Essential to many tasks.
Secure information processing		1	9	1		Although we know the importance, we rely on the programs we have.
Social media management			1	2	8	It's becoming more important every day, to disseminate projects, information, etc.
GREEN-RELATED SOFT SKILLS:						
Recycling consciousness					11	We apply on our company/school
Critical consumer behaviour (grocery/food/clothing.)					11	It's always a theme brought among trainers/learners.
Eco friendly / green travels				10	1	Needs to be more widespread.
Environmental footprint				9	2	Very important to know, and it's always mentioned.
Awareness about ecological impact of textile materials production				8	3	Needs to be more widespread.
Water consuming and consciousness				1	10	Very important to know, and it's always mentioned.

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Would you like that one or more of the green, soft, and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making	11		
Risk management	11		
Time management	11		
Flexibility	10	1	
Adaptability	11		
Teamwork	11		
Problem solving	11		
Logical thinking	11		
Literacy	3		8
Numeracy	1	2	7
Communication	8		3
Communication in a foreign language	7	1	3
STEM skills	7	1	3
DIGITAL SKILLS:			
Computer literacy	6	2	3
Data entry	1	2	8
Data analytics		1	10
Word processing	7	1	3
Web-based communications and research	10		1
Secure information processing	7	1	3
Social media management	11		
GREEN-RELATED SOFT SKILLS:			
Recycling consciousness	11		
Critical consumer behaviour (grocery/food/clothing.)	11		
Eco friendly / green travels	11		
Environmental footprint	11		
Awareness about ecological impact of textile materials production	9		2
Water consuming and consciousness	11		

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3.6. SLOVENIA

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

In Slovenia we can talk about the good condition of most environmental elements, especially in recent decades the quality of water and air has improved, we manage waste better, we are more aware of the importance of preserved biodiversity and natural values. Knowledge and understanding of the links between environmental pressures and the state of the environment have also improved. The improving situation in this area is also due to the effect of environmental protection policy, which has been determined in the past by national environmental protection programs based on the results of environmental monitoring and taking into account identified environmental protection challenges. , No. 83/99 and 41/04 - ZVO-1; hereinafter NPVO 1999) and Resolution on the National Environmental Protection Program 2005–2012 (Official Gazette of the Republic of Slovenia, No. 2/06; hereinafter: NPVO 2005–2012). Slovenia's future environmental challenges related to the traditional notion of environmental protection are mainly excessively polluted areas due to past activities, annual short-term deterioration of air quality, care for the preservation of biodiversity and natural values, and climate change management and adaptation. Environmental challenges in the future are also systemic in nature, especially the potentially endangered capacity of the environment to enable future social development. We have achieved a high level of prosperity in Slovenia and Europe in a way that is typical of practically all developed countries - with overuse and excessive pollution of the resources provided by the Earth. Slovenia's future environmental challenges are not limited to the territory of our country, but our environment will also be significantly and long-term affected by global processes.

http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985

WATER

In recent years there was a big increase in the quantity of wastewater. From year 2013 to 2020 the quantity of treated wastewater has increased, which means less potential for polluting groundwater, streams, reservoirs, lakes, and the sea. Bad news is that quantity of untreated wastewater has also increased even more than treated water.

	Wastewater by type of water - TOTAL	Treated wastewater	Untreated wastewater
2013	892950	84370	712723
2020	1048975	177744	871231

Sludge production has increased in Slovenia in years from 2009 to 2019 for 7,50 thousand tonnes per year. While sludge production has increased, the disposal of it on landfills and by incineration

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has decreased. Data on table below shows that disposal on landfills has decreased for 4,5 thousand tonnes per year, while disposal by incineration has decreased by 7,3 thousand tonnes per year.

WW_TPAR (Labels)	Sludge production - total	Sludge disposal - landfill	Sludge disposal - incineration
2009	27,30	5,00	16,90
2019	34,80	0,50	9,60

WASTE

There is a significant decline in produced waste in Slovenia from year 2004 to 2018. Slovenia has greatly improved in waste generation (664kg per capita less waste produced from 2014 to 2018), especially when compared to EU average, where the amount of waste has increased in the last few years.

GEO (Labels)	European Union - 27 countries (from 2020)	Slovenia
2004	1.800	2.143
2018	1.820	1.479

Disposal of waste has decreased in Slovenia, as well as in landfills as by incineration, just like the sludge disposal, which was shown in one of the previous tables. This could be showing us that both Slovenians and Slovenian companies are gaining greater environmental awareness by being aware of the impact of landfilling and waste incineration.

WST_OPER (Labels)	Disposal - landfill (D1, D5, D12)	Disposal - incineration (D10)
2004	1.542.112	105.862
2018	310.136	39.263

Packaging presents a big environmental problem across all Europe. Packaging waste has increased from 2011 to 2019 in Europe for approximately 21 kilograms (13,3%) per capita, while in Slovenia increased for 16 (16,2%) kilograms per capita.

GEO (Labels)	European Union - 27 countries (from 2020)	Slovenia
2011	157,15	s 101,03
2019	178,08	117,44

ENERGY

The final energy consumption in Slovenia has decreased a little during last 9 years, but in 2020 (which was a profound effect of Covid-19 on the European economy) has been noticeable significant reduction in energy consumption both in the EU average (for 8,7%) and in Slovenia (for 10,4%) compared to the 2019. COVID-related reductions are anyway likely to be short lived unless backed by structural changes.

GEO (Labels)	European Union - 27 countries (from 2020)	Slovenia
2011	984.528,426	5.050,294
2019	986.384,982	4.850,693
2020	906.989,575	4.391,519

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The most common type of fuel in final energy consumption in Slovenia are oil and petroleum products (presents 42,01% of all final energy consumption), followed by electricity (presents 25,14% of all final energy consumption). While the use of oil and petroleum products and solid fossil fuels decreased in the last 9 years, the consumption of other energies increased (natural gas, renewables/biofuels, electricity, and heat).

SIEC (Labels)	Solid fossil fuels	Natural gas	Oil and petroleum products (excluding biofuel portion)	Renewables and biofuels	Electricity	Heat
2011	1,07	11,48	48,28	13,71	21,34	3,78
2020	0,64	13,14	42,01	14,15	25,14	3,85

AIR POLLUTION

Greenhouse gas emissions have been reduced as well in Slovenia as in the Europe. In Slovenia was a 14,8% decrease in greenhouse gas emissions from 2010 to 2019, while there was a 14,2% decrease in Europe.

GEO (Labels)	European Union - 27 countries (from 2020)		Slovenia	
2010	4.277.231,53		19.686,91	
2019	3.742.640,85		17.143,35	

Households in Slovenia produce the most greenhouse gas emissions, followed by electricity, gas, steam and air conditioning supply industry and manufacturing industry, according to the 4th quartile in 2021.

TIME	2021-Q4		
NACE_R2 (Labels)			
Agriculture, forestry and fishing	s	122.581,668	s
Mining and quarrying	s	15.409,224	s
Manufacturing	s	216.451,199	s
Electricity, gas, steam and air conditioning supply	s	223.702,488	s
Water supply; sewerage, waste management and remediation activities	s	38.886,768	s
Construction	s	15.849,191	s
Services (except transportation and storage)	s	67.091,461	s
Transportation and storage	s	112.534,049	s
Total activities by households	s	228.947,363	s

TRAFFIC

Registration of passenger cars in Slovenia increased during last years. The most common cars by type of motor energy were the petrol ones, while the registration of diesel cars decreased from 2015 to 2019. Besides cars with petrol energy, the number of electric cars also increased a lot from 2014 to 2019.

MOT_NRG (Labels)	Diesel	Electricity	Motor (without hybrid)

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2015	31.031		123		29.038
2019	21.499		695		47.937

Volume of passenger transport relative to GDP has decreased in Slovenia and also in EU average (Index, 2010=100).

GEO (Labels)	European Union - 27 countries (from 2020)		Slovenia	
2010	100	e	100,0	
2019	92,7	e	91,8	e

While there was a decrease in volume of passenger cars, the volume of freight transport increased during last 9 years. While the EU average of volume of freight transport slowly decreased during years (except for 2020), Slovenian freight transport increased a lot. Year 2020 is an exception – in that year the volume of it decreased, which is quite the opposite as in the EU average (which had an increase in that year).

GEO (Labels)	European Union - 27 countries (from 2020)		Slovenia	
2011	98,0		101,9	
2019	96,8	ep	116,4	
2020	100,3	ep	111,8	

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges.

National Environment Protection Programme with programmes of measures until 2030

Ministry of the Environment and Spatial Planning

http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985

In 2005, the National Assembly adopted the previous national environmental protection programme, NEAP 2005–2012, as the basic strategic document in environmental protection for the improvement of the environment and quality of life, as well as the protection of natural resources.

The programme emphasises the importance of environmental protection for sustainable development and sets goals and measures for four areas: climate change, nature and biodiversity, quality of life, and waste and industrial pollution.

A review of implemented measures in climate change shows an increased awareness of climate change, a reduction in GHG emissions and ozone-depleting substances, and the achieved goal of the share of RES in the country's total energy supply. However, the goals regarding the reduction of energy intensity, the share of biofuels in transport and the share of cogeneration of heat and energy in electricity production have not been achieved. The NEAP 2005–2012 also set out tasks for the establishment of a GHG emission monitoring system, of which tasks related to GHG emission records and the Emissions Trading Scheme have been completed, while the tasks for

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climate change adaptation and monitoring of sinks for land use, land use change and forestry have not been completed.

In the field of nature conservation and biodiversity, important strategic documents were adopted on the basis of the NEAP 2005–2012 (Biodiversity Conservation Action Plan with the NATURA 2000 Area Management Programme, Natura 2000 Area Management Programme (2007–2013) and large carnivore population management strategies), and a management system for NATURA 2000 areas has been established. In activities with their own natural resource management plans (forestry, hunting, fisheries), these plans are also management plans for NATURA 2000. However, no strategic documents have been adopted on invasive non-native species and on the protection of valuable natural features. In areas important for the conservation of biodiversity, the founding acts for wider protected areas were not harmonised with the Nature Conservation Act and the founding acts for narrower protected areas were not adopted; a central unit for protected areas has not been established either and the goal of the area of protected areas reaching 10% of Slovenia's surface has not been achieved. However, progress has been made for these areas in terms of their inclusion in agri-environmental programmes, their purchase, the restoration of their degraded parts and the system of compensation for limited property rights. Regarding the protection of valuable natural features, the goals regarding their protection, contractual protection or custody, information system, their restoration in nature and regulation or physical protection for those that may be endangered by viewing have been partially achieved. Regarding the monitoring of the biodiversity status, a comprehensive system has not yet been established, and a revision of the red list of endangered species has not yet been carried out. There are several reasons for the poor implementation of measures, from too ambitious goals and lack of political will to establish new protected areas to the reduction of funds due to the financial crisis and the redeployment of key personnel to other tasks.

In the field of quality of life, Slovenia has achieved the goals regarding the reduction of emissions of sulphur oxides (SOx), nitrogen oxides (NOx), non-methane volatile hydrocarbons (NMVOC) and ammonia (NH3) in its territory, but not the goals regarding daily limit values for PM10 particles and ground-level ozone. The goals regarding the management of chemicals and genetically modified organisms (hereinafter: GMO) have been achieved and water management measures have been implemented. In environmental noise protection, strategic noise maps have been made, while operational programmes with noise protection measures were delayed in the making.

The goals and measures in waste management and industrial pollution have been achieved and implemented, respectively.

The NEAP 2005–2012 also contained goals and measures in other areas where no or little progress has been made and challenges for future action remain: these are the integration of environmental protection into the policies of other sectors, use of economic instruments for environmental protection, the shift to sustainable consumption and production, and the restoration of degraded areas.

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Vocational Education and Training

Describe briefly the organization of the VET system in your country.

Formal vocational education and training (VET) in Slovenia starts at upper secondary level and is provided mainly by public schools that are founded and financed by the State. The education and labour ministries share responsibility for preparing legislation, financing, and adopting VET programmes and qualifications. While the education ministry governs VET at upper secondary and tertiary levels, the Institute of the Republic of Slovenia for VET (CPI) is responsible for research and development; it monitors and guides the development of VET and provides in-service teacher training and VET curricula. The CPI (Institute of the Republic of Slovenia for Vocational Education and Training) acts as a link between ministries, schools and social partners.

After completing compulsory basic education, VET students have a choice of upper secondary programmes. Technical upper secondary programmes (ISCED 354) are four-year programmes that lead to vocational matura (with two general and two vocational – theoretical and practical – exams, partly external). These programmes consist of 40% general subjects and at least eight weeks of in-company work-based learning. Vocational upper secondary programmes (ISCED 353) are three-year labour-market oriented programmes and offer two paths: • school-based path: approximately 20% (at least 24 weeks) of the programme is undertaken at an employer and the rest at the school (consisting of general subjects and VET modules); • apprenticeship path: a minimum 50% of the programme is undertaken at an employer, while at least 40% – general subjects and VET modules – is delivered in school. Changing paths midway is possible. After final exams, students from both school and apprenticeship paths can enter the labour market or enroll in two-year vocational technical education programmes at ISCED 354 that lead to vocational matura. There are also short vocational upper secondary programmes (ISCED 353). These are two-year programmes that qualify learners for less demanding occupations (at assistant level) or continuing education in vocational programmes. Graduates with a vocational matura can enroll in two-year higher vocational programmes (ISCED 554) or first-cycle professional education (ISCED 655) and, under special conditions, also in first-cycle academic education (ISCED 645). Higher vocational programmes are practice-oriented and include 40% of work-based learning in companies. These were developed to meet the needs of the economy, as they train graduates for management, planning and controlling work processes. Adults can enroll in the same formal VET programmes as young people. Many activities to support adult education are organised by adult education centres. Recognition of non-formal and informal learning is possible within the national vocational qualifications (NVQ) system that has been in place since 2000. In 2021, NVQ certificates can be obtained for 316 qualifications. Candidates must prepare a personal portfolio and take part in a validation procedure.

https://cpi.si/wp-content/uploads/2021/08/Spotlight-on-VET-SLOVENIA.pdf

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Is there any specific training / training module / WBL experience on green skills?

For the following trainings and workshops you don't get any certification:

Training: Green skills

What are green skills, how do they work and what can be achieved with them. The goals, values, tools, and technologies used in this field are presented in this training.

http://vss.scng.si/green-skills-zelene-vescine/

Training: Education for sustainable development

The original purpose was to introduce and substantiate the topic of education for sustainable development (ESD) in adult education. After 14 years, the intention is to continue the implementation of the two educational programs created, to formulate the ESD criteria (for demonstration facilities, teaching materials and educational programs) and to empower decision-makers for decisions in accordance with the ESD.

https://www.acs.si/projekti/domaci/izobrazevanje-za-trajnostni-razvoj/

Workshop: Climate unites us all

The workshop includes an interactive lecture on climate change and sustainable development, as well as a discussion that encourages participants to think and act more environmentally and socially responsible. In a visually rich presentation, participants learn about the phenomenon of global warming and the impact of climate change on the natural and social environment and our lives. Participants learn about the consequences of climate change, such as extreme weather events (severe storms, heat waves, floods, droughts), rising water levels and acidification of the oceans, extinction of plant and animal species, water scarcity, environmental migration, and environmental refugees, etc. In the second part, they focus with the participants on solutions - they learn about good practices and ask themselves what they can do as active individuals and as a community.

https://www.umanotera.org/kaj-delamo/aktualne-kampanje-in-projekti/delavnice/

Workshop: Green jobs

The workshop focuses on green jobs in Slovenia - what they are, why they are important and what are the opportunities that arise from them. They think with the participants about what green jobs are and what they are not. In the most promising areas where Slovenia can develop the greenest jobs (sustainable tourism, forest-timber chain, organic farming, efficient use and renewable energy sources, waste management and social entrepreneurship), they learn about the success stories of local communities, companies, and farms. In the second part, together with the participants in the interactive process, they search for natural, human and other local resources and identify the green jobs that arise from them.

https://www.umanotera.org/kaj-delamo/aktualne-kampanje-in-projekti/delavnice/

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Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

Higher education study program NATURE PROTECTION: **NATURE PROTECTION AND SPATIAL PLANNING**

In the course, in addition to generics, the student acquires the following subject-specific competencies:

- prepares expert proposals for measures for the protection of the environment and space;
- participates in the preparation of spatial development plans in the field of protection of natural values, biodiversity;
- informs the public about the importance of preserving natural values in space;
- prepares expert proposals for measures for the protection of components of biodiversity, measures for the protection of natural values;
- plans, directs, and manages the use of Eco remediations for nature protection and spatial planning

https://cpi.si/wp-content/uploads/2020/08/VSPNARAVOVARSTVOKZVARSTVONARAVEINUREJANJEPROSTORA.pdf

Secondary professional education ENVIRONMENTAL TECHNICIAN: **ENVIRONMENTAL PROTECTION**

- analyse the functioning of nature and the environment,
- handles the environment responsibly and acts in accordance with the principles of environmental protection,
- identify the impacts of human activities on the environment and
- suggests a way to solve environmental problems.

https://cpi.si/wp-content/uploads/2020/08/SSI_Okoljevarstveni_tehnik_KZ__Varstvo_okolja.pdf

Secondary professional education FOOD AND NUTRITION TECHNICIAN: **SUSTAINABLE DEVELOPMENT**

- Respects the basic principles of sustainable development
- Acts responsibly and environmentally friendly, respecting the basic principles of ecology
- Protects space, natural values, and cultural heritage
- Waste management in line with sustainable development
- Rational use of energy sources and raw materials and seeks the possibility of using renewable sources and raw materials

https://cpi.si/wp-content/uploads/2020/08/SSI_Zivilsko-prehranski-tehnik_KZ__trajnostni_razvoj.pdf

Secondary professional education NATURE CONSERVATION TECHNICIAN: **ECOSYSTEMS, SPATIAL ACTIVITIES AND ECOREMEDIATIONS**

- monitors the distribution of ecosystems, records their ecological status
- includes extreme biotopes in sustainable environmental protection
- cooperates with professional services in the planning, implementation and monitoring of Eco remediation measures.

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https://cpi.si/wp-content/uploads/2020/08/SSI_Naravovarstveni_tehnik_KZ_Ekosistemiizvajanje_dejavnosti_v_prostoru_in_ekoremediacije.pdf

Secondary professional education NATURE CONSERVATION TECHNICIAN: **PROTECTION OF NATURAL VALUES**

- regulates and maintains the area of natural and cultural landscape or landscape with special status
- arranges and maintains the area of anthropogenic landscape for various purposes
- takes care of the goods of the natural and cultural landscape and implements measures to preserve the vitality of the protected (maintained) area
- informs visitors in the regulated area

https://cpi.si/wp-content/uploads/2020/08/SSI_Naravovarstveni_tehnik_KZ_Varstvo_naravnih_vrednot.pdf

Higher education study program NATURE PROTECTION: **ENERGY AND ENVIRONMENTAL PERSPECTIVES**

- understand the cross-section and guidelines of the global energy sector,
- analyse the energy system in Slovenia,
- identify the supply of energy resources; energy independence, renewable and non-renewable energy sources,
- implement innovative and sustainable energy management,
- recognize the impact of the energy sector on climate change,
- rational management of natural resources,
- identify natural resources, stocks, and recovery processes

https://cpi.si/wp-content/uploads/2020/08/VSP_NARAVOVARSTVO_KZ_ENERGETSKEINOKOLJSKEPERSPEKTIVE.pdf

WASTE MANAGEMENT

- acquires basic knowledge of waste management;
- learns about the sources and properties of waste;
- identify the impacts of waste and waste management on the environment and mitigation measures;

Higher education study program ENVIRONMENTAL PROTECTION AND UTILITIES: **RURAL MANAGEMENT AND NATURE CONSERVATION**

- knows and applies basic regulations in the field of nature protection and protected areas;
- understands the importance of sustainable forestry;
- knows the principles and objectives of rural renewal;
- understands the importance of the intended use of space and protected areas of nature;
- uses urban norms and recommendations in the planning of rural settlements;

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- understands the effects of the use of genetically modified organisms in material circulatory systems;

https://cpi.si/wp-content/uploads/2020/08/P18_UREJANJE_PODEZELJA_IN_VN.pdf

Higher education study program ELECTRIC POWER ENGINEERING: **EFFICIENT USE AND RENEWABLE ENERGY SOURCES**

- efficient energy management;
- performing simpler emission calculations;
- ensuring a reliable and environmentally friendly electricity supply;
- professional evaluation of potential savings and understanding of technological solutions for energy efficiency;
- professional assistance in the integration of qualified producers of electricity from renewable energy sources into the electricity system;

https://cpi.si/wp-content/uploads/2020/08/P15_Ucinkovita_raba_obnovljivi_viri_energije.pdf

Higher education study program BIONIKA: **ENVIRONMENTAL ECONOMICS AND ENTREPRENEURSHIP**

- acquiring knowledge that includes the management of economic, environmental, and spatial resources and public health;
- develop corporate social and environmental responsibility and promote ethical awareness;
- systematic approach to sustainable business planning;
- effective use of business performance assessment tools, taking into account the needs of sustainable development;
- monitoring, implementing, and controlling the social responsibility of the organization.

https://cpi.si/wp-content/uploads/2020/08/Bionika_2011_P10_Bionska_ekonomika_in_podjetnistvo.pdf

Secondary professional education ENVIRONMENTAL TECHNICIAN: **WASTE MANAGEMENT**

- classifies waste according to resources and properties,
- reduces the impact of waste and waste management on the environment,
- handles hazardous substances, chemicals, and hazardous waste correctly.

https://cpi.si/wp-content/uploads/2020/08/SSI_Okoljevarstveni_tehnik_KZ_Gospodarjenje_z_odpadki.pdf

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Is one of the following green career paths, part of the VET system in your country?
Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer and sheet-metal worker.
Low-skilled occupation: refuse/recycling collector.

MEDIUM SKILLED OCCUPATIONS:

1. **SECONDARY VOCATIONAL EDUCATION:**

Electrician

(http://eportal.mss.edus.si/msswww/programi2020/programi/SPI/eletrikar-2020/kazalo.html **)**

Green competencies gained:

- learn about alternative energy sources and their installation in the system,
- develop ecological awareness for environmental protection, economy, and personal responsibility for reducing environmental pollution.

2. **SECONDARY PROFESSIONAL EDUCATION**

Environmental technician
(http://eportal.mss.edus.si/msswww/programi2020/programi/Ssi/okoljevarst_tehnik-2020/kazalo.htm **)**

Green competencies gained:

- are able to analyse the functioning of nature and the environment and identify the effects of human activity on the environment,
- develop awareness and a positive attitude towards measures to reduce pollution, to improve environmental protection, to rationally use energy and materials,
- are able to manage environmental technologies,
- acquire skills of complex thinking about environmental problems,
- get acquainted with environmental legislation and implement it within their competences

3. **SECONDARY PROFESSIONAL EDUCATION**

Nature conservation technician
(http://eportal.mss.edus.si/msswww/programi2020/programi/Ssi/naravov_tehnik-2020/kazalo.htm **)**

Green competencies gained:

- comply with legislation in the field of nature protection,
- recognize the effects of human activity on nature, the environment and space,
- are able to maintain the natural and cultural landscape and implement measures to preserve the vitality of the protected area,

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- inform the public about the importance of natural values, protection of natural resources and resources, environmental protection, and spatial planning,
- to cooperate with professional services in the preparation of professional spatial planning measures and to monitor the implementation of environmental protection measures,
- are able to perform analyses of environmental parameters

4. VOCATIONAL AND TECHNICAL EDUCATION

Agricultural and entrepreneurial technician

(http://eportal.mss.edus.si/msswww/programi2020/programi/Pti/zivilsko_prehranski_tehnik/kazalo.htm)

Green competencies gained:

- acquire general and basic knowledge for understanding legality in nature and society,
- carry out work in plant and animal production and ancillary activities in accordance with the principles of sustainable development, quality assurance and safety at work,
- are able to plan agricultural production and animal husbandry and to grow crops and vegetables, fruit and grapes, fodder and raise animals,
- safely handle harmful and dangerous substances and waste from agricultural production and breeding and prevent environmental pollution

HIGH SKILLED OCUPPATIONS:

1. HIGHER EDUCATION STUDY PROGRAM NATURE PROTECTION

Nature conservation engineer

(https://cpi.si/wp-content/uploads/2020/08/VSP_Naravovarstvo_AB.pdf)

Generic green competencies gained:

- informs the public about the importance of preserving natural values
- participates in research work in the field of protection of natural values
- carries out project work for the protection of natural values
- participates in the implementation of market research and provides market consulting in the field of natural protection values
- organizes and participates in the process of formal and non-formal education and training protection of natural values
- ensures the quality and efficiency of work in accordance with the standards for the protection of natural values
- uses energy, material, and time rationally
- protects health and the environment, is responsible for his own safety and the safety of others

Vocational-specific competencies:

- implements sustainable development in the field of natural resource management
- prepares expert proposals for measures for the protection of components of biodiversity, protection measures natural values and Eco remediations

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- advises on the use of genetically modified organisms (GMOs)
- advises on the handling of persistent organic pollutants
- organizes, implements and monitors measures for the protection of natural values, habitat protection and Eco remediation
- prepares expert proposals for measures for the protection of the environment and space
- plans and organizes the cultivation and care of beneficial organisms
- plans and organizes the maintenance of premises and equipment for the cultivation of beneficial organisms
- advises and sells products, devices, and other aids for maintaining natural balance and biodiversity
- evaluate waste, wastewater, and hazardous substances
- participates in the rehabilitation of water, air, and soil
- keeps records in the field of various works, processing of raw materials and processes
- prepares implementation programs for the protection of protected areas
- participates in the preparation of nature protection consents
- monitors the implementation of measures for the protection of natural values and the conservation of biodiversity

2. HIGHER EDUCATION STUDY PROGRAM ENVIRONMENTAL AND UTILITIES:

Environmental Engineer / Environmental Engineer

(https://cpi.si/wp-content/uploads/2020/08/VSP_Varstvo_okolja_in_komunala_StudijskiProgram.pdf)

Generic competencies:

- ability to record and define environmental problems, analyse problems, and prepare professionally based solutions,
- ability to integrate knowledge from different fields in the application and development of new technical measures for environmental protection, applications in the field of supply systems and spatial planning,
- managing and solving concrete work problems in the field of environmental protection, spatial planning and management of protected areas

Vocational-specific competencies:

- understand the importance of prevention for the preservation of the environment and nature,
- know how to realistically solve concrete environmental problems in the field of supply systems, environmental technologies, production processes, key activities in the natural (agriculture, forestry, hunting, fishing) and urban environment,
- are aware of the limitations of raw materials and energy resources, the importance of economic consumption and reuse, and the legality of the natural circular flow of matter and energy,
- ability to integrate knowledge from various fields and its incorporation into concrete solutions in environmental care systems, technical measures for environmental protection, spatial planning and management of protected areas,

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- be trained in the design and operation of environmental care systems,
- know how to use theoretical natural science bases in the planning and operation of health hydrotechnical systems, municipal waste management, urban roads, other urban networks or municipal infrastructure and spatial systems,
- get acquainted with sectoral legislation with an emphasis on public services for environmental protection, nature protection, companies and procedures for planning and locating municipal, industrial and craft activities in space,
- learns about the procedures for preventing environmental impacts in settlements, industry, and other activities, as well as measures for preventing negative environmental impacts,
- are trained in planning, management of operation and maintenance of urban transport, spatial planning, partly other urban networks (municipal energy - hot water and gas pipelines) and practical engineering knowledge of maintenance and management of facilities and devices intended,
- knowledge and ability to use practical engineering knowledge in the field of hydraulic engineering in the economy (industrial, process and fire water supply, industrial sewerage, industrial wastewater treatment) and energy, industrial waste management, flue gas cleaning and prevention of emissions of various pollutants into the air,
- gets acquainted with the basics of sustainable farming and forest management, natural resources and watercourse management, landscape planning and rural renewal,
- acquires the ability to use theoretical natural sciences in the management of ecosystems, protected areas and other areas with special or protected status (landscape and national parks, wetlands)

Employment Perspectives in Green Occupations

Green jobs occupational trends.

Employment in the environmental goods and services sector has increased from 2010 to 2019, both in Slovenia and Europe. In EU average there was a 15,4% increase, while in Slovenia was a 24,4% increase.

TIME/GEO	European Union - 27 countries (from 2020)	Slovenia
2010	3.929.000	24.914
2019	4.535.000	31.016

The table below shows economic activites in Slovenia, which have the most numerous employees in the field of environmental goods and services sector. The economic activity in Slovenia with the largest number of employments in the environmental goods and services sector is manufacturing, followed by water supply;sewerage;waste management;remediation activities and agriculture, forestry and fishing. It should be mentioned also that the number of employees has increased in almost all fields of environmental goods and services sectors from 2011 to 2019.

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NACE_R2 (Labels)	Agriculture, forestry and fishing		Manufacturing		Electricity, gas, steam and air conditioning supply		Water supply; sewerage, waste management and remediation activities		Construction		Public administration and defence; compulsory social security	
2011	2.855		7.213		2.360		6.940		3.492		2.600	
2019	5.762		8.417		3.000		7.768		3.590		2.091	

Slovenia has set yet another shining example in the region when it comes to sustainable development efforts, offering EUR 1.5 million in subsidies to employers who hire people in green jobs. The funding is provided by the Ministry of the Environment and Spatial Planning from its climate change fund. Eligible employers in Slovenia will receive financial subsidies of EUR 340 per month for a period of two years for hiring an unemployed person in a full-time green job, which amounts to a total of EUR 8,160 per employee. Depending on the number of new employees in green jobs, an employer will be able to receive two to ten subsidies. With these incentives, the ministry seeks to contribute to the greening of the Slovenian economy, reducing greenhouse gas (GHG) emissions, and stepping up efforts to use energy and resources more efficiently. Green jobs, such as recycling workers, solar panel installers, environmental consultants, or green building designers, are an important aspect of sustainable development, as they can help achieve climate change goals, conserve nature and environment, and increase human potential in the transition to a low-carbon society. Among other criteria, the public call takes into account what is described as “shades of green.” For example, less green jobs include construction technicians and hotel managers, while greener includes foresters and waste sorters. Products, services, and workplace activities in line with climate and environmental goals will also be taken into account. The employer will be able to demonstrate an additional contribution with the obtained standards and certificates (ISO 14001, EMAS, and others), and the criteria will also include the employer’s products and services and workplace activities that are in line with climate and environmental goals, according to the ministry.

https://balkangreenenergynews.com/slovenia-offers-eur-1-5-million-in-incentives-for-green-jobs/

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Findings from the FIELD SURVEY in Slovenia

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

Focus group was conducted in accordance with methodological guidelines from the leader of the R1. We contacted some students that we though are proper for the theme of the focus group and that are currently studying at CPU and a few lecturers and trainers. We contacted the potential participants by phone, where we explained them the purpose of the project and the course of

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focus group and then invited them to participate in it. Most of them were interested. At the end we got 11 participants that confirmed the participation in a focus group. We discussed with participants about the most suitable date and time of implementing the focus group and if they prefer to conduct it on-line or face-to-face. All of them agreed to do it face-to-face. We decided to conduct it on 23rd of June, starting at 16:30 in the classroom of CPU. Focus group was moderated by Petra Velkovrh. The focus group lasted around 1 hour and a half. Participants were quite open and willing to participate. The only thing that was bothering them, was the length of the focus group. A lot of them said in the end that it was too long and it also can be seen from the answers that they were already losing interest in cooperating and answering to the questions towards the end.

NUMBER OF PARTICIPANTS	11
THE DIVISION BETWEEN LEARNERS AND PROFESSIONALS	5 professionals, 6 students
GENDER	9 M, 2 F
EDUCATION (LEVEL)	*2 Master's Degree* *3 Bachelor's Degree* *6 Vocational Education*
THE PROFESSIONAL BACKGROUNDS	*Traffic; Economy; Construction*
THE EXPERIENCE WITH GREEN TECHNOLOGIES OR GREEN-RELATED SUBJECTS	*8 – No experience,* *3 – With experience*

NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

Participants mainly exposed that importance of sustainable development, use of renewable energy resources, effective use of energy, packaging management, recycling and the exploitation of potentials that Slovenia has (forests, effective use of hydro potential…), needs to be promoted or introduced in order to improve the environment in Slovenia. The pollution of groundwater, air pollution, car emissions, biodiversity protection and waste management are the main environmental challenges in Slovenia, according to the answers of participants. Pollution of groundwater in some places in Slovenia results in poor water quality, which makes it expensive for cleaning it up or can even cause health problems, even though we are a water rich country, said one of the participants. Regarding air pollution in Slovenia, the main problem is air pollution with particles (PM10) and ozone in the summer. Air pollution, same as water pollution can cause health problems among people or can even damage the ecosystems. Participant pointed out that car emissions are the one of the main factors that affect the quality of air in Slovenia, because we have a heavy truck transport and also the main mean of transport of Slovenians is car, which results in heavy traffic, especially in bigger cities and that Slovenia has a diverse and relatively well-preserved nature, that's why biodiversity protection is important. Water and air pollution with a mass tourism, heavy traffic, urbanisation, and industrialisation of Slovenia, can cause that

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biodiversity becomes endangered. Waste management is also one thing that we in Slovenia should take care of. Every year the size of waste is bigger (because households as well as companies/factories produce more waste) and we need to accept some measures and new policies that will force people to consume or throw away less. One of participants also pointed out that we have a lack of resources for accepting environment friendly decisions, because just promoting environment friendly and more economic ways of handling things, is consequently not always feasible and prioritized. Some of them also said that we're successfully solving environmental challenges in our country, but we would need to pay more attention to emissions in companies and car emissions. One said that he would introduce programs for transition of cars with electric internal combustion engine. For that, he said, strong motivational programs are needed, which also supports car drivers.

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

Participants said that we need to first introduce themes/modules, that are connected to environmental problems. It's also important to get acquainted with topics, raising awareness, introducing programs that are dedicated to getting the right knowledge, which is needed for green related jobs. Some said that the national strategy of education and the possibility of employment in green jobs would help to become more responsive to environmental challenges. State's support in sense of clustering in the industry is also needed. Awards for energy effective companies and household could also improve education/knowledge about environmental challenges. Some of them think that in last years the education and training systems started to emphasize more the environmental problems in general and also more specifically, it depends on the profession people are training for - eg builders talk about how important it is to know where they can dispose construction waste, how to handle it, how to reduce it, why it is important not to dispose of waste in black dumps, etc.). Mainly, the participants agreed that people need to start get aware of environmental problems that we're facing with today and that we can do with getting the right knowledge of how to operate ecologically in practice and understanding why it's important to act environmentally friendly.

Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

The most of participants thought that the standards of qualifications and the training programmes are appropriately updated and are following global trends in Slovenia. The problem is that there is a lack of transfer of knowledge into everyday life and incentives to use this knowledge. Some of

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them think that more technical knowledge (not just theoretical) for gaining accurate green skills is important. The gaps in gaining the right green skills according to the employment trends should be considered, that's why a regular check of appropriateness of green VET programmes is needed. The right skills that correspond to solving current environmental problems globally as well as nationally should be included in VET programmes in order to have a greener economy. They think that education about environmental policies should also be included in VET programmes.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

Participants mainly think that free seminars with introduction of green careers in Slovenia could be a good solution to improve information and guidance on green VET opportunities. Those could take place in different companies, public institutions, schools… More promotion for green career opportunities could be used in Slovenia, because it would probably raise the interest of people. Use of social media for educating/informing people about green vet careers could also be a good idea to reach a high number of people and potentially those, who will decide that they want to work in green jobs. Seminars and promotion events were again mentioned. They could improve information and guidance on green VET opportunities. One of the opinions was also that education institutions should make contacts with potential employers and help graduates find employment through directed/focused education. The change of mentality (awareness of people about importance of environmental challenges) is the first thing that needs to be changed if we want to get people interested in working in green jobs. Then we should provide appropriate education and trainings and then create new or updated green careers opportunities, said one of the participants.

VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

Few VET trainers said that they have enough knowledge about green issues, while the other two were not so convinced. They felt most competent about knowledge of effective use of energy, sustainable development, the use of renewable sources of energy, saving energy and waste management in general. It should be pointed out that most of them are educated in the field of construction, economy, and traffic, that's why they're probably most educated about energy use and waste management. They pointed out that would need additional training for example in ecosystem management, environmental policy, sustainable fashion, prevention of pollution of surface waters and biodiversity/biology. Most of them are interested in additional education about green skills.

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What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

Few of participants agreed that visiting fairs, education in foreign countries, where they have already implemented effective green practices in their economy would be a good way to implement a training programme. It would make the training interesting and the learners could actually see why are green jobs important for the development of a greener economy and society. Considering training needs in Slovenia, the researchers that are identifying the skills that are needed or wanted in the labour market, should look not only at them but also at the general skills needs of the Slovenian population, and think about the way to connect them to the identified green skills, said one of the participants. It was pointed out that besides the theoretical part of the training, practical part is also important. For example, the training could include the visual presentation of the use of green technologies, materials, tools, machines in different areas or the use of different case studies of companies that successfully implemented green techniques in their work. Practical exercises and open discussions after the theoretical part would also be useful, because it would encourage learners to think on their own. Another idea was that some experts that work in the fields of green economy could be brought to the training, to exchange and transfer their experiences to the learners.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

Most of them said that they never collaborated with green entrepreneurs/green industries in their training programmes. One of them said that he did collaborate with companies engaged in the processing, recycling of construction waste materials, and companies engaged in the production of energy from renewable energy sources. He concluded that the experiences were positive.

LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

Most of them think that they have some general knowledge about green issues and environmental awareness. They have the knowledge about the current environmental issues around the world and what are the causes for the environmental challenges that we are facing today in the modern world. They know some ways of how to behave environmentally friendly. Most of them were informed about the environmental issues in the school or by the media. One of them said that he doesn't have enough professional knowledge about green issues at all and one of them said that

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he's slowly getting the knowledge needed in the school in which he is currently studying. They mostly think they have the lack of technical knowledge and lack of deeper knowledge about the green issues. They also think that the use of critical thinking is important in training for green jobs, because people need to have the skill to recognize the wrong and right ways that something is done (to be environmentally aware) and to have the skill to find accurate solutions for specific environmental problems. Risk management, environmental impact assessment and circular economy was also one of the skills they mentioned when talking about the topics they think they need additional training.

Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

Most of the participants said that this kind of job are necessary in today's society. The jobs help to reduce human impact on the environment and to change green actions or practices into a common functioning of and society and integration of it in the everyday lives of individuals. We need to bring the need for this kind of jobs to younger generations, one said. They are aware that jobs, that support the green economy already exist in the world. In Slovenia is the trend or emergence of green jobs opportunities still quite a new thing. Green jobs and awareness about it is welcome in companies, one of the participants said. He continued that such personnel contribute to a lot to a ''cleaner'' company and also limiting certain elements (electricity, water, recycling of materials ...). ''Because we currently have companies that are dealing with the production of energy (biomass) or processing and recycling, I can say that we have exploited only 20% of the potential and that there is still a lot of potential waiting to be used.'', one of participants said.

In your opinion, which are the most demanded green jobs in your region / country? Why?

Most common answers were the following:

- Production and installation of solar cells, solar power plants. We also have HiTech companies in Slovenia, such as Pipistrel, which employs engineering staff.
- Environmental consultant
- Event organizer
- Solar and power engineer
- Organic farmer
- Forester
- Efficient energy use
- Sustainable tourism

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If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?

For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	Most of them don't know what kind of education they need for this profession or who to contact. Some of them said that you need a university degree for this job.
Insulation worker	Most of them think that you need vocational education in construction to work in that field or at least a study program that is connected in some ways to construction.
Solar photovoltaic installer	Most of them don't know what kind of education they need for this profession or who to contact. Some of them pointed out that it's an interesting job and that is the first time they hear of this profession. Some of them said that you need a vocational education in the field of electrical engineering with additional trainings. One pointed out that they can train employees for this job position in the PLANNET d.o.o. and BIJOL d.o.o. company.
Installer of electrical networks with better efficiency	Some of them said that you need to have a vocational education in electrical engineering. One of them pointed out that you can get trained for this job in the companies that deal with electrical installation work.
Refuse / recyclable material collector	Most of them don't know what kind of education they need for this profession or who to contact. One of them pointed out that you can get trained for this job position in BIOTERA d.o.o.
Sheet-metal worker	Most of them think you need a high school degree for this profession. Some of them said you need to have a metal or mechanical high school education for this profession.
Mechatronic	Some said that you need an engineer education in mechatronics or a vocational education in general. Some said that you need a vocational education in electrical engineering.
Installer of air conditioning systems with low environmental impact	Most of them think that you need any kind of vocational education and additional specific training with a professional exam in air conditioning systems in the end in order to get the certificate. When you get the certificate, you can work in this profession.
Air quality engineer	Most of them said that you need engineering education in the field of mechanics. One think that you need additional professional training in order to perform this job. Some said you need vocational education and some said you need a university degree in technical study programs.
Environmental quality certifier	Most of them don't know what kind of education they need for this profession or who to contact.

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

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Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

(Only students rated this questionnaire)!

Skill	**1** (I am not satisfied)	**2**	**3**	**4**	**5** (I am very satisfied)	**Motivation**
SOFT SKILLS:						
Decision making			1x	1x	4x	/
Risk management			2x	2x	2x	/
Time management			2x	1x	3x	/
Flexibility				2x	4x	/
Adaptability				3x	3x	/
Team work				2x	4x	/
Problem solving			1x		5x	/
Logical thinking			1x		5x	/
Literacy				2x	4x	/
Numeracy			2x	2x	2x	/
Communication				1x	5x	/
Communication in a foreign language			1x	3x	2x	/
STEM skills				2x	4x	/
DIGITAL SKILLS:						
Computer literacy				1x	5x	/
Data entry			1x	1x	4x	/
Data analytics			1x	1x	4x	/
Word processing			2x	1x	3x	/
Web-based communications and research			1x	1x	4x	/
Secure information processing			1x	2x	3x	/
Social media management			3x	2x	1x	/
GREEN-RELATED SOFT SKILLS:						
Recycling consciousness				3x	3x	/
Critical consumer behaviour (grocery/food/clothing.)			2x	3x	1x	/
Eco friendly / green travels			3x	2x	1x	/
Environmental footprint			2x	2x	2x	/
Awareness about ecological impact of textile materials production			3x	2x	1x	/
Water consuming and consciousness			1x	2x	3x	/

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Would you like that one or more of the green, soft, and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making	8x	3x	
Risk management	8x	2x	1x
Time management	8x	3x	
Flexibility	7x	3x	1x
Adaptability	7x	4x	
Team work	9x	2x	
Problem solving	9x	2x	
Logical thinking	11x		
Literacy	7x	2x	2x
Numeracy	7x	2x	2x
Communication	9x	2x	
Communication in a foreign language	8x	3x	
STEM skills	7x	1x	3x
DIGITAL SKILLS:			
Computer literacy	10x	1x	
Data entry	8x	3x	
Data analytics	8x	3x	
Word processing	7x	4x	
Web-based communications and research	10x	1x	
Secure information processing	8x	3x	
Social media management	8x	1x	2x
GREEN-RELATED SOFT SKILLS:			
Recycling consciousness	11x		
Critical consumer behaviour (grocery/food/clothing.)	10x		1x
Eco friendly / green travels	10x	1x	
Environmental footprint	10x		1x
Awareness about ecological impact of textile materials production	9x	1x	1x
Water consuming and consciousness	11x		

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4. Analysis of similar trends and common strategies

4.1 Similar trends and common strategies in partner countries

This section dives into the comparison and analysis of the situation in the project's partner countries, as pointed out in the GREEN VET CHOICES partners' National Survey reports.

In this first part of the transnational study, we will take into consideration similar trends highlighted by partners through their desk researches.
In fact, as emphasised by all partner's, the main environmental challenges are:

- CLIMATE CHANGE

In Italy, Portugal (as stated by the Calouste Gulbenkian Foundation) and Slovenia, climate change is linked to increases in temperature, changes in rainfall regime and increased frequency and duration of extreme climatic phenomena and increase of the surface temperatures and sea level, with several negative impacts on the ecosystems.

- WASTE PRODUCTION

Waste production impacts all partner countries, and especially Cyprus reported so. Due to very high consumption patterns Cyprus has one of the fastest rising waste generation rates. The environmental, health and socioeconomic impacts of the uncontrolled disposal of waste are considerable given the size of the island. Reducing waste generation remains, therefore, a key priority for future waste management in Cyprus.
On the other hand, Slovenia pointed out a positive issue as there is a significant decline in produced waste from year 2004 to 2018. Slovenia has greatly improved in waste generation (664kg per capita less waste produced from 2014 to 2018), especially when compared to EU average, where the amount of waste has increased in the last few years.

- WASTEWATER

In regards to the management of water, Cyprus is a country where climate change is impacting on water supply. However, in recent years, there was a big increase in the quantity of wastewater in Slovenia too. As highlighted in its National Survey Report, from year 2013 to 2020 the quantity of treated wastewater has increased, which means less potential for polluting groundwater, streams, reservoirs, lakes and the sea. Bad news is that quantity of untreated wastewater has also increased even more than treated water.

- AIR POLLUTION

Even though it has been identified as a common challenge by Austria, Cyprus, Ireland, and Slovenia, in Austria it is a problem which has already found some solutions.

- Other reported environmental challenges concern plastic waste, the pollution of water, the consumption of the land i.e. the prevalent sealing of the soil surface for constructions, roads etc, which is a huge problem for the availability of water, flora and fauna. This last environmental challenge has been identified both in Austria and in Italy. Austria appears, in fact, to be the country in Europe with the highest rate of sealed soil surface.

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Regional/national initiative or programme undertaken to overcome environmental challenges

In all partner countries it has been found some existing regional / national initiatives/programmes undertaken to overcome different environmental challenges; we provide here three examples coming from Austria, Cyprus and Italy and we recommend to read the National Survey Report of each partner to get more insights in the existing regional / national initiatives/programmes undertaken to overcome environmental challenges.

The Tiganokinisi, for instance, is an educational environmental programme applied in more than 400 schools in Cyprus about the collection of used cooking oil. Through the programme, the used cooking oil is transformed into biodiesel. The participating schools then receive financial aid for further environmental education and support of their facilities.

An interesting programme in case of environmental disasters is applied by Austria and this is the Bundesheer (Austrian Army) – Disaster and emergency management. As mud slides, fire, floodings, extreme snowfall occurs at an increasing rate due to extreme weather conditions caused by climate change and sealing of the soil surface, in Austria there is a growing need for rescue operations. The Austrian Army has the necessary equipment, expertise, and manpower to intervene after events caused by bad weather to help those in need whenever civil protection and aid is not enough.

At last, in Italy, from January 2022, the separate collection of textile fibres is compulsory thanks to the decree D.LGS. 116/2020 with whom Italy has implemented a series of directives on the circular economy, adopted by the European Union in 2018 (According to these EU directives, sorting of textile waste will be mandatory by 2025). Therefore, from the beginning of 2022, in Italy the separate collection of discarded clothes, old sheets, blankets, upholstery, or anything that is made of a textile fibre, is mandatory. The goal is to reduce the environmental impact of textiles and encourage reuse and recycling, as today most of the textile waste ends up in landfills or incinerators as general waste.

Presence of training module and work-based learning experience on green skills

In each respective National Survey report, each partner has thoroughly described its Vocational Education and Training system. We advise to read each National Survey report for a detailed overview about the organisation of the VET system in each partner country.

Here, we summarize the presence of a specific training course / training module / WBL experience on green skills in each country.

For what concerns Austria, the degree to which green skills are taught in VET schools depends on the individual setting and chosen educational path as well as on involved institutions and persons (teachers, mentors). Overall, many aspects of sustainable lifestyles are included in the curricula. However, a stronger focus on these topics should be raised up.

In Cyprus, the project “SMEm Power Efficiency” aims to empower SMEs to run energy audits and implement their proposals. This initiative uses a holistic methodology to address different barriers, where the first concerns the design and delivery of an integrated Education & Training programme targeting energy related SME staff, of 5 ECTS/EQF 6.

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In Ireland, it appears that there are more than 50 programmes being delivered by 16 Education and Training Boards with a focus on green skills. Some of these training programmes include:

- Environmental sustainability for the Workplace
- Lean Practice for Sustainable Business
- Resource Efficiency in the Workplace
- The Circular Economy
- Sustainable Procurement
- Greening the Supply Chain.

An interesting Italian project aimed at bringing green skills at school is the Progetto Green Jobs (http://www.progettogreenjobs.eu/), which is a project promoted by the Cariplo Foundation in 2015 as a school-work alternation pathway to orientate and train VET students on the sustainability culture in the cultural, social, environmental and professional field. The project, as already mentioned, aimed at stimulating students and teachers in the acquisition of green skills as a tool to protect the territory where they live as well as a professional opportunity. From 2018, it has engaged more than 220 classes and 4500 students at secondary level schools in the Piemonte region and in the city of Genova. If you would like to know more about this project, please read the National Survey Report provided by Italy.

In relation to green skills offer, Portugal has reported the presence of the following courses:

1) Professional Courses with double certification: they have a duration of 3 years and are valid for young people up to 20 years old. Some examples are:
    - Environmental Management Professional Course
    - Professional Course of Photovoltaic Solar Systems Installer
    - Professional Course of Renewable Energy Thermal Systems Installer
2) Professional Courses (online or face-to-face) with certification:
    - Organic and Sustainable Agriculture Course
    - Agricultural Management
    - Renewable Energies
    - Solar Energy
    - Transport vehicle emissions inspector
    - Environmental Management
    - Photovoltaic Solar Energy.

In addition, there are different courses and workshops for adults on green skills.

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At last, in Slovenia it's possible to find a general training on green skills, a training on sustainable development, a workshop on green jobs. However, it has been reported that none of them provide a formal VET certificate.

Initiatives, programmes, and projects undertaken in each country to include green / environmental awareness in VET programmes / courses

Environmental awareness has also been included in VET programmes / courses in partner countries as follows:

in Austria, green skills are included in the curricula to a certain extent, but there should be a stronger focus on them, as highlighted in the previous paragraph. Moreover, sustainability topics are part of teaching and many aspects of sustainable lifestyles are part of the curricula. It is, however, rather difficult to implement sustainability in the actual training during real life situations in the apprenticeship companies.

Cyprus presented two projects available in the country on environmental awareness in VET:

1. The project WE-Qualify and the Build-up Skills initiative - «Improve Skills and Qualifications in the Building Workforce in Cyprus».
The WE-Qualify project «Improve Skills and Qualifications in the Building Workforce in Cyprus» is an EU co-funded project through the «Intelligent Energy Europe» programme under the European initiative «Build Up Skills». The initiative aimed at promoting the continuing vocational education and training of workers in technical occupations in the Construction sector, as well as other relevant sectors in connection with the installation and maintenance of energy saving and renewable energy systems.
The following skills were part of different training programmes through this project:

- Skill 1: Installation of thermal insulation
- Skill 2: Installation of thermopanes and exterior sunshades
- Skill 3: Installation and maintenance of biomass boilers and stoves.

2. HRDA Subsidised Training Programmes from the PV Technology Lab of FOSS Research Centre for Sustainable Energy of the University of Cyprus. The PV Technology Lab has intensified its efforts to shape the wide range of educational activities it offers. As climate change and energy security is an intergenerational and multifaceted problem, it has tailored its educational courses to meet a variety of people of different age groups, educational backgrounds, and a cross-section of topics. The PV Technology Lab currently offers vocational training on topics such as smart grids, renewable energy sources and nearly zero energy buildings. The PV Technology Lab provides vocational training courses to professionals on energy issues.

The courses offered are the following:

- PV System Designer and Installer
- Energy Storage: Diverse Role in the Modern Electricity Network
- Fundamentals of Nearly Zero Energy Buildings
- Fundamentals of Building Integrated Photovoltaics
- Commissioning tests and inspection according to EN 62446 standard.

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In Ireland, and more specifically in the Cavan Region, the Cavan training institute offers the following training programmes on environmental awareness (please read the Irish National Survey report for further details):

1. Sustainable Energy and Construction Technology - This 1-year course is designed to equip students with the knowledge and skills associated with environmentally sustainable building and construction technology.

2. Renewable Energy Technology and Control Systems (2 Year programme) course enables students to develop an understanding of sustainability issues and renewable energy systems. Students develop knowledge, skills, and competence in areas such as solar photovoltaic (PV), solar thermal and domestic wind turbine system specification and control systems used in industry.

3. Carpentry Techniques course focuses on passive house building techniques and "Nearly Zero Energy Building" (NZEB) standards, and aims to produce graduates who are equipped to work in the rapidly changing landscape of today's wood construction industry.

In Italy, the Ministry of Education has developed the RiGenerazione Scuola plan (https://www.istruzione.it/ri-generazione-scuola/index.html) implementing the objectives of the 2030 UN Agenda. The Plan is designed to accompany schools in the ecological and cultural transition and implementation of educational paths on sustainable development.

In Portugal, the municipality of Oeiras (in Lisbon District) provides an annual Environmental Education programme for Educators called PEA (Programa de Educação Ambiental). It aims to constitute a set of transversal and multidisciplinary resources through which schools can promote education for sustainability. The programme is advertised annually to all public, private and social solidarity teaching establishments in the Municipality, through an information brochure.

At last, in Slovenia there are several VET programmes which take into consideration environmental awareness such as the higher education study programme “NATURE PROTECTION: NATURE PROTECTION AND SPATIAL PLANNING”, two secondary professional education programmes called “Environmental Technician: Environmental Protection as well as three secondary professional education programmes called “Food and Nutrition Technician: Sustainable Development”. For further details on these environmental awareness VET programmes, please read the Slovenian National Survey report.

Green career paths in partner countries’ VET systems

In the table below we have summarized different green career paths and if and to which extent they are part of the VET system in each partner country, in accordance with the information provided by project partners. For further details and information, we recommend to read the National Survey reports specific section

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Is one of the following green career paths, part of the VET system in your country?

	Austria	Cyprus	Ireland	Italy	Portugal	Slovenia
HIGH-SKILLED OCCUPATIONS						
Engineering technologist	University degree (university of applied science) required for professions falling into this category e.g., medical technologist, health assisting engineering, safety and systems engineering, electronics technician, information technology technician.	University degree required.	N/A	17 Istituti Tecnici Superiori (ITS) focus on the environment, an eco-sustainable future and energy efficiency	The courses related to engineering have academical degree and a duration of 6 semesters.	Several paths are available as higher education study programme
Environmental engineer	University degree (university of applied science) required	University degree required.	N/A	To some extent part of the VET system. University degree required.	The courses related to engineering have academical degree and a duration of 6 semesters.	Available as higher education study programme
Other			Eco-construction specialist, energy data analyst, sustainable energy engineer, green asset manager and carbon analyst.		Environmental management available as VET course.	Nature conservation engineer

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	Austria	Cyprus	Ireland	Italy	Portugal	Slovenia
MEDIUM-SKILLED OCCUPATIONS						
Energy auditor	A number of certifications are required, but not through a VET programme	VET programme available. The VET programme of the University in Cyprus - PV Technology Lab includes solar photovoltaic installer skills and energy auditor skills.	N/A	To some extent, part of the VET system.	VET programme available.	VET programme available.
Transport vehicle emissions inspector	VET programme available	VET programme available.	N/A	To some extent, part of the VET system.	VET programme available.	VET programme available.
Insulation worker	VET programme available	VET programme available (not at university).	N/A	To some extent, part of the VET system.	VET programme available.	VET programme available.
Electrician	VET programme available	VET programme available (not at university).	N/A	To some extent, part of the VET system.	VET programme available.	VET programme available - secondary vocational education.
Solar photovoltaic installer	VET programme available	VET programme available. The VET programme of the University in Cyprus - PV Technology Lab includes solar photovoltaic installer skills and energy auditor skills.	N/A	To some extent, part of the VET system.	VET programme available.	VET programme available.

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	Austria	Cyprus	Ireland	Italy	Portugal	Slovenia
sheet-metal worker	VET programme available	VET programme available.	N/A	To some extent, part of the VET system.	VET programme available.	N/A
Other						Environmental technician and nature conservation technician available as Secondary Professional Education; agricultural and entrepreneurial technician available as Vocational and Technical Education.
LOW-SKILLED OCCUPATIONS						
Refuse/recycling collector	No VET programme available	VET programme available.	N/A	To some extent, part of the VET system.	No specific course for people who would like to work in this profession. Each company give their employees the training necessary for them to be able to do their activities.	N/A
Other	A VET programme for waste management is available					A VET programme for waste management is available

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Green jobs occupational trends.

The general EU trend in the last decade clearly goes towards a greener future, in fact there is a rise of green jobs as well as more inclusion of green topics in the educational curricula in all partner countries.

In Ireland, for instance, there are approximately 37.400 people employed through the green economy. Around 27.800 of them, work in the industry sector.
For what concerns Italy, the request of green jobs in the next years is expected to be pulled strongly from Eco-sustainability and the digital revolution. These two sectors will play an important role in the characterization of Employment needs in various economic sectors, involving in the next five years 26-29% of workers both from the Public Administration and the private companies. Overall, it's foreseen that the need of green jobs will increase of the 38% by 2025.
The new construction industry In Italy, but also in Cyprus and elsewhere, is growing because it is focused on requalification, energy saving, the recovery of abandoned urban areas and earthquake safety: all jobs which will become increasingly central as Europe sets increasing ambitious targets in cutting emissions.

Employment in the environmental goods and services sector has increased in Slovenia from 2010 to 2019. In EU average there was a 15,4% increase, while in Slovenia there was a 24,4% increase.

A slightly different trend has been reported by Portugal as, according to INE (National Institute of Statistics), in 2020 companies in the industrial sectors employed 10.858 people dedicated to environmental protection, 1.809 less people compared to 2019.
The key green skills in demand reported by Ireland, but also applicable to the other partner countries, are:

- Energy and resource efficiency awareness across all occupations
- Entrepreneurial skills to meet demand for eco-friendly goods and services
- Eco-design and Innovation skills applied to processes, products, and services
- Interdisciplinary Sustainable Engineering, Science and Building skills
- Sustainable Supply Chain Management and Logistics skills
- Lean Manufacturing skills - minimising waste, improving productivity
- Commercial and Marketing skills to advise consumers on energy efficiency solutions
- Sustainable and Ethical Procurement skills
- Enterprise Carbon Monitoring and Accounting skills
- Clean Energy Research & Development skills.

Some of these skills are very specific and technical, however some of them (entrepreneurial skills, energy and resource efficiency awareness, commercial and marketing skills) might be considered as transversal and might be taught even through the GREEN VET CHOICES Virtual Portal.

For a more detailed overview on the occupational trends in green jobs in partner countries, please read the National Survey reports section.

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4.2 Similar trends and common strategies in partner countries according to field survey participants

In this section, we will compare and analyse the opinion of the field survey participants, gathered through the focus group surveys held in partner countries. For an overview of the questions which have been asked to focus groups' participants, please see Annex 1 of this Report.

General overview on the focus groups participants

In total, 58 participants out of the 60 foreseen attended the focus groups in partner countries.

Half of them (29 out of 58) were VET staff, while the remaining 29 persons were learners.

Regarding the gender division, 35 participants were male, while 23 participants were female.

No division between current and future learners have been reported, as some partners mentioned it, but others didn't mention this data.

In the table here below, we present the number of participants attending the focus group in each partner country, as well as the gender division.

	Austria	**Cyprus**	**Ireland**	**Italy**	**Portugal**	**Slovenia**	TOTAL
VET staff	5	5	3	5	6,05	5	29,05
Learners	5	5	3	5	4,95	6	28,95
Total male	6	6	2	8	3,96	9	34,96
Total female	4	4	4	2	7,04	2	23,04
Total participants	**10**	**10**	**6**	**10**	**11**	**11**	**58**

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

According to the opinions of focus groups' participants, climate changes are severely impacting partner countries territories everywhere. Temperatures have been rising over the last few years, leading not only to warmer summers, but also to warmer winters and a decline in snowfall in most countries (e.g. Austria and northern Italy), melting glaciers and causing erosion. Warmer temperatures also influence biodiversity as it attracts non-native plants and animals which, in turn, frequently cause a threat to native species.

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Increased temperatures, especially in summer, disturbs various sectors of the industry, such as agriculture and tourism. extreme weather events have also been observed in recent years, e.g. heavy rain, and hail (especially during the winter), destroying crops and private properties.

Other environmental challenges highlighted by focus groups participants in all partner countries are air pollution, water pollution and waste disposal. Both air pollution and water pollution have been seen as more dangerous than others because they may cause health problems among people or even damage the ecosystems.

It is worth mentioning that these challenges correspond to the ones identified by partners through their desk researches (see previous section of this report).

Participants from Cyprus highlighted the following factors, as potential causes for the climate change:

- Lack of awareness on how to recycle - facilities
- Older generations have less awareness about environmental issues and it's difficult to change their culture
- Transportation - limited options besides personal cars
- Energy - limited capacity of renewables
- Some solutions pointed out by VET teachers and learners from the Italian focus group to fight against these environmental challenges are the following:
- incentivize investments to support the production of renewable energy, from solar to geothermal, from wind to biomass, from waste recycling to hydroelectric, also promoting the use of new technologies for the capture and storage of CO2
- succeeding in combining environmental sustainability with economic sustainability
- carry out a profound cultural change and apply political strategies that know how to combine environment and development.
- planting as many trees as possible in urban areas
- reduce CO2 emissions to decrease the greenhouse effect by replacing fossil fuels with renewable forms of energy.

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

In order to make VET offers more responsive to environmental challenges focus groups participants from Italy and Austria propose to deliver more hands-on trainings on climate-related issues as well as more education on these topics at school level. Participants from Italy advise to create active learning environments that might be useful to engage VET students through real-life experiences. Furthermore, in their opinion, teachers must be trained to teach sustainability by promoting collaboration and synergies with the local community, for instance co-operating with local companies and stakeholders.

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In Austria, participants provided additional advises to make the VET offer more responsive to environmental challenges, as follows:

- Understand job local demands so that VET professionals could be trained accordingly
- Internalization to see what other countries do.

Participants from Ireland advise the following:

- Continued investment in green skills training programme, because people need to be encouraged and guided to take up these courses
- CPD training for teachers and trainers – allocation of credits under the Croke Park Agreements – to encourage teachers and trainers to improve their skills and knowledge
- Expand the Green Flag initiative from primary schools to secondary and FET schools so as to encourage young people to continue with their environmental projects and positive behaviours.

Participants from Cyprus also suggest focussing on the particularity of each country and the available industries in order to train up to date professionals.

At last, Slovenian participants propose to introduce themes/modules in relation with environmental problems in the education system. Anyway, some participants think that in the last years the education and training systems started to emphasize more the environmental problems. However, it depends on the profession people are being trained for: builders talk about how important it is to know where they can dispose construction waste, how to handle it, how to reduce it, why it is important not to dispose of waste in black dumps, etc.

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

For this issue, on one hand we have the opinion of Austria, Italy, Portugal, and Slovenia. In fact, in Austria, the general consensus of the focus group participants is that the existing curricula and training programmes and the current qualification standards for VET are not sufficiently up to date. There needs to be a shift from traditional VET professions towards an increased focus on occupations in the environmental field. Participants also think that VET students are not sufficiently aware of environmental aspects in the potential green careers they might undertake.

In Italy, focus group participants think that there is a sort of disorder, as Italy follows regional guidelines. There is a lack of a large-scale vision of training courses, qualifications and curricula and participants think that VET courses should be structured in such a way to be more attractive on the job market. Furthermore, in their opinion, the school system lacks training courses for the occupations of Environmental Manager and Expert in Waste Management. In addition, for them it would be necessary to host companies operating in the green sector, to strengthen work-based learning activities, to facilitate students' access to green jobs.

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For focus group participants from Portugal, understanding the labour market needs in terms of required green skills, is a process which should start with the initiative of the policy makers.

At last, for participants from Slovenia there is a lack of transfer of knowledge into everyday life and of incentives to use this knowledge. Some participants think that the VET system should provide more technical skills (not just theoretical) to gain accurate green skills. The gaps in gaining the right green skills according to the employment trends should also be considered.

On the other hand, we have the opinion of Ireland and Cyprus. In fact, participants from Cyprus and Ireland reported that the existing curricula, qualification standards and training programmes are to a very high extent up-to- date: in Ireland, they have been developed in consultation with industry, therefore they reflect the skills that are needed in the labour market. According to focus group participants from Cyprus, the adequate assessment of the labour market demand in terms of the required green skills, is essential to better link it with the curricula, qualification standards and training programmes.

To conclude, we can affirm that in all partner countries the main idea of focus groups participants is that VET courses should be designed keeping more into consideration the labour market needs in terms of new required green and environmental skills, to respond adequately to the labour market requirements and to the challenges of the ecological and digital transition operated by all EU member states. However, VET courses should be developed at systemic level involving and consulting different industries/companies/stakeholders.

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities?

Focus groups participants from all partner countries think that existing regional / national systems of information, advice and guidance do not provide enough information to attract potential learners in green career opportunities. In some partner countries, VET courses are seen as inferior in comparison to university courses, while in other countries, such as Italy, the subject is not given the importance it should have, especially among young people.

Austrian participants say that to attract more potential and future VET learners, there have to be more national initiatives and campaigns easily accessible for students as well as for teachers. One idea would be to launch a combined campaign in traditional and new media in TV, on print outlets as well as on innovative social media channels, coordinated and organised by the state. This campaign should illustrate the benefits of VET programmes and the importance and advantages of VET professions in a career later on.

Cyprus participants also propose the further dissemination of relevant information on VET careers through various communication channels including social media (which have gained high power nowadays) and new digital platforms. They also propose direct collaboration with green industries and companies in the form of work placements. This “dialogue” between the world of education (schools and universities) and businesses has also been pointed out by Italian participants, which think that it must be strengthened. Italian VET students also think that they don’t have enough knowledge on the skills required for green jobs, this is why in their opinion there should be training

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paths with professionals working in green industries to really understand what is required in that specific sector.

Participants from Portugal again pointed out that politicians must start working on green initiatives which will raise the awareness and necessity of having professionals to feed the labour market with skilled workers. Thanks to this, more students will be interested in these careers.

Slovenian focus group participants mainly think that free seminars with introduction to green VET careers could be a good solution to improve information and guidance on green VET opportunities. Those could take place in different companies, public institutions, schools. They also think that, in any case, the change of mentality (awareness of people about importance of environmental challenges) is the first step to be done, to get people interested in working in green jobs. Then, it is possible to provide appropriate education and training and, only afterwards, it is possible to create new or updated green career opportunities.

Irish focus group participants suggest what could be done to attract more VET students in green VET careers, as follows:

- Green Skills Career Events
- Meeting the "Green Employer Events" at regional level
- Behind the Scenes – TikTok video testimonials of young people working in green jobs – interviews to highlight what the work entails and its benefits
- Training for Career Advisors and Adult Guidance professionals
- Networking sessions between VET trainers, employers, and guidance professionals – identify gaps, share experiences, and support expertise development.

To conclude, we can summarize the "tools" to attract more learners in green vet careers proposed by the focus groups' participants, in three main categories:

- Campaigns on different media, social media, and new digital platforms
- Live seminars / events on green skills and green VET opportunities
- Collaboration and networking with green industries (meetings, work placements, training paths, etc).

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The following questions have been addressed to VET TRAINERS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

When asked to VET teachers if they felt they have enough knowledge / expertise on green issues to provide their students with, these are the main answers they provided:

Austrian VET teachers are convinced that they can already convey a general idea about environmental protection and environmentally friendly actions, such as recycling, to their students. They are also quite confident that they have a good knowledge about environmental aspects in their own field of expertise. Despite of that, they would like to get more input and more well-founded background knowledge on environmental topics – and, in particular, about future trends and developments in the green sector in terms of modern jobs and newly created professional fields and positions.

In Cyprus, VET teachers also think that they need a wider training on environmental issues and on soft skills.

Irish participants say that they need more specific green skills such as environment protection, biodiversity, waste management, green technologies knowledges (such as renewable energies), sewage treatment, etc.

Italian VET teachers also highlight the importance to get continuous training and updating as technologies evolve.

All of the VET trainers who participated in the focus group in Portugal think that they need to better understand the current scenario with concrete data and more information on the loss of biodiversity and on the widespread impact of man on level of natural ecosystems.

Most of VET professionals involved in the Slovenian focus group are educated in the field of construction, economy, and traffic, that's why they are skilled on energy use and waste management. However, they pointed out that they would need additional training for example in ecosystem management, environmental policy, sustainable fashion, prevention of pollution of surface waters and biodiversity/biology.

At conclusion of this analysis, we can surely affirm that overall, most of the VET teachers who attended the focus groups in partner countries have got basic green skills but that they would like to gain additional skills to be able to convey specific green skills to their VET students.

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What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues?

VET teachers from Austria think that their professional knowledge and expertise are of utmost importance in designing and implementing a training programme which deals with environmental awareness / environmental issues, as students don't want to complete a training which only touches on the surface and is based on vague and inexact facts, especially on a delicate field such as climate change and environmental protection. Therefore, for them, an expert on environmental topics should always be consulted when new programmes are developed or when curricula are updated in order to set a clear focus on environmental aspects. Nevertheless, the trainers clearly state that they would like to have the possibility to make their voice heard, to prove their "on the job" insights in terms of needs and experience.

Participants from Cyprus and from Ireland think that there is a strong need of up-to-date educational material and available/appropriate equipment. Irish participants also find it important to have access to high-quality learning materials that could be adapted to the country/local context if needed. In addition, they propose the following provisions to design and implement a training programme which deals with environmental awareness / environmental issues:

- Train-the-trainer programmes – hybrid format
- Seeing some of the new technologies in action – very practical learning
- Setting up a green technology lab for trainers and students.

For Italian participants, the design of a training programme on environmental education, due to the complex nature of this issue, requires a holistic approach in dealing with the various topics, which cannot be limited to the discussion within a single discipline by a specific teacher. It should, instead, be the result of interdisciplinary and coordinated paths. The collaboration between teachers, experts, public bodies, companies would be, for them but also for Slovenian participants, very useful to create a well-designed training programme which can touch environmental issues from various perspectives. Both Italian and Slovenian participants affirm again the importance of providing work-based learning experiences to VET students, instead of just offering them theoretical lessons on environmental topics.

To conclude, focus group participants from Portugal point out that there are VET programmes that require much more equipment than others for their smooth implementation, this is why they think that this equipment should be provided by the government, or at least it should have some kind of discounts as an incentive for the VET centres to buy it, especially because it can be very expensive.

To sum up, the main factors identified by VET trainers of partner countries for designing and implementing a training programme which deals with environmental awareness / environmental issues, can be listed as follows:

- Continuous professional training for the VET teachers and trainers
- Availability of high-quality learning material
- Interdisciplinary and coordinated training paths, in collaboration with green experts, green companies and green industries (meetings, practical workshops, WBL experiences, work placements, etc)

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Availability of appropriate equipment (thanks to incentives or free of charge for the VET centres).

Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)?

On one hand, in Austria, because of the dual system, there is a strong connection and good networking between VET schools and apprenticeship companies, however, according to Austrian VET trainers, there could be a stronger focus on networking in relation to environmental topics.

The same is in Italy, as according to the VET trainers who attended the focus group, the training system is not yet able to respond concretely, quickly, and effectively to this need of innovative skills. Networking is the best answer, but adequate skills are needed and the educational system must develop them. In general, there is a sort of networking between VET centres and companies, but it should be strengthened for the acquisition of these new demanded green skills.

On the other hand, VET trainers from Cyprus and Ireland declare that they have never collaborated with green companies and industries in their VET programmes as well as most of the VET trainers from Slovenia. Just one of the Slovenian trainers said that he collaborated with companies engaged in the processing, recycling of construction waste materials, and companies engaged in the production of energy from renewable energy sources.

To conclude, from the answers collected to this question, we can affirm that networking with green companies and industries should be strengthened in all partner countries, to design and implement an effective training path, based on the acquisition of green skills as well as all the skills necessary for a digital and ecological transition.

The following questions have been addressed to LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness?

In Austria, VET learners and future VET learners state that they have got a high level of basic knowledge about environmental awareness such as general waste management and recycling, energy saving potential in the house and of the importance of an intact nature. However, what is often missing in their opinion, is an in-depth knowledge about these topics and, more importantly, a profound knowledge about environmentally friendly actions in the workplace.

VET learners from Cyprus, Italy and Slovenia also think that they have got some general knowledge but that they need an in-depth knowledge and more technical skills on green issues.

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The participating VET learners from Austria and, in particular, the future Austrian VET learners complained again the fact that there was little information available about trendy, green future job opportunities. The same has been reported from the Italian VET learners involved within the focus group in Italy.

While VET learners from Austria, Cyprus, Italy and Slovenia think that they have got a general knowledge on environmental awareness, all VET learners from Ireland agreed on the fact that they do not have these skills. Through their vocational studies, green skills were not a feature and they would like to be provided a general understanding on environmental issues throughout their training programmes.

At last, it is important to point out that learners from Slovenia also think that the use of critical thinking is essential in the training for green jobs, because people need to own the skills to recognize the wrong and the right ways to do something and to have the skills to find accurate solutions for specific environmental problems. Risk management, environmental impact assessment and circular economy were also some of the skills they mentioned when talking about the topics they think they need additional training in.

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

Summarizing the answers provided by the VET learners who attended the focus groups in all partner countries, we can state that according to the GREEN VET CHOICES field survey participants, green skills are those which include the person's attitude to always seek "energy saving" and try to make a company, activity, industry, etc, ecological and sustainable. They can also be seen as being environmentally-conscious (e.g. knowledge about how to separate waste or how to save energy in the house) and knowing how to implement positive climate actions.

According to field survey participants, green jobs are those aimed at protecting and promoting the environment, or those which consider their impact on the health of the planet at all times and endeavour to minimise it. Therefore, green jobs are those professions where efforts are made to safeguard the environment and the planet by reducing waste and the pollution. It is important to be aware that some existing jobs can become greener. In fact, most professions nowadays show a shift towards a “greener” approach in their policies, even if they are traditionally not a green business.

Participants listed a number of professional fields that fall into this category: anything connected to renewable energy, professional waste management, product and package design, gardening and landscaping, ecotourism, etc.

To conclude, learners from Portugal say that no matter what kind of position a person has got, they must have the skills and know-how to be aware of the impact their actions will have on the environment. For instance, by printing less materials, you’ll have a big impact on preserving the environment.

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In your opinion, which are the most demanded green jobs in your region / country?

The answers to this question are very similar from a partner country to another. Therefore, we assume that there are a lot of new potential green professions and opportunities which are evolving all over EU, and VET institutions should pay more attention on creating training offers able to provide suitable training paths in these sectors to answer to the labour market needs.

To make some examples, the learners from Austria stated that they are aware of several green job opportunities. Most notably, these jobs come from the fields of landscaping, gardening, forestry and agriculture, renewable and bio energy, bicycle technics, construction work and tourism. In other countries VET learners mentioned some concrete green jobs such as agricultural scientist, electric car engineer, green building designer, solar-panel installer, natural gas engineer, recycling operator, energy assessor, etc.

An interesting new green job opportunity that came out from the Italian focus group is the one of lawyer specialized in the environmental sector, due to all the new laws and regulations that have been made in recent years. At last, in Slovenia some new green job opportunities which have been mentioned during the focus group concern environmental consultant, organic farmer and sustainable tourism operator.

After listing different green jobs, VET learners were also asked if they know how / who to get in contact with, in order to pursue one of these green career paths. We advise to check the respective National Survey report, to get information on the answers provided by participants in partner countries.

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft and digital skills useful for a greener transition and more sustainable economy.

For this reason, one of the last two questions of the field survey, aimed at understanding if VET trainers and learners were satisfied with the skills trained in their VET institution.

For this survey, we have got 43 respondents: 5 from Austria, 5 from Cyprus, 6 from Ireland, 10 from Italy, 11 from Portugal and 6 from Slovenia. In fact, Austria, Cyprus and Slovenia had the answers only of their VET learners, while Italy, Portugal and Ireland had the answers of all the participants involved within the focus groups.

Participants had to evaluate their level of satisfaction on a scale from 1 to 5, where 1 meant “Not satisfied” and 5 meant “very satisfied”.

We present here below a table, summarizing for each skill identified by the partnership, the number of answers received by each item on the scale.

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AUSTRIA - CYPRUS - ITALY - PORTUGAL - SLOVENIA - IRELAND							
Skill	1 not satisfied	2	3	4	5 very satisfied	TOTAL answers	NOT answered
SOFT SKILLS:							
Decision making	0	11	21	3	8	43	
Risk management	2	8	4	14	15	43	
Time management	6	0	11	15	11	43	
Flexibility	5	0	18	14	6	43	
Adaptability	5	0	9	21	8	43	
Team work	0	0	7	10	26	43	
Problem solving	0	0	15	7	21	43	
Logical thinking	1	2	20	10	10	43	
Literacy	0	2	10	19	12	43	
Numeracy	0	1	8	25	9	43	
Communication	1	3	12	8	19	43	
Communication in a foreign language	1	10	13	13	6	43	
STEM skills	2	17	5	10	9	43	
DIGITAL SKILLS:							
Computer literacy	3	8	2	8	22	43	
Data entry	3	14	14	8	4	43	
Data analytics	4	5	14	15	5	43	
Word processing	0	1	9	7	26	43	
Web-based communications and research	0	0	3	10	29	42	1
Secure information processing	3	8	13	10	9	43	
Social media management	1	3	10	17	11	42	1
GREEN-RELATED SOFT SKILLS:							
Recycling consciousness	0	0	7	12	24	43	
Critical consumer behaviour (grocery/food/clothing.)	2	0	12	17	12	43	
Eco friendly / green travels	2	11	7	19	2	41	2
Environmental footprint	2	7	8	20	4	41	2

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Awareness about ecological impact of textile materials production	21	2	5	11	4	**43**		
Water consuming and consciousness	4	1	6	7	25	**43**		

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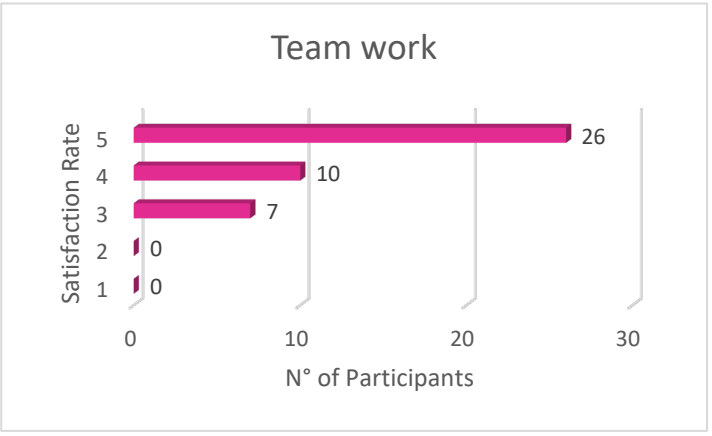
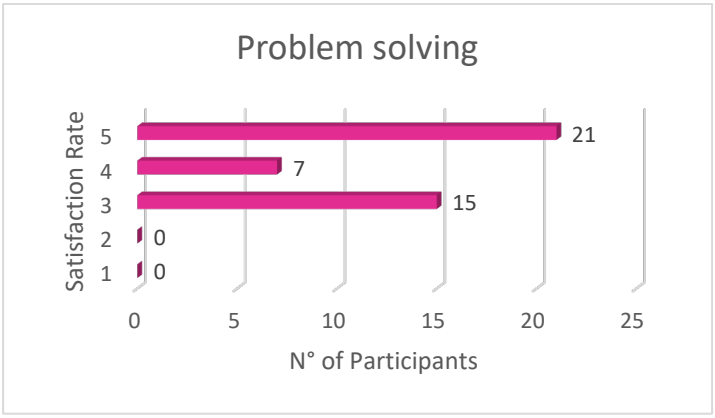
According to the findings presented in the table above, we can see that participants are overall satisfied on the training received in the following skills: teamwork, problem solving, numeracy, computer literacy, Word processing, web-based communications and research, recycling consciousness and water consuming and consciousness.

In fact, as we can observe from the charts below:

- 26 participants are very satisfied (5th rate on the scale) and 10 participants are satisfied (4th rate on the scale) on the training received on team work



- 21 participants are very satisfied (5th rate on the scale), 7 participants are satisfied (4th rate on the scale) and 15 are neutral on the training received on problem solving



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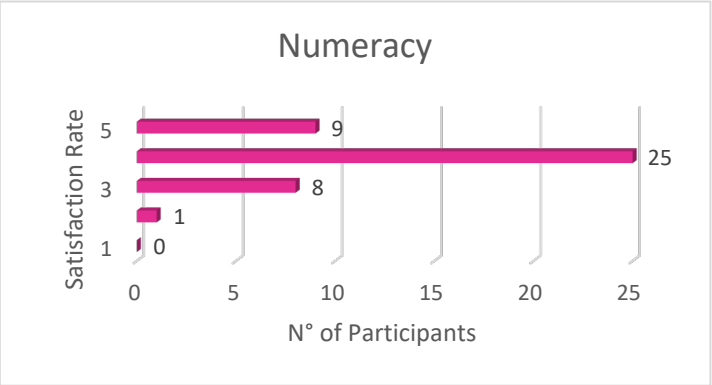
- 25 participants are satisfied (4th rate on the scale) and 9 participants are very satisfied (5th rate on the scale) on the training received on numeracy



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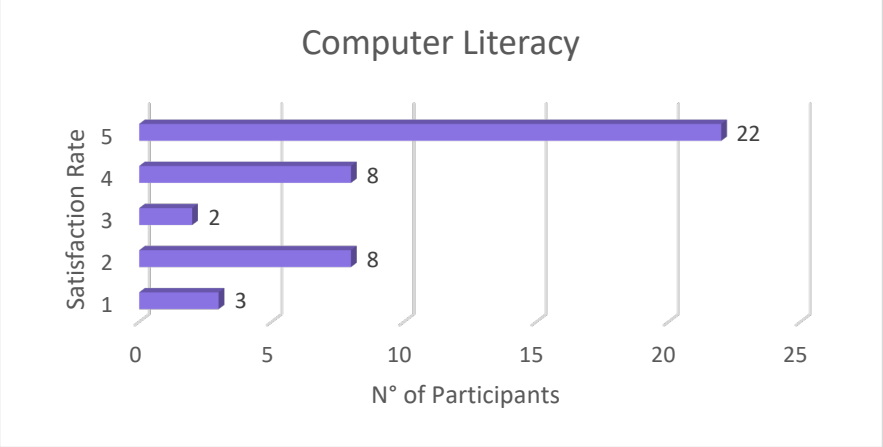
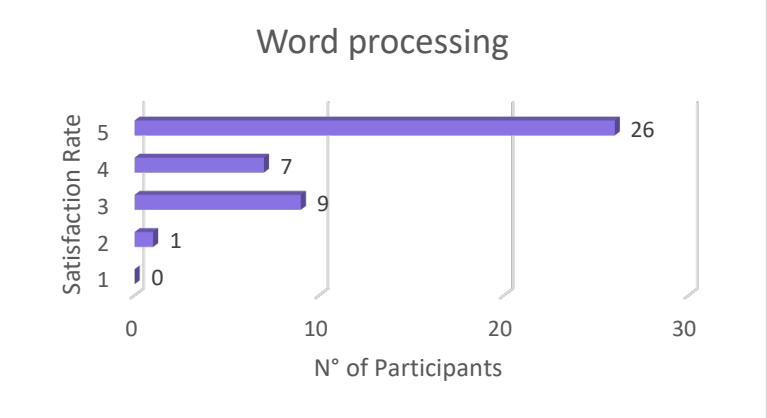
- 22 participants are very satisfied (5th rate on the scale), and 8 participants are satisfied (4th rate on the scale) on the training received on computer literacy



- 26 participants are very satisfied (5th rate on the scale) and 7 participants are satisfied (4th rate on the scale) on the training received on Word processing



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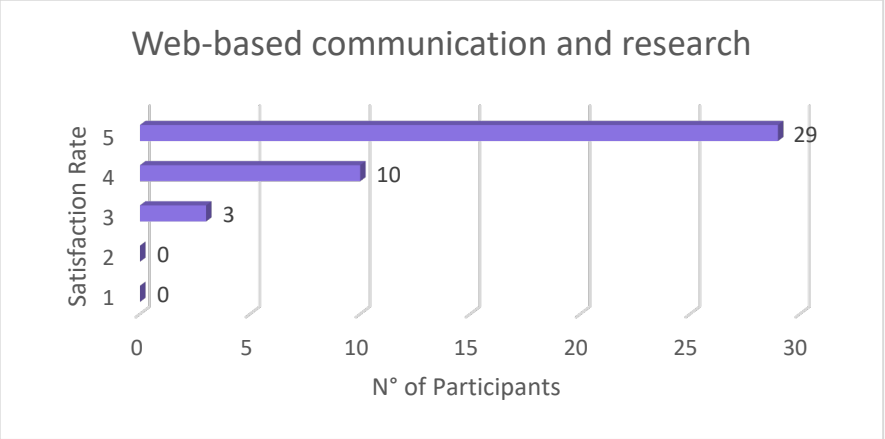
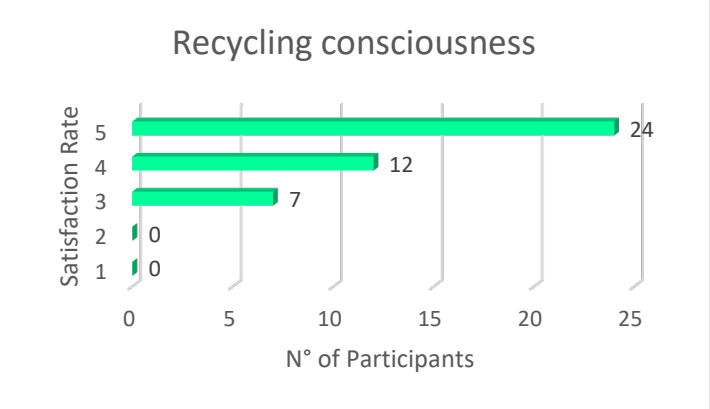
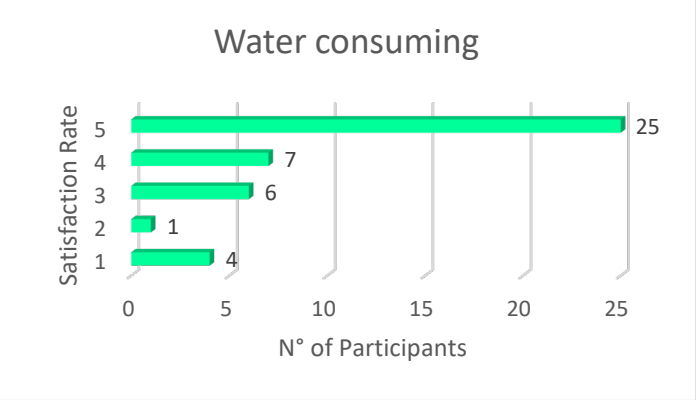
- 29 participants are very satisfied (5th rate on the scale) and 10 participants are satisfied (4th rate on the scale) on the training received on web-based communication and research



- 24 participants are very satisfied (5th rate on the scale) and 12 participants are satisfied (4th rate on the scale) on the training received on recycling consciousness



- 25 participants are very satisfied (5th rate on the scale) and 7 participants are satisfied (4th rate on the scale) on the training received on water consuming and consciousness.



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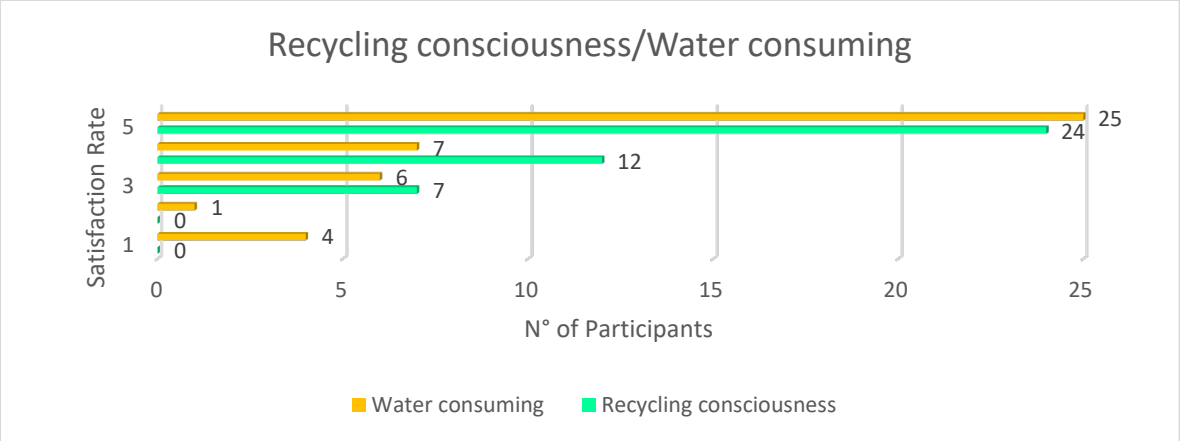
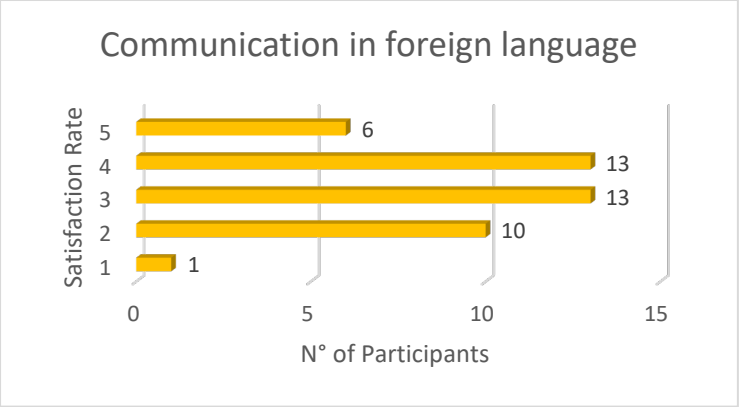
It is interesting to observe that participants are satisfied with the training received on three digital skills, that is to say computer literacy, Word processing and web-based communication and research, which are basic IT skills very essential nowadays.

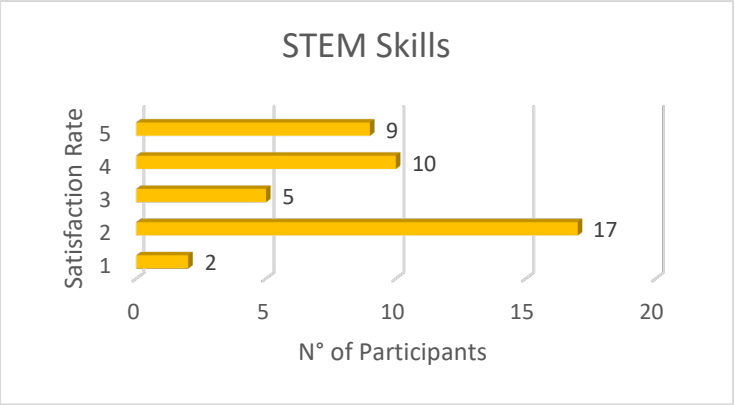
It is also worth mentioning that, the number of respondents which are overall satisfied with the training received on recycling consciousness (36 persons) overcomes greatly the overall satisfaction on the training received on water consuming and consciousness (32 persons).



On the other hand, the charts below show that participants are overall les satisfied with the training received in the following skills:



- Communication in a foreign language



- STEM skills

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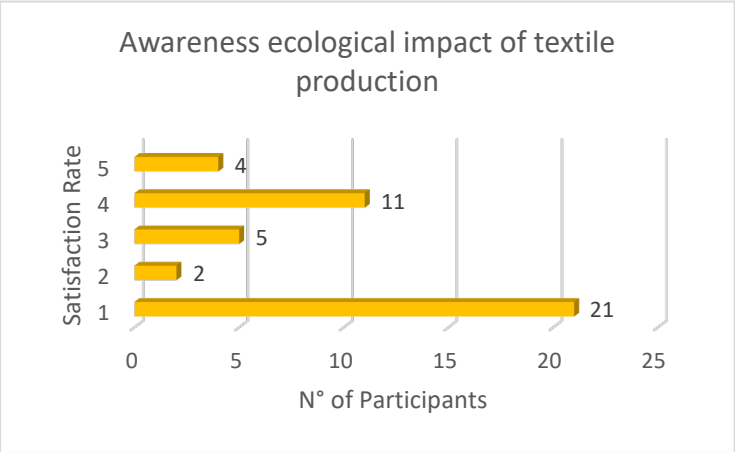

- Awareness about ecological impact of textile materials production.

Therefore, we assume that in the GREEN VET Choices Virtual Learning Portal it would be significant to focus also on these skills, where participants feel they have received less training so far.

In the last question, participants were asked if they wanted that one or more of the green, soft, and digital skills chosen by the partnership, are trained in the GREEN VET Choices Virtual Learning Portal.

Participants had to state if they would like to get some training in a specific skill “Yes”, “No” or if they “don’t know”.

For this survey we have got 48 respondents: 5 from Austria, 5 from Cyprus, 6 from Ireland, 10 from Italy, 11 from Portugal and 11 from Slovenia. This time, in Slovenia both the VET teachers and the VET learners have answered to the question (11 participants instead of just the 6 learners attending the focus group as for the previous question).

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The answers to this survey have been summarized in the table here below.

AUSTRIA - CYPRUS - ITALY - PORTUGAL - SLOVENIA - IRELAND					
Skill	yes	no	don't know	TOTAL answers	NOT answered
SOFT SKILLS:					
Decision making	37	11	0	48	
Risk management	34	13	1	48	
Time management	35	12	1	48	
Flexibility	37	8	3	48	
Adaptability	38	7	3	48	
Team work	33	11	4	48	
Problem solving	41	7	0	48	
Logical thinking	41	6	1	48	
Literacy	17	20	11	48	
Numeracy	11	24	12	47	1
Communication	20	13	5	38	10
Communication in a foreign language	31	12	5	48	
STEM skills	29	13	6	48	
DIGITAL SKILLS:					
Computer literacy	25	19	4	48	
Data entry	26	12	9	47	1
Data analytics	31	5	11	47	1
Word processing	18	25	5	48	
Web-based communications and research	30	14	4	48	
Secure information processing	37	4	7	48	
Social media management	26	17	5	48	
GREEN-RELATED SOFT SKILLS:					
Recycling consciousness	33	15	0	48	
Critical consumer behaviour (grocery/food/clothing.)	40	7	1	48	
Eco friendly / green travels	38	9	1	48	
Environmental footprint	46	1	1	48	

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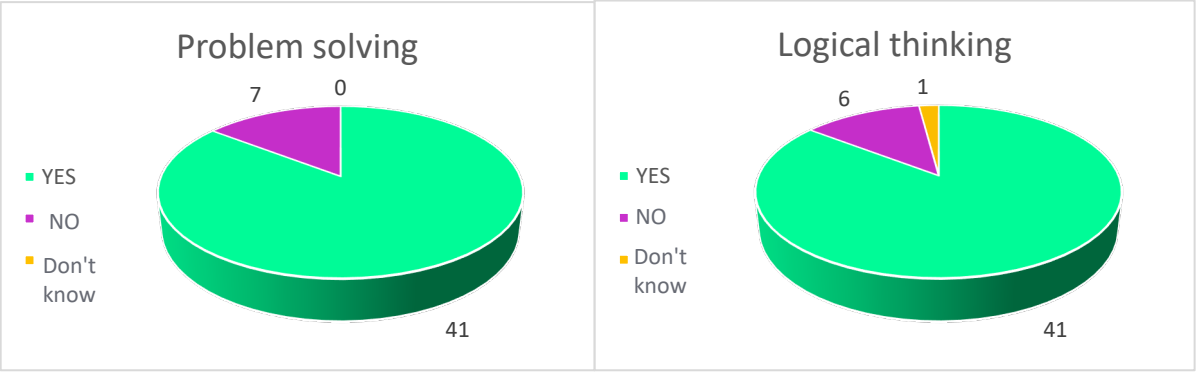
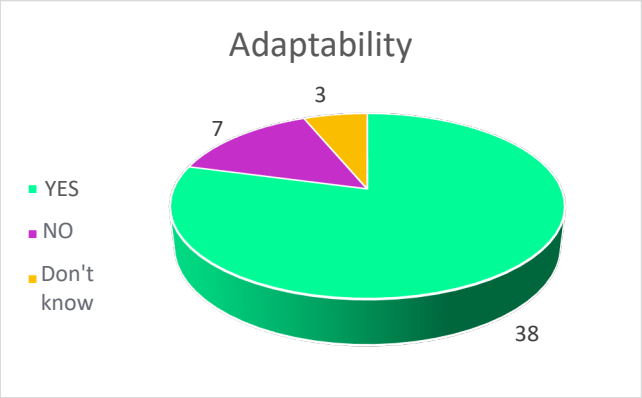
Awareness about ecological impact of textile materials production	42	2	4	**48**	
Water consuming and consciousness	40	3	0	**43**	5

From the table above, we can see that participants would like to be trained in the following skills: problem solving, logical thinking, adaptability, flexibility, decision making, secure information processing, environmental footprint, awareness about ecological impact of textile materials production, critical consumer behaviour (grocery/food/clothing…), water consuming and consciousness.

Among the soft skills, problem solving, and logical thinking are the most demanded ones (41 yes each)



followed by adaptability (with 38 yes)



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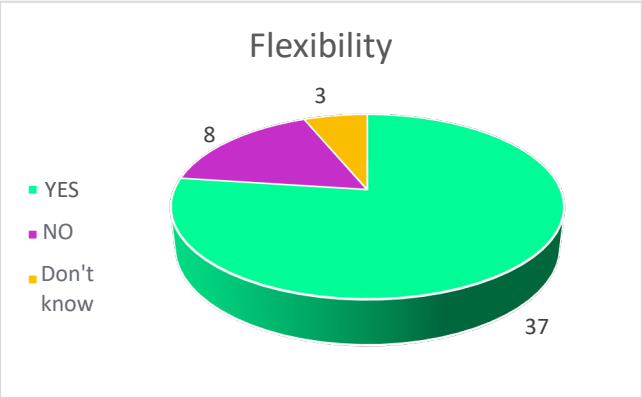
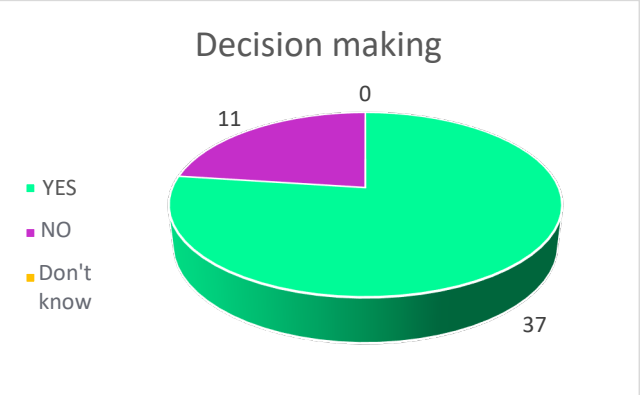
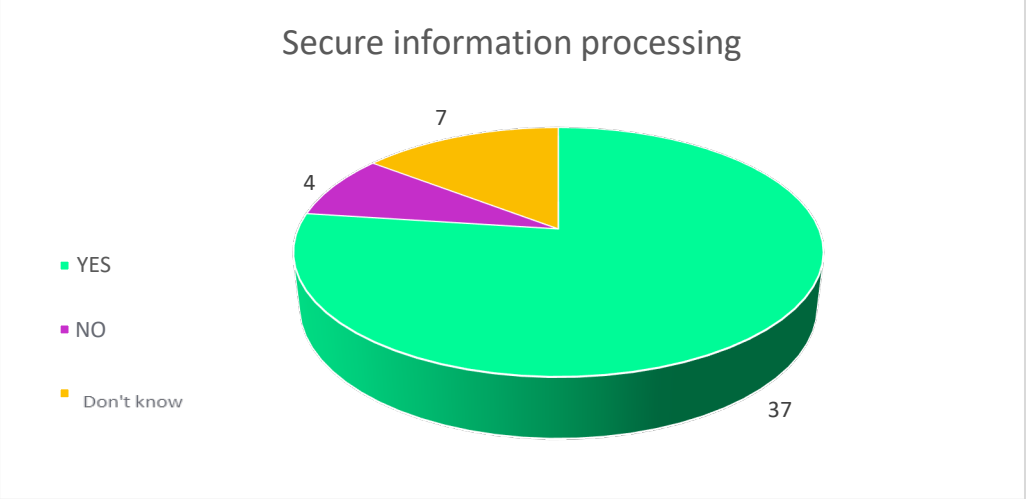
and by flexibility and decision-making (both with 37 yes).





Among the digital skills, the most demanded one is secure information processing which received 37 “yes”.



Looking at the green skills, we can observe that in comparison to the soft skills and the digital skills they are the most demanded ones in terms of the overall number of participants who think they require to be trained on them.

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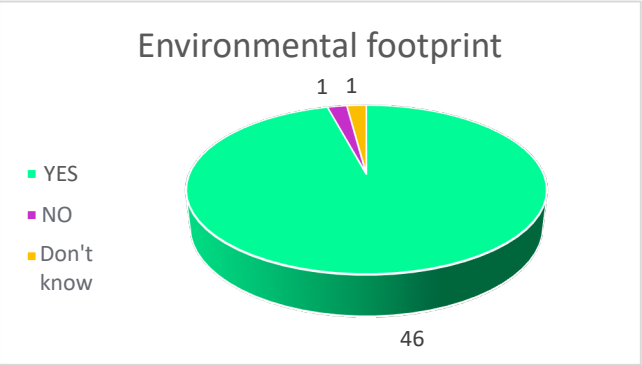
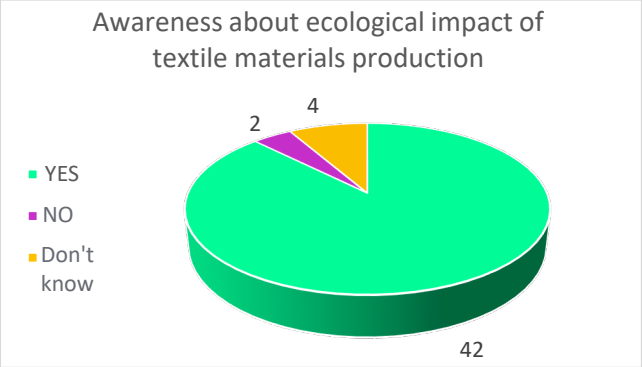
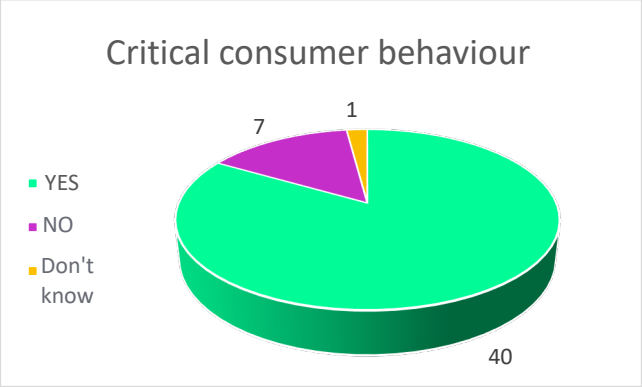
In fact, environmental footprint received 46 “yes”

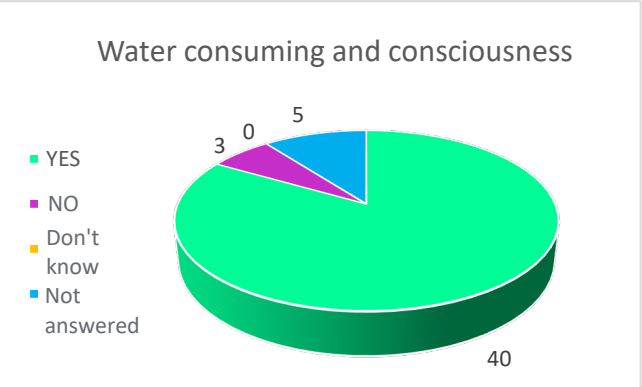


followed by awareness about ecological impact of textile materials production (with 42 yes)



and by critical consumer behaviour (grocery/food/clothing...) and water consuming and consciousness (both with 40 yes).





It is worth mentioning that the awareness about ecological impact of textile materials production has been identified as a skill where participants feel they have not received enough training in their VET institution, as well as a skill they would like to be trained in the GREEN VET Choices Virtual Learning Portal.

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To conclude, the results of the last two questions of the field survey, appear to be very useful for our study. They indicate that the GREEN VET Choices Virtual Learning Portal which will be elaborated by the partnership through the Project Result N° 2 should allow VET learners to be trained on the acquisition of the following skills:

- problem solving
- logical thinking
- adaptability
- flexibility
- decision-making
- secure information processing
- environmental footprint
- awareness about ecological impact of textile materials production
- critical consumer behaviour (grocery/food/clothing…)
- water consuming and consciousness.

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5. Conclusions

Thanks to the Green VET Choices Transnational Survey report the partnership analysed national environmental issues, skills necessary for contributing to a carbon-neutral future as well as awareness of the green VET professions and of environmental topics.

According to these findings, it is clear that we should go towards an increased focus on environmental education and towards an increased number of green career opportunities, even though in some partner countries it already exists projects, training modules, WBL experiences which show that in the last years there has been a higher interest on this matter all over EU.

In general, VET students seem not to be sufficiently aware of environmental aspects in the potential green careers they might undertake. For this reason, VET courses should be structured and delivered in such a way to be more attractive on the job market.

At first, existing regional / national systems of information, advice and guidance should provide information to attract potential learners in green career opportunities, trough, for instance:

- Campaigns on different media, social media, and new digital platforms
- Live seminars / events on green skills and green VET opportunities
- Collaboration and networking with green industries (meetings, work placements, training paths, etc).

On this regard, it is worth mentioning that one of the aims of the Green VET Choices Virtual Portal is to provide green career information through digital storytelling, thus replying to the lack of information on green VET career opportunities for potential VET learners. Another element which should be taken into consideration from the very beginning by VET institutions, but more than all by decision makers, it is to understand the green jobs' local demand to plan suitable VET programmes as well as to train new green professionals accordingly. For this reason, VET courses should be developed at systemic level involving and consulting different industries/companies/stakeholders.

Then, in order to make VET offers more responsive to environmental challenges, VET institutions should offer more practical trainings on climate-related issues such as, for instance, environmental education and /or sustainability workshops, meetings with green industries / entrepreneurs, work-based learning experiences in green companies, etc. In this way, it will be possible to engage VET students through real-life experiences. In addition, it is imperative that VET trainers / teachers are trained to teach environmental subjects and are ready to promote collaboration and synergies with local companies and stakeholders. Co-operation with green industries, entrepreneurs and stakeholders has been pointed out again as a key factor to foster environmental awareness as well as to promote green VET careers.

To conclude, the acquisition of the necessary knowledge and skills to employ more persons in green occupations is a necessary prerequisite for the achievement of the goal for the transition to a greener, digital and more resilient economy all over EU. It is also important to continuously upgrade and enhance the soft and hard skills needed in these occupations by persons who are already employed to enhance the envisaged ecological and digital transition. These identified green skills are

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new skills that relate to new green technologies, environmental legislation and digital skills that require a high degree of specialisation. Digital skills appear also to be fundamental, as highlighted by the Digital Education Action Plan 2021-2027.

To sum up, the aims of the project well fit to the actual needs, also highlighted in this Transnational Survey Report and which will be taken into account for the development of the Green VET Choices virtual Portal.

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6. Annexes

Annex 1 GREEN VET Choices National Survey report template

GREEN VET CHOICES NATIONAL SURVEY REPORT *[Insert country]*

Developed by *[Insert partner organization name]*

Findings from the desk research

Regional / National Environmental Challenges

Describe the most relevant regional / national environmental challenges in your country and provide comparative data in relation to the last 10 years.

Example of relevant environmental challenges might be air pollution, traffic congestion, water consumption and waste.

Please, include charts to illustrate visually the provided data.

Describe at least 1 regional / national initiative or programme undertaken to overcome these environmental challenges. Provide a detailed overview including at least:

- Name of initiative / programme
- Leading institution
- Eventual contacts (including website)
- Description (including expected impact and impact achieved so far).

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Vocational Education And Training

Briefly describe the organization of the VET system in your country.

Is there any specific training / training module / WBL experience on green skills?

Describe any initiative / programme / project undertaken in your region / country to include green / environmental awareness in VET programmes / courses.

Is one of the following green career paths, part of the VET system in your country?

Please describe and provide information.
Examples:
High-skilled occupations: engineering technologist and environmental engineer;
Medium-skilled occupations: energy auditor, transport vehicle emissions inspector, insulation worker, electrician, solar photovoltaic installer, and sheet-metal worker;
Low-skilled occupation: refuse/recycling collector.

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Employment Perspectives in Green Occupations

Green jobs occupational trends.

Please provide an overview of the occupational trends in Green Jobs in your region / country including data and statistics about youth and women employment rate in this field. Please include charts to show your occupational trends and compare with previous years.

Findings from the FIELD SURVEY in *[insert country]*

Focus Group Implementation and Information on the Participants

Provide a short description on the implementation of your field survey: indicate in particular where and when you did it, how long it took, if it was conducted face-to-face or online.

Please describe in this field the composition of your focus group participants (including number of attendees) and their sociodemographic information. Please indicate:

- The division between learners and professionals
- The gender prevalence
- The level of education
- The professional background
- The experience with green technologies or green-related subjects.

Please include some charts to illustrate visually the sociodemographic data you provide.

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NATIONAL / REGIONAL ENVIRONMENTAL CHALLENGES according to field survey participants

Which are in your opinion the most relevant regional / national environmental challenges in your country? Why?

_

What would in your opinion make vocational education and training systems more responsive to environmental challenges?

_

Vocational Education and Training Opportunities According to Field Survey Participants

Are in your opinion existing curricula, qualification standards and training programmes up to date in terms of green skills / environmental awareness? What would you eventually propose in order to have them more respondent to the labour market demand?

_

Do you think that existing regional / national systems of information, advice and guidance provide enough information to attract potential learners in green career opportunities? Please provide your opinion and describe what you think it should be done to improve information and guidance on green VET opportunities.

_

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VET TRAINERS / PROFESSIONALS ONLY

As VET trainer, do you feel you have enough knowledge / expertise on green issues to provide your students with these skills? In which field / topic do you feel more competent? In which area do you think you need additional training?

What do you think would help you in designing and implementing a training programme which deals with environmental awareness / environmental issues? Please think in terms of organization, skills, equipment, content, etc.

Networking with other stakeholders. Have you ever collaborated with or involved green entrepreneurs / green industries in your training programme (e.g. through work-based learning opportunities)? Please describe.

LEARNERS ONLY

As VET learner, do you feel you have enough knowledge / expertise on green issues and environmental awareness? In which field / topic do you feel you need additional training?

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Employment in green Professions

What are in your opinion green jobs and skills, how do they impact current occupations and how can they contribute to a greener and more modern economy?

In your opinion, which are the most demanded green jobs in your region / country? Why?

If you would like to pursue one of the following career paths, would you know how / who to get in contact with? Do you know what is the training path to follow and the necessary qualification / educational level required in your country?
For each profession specified here below, please describe the outcomes of your focus group discussion.

Green Jobs	Discussion Outcomes
Energy auditor	
Insulation worker	
Solar photovoltaic installer	
Installer of electrical networks with better efficiency	
Refuse / recyclable material collector	
Sheet-metal worker	
Mechatronic	
Installer of air conditioning systems with low environmental impact	
Air quality engineer	
Environmental quality certifier	

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Other. Please specify other professions	

Skills to train in the GREEN VET Choices Virtual Learning Portal

The GREEN VET Choices partnership aims at developing a learning portal (R2) where VET learners will be trained on green, soft, and digital skills useful for a greener transition and more sustainable economy.

Do you think that the following skills are trained in your VET institution? Are you satisfied with the received training?

Ask your participants to rate each skill on a scale from 1 to 5, where 5 means "I am very satisfied on the training received" and 1 means "I am not satisfied at all on the training received". Please, motivate your choices.

Summarize in the table below the rates received by each skill from your focus groups' participants.

Skill	1 (I am not satisfied)	2	3	4	5 (I am very satisfied)	Motivation
SOFT SKILLS:						
Decision making						
Risk management						
Time management						
Flexibility						
Adaptability						
Team work						
Problem solving						
Logical thinking						
Literacy						
Numeracy						
Communication						
Communication in a foreign language						
STEM skills						
Other: ___						
DIGITAL SKILLS:						
Computer literacy						
Data entry						
Data analytics						
Word processing						

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Web-based communications and research						
Secure information processing						
Social media management						
Other: ___						
GREEN-RELATED SOFT SKILLS:						
Recycling consciousness						
Critical consumer behaviour (grocery/food/clothing.)						
Eco friendly / green travels						
Environmental footprint						
Awareness about ecological impact of textile materials production						
Water consuming and consciousness						
Other: ___						

Would you like that one or more of the green, soft, and digital skills mentioned above are trained on the GREEN VET Choices virtual learning portal?

For each skill summarize in the table below how many focus groups' participants stated "Yes", "No" or "I am not sure".

Skill	*"Yes"*	*"No"*	*"I am not sure"*
SOFT SKILLS:			
Decision making			
Risk management			
Time management			
Flexibility			
Adaptability			
Team work			
Problem solving			
Logical thinking			
Literacy			

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Numeracy			
Communication			
Communication in a foreign language			
STEM skills			
Other: ___			
DIGITAL SKILLS:			
Computer literacy			
Data entry			
Data analytics			
Word processing			
Web-based communications and research			
Secure information processing			
Social media management			
Other: ___			
GREEN-RELATED SOFT SKILLS:			
Recycling consciousness			
Critical consumer behaviour (grocery/food/clothing.)			
Eco friendly / green travels			
Environmental footprint			
Awareness about ecological impact of textile materials production			
Water consuming and consciousness			
Other: ___			

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Annex 2 - CONSENT FORM FOR FOCUS GROUP

Consent to the GREEN VET CHOICES Focus Group sessions and their way of data processing

The aims and purpose of the GREEN VET CHOICES project (Project n. 2021-1-IT01-KA220-VET-000032968) in general as well as of this Focus Group sessions in particular have been explained to me. I agree that my statements are recorded by written notes and/or audio/video files. I was assured that – if I request - all written and/or electronic records of my statements will be deleted immediately. My participation is voluntary, and I have understood that I am free not to answer one or more questions or to withdraw from the session at any time without giving any reason. All my data and statements will be kept fully anonymously and confidentially, always in accordance with the EDPR (https://ec.europa.eu/info/law/law-topic/data-protection/data-protection-eu_en); they won't be shared with anyone outside of the GREEN VET CHOICE project group unless all identifying information was removed first. All data and information that I provide during the sessions will be grouped with answers from others so that I cannot be identified. In the case that audio recording, pictures or screenshots are taken, I have been assured that they will not be published anywhere and that they will only be used for internal documentation purposes.

Given these conditions, I consent to take part in the GREEN VET CHOICES Focus Group activities.

DATE_____ SIGNATURE_____

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