

A conceptual image of a lightbulb where the filament is replaced by a globe of the Earth. The lightbulb is shown splashing in water, with numerous water droplets and splashes around it, symbolizing innovation and environmental focus. The background is a light blue gradient with some white diagonal lines in the upper right corner.

RES-SKILL

**Reskilling coal industry workers for
the renewables energy sector**

**O3-T3: RES-SKILL
VET Integration Guidelines**

October 2022



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Introduction

The purpose of this report is to offer VET providers with detailed guidelines on how to facilitate the introduction and integration of the developed RES-SKILL learning units into existing training courses for the renewables energy sector.

The RES-SKILL Project makes available a course which can be integrated into existing educational courses.

The surge of jobs in the Renewable Energy Sources (RES) sector is already happening and expected to continue and perhaps grow. VET education & the labour market are expected to be challenged by a) the spike of coal workers seeking reemployment in the near future, b) the surge in unfilled positions in RES.

RES-SKILL aims to strengthen VET provision in the energy sector aimed at coal workers for compatible RES sector jobs, to increase their reemployment opportunities & cover at the same time RES sector's skills demand. The project's specific objectives are to:

1. Develop a novel curriculum & tailored training content to facilitate coal workers' reorientation to the RES industry.
2. Support VET providers to integrate the RES-SKILL materials into their VET & WBL offerings.
3. Improve cooperation between VET providers & businesses to provide opportunities that will enable coal workers to transition to the RES sector.

These VET Integration Guidelines provide instructions on how to:

- implement training making use of the RES-SKILL learning units,
- attribute the most appropriate reference levels to learning units;
- develop additional units fitted to their current training programmes.

Finally, the Guidelines present a practical example on how an existing VET programme could be modified to include the RES-SKILL learning outcomes and units.

This document also provides information on the recommended background to access the RES-SKILL learning units, and on the necessary equipment and software to be installed in the work station (Libraries).

Learning units integration methodology

In line with CEDEFOP indications, organization and planning of a training or education action, the learning integration methodology is based on four distinct phases: prepare, design, run pilot & evaluate, and optimize. For each phase, VET providers are guided through a sequence of processes in order to guarantee that their organization will get the best results from the use of the RES-SKILL learning units.

The integration and the creation of new courses is a big challenge for VET providers, considering that the Covid-19 pandemic has emphasised the overall importance of VET to Europe's recovery and transformation and that renewable energy represents a huge potential for economic and social development.



Phase 1: Prepare

Identify an individual or team (change-team) that will be responsible for undertaking the integration process. Working in collaboration with peers/experts will ensure the adoption of the widest possible perspective, and will avoid the risk of adopting only a trainer's viewpoint.

Understand the factors that encourage change in the existing curriculum. Examine RES-SKILL outputs, evaluating the different opportunities they offer to address effectively the new occupational skills needs emerging from the industry. It is particularly important to determine if there is a mismatch between jobs demand and job offerings concerning the specific innovative skills RES project aims to develop, so to choose from the RES outputs those educational resources that fill the identified gap in existing curricula.

All outputs of the project are available online, published on the official website. The contact details of RES-SKILL partners are also available there, and can be used for establishing contact and discussing/clarifying terms and opportunities for using and promoting RES-SKILL results.

Select the curriculum that is most suitable for integrating one or more RES-SKILL learning units. Go through existing curriculum offered by the organization (VET provider) targeting topics related to renewable energy sector, taking into consideration:

- the relevance of content and objectives between existing courses and RES-SKILL learning units;
- the demand for existing curricula, selecting the curriculum that could best integrate RES-SKILL learning units and offer added value to the organization and the market.

Get feedback from industry stakeholders. Contact companies, present RES-SKILL learning outcomes and consult on which of them would best answer their demand of energy sector skills.

Define the revised learning objectives of the curriculum, based on the RES-SKILL learning units to be integrated. Following feedback from local industry stakeholders, the change-team consults on how the RES-SKILL and existing learning units could be combined, and decides on the main learning objectives of the new curriculum, which will be the axes for the design phase.

Phase 2: Design

Define the main constraints for the design of the course. Consult with the VET provider's management board/programme director and identify constraints related to:

- Time available in the programme of the organization (will the selected curriculum be extended or will one or more existing learning units be replaced?) For example: There is usually a fixed number of hours available for the course's completion, therefore the number of hours devoted to each unit will have to be adjusted. In some cases it may be difficult to integrate a complete unit without adjusting the courses duration. There is therefore a risk that the content integrated may not be taught/explained thoroughly due to the limited time availability.



- Human resources available to design, implement and run the new curriculum (is the teaching staff qualified and able to teach the material or is there a need to train or hire new people?);
- Time available until the release of the new curriculum;
- Availability of teaching equipment for hands-on lessons (is there a need to acquire related equipment?);
- Any other conditions that should be taken into consideration.

Decide on which of the existing learning units could be potentially replaced by the RES-SKILL ones. If, based on constraints above, the course duration cannot be extended and one or more learning units from the existing curriculum have to be replaced by new ones, then break down the existing curriculum into its learning units and, after examining potential overlaps among them, decide on which of the existing learning units will be replaced.

Check prerequisites' consistency of the selected RES-SKILL learning unit(s) to be integrated. Examine whether knowledge and experience required for a student to attend the course are covered by the prerequisites of the existing curriculum. If so, RES-SKILL learning units can be used independently from the existing learning units. If not, learners should attend first the existing learning units that provide the knowledge required for attending the RES-SKILL learning units.

Ensure that the prerequisites of the RES-SKILL learning units are added to the overall prerequisites of the curriculum. Define the sequence of learning units based on the prerequisites described above, as well as on a teaching flow that suits the objectives of the course.

Calculate total duration of the curriculum, by aggregating contact, hands-on, self-study and assessment hours of new and existing learning units.

Train (if needed) the teaching staff. Assuming that the teaching staff have adequate teaching experience/qualifications, a study of the RES-SKILL trainer handbook, which facilitates the integration of the RES-SKILL training and assessment material with the existing curriculum should be sufficient.

Phase 3: Run Pilot & Evaluate

Run a pilot course. The first step that a VET provider should do to run a pilot session is to form a group of students (at least 5) that meet the prerequisites. (Alternatively trainers can assume the role of students, and the teaching staff delivers a mini course with the new learning unit(s) combined with the learning and assessment materials. This could be useful to identify weaknesses and inconsistencies that may arise from the integration of new learning units.

Evaluate the pilot course. Evaluate the learning process, based on feedback provided by the involved teaching staff and learners. The evaluation tools will include personal interviews and group discussions, focusing on the achievement of learning objectives and potential course improvements.



Phase 4: Optimize & Run

Optimize the curriculum. Based on the evaluation process, make any necessary amendments to the structure, content and materials of the curriculum in order to best meet learning objectives.

Run the new curriculum. Proceed with any necessary promotional activities and run the course.

Referencing National Qualifications Levels to the EQF

What is referencing to the EQF

Referencing is the process that results in the establishment of a relationship between the levels of national qualifications - usually defined in terms of a national qualifications framework - and the levels of the European Qualification Network (EQF). Through this process, national authorities responsible for qualifications systems, in cooperation with stakeholders responsible for developing and using qualifications, define the correspondence between the national qualifications system and the eight levels of the EQF.

The EQF system does not replace the existing National Qualification Framework (NQF), nor does it describe any particular qualifications or individual competences, but it describes the EQF in terms of three broad categories “knowledge”, “skills” and “competences”. Therefore, reference to the EQF relates to the process of linking the national qualification levels, commonly defined in the NQF with the EQF.

How referencing is applied in RES-SKILL

Based on the European Qualification Framework descriptors and RES-SKILL learning outcomes in terms of skills, competence and knowledge, RES-SKILL learning units have been attributed to the EQF level 4. Level 4 EQF descriptors for skills, competence and knowledge define the following:

Knowledge: Learners should have a Factual and theoretical knowledge in broad contexts within a field of work or study

Skills: Learners should have a a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study

Competence: Learner should be able to exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

RES-SKILL partners researched and consulted on how level 4 of the EQF can be translated to each partnership country’s NQF, so that VET providers in each country (Greece, Germany, Austria, Romania, Bulgaria and Poland) can attribute the most appropriate level to the new RES-SKILL curriculum.

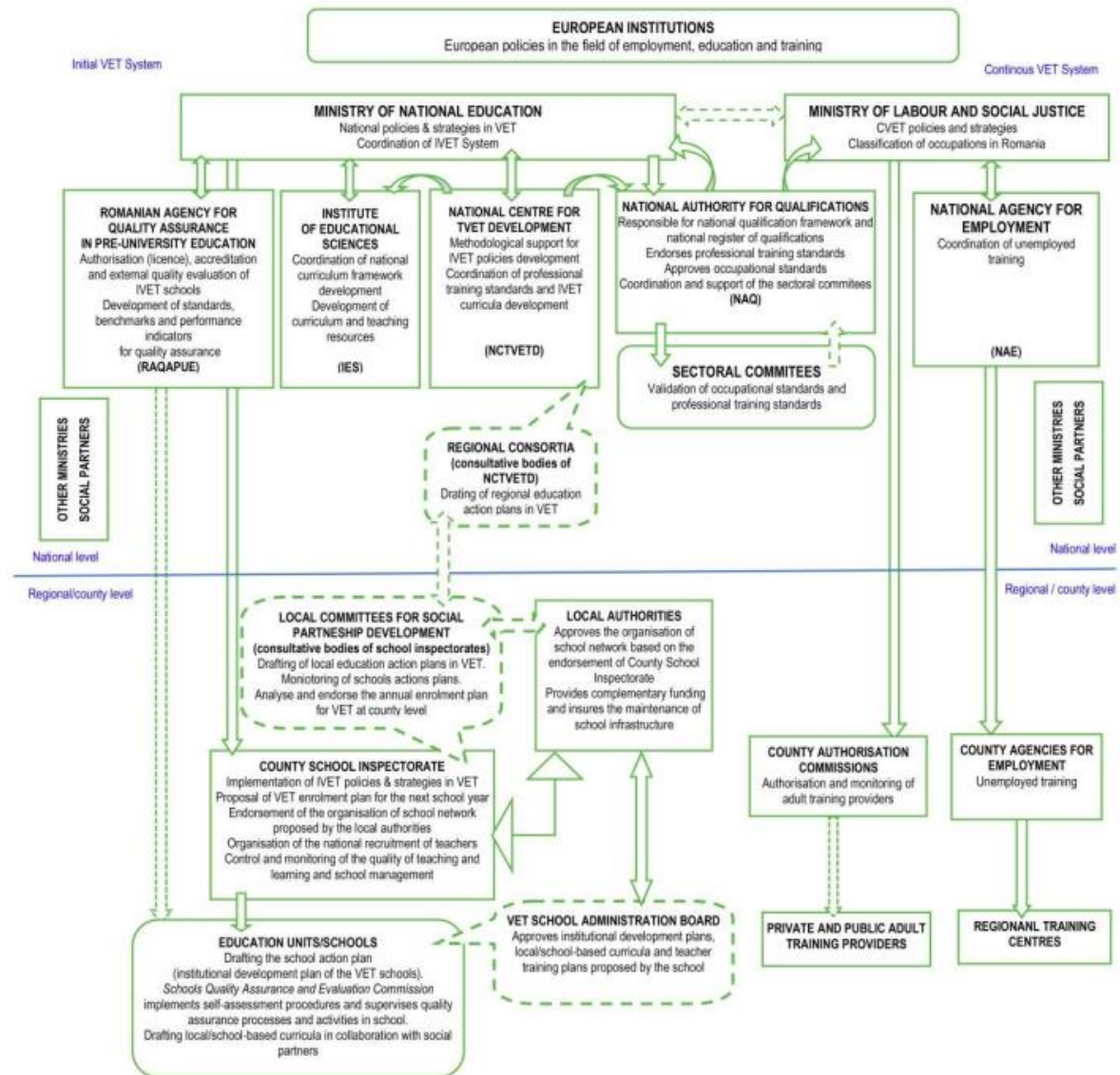


Romania Qualification Framework

Romanian VET offers diverse paths for learners. It comprises professional and technological programmes, regularly updated to combat low participation in lifelong learning and early leaving from education and training.

As many EU countries, Romania has an ageing population. This has an impact on VET, with an 8.5% decrease in the number of VET upper secondary schools since 2012/13. Efforts are being made to increase student participation, enable access to VET, and improve its quality and its relevance to the labour market. Recent system developments include the introduction of a dual VET form: it complements the work-based learning tradition in school-based programmes and aims at making VET a more attractive option for learners, while adapting training better to employer needs.

National, regional and local levels all have a role in some form of VET governance (Source: Cedefop based on ReferNet Romania):





The Ministry of Education is the national authority for formal pre-university education (including IVET) and higher education. The ministry is responsible for IVET policies which are developed by the National Centre for Technical and Vocational Education and Training Development (CNDIPT). Sectoral committees are responsible for defining and validating occupational standards and qualifications. VET participation in Romania is above the EU average and initial reforms included the introduction of a competence-based curriculum in primary and secondary education and training of teachers on how to use the curriculum. In 2016, the dual form of initial VET at EQF levels 3, 4 and 5 was introduced, and in 2018 the dual system was endorsed by amendments to the education law. The implementation of dual VET started in 2017/18 and is currently available only at EQF level 3.

The Romanian vocational education and training system meets the demands of the labour market and the needs of the direct beneficiaries, by making use of human resources' competences and skills.

ROQF level	Qualification types	EQF level
3	<p>VET certificate level 3 / Qualification certificate (Certificat de calificare) and Descriptive Supplement (authorised training provider)</p> <p>VET certificate level 3 / Qualification certificate / Certificate of professional* competence (Certificat de calificare / Certificat de competente profesionale) and Descriptive supplement (accredited training centre)</p> <p>VET certificate level 3 / Certificate of professional* competence (Certificat de competente profesionale) (authorised assessment centre)</p> <p>VET certificate level 3 / Qualification/Graduation certificate (Certificat de calificare/absolvire) and Descriptive supplement (authorised training provider / training programme)</p> <p>VET certificate level 3 / Qualification certificate (Certificat de calificare) and Descriptive supplement (education unit / technological/vocational high school)</p> <p>VET certificate level 3 / Qualification certificate (Certificat de calificare) and Descriptive supplement (education unit / vocational training programme organised in dual system)</p> <p>VET certificate level 3 / Qualification certificate (Certificat de calificare) and Descriptive supplement (education unit / professional* education lasting at least 3 years)</p>	3
4	<p>VET certificate level 4 (Certificat de calificare) and Descriptive supplement (technological / vocational high-school)</p> <p>VET certificate level 4 / Qualification/Graduation certificate (Certificat de calificare/absolvire) and Descriptive supplement (authorised training provider / training programme)</p>	4



	VET certificate level 4 / Qualification certificate (Certificat de calificare) and Descriptive supplement (authorised training provider / apprenticeship programmes in the workplace)	
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The constitution guarantees public education, including tertiary, free of charge. General objectives, aims, principles, structure and organisation of the education and training system are described in the National Law of Education. It defines the following education levels:

- early education (age 0 to 6):
 - the before pre-school level (age 0 to 3);
 - pre-school education (age 3 to 6);
- primary education (ISCED 1):
 - preparatory grade (age 6 to 7);
 - grades 1 to 4;
- secondary education:
 - lower secondary education (ISCED 2, grades 5 to 8) also called 'gymnasium';
 - upper secondary education (ISCED 3) also called 'secondary superior education', comprising:
 - four-year general and VET
 - programmes (grades 9 to 12) providing access to higher education;
 - three-year school-based VET programmes (nationally referred as 'professional' programmes and may be offered as dual VET);
 - short (720 hours of practical training) VET programmes;
- post-secondary VET programmes (ISCED 4);
- higher education (ISCED 5-8).

Primary, lower secondary and first two years (grades 9 and 10) of upper secondary education are compulsory (11 years in total). After completing lower secondary education, learners continue their studies in upper secondary education: general or VET. To enrol, learners need to present their grades in the national exams, lower secondary diploma and a final mark transcript for all subjects. The national exams comprise the Romanian language and literature, mother tongue (if different from Romanian) and mathematics. If the number of places on offer is lower than the number of gymnasium graduate requests, VET schools may organise entry exams.

Higher education has no formal VET programmes. However, some bachelor and master programmes are more practice-oriented than others. To enrol in higher education, all upper secondary graduates need to have passed baccalaureate exams

The Ministry of Labour and Social Justice manages measures for promoting and supporting participation in VET and better labour market access. Measures supporting transition from unemployment or inactivity to employment, focus on improving the employability of individuals as well as stimulating mobility, including free of charge:

- personalised career information and counselling programmes;
- jobseeker profiling (easy, medium, difficult and very difficult to find a job) based on geographic, demographic, attainment and other criteria. As a result jobseekers are



offered a specific set of activation measures, including vocational training programmes, apprenticeship and traineeship;

- evaluation and certification of jobseeker professional competences acquired through informal and non-formal learning;
- counselling and assistance to start an independent activity or to start-up a business;
- insertion bonus for the graduates of education institutions and the graduates of the special schools who get hired, within 60 days from graduation, for a normal working schedule and for a period longer than 12 months;
- activation bonus for the unemployed, registered within the public employment service for at least 30 days, not being entitled to unemployment benefit, who get hired for a normal working schedule for a period longer than three months,
- stimulating internal labour mobility through three types of bonus that are offered to jobseekers willing to work away from the residence area: relocation (first rent programme), establishment and employment bonuses.

Training standards (standard de pregatire profesionala) describe learning units consisting of learning outcomes and are based on occupational standards. Training standards are developed by representatives of companies from the respective sectors and of VET providers, with the methodological support of the National Centre for Technical and Vocational Education and Training Development, endorsed by National Authority for Qualifications. They are validated by employers and other social partners through sectoral committees. The revision of standards is carried out at least every five years or at the request of economic operators.

Currently, the VET system in Romania faces the following challenges:

- low level of performance of students from primary and secondary education, among others, being partially attributed to educational factors (teaching and curricula);
- few investments to support the institutional development of education and training;
- unequal access to education and training and high rate of abandon;
- youth unemployment;
- the lowest participation in lifelong learning in the EU;
- low attractiveness in VET.

Bulgaria Qualification Framework

Bulgaria is reforming all levels of education as a political priority. Although measures do not yet match the magnitude of challenges, there is an increased focus on reducing early school leaving, increasing teacher salaries, introducing dual learning, improving digital skills and strengthening inclusive education. The employment rate of Bulgarian VET graduates is low; 59.1% of recent graduates were in employment in 2017, well below the EU average of 76.6%.

The Bulgarian national qualifications framework for lifelong learning (BQF) was adopted in 2012, to raise trust in the Bulgarian education system and to support mobility and recognition of qualifications. The framework was also seen as an enabler of national reform, with implications for setting up a system for validating non-formal learning, improving education and training quality, modernising curricula and strengthening provider accountability.



The overall objective of developing and introducing a comprehensive national qualifications framework (NQF) compatible with the European qualifications framework (EQF) and the QF-EHEA is to make Bulgarian education system levels clearer and easier to understand by describing them in terms of learning outcomes. This will also improve understanding of national qualifications among target groups and stakeholders. It is hoped that this will raise trust in education and training and make mobility and recognition of qualifications easier. More specific aims addressed by BQF development:

- develop a device with translation and bridging functions;
- promote mobility within education and in the labour market;
- promote learning-outcomes orientation of qualifications;
- support validation of prior learning, including non-formal and informal learning;
- strengthen orientation towards a lifelong learning approach;
- increase cooperation between stakeholders.

Currently, the BQF comprises all education stages and levels (from preschool to doctoral level); it can be regarded as a comprehensive framework. VET can start quite early (at age of 13) and is spread over four levels in the BQF (levels 2 to 5), starting with the 'first level' of a vocational qualification placed at level 2, along with the basic education certificate. Levels 3 and 4 comprise lower and upper secondary stages and include the 'second and third level' of a vocational qualification, along with general education. Level 5 comprises VET only; the 'fourth level' of a vocational qualification is placed here. This is the most advanced (post-secondary) vocational qualification. Levels 6-8 relate to qualifications obtained in higher education: bachelor, master and doctor degrees. However, it is restricted to qualifications from formal education and training; levels 6 to 8 are limited to qualifications awarded by higher education institutions.

BQF levels	BQF	EQF levels
8	Doctor degree Continuing training	8
7	Master degree Continuing training	7
6	Bachelor degree Degree of 'professional bachelor in...' Continuing training	6
5	Vocational qualification-level 4	5
4	Upper secondary general education school leaving certificate Vocational qualification-level 3	4
3	Lower secondary school leaving certificate	3



	Vocational qualification-level 2	
2	Basic education certificate (class five to eight) Vocational qualification-level 1	2
1	Primary education certificate	1
0	Pre-primary education	N/A

Poland Qualification Framework

In Poland, the formal general and vocational education system is governed by a separate act. This system includes pre-school, primary, lower secondary and upper secondary schools, continuing education institutions, other types of educational institutions and colleges. It should be noted that the Polish formal general and vocational education system also includes primary, lower secondary and upper secondary schools for adults.

The majority of schools in Poland are operated by local government units and supervised by the Minister of National Education. Certain schools are under the jurisdiction of the Minister of Culture and National Heritage, the Minister of Agriculture and Rural Development, the Minister of Justice and the Minister of the Environment.

Vocational school pupils (young workers receiving their theoretical foundation in school) have another way to achieve vocational qualifications. If the school they attend offers studies in a crafts trade related field, they can attain a journeyman's certificate in the occupation after having passed the journeyman's examination offered by the relevant examination commission of the crafts chambers. Pupils completing a general upper secondary or technical school do not have to take the matura examination; however, passing this examination opens the door to further education in higher education institutions. Graduates of such schools can also continue their education in a postsecondary non-tertiary school, which awards vocational diplomas upon passing the appropriate vocational examinations.

A graduate of lower secondary school has already completed compulsory schooling, but is still required to continue his/her education until he/she reaches age 18. This requirement can be fulfilled in an upper secondary school or by learning an occupation while employed (e.g. in a crafts trade), and in special cases, also by attending a vocational qualification course.

Upper secondary schools (are categorised as follows:

- three-year basic vocational school, which offers the opportunity to obtain a vocational diploma after having passed vocational examinations (for all qualifications distinguished in a given occupation) as well as allowing further education to be attained, starting from the second year of a general upper secondary school for adults;
- four-year technical upper secondary school enabling the achievement of a vocational diploma after having passed vocational examinations (for all qualifications distinguished in a given occupation); pupils may also obtain a matura certificate after having passed the matura examinations;



- three-year general upper secondary school, which provides the opportunity to obtain a matura certificate after having passed the matura examinations.

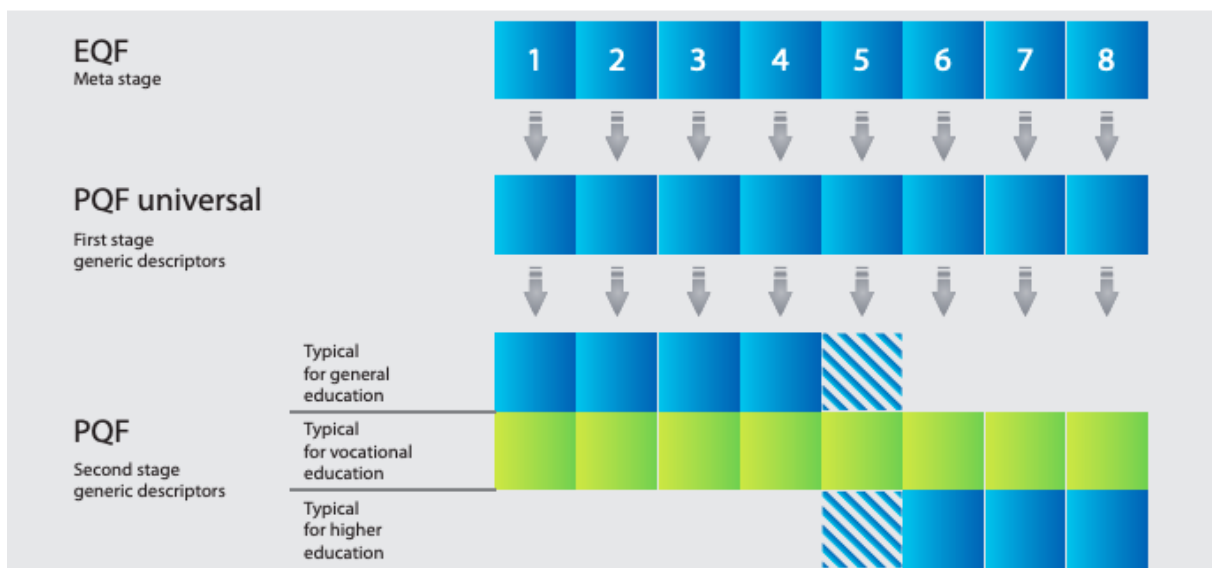
The Polish Qualifications Framework (PQF), like the European Qualifications Framework (EQF), consists of eight qualification levels. Each PQF level is described with the use of descriptors, that is, general statements indicating the learning outcomes relevant to a qualification at a given level. The PQF takes into account learning outcomes achieved through formal and non-formal education, as well as informal learning.

The descriptors in the PQF capture the full spectrum of learning outcomes. They reflect progress from the lowest to the highest level achieved by the learner. The PQF descriptors show how the following abilities advance at successive levels through learning in different contexts and stages of life:

- knowledge (depth, scope),
- skills (problem-solving, the innovative application of knowledge in practice, learning and communication),
- social competence (readiness to work with others and to assume responsibility for assigned tasks).

In developing the Polish Qualifications Framework, great importance was placed on the need to ensure coherence and completeness of the general characteristics of each level, and for this reason, many various aspects were taken into account.

A unique Polish solution is to distinguish two stages of generic descriptors in the PQF. Second stage generic descriptors further detail the first stage generic descriptors, which have a universal character (they relate to all sectors of education). Universal descriptors and second stage generic descriptors should be read together. The next figure illustrates the structure of the Polish Qualifications Framework.



The Polish Qualifications Framework, serving as the foundation for the national qualifications system, is to be a common referencing system for qualifications awarded in Poland. The qualifications register will include those qualifications whose quality is guaranteed by defined procedures and monitored by a specific entity. Entering a qualification into the integrated



register will be related to assigning a level to it. The presence of a qualification in the national register will attest to its reliability.

For many years, the formal general, vocational and higher education system in Poland has functioned under clearly defined principles set forth in legal regulations for validating qualifications and ensuring their quality. These are mainly full qualifications that define a level of education. Full qualifications are awarded solely by institutions in the formal general, vocational and higher education system. These institutions can also award partial qualifications for significantly smaller units of learning outcomes (e.g. vocational certificates or those attained in a non-degree post-graduate study programme). These qualifications can be assigned a PQF level in the first stage of implementing the Framework. The certification of qualifications outside of the formal general, vocational and higher education system is based on various laws or other regulations of varying rank approved by a variety of institutions: entities governing specific occupations, professional organisations, training institutions. These are exclusively partial qualifications, which in no way can be deemed an alternative (replacement) to full qualifications.

Austria Qualification Framework

Austria has one of the lowest youth unemployment rates in the EU, with early school leaving below the EU average (6.9% compared to 10.7% in 2016). The main factor explaining this success is high participation in vocational education and training (VET); this is one of the main educational pathways in the country, well adapted to the labour market, with VET courses of high quality and relevance. VET is also seen as crucial in the integration of refugees and migrants.

The main roles of the Austrian NQF are communication and transparency of qualifications, nationally and internationally. The framework helps map national qualifications from all education and training subsystems and learning settings, present them in relation to one another, and make explicit the implicit levels of the qualification system. It aims to strengthen coordination between the different subsystems by highlighting existing pathways and developing new ones to open up new progression possibilities. It is also expected to aid validation of nonformal and informal learning and to be an important tool in promoting lifelong learning. While having no regulatory functions and no legal effect on vocational and other authorisations, the NQF is used as a basis for reform and further development in VET qualifications.

Specific objectives are the following:

- strengthen transparency, understanding and comparability of Austrian qualifications internationally;
- promote cross-border mobility;
- make formal and non-formal qualifications easier to understand and more visible for Austrian citizens;
- improve permeability between formal and non-formal sectors of the qualification system: develop new pathways, open new progression possibilities, and support lifelong learning;
- progress the learning outcomes orientation;



- promote the European dimension in higher education.

The Austrian NQF has eight levels. The decision on the number of levels followed broad consultation and a study providing information on implicit hierarchy in the national qualification system, using statistical educational research and statistical frameworks. One important topic of discussion was the inclusion of non-traditional higher education qualifications at NQF levels 6 to 8. A 'Y-structure' was agreed, to capture differences between academic higher education and VET qualifications at these levels. EQF level descriptors are used for all qualifications except those awarded by higher education institutions, with additional explanations serving as a guide to make the EQF descriptors understood in the Austrian context.

In school-based VET, learning outcomes are defined in VET educational standards; this has been implemented in a step-by-step approach in recent years. Educational standards for VET schools and colleges define 'content' (subject and knowledge areas and topics with specified goals), 'action' (cognitive achievements required in particular subjects), and personal and social competences related to a specific field. Higher VET curricula are being revised and qualifications awarded by VET colleges are being updated based on NQF principles. A recent initiative was piloted to increase transparency and quality assurance in the master craftsman qualification (Meister) and examinations, with a more detailed definition of learning outcomes and implementation of a competence-oriented structure of the preparatory courses. The master craftsman qualification has now been allocated to NQF level 6, increasing the comparability of training pathways and reflecting the high esteem of this qualification in Austria.

NQF levels	Qualification types	EQF levels
8	Doctorate (Doktorgrade)	8
7	Master degree (Master- bzw. Diplomgrade)	7
6	Bachelor degree (Bachelorgrade) Master craftsman (Meister) Engineer (Ingenieur)	6
5	VET college school leaving certificate (Reife- und Diplomprüfung der berufsbildenden höheren Schulen)	5
4	VET school qualification (Abschluss der berufsbildenden mittleren Schule) Apprenticeship diploma (Lehrabschluss)	4

Germany Qualification Framework

Germany has one of the highest employment rates for recent graduates (ISCED 3-8) in the EU, at 92.7% in 2019; among highly qualified individuals (ISCED levels 5-8) this is even higher at 94.7%. Although participation in early childhood education and care for older children is



high, it has barely progressed for younger children (under three years old). Tertiary education attainment and participation of adults in lifelong learning have increased in recent years, but the two indicators remain below EU average levels. Germany continues to have the highest proportion of STEM graduates in the EU. Performance on basic skills is above the EU average but has somewhat declined over years. The proportions of 15-year-olds underachieving in reading (20.7%), science (19.6%) and maths (21.1%) have increased since 2017 but remain slightly below the EU average (22.5%, 22.3% and 22.9% respectively in 2019). Socioeconomic and migrant background have a strong impact on education outcomes and disadvantaged students tend to be more concentrated in certain schools. Early leaving from school has been stable since 2015, just above the EU target, with an increasing gender gap; it is 10.3% in 2019, close to Germany's national target of 10%. Despite the rising number of VET learners at 0.9%, the number of new apprenticeship contracts dropped by 1.2% in 2019. Germany is thus modernising VET to align it with future requirements. Several new pieces of legislation came into force in 2020. In January 2020 the new Vocational training Act came into force, introducing a minimum training wage for apprenticeships, emphasising equivalence between regulated further vocational qualifications and academic qualifications, expanding part-time vocational training to new target groups and facilitating recognition of prior learning. In April 2020, the act on the promotion of continuing vocational training during times of structural change and further development of funding of vocational training assistance was adopted; investing in upskilling and reskilling helps to prepare for future challenges.

An eight-level structure has been adopted to cover all main types of German qualifications. Level descriptors describe the competences required to obtain a qualification. The overall structure is guided by the established German terminological and conceptual approach, referring to the ability to act (*Handlungskompetenz*). The DQR differentiates between two categories of competence: professional and personal. The term competence lies at the heart of the DQR and signals readiness to use knowledge, skills and personal, social and methodological competences in work or study situations and for occupational and personal development. Competence is understood in this sense as comprehensive action competence. Methodological competence is understood as a transversal competence and is not separately stated in the DQR matrix. The DQR expresses only selected characteristics; the comprehensive and integrated notion of competence, underlying the DQR, has a strong humanistic and educational dimension.

NQF LEVEL	QUALIFICATION TYPES	EQF LEVEL
8	Doctorate and equivalent arts degrees (<i>Doktorat und äquivalente künstlerische Abschlüsse</i>)	8
7	Master degrees and equivalent higher education qualifications (traditional German courses of higher education study such as the first degrees of Diplom or Magister, State examinations) (<i>Master und gleichgestellte Abschlüsse (Diplom, Magister, Staatsexamen)</i>) Strategic professional (IT) (certified) (<i>Strategische/r IT Professional (Geprüfte/r)</i>)	7



	Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trades Regulation Code (level 7) (<i>Sonstige berufliche Fortbildungsqualifikationen nach BBiG/HwO (Niveau 7)</i>)	
6	<p>Bachelor degrees and equivalent higher education qualifications (<i>Bachelor und gleichgestellte Hochschulabschlüsse</i>)</p> <p>Specialist commercial clerk (certified) (<i>Fachkaufmann/-frau (Geprüfte/r)</i>)</p> <p>Business management specialist (certified) (<i>Fachwirt (Geprüfter)</i>)</p> <p>Master craftsman (certified) (<i>Meister (Geprüfter)</i>)</p> <p>Operative professional (IT) (certified) (<i>Operative/r Professional (IT) (Geprüfte/r)</i>)</p> <p>Trade and technical school (advanced vocational training governed by federal State law) (<i>Fachschule (Landesrechtlich geregelte berufliche Weiterbildungen)</i>)</p> <p>Advanced vocational training pursuant to § 54 of the Vocational Training Act (level 6) (<i>Berufliche Fortbildungsqualifikationen nach 54 BBiG (Niveau 6)</i>)</p> <p>Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trades Regulation Code (level 6) (<i>Sonstige berufliche Fortbildungsqualifikationen nach BBiG/HwO (Niveau 6)</i>)</p>	6
5	<p>IT specialist (certified) (<i>IT-Spezialist (Zertifizierter)</i>)</p> <p>Service technician (certified) (<i>Servicetechniker/in (Geprüfte/r)</i>)</p> <p>Advanced vocational training pursuant to § 54 of the Vocational Training Act (<i>Berufliche Fortbildungsqualifikationen nach § 54 BBiG (Niveau 5)</i>)</p> <p>Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trades Regulation Code (level 5) (<i>Sonstige berufliche Fortbildungsqualifikationen nach BBiG/HwO (Niveau 5)</i>)</p>	5
4	<p>Upper secondary general education school leaving certificate – General higher education entrance qualification (<i>Allgemeine Hochschulreife (AHR)</i>) <i>Subject-linked higher education entrance qualification (Fachgebundene Hochschulreife (FgbHR))</i></p> <p>Higher education entrance qualification for university of applied sciences (<i>Fachhochschulreife (FHR)</i>)</p> <p>Dual VET (three-year and three-and-a-half-year training courses) (<i>Duale Berufsausbildung (3- und 3 ½-jährige Ausbildungen)</i>)</p>	4



	<p>Full-time vocational school (vocational education and training governed by federal State law) (<i>Berufsfachschule (Landesrechtlich geregelte Berufsausbildungen)</i>)</p> <p>Full-time vocational school (vocational education and training governed by federal law in healthcare and elderly care) (<i>Berufsfachschule (Bundesrechtliche Ausbildungsregelungen für Berufe im Gesundheitswesen und in der Altenpflege)</i>)</p> <p>Full-time vocational school (fully qualifying vocational education and training pursuant to the Vocational Training Act or Crafts and trades regulation Code) (<i>Berufsfachschule (vollqualifizierende Berufsausbildung nach BBiG/HwO)</i>)</p> <p>Retraining qualification pursuant to the Vocational Training Act (level 4) (<i>Berufliche Umschulung nach BBiG (Niveau 4)</i>)</p>	
3	<p>Intermediate secondary school leaving certificate – General education, 10 years (<i>Mittlerer Schulabschluss (MSA)</i>)</p> <p>Intermediate secondary school leaving certificate – Full-time vocational school (<i>Berufsfachschule (Mittlerer Schulabschluss)</i>)</p> <p>Dual VET (two-year training courses) (<i>Duale Berufsausbildung (2-jährige Ausbildung)</i>)</p>	3
2	<p>Lower secondary school leaving certificate – General education, 9 years (<i>Erster Schulabschluss (ESA)</i>)</p> <p>Vocational training preparation (vocational preparation scheme, prevocational training year, introductory training) (<i>Berufsausbildungsvorbereitung (Niveau 2; BvB, BvB-Reha, BVJ, EQ)</i>)</p> <p>Basic vocational training – Full-time vocational school (<i>Berufliche Grundbildung)</i>)</p>	2
1	<p>Vocational training preparation (vocational preparation scheme, prevocational training year) (<i>Berufsausbildungsvorbereitung (Niveau 1; BvB, BvB-Reha, BVJ)</i>)</p>	1

Greece Qualification Framework

The aim of the Hellenic Qualifications Framework (HQF) is to create a coherent and comprehensive system of classification of all qualifications obtained from formal, non-formal education and informal learning in Greece. This will be done gradually. In this first phase, the objective is the classification of qualifications within the formal educational system of the country. At a later stage a classification system will be developed for qualifications acquired through non-formal education and informal learning.

The architecture of the HQF is simple and, above all, functional:



- Levels - Learning Outcomes - Descriptors - Types of Qualifications. The current needs of the country as well as the relevant European and international developments were taken into account when designing the Hellenic Qualifications Framework. The 8 Levels of HQF cover the entire range of qualifications, from compulsory education to higher education. Each level is defined by descriptions of the knowledge, skills and competence which determine the learning outcomes for this particular level.
- Learning outcomes, i.e. what a person knows, understands and is able to do upon completion of a learning process, are classified into knowledge, skills and competence. The qualifications have the form of learning outcomes which are classified into levels.
- Level descriptors are the defining element of the structure and will provide the mechanism for the referencing of the Hellenic Qualifications Framework to the EQF. Learning outcomes corresponding to the qualifications of a specific level are defined by descriptors, which are determined by qualitative and quantitative grading of knowledge, skills and competencies.
- Types of Qualifications are the instrument that will allow the classification of Greek qualifications into the levels of the Hellenic Qualifications Framework, as well as enabling the comparison between them. Each qualification type will have a Type Specification that will describe the characteristics of qualifications of that type. Qualification types can constitute the basis for the subsequent development of new qualifications in the future.

Given that level descriptors and Types of Qualifications serve different functions, they also feature different characteristics:

- The level descriptors give a relatively short description, are general and totally independent of the field of learning.
- The Types of Qualifications are relatively extensive; they enrich the content of the level descriptors to provide descriptions of the learning outcomes for the type; in addition, they describe key characteristics of qualifications of the type, such as the purpose, the learning process, the transition arrangements, as well as the connection to employment.

The structural arrangement for the inclusion of qualifications in the HQF is that specific qualifications are related to define Qualification Types and the Types are placed at framework levels as appropriate. The following table illustrates the Qualification Types that are currently awarded and for which Type Specifications have been developed.

Level	Vet	General Education
1		Primary School Certificate (Compulsory)
2		Lower Secondary School Certificate (Compulsory)
3	Initial Vocational Training	



	Vocational Training School	
4	Vocational Education Vocational School Certificate Vocational Upper Secondary School	General Upper Secondary School Certificate
5	Vocational Education Vocational Upper Secondary School Initial Vocational Training Vocational Training Diploma (Post Secondary Level) Post Secondary And Not Higher	
6		Bachelor Degree Universities/Technological Educational Institutions
7		Master's Degree Universities/Technological Educational Institutions
8		Doctorate Universities

Example of integrating learning units

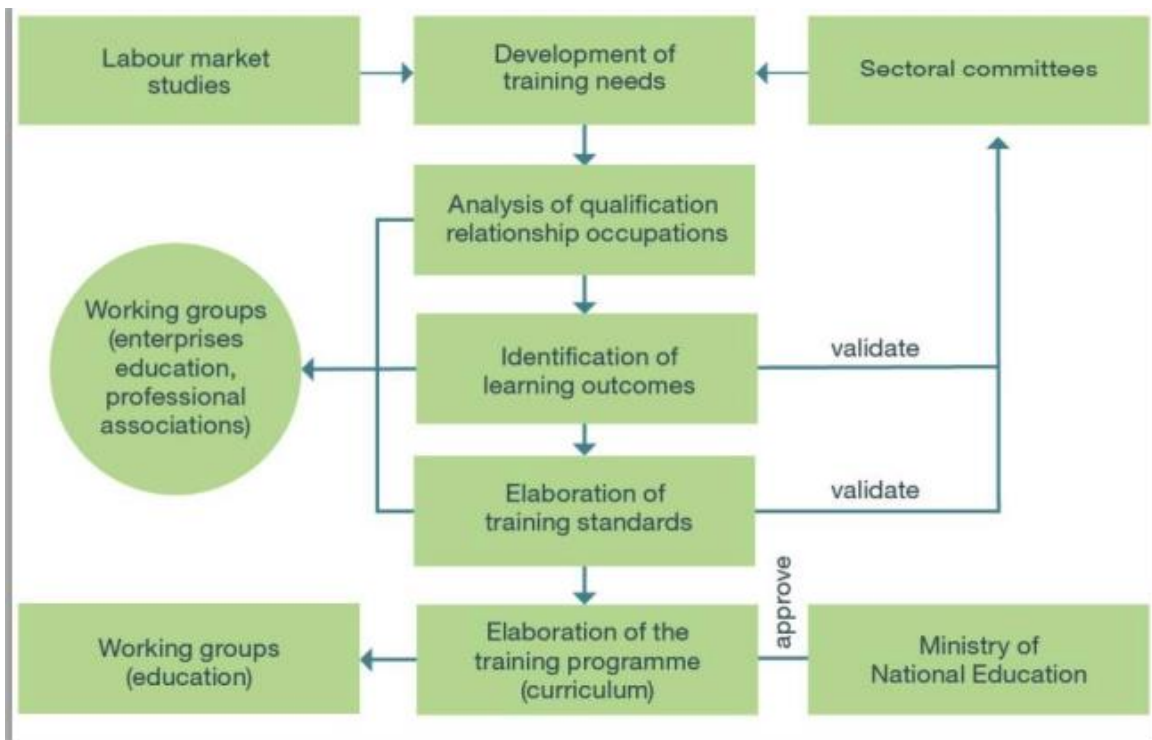
The RES-SKILL lessons lay the ground for the development of RES-SKILL training and assessment material. The learning training and assessment material should be specified in intellectual output 3, according to the project application form. A lesson should include the following items: a title, the learning unit of which the lesson is part of, the list of topics of the learning unit content, prerequisites, learning materials, planned duration of the lesson and references.

Training materials will be created and if suitable reused to support learning on the technical components and practical applications, such as lecture notes, slide presentations, case studies, FAQs. Assessment of learning outcomes means methods and processes used to establish the extent to which a learner has in fact attained particular knowledge, skills and competences. In order to determine whether the learner has acquired the proposed knowledge, skills and competences and to provide learners with the opportunity to evaluate the extent to which they have attained the desirable knowledge and skills, assessment materials for each learning unit will be developed.



The four learning units in which learning outcomes have been structured constitute a natural founding ground for learning units. Each learning unit has been divided into a set of coherent lessons. The following figure gives a graphical view of the global structure. After that, each lesson is specified.

From the National Centre for Technical and Vocational Education and Training Development we have the following visual representation of VET integration:



The following example is based on a real curriculum that has been properly modified for demonstration purposes, in order to provide exemplary guidelines on how existing programmes could integrate RES-SKILL learning outcomes and units.

The example shows how it is possible to integrate the RES-SKILL Learning Units within the curriculum.

LU1: PV system installer

The learning unit is part of the package for upskilling coal workers into the PV industry. Taking into consideration the skill gap identified between coal workers and blue-collar workers in the PV industry, all the essential themes to bridge this gap are covered within each unit but not exhaustively, since this is not possible in a text of this size. Also, it is important to note that the information given here needs to be critically interpreted. While most of the information will be relevant to your location/situation, some may not, or only partially, apply. Sources for further information on all the topics have been supplied – in the form of some books on the subject, national electrical codes and national guides to installation and good practice.

Course Objectives

Learning unit 1 which is designed for PV System Installer aims at giving them the basis into the PV technology. After the training, they should be able to:



- explain how solar energy is captured and converted into electrical energy.
- name the components of PV systems
- assemble and put in place the mechanical components of the system on different sites.

Learning outcomes

After this course, you should be able to:

- describe using basic knowledge the different components of a PV systems and how these components function;
- appraise PV system design and assess the destined site.
- install civil and mechanical components of the Solar Photovoltaic systems.

Learning Units

- Course 1.1 Solar energy and PV systems basics
 - Introduction to solar Energy
 - Photovoltaic technology fundamentals and system components
- Course 1.2 Photovoltaic system design and site survey
 - Photovoltaic system categories / application
 - Energy flow and metering options
 - Main components of grid-tied PV systems
 - Solar resource assessment and site survey
 - Design and sizing of grid-connected PV systems
 - Design and yield simulation with standard software
- Course 1.3 Installation of civil and mechanical components of PV system
 - Introduction
 - Preparation/planning
 - Who is allowed to install a PV system?
 - Installation guidelines
 - Tools, instruments, other equipment
 - Review of the whole construction and installation process
 - PV-specific occupational Health and Safety