

**United Nations Economic Commission for Europe Steering Committee on
Education for Sustainable Development**

9th meeting, 3 and 4 April 2014

Draft for discussion

Information Paper 5

**Aligning technical and vocational education and training with sustainable
development**

**- Outcomes of an electronic consultation jointly organized by United Nations
University – Institute for Advanced Studies of Sustainability (UNU-IAS) and ECE**

I. Introduction

Requirements of contemporary development put technical and vocational education and training (TVET) in a particularly important position in the development of values, knowledge and skills that are critical for transforming labor markets as well as non-market livelihood activities. TVET holds a high potential to contribute to employment, entrepreneurship and innovation in line with sustainable development.

Recognizing the important role TVET has to play for sustainable development, the ECE Steering Committee for Education for Sustainable Development (ESD) adopted as a priority action area for implementation phase III of the ECE Strategy for ESD¹ (2010-2015) *to reorient TVET in support of sustainable development and the transition to a green economy*² and moreover underlined that TVET should remain at the core of ESD implementation also beyond 2015. While the importance of TVET for sustainable development appears to receive considerable recognition in the ECE region³, member States of the ECE Strategy for ESD have reported that TVET is rarely structurally aligned with sustainable development of the relevant countries.

In 2012, electronic working groups on the priority action areas⁴ were established by the Steering Committee, in order to bring together expertise of members and observers of the ECE Steering Committee for ESD and to work virtually on recommendations for specific actions to advance the priority action areas. However, while a broad range of observers and members of the ECE Steering Committee engaged in the working groups on teacher education and ESD school planning, there were limited contributions for the working group on TVET. Against this background the ECE Secretariat initiated cooperation with the United Nations University – Institute for Advanced Studies of Sustainability (UNU-IAS) and the Regional Centres of Expertise for ESD (RCEs) that are supported by UNU-IAS.

RCEs, rather than being a physical center or building, are a network of organizations which are committed to using education as a tool for building a sustainable future. Each RCE is regionally-based and members bring in-depth knowledge of the challenges facing the towns, cities and villages in their regions. Together, RCE members are dedicated to creating more livable societies for present and future generations by influencing the learning processes at work in their region. This includes formal learning institutions, like schools and universities, as well as informal learning establishments, such as parks, museums, private enterprises, local governmental organizations, nongovernmental organizations and the media. RCE activities range from organizing sustainable development workshops for educators to conducting research and creating policies that focus on ESD. They create close ties among regional universities, schools and informal learning institutions to make sure that sustainability issues are integrated into all formal curricula and non-formal learning processes. Moreover, the cooperation with local businesses has an important role to play, which make RCEs valuable change agents for supporting the re-orientation of TVET with sustainable development in the relevant region.

¹ CEP/AC.13/2005/3/Rev.1

² ECE/CEP/AC.13/2012/2 para. 32

³ Cf. Chair's summary of Seventh "Environment for Europe" Ministerial Conference: "Participants stressed the need for technical and vocational training to transition to a green, entrepreneurial and sustainable economy" (ECE/ASTANA.CONF/2011/2/Add.2; para.85)

⁴ There are three priority action areas for implementation phase III, i.e : (a) to ensure that there was an ESD school plan in every school by 2015; (b) to promote the introduction of ESD into teacher education; and (c) to reorient technical and vocational education and training (TVET) in support of sustainable development and the transition to a green economy. (ECE/CEP/AC.13/2012/2 para. 32)

Against this background the ECE Secretariat for ESD and UNU-IAS initiated a joint electronic consultation to explore the questions of aligning TVET system with sustainable development of the participating countries.

The results of the consultation will be presented to the Steering Committee for consideration at its 9th meeting, on 3 and 4 April 2014. Moreover, the results are expected to inform the implementation of phase III of the ECE Strategy for ESD as well as potentially the future implementation framework for ESD of the ECE region.

II. Joint consultation of ECE and UNU-IAS

Members and observers of the ECE Steering Committee for ESD as well as members and supporters of the RCE network were invited to participate in the electronic consultation, which was hosted on the ECE online collaboration platform, from 18 February to 17 March 2014.

The preparation, facilitation and reporting on the discussion was carried out by Dr. Zinaida Fadeeva, Senior Research Fellow of UNU-IAS; Dr. Laima Galkute (Vilnius University), Director of the RCE Lithuania; and Ms. Simone Hofner, Secretary of the ECE Strategy for ESD.

Participants from 11 ECE countries, namely from Finland, Germany, Ireland, Kyrgyzstan, Lithuania, the Republic of Moldova, Montenegro, the Netherlands, Sweden, Switzerland and the USA actively contributed to the consultation – thus contributions were made from nearly all sub-regions of ECE. Participants' institutional affiliations included national and local governments (incl. ministries of education, labour and environment), technical college and (applied) university, technical and vocational education centre, National Association of Principals and Deputies, as well as of educational networks and NGOs. The diversity of regional and professional backgrounds allowed for a breadth of perspectives and information shared.

The guiding questions for discussion addressed the following core themes:

- Defining TVET;
- Strategic documents for TVET and beyond;
- Responsibilities and partnerships for TVET;
- TVET learning outcomes;
- 'Non-traditional' learners and
- Educators for the TVET system.

In the following, the main conclusions arising for each thematic discussion are summarized. Moreover, recommendations for further advancing the alignment of TVET with sustainable development are proposed.

III. Key arguments presented during the discussion and recommendations

1. Defining TVET

Policy considerations:

Diversity of possibilities to acquire profession is necessary, including different levels of education and flexible learning paths as well as relevant forms for adult education.

Background:

The consultation demonstrated that there is no universal definition of TVET in the participating countries. Differences exist mainly in the levels of education, but also in goals as well as mobility between TVET and non-TVET educational streams.

In terms of levels of education, TVET may include:

- Secondary and upper secondary level;
- Professional higher education (professional bachelor, professional master);
- Adult education including non-formal (on-job-training, improving qualification, community-based training, etc.) and
- Adapted professional education for socially sensitive groups: Early dropouts and people with special needs, long-term unemployed, etc.

Due to the different understanding of TVET, it also refers to different levels of education. For example, while vocational education and training is deeply embedded and widely respected in German society, the sector has only recently been formally recognized in Ireland. As a result, Germany also offers a higher degree of mobility between TVET and non-TVET educational streams. German TVET students can choose between different paths and divide the time spent in vocational schools or universities of applied sciences and practical experience in a company according to their own preferences. Moreover, after two to three years of work experience in the dual systems, pupils can get the Master of Craftsmanship and are thus on the same level as Bachelor students in the European Qualification Framework. Similarly, there exists a dual-track VET approach in Switzerland. Here, students usually spend 1-2 days per week in vocational schools for the theoretical background and 3-4 days in a company, to receive practical training.

With various combination of learning path, the flexibility of learning frames are largely dependent on the wills and strategies of the key stakeholders (see Box 1).

Box 1

“The flexibility and combination of the learning frames (in Germany) depend on the good will and the decisions of the chambers of commerce, the ministry of education of the 16 Länder and the faculties of the universities. There is no strict or common way for cooperation between the different stakeholders. One Key for the cooperation is the **European Qualifications Framework**. For example, the Nuremberg University is talking with the vocational schools about the credit-point-system in technical education and engineering. The same cooperation you will have in the banking sector or in work--based dual-studies (cooperation between companies and universities)”.

In the Netherlands there are two educational columns: the general one, leading to university studies at research-universities and the vocational one, leading to a study at a university for applied science.

Both types of universities are mandated to deliver BA and MA studies within the Bologna system. Transferring from the vocational column to the general one is possible, but can sometimes be difficult and time-consuming.

2. Strategic documents for TVET and beyond

Policy considerations:

National developmental goals shall be explicitly reflected in the TVET policy documents, providing a long-term vision for TVET and ensuring forward-looking competences, including 'green skills' and SD competences in particular.

Conversely, the national development processes would have to keep in mind TVET as a key strategic element for implementation of short and long-term national objectives. Defining competencies of TVET graduates and relevant support system for their development, professional practices and employment need to be considered in a more systematic manner.

TVET development has to be perceived not only as relevant for today's market requirement but, more importantly, for the whole livelihood development strategies beyond market.

It is important to recognize and reflect international tendencies in TVET development aligning national and international policies. Among such policies could be European Qualifications Framework, European Credit System for Vocational Education and Training.

Background:

TVET is included, to a certain extent, into national and education strategies of the participating countries and regulated by specific documents. One example is the Republic of Moldova, which has adopted the 'Development Strategy of vocational/technical education on the years 2013-2020'. This strategy foresees a systematic reform of vocational/technical education, and is implemented in accord with other socio-economic measures, within the process of the country's European integration.

Moreover, Finland devotes a whole chapter to vocational education and learning in its document "Education and research 2011 – 2016", published by the Ministry of Education and Culture. This plan outlines the guidelines for education from basic education to universities, and also describes the country's goals, such as a reduction in dropout rates, quality control and internationalization. In the document, Finland argues for TVET's importance, amongst other reasons, with reference to the changing needs of the labor market.

In Sweden the National Agency for Higher Vocational Education holds responsibility for all matters concerning higher vocational education. Similarly, it analyses labor market demands for workforce education, decides what programs are to be included in higher vocational education and allocates public funding to education providers.

While a number of countries refer to TVET in their national education strategies, some run the risk of reducing TVET's significance to labor market and business needs. This would be a narrow interpretation, leading to short-term development (and corresponding educational) objectives, to low

resilience of the educational system in terms of its continuing relevance and, consequently, ability of graduates to adapt to the rapidly changing labor market.

3. Responsibilities and partnerships for TVET

Policy considerations:

The development of TVET system requires further attention especially because of its strong relations with immediate and long term national development and its relevance for multiple groups in the society. The governance and coordination has to reflect these characteristics while aligning itself with priorities in national and international development processes. The system of TVET has to be further systematically understood and, where necessary, optimized (as it is the case of Ireland).

Systemic cooperation for the TVET shall be established including cross-sectoral partnerships as well as links with higher education for different inter-related purposes: aligning sectoral goals, defining learning outcomes/competences of graduates, creating models for professional practices, pre-service in-service training as well as internship of the TVET teachers, etc.

Planning and implementation of the TVET requires synergy of educational and developmental strategies; permanent cross-sectoral coordination body could be helpful in achieving future-oriented decisions and financial efficiency at the national level.

The UNECE Working group might consider establishing long-term process to acquire knowledge and develop strategies in this area at the national and international level (see section 2).

Background:

There are special bodies for the TVET strategy and administration within education systems, which are often responsible for creating partnership of the education sector with other sectors in various stages of the TVET planning and implementation process, which can be crucial for the programs' success.

One example of a successful partnership can be found in Lithuania, where the education sector closely collaborates with representatives of the business sector throughout all phases of the TVET study program development. Upon the creation of a new study program, one of the first steps is to identify its relevance for the labor market. To that end, representatives of the relevant companies and organizations are consulted and are often even members of the study program committees, through which they can directly influence the development and revision of programs. Moreover, social partners also supervise student's final thesis and participate in the qualification commissions for the thesis defense and are thus directly involved in all stages of the program.

Another example can be found at the Galway-Mayo Institute of Technology (GMIT) in Ireland. GMIT is a third-level college with a number of different schools or colleges, each specializing in a different area. GMIT Letterfrack has established itself as a national and international center of excellence in the field of furniture design and wood technology. GMIT regularly invites guest speakers from international universities, companies and NGOs, for presentations on the topics of sustainable forestry, the environment and waste management. Moreover, GMIT has created a partnership with Connemara National Park and 'One Million Trees in One Day', through which students took part in the planting of 7000 trees in 2013. There are also regular forest visits in order for students to learn about sustainable forest management.

In the Dutch TVET system the decisionmaking is shared between the educational and the business sector. Qualifications for the different professional trainings are made in so called 'Centres of Expertise on Vocational Education, Training and Labour Market'. For example, for the economic/administrative, ICT and security professions such centre is ECABO (<http://www.ecabo.nl/international>).

For the United States of America, the community college system is often named as the TVET system equivalent. The American Association of Community Colleges (AACC) has started the Sustainability Education and Economic Development (SEED) initiative to help all community colleges with ESD. They provide a resource center covering materials for curricula, competencies and employment projections, community partnerships and more topics in the sectors of solar, wind, energy efficiency, biomass and fuels and sustainable agriculture, green building and sustainability in general. Over 450 community college presidents have signed on to be part of the SEED Center. The SEED center is funded by foundations and several private companies.

Occupational standards are the basis for obtaining qualifications in vocational education in Montenegro. Through these standards, employers can express their specific expectations for key tasks in certain vocations and for the knowledge, skills and competences necessary to complete such tasks. At the same time, social partners and participants in the social dialogue have been involved in the processes of defining strategies of development and goals of changes in the education through the cooperation with the relevant Ministry.

Partnerships are especially important in defining the learning outcomes and competences of graduates. Moreover, there is often a strong focus on the specific needs of the labor market and businesses, which might lead to the neglect of other, equally important aspects.

4. TVET learning outcomes

Policy considerations:

TVET competencies have to be defined beyond the ones attributed to the immediate requirements of today's markets or even beyond narrowly understood "green skills". Definition of these competencies has to become part of the consultative process where stakeholders from educational and development community come together.

Background:

The consultation demonstrated that TVET learning outcomes are not consistent in the participating countries. In fact, there even exist differences in certain regions and schools within some of the participating countries.

In Germany, TVET learning outcomes are working competences, as well as workplace and workplace independent knowledge. ESD is one of the major goals, as the environmental rules and laws are very strict in all business sectors. Moreover, based on the structure of the German economy, the responsibility for society and the region is very high (e.g. Corporate Social Responsibility), which leads to a great relevance of ESD in the daily processes in the companies.

In other countries TVET learning outcomes are very dependent on the specific subject and school. Secondary Dutch VET-schools, for example, offer education in 350 different topics, divided into 4 sectors (agriculture, engineering and technology, economics, health and social care). Consequently, much freedom is left to the individual VET college and therefore the methods, priorities and orientation can vary a lot, according to the type of college and the geo-economic characteristics of its region. Similarly to the Dutch model, there exist around 150 different subjects in various sectors in Lithuania. Consequently, learning outcomes differ from qualification to qualification.

Box 2

“As mentioned earlier, we have in Finland national qualification requirements. The requirements are described as learning outcomes and answering the questions "what is the student able to do?" In addition we have the assessment criteria divided into 4 targets of assessment showing us what we are looking for when assessing the students performance: mastering the work process, mastering tools, methods and materials, mastering the underpinning knowledge and key skills for life long learning. Then we describe how the student is achieving the goals on 3 levels from satisfactory, good, excellent. The criteria are the same in the whole country.

We came to these national qualification requirements in the curriculum process. A network of education providers were in charge of each qualification. There were representatives of teachers and people from the work places and the process was supervised the education counsellors from the National Board of Education. The National Board of Education has 26 education committees, the tasks of which are stipulated in legislature. They consist of experts in education as a well as a wide variety of stake holders including the industry in question.

After the national requirements have been made a regulation, the education providers draw up their own curricula for local needs. Meaning that they can choose which of the optional modules are offered, in what order, if they are divided into smaller units and interpreting what the requirements mean in the area the education provider is operating in. Also they are allowed to define the teaching methods and assessment methods, except for vocational modules, where the assessment method is demonstration of skills (or for adults skills tests). Both mean that the student (young) or candidate (adult) shows the skills in real work processes and the assessment is done by the student, work place instructor and the teacher. In adult education the teacher is not allowed to participate in the assessment process, but a specially trained assessor. The demonstration of skills process is supervised by a local board of skills demonstration, which consists of working life representatives, teachers, students and administrative representatives of the education provider. Before a student is going to work placement the period is planned together with the work place instructor and student and teacher as well as the demonstration of skills. Sometimes the skills demonstrations take place at school, and it is preferred that the employers should also participate in this, but it quite seldom realized.

It is a recommendation that the representatives also participate in the planning of the curriculum, but this also happens very seldom, except when local modules are defines. There's a possibility to include in the qualification one or two local modules, which are based on the needs of industry in the area. One example of this at Omnia Vocational College is in the qualification in Business and Administration. The Wholesalers of plumbing equipment and electrical engineering asked if we could make a local module and teaching the basics of plumbing and electronics for business students, so that they can better sell the specialist equipment.”

5. ‘Non-traditional‘ learners

Policy considerations:

Accessibility of TVET should be a component of the TVET strategies leading to the involvement of under-represented, socially sensitive and vulnerable groups.

Diversity of learning paths should be encouraged and supported including both ‘vertical mobility’ (between educational levels) and ‘horizontal (cross-sectoral) mobility’ by recognition of non-formal and work-based competences, bridging courses, etc.

TVET for the marginalized communities would have to be stronger aligned with the social services, potential employers, investors and developers securing maximum flexibility and required tailor-made solutions. Inclusion of the indicators specifically related to the learners with special requirements into the quality assessment system of TVET could help to mainstream the concern into the TVET system.

Background:

Participants discussed whether there existed any non-traditional TVET learning paths in the respective countries, for example for dropouts and disabled people. Moreover they were asked to describe examples of engagements involving and supporting socially sensitive and vulnerable groups.

The system of vocational education and training in the Kyrgyz Republic, for example, specifically addresses six groups of people. Amongst them are:

- The out-of-school youths who leave the general education and the vocational education systems early;
- The disabled and ethnic minorities and
- The unemployed and underemployed adults who are already in the labor market.

Moreover, there are specific TVET programs for the disabled, formerly detained people and other socially disadvantaged groups. For that purpose, trainings can be carried out in specially formed rehabilitation groups. There also exist courses for orphans and other children from socially vulnerable groups, for which the costs are completely covered by the Kyrgyz government.

Furthermore, in some countries such as Germany, socially sensitive groups get support from the social welfare or employment center to get access to courses of non-formal or formal education. In the Netherlands, there are special education courses, intended for pupils who require more support and guidance due to a mental, sensory or physical handicap. However, in general there seems to be a lack of TVET paths for non-traditional learners and the initiatives outlined appear to remain stand-alone examples.

Box 3

“All vulnerable students have their own specific needs and care. Usually equal treatment is not the way forward for these groups, they need tailor-made solutions.

For example for blind student there are special schools, for other groups (difficult home-situation; psychological problems; drop-outs) all TVET schools have a system to help social vulnerable students. Schools have protocols for recognising and helping vulnerable students. The intake of new students is one of the focuspoint. Most schools have a coach for these groups of students, they have a individual mentor and schools built dossiers on the students, so that all teachers and others are aware of activities and interventions that have been taken for this student.”

“A quality auditor in the field of TVET must look at aspects as tailor-made education (with indicators like differentiation, fixing educational disadvantages), ‘differentiation’ (education is also about individual need for help and support from the students, related to information from the intake and from specific treatment trajectories etc.). The most specific is Aspect 1.8: Care: “For students with specific needs is in the organisation sufficient care available in the primary and secondary line and there is a structural cooperation with third line organisations outside the school.” First and second line is about social-economic aspects and cognitive development. You have to think about care concerning disadvantages in the field of language and mathematics, dyslexia, dyscalculia, performance anxiety. But also on personal or family-related problems. The effects are regularly to be evaluated and communicated with the teachers. By heavier problems the professionals from the external network have to be brought in.”

6. Educators for the TVET system

Policy considerations:

Rethinking of education and in-service training of the TVET teachers is necessary in order to develop clear requirements and schemes in provision of corresponding competences. Particularly, cooperation of higher education institutions of technological/ engineering and pedagogical profiles will be important. Systems of mentorship within professional practices have to be, where necessary, strengthened.

Background:

Currently, there exist a number of different ways of organizing education training for TVET teachers in the various countries. The task of education training is particularly complex, taking into account that TVET teachers need competences in a particular professional field, developmental issues and also pedagogics. Yet, a substantial time allocated for professional practice at the work place requires a relevant system of mentors.

In order to get an impression of the different systems, a few examples are outlined here. In Finland teacher qualification requirements consist of a bachelor or master degree and official teacher training, which is mainly organized by certain universities of applied sciences. In the Kyrgyz Republic only three universities provide the training of teachers especially for TVET, and many teachers have a solid technical education but lack pedagogical skills. In the Netherlands, universities of applied science provide teacher education for specific topics (i.e. English, Math, etc.). In VET schools, teachers are often practitioners in a specific field (i.e. hairdressing, nursing, etc.) and added a

teaching-diploma afterwards. Finally, in Lithuania VET teacher training follows a consecutive model whereby a vocational qualification is studied first, followed by studies on pedagogy.

This brief and incomplete summary demonstrates the different requirements in the various countries. It also shows that, at the moment, TVET educators appear to possess either predominantly technical expertise or the theoretical knowledge, but not always both.

Box 4

“In Kyrgyzstan, only four universities and institutes provide the training of teachers especially for TVET at engineer – teacher training departments. Tokmok industrial – pedagogical college provides the training of masters on practical training.

The following types of teachers exist in schools of TVET of the Kyrgyz Republic:

1. Teachers of special subjects
2. Teachers of general professional subjects
4. Teachers of practical training (masters of practice training)
5. Teachers in general education disciplines (languages, biology, mathematic etc.).

Teachers in special subjects are different from teachers in general subjects in that the former should have good knowledge of the special technology which workers are prepared.

Teachers / Masters. Most of the teachers are not updated on modern teaching methodologies and on technological developments in their areas of specialization. Few have actual industry experience. Majority of them also are advanced in years as younger ones do not find teaching in VSs attractive mainly due to low salary. The following can be presented as one of a future – oriented examples for TVET (in-service training):

(2008 – 2013) Within the GTZ “Regional teacher training network in the Central Asian countries” project were developed 7 modules for professional development of VS’s teaching staff without basic professional – pedagogical training: teaching and training methods, curriculum development and didactics. These modules were adapted to the conditions of the educational system of the country and now being delivered for improving the professional skills of teachers during the upgrading courses on the base of Republican Scientific – Methodological Centre under the Agency on VET.

These modules were developed considering the opinions of representatives of primary, secondary and higher educational institutions from the five partners - countries. Besides, it is planned in the future to:

- start to introduce developed modules into the training programs of the higher educational institutions which are oriented to the training the teachers for TVET;
- develop of appropriate, modern and practice-oriented study and training programs and teaching materials in the fields of professional pedagogic and didactic, both at the university and college levels;
- develop the scientific discipline of professional didactics for TVET teachers;
- continue further training of teaching staff of the partner universities, vocational colleges and schools

ANNEX A: Highlights from the electronic discussion

Note: The information presented in the following table is based on information shared during the discussion. It reflects the richness of the exchanges and urgency of the area for the national development. It does not represent the situation with TVET learning and policies in the individual countries in the full but highlights some of the critical areas of concern where further elaborations and discussions are necessary.

These critical points do not reflect any official opinion whatsoever on the part of the Secretariat of the United Nations and is also not officially approved by the governments of the mentioned countries. Not all countries have yet been able to provide information on all issues listed in this chapter. Countries will be consulted individually to complete the information and a revised version of this report will subsequently be made available.

1. Defining TVET

Finland	TVET includes upper-secondary level education and training; vocational qualifications give general eligibility to higher education. General upper-secondary level education mainly leads to universities.
Germany	There is two- path approach (academic and VET); after a minimum time of 2 or 3 years working on their job in the dual systems, pupils can get the Master of Craftsmanship e.g. are on the same level as a Bachelor study in the European Qualification Framework (EQR). There are various possibilities for students in (T)VET: a) Dual System: practical experience by training on the job and basic & general education by the vocational schools; b) Full-time education in vocational schools: some apprenticeships are a fulltime study in vocational schools; c) Dual Study: work in a company for six months and study at a university of applied sciences for the same time. Most of the BA studies are offered by universities or universities for applied sciences. These BAs are often more practice-oriented, so that they are recognized more as a part of TVET.
Ireland	Further Education and Training Sector (FET) embraces education and training which occurs after second level schooling but which is not part of the third level system. This includes programmes such as Post Leaving Certificate courses, the Vocational Training Opportunities Scheme (second chance education for the unemployed), programmes in Youthreach and Senior Traveller Training Centres for early school leavers, adult literacy and basic education, and self-funded evening adult programmes in second level schools.
Kyrgyzstan	Kyrgyzstan has two separate systems of vocational education: VET and SVE (Secondary Vocational Education), professional higher education is not considered.
Lithuania	VET in Lithuania is secondary school-based with major component of practical training (60-70%, including 8-15 weeks in a company or a school-based workshop). Programmes also exists at post-secondary education level for learners who having completed upper secondary general education. There is a branch of professional higher education (professional bachelour) provided at the universities of applied sciences, however it is not considered as TVET in Lithuania. There are difficulties in moving between different levels; the design of learning outcomes at different levels is insufficiently coordinated, so the challenge is to bridge VET and higher education.
Moldova	According to the Development Strategy of vocational/technical education on the years 2013-2020, vocational/technical education will be organized on two levels: secondary and post-secondary vocational/technical education and will be realized in the vocational/technical schools and high schools, and the post-secondary vocational/technical education in colleges. Curricula include theoretical and practical hours to achieve in the enterprise.
Montenegro	According to the provisions of the General Law on Education and provisions of the Law on Vocational Education, vocational education in Montenegro is implemented as lower vocational education (two years), secondary vocational education (three or four years) and post-secondary vocational education (up to two years, which is a continuation of secondary vocational education). Vocational education also includes Master Craftsman's Exam.

Netherlands	There are two educational branches: the general, leading to university or academic (research) studies at research-universities, and the vocational (proessional), leading to a study at a university of applied sciences. During the BA-studies a student must have earned at least 30 ECTS; Transferring from the vocational branch to the general one is sometimes difficult; BA-studies in the vocational sector take 4 years (in the research sector 3); yet the step-over with a vocational BA-diploma to a research-MA is subject to quite some time-taking requirements.
Switzerland	VET includes upper-secondary level education and training. Adults may take remedial courses to acquire a VET qualification. There is also Federal Vocational Baccalaureate (FVB). Multiple transitional options between lower- and upper-secondary levels exist.
USA	For the United States, the community college system is often named as the TVET system equivalent. There are 1200 community colleges, which cover geographically the whole country. Approximately half of all undergraduates attend the community colleges. Professional higher education appears to be not part of TVET system. Community college students are often not well prepared for college level work, so developmental classes are either recommended or required (depending on the institution) to bring up their skills before they can enrol in college level courses.

2. Strategic documents for TVET and beyond

Finland	Education is a part of the governmental strategy; at the same time "Education and research 2011 – 2016“, a specific plan for education was approved. Special development targets in the plan are to alleviate poverty, inequality and exclusion, to stabilise the public economy and to foster sustainable economic growth, employment and competitiveness. Adult vocational education and training supports vocational upgrading in response to the changing needs of the labour market and individual career development.
Germany	The TVET goals and national goals are articulated by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK). These educational standards give the 16 Länder the possibility for different ways to reach the goals. These ways are sometimes different, cause of the history of education (e.g. East, West), the political, demographic, economic und social structure of the countries but comparable in total.
Ireland	Further Education and Training Sector (FET) have been recently formally recognized; the process of streamlining the system to reach coherence in coordination and delivery; relationships between vocational schools and employers, civil society are being developed. The 33 Vocational Education Committees (VEC) were replaced by 16 Education and Training Boards under the national body of SOLAS.
Kyrgyzstan	National strategy for sustainable development of the Kyrgyz Republic – up to 2017; Education development strategy up to 2020; Action plan for 2012-2017. The main performers to promote the principles of sustainable development in the country are public authorities. Primary vocational training is carried out in priority areas of economic sectors : construction (22.5%) , light industry (15%) , agriculture (17%) , transport (16%) , energy and communications (6.5%) , services (10%) , engineering and mining (3 %) and others.
Lithuania	National Development Strategy for 2014-2020, National Education Strategy 2013-2022, Action plan for VET Development (to be adopted soon).
Moldova	Development Strategy of vocational/technical education on the years 2013-2020, which based on a systematic reform of vocational/technical education, correlated with vector socio-economic development and European Integration from Republic of Moldova. The qualities of vocational/technical education determine largely the development of the national economy based on knowledge and innovation and create the opportunities for the full realization of the capabilities of each citizen.
Netherlands	17 “National Centres of Expertise on Vocational Education, Training and the Labour Market”. Dutch Centres of Expertise have been appointed by the Ministry of Education to develop the Dutch qualifications structure within VET. An important aspect of the Dutch vocational education and training (VET) is the practical approach and the strong relation between education and the labour market. Much freedom is left to the VET colleges and therefore methods, priorities and orientation can vary a lot, according to the type of college or the geo-economic characteristics of the region they are in.

3. Responsibilities and partnerships for TVET

Finland	The National Board of Education is responsible of the National Core Curricula (previous) and Vocational Qualification Requirements (present). For each qualification there were a lot of specialists including people and organisations from the sector, teachers representatives, union representatives, student organisation representatives etc.
Germany	Formal TVET: competences are defined by the KMK, the chambers, and labor representatives and fixed in the by law and rules: http://www.juris.de/purl/gesetze/_ges/BBiG Informal TVET: there is a big variety of private institutions, which offer informal TVET.
Kyrgyzstan	By the Resolution of the Government of the Kyrgyz Republic was created National Council on skills development under the Government of the Kyrgyz Republic. The Council is an association of concerned ministries and agencies, employers, non-governmental organizations as social partners in the field of vocational education and training to coordinate the work on training, retraining, skills and expertise, promote skills development according to the needs of the labor market.
Lithuania	Defining competencies of learners is in a new phase in Lithuania. We're changing our system and competences (learning outcomes) for VET qualifications will be defined in a „new generation“ sectoral qualification standards for a particular sector of the economy. Another type of standards for VET curricula are “VET standards” that describe only one VET qualification in terms of competences/ learning outcomes and we have 77 standards have been approved for the VET sector. However the priority is to develop sectoral qualifications standards. The standards are developed by expert groups (consisting of HE and VET people and employers/ social partners) under supervision of Qualifications and VET Development Centre. At the PHE level, representatives of the business sector are involved in all phases of study programme development
Montenegro	Since the beginning of the education system reform, social partners and participants in the social dialogue have been involved on the national level in the processes of defining strategies of development and goals of changes in the education through the cooperation with the line Ministry. Social partners have their representatives in school boards of vocational schools.
Netherlands	The process of defining learning outcomes is well described and monitored by the ministry of Education as well as by the social partners / business community.

4. TVET learning outcomes

Finland	<p>Key skills for lifelong learning are presented as sustainability skills including also elements of economic sustainability. The identification and recognition of previously acquired skills is one of the principles in the vocational education system.</p> <p>ESD competences are mentioned explicitly in the TVET documents.</p>
Germany	<p>The learning outcome from TVET is working competences, workplace and workplace independent knowledge. ESD is one of the major goals, because first the environmental rules and laws are very strict in all business sectors. Second based on the structure of the German economy the responsibility for the society and the region is very high (e.g. CSR), so there is a big sense for ESD in the daily processes in the companies.</p> <p>ESD competences are mentioned in different ways in the curricula and training plans. It depends on the training, the economical sector, etc.</p> <p>The teaching of "green skills" depends on the training or the special interests of the company or the employee; Green skills are often supported by companies.</p>
Ireland	Acknowledging changing nature of skills and importance of generic skills.
Kyrgyzstan	<p>For more effective action to integrate the ideas and principles of sustainable development and "green" economy in primary vocational training system is necessary to develop regulations designed to regulate this activity, as well as inter-agency and inter-sectoral cooperation including the participation of donor organizations and the business sector.</p> <p>ESD competences are mentioned according to National Strategy of Sustainable Development of Kyrgyz Republic.</p> <p>In vocational and specialized secondary schools a special course "Environmental protection and rational use of natural resources" has been introduced. Relationships between vocational schools and employers and civil society are being developed.</p>
Lithuania	<p>Professional skills, key competences, green skills, transferable competencies, ESD competencies to some extent can be considered as learning outcomes from TVET, but should be more clearly defined in TVET programmes.</p> <p>Learning outcomes of study programmes within Lithuanian PHE sector are compatible with the descriptor of study cycles. The descriptor of study cycles defines knowledge and its application, research, special, social and personal abilities, particularly transferrable social and personal abilities are to some extent compatible with the SD competences such as citizenship and ethics, creativity, self-confidence and value-orientation.</p> <p>Green/ SD skills are often not appreciated in practice. There are aspirations to align learning outcomes with the Federation of Entrepreneurs.</p>
Montenegro	<p>Curricula are developed on the basis of one or several occupational standards, according to the methodology established on the national level. Up to now, we have developed more than 100 educational programs for all levels of formal vocational education.</p> <p>Occupational standard is the basis for obtaining qualifications in vocational education and it defines the contents of vocational qualifications at a certain level of difficulty, as well as necessary knowledge, skills and competences.</p> <p>Through the occupational standards employers express their requests for key tasks in certain vocations and for the knowledge, skills and competences necessary to do such tasks.</p>
Netherlands	<p>Very dependent on the specific education and school. Secondary VET-schools (students are 16+) offer education in 350 different topics, divided into 4 sectors (agriculture, engineering & technology, economics, and health & social care). Market relevance is a part of accreditation processes.</p> <p>ESD competencies are mentioned explicitly. For TVET schools ESD competencies are mentioned both in the common qualifications for all sectors: Qualifications for career/employability and for vital citizenship and consumer-skills (economic -, political-, healthy- & environmental responsible) as well as in the professional part of the curriculum (the job-qualifications). But it is a bit of a paper tiger, educators find it difficult to address all these issues, also since the time available for the common qualifications is usually very limited.</p>
Sweden	<p>A particular attention in Sweden is paid to skills of TVET teachers as it is regulated by the Swedish National Agency for Higher Education. There are two requirements to get admitted into VET teacher training: (1) a general university entrance requirement based on completed high-school studies with so-called core subjects, and (2) specific competency-based</p>

	requirements for vocational knowledge and skills in subjects matching the upper-secondary vocational subjects in different areas. The 60 ECTS studies of VET teacher training contain courses on general knowledge and skills that all teacher categories study, called “a joint core of educational science”. These are to some extent related with ESD skills, for example: organisation of education and its conditions, foundations of democracy; development and learning social relations, conflict management and leadership.
USA	There is alignment with green skills as well as skills to participate in proactive problem-solving and systemic thinking to help create a more sustainable future; partnerships are common with community and other stakeholders. ESD comes through informal influence of NGO - The American Association of Community Colleges (there is no country-wide plan).

5. ‘Non-traditional‘ learners

Germany	Although Germany has recently opened more pathways from upper-secondary VET to tertiary education, to date very few VET graduates have made use of those pathways
Lithuania	Providers of VET at the secondary level offer educational support for their students including those in risk of dropping out. Adult education is open for drop-outs. They can continue their studies when they become more motivated. Their prior learning achievements are recognized. As for the handicapped, not all the colleges have equally appropriate physical and technical conditions for their studies, though formally accessibility to higher education is assured through the general admission scheme. In reality some handicapped people may feel not well prepared for competition.
Netherlands	Special education is intended for pupils who require more support and guidance due to a mental, sensory or physical handicap. Secondary special education is open to pupils between the ages of twelve and twenty (maximum). Almost half of these pupils move on to some form of vocational education either in special schools or within the regular ones (with extra care offered). Adult education is open for drop-outs, so they can finish their (secondary/highschool) education and get the diploma.

6. Educators for the TVET system

Finland	<p>The teachers qualifications requirements is a bachelor or master level degree (in adult education some exceptions) and official teacher training mainly organised by certain universities of applied sciences.</p> <p>The National Board of Education also offers voluntary training and information sessions. Also there are a lot of development projects funded e.g. by the National Board of Education or European Social Fund etc. so that different organisations can arrange training and support for the implementation of new requirements.</p>
Germany	<p>The preparing educators is the duty of the universities in all 16 Länder, after the study, it's there are different institutions (by the states, by the cities, by companies) which offering trainings and courses.</p>
Kyrgyzstan	<p>Only three universities provide the training of teachers especially for TVET.</p> <p>Most of teachers on special subjects and masters have technical education and they do not have the enough knowledge on professional pedagogic and didactics.</p> <p>Lack of competence of teachers in the field of "green" economy, weak infrastructure, lack of training programs, modules and manuals on "green" economy are the main barriers.</p>
Lithuania	<p>In Lithuania, it is required that VET teachers must have a vocational and a pedagogical qualification or have participated in a course on pedagogy and psychology principles.</p> <p>Teachers without a pedagogical qualification, irrespective of their educational attainment level, are offered a course on pedagogy and psychology principles.</p> <p>Training of teachers in the area of green skills and ESD competences is important (both in terms of raising awareness, defining and teaching competences) and this area should be improved.</p> <p>Teachers-practitioners are very welcome to work at <u>Lithuanian colleges</u>. There is a possibility to acquire pedagogical knowledge and skills through non-formal education provided by universities and colleges.</p>
Netherlands	<p>In VET schools often teachers are practisioners in a specific topic (hairdressing; nursing etc) and added a teaching-diploma afterwards.</p> <p>In-service education is provided by different organisations, can be Universities but can also be (certified) commercial training-institutes</p> <p>All VET teachers have to be formally certificated.</p>

7. Challenges

Germany	<p>The transition system suffers from fragmentation and an absence of transparency; too few programme participants make a successful transition into the regular VET system; career guidance is highly variable across the <i>Länder</i>; some students leave compulsory school with weak core academic skills; the final student evaluation in the dual system is dominated by the Chamber exam.</p>
Ireland	<p>Aligning provision to meet national skills needs i.e. supply side measures; engage across sectors and occupations i.e. demand side measures; changing nature of skills requirements; improved quality of survey and evaluative data; quality and progression potential of programmes; ensure accredited outcomes for people with low levels of initial education; engage local employers and other providers; develop workplace learning and flexible learning opportunities; enhanced guidance provision; generic, transferable skills; integrating literacy.</p>
Kyrgyzstan	<p>Quality of programmes in different areas (rural/urban); education of educators; insufficient analysis of labour market; lack of work experience with sector's councils and involvement of employers for cooperation with schools; no National Qualification Framework; need for progressive school management tools; weak usage of information and communication technologies.</p>
Lithuania	<p>Engagement of adults into lifelong learning is a weak point.</p>
Moldova	<p>There are 66 educational vocational/technical institutes. The priority for these institutions is to have the effective management, better partnership with operators from region and nationally.</p>

ANNEX B: Discussion participants

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Dr. Detlev Lindau-Bank	Coordinator of European RCEs	Germany
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Mr. Gerard Looney	National Association of Principals and Deputies	Ireland
Mr. Dermot O'Donovan	Head of Department, Glway-Mayo Institute of Technology Letterfrack	Ireland
Ms. Byrul Chokoeva	Head Specialist of the Agency of the Professional and Technical Education, Ministry of Labour	Kyrgyzstan
Dr. Nijole Zinkeviciene	Deputy Director for Academic Work, 'Kauno Kolegija'/University of Applied Sciences	Lithuania
Ms. Lina Vaitkute	Head of Information and Administration Unit, Qualifications and VET Development Centre	Lithuania
Ms. Sandra Brkanovic	Montenegrin Center for Vocational Training	Montenegro
Prof. Jos Hermans	Advisor to UNU on European RCEs	The Netherlands
Mr. Ton Remmers	ENSI	The Netherlands
Ms. Machtelijn Brummel	Advisor, Sustainable Development and Learning, Ministry of Economic Affairs	The Netherlands
Ms. Galina Noroceva	Ministry of the Environment	Republic of Moldova
Dr. Zinaida Fadeeva	Senior Researcher	United Nations University
Dr. Laima Galkute	Director of the RCE Lithuania	Lithuania
Ms. Simone Hofner	Associate Environmental Affairs Officer	UNECE
Ms. Ingrid Henning	Head, TVET Programme, University of Gothenburg	Sweden
Ms. Christine Affolter	ENSI	Switzerland
Dr. Debra Rowe	U.S. Partnership for ESD	U.S.A.