

Result 6.1

Handbook with all project results



Hanse-Parlament



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Promoting permeability through dual bachelor's programs with integrated initial and further vocational training BA&VET)



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Dual bachelor's programs with integrated initial and further vocational training

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1 Project Summary and Introduction

1.1 Background and Experiences

For demographic reasons, there is already a clear shortage of entrepreneurs, managers and skilled workers, which will increase sharply in the future. At the same time, vocational training has become less attractive. More and more young people are pursuing university studies, and in most EU countries the number of universities entrants is much higher than the number of apprentices. Securing the next generation of entrepreneurs and skilled workers is the most important support task for SMEs and must be given the highest priority.

Young people in SMEs are primarily recruited through vocational education and training. SMEs need personnel who have good theoretical knowledge, practical skills and professional experience. Graduates of Bachelor's degree programmes may be well qualified in theory, but they usually lack professional skills and practical experience. For this reason, SMEs can only gain a limited amount of the young talent they need from the high numbers of graduates from colleges and universities.

In addition, the qualification requirements are high and growing. Dynamic economic change, digitalisation, mastering the challenges in the energy sector, climate and environmental protection, etc. require qualifications that many current skilled workers do not have and that cannot be adequately taught in vocational training. For this reason, continuing vocational training is becoming increasingly important.

The demands on entrepreneurs are also very high and growing. In Germany, further training to become a vocational master is of outstanding importance in trade and industry. This provides entrepreneurs and managers with practical experience and comprehensive competences that guarantee the continuity of companies and job security when setting up a new business or taking over an existing one. In recent decades, however, it has become increasingly clear that vocational master training alone is less and

less sufficient to successfully run a business. Therefore, in addition to master craftsman training, longer further training to become a business economist was developed and successfully implemented for prospective entrepreneurs.

In Germany, master craftsman training, like the bachelor's degree, is classified at level 6 and further training to become a business economist at level 7 of the qualification framework. However, this has hardly any practical effects and the actual permeability is very low. Similarly, competences, knowledge, etc. already acquired in vocational education and training are generally not recognised for a degree course.

Against the background of these far-reaching challenges, the project BA&VET pursued the following objectives.

- Increasing the permeability between VET and higher education and thus promoting the attractiveness of VET.
- Increasing the recruitment of colleges and universities for the important tasks of continuing vocational education and training.
- Providing excellently qualified entrepreneurs, managers and skilled workers who, in addition to good theoretical knowledge, have practical competences, skills and professional experience.
- Attracting entrepreneurs and executives who have all the competences to run a company successfully and, in particular, to implement a forward-looking human resources policy and workplace innovation.
- Contributing to the satisfaction of the high demand for entrepreneurs, managers and skilled workers to cope with the very large tasks in the energy and climate sector.
- Strengthening the productivity and competitiveness of companies through knowledge and technology transfer, promotion of innovations and implementation of manageable R & D projects.

To achieve these ambitious goals, two dual Bachelor's degree programmes with integrated vocational training and comprehensive continuing vocational training were developed, practically tested, evaluated and implemented.

- a) Business Administration & Sustainable Management of SMEs
- b) Management of Renewable Building Energy Technology
 - Duration four years, with approximately half of the qualification taking place in a university/college and half in a company.
 - The required credit points can be acquired to a certain extent in the coordinated vocational training and activity in the company.
 - The three-stage programmes include vocational training, continuing vocational training and a full Bachelor's degree. All three stages are carried out in cooperation between colleges/universities, vocational training institutions and companies.

Stage 1: Vocational training

Completion after two years with a nationally and internationally recognised qualification as a journeyman or skilled worker (EQF Level 4).

Stage 2: Continuing vocational education and training

Completion after two and a half or three years with a nationally and internationally recognised qualification (EQF Level 5), for example Energy Service Manager or Business Administrator.

Stage 3: Higher education

Completion after four years with a Bachelor's degree (EQF Level 6). As a Bologna-compliant degree programme, "automatic" international recognition of the degree and cross border transfer of CPs already acquired. Depending on the performance, interests, etc. of the respective participant, after the first and second stage it is possible to the training can be completed and work can be taken up, or

- interrupt the training to start work and continue afterwards, or
- the training can be continued immediately.

Within the framework of the training cooperation between colleges/universities and companies, innovations and manageable R & D projects are simultaneously realised by the students and lecturers in the SMEs.

Concepts, curricula, etc. are always internationally oriented for use in different European countries.

The primary target groups of the project are:

a) school leavers who wish to combine vocational education and training with a bachelor's degree and thus receive excellent employment and professional career opportunities.

b) students who are qualified in higher education and university and at the same time in a company and who are highly welcome in SMEs as managers and professionals or as independent entrepreneurs.

c) owners, managers and specialists of SMEs who are qualified in continuing vocational training, acquire tailor-made competences and skills for high-quality activities in climate and environmental protection and achieve a recognized continuing vocational qualification.

d) SMEs that attract suitably qualified young entrepreneurs, managers and specialists, receive innovation funding and carry out R&D projects together with colleges/universities.

The project addresses the following secondary target groups (beneficiaries):

a) colleges and universities which, in order to expand their educational opportunities in climate and environmental protection, receive all the documents and materials for two new dual bachelor's degree programs in order to meet the labour market needs and the conditions of SMEs in particular.

b) chambers and other vocational training institutions which attract strong young people to vocational training, receive curricula for continuing vocational training modules for the qualification of SMEs and their staff, and cooperate intensively with colleges/universities in teaching and innovation promotion.

c) teachers, advisers and lecturers from chambers, other VET providers and colleges/universities who are qualified in Train the Trainer programs to provide high-quality further training, to carry out dual study courses in cooperation with companies as well as innovation promotion and R&D projects for SMEs at a high-quality level.

As part of the project implementation, the development work and, in particular, the trials in live operation under various national conditions and the evaluations of the two degree courses and the two further education programmes have shown that these educational programmes

- the ambitious objectives are fully achieved with these educational programmes.
- the participating companies have given the programmes very positive evaluations and attested to their high practical suitability.
- the evaluations by the participants were also very positive.
- the required qualifications and skills are imparted in a precisely tailored manner and the further training programmes, which end with a recognised further training qualification, are rated very positively by both the participants and the companies.
- at the same time, innovation promotion and the realisation of R&D projects in the companies take place in an ideal way and are described as very effective.

The SMEs expect that they will be able to attract the urgently needed new generation of specialists, managers and entrepreneurs through these education programmes. The fact that these expectations are highly justified is demonstrated by the fact that dual Bachelor's degree programmes have now been running in northern Germany for

twenty years: after completing their training, over 90 % of graduates are highly valued by the company in which they were trained.

Another experience from the implementation of dual Bachelor's degree programmes is that the drop-out rates are comparably low. While the drop-out rates in conventional degree programmes average over 30% (in technical degree programmes such as construction engineering even over 50%), the combination of practical and theoretical learning means that significantly less than 10% drop out of dual study programmes. And these dropouts then have a completed vocational qualification. Accordingly, the drop-out rates in the trial study programmes of the BA&VET project will also be correspondingly low and the (few) dropouts will have a vocational qualification (EQF Level 4) and an official further education qualification (EQF Level 5).

1.2 Participating Project Countries and Partners

The project was carried out by seven experienced partners from four countries. Initially, the partner countries were selected so that countries with different experiences and different levels of development are represented, so that different national conditions are present and a high degree of learning from each other is possible. In each country, a college/university and a chamber were represented as partners so that

- a) close co-operation between the higher education sector and industry could be developed and secured in the long term.
- b) SMEs were acquired as training partners for dual study programmes.
- c) all relevant tasks of vocational and higher education were covered.

The project partners were selected in such a way that all requirements, competences and preliminary work were covered in the consortium.

Partner 1 Hanse-Parlament, which is very experienced in the realisation of complex international projects with up to 40 partners, took on the project management. The partner has extensive experience in SME promotion as well as in vocational and higher education in all countries of the Baltic Sea region, contributed best practices from Germany and all analyses, initial and continuing vocational training and dual Bachelor's degree programmes. The Hanse-Parlament has conducted analyses, developed realisation concepts and developed the Train the Trainer programme and managed its implementation.

Partner 2 Satakunta University is particularly recognised in teaching and research in the fields of energy, climate and environmental protection and is already very successfully realising innovation funding and R&D projects with SMEs. The partner played a leading role in developing the concept, curricula and module handbook for the three-cycle dual study programme 'Engineering in Management of Renewable Energy Technology in Buildings' and the further education programme 'Energy Consultant'. Satakunta University promoted innovation.

Partner 3 Tallinn University of Technology also contributed teaching and research specialising in energy, climate and environmental protection. Extensive experience was gained in. The partner contributed to the development of the Energy Service Manager training programme, which is based at EQF Level 6 in Estonia and is run in conjunction with a business association. The partner was involved in the development of the study programme 'Engineering in Management of Renewable Energy Technology in Buildings' and the further education programme 'Energy Consultant', tested modules of the study programme in practice, promoted innovation and carried out evaluations and quality assurance.

Partner 4 Politechnika Gdanska was represented by the Faculty of Economics and was interested in expanding the range of courses to include a new degree programme in 'Business Administration & Sustainable Management of SMEs'. Dual study programmes are possible in Poland but have not yet been implemented by the partner. The partner was involved in the development of the study programme 'Business Administration & Sustainable Management of SMEs' and the further

education programme 'Commercial Specialist in Sustainable Management', tested modules of the course in practice, promoted innovation and carried out evaluations and quality assurance.

Partner 5 Estonian Chamber of Commerce and Industry and Partner 6 Pomeranian Chamber of Handicrafts for SMEs are responsible for vocational education and training, contributed their experience in SME promotion and vocational training, involved SMEs in the project work and will implement the training programmes in future. Partner 5 tested the 'Energy Consultant' training programme and Partner 6 the 'Commercial Specialist in Sustainable Management' training programme in practice during the project period.

Partner 7 Berufliche Hochschule Hamburg is very experienced in the development and implementation of dual study programmes with a focus on business administration. The partner has contributed its extensive experience and preparatory work to the project work and all partners have been involved in the implementation of innovation promotion and R&D projects with SMEs. The partner played a leading role in developing the concept, curricula and module handbook for the three-cycle dual study programme 'Business Administration & Sustainable Management of SMEs' and the further education programme 'Commercial Specialist in Sustainable Management'.

Associated partners were 50 chambers/SME associations and 24 colleges/universities from 13 countries, which received all project results as transfer recipients and implementation partners. They were involved in all work from the start of the project.

The composition of the project consortium, the great commitment of all partners and a smooth cooperation ensured the outstanding success of the BA&VET project. We sincerely thank all partners, and the persons involved for the excellent cooperation.

Hanse-Parlament

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Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



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2. Overview of the results of the project

In the BA&VET project, the following results were produced, tested in practice, evaluated and revised, finalised and implemented on the basis of the evaluation results. Various results, for example module handbooks, curricula, teaching materials or analysis reports, are so extensive that they would go beyond the scope of this publication. For this reason, only selected parts or summaries of the various results are reproduced in this manual. The complete results with all documents are published on the project website with public access and can be downloaded free of charge, see <https://ba-vet.eu/>.

Result 1.1 Interim reports and final report of the project

The progress report, the interim report and the final report on the BA&VET project are for internal purposes only and will not be published

Result 1.2 Quality manual

Result 1.2 Quality manual comprises the evaluation concepts and quality plans of the BA&VET project. A distinction is made between two types of evaluation and quality assurance.

1. Evaluation of the educational measures

This quality assurance is carried out specifically for each training measure in connection with the development, testing and completion of the respective training programs.

2. Evaluation of the processes

Quality assurance is carried out for project implementation, overall management, transfer and implementation. The basis is formed by the objectives, tasks with content, cost and time specifications etc. of the partner agreement, the activity and

dissemination plans. Cooperation, communication and the implementation of activities and events are evaluated through written and electronic surveys and personal interviews. The results are continuously fed into further work, resulting in a continuous improvement process.

For further evaluations of the cooperation, project management, transfers and implementation consultations, an external office is called in, which carries surveys of the project partners, transfer recipients and evaluations of implementations.

Result 1.3 Report on the results of all evaluations and quality assurance

At the beginning of the project, a concept and quality plans for the quality assurance and evaluation of the project implementation of the project results were prepared and discussed and agreed with all project partners (see Result 1.2 Quality manual).

On the basis of this concept, the quality assurance and evaluation measures were carried out throughout the project duration. Result 1.3 “Report on the results of all evaluations and quality assurance” includes in a summary the results of quality assurance and evaluations.

Result 2.1 Report on results of analyses of the economy, demography, education and labour markets

The analysis refers primarily to the countries of the Baltic Sea Region. The Baltic Sea Region comprises eleven countries, eight of which belong to the EU: Denmark, Sweden, Finland, Estonia, Lithuania, Latvia, Poland and Germany. Three neighbouring European countries border the region - Belarus, Norway and Russia. For reasons of availability, comparability and need for statistical data, Russia and Belarus are not included in this study.

The current socio-economic situation in the Baltic Sea region is analysed, taking into account demographic and economic aspects. A comprehensive overview of the

education markets and national education systems is also provided. Included in the analyses are:

1. All partner countries in the project, so that
 - a) uniform basic data are created for all development work of the BA&VT project.
 - b) the national and legal conditions and needs that have to be taken into account for the development and implementation of the project's education measures are recorded.
2. The countries of the 70 associated partners involved in the project implementation as transfer recipients and implementation partners. In this way, the development of the economy, demography and labor market as well as the legal and national conditions are already included in the development work of the project for these countries as well, and thus the later transfer and implementations of the project results are significantly promoted.

Result 2.2 Report on the results of analyses of skills needs in the green economy

The analysis of the qualification needs and requirements for the countries of the Baltic Sea Region include all partner countries in the project and the countries of the 70 associated partners involved in the project implementation as transfer recipients and implementation partners.

Based on the analyses of the development of the economy, demography, education and labor markets (see Result 2.1 Report on results of analyses of the economy, demography, education and labour markets), the qualification requirements and needs in the Green Economy for SMEs in the Baltic Sea countries were examined as a further basis for the development and implementation of the education measures of the BA&VET project. First of all, statistical documents and literature were analyzed and on this basis conclusions and recommendations for education policy were developed.

In the framework of another project, which was carried out with Erasmus+ funding from 2019 to 2022, comprehensive research and surveys were conducted on the qualification conditions and needs for SMEs in the Baltic Sea countries in the Green Economy. An evaluation and summary of the results of these studies is the second part of result 2.2.

A final part of the results comprises brief analyses carried out specifically for Estonia.

Result 2.3 Report on results on national and legal conditions in the partner countries and alternative solution models for the implementation of training measures

In Germany, the legal conditions are given for the implementation of

- dual Bachelor courses of study
- further vocational training programs with recognized official qualification
- dual Bachelor's degree programs with integrated vocational training and further vocational training

Dual Bachelor's degree programs and comprehensive further vocational training are being implemented. In Germany, there are already the first dual Bachelor's degree programs with integrated further training (master craftsman training).

In order to be able to implement dual Bachelor's degree programs and also dual programs with integrated vocational training and continuing vocational training developed in the BA&VET project in other EU countries in the future, the project investigated the extent to which there is interest in this in other countries and which legal requirements exist for this. The partner countries included in the project - Estonia, Finland, Germany and Poland - were included in these analyses as examples.

Result 2.3 includes analyses of the legal conditions in the partner countries and solution models for implementation.

Result 2.4 Concept, curriculum and teaching materials for a Train the Trainer program

In order to ensure that qualified lecturers and advisors are always available in sufficient numbers for the implementation of three-stage dual study programs and for the promotion of innovation by SMEs in all regions of the Baltic Sea Region, the following work was carried out:

- Development of a concept, curriculum and teaching materials for a Train the Trainer program for the qualification of teachers, consultants and university lecturers for the implementation of dual bachelor's degree courses, demanding further education as well as innovation promotion and R&D projects in and with SMEs
- Testing and evaluation of the Train the Trainer program
- Revision and finalization of the Train the Trainer program and transfer to 24 colleges and universities from all Baltic Sea countries, which will implement the training on an ongoing basis.

The implementation report, the evaluation concept and the evaluation report are summarized in Result 2.5 “Qualification of teachers, counsellors and university lecturers of all project partners”. Concept, curriculum and teaching materials for a Train the Trainer program are listed as Result 2.4.

Result 2.5 Qualification of teachers, counsellors and university lecturers of all project partners

The Train the Trainer program developed (see Result 2.4 Concept, curriculum and teaching materials for a Train the Trainer program) was tested in practice, evaluated and finalized on the basis of the evaluation results.

The completed Train the Trainer program was transferred to 24 colleges and universities and implementation advice was provided. In future, the colleges and universities will implement the Train the Trainer program on an ongoing basis in line with demand, so that a sufficient number of well-qualified teaching staff and advisors are always available in all countries and regions of the Baltic Sea region to implement the dual courses of study and the two further vocational training programs.

During the project period twelve university lecturers, teachers and consultants from all project partners were qualified so that they can implement the educational programs developed in the project at a high level of quality. The following main activities were carried out to achieve this result:

- Development, counselling and coordination of an evaluation concept
- Practical testing with teachers and counsellors from all project partners
- Analyses and preparation of an evaluation report

Result 3.1 Solution concepts for the integration of vocational training or in combination with dual study courses

For the implementation of the project work, concepts, models and module handbooks for Bachelor's degree programs with integrated vocational training and continuing vocational training were developed, discussed and agreed upon:

- a) “Business Administration & Sustainable Management of SMEs” degree course with integrated recognized continuing education in “Sustainable Management”.

b) “Engineering in Management of Renewable Energy Technology in Buildings” degree course with integrated recognized continuing education “Energy Service Manager/energy Consultant”.

Both courses combine practice and theory as well as the integration of vocational training, further education and higher education. In the partner countries of the project, however, the legal regulations on the implementation of dual study courses and the integration of vocational training into study courses vary greatly. Alternative solution models were therefore developed with a view to future implementations for

- the realization of vocational education and training and
- the implementation of Bachelor's degree courses with integrated vocational education and training.

Result 3.1 “Solution concepts for the integration of vocational training or in combination with dual study programs” comprises the alternative models and possible solutions developed.

Result 3.2 Examination regulations „Sustainable Management” with recognized continuing education qualification

Official examination regulations with recognized further vocational qualifications have been developed for the two further vocational VET programs of the BA&VET project:

- Commercial Specialist in Sustainable Management
- Energy Consultant

These examination regulations are reproduced in the English version in Chapters 2 and 3.

A procedure for the evaluation and international recognition of the two further vocational education degrees was also developed and is presented in Chapter 4.

Result 3.3 Concept, curricula, module handbook and examination regulations for three-cycle dual study program "Business Administration & Sustainable Management of SMEs"

A Bachelor's degree course in "Business Administration & Sustainable Management of SMEs" has been developed, which also integrates initial and continuing vocational training and combines theory (learning at the university) with practice (learning in the company). This "trial" course of study is designed in such a way that

- a) it can also be completed without initial vocational training.
- b) the integrated continuing education program "Sustainable Management" with a recognized continuing education qualification can also be carried out separately without studying.

The Transition from the VET program "Commercial Specialist in Sustainable Management for SMEs" to the Dual Bachelor Study Program "Business Administration and Sustainable Management for SMEs" with recognition of academic achievements is described in the last chapter of the Results.

Main modules of the developed study program were tested, evaluated and the entire study program was finalized based on the evaluation results. The concept and module handbook of the study program including the transition of the VET program form Result 3.3 Concept, curricula and module handbook for three-cycle dual study program "Business Administration & Sustainable Management of SMEs".

The trials, implementation report, evaluation concept and report are listed in Result 3.4 Implementation report, evaluation concept and report for course "Business Administration & Sustainable Management".

Result 3.4 Implementation and evaluation course "Business Administration & Sustainable Management" and qualified students

A trial Bachelor's degree course in "Business Administration & Sustainable Management of SMEs" (see Result 3.3) was developed, in which initial vocational training and further vocational training are integrated, and which combines theory (learning at the university) with practice (learning in the company). After this time-consuming work, in the three-year project period the most important main modules were trialled, and the following objectives were pursued:

- Testing the degree program in live operation at the university and quality assurance.
- Initial qualification of students at the university and in companies.

An evaluation concept was developed for the tests, and the degree program was finalized on the basis of the evaluation results. Finally, accreditations and implementations were prepared after the end of the project period.

The results of this work are presented in Result 3.4 Implementation and evaluation course "Business Administration & Sustainable Management" and qualified students.

Result 3.5 Concept, curricula, teaching materials and examination regulations Training program "Sustainable Management"

A further training program "Commercial Specialist in Sustainable Management" was developed. This further training program was integrated into the trial Bachelor's degree course "Business Administration & Sustainable Management of SMEs" (see Result 3.3) but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

Result 3.5 Concept, curricula and teaching materials further Training program “Sustainable Management” comprises the completed further training program, which will be carried out regularly by individual project partners in the future.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons are shown as Results 3.6 Evaluation concept and reports training program "Sustainable Management" and prospects of further implementing.

Result 3.6 Evaluation concept and reports Training program "Sustainable Management" and Prospects of further implementing

A further training program “Commercial Specialist in Sustainable Management” was developed. This further training program was integrated into the trial Bachelor's degree course “Business Administration & Sustainable Management of SMEs” (see Result 3.3) but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons as well as the planning of future uses are shown as Results 3.6 Evaluation concept and reports training program "Sustainable Management" and prospects of further implementing.

Result 4.1 Concept, curricula and module handbook for three-cycle dual study program "Engineering in Management of Renewable Energy Technology in Buildings"

A Bachelor's degree course in “Engineering in Management of Renewable Energy Technology in Buildings” has been developed, which also integrates initial and

continuing vocational training and combines theory (learning at the university) with practice (learning in the company). This “trial” course of study is designed in such a way that

- a) it can also be completed without initial vocational training.
- b) the integrated continuing education program “Energy Service Manager/Energy Consultant” with a recognized continuing education qualification can also be carried out separately without studying.

Main modules of the developed study program were tested, evaluated and the entire study program was finalized based on the evaluation results. The concept and module handbook of the study program including the transition of the VET program form Result 4.1 Concept, curricula and module handbook for three-cycle dual study program "Engineering in Management of Renewable Energy Technology in Buildings". The trials, implementation report, evaluation concept and report are listed in Result 4.2 Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings".

Result 4.2 Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings"

A trial Bachelor's degree course in “Engineering in Management of Renewable Energy Technology in Buildings“ was developed, in which initial vocational training and further vocational training are integrated and which combines theory (learning at the university) with practice (learning in the company). First of all, the qualification requirements had to be analyzed, and a concept developed, discussed and agreed. Building on this, the entire work of developing the curriculum and module handbook was carried out, discussed and agreed. After this time-consuming work, there was no time for accreditation and complete implementation during the three-year project period.

However, the most important main modules were trialled, and the following objectives were pursued:

- Testing the degree program in live operation at the university and quality assurance.
- Initial qualification of students at the university and in companies.

An evaluation concept was developed for the tests, and the degree program was finalized on the basis of the evaluation results. Finally, accreditations and implementations were prepared after the end of the project period.

The results of this work are presented in 4.2 Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings".

Result 4.3 Examination regulations "Energy Service Manager / Energy Consultant"

Official examination regulations with recognized further vocational qualifications have been developed for the two further vocational VET programs of the BA&VET project:

- Commercial Specialist in Sustainable Management
- Energy Service Manager/Energy Consultant

These examination regulations are reproduced in the English version in Chapters 2 and 3.

A procedure for the evaluation and international recognition of the two further vocational education degrees was also developed and is presented in Chapter 4.

4.4 Concept, curricula and teaching materials further training program "Energy Service Manager/Energy Consultant"

A further training program “Energy Consultant” was developed. This training was originally called “Energy Service Manager”. However, as part of the development work, the project consortium decided to give this training the title “Energy Consultant”.

This further training program was integrated into the trial Bachelor's degree course “Engineering in Management of Renewable Energy Technology in Buildings” (see Result 4.1) but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

Result 4.4 Concept, curricula and teaching materials further training program "Energy Service Manager/Energy Consultant" comprises the completed further training program, which will be carried out regularly by individual project partners in the future.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons are shown as Results 4.5 Evaluation concept and reports training program “Energy Service Manager/Energy Consultant” and prospects of further implementing

4.5 Evaluation concept and reports training program “Energy Service Manager/Energy Consultant” and prospects of further implementing

A further training program “Energy Consultant” was developed. This further training program was integrated into the trial Bachelor's degree course “Engineering in Management of Renewable Energy Technology in Buildings” (see Result 4.1) but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons as well as the planning of future uses are shown as Results 4.5 Evaluation concept and reports training program “Energy Service Manager/Energy Consultant” and prospects of further implementing.

Result 5.1 A coordinated approach to promoting innovation by SMEs

Within the framework of the project "Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)",

- a) two further training courses
 - Commercial Specialist in Sustainable Management
 - Energy Consultant

are being developed, tested, evaluated, transferred and implemented for SMEs. At the same time, these training courses are intended to promote innovation in the companies.

- b) two three stage dual Bachelor's degree programs with integrated vocational education and further training
 - Business Administration and Sustainable Management for SMEs
 - Management of Renewable Energy Technology in Buildings

are newly developed, practically tested, evaluated and implemented.

In direct connection with the implementation of further trainings (a) and Bachelor programs (b)), innovation support for companies is to be realised. For this specific support of enterprises, a concept is presented which were applied and evaluated during the project period in connection with the testing of the education programs.

Result 5.2 Evaluation concept and report for innovation support and R&D projects carried out in SMEs

A specific concept was developed for the promotion of innovation and realization of manageable R&D projects in SMEs (see Result 5.1). In accordance with this concept, innovation promotion and R&D projects in SMEs were carried out in conjunction with the implementation of the dual (trial) Bachelor's degree courses during the project period. This funding was evaluated, and the funding concept was revised and finalized on the basis of the evaluation results.

Result 5.2 Evaluation concept and report for innovation support and R&D projects carried out in SMEs comprises summarized reports of the R&D projects carried out, the evaluation concept and an evaluation report.

Result 6.1 Handbook with all project results

Towards the end of the project, the most important results of the project were summarized in a manual with application notes. The manual is available in bookshops and can also be downloaded free of charge from the project website <https://ba-vet.eu/> and the EU dissemination platform.

Result 6.2 Report dissemination activities and implementation consulting

All results of the project were transferred to 70 chambers, SME associations and colleges/universities from 13 countries, which received implementation advice and are involved in the project work as associated partners from the beginning of the project.

At the beginning of the project, the following were developed and agreed in the consortium:

a) A strategic plan for the implementation of the dissemination activities on the project and its results.

b) A form to plan and record all dissemination activities including activities to be carried out, target groups, target numbers, deadlines, etc.

On this basis each partner made an initial planning of the activities. An update of the planning and a recording of the activities already carried out was made by each partner every year. The results achieved and the further plans were intensively discussed and agreed with all partners at the biannual project workshops.

Result 6.2 Report dissemination activities and implementation consulting includes:

- The strategic plan for the implementation of the dissemination activities.
- Measures and results of dissemination activities and implementation consulting.
- Measures of further dissemination activities of all project partners.

Result 6.3 Binding action plan with financing plan for the continuation of activities after the end of the project

Towards the end of the project period, the lead partner Hanse-Parlament drew up a work and financing program for the continuation of the work after the end of the project, which was initially discussed and agreed in the project consortium. This was followed by consultation and coordination with all 70 associated partners.

Result 6.3 “Binding action plan with financing plan for the continuation of activities after the end of the project” comprises an agreement on the continuation of tasks after the end of the project, which was bindingly adopted by the project and associated partners, and which also includes the tasks to be carried out and their financing.



Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



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3. Results of the evaluations and quality assurance

3.1 Methods and goals of evaluation

Numerous evaluation methods and standards have been established on an international level. The comparison of applied methods shows that concerning the validity evaluation criteria, they play a significant role (cf. among others Widmer, Th., Evaluation: Ein systematisches Handbuch, Wiesbaden, 2009).

Depending on which criteria certain priority is assigned to, the evaluation results turn out correspondingly.

The same significance has pragmatic direction. Therefore, the question: which goals have to be reached with the evaluation?

As a rule, the evaluation has the following goals:

1. It has to provide objective knowledge about the progress (quantity and quality) of processes.
2. It serves to control such processes and helps to capture the strong and the weak points. Therefore, it is an instrument of quality assurance.
3. It serves legitimization. In other words, a successful evaluation is evidence of competence of the person responsible for the process being evaluated.
4. Transparency, to make a dialogue possible.

In order to achieve these goals, the evaluation was performed in a process-related and summative manner: process-related (also formative, development-related) in order to evaluate the quality of the project progress and if necessary, to make changes. The

summative evaluation or evaluation of results serves the evaluation of the specified objectives within the framework of the project, final evaluation of impact and efficiency of the project lecturers management, of cooperation and transfer.

As a rule, it is reasonable to use a combination of qualitative and quantitative instruments for evaluations: “If one wants to ensure the availability of statements concerning relevant pro-program conditions and impacts through the framework of mutually reinforcing evidence so the multiple methodical access providers, in general, a more comprehensive and informative picture than a monomethod approach” (Brandtstädter, Jochen (1990): Development during the course of life. Approaches and problems of lifespan development psychology. In: Mayer, Karl Ulrich (Hg.): Life courses and social transformation (special issue of the Cologne magazine for sociology and social psychology. Opladen: Westdeutscher Verlag.).

Whereas for the analysis of process-related data (program control, execution etc.) first of all qualitative survey methods are suitable, for the verification of achievement of the goals, of impact and causal assessment quantitative survey and evaluation methods have to be implemented (Stockmann, Reinhard: Was ist eine gute Evaluation. Saarbrücken: Centrum für Evaluation, 2002. (CEval-Arbeitspapiere; 9).

Within the framework of evaluations, the most frequently used methods are:

- Secondary analysis of available materials
- Guided interviews
- Standardized surveys or partly standardized surveys
- Case studies

Which methods are selected and implemented in particular depends on the central questions of evaluation discussed herein, therefore which goals and tasks are set, who performs the evaluation, and which research paradigm must be the basis for this.

Within the framework of the present evaluation the mixed model – consolidation model – is implemented. According to the general description it means that first of all quantitative survey/research is performed. The obtained data material is subsequently evaluated quantitatively, then it is followed by qualitative research method which is aimed at the consolidation of achieved results. So, it provides material for the interpretation of expected and unexpected effects and illustrates the results of quantitative studies on the basis of case examples.

Therefore, for the evaluation of the BA&VET project standardized as well as partly standardized surveys were used in the form of written questionnaires during planned and conducted partner workshops as well as an online survey. Complementary results were achieved after that with the help of guided interviews.

The secondary analysis of available materials was also included in the broadest sense, i. e. for the registration of framework data of the project the control instrument “Activity planning” and “Project application” were evaluated in order to capture project goals, terms and tasks of the project consortium and to take them into account during the implementation of separate evaluation steps and assessments.

3.2 Quality assurance and evaluation of educational measures

In the context of the project, the following educational measures shall be developed, tested, evaluated and implemented:

- In Work Package 2 Train the Trainer program for the qualification of teachers, consultants and university lecturers for the implementation of dual bachelor’s degree courses, demanding further education as well as innovation promotion and R&D projects in and with SMEs.

- In Work Package 3 three stage dual study program “Business Administration & Sustainable Management for SMEs”.
- In Work Package 3 further Training program “Commercial Specialist in Sustainable Management”.
- In Work Package 4 three stage dual study program “Management of Renewable Energy Technology in Buildings”.
- In Work Package 4 further Training program “Energy Consultant”
- In Work Package 5 Innovation funding and R&D projects with and in SMEs

A specific concept for evaluation and quality assurance was developed by a project partner for each of the above educational and funding measures and agreed within the consortium. On this basis, the respective partner evaluated the testing of the educational programme and developed an evaluation report including recommendations for future applications. The evaluation concept and the evaluation report are part of the respective educational programme and are accordingly reported together with the curricula, teaching materials, examination regulations, etc. in the results of the respective educational programme.

Quality assurance for all professional educational measures shall follow EQAVET. The development of curricula for study programs shall follow the guidelines of an official certification body.

Target groups and beneficiaries are SMEs, their owners, managers and specialists, youth and students. In order to completely understand their true requirements, representatives from SMEs as well as other target groups shall be engaged intensively. SMEs shall be included in technical discussions and practical testing as well as taking part in workshops from the very beginning.

In order to cover differing national requirements, the educational measures developed as part of the project shall be tested in different countries through trials and evaluated scientifically using written participation surveys, interviews with participants, teachers and SMEs as well as accompanying observations.

Indicators include number of participants, distribution across industries, position in the company; satisfaction levels of the participants with lecturers, organization, documents, etc.; assessments of the lecturers; evaluations of SMEs regarding practical relevance; results of examinations and project work.

Institutions of higher education implement specific R&D tasks for and with individual SMEs for specific aspects of Sustainable Management and Renewable Building Energy Technology in the context of cooperation between institutions of higher education with SMEs. Requests and tasks come from the SMEs which participate as the training partner for dual programs of study or from other SMEs through arrangements with their chamber. The results are the property of each SME. They shall only be used in this context and only with the agreement of other interested parties. Research activities of institutions of higher education during editing of the SME specific R&D tasks shall be considered part of the daily work of the company. Therefore, the R&D requirements of the company shall be included within the development work of the universities.

3.3 Quality assurance and evaluation of processes

Planning includes two areas of project implementation:

1. Processes of project implementation

Quality assurance and evaluation of project management, partner meetings and further tasks in the context of Work Package 1 "Project Management".

2. Processes of Transfer and Implementation

Quality assurance and evaluation of written and personnel transfer, individual implementation counselling as well as additional measures for distributing the project results in the Work Package 6 "Dissemination and Implementation".

As the planning and control mechanisms as well as the data collection and evaluation are identical for all two areas, the relevant planning that follows shall be the same for all.

Concerning the evaluation criteria which must be used in relation to the evaluated processes, the opinions in scientific literature diverge strongly. Often it is recommended to use checklists which contain up to 100 and more criteria according to which the processes can be evaluated.

To ensure the practicability of the evaluation but nevertheless to assess the results thoroughly, the evaluation of the project implementation concentrated on four criteria.

1. The quality and the efficiency of management
2. Communication and cooperation in the project consortium and in the Knowledge Alliance
3. The involvement of transfer recipients and success of transfer activities
4. The expected benefits of implementation of products developed within the framework of the project

According to international experiences with evaluations which are available first of all in the English-speaking countries a holistic (integral) evaluation of processes should have the priority.

During the evaluation of the registered data the focus was on the following criteria:

- a) How do project partners assess the cooperation in consortium and the project management of the Lead Partner?
- b) Have the expectations of the project partners been met?
- c) Did the management meet the requirements?
- d) How do transfer recipients assess their involvement and the transfer activities?
- e) What benefits do the developed products have for the project partners and the transfer recipients?

3.31 Planning and control mechanisms

The project uses four central planning and control mechanisms:

1. A binding agreement with
 - foundations of implementation
 - responsibilities and consequences of non-compliance
 - detailed description of goals, activities and envisaged results
 - tasks, obligations and budgets for each partner
 - binding rules of management and accounting statements
 - uniform paperwork for work reports, registration of working times etc.

The agreement shall be developed by the Lead Partner at a workshop with input and votes from all partners and agreement from the Lead Partner and each individual projected partner by 31 January 2023.

2. A differentiated activity plan which sets out individual work steps, tasks, events, etc., until the end of the project

- responsible and contributing partners
- deadlines for implementation and execution
- goals and expected results
- all tests and implementation
- quantity structures and quality criteria

This plan shall be created by the Lead Partner at a workshop along with all partners, who advise, vote on and adhere to a binding agreement. Therefore, the activity plan from the Lead Partner shall be monitored, updated and discussed at bi-annual workshops with all partners.

3. On the basis of a uniform foundation, each partner shall vote on a communication and dissemination plan from the Lead Partner with target groups, deadlines, indicators, obligations, dissemination measures etc.

An initial plan shall be created by all partners by 31 March 2023.

An initial record of all measures implemented and an update to the plan shall be created by all partners by 30 November 2024.

The final record of all measures implemented shall be created by all partners by 30 November 2025.

The communication and dissemination plan shall also be discussed at bi-annual workshops.

4. The Lead Partner shall develop a separate project accounting plan with sub-budgets for each partner and financial specifications for tasks undertaken. For this

purpose, money for the expenses shall be reserved. The partners shall only receive payment when the agreed task has been completed, and all receipts have been submitted.

The activity and dissemination plan as well as accounting are the central control and monitoring instruments with regards to achieving project goals, implementation of all activities, compliance with all deadlines, cost-effective implementation and financial development. Monitoring and accounting shall be run by an experienced employee of the Lead Partner, who is responsible for compliance with all requirements, assessments of invitations for tenders, cost efficiency, etc. In addition, the Lead Partner shall create an external tax consultancy office for monitoring and evaluation, which is also responsible for compliance with all requirements, fiscal accounts and cost efficiency. Planning and monitoring results shall be consulted at meetings where all partners are present. Large savings, greater cost efficiency, faithfulness to goals and deadlines and attaining greater quality shall be ensured with this approach.

3.32 Project Management

Partner 1 Hanse-Parlament shall be responsible for overall project management, which includes:

- Creation, coordination and completion of a partner agreement
- Creation and coordination of a differentiated activity plan for the entirety of the project period
- Development and coordination of a communication and dissemination program with each partner
- Creation and continual implementation of separate project accounting

- Bi-annual activity report and statements with all receipts from all partners
- Continual administrative and financial project management
- Creation and publication of 2 newsletters yearly
- Securing communication and intensive bilateral exchange between the Lead Partner and project and associated partners
- Preparation, management and follow-up of at least six workshops with all project partners
- Preparation, management and follow-up of an international counselling and transfer conference
- Creation of mid- and final reports with project accounting

In addition to the data, results, etc. that result from the central planning and control mechanisms, the following sources of data shall also be used for the evaluation of project management:

- Written evaluation of each partner workshop
- Reoccurring, anonymous electronic survey of project and associated partners
- Comprehensive personal interviews with project and associated partners using external experts

The results of the evaluation shall be reviewed with all partners through workshops and used in additional projects, resulting in a continuous improvement process. A comprehensive project management evaluation report shall be created by Partner 1 Hanse-Parlament.

3.33 Transfer, implementation and dissemination

1. Development and agreement of a communication and dissemination plan individually for each partner with separate activities including transfer, counselling and further dissemination, target groups, deadlines, etc.
2. Preparation of concepts, curricula, teaching materials and instructions for use for all educational and other measures developed as part of the programme as well as paper and electronic transfers for all direct and associated project partners from 13 countries as well as additional education institutions and stakeholders
3. Individual implementation consulting for project and associated project partners from 13 countries as well as additional education institutions
4. Creation of a book for all results of the project and distribution through a publisher
5. Implementation of measures for further dissemination
 - Complete results, materials, etc., shall be made available on three Internet platforms accessible to the public as well as on the websites of the project partners
 - The project results and its uses shall be reported intensively in at least three press conferences and at least six press releases.
 - Ongoing information for all project and associated partners on their own platforms and in member journals
 - Project and associated partners introduce the results of the project into the political decision-making processes of their daily business with special support of work-based learning

- The project results, possibilities of use, etc. shall be presented in person to at least 18 third-party institutions, including universities and business forums, in different countries
- Partner 1 Hanse-Parlament is an international organisation in numerous political committees and shall inform them about project goals and results, in order to further promote their inclusion in political decision-making processes.
- In addition, seven result videos are to be created.
- An international consultation and transfer conference will also be held in Gdansk.

In addition to the data, results, etc. that result from the central planning and control mechanisms, the following sources of data shall also be used for the evaluation of transfer, implementation and deployment:

- Reoccurring, anonymous electronic survey of project and associated partners
- Comprehensive personal interviews with project and associated partners using external experts

The results of the evaluation shall be reviewed with all partners through workshops and used in additional projects, resulting in a continuous improvement process. A comprehensive transfer, implementation and deployment evaluation report shall be created by Partner 1 Hanse-Parlament.

The following are published on the project website with public access <https://ba-vet.eu/>:

- Result 1.2 Quality manual
- Result 1.3 Report on the results of all evaluations and quality assurance



Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



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4. Results of the analyses of the economy and skill needs

4.1 Analyses of the economy, demography, education and labour markets

The analyses refer primarily to the countries of the Baltic Sea Region. The Baltic Sea Region comprises eleven countries, eight of which belong to the EU: Denmark, Sweden, Finland, Estonia, Lithuania, Latvia, Poland and Germany. Three neighbouring European countries border the region - Belarus, Norway and Russia. For reasons of availability, comparability and need for statistical data, Russia and Belarus are not included in this study.

The current socio-economic situation in the Baltic Sea region is analysed, taking into account demographic and economic aspects. A comprehensive overview of the education markets and national education systems is also provided.

Included in the analyses are:

1. All partner countries in the project, so that
 - uniform basic data are created for all development work of the BA&VT project.
 - the national and legal conditions and needs that have to be taken into account for the development and implementation of the project's education measures are recorded.
2. The countries of the 70 associated partners involved in the project implementation as transfer recipients and implementation partners. In this way, the development of the economy, demography and labour market as well as the legal and national

conditions are already included in the development work of the project for these countries as well, and thus the later transfer and implementations of the project results are significantly promoted. Hungary is also included as the only country that does not belong to the Baltic Sea Region, since Hungary, as a long-standing member of the Hanse-Parlament, is an important transfer recipient and implementation partner.

The analyses carried out cover the following areas:

- Mapping the Baltic Sea Region: Demography, Migration and Urbanisation
- Macroeconomic Conditions and Trade
- Labour Market Development
- Educational Markets
- Education Systems in the Baltic Sea Region Countries

From the entire report, which comprises 140 pages and is published in full on the project website <https://ba-vet.eu/>, only the synopsis of education systems, which is particularly important for the BA&VET project, is reproduced below with brief recommendations for future education policy.

The different cultures, educational systems and achievements of the various States of the Baltic Sea Region provide an excellent basis for learning from one another and with one another. The major concern is to promote this, to identify points for further development in the educational policy and develop proposals regarding the specific development and quality of education in the Baltic Sea Region. The focus of the considerations lies in the areas of the general and vocational education; university education is subsidiary and included particularly as regards the transitions and regulatory requirements.

General education

Kindergartens exist in all the countries of the Baltic Sea Region – with significant differences in the levels of care. They are open form children from 3 to 6 or 7 years of age (depending on the starting age), attendance is voluntary.

Conclusions: Learning begins at a very early age; kindergartens should be understood not as mere storage sites, but as early learning and development while playing.

Preschools exist in almost all countries, mostly they are meant for children of the last year before starting school. An exception is Estonia in which 3-7-year-olds attend preschools. In principle, the preschool attendance is voluntary. A compulsory preschool attendance exists in Latvia (for 5-6-year-olds) and in Poland in the form of the so-called zero classes, which are attended by 6-year-olds who learn the basic skills in reading, writing and arithmetic.

Conclusions: A mandatory 1-year pre-school (from 5 years) is desirable.

The compulsory education in the Baltic States is between 9 and 10 years. It begins with the enrolment (6- or 7-year-olds). Only in Denmark there is no compulsory school attendance but the compulsory education. This allows for the attendance of the so-called free schools.

In Scandinavian countries there is an explicit guarantee of a further education after compulsory schooling. This law applies in Sweden in terms of a further 3-year education (until 18 years of age); an extension till 20 years of age is planned. In Germany and in Russia compulsory (school or vocational school) attendance applies until 18 years of age.

Conclusions: As regards the compulsory school attendance, the general educational law provides for the age of up to 18 years.

The middle school education (primary or secondary school) is in all countries between 9 and 10 years.

There are significant differences in the distribution of school time. In the Scandinavian States of Denmark, Finland, Norway and Sweden there is 9-year basic education that is uniform and without distinctions for all children. Only in Sweden there are slight differentiations concerning the last 3 years.

In other countries within the 9- or 10-year basic education there is a clearer distinction between primary, secondary and middle school. The primary school in Poland encompasses 6 years. In Germany, Lithuania, Russia and Belarus, the primary school attendance is much shorter with a period of 4 years. In these countries primary school is followed by middle school education in many various forms. In Germany there is a choice between high school, junior school, secondary school and grammar school. In Poland the 6-year primary school is followed by a 3-year middle school. In Russia and Belarus, it is followed by 5-year and 6-year middle school, which despite the formal separation of basic and intermediate levels, is mostly located in one school.

The biggest difference between the school systems are the integrated and selective approaches. In the integrated school system, all 9- to 10-year students undergo school education (mostly referred to as basic education). In selective school systems, division of students takes place after the primary school. The former type of school can be found mainly in the Scandinavian countries; the latter is particularly pronounced in Germany.

Conclusions: The selective system is expected to be better targeted, and specific strengths will be supported, though actually the promotion of individual strengths may only be a small-scale experience. In some countries there is an impression that all people should learn by means of the same methods. It results in strong uniformity. In selective education systems everything is strongly divided and marginalised. However, the targeted elite promotion and sustainable support of weaker students is rather limited. Nowadays, in particular Baltic States up to 20 per cent of school graduates are incapable of undergoing vocational training. They are excluded and have no chance for

their whole life. However, each person has at least one strong point which can give them a good chance if it is supported within the framework of education and encouraged in the economy, can be put in the right place.

Individual support will be primarily determined by an appropriate education and appear in principle in all schools (with and without selection). Small and medium-sized enterprises demand from general education no narrow economic focus, no general vocational orientation, but the preparation for life in general. The graduates must have mastered the basic cultural techniques such as reading, writing and arithmetic well and they must have personal-social skills such as readiness to learn, openness, cooperation and motivation. But these skills and characteristics are needed not only in the economy but also, they are generally required for mastering life. The acquisition of personal-social skills and learning from one another in integrated school systems is generally possible.

The secondary stage encompasses 2-3 years in all the Baltic States. In many countries there is a choice between general and vocational secondary schools, for example in Denmark, Germany, Poland and Finland. In Sweden the elements of vocational training are provided in all types of high schools to a varying extent. In the Baltic States, Russia and Belarus there are only general education schools, in which, however, an occupation-based focus of education is possible.

In the Baltic Sea countries, the secondary stage, high school is completed with the diploma entitling to a university degree; in different countries also complementary or additional entrance exams for studies are needed.

Conclusions: The various forms of pedagogy and content taught are much more important than the different school structures. Educational systems are often excessively intellectualised and become too heavy. In many areas, they only support certain unilateral ability and threaten to become a special institution which fails to educate young

people in a holistic and supportive way. The general character of vocational education has to be compared to the one-sided ideal of education. Even in the general educational the intellectual, musical and manual skills are taught to the same extent. The introduction of technology education, learning in the practical action and a holistic education is essential. Education must include all the senses. If this prerequisite is not met, there can be no real learning.

For the students and for their future career, it is advantageous when vocational elements are taught in secondary schools. In this way, interest in choosing a career can be increased also in the case of high school graduates and the learning of a profession also becomes attractive. A polytechnic focus in general education is the best approach to encourage all the young people and the people of all abilities.

Vocational education

The training duration is between 2 and 4 years. In almost all the Baltic Sea States training takes place at full-time schools. Practical elements are acquired by means of vocational practice, project works and training workshops. An exception is the dual training in Germany (about 60 per cent of vocational training courses are conducted in this way). In this case the apprentice training contract needs to be made with one or more companies; the theory can be obtained in an external state vocational school. In Denmark and Norway, there is a mixed form, and the basic training is conducted at a vocational school, and then main training takes place in enterprises. If in Germany, Denmark and Norway not enough training places are available, also here vocational training is conducted at schools with integrated practice internships. In Poland, apart from the school education, also a dual course is possible; it was introduced; however, few students actually take it into account.

Sweden, at least 15 per cent of the training must be acquired in companies; an increase of this share to 20 per cent is being discussed.

Conclusions: A significant expansion of the practical training periods in companies, a further improvement of the theoretical teaching, and better coordination between practical and theoretical training seem to improve the quality and increase the attractiveness of training which is particularly important.

Majority of the countries have no entry requirements for vocational training. Some states, however, differ in this respect: In Estonia a high school diploma is needed to pursue vocational education. In Finland job-related requirements concerning the acquired qualifications are set for each profession at different levels.

Conclusions: The introduction of uniform access conditions in the Baltic Sea Region which would be profession-specific should be examined.

In some countries, courses are offered at different levels (e.g. in Latvia and Lithuania). The lowest level is open to young people without qualifications, with duration of 1 - 2 years and provides simple professional qualifications. The middle level encompasses 2 - 3 years and provides practical and theoretical qualifications. The upper level provides advanced skills for stronger students (e.g. for high-school graduates). In Denmark and Sweden there is a guarantee that each person can obtain vocational education regardless of their previous education.

Conclusions: In particular, the crafts are destined to train young people with learning difficulties. They are willing and committed to this social problem. But craft businesses may not be the sole specialist for the training and integration of weaker students. Crafts need also the best students to a large and still increasing extent. The creation of differentiated training courses with different entry requirements and different levels of training in an open, transparent system is a priority for targeted development of professional training.

The educational systems of Russia and Belarus are in the course of a transition process. With the collapse of the Soviet Union, the previously existing structures and the

close co-operation with the large companies is falling apart. Outdated curricula and equipment contribute to the loss of prestige and the level of vocational education. Russia has shown great interest in the dual system and works on the reform of the professional training, together with German partners. However, social partnerships are created gradually. In Belarus, vocational training takes place in public schools on a full-time basis.

Conclusions: As part of the Russian and Belarusian reform process, an intensive learning from the experiences of other the Baltic Sea States is possible and appropriate. The provision of information, exchange of experiences, development of partnerships and other support is suitable in a way that is also within the interest of the other the Baltic States. The cooperation in education also promotes sustainable economic cooperation.

In most countries of the Baltic Sea vocational training with a recognised qualification examination on the basis of state examination regulations will be terminated. The entitlement to pursue technically oriented courses of study is connected with it especially in Denmark, Latvia and pronounced in particular in Finland. In Sweden such a university entitlement is valid for employees being at least 25 years old and having 5 years of professional experience. In exceptional cases (e.g. Estonia) vocational training is completed with a certificate of completion which is not a formal qualification.

Conclusions: In all the Baltic countries, vocational training should be completed with formal degree examinations, which are based on comparable standards and mutual recognition. The right of ruling the vocational education as well as all intermediate and final examinations should be transferred as sovereign tasks to the chambers in all Baltic Sea states. Due to its closeness to the enterprises the economic self-administration can perform these tasks in a more proper and cost-efficient way. An appreciation of the professional education with strong gender equality in higher general qualifications and a higher permeability is needed between vocational education and studies.

In the majority of the Baltic countries, training has lost much of its attractiveness; too low levels, poor quality and limited practical skills and experience are the subject of complaints. For example, in Poland only around 11 per cent of school graduated decided to pursue vocational training. In some countries (e.g. in Germany and the Scandinavian countries), efforts are intense in order to improve the situation. In Sweden the vocational schools are located exclusively on the upper secondary level. In addition to the appreciation, the vocational training and quality improvement of the theoretical instruction in particular, expansion and optimisation of practical training is pursued.

Conclusions: A major problem in all the Baltic States is the declining popularity of vocational education. For young people it is desirable to go to high school and pursue university education. Demographic trends exacerbate this problem. Craft businesses are especially affected in this case. Young people prefer a course of study or training in other sectors in the so-called "white collar" occupations. Any increase in the attractiveness and quality improvement of professional education are the overriding tasks for the promotion of crafts and SMEs within the Baltic Sea Region.

There are much differentiated systems within the framework of vocational training. In Germany, vocational training is not regulated predominantly by the state. The organisation of training and acceptance tests are principal task of the economic self-government (chambers). In most States there are public or private systems with vocationally oriented higher educational institutions like vocational schools, technical schools, technical universities and colleges, which offer higher professional qualifications and include more or less smooth transitions to universities and colleges.

Conclusions: Vocational training should in the first place be the responsibility of the business and economic authorities and it should be regulated by the state in a very limited way. Very important, however, are the quality improvements, greater transparency, smooth transition to general education and study, as well as mutual recognition of qualifications based on comparable standards. The work of the EU on the creation

of a European education system within the Baltic Sea Region with the European Qualifications Framework (EQF) and Credit System (ECVET) could be a good basis for the creation of innovative, non-bureaucratic systems with high quality.

In most of the Baltic Sea States within the framework of the pronounced harmonisation of European educational systems, the introduction of bachelor's and master's Degrees is already at an advanced stage. The Bachelor can be obtained only 3-4 years of studies; on the basis of it, a 1-2-year scientific study takes place, which is completed with a master's degree. In addition to this, promotion is also possible.

In a number of countries already the completed high-school education is an entitlement to enrol for studies at a university or college. In some States (e.g. Denmark, Germany, Finland, Latvia and Sweden) the system is more permeable; it focuses on the universities and colleges, as well as individuals with specific professional training or further education or vocational qualifications with several years of professional experience.

In Finland, Russia and Belarus the universities conduct entrance examinations. In the case of failing these exams, there is, however, still the possibility to study in Russia and Belarus but it is necessary to pay a tuition fee.

In some countries it is possible to apply to a non-scientific university or academy after graduating a vocational school. However, these are not university or college studies with recognised academic qualifications, but training courses which are situated between vocational training and studies.

Conclusions: In connection with the far-reaching reforms under the Bologna process and the widespread introduction of the bachelor's and master's degrees, Bachelor courses should be much more practice-oriented and offered as a dual system.

The vocational further education with high permeability and flexible transitions for the study will gain an increasing importance and needs to be established as a separate training area. Also, here the Baltic Sea Region can perform the pioneering role with its innovative and business-related concepts.

4.2 Analyses of skills needs in the green economy

Based on the analyses of the development of the economy, demography, education and labour markets (see Result 2.1 Report on results of analyses of the economy, demography, education and labour markets), the qualification requirements and needs in the Green Economy for SMEs in the Baltic Sea countries were examined as a further basis for the development and implementation of the education measures of the BA&VET project. First of all, statistical documents and literature were analysed and on this basis conclusions and recommendations for education policy were developed.

As part of another project, comprehensive research and surveys were conducted on the qualification conditions and needs for SMEs in the Baltic Sea countries in the Green Economy. These comprehensive studies were analysed for the BA&VET project, which is strongly concerned with qualifications in the Green Economy.

Of the comprehensive report, which is published as Result 2.2 “Report on the results of analyses of skills needs in the green economy” on the project website <https://ba-vet.eu/>, only a brief summary with recommendations for educational and regional economic policy is presented below.

Further decrease in transport and communication costs increases the mobility of production factors. Enterprises migrate to locations with high potential of professionals and workers, to locations with attractive educational opportunities and diverse labour market.

The local competition for (highly) skilled workers and capital is as a result more intense.

Education programs are a key competitive factor. Education policy, therefore, enhances to a large extent the overall location, regional and spatial planning policy.

Education promotes innovation and competitiveness and includes the main support task for small and medium enterprises. Education policy must be organized and have the highest priority over other types of policies. Understood in this way, the Baltic-wide concerted education policy must:

- increase the competitiveness of the entire Baltic Sea Region.
- promote and develop human capital and the existing advantages and strengths.
- specifically develop individual sub-regions and optimally support the competition between locations within the Baltic Sea Region in order to support the best educational opportunities and qualified professionals.
- together with the overall attractiveness and competitiveness of the Baltic Sea Region compared with other regions, increase migration of workers and enterprises.
- be enshrined in the EU Baltic Sea strategy and have priority.

Politics, economy and society of the Baltic Sea Region must address their outstanding position of education policy, and it is necessary to recognize that investment in human capital is the safest and brings the best profits.

The German system of dual vocational education, which leads to a comparatively low youth unemployment, integrates enterprises in the task of ensuring the influx of junior staff, as well as combines the requirements of the labour market with the

enterprises in a much better way, can provide large contributions to the achievement of objectives with a lasting impact.

The introduction of dual systems of vocational education is the most innovative in the countries with school-based vocational education. This is connected with far-reaching reforms and extensive changes, which constitute a major challenge to these countries. The involved countries are in principle interested in implementing dual vocational training; however, they are afraid of great expenses and risks connected with the conversion.

It is also impossible to simply transfer the existing dual systems (e.g. from Germany). It is rather necessary to consider the regional conditions, political conditions, cultural differences, experience, etc., as well as lead to appropriate changes and adjustments, and implement customized solutions which comply with the basic principles of dual vocational education.

In some countries, up to 15 – 20% of school graduates cannot start their professional education, since they lack general education knowledge and/or there are problems in social behaviour. This also includes a significant proportion of young people who cannot start their vocational education immediately despite the acquired training maturity. These young people wait in long queues or receive no vocational training, and as a result are prone to face unemployment.

Up to 30% of young people, who complete vocational education, break it up; only about a half of them begin a new vocational education course. A substantial proportion of dropouts fail in theoretical parts of education. The central reasons for this are that the academic knowledge for the selected profession is not sufficient; the career choice made does not correspond with the actual tendencies or competences due to the absence of relevant information and experience or problems or personal and social behaviours.

Vocational education has lost much of its attractiveness. Especially in the new countries of the EU (e.g. Lithuania, Latvia, and Estonia) with primarily school-based vocational education, the training participation is low, dropped to an alarmingly low level, and is perceived as a dead end by many young people. In a few countries (e.g. in Lithuania) only one- or two-year programs are carried out in the school-based vocational education, which open a faster entry to the labour market with a higher earning potential, however, they do not qualify in a sufficient way and increase the unemployment of young people on an ongoing basis. Only short internships take place in enterprises, so that work-based learning is conducted to a very limited extent. The consequence is the unemployment of 15 – 24-year-olds at the level of 28 – 30% in Lithuania or Latvia. Insufficient professional qualification leads to long-term unemployment which amounts to e.g. 20% in Poland, 28% in Latvia, and 40% in Lithuania for persons with only primary and lower secondary education.

At the same time, companies complain about the lack of skills of graduates. School-based vocational education can consider the conditions of the labour market and the qualification requirements of enterprises only to a very limited extent, since there are few aligning mechanisms between the number of training places and the development of the demand of workplaces. In the case of school-based education, there is little contact between schools and enterprises, so that the qualification requirements of enterprises can be included in the training only inadequately. The students learn the everyday business life only in a very limited way, are not sufficiently involved as interns in the company's operations, and the increasingly important personal and social competences can be taught in the classroom only to a limited extent. After a survey conducted in enterprises by the Baltic Sea Academy in Lithuania, 70% of SMEs require additional skilled employees who are very difficult to acquire. 96% of SMEs require better practical training, and 74% better theoretical training.

Because of the demographic change, the number of school leavers in all Baltic States has dropped significantly, with the exception of Sweden. By 2030, the number of the working population aged 15 – 44 will decrease by 25%. Already today there is a shortage of skilled workers in most countries, which will have an even stronger effect in the future and will strikingly limit the developments. Simultaneously, we can observe shockingly high youth unemployment, in particular due to the lack of vocational qualifications.

SMEs threaten to be a loser in the competition for qualified young employees. Due to a lack of qualified staff, innovations in SMEs are much smaller than they actually should and could be. The shortage of young entrepreneurs, managers, and professionals, as well as significant skill gaps are the factors which limit the growth of SMEs the most. The increase in the qualifications with the simultaneous elimination of the shortage of skilled workers is the most important promotional task and the central key to sustainable strengthening of innovations, competitiveness, and growth of SMEs in the Baltic Sea Region.

Given this, it is of crucial importance to

- a) prioritize the integration of young people and reduction of youth unemployment as well as
- b) the provision of qualified employees to SMEs and a significant reduction in the shortage of entrepreneurs and of skilled workers.

In dual vocational training, about 70 – 75 % of the total training time is spent in the company. This inevitably means that in the case of a transition from school-based into dual vocational education, personnel and spatial capacities are released. The fear of losing a job is a large inhibiting factor for appropriate reforms. It is necessary to develop new areas of activity for vocational schools; continuing education for example is offered, for which there is a large demand in the majority of Baltic States and so far, the

supply has been very limited. Vocational schools must therefore be developed into regional education and innovation centres that are jointly supported by chambers, vocational schools and universities and all tasks from the transition of the general in vocational education, vocational education and training up to dual bachelor's degree programs.

5. Results on solution concepts and models

5.1 Results on solution concepts for the integration of vocational training

For the implementation of this project work, concepts, models and module handbooks for Bachelor's degree programs with integrated vocational training and continuing vocational training were developed, discussed and agreed upon:

- a) “Business Administration & Sustainable Management of SMEs” degree course with integrated recognized continuing education in “Sustainable Management”.
- b) “Engineering in Management of Renewable Energy Technology in Buildings” degree course with integrated recognized continuing education “Energy Service Manager/Energy Consultant”.

Both courses combine practice and theory as well as the integration of vocational training, further education and higher education. In the partner countries of the project, however, the legal regulations on the implementation of dual study courses and the integration of vocational training into study courses vary greatly. Alternative solution models were therefore developed with a view to future implementations for

- the realization of vocational education and training and
- the implementation of Bachelor's degree courses with integrated vocational education and training.

The alternative models and possible solutions developed are listed below as Result 3.1 Solution concepts for the integration of vocational training or in combination with dual study courses.

5.11 Current situation related to permeability of vocational and academic training¹

Whereas in the earlier years and decades a relatively clear distinction was identifiable in the profile of vocational and academic educational and qualification pathways², especially in Austria and Germany as well as other European countries the contours have blurred nowadays.

With the increase of the number of bachelor courses since the beginning of Bologna re-forms in 1999 and their professional differentiation and specialization today many courses have acquired strong professionally utilized components with a view to the requirements of the economy³. On the other hand, in the field of vocational further

¹ Compiled by Berufliche Hochschule Hamburg

² professional training and further training = orientation at operating requirements of economy; academic training = orientation at scientific and research-oriented requirements of society

³ Thanks to the Bologna process especially further development of national higher education systems in Europe, the qualification of specialists for the labour market as well as of the junior scientific staff were taken into consideration. In this regard the increase of the so-called employability plays a special role. It means that university graduates can take up qualified employment on the basis of scientific education (professional and interdisciplinary competences as well as qualifications related to the specific profession). (Source: https://www.bmbf.de/files/Bericht_der_Bundesregierung_zur_Umsetzung_des_Bologna-Prozesses_2012-2015.pdf, p. 5). In actual fact the higher education system thereby becomes closer exactly to the (at least) German vocational training system, because in § 1 paragraph 3 of the Vocational Training Act (BBiG) it is defined for the training that vocational training (...) has to convey required

training the requirements to the participants, for example, vocational further training courses become stricter on the basis of permanent consideration of current technologies and techniques, or they stay consistently strict. These overlaps with other training and qualification systems result in the fact that professional requirements which have to be fulfilled in the professional sphere in some places are more and more difficult to distinguish from the requirements of bachelor courses.

In many cases within rather technically oriented qualification pathways (vocational and academic) it is required to perform a comprehensive and profound analysis of a problem or issue from practical experience having recourse to valid obtained measurement results using approved tools, methods and methodologies, and subsequently to develop reflected suggestions concerning the form and the solution of the problem and to document them in a legal manner.

Therefore, it comes as a little surprise that the question of equivalence of vocational and academic training and qualification pathways and degrees is being increasingly discussed in the European countries which have both: a differentiated academic and at the same time professional training and qualification system (e.g. Germany, Austria, Switzerland). Thereby an important milestone is the creation of the instrument of the national qualification network using which it can be specified on which levels vocational and academic training and qualification can be acknowledged as equivalent. In the German Qualifications Network (DQR) after intensive verification and application of DQR criteria further vocational qualifications was classified on Level 5 and the

professional skills, knowledge and capabilities (occupational competence) within the framework of well-regulated courses in order to perform qualified professional activity in the changing working environment. Also, within the framework of further training in the field of skilled crafts the orientation of the examination in crafts which are subject to authorization according to the criteria of employability and thereby the participation at the market or competition belongs to the cornerstones of the vocational training system. In § 45 paragraph 2 of the Trade and Crafts Code it is determined that “thanks to the master examination it has to be determined if the examinee is qualified to exercise a craft which is subject to authorization and to perform independently as well as properly train the apprentices.

vocational qualification “Meister (Master craftsman)” was classified as equivalent (not: similar) to the academically established Bachelor’s degree.

However, due to diverse national provisions in the laws related to higher and vocational education this basic representation of equivalence in everyday life does not lead to any particular consequences for the holders of corresponding vocational or academic degrees. A master craftsman may not refer to himself only on the basis of obtained master craftsman degree either as “Bachelor” or this fundamental equivalence of degrees in the DQR does not enable him to have simplified access possibility to master craftsman courses.

On the other hand, graduates with a bachelor’s degree also may not refer to themselves as master craftsmen even if they should have acquired their academic bachelor’s degree in a similar professional field.

It is very unlikely that the fundamental legal barriers will be removed in the foreseeable future and a genuine applicability of equivalence will be available in the everyday practice through full recognition of performance in the corresponding other system.

Due to the not complete legal separation of different vocational and academic educational and qualification pathways there are however fundamental possibilities of application of performance results in one system into the other system.

Therefore, for example, there is a fundamental possibility to achieve (at least) partial applicability of performance during one training according to the requirements of the vocational training system in order to have passed both training and qualification pathways in the end according to a very costly procedure which can only be schedulable conditionally as well as be able to use corresponding qualification designations without legal restrictions.

On the other hand, there is also a fundamental possibility to credit vocational qualifications of training and further training in one course of studies at least partially in order also to subsequently obtain a degree according to the model which will be kind of streamlined concerning time, based on vocational degrees.

Both possibilities will be presented and critically examined below.

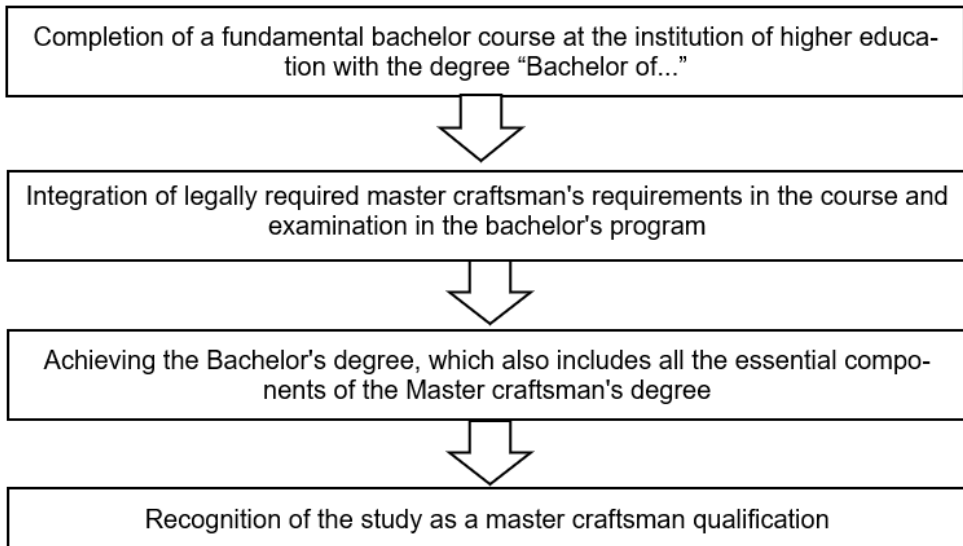
5.12 Possibilities of application of performance results which have been already obtained in one educational system⁴

a. Recognition of academic achievements in the parts of further the vocational master examination

If an academic training is completed successfully the graduate in Germany can be exempt from separate of the four parts of the master craftsman's examination in a craft subject to authorization according to relevant provisions in the Crafts Code if during these examinations at least similar requirements are set as during the master craftsman's examination (cf. § 46 paragraph 2).

Overview 1: On the basis of training to become also a master craftsman

⁴ Compiled by Berufliche Hochschule Hamburg. The possibilities are presented using the example of further vocational training to become a master craftsman.



Peculiarities and problems:

The determination to meet the requirements is up to the examination board of the vocational training organization (as a rule Chamber of Crafts). Thereby the determination of requirements takes place only afterwards, i.e. after the completion of the studies. Thus, there is absolutely no planning certainty, predictability or even "guarantee" for the determination of meeting the requirements of the studies for the master craftsman's examination. Besides, it can be almost impossible that the bachelor course which is designed solely for the purpose of achieving an academic degree reproduces all the parts of the master craftsman's examination completely and extensively.

Therefore, in practice it is about determining the similar requirement for separate parts of the master craftsman's examination but never about complete recognition of the course for all the parts of the master craftsman's examination. Therefore, the still

absent parts of the master craftsman's examination must still be completed additionally by the graduates of a course subsequently with the corresponding amount of effort.

Conclusion:

In conclusion, it can be determined for this procedure that there are significant risks in respect of the scope of actual acknowledgement of course contents. Furthermore, as a rule separate parts of the master craftsman's examination are not covered by the course anyway so that even after the partial acknowledgment persons interested in the master craftsman's degree face not only additional loads related to time but also organizational and as a rule financial loads financial load.

In the end this is not an attractive educational and qualification pathway which meshes vocational and academic qualification together in a reasonable manner. Despite basic available transparency related to the represented possibility of acknowledgement of studies for the master craftsman's examination this procedure is not the expression or even a good example for the creation of extensive equivalence of vocational and academic pathways and degrees.

Theoretically it would be possible to extend the above-mentioned procedure for the real equivalence only so that all the requirements of the master craftsman's examination which are relevant for this examination had to be integrated in the existing structures and legal provisions of the (already available) course. With the acquisition of the regular bachelor's degree, it could be proven that all the requirements of the master craftsman's examination are met. This evidence could in turn be completely acknowledged by the responsible master craftsman's examination board in order to be able to award also the title of a master craftsman correspondingly.

However, it must be critically noted that such integration of master craftsman's examination requirements in existing structures of a course which are secured by the

higher education laws hardly has any realistic chances for success. Subsequent change of courses can therefore be regarded as generally pointless and hardly realizable.

Another possibility to at least partially credit vocational qualifications of training and further training in the course for the purpose of creating more equivalence is presented below.

b. Acknowledgement of further vocational master qualification for the parts of the training

This option is based on the crediting of knowledge and skills which have been acquired by people with vocational qualification interested in the course outside of higher education. Institutions of higher education⁵ have various possibilities to credit knowledge and skills which have been acquired within the framework of vocational training and further training, e.g. master craftsman's examination or within the framework of professional practice. The duration of studies should be reduced through crediting the performance results of people with vocational qualifications interested in the course and therefore one of the biggest inhibitions for the taking of a course for the target group of people with vocational qualifications should be lowered.

This acknowledgement of educational background including not formal and informal learning required by the European education ministers within the framework of the Bologna process was obligatorily implemented, for example, in Germany for the institutions of higher education already through decisions of the Conference of

⁵ Also further in the text the term "Institution of higher education" is used as a generic term for institutions of the tertiary education sphere, including universities, universities of applied sciences, technical colleges etc.

Ministers of Education and Cultural Affairs⁶. According to the results of the Conference of Ministers of Education and Cultural Affairs the crediting of performance results can be performed through:

Individual examination on a case-by-case basis

Therefore, on the basis of documents provided by the vocationally qualified applicant it is examined to determine if and to what extent his qualifications acquired outside of the sphere of higher education are equivalent to the parts of the course concerning the content and the level. If equivalence is determined within the framework of the examination on a case-by-case basis these proven qualifications can substitute the equivalent results of performance during studies and examinations.

General crediting

Thereby certain vocational qualifications which have been as a rule determined by the institution of higher education in advance as an equivalent concerning content and level are acknowledged for a homogenous group of applicants (like e.g. graduates of a master craftsman's examination) without further verification of the individual case.

Placement examination

Thereby individual knowledge and skills of the vocationally qualified applicant are verified in a formal examination procedure for the purpose of his placement to a higher study semester.

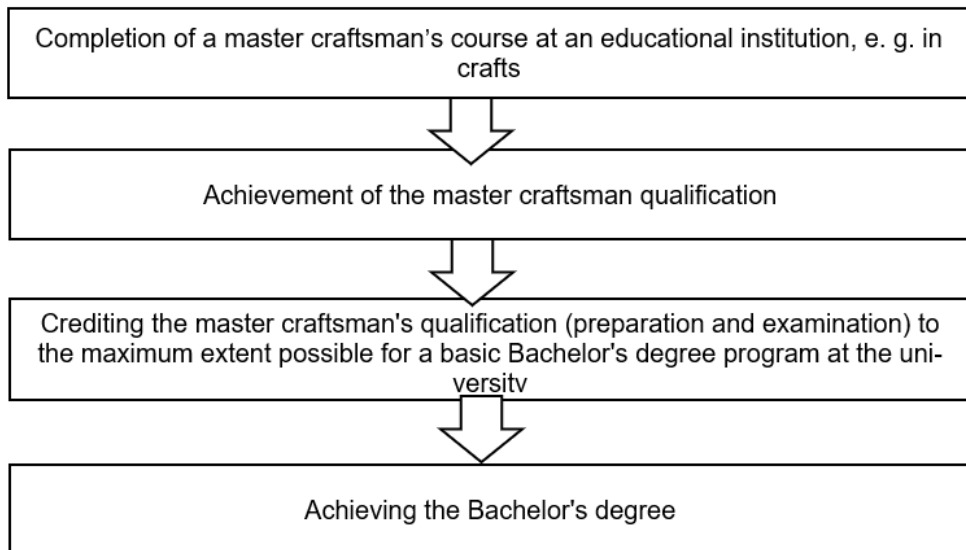
The Conference of Ministers of Education and Cultural Affairs in Germany has limited the amount of credit possibilities to 50% of the volume of higher education studies.

⁶ Cf. decisions of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education I (dated 28.06.2002) and II (dated 18.09.2008)

Peculiarities / problems:

The regulation related to the crediting of knowledge and skills of persons with vocational qualifications as performance results of studies and examinations is basically reasonable and on the basis of theoretically possible share of credit of 50% can contribute to the reduction of the period of studies and therefore to the politically de-sired facilitation of transfer of persons with vocational qualification in the sphere of higher education.

Overview 2: On the basis of master craftsman's qualification also become a bachelor



In the crediting practice of institutions of higher education, the situation however shows that crediting volume leads to a significant reduction of studies and thereby creates an incentive for taking a course which is achieved relatively seldom. The decision of the Conference of Ministers of Education and Cultural Affairs from the year 2008 has basically determined that the institution of higher education shall decide under own

responsibility if and to what extent the crediting of those knowledge and skills can be performed which have been acquired outside of the sphere of higher education. Thereby it is explicitly pointed out that such a decision of the institution of higher education [can] not be replaced “On the basis of diverse possibilities of content-related design of courses, [...], on the one hand, and the variety of possibilities for professional training and further training, on the other hand [...]”⁷.

Especially due to the reason of diversity of vocational and academic qualification substantial problems arise during the verification of proven vocational qualifications in respect of equivalence concerning contents and level. The equivalence of vocational qualifications is therefore often not determined only because the quantity of hours of courses attended within the framework of formal vocational qualification measure is as a rule lower than the workload⁸ of courses evaluated within the framework of the ECTS. Therefore, however, knowledge and skills which are acquired in this field in the professional environment in the informal manner are not taken into consideration completely. Moreover, in the curricula of vocational qualification measures as a rule only the number of classroom-based events (class hours) is declared and not the time for “self-study phases” which are however entered as “self-study” in the estimation of academic courses workload.

Further difficulties can arise during the verification of equivalence with regard to levels. Due to diversity of goals of vocational qualifications and academic courses the comparison is also difficult in this case. While vocational qualification measures are first of all aimed at the transmission of professional competences in the case of academic courses also science-oriented goals are paramount. In the form of the German

⁷ Cf. decision of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education II (dated 18.09.2008), p. 3

⁸ Workload = amount of work for studies in a classroom and self-study

Qualifications Network (DQR) an aid is available for the determination of equivalence which can help at least by formal recognized vocational qualifications. So, for example, the master craftsman's qualification is assigned to the same level as the bachelor degree. However, vocationally qualified applicants cannot derive a right for the crediting of their qualifications. During the verification institutions of higher education can independently of the grading in the DQR come to the result that qualifications are not equivalent. Therefore, the DQR does not have a direct influence on the crediting practice of institutions of higher education.

Apart from these problems during the verification of equivalence due to structural diversity substantive reservations are observed by several university representatives in respect of acknowledgement of equivalence which can lead to an especially strong application of formal verification criteria with regard to content, time scope and levels in the verification practice.

5.13 Generalized crediting through cooperation with vocational education and further education institutions⁹

The decisions of the Conference of Ministers of Education and Cultural Affairs in Germany already cited above obligate the institutions of higher education "... to make use of existing possibilities of crediting and to develop procedures and criteria for the crediting of knowledge and skills acquired outside of the sphere of higher education in the corresponding examination regulations¹⁰". The Conference of Ministers of Education and Cultural Affairs recommends the institutions of higher education to use cooperation with appropriate training and further training institutions in order to reduce

⁹ Compiled by Berufliche Hochschule Hamburg

¹⁰ Cf. decision of the Conference of Ministers of Education and Cultural Affairs concerning the crediting of knowledge and skills acquired outside of the sphere of higher education in the higher education II (dated 18.09.2008), p. 3

effort related to examinations on a case-by-case basis and to enable generalized crediting for homogenous applicant groups.

An example of such cooperation is the collaboration of a university of applied sciences for SMEs (FHM) with the Cologne Chamber of Crafts. Collectively the course “B. Sc. Industrial Engineer” was developed which is based on the complete crediting of master craftsman training conducted by the Chamber of Crafts. The course was “... conceived so that competences transferred during the master craftsman training correspond to the competences provided for the bachelor course of FHM and due to equivalence can be completely credited during studies¹¹”. Thereby the allowed volume of acknowledgement of 50% was exploited completely and thus the reduction of the regular study time from 18 terms to 9 terms was achieved¹².

It is undisputed by university representatives if vocational qualification measures in respect of conveyance of science-based fundamentals are sufficient¹³.

Both specified fundamental possibilities of crediting of acquired performance results of a training and qualification system in the corresponding other system and the outline of problems which are related thereto and which are partly substantial during the achievement of real equivalence of vocational and academic degrees and authorizations

¹¹ Expert report related to the decision of the FIBAA accreditation board for programs concerning the accreditation of the course Industrial Engineer (B. Sc.) dated 27./28.9.2012, p. 13

¹² Cf. Homepage of FHM, <http://www.fh-mittelstand.de/wirtschaftsingenieur/>

¹³ So, in the expert report related to the initial accreditation of the course “B. Sc. Industrial Engineer” of FHM it is criticized: “Especially concerning the part of the course related to engineering sciences experts missed various basic subjects. So, experts missed, for example, the following technical subjects: Fundamentals of Mechanics, Fluid Mechanics, Thermodynamics and Chemistry on the level of engineering sciences. The fundamentals resulting from the master craftsman training are oriented at crafts. The module provided in the FHM “Natural and engineering fundamentals I and II” is not sufficient in the opinion of experts for the conveyance of required fundamental knowledge of an engineer. (Expert report related to the decision of the FIBAA accreditation board for programs concerning the accreditation of the course Industrial Engineer (B. Sc.) dated 27. /28.9.2012, p. 28

lead to the consideration that it is more expedient in total to conceive a bachelor course from scratch so that both the required science-oriented fundamentals and competences necessary for the achievement of a master craftsman's qualification are conveyed integrally. This possibility is presented in the following option.

5.14 Integral conveyance of further vocational training master and bachelor within the framework of studies¹⁴

On the basis of the presented procedure related to the creation of equivalence as well as demonstrated problems, difficulties and challenges the third way for the design of vocational master's and bachelor's degrees is presented below.

The fundamental objective of the project idea outlined here is to create an educational and qualification system where the master craftsman's qualification and the bachelor course are integral parts of a common system. Thereby all the required legal provisions and framework conditions for obtaining corresponding degrees have to be identified first and they have to be considered during the design of a common educational and qualification pathway.

The design of such a third way of a bachelor course with integral vocational master qualification in addition to legal provisions includes also a variety of institutional, organizational, curricular, personal and if necessary other design parameters which are clarified exemplary in the overview below.

Overview 3: design parameters for an integral vocational and academic educational and qualification system

¹⁴ Compiled by Berufliche Hochschule Hamburg. The possibilities are presented using the example of further vocational training to become a master craftsman.

Fundamental design parameters of the system	Verification of of...	necessity and suitability
Institutional and spatial equipment for courses and examinations	Seminar rooms, laboratories, technical rooms, libraries, examination rooms...	
Sufficiency of personnel incl. lecturers and examiners	Qualifications, experiences, ideas about equipment and staffing incl. full-time and part-time lecturers and examiners	
Sufficiency of personnel incl. employees for organisation, management and administration	Qualifications and experiences	
Curricular and contentual requirements	(Framework) course concepts, module handbooks, minimum number of hours for modules, courses and examinations, examination requirements and tasks (written, oral, practical...)	
Institutional and legal requirements	Implementing course and examination organizations, e. g. chambers, universities, educational institutions...	
	Legal provisions for vocational and academic education pathways, e. g. admission regulations, course and examination regulations...	
Practical requirements	Cooperation and practice partners, e. g. enterprises for the acquisition of practical experiences...	
Other requirements	...	

If you follow this third way, there are three central areas of responsibility in particular which emerge for the creation of such an integral system and which are briefly described below.

Area of responsibility A

First all existing and available legal and curricular framework conditions (as a rule laws and regulations) for the identification of (minimum) requirements of the vocational master craftsman examination and subject-specific comparable bachelor course should be surveyed and analysed.

The main focus of the analysis should be especially the corresponding admission provisions, scope and duration of the course and studies (minimum workload), main topics, types and scope of examinations, requirements and scope of final examinations as well as further specific requirements if any which have to be taken into account for the creation of an integral system.

Area of responsibility B

In connection with the survey and analysis a synopsis (comparison) should be prepared for the relevant legal provisions and regulations as well as curricular benchmark figures in respect of their differences and similarities and “open points”. Thereby the matching and especially not matching of the relevant legal and curricular framework conditions can be shown and the scope of substantial organizational areas can be determined.

Area of responsibility C

In this area of responsibility C on a specific example the development of a kind of “blueprint” for the organization of a bachelor course with integrated master craftsman’s qualification on the basis of legal and curricular required framework conditions and organizational areas can be conceived.

The model is realized in the present project with a complete integration of vocational master craftsman training in a dual bachelor's degree programme.

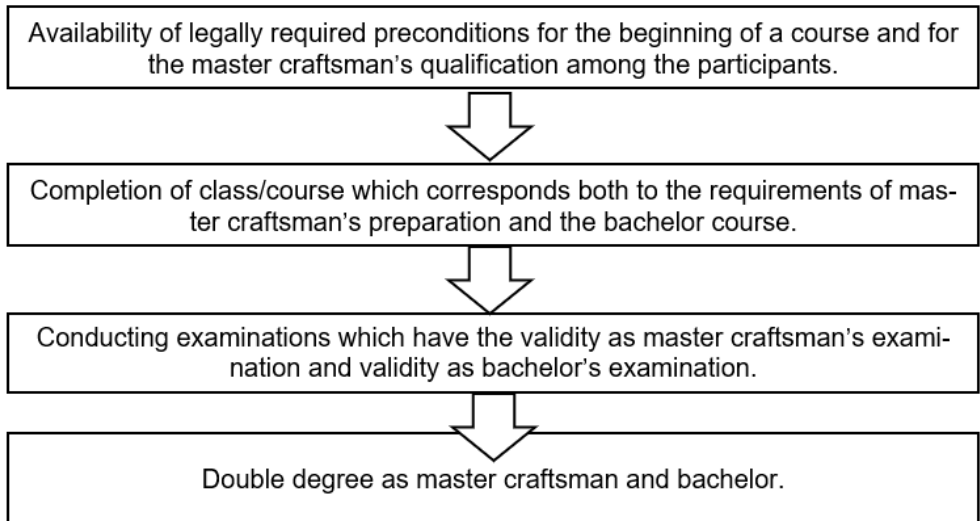
In addition, however, initial vocational training is integrated within the framework of the four-year dual study programme, so that the participants acquire three recognised educational qualifications:

- Journeyman or skilled worker
- Vocational Master in the learned occupation

- Bachelor in the chosen field of study

In the event that initial vocational training is not to be integrated, alternative models for acquiring vocational training are described in the following chapter.

Overview 4: Integral attainment of a bachelor and master craftsman degree



5.15 Alternative options for achieving vocational training and activities

Many dual Bachelor's degree programmes integrate initial vocational training. Furthermore, since recognised continuing vocational education and training degrees usually require completed vocational training, the question arises as to how initial vocational training can be realised in Bachelor's degree programmes with integrated continuing vocational education and training.

Vocational Training

To begin with, it is plausible to develop a training program that integrates initial vocational training, further vocational training and a bachelor's study course with respective three recognised educational qualifications/diplomas/degrees. In Germany, occasionally such pathway is chosen as a so-called "three-way study pathway". In fact, this is not an integrated training program, but rather single parts of the training are completed one after the other. Integration of all three training courses under dual bachelor's programs is an excessive demand for the participants.

If all three training courses were integrated in a dual bachelor's study program, with a study term of about four years, participants would have to complete:

- a) dual vocational training, in a company and in a vocational school, usually lasting 3 to 3,5 years, including the option of reduction by about one to one and a half year, if the participant has a high school degree and can evidence particularly excellent educational achievements,
- b) further vocational training, lasting in a full-time mode some, but for many professions one year,
- c) a complete bachelor's degree program, usually lasting at least three years,
- d) training and professional activities in a company, comprising at least 50% of the total training time for dual study programs, during the entire four-year qualification period.

If all three parts (a) - c)) are not to be integrated into one training programme, there are four alternative ways to complete vocational training.

Several years of professional activity or study

With any vocational training at all, conditions for admission to the further vocational examination are absolutely equally fulfilled:

- a) in case of evidenced professional activity of at least five years in the relevant or in a related profession, or
- b) upon completion of a bachelor's study in a subject relevant to the respective profession of further vocational training.

The dual bachelor's degree program fulfils these admission requirements.

Completion of vocational training prior to commencing a study

Prior to commencing a study, participants complete a dual vocational training course, which upon presentation of a middle school leaving certificate, high school diploma and good grades during vocational training usually lasts two years. This path is especially recommended.

Successful completion of the journeyman or skilled worker exam, plus several years of professional experience also entitle candidates with no university qualification to admission to a subject-related study at a technical college (German Fachhochschule).

External journeyman or skilled worker examination

Participants without any formal vocational training can apply during their study as extraordinary applicants for admission to a journeyman or skilled worker examination. The decision on admission is with the competent examining board or competent chamber.

If the required knowledge and skills were not part of the dual study course at the university or in the partnering company, they shall be acquired in self-study.

This approach involves some legal uncertainty for candidates, making it impossible to know in advance whether they will get admission to a journeyman or skilled worker

examination, and whether their knowledge and skills acquired are sufficient to pass the exam.

Admission to the further vocational training examination without any prior vocational training

One final option is the possibility of admission to the further vocational examination without any prior professional training. The decision regarding such exceptions is with the competent examination board.

However, this pathway involves the legal uncertainty that it is not certain in advance, whether admission to the further vocational examination will be granted. For dual study programs, chances for admission to the further vocational examination without prior vocational training are high due to the occupational activity and training in the partnering company during the study period.

It is optimal if the vocational training is integrated into a dual Bachelor's degree programme. If this is not possible or desired, the first alternative appears to be suitable for dual Bachelor's degree programmes. However, given the significance of vocational training and experience with regard to further vocational training and subsequent employment in small and medium-sized enterprises, participants should also be recommended the second option, with prior vocational training. By contrast, option three and four should remain exceptions. However, the final decision is with participants, they shall decide for themselves. But in neither case, successful completion of vocational training shall constitute a condition for admission to a dual bachelor's degree program with integrated further vocational education.

5.16 Concept of study-integrating vocational education and training

The following overview provides a summary of the different formats for dual study programmes.

Individueller Bildungsabschnitt	Beziehung der Lernorte		
	verzahnt	parallel	
Erstausbildung	mit Berufsausbildung	<u>ausbildungsintegrierend</u> (Bachelor)	<u>ausbildungsbegleitend</u> (Bachelor)
	mit Praxisanteilen	<u>praxisintegrierend</u> (Bachelor) gestalteter Ausbildungsanteil beim Praxispartner	<u>praxisbegleitend</u> (Bachelor an FH oder Uni) mit obligatorischen Praktika in Unternehmen
Weiterbildung	mit Berufstätigkeit	<u>berufsintegrierend</u> (Master/Bachelor) mit gestalteten Bezugnahmen	<u>berufsbegleitend/berufsintegrierend</u> (Master/Bachelor) ohne gestaltete Bezugnahmen
	mit Praxisanteilen	<u>praxisintegrierend</u> (Master/Bachelor)	<u>praxisbegleitend</u> mit Praktika oder praktischen Anteilen (Master/Bachelor) ohne gestaltete Bezugnahmen

Wissenschaftsrat (2013): Empfehlungen zur Entwicklung des dualen Studiums -Positionspapier.https://www.wissenschaftsrat.de/download/archiv/3479-13.pdf?__blob=publicationFile&v=4

For the integration of vocational training in Bachelor's degree programmes, a distinction must be made between

- a) training-integrated format, which provides for an interlocking of vocational training and Bachelor's study.
- b) training-integrated format, which conducts vocational training and Bachelor's studies in parallel.

In the present project, initial vocational training, further vocational training and a bachelor's degree course are to be developed and realised in one training course. Both concepts are suitable for this demanding project, especially the training-integrating model.

The concept of study-integrating training comprises the following key points:

- The starting point for the considerations is dual training, study content is linked to the acquisition of competences in dual training
- Equal learning venues: company, vocational school, university
- Recognition of achievements at non-university places of learning
- Interlinking of curricula in terms of content and personnel
- Orientation of the annual workload to a 40-hour week to ensure study ability
- Experience-based decision on continuation of studies after 1.5 years with coaching support

The diagrams below provide an overview of the structure and model of the integrated degree programme.

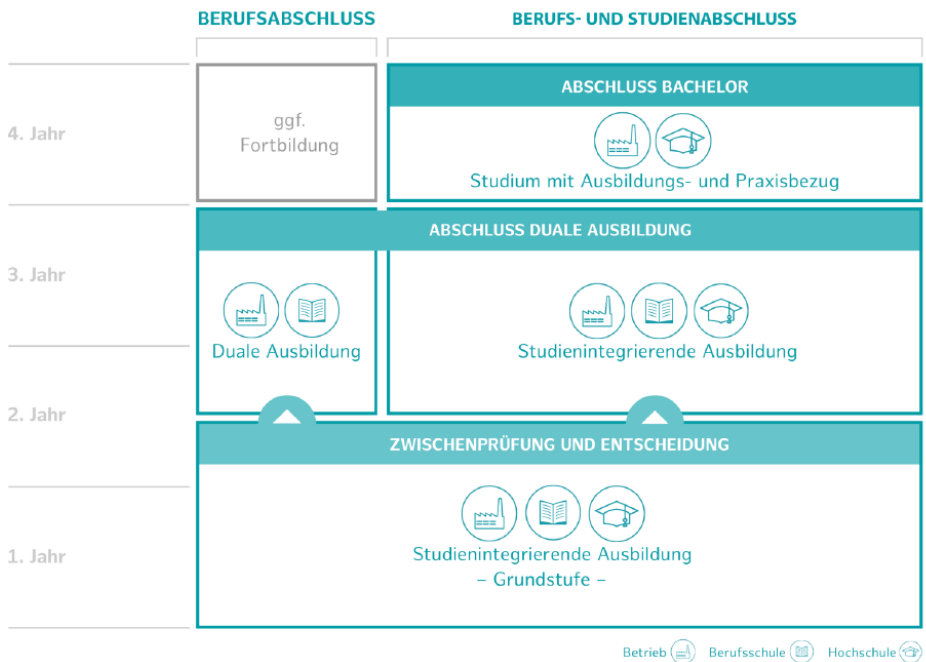
In the present project initial vocational training is integrated within the framework of the four-year dual study programme, so that the participants acquire three recognised educational qualifications:

- Journeyman or skilled worker
- Recognised vocational further education qualification
- Bachelor in the chosen field of study

Structure of the study-integrated training¹⁵

Training and study model

¹⁵ Prof. Dr. Joachim von Kiedrowski, Berufliche Hochschule Hamburg, 2022



5.17 Vocational training, further vocational training and fields of studies

The following must be selected for the implementation of this project:

- a) fields of studies with a focus for the bachelor's degree
- b) occupations for initial vocational training
- c) further vocational training with a recognised qualification, the content of which can be combined with a Bachelor's degree programme (see a)).

These decisions must be made against the background of tomorrow's world of work and according to the conditions and needs of the younger generation and companies. These aspects are summarized in the following excursus.

Excursus: Tomorrow's world of work

Division of labour

In order to be able to cope with the high and rising costs of increasing prosperity and social security, it was necessary to rationalize to a large extent, to condense work and to make it more and more joyless. The result is an economy in which work is increasingly seen as a necessary evil of earning a living, and this evil should be kept to a minimum:

Achieving continuous productivity progress is the basis of the economy and has so far enabled steady growth. Increasing productivity is achieved through division of labour and specialization. At the same time, division and specialization must be driven forward in accordance with the system in order to enable productivity growth until the individual person only performs the smallest excerpts, can no longer establish the overall context for himself and loses a strong degree of wholeness. For the narrow specialist, it is then hardly possible to find meaning in working life. At the same time, the tactility is lost: the individual can recognize the effects of his actions less and less.

Far-reaching division of labour leads to a loss of quality; the sum of the individual parts does not result in a living whole.

Progressive division of labour leaves behind uncoordinated states that require control. Inevitably, this is associated with more and more unproductive action in the intrinsic sense; the effort for coordination and control is increasing rapidly. Coordination and control take place once with the help of power apparatuses of the different

hierarchical levels. A constantly increasing external determination is the inevitable consequence.

Even more effectively, however, the control is carried out by self-manipulation of the individual. Idealistic values such as wholeness, self-determination, influence, co-creation, finding meaning, etc. are suppressed and material values come to the fore one-sidedly. Work is then perceived as a necessary evil in order to achieve growing material prosperity. The decade-long suppression of essential values leads to long-term consequences that we are experiencing today: alcohol and drug abuse, ideals of fascism and accumulation of mental illness.

Cooperation

The negative consequences of the division of labour, such as loss of meaning or increase in social costs, are overcome through comprehensive cooperations that enable further productivity progress at a high level of quality.

Cooperation requires outstanding and new qualifications; personal-social skills are gaining a significant increase in importance. Internal, inter-company and international cooperations are based on the principle of combining individual or operational strengths: Everyone does what they do best and is an integrated member of a team of holistic work. Through these paths of "cooperative specialization", higher qualities, lower costs and great productivity advances are achieved.

Cooperation requires the highest degree of decentralised availability and intensive exchange of information. Information technologies are ideal problem solvers for this. They make information available decentral and in the future the living room will also become the workplace. Information advances are becoming smaller, which is accompanied by a gradual disempowerment of the headquarters.

Cooperative forms of work must be created within the company. Employees are no longer reduced to their employment contract and the "sale" of their labour. As part of their remuneration, they will receive co-ownership rights and participate financially in the company's success by contributing their manpower and personality. Material and intangible employee participation are experiencing a rapid increase in importance. The boundaries between specialists and managers and also between employees and entrepreneurs are blurred. Everyone becomes a co-entrepreneur.

The highest levels of innovation and creativity are required. Every head is needed and must be involved in independent thinking and acting responsibly. Changed value weightings have an effective effect with an increase in the importance of previously suppressed values, such as self-determination, influence, co-creation, holisticness, manageability, etc. Independence is becoming an important determining factor.

Internal and inter-company as well as international cooperation requires the highest degree of trust. This is an economically indispensable principle. The only cultural feature for securing the prosperity and competitiveness of a company and also of a society is trust. Responsible action is required in all areas.

Holisticness, cooperation and personal responsibility on the basis of trust create an almost inexhaustible free energy in all areas of work and life. Trust motivates people to the highest degree and is at the same time the most important organizational principle and control instrument, especially in cooperation.

Decentralization

Changes in the framework conditions favour decentralization and the development of smaller units. New and additional jobs will be created almost exclusively in smaller companies. The economics of scale are declining.

Control and guidance

In the working world of tomorrow, the self-coordination of the individual as well as over-visible groups will gain in importance and increasingly be controlled by lived value cultures. The individual companies must become one with their moral substance. They will form a kind of "faith community" in which the employees are intensively in-volved and find what they really need in terms of material and idealistic values.

The previous economy had primarily demanded functioning technocrats and washed them to the top of the companies. In the future, corporate management will again need much more personalities who have mastered the art of leadership – people of the type of artist or visionary as well as the original German master craftsman.

While the employees develop into co-entrepreneurs, the employers become the meaning of the work. This frees up free social energy in companies, the enormous potential of which has so far remained largely untapped in most companies. The reserves in this regard are so considerable and the economic effects so far-reaching that the associated economic gains are greater than the international differences in the level of labour costs.

Work undergoes decomposition again. Perceived personal responsibility and intensive self-coordination create economic freedom for this. In the old economy, a high effort has to be made for control and coordination, which must be estimated at over twenty percent of the total costs in the construction sector, for example. In the future, these unproductive costs will be converted into productive activities within the framework of cooperation and self-control and will also densify work, reduce error rates and allow higher qualities.

Work will also slow down.

Flexibilization

In the future, work will not be less, rather more – but also worked differently. Rigid boundaries will fall, and extremely flexible working hours will be created. Work is done when work is actually available in the company. In this way, various other activities are carried out or learning or leisure time is taken.

The far-reaching flexibilization concerns daily, weekly, annual and lifetime working hours. The hatchet of retiring at a certain age will lose its sharpness and make way for smooth transitions even beyond the age of seventy. The strict separation between leisure time and working time is a thing of the past; work tends to become a hobby and a hobby becomes work.

People will engage in several activities at the same time; at least 75 percent will feed their income security from three or even more sources. The dependence on only one source of income and on only one company is significantly reduced. For many people, multidimensionality is becoming the norm not only for economic constraints, but also for reasons of independence, finding meaning and joy.

The market power of workers will grow, as the number of people in employment will decline dramatically in the vast majority of EU countries due to demographic factors. Companies will enter fierce competition for "co-entrepreneurs"! Labour force participation will increase significantly, for economic reasons, in order to counteract the shortage of labour. On the other hand, however, higher employment rates for all age groups are also a clear expression of the new importance of work as a source of meaning. Women are experiencing an intense increase in importance, not only for economic reasons (because of a lack of workers), but especially because a new economy depends on their specific characteristics and qualities.

Culture of working life

Determining the substance of one's own culture is the all-important prerequisite for shaping the working world of tomorrow. It is about answering individual questions:

"What do I do in this world? What is important to me? Which principles are sacred to me? What values do I pursue that should determine my life?"

Only through the process of an individual redefinition of values and cultures can a good future of the working worlds be shaped. It is a spiritual process: If you want a better world tomorrow, you should not start with the material, but with new thinking. It is crucial that employers and employees see themselves as equal partners and interact with each other on an equal footing. Companies must treat their employees as responsible entrepreneurs, give them all support and help.

A basic evil is the devaluation of others in order to enhance oneself. Such behaviour requires rigorous eradication.

The working world of tomorrow already clearly characterizes the conditions and requirements for the future actions of entrepreneurs. Further conditions and needs for the entrepreneurship of tomorrow can be derived in particular from today's economic and social bottlenecks.

Excursus: Needs of the economy.

Today's bottlenecks in economic and social development always characterize the growth areas of tomorrow.

Energy and environment bottleneck

An outstanding bottleneck of today concerns energy, environmental and climate protection. The emerging solutions mainly place particular emphasis on eco-efficiency. However, the principle of eco-efficiency has a fatal disadvantage: it leaves the basic concept of industrial production unchanged. reduction, reuse and regulations reduce environmental impacts and slow down the loss of natural resources; however, these processes do not attack the conceptual errors at their root – they are dead-end solutions. As important as eco-efficiency is at the moment, it must not be overlooked that

it only pushes the limits of environmental pollution and resource consumption. Basic innovations with new leading technologies must design products in such a way that they do not become waste but can be used 100% as possible after use. The development of such a circular economy requires the highest level of innovation with far-reaching rethinking and redesigning.

Bottleneck health

Another bottleneck area today and thus an increasing growth area concerns the healthcare sector, which must not be understood solely as a cost burden on the economy as a whole. The potential of an above-average growth sector of the economy would thus be viewed negatively and possibly suppressed. The growing health sector is a sign of increasing prosperity, which gives rise to a greater willingness individually and socially to invest in the good of health. The higher appreciation for health, a strong ageing of the population and, in particular, a dramatic increase in the number of people in need of care will lead to significantly increased expenditure on medical services, care and support. Medical-technical and organizational innovations in the healthcare industry are of great importance and are growing.

Bottleneck of skilled workers and organization of work

A third bottleneck area, which is still little discussed today, concerns the organization of work and the design of processes for the production of products and the production of services. The field of growth requires a high degree of innovation and investment. Through far-reaching innovations in personnel and organizational development, companies will have to intensively awaken and use social energy. The broad field of education and organization of work is a first-class growth area.

Closely related to this, information processing and problem-solving capacities have increasingly emerged as further new limitations, which require intelligence-saving or expanding progress through technical and organizational innovations. In the global

world, which is strongly divided by division of labour, ever-increasing amounts of information must be exchanged. On the one hand, the basic innovations of information and communication technologies come as called for, on the other hand, they trigger huge avalanches of information waste. In addition, the abundance and turbulent dynamics of the tasks to be mastered at the same time reach the limits of the problem-solving capacities of a leadership layer that is too thin. Much more all minds must be involved in the acquisition and processing of information. Intensive education must increase the capacity for problem solving and teach the use of technologies created for this purpose.

Mastering the challenges of overcoming the narrow areas reflects in particular the needs of the economy. In order to meet these challenges, corporate cultures must be realigned.

Art of Leadership

Productivity growth is stagnating or increasingly reaching macroeconomic limits. Through self-motivation and passion for action, more and new energy can be achieved for more productivity. Today's business administration includes technology in management, but not the art of management.

In economic life, values, emotions and intuitions have so far been strongly ignored. However, they describe the power behind the processes, namely the social and personal energy that grows through joy, love and spirit. Business models cannot capture these extremely important factors. They are always an abstraction and pretend that this abstraction is already reality.

This is not against business administration. It is about achieving holistic management with business administration and new orientation, a new culture and radical humanity.

Business success is achieved through mental development and morality. Spirituality becomes a competitive factor of the first order. The superiority of a company depends on lived spirituality. Written corporate culture, corporate identity, etc. are pointless if they are not exemplified by the managers and supported by everyone. No company can maintain identity and quality in the long run without becoming one with its moral substance.

What is needed is leadership through visions that convey worthwhile goals and generate the same will in the company. The visions will be reflected in the company in the strategic goals, but also clearly in the values of the company. The "hardware" of corporate management such as project plans, budgets, performance evaluation, controlling, etc. will continue to be indispensable in the future. Of at least equal importance, however, is the "software", the lived value attitude, which is expressed in the corporate culture with the promotion of identity and enthusiasm, with motivation, generation of the same will, etc.

New rationality

With strong turbulence and rapid pace of change, our world gets into disarray. It becomes inscrutable, and the developments are characterized by decreasing strength. The complexity is increasing so rapidly that the decision-making centres are increasingly overwhelmed and the greatest bottlenecks in problem-solving capacities arise.

The processes can no longer be rationally justified alone. A good feeling that many things are no longer true with our environment, for example, is enough to act without waiting for scientific explanatory contexts.

A new rationality is required, because

1. the rationality of facts decreases. Companies will therefore increase from internal orientation to environmental orientation. In doing so, they will involve as many minds as possible for information acquisition and processing.

2. the strategic rationality is decreasing. The markets are becoming more and more fidgety. In a very turbulent world, it will be less and less about realizing plans once created. Rather, any increase in flexibility and creative and innovative potential is required.

3. cadre rationality is decreasing. People no longer simply obey orders and instructions. They want to use their own minds; they want to be involved. What is needed is powerful leadership without leading in the sense of orders and commands.

Only with such corporate and management cultures can the needs, wishes and values of the younger generation be met.

Excursus: Needs of the younger generation

A central question that concerns many companies even before the corona pandemic is:

What human resource management requirements will SMEs have in terms of recruiting suitable trainees and skilled workers?

From a scientific perspective, some considerations can be made, and findings can be shown.

Dealing with Generation Y and especially Generation Z plays a major role in attracting young people, in particular to small and medium-sized companies. Generation Z in particular (people born around the end of the 1990s - 2010) sometimes focuses on different values with regard to professional requirements than previous generations. They attach great importance to a healthy lifestyle and have grown up with mobile

devices (especially smartphones), which are everyday companions for them, whether in their professional or private life.

For companies and especially for personnel management, leading members of the different generations is a special challenge. Different values and attitudes in the generations of employees lead to different behaviours and actions and often cannot be managed productively with a “one fits all” idea without creating tensions and conflicts.

Therefore, in the more recent discussions on the role of personnel management, great importance is attached to taking the different needs of employees from all generations (X, Y and Z) into account. With regard to Generation Z, their expectations of a future employer are particularly emphasized due to the shortage of skilled workers.

Above all, recruiting is about changing its perspective. The company applies to potential applicants or future employees; this is the reverse of the earlier idea when there was no or only a minor shortage of skilled workers.

The special needs of Generation Z can hardly be consistently identified for all young people belonging to this generation. In one of the first comprehensive studies (Gen Y vs. Gen Z Workplace Expectations), the differences between Generation Z and Generation Y were particularly highlighted. The key messages and recommendations for executives in this study are as follows:

Gen Z has more of an entrepreneurial spirit.

17% of Gen Z vs. 11% of Gen Y want to start a business and hire others.“

For Gen Z, it's not about the money ... yet.

Only 28% of Gen Z said money would motivate them to work harder and stay with their employer longer, as opposed to 42% of Gen Y.

Gen Z prefers face-to-face communication over technology.

Gen Z grew up with technology, yet 53% prefer in-person communication over tools like instant messaging and video conferencing. (...)

If you're the leader, be honest!

Take note business leaders:

- One-half (52%) of both Gen Z and Gen Y state that honesty is the most important quality for being a good leader.
- The generations agree that after honesty, leaders should exhibit a solid vision (Gen Z 34%, Gen Y 35%), followed by good communication skills (Gen Z 32%, Gen Y 34%).

Let's talk. In person.

- Contrary to the assumption that younger workers want "constant connection" to technology, a majority of Gen Z respondents say they prefer in-person communications with managers (51%), as opposed to emailing (16%) or instant messaging (11%).
- The same trend applies to Gen Y: in-person (52%), emailing (18%), instant messaging (11%).
- And few believe that technology actually enhances personal relationships with co-workers (Gen Z 13%, Gen Y 14%).

Technology is a distraction

- Slightly more than one-third (37%) of Gen Z ranked instant messaging as the biggest work distraction, followed by Facebook (33%) and email (13%).
- Gen Y reports being most distracted by email (31%), Facebook (28%) and instant messaging (25%).

And not all of us like to multitask, after all

- When asked if they like to multitask, just over one-half (54%) of Gen Z responded in the affirmative, while two-thirds (66%) of Gen Y said yes.
- Gen Z is not as inclined to work in a fast-paced environment: 59% of Gen Z report liking a fast pace, while 68% of Gen Y says the same.“

In a further comprehensive study, the following characteristics of Generation Z were identified with reference to various studies:

Characteristics of Generation Z

- According to the Institute for Emerging Issues (2012), Gen Z is the most ethnically diverse and technologically sophisticated generation.
- Gen Z has an informal, individual and very straight way of communicating and social media is a vital part of their lives.
- They are a Do-It-Yourself generation.
- In the study conducted by Dan Schawbel (2014), Gen Z tends to be more entrepreneurial, trustworthy, tolerant and less motivated by money than Gen Y.
- They are more realistic about their work expectations and more positive about the future.
- Based on the findings of Generational White Paper (2011), Gen Z tends to be more impatient, instant minded, lacking the ambitions of previous generations, have acquired attention deficit disorder with a high dependency on the technology and a very less attention span, individualistic, self-directed, more demanding, acquisitive, materialistic and entitled generation so till now.

- Max Mihelich (2013) describes that the Gen Z are very much concerned with environmental issues, very conscious of looming shortages and water shortages which indicates that they have a high sense of responsibility towards natural resources.
- Amanda Slavin (2015) finds the Gen Z wants to be heard irrespective of their young age.
- Technology is a part of their identity, and they are tech savvy but lack problem-solving skills and have not demonstrated the ability to look at a situation, put in context, analyse it and make a decision (Joseph Coombs, 2013).
- They also appear to be less inclined toward voting and to participating in their communities than earlier generations (Institute for emerging issues, 2015).“

As a further and at this point the last look at Generation Z, the results of a study are cited that compiled some findings on the subject of recruiting and retention that can be found in other studies in this way or similar.

Gen Z is ready to perform but also has clearly defined desires:

When choosing an employer, the company's image is less important than recommendations about personal surroundings and social media. Overall, the working atmosphere is the most important criterion. Clear tasks, clear boundaries and a strict separation of professional and private life are important. Incidentally, this seems to be a difference to Gen Y, which is more inclined to mix professional and private life.

Also, unlike Gen Y, for whom desk sharing is not a problem, Gen Z seems to want its own, well-equipped workstation.

The possibilities of flexible working hours from home office, job sharing, part-time work (...) remain attractive for Gen Z.

Equipped with healthy self-confidence in their own technological abilities and aware of the importance of rapid knowledge acquisition, Gen Z expects that their expectations will be met.

They are largely resistant to pressure - such as internal competition - ("If I don't like it, I'll look for something else"). The mobility of young workers is likely to surprise conventional companies. It is therefore to be expected that companies will increasingly have to apply for young employees.

Companies have to ask themselves how they manage and motivate these people, how they optimally use their performance potential and how they reward them for it.

Once again, the mindsets and behaviour of Gen Z are likely to rub off on other generations with only a short delay.

Conclusion

Recruiters are advised not to post any employer branding empty phrases on poorly maintained company Facebook accounts. Gen Z expects a highly personal person-to-person dialogue. Companies that do this awkwardly have to expect to give up on social media. "

Special attention to the different expectations and ideas of Generation Y compared to Generation Z for the recruiting process.

With a view to the information and results of the preceding studies, it can be stated that some fundamental differences between the generation and other generations can be seen, which also affect the way in which this young generation should be recruited by the company.

In this context, the topic of digitization plays a very important role in their lives for this generation. Even if it is not to be expected that this generation will have acquired ext-ensive, professionally usable competencies in the field of computer science and

digitization technologies due to their previous life, it can be assumed that a large number of private or professionally relevant information and knowledge components are used about digital technologies.

In this context, it is also known, on the basis of the above-mentioned findings, that there is a particular expectation of receiving relevant authentic information via digital media and thus satisfying many needs through the use of digital media.

This plays a crucial role in the exchange between companies and potential applicants and employees and sometimes poses great challenges for personnel management in companies. Because the expectations of Generation Z outlined above also apply to all processes and activities related to getting to know and receiving authentic information from a potential employer.

This is an essential reason why companies should deal with the topic of digitization of personnel management tasks in relation to recruitment activities. Because in the worst case, they will not reach the interesting target group of Generation Z and / or they will not be able to meet their expectations with regard to the digital exchange of authentic information about the workplace, development and career opportunities, the actual working atmosphere and many other topics. The topic of digitization is therefore directly related to a central task of personnel management.

Conclusion for companies

The following non-selective questions could be considered in the analysis of companies for the recruitment of Generation Z:

- Are we making Generation Z aware of our company with the appropriate (digital) information?
- Are the job profiles in our company also suitable for people from Generation Z or would they have to be adapted once?

- Do we consider Generation Z in our recruiting activities in the company and their expectations of employment?
- Do we have suitable digital information from the company that is interesting or important for Generation Z, e.g., lived values, actual leadership culture, dealing with feedback and criticism, consideration of individual needs for flexible working hours, etc.
- Are our personnel selection procedures suitable for identifying good applicants from Generation Z?
- Does our company have personal contact for applicants from Generation Z?
- Do we have a suitable generation management system that takes into account the different needs of the employees of generations X, Y and Z during their employment in the company?

5.18 Choice of professional training, further vocational training and field of study

Branch of study

The development, testing and implementation of two different study programmes were decided.

Business Administration & and Sustainable Management of for SMEs

These study programs largely correspond to the conditions of tomorrow's working world. Implementing this degree programme will make decisive contributions to the urgently needed recruitment of skilled workers and entrepreneurs as well as to overcoming outstanding bottlenecks, in particular:

- Energy and environment bottleneck
- Bottleneck of skilled workers and organization of work
- Art of Leadership
- New rationality

Moreover, this qualification and the corresponding professional activity correspond in various respects to a particular extent to the desires and ideas about life of the younger generation.

Management of Renewable Energy Technology in Buildings Management of Renewable Building Energy Technology

The growth field "Energy, Climate and Environment" is addressed, in which on the one hand there is a very high need for action with excellent future prospects for companies and on the other hand a particularly high shortage of qualified managers and specialists can currently be observed.

Activities in the energy and environmental sectors and the use of modern technologies also correspond to the ideas and wishes of the younger generation. By carrying out such tasks, graduates of the dual study program can earn a very good income and at the same time gain meaning.

Occupations for initial vocational training

In principle, for vocational training a large number of different professions can be integrated into the dual course of study. In principle, vocational training of all

professions can be integrated into the study programme “Business Administration & Sustainable Management of SMEs”. Commercial professions are naturally particularly predestined.

In the study programme "Management of Renewable Building Energy Technology", vocational training in relevant technical and many craft professions in particular can be integrated, for example:

- Electronics technician for building and infrastructure systems
- Electronics technician for energy and building technology
- Electronics technician for building system integration
- Plant mechanics for sanitary, heating and air conditioning technology
- Gas and Water Installer
- Mechatronics technician for refrigeration technology
- Refrigeration and air-conditioning technicians
- Technical System Planner

Continuing vocational Training

Continuing vocational education and training must be designed in such a way that it is

- a) correspond in content to the respective Bachelor's degree programme.
- b) fit in with the occupations of the initial vocational training.
- c) can also be carried out independently of the respective degree programmes as continuing vocational training measures.

- d) enable a recognised CET qualification in terms of scope and content.
- e) serve to overcome existing bottlenecks and meet the needs of SMEs.

According to these conditions, the continuing vocational training program “Sustainable Management” is developed, tested, evaluated and implemented for integration into the study programme “Business Administration & Sustainable Management of SMEs”. The starting point is the existing further training measure in Germany “Kaufmännischer Fachwirt”, which is being further developed with regard to sustainable management. The programme will comprise around 450 teaching hours and will end with a recognised official continuing education qualification in Germany.

An important task in energy-efficient building refurbishment concerns the comprehensive assessment of the buildings, the development of all necessary measures, the preparation of renovation plans, the determination of costs and refinancing options through energy savings and the comprehensive advice to investors. In order to impart the necessary skills, the further vocational program “Energy Service Manager” is developed, tested, evaluated and implemented for integration into the study programme “Management of Renewable Building Energy Technology”. The program will comprise around 350 teaching hours and will end with a recognized official continuing education qualification in Germany. Official examination regulations with recognized degrees also exist for Estonia and Poland, but here with the special feature that only those who have successfully completed a relevant Bachelor's degree are admitted to the examination. For the BA&VET project, this means that in Poland and Estonia this examination can only be taken after successful completion of the Bachelor's degree, whereas in Germany this further education examination can already be taken during the Bachelor's degree for example, at the end of the third year of study (one year after attainment of the vocational training degree).

In the BA&VET project, a demanding qualification is developed and implemented that integrates three apprenticeships with three independent, recognised qualifications:

- dual vocational training (EQF Level 4)
- further vocational training (EQF Level 5)
- dual bachelor's degree (EQF Level 6)

In the first two years of the four-year training, participants are trained in a company, in a vocational school and in a college/university.

After two or two and a half years, participants take an examination to become a journeyman/skilled worker and thus acquire an internationally recognised vocational qualification.

In the third and fourth year, the qualification takes place in the company and at a college/university.

Towards the end of the third year, the participants take the further vocational examination thus acquire the internationally recognised further vocational training.

Towards the end of the fourth year, the participants take a bachelor's examination thus acquire the internationally recognised bachelor's degrees. In Poland and Estonia is the further education examination "Energy Service Manager" only taken after successful completion of the Bachelor's degree.

In the project's training programs, the further vocational training is fully integrated in accordance with the framework of studies described in Chapter 4 Integral conveyance of vocational master craftsman and bachelor within the framework of studies.

During the entire qualification, approximately half of the training takes place in the company and half in the college/university. During the entire training period, the

company pays the trainees a collectively agreed salary and annual leave in accordance with national regulations.

The integration of initial vocational training into the qualification programme has significant advantages, including:

- With the vocational qualification, the participants receive the admission requirements for taking the further vocational training examination.
- Dropouts acquire at least one or two recognised vocational qualifications.

Both study courses can be carried out in different Combinations, for example:

a) Implementation without integrating the initial vocational training. Likewise, participants who already have vocational training at the start of the qualification can complete this training. In these cases, attendance of a vocational school is omitted, the training also takes place in the first two years only in the company and the college/university, no vocational training examination is taken, and the graduates acquire "only" a further vocational training degree and a bachelor's degree.

b) Implementation of the dual Bachelor's degree programme with integrated vocational training and achievement of a vocational training qualification and a Bachelor's degree.

c) Implementation of dual Bachelor studies without integrated vocational training and without integrated continuing vocational training and only a Bachelor degree.

5.2 Results on national and legal conditions and solution models

In Germany, the legal conditions are given for the implementation of

- dual Bachelor courses of study

- further vocational training programs with recognised official qualification
- dual Bachelor's degree programs with integrated vocational training and further vocational training

Dual Bachelor's degree programmes and comprehensive further vocational training are being implemented. In Germany, there are already the first dual Bachelor's degree programmes with integrated further training (master craftsman training).

In order to be able to implement the dual Bachelor's degree programmes with integrated vocational training and continuing vocational training developed in the BA&VET project in other EU countries in the future, the project investigated the extent to which there is interest in this in other countries and which legal requirements exist for this. The partner countries included in the project - Estonia, Finland, Germany and Poland - were included in these analyses as examples.

The results of these analyses of national conditions and the alternative solution models developed are presented in Result 2.3 'Report on results on national and legal conditions in the partner countries and alternative solution models for the implementation of training measures'. Only a summary of the solution models developed is given below. With regard to all analysis results for the four partner countries and the conclusions on solution models, reference is made to the complete result, which is published on the project website <https://ba-vet.eu/>.

5.21 Estonia

Initial vocational training

In Estonia there are different forms of initial vocational training: school based and work-based learning. Formal VET is mostly State financed. In 2016/17, 99% of 25 071

initial and continuing VET learners were in State-financed programs. Private VET schools may also apply for State-commissioned education. Initial vocational training cannot be carried out in Estonia as an integrated part of a dual Bachelor's degree program. In order to enable implementation, the Higher Education Act must be amended accordingly. However, this is not desired by vocational schools, universities and companies in Estonia. The principles of higher education need to be substantially changed for implementing vocational training officially in bachelor's degree programs.

For the implementation of the BA&VET project in Estonia, this means that initial vocational training cannot be acquired within the framework of the two dual courses of study. If vocational training is desired or is a prerequisite for admission to official further training examinations, this must be acquired in other ways, for example before the start of the course.

Further vocational training

Continuing VET programs are provided at the fourth and fifth levels of Estonian Qualification Framework. For every type of vocational education, learning outcomes, i.e. the knowledge, skills and attitudes acquired as a result of learning, have been described in the Standard of Vocational Education. Further education can be completed in Estonia with an official, recognized qualification. Those entering continuing VET programs must have EQF level 3 qualification or competences in addition to basic education to enrol.

For the implementation of the BA&VET project in Estonia, this means that the further training program "Sustainable Management" can be carried out and completed with a recognized qualification.

In Estonia there are also two official examination regulations with a recognized qualification for qualifying as an energy auditor. Admission to the examination, however, requires the successful completion of a bachelor's degree.

For the implementation of the BA&VET project, this means that the advanced training program "Energy Service Manager" can be carried out, but admission to the examination is only possible if a Bachelor's degree has already been obtained.

Dual Bachelor's degree programs

Dual Bachelor's degree programs can be implemented in Estonia, currently, there is no willingness to include VET training in bachelor study programs in Estonia. The companies and universities/higher education institution are not willing to collaborate at the bachelor level in Estonia. The collaboration is already established and working at VET level studies through apprenticeships studies.

For the implementation of the BA&VET project, this means that the two dual courses with integrated further training developed in the project can be carried out, but a lot of persuasion is required.

Solution model

In summary, the following can be stated for Estonia:

- It is not possible to integrate initial vocational training into dual courses of study.
- The two further training programs "Sustainable Management" and "Energy Service Manager" can be carried out and also completed with a recognized further training degree.
- The two dual study courses of the project with further integrated training could be carried out.

Against this background, a solution model with the following main activities is recommended for Estonia during the BA&VET project period:

- Testing and evaluation of the Energy Service Manager further training program and ongoing implementation after the end of the project.
- After testing, evaluation and completion in Poland, transfer of the further training program "Sustainable Management" to Estonia and ongoing implementation after the end of the project.
- Testing and evaluation of main modules of the dual Bachelor's degree program "Management of Renewable Building Energy Technology" and ongoing use of the modules after the end of the project for a) integration in existing study programs and b) further education.
- After testing, evaluation and completion in Poland, transfer of the dual Bachelor's program "Business Administration & Sustainable Management of SMEs" to Estonia and, after the end of the project, ongoing use of the modules for a) integration in existing study programs and b) further training.
- Intensive consultations on the implementation of dual Bachelor's degree programs in the medium term.

5.22 Finland

Initial vocational training

In Finland, school-based VET exists with pronounced internships and extensive project work in companies. The realization of dual vocational training is not possible by law, but is also rejected by business, educational institutions and politics. Vocational qualifications can be completed in school-based VET or as competence-based qualifications. In Finland dual model is mostly understood as a combination of VET and matriculation examination.

In Finland, the implementation of initial vocational training in conjunction with dual Bachelor's degree programs is not possible but is also not desired here.

For the implementation of the BA&VET project in Finland, this means that initial vocational training cannot be acquired within the framework of the two dual courses of study. If vocational training is desired or is a prerequisite for admission to official further training examinations, this must be acquired in other ways, for example before the start of the course.

Further vocational training

State-recognized further education qualifications can be obtained. The qualifications of completed further VET, and for completes specialist VET de-pend on the qualification titles and competence areas.

For the implementation of the BA&VET project in Finland, this means that the further training program "Sustainable Management" can be carried out and completed with a recognized qualification.

For the qualification as Energy Service Manager there are legal regulations on VET qualifications and on higher education. The education level required for Energy advisors is:

- Bachelor of Engineering or Master of Engineering (university of applied sciences), study field energy technology.
- Bachelor of Science or Master of Science in engineering, study field energy technology.
- other educational backgrounds, such as environmental engineering and environmental science. In such case further education may be required.

For the implementation of the BA&VET project, this means that the advanced training program "Energy Service Manager" can be carried out, but admission to the examination is only possible if a Bachelor's degree has already been obtained.

Dual Bachelor's degree programs

There are no dual study programs in Finland. The strict education system and legislation do not support dual study programs. In Finland higher education is tightly linked into the surrounding working life.

For the implementation of the BA&VET project, this means that the two dual courses with integrated further training developed in the project cannot be carried out.

Solution model

In summary, the following can be stated for Finland:

- It is not possible to integrate initial vocational training into dual courses of study.
- The two further training programs "Sustainable Management" and "Energy Service Manager" can be carried out and also completed with a recognized further training degree.
- The two dual study courses of the project with integrated further training could not be carried out.

Against this background, a solution model with the following main activities is recommended for Finland during the BA&VET project period:

- Development of the further vocational training program "Energy Service Manager".
- Development of the dual bachelor's degree program "Management of Renewable Building Energy Technology".

- After testing, evaluation and completion in Poland, transfer of the further training program "Sustainable Management" to Finland and ongoing implementation after the end of the project.
- After testing, evaluation and completion in Estonia, transfer of the further training program "Energy Service Manager" to Finland and ongoing implementation after the end of the project.
- After testing, evaluation and completion in Poland, transfer of the dual bachelor's program "Business Administration & Sustainable Management of SMEs" to Finland and, after the end of the project, ongoing use of the modules for a) integration in existing study programs and b) further training.
- After testing, evaluation and completion in Estonia, transfer of the dual bachelor's program " Management of Renewable Building Energy Technology " to Finland and, after the end of the project, ongoing use of the modules for a) integration in existing study programs and b) further training.

5.23 Germany

Initial vocational training

Dual VET is provided in Germany. The integration of dual vocational training in dual bachelor's degree programs has been successfully carried out in Germany for many years.

In conclusion, the dual vocational training developed in the project can be implemented in general and in combination with dual bachelor's degree programs in Germany.

Further vocational training

Continuing training plays an increasingly important role in improving employability. It is characterized by a wide variety of training providers and a low degree of State regulation.

In Germany, there are a large number of official examination regulations for the attainment of recognized CVET qualifications. It is also possible to integrate continuing vocational education and training programs into bachelor's degree programs, so that two official educational qualifications "continuing vocational education and training" and "bachelor's degree" are achieved.

The conclusion is that the two further vocational training programs developed in the project can be realized in Germany in general and in combination with dual bachelor's degree programs in particular.

Dual Bachelor's degree programs

Dual bachelor's degree programs with approximately half of the training taking place in companies and half in universities are particularly pronounced in Germany and have been successfully implemented here to an increasing extent for many years. It is also possible to integrate initial vocational training and continuing vocational and training programs into bachelor's degree programs.

The conclusion is that all educational measures developed in the project can be realized in Germany in general and in combination with dual Bachelor's degree programs in particular.

Solution model

In summary, the following can be stated for Germany:

- It is possible to integrate initial vocational training into dual courses of study.

- The two further training programs "Sustainable Management" and "Energy Service Manager" can be carried out and also completed with a recognized further training degree.
- The two dual study courses of the project with integrated initial vocational training and further vocational training could be carried out.

Against this background, a solution model with the following main activities is recommended for Germany during the BA&VET project period:

- Development of the further vocational training program "Sustainable Management".
- Development of the dual bachelor's degree program "Business Administration & Sustainable Management of SMEs".
- After testing, evaluation and completion in Poland, transfer of the further training program "Sustainable Management" to Germany and ongoing implementation after the end of the project.
- After testing, evaluation and completion in Estonia, transfer of the further training program "Energy Service Manager" to Germany and ongoing implementation after the end of the project.
- After testing, evaluation and completion in Poland, transfer of the dual bachelor's program "Business Administration & Sustainable Management of SMEs" to Germany and implementation after the end of the project.
- After testing, evaluation and completion in Estonia, transfer of the dual bachelor's program "Management of Renewable Building Energy Technology" to Germany and implementation after the end of the project.

5.24 Poland

Initial vocational training

In Poland, initial vocational education and training (IVET) is organized through a combination of school-based and dual vocational training programs. IVET programs lead to recognized state qualifications, which are awarded to students who successfully complete their vocational training programs and pass the final examinations. The financing of IVET programs in Poland is generally supported by the state budget and is free of charge for students.

Initial vocational training can be carried out in Poland as an integrated part of a dual bachelor's degree program. In Poland, the dual education system, also known as "dual vocational education and training" (DVET), combines both theoretical education and practical vocational training, allowing students to gain practical skills and knowledge while pursuing their academic studies.

In conclusion, the dual vocational training developed in the project can be implemented in general and in combination with dual bachelor's degree programs in Poland.

Further vocational training

CVET qualifications in Poland are classified into two main categories: technician and vocational master craftsman. These qualifications are recognized by the state and are issued by relevant bodies authorized by the Ministry of National Education or other competent institutions, depending on the specific field or industry. It's important to note that CVET in Poland is subject to quality assurance measures, including accreditation and monitoring by relevant bodies to ensure that the training programs and qualifications meet the required standards.

The conclusion is that the two further vocational training programs developed in the project can be realized in Poland in general and in combination with dual bachelor's degree programs in particular.

Dual Bachelor's degree programs

Dual bachelor's degree programs do exist in Poland. These programs are commonly referred to as "dual studies" or "studies with practice". They are offered by various universities and vocational schools in Poland in collaboration with companies, providing students with the opportunity to combine academic studies with practical work experience. In 2019, 43 Polish universities provided education in the dual system, combining theoretical preparation with practical vocational training. In conclusion, the implementation of dual bachelor's degree programs with integrated initial vocational training in Poland can have several potential benefits, including enhancing employability, bridging the gap between academia and industry, addressing skills shortages, increasing student.

The conclusion is that all educational measures developed in the project can be realized in Poland in general and in combination with dual Bachelor's degree programs in particular.

Solution model

In summary, the following can be stated for Poland:

- It is possible to integrate initial vocational training into dual courses of study.
- The two further training programs "Sustainable Management" and "Energy Service Manager" can be carried out and also completed with a further training degree.
- The two dual study courses of the project with integrated initial vocational training and further vocational training could be carried out.

Against this background, a solution model with the following main activities is recommended for Poland during the BA&VET project period:

- After testing, evaluation and completion of the further training program "Sustainable Management" ongoing implementation after the end of the project.
- After testing, evaluation and completion in Estonia, transfer of the further training program "Energy Service Manager" to Poland and ongoing implementation after the end of the project.
- After testing, evaluation and completion of the dual bachelor's program "Business Administration & Sustainable Management of SMEs" ongoing implementation after the end of the project.
- After testing, evaluation and completion in Estonia, transfer of the dual bachelor's program "Management of Renewable Building Energy Technology" to Poland and ongoing implementation after the end of the project.

5.25 Conclusion

There is a growing demand across all fields of studies for practical, professional, work-based higher education in Europe overall, including the partner countries, thus such a dual study program format has a good potential in order to meet the shortage of labour force and to meet the demand of labour market skills. The aim of dual examination is to enable a student not only to gather the practical skills needed in his / her profession or business but also to reach theoretical knowledge needed to advance in career or business.

Although the competition among bachelor level study programs is certainly high, the offer of the innovative format (dual) will surely serve as an element of attraction, a substantial `selling point`.

Attraction of companies as co-producers of such a dual study program shall be a challenge as 1) the bachelor level programmes are mainly considered by young people (~18~23 of age), 2) this group generally have less working experience, 3) companies mostly need working experience, 4) time devoted to work at the company during the studies is fragmented. The solution for this is to involve companies in the very preparation of the program and create few success stories to ensure further continuation.

The dual bachelor's degree program developed in the project with an integration of vocational initial training and further vocational training

- greatly improves the permeability between vocational and higher education
- significantly increases the attractiveness of vocational education and training.
- significantly reduce drop-out rates compared to conventional courses of study.
- leads to a holistic learning process that appeals to all senses.
- meets the expectations and wishes of the younger generation in particular.
- meets the requirements of the labour market and companies in an excellent way.
- provides management and skilled workers in line with demand - especially for SMEs - and makes a decisive contribution to overcoming the growing shortage of skilled workers and young entrepreneurs.
- saves time and resources.

The integrating study programs developed in the project can be transferred on a broad basis and implemented in other European countries. In countries that do not



Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



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(yet) permit the implementation of dual Bachelor's degree programs, individual modules of the courses can be used for integration into existing degree courses or for further training and represent valuable enrichment.

6. Results of the Train the Trainer program

In order to ensure that qualified lecturers and advisors are always available in sufficient numbers for the implementation of three-stage dual study programmes and for the promotion of innovation by SMEs in all regions of the Baltic Sea Region, the following work was carried out:

- Development of a concept, curriculum and teaching materials for a Train the Trainer programme for the qualification of teachers, consultants and university lecturers for the implementation of dual bachelor's degree courses, demanding further education as well as innovation promotion and R&D projects in and with SMEs¹⁶
- Testing and evaluation of the Train the Trainer programme
- Revision and finalisation of the Train the Trainer programme and transfer to 24 colleges and universities from all Baltic Sea countries, which will implement the training on an ongoing basis.

The implementation report, the evaluation concept and the evaluation report are summarized in Result 2.5 “Qualification of teachers, counsellors and university lecturers of all project partners”. Result 2.4 Concept, curriculum and teaching materials for a Train the Trainer program is listed below.

¹⁶ The development of this program builds on the concepts and experiences of three successful Train the Trainer programs:

- Train-the-Trainer program for university lecturers and SME advisors, Berufliche Hochschule Hamburg, 3LOE project, Hamburg 2022
- Train the Trainer program DIG-CON project, Satakunta University of Applied Sciences, compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Pori 2023
- Train the Trainer – concept Master BSR project, Gdańsk University of Technology, compiled by Marzena Grzesiak, Magdalena Olczyk and Marzena Starnawska, Gdańsk 2016

6.1 Concept

Aim and target groups of the course

The aim of this course is to introduce teachers from further education institutions, advisors from SMEs Promoters and university lecturers for the implementation of dual bachelor's degree courses, demanding further education as well as innovation promotion and R&D projects in and with SMEs. The attention will be paid to motivation, fundamental terminology, dual study programs, innovation promotion, pedagogic issues mentoring, and coaching.

The important goal of the trainer seminar is also to present the possibilities of inter-linking vocational training and academic education in the different project partner countries on the basis of comparable criteria.

The target groups of this course are teachers from further education institutions, advisors from SMEs Promoters and university lecturers.

The target group in such a seminar should consist of representatives of vocational and academic education with extensive experience in the planning and design of vocational education programs and academic study programs. As experts in their organizations, these representatives are generally familiar with the diverse administrative, legal, organizational, curricular, didactic and other framework conditions when planning and implementing measures, courses or complete educational and study programs. This makes them ideal for analysing, reflecting on and assessing the possibilities for improving qualifications in the fields of business administration, sustainable management and renewable building energy technology by interlocking theory and practice. In addition, based on experience, they can assess which framework conditions can and must be changed locally for such an improvement in qualifications.

Duration of the training

The training usually lasts two days. For participants with less previous knowledge and experience, three days can be scheduled. For participants with extensive knowledge and experience in continuing vocational education and training and the implementation of dual study programmes, a one and a half day training course may be sufficient. As the testing of the training program takes place with lecturers and advisors of the project partners who already know the CVET programmes and dual study programmes well, the testing takes place for one and a half days.

Methods and Facilitations of the course

Varying methods will be used, e.g., lectures and presentations, group work, discussions, practices, self-studies, data searching etc. The aim is to give the trainees experience of as many methods as possible.

For the training a room that is big enough for all the participants and trainers, and smaller rooms or other space for group work, will be needed. In addition to rooms, the following equipment is recommended:

- Video projector with the most common plugs for connections with presenters' laptops
- A computer and internet connection for those presenters who do not have a laptop of their own.
- An opportunity to wireless connect to internet for all participants is also recommended.
- Paper, pens, post-it-pads, whiteboard or blackboard in the classroom and flip charts in both the classroom and group-workrooms are necessary too.

If a trainer needs some special equipment or resources, he / she should inform the facilitator in advance about these needs.

6.2 Contents of the course

The training consists of 11 modules. The necessity and significance of dual bachelor's degree programs, alternative forms of combining practice and theory as well as the integration of continuing vocational education and training with recognized continuing education and training qualifications are dealt with. The two continuing vocational education and training courses and the two trial courses of study are comprehensively presented and advised on, as well as their possibilities of realization under different national conditions and legal regulations. A program for the promotion of innovations in SMEs will be presented and discussed, which can be optimally and precisely combined with the implementation of R & D projects according to the specific conditions of the companies. Finally, pedagogy, coaching, and mentoring will be discussed.

The “Train the Trainer” -program includes following topics, which are not necessarily in the same order in the implementation:

Module A: Introduction

- Greetings
- Objectives and execution of the training
- Self-presentation of the participants
- Determination of the participants' previous knowledge and their expectations of the seminar

Module B: Motivation

By presenting serious bottlenecks and challenges and the important contributions of dual study programs to overcoming these problems, participants will be motivated to implement dual study programs with integrated vocational training. Such challenges concern for example:

- Tackling the urgent tasks in the energy, climate and environmental sectors.
- Overcoming the high and growing shortage of skilled workers and entrepreneurs.
- Aligning qualifications with the conditions and needs of SMEs.
- Strong increase in the attractiveness of vocational education and training.
- Establishing complete permeability between vocational and academic training.
- Crediting of already acquired competences.
- International recognition of educational qualifications, especially in continuing vocational education and training.
- Significant reduction of drop-out rates in study programmes through the combination of practice and theory.
- Achievement of IVET and CVET degrees for students who do not achieve a Bachelor's degree.
- Increasing innovation, productivity and competitiveness in SMEs.

Module C: Comparison of education systems with regard to interlocking of theory and practice

Various points of connection to the previous lectures will be established and supplemented with further reflections on the dovetailing of theory and practice by using the example of the idea of study-integrated training at the Hamburg University of Applied Sciences (BHH).

Explanations of the central idea and the interlocking of theory and practice in study programs at the BHH.

The BHH was founded in 2020 to upgrade vocational education in the education system. In many federal states, young people would rather study than do a state-recognized apprenticeship. Apprenticeship places therefore often remain unfilled.

The BHH as a public higher education institution is pursuing a new concept to strengthen vocational and academic education. Many young people (target group 1) are faced with the decision of study or recognized apprenticeship (vocational training) after the general school system. The question cannot always be answered clearly and leads to uncertainty. BHH provides a remedy and offers a path that combines study and apprenticeship (legal recognition). With the study-integrated training model, both options go hand in hand.

Young people can obtain a double qualification by studying for a Bachelor's degree in combination with an apprenticeship (examination and certification), and this in a period of only four years. Achievements at three places of learning (university, company and vocational school) are mutually recognized (learning places). The interlocking of contents reduces inefficient duplication in different courses and enables a workload that is oriented towards the classic five-day week.

One of the most important features of study integrated apprenticeship (special type/modification of dual study program) is the combination of demanding practical skills in the teaching company (target group 2), broad knowledge of the entire vocational field at the vocational school, and academic skills and scientific methods at the university. The phases at the three places of learning are largely structured in coherent blocks and some university afternoons. Organizational and curricular coordination is one of the most important tasks between the different learning places.

Based on this example of interlinking vocational and academic education, the main comparison criteria can be identified (terms in bold). These played an essential role in the further course of the training. This is because they can be used for the design of a

matrix. Using these criteria, the relevant activities and examples from the academic world', in particular self-conception and framework conditions for the design and implementation of the study program ("theory") and the vocational world, in particular self-conception of the representatives of professional practice (e.g. companies, chambers) and framework conditions for the design and implementation of vocational training) ("practice") in the single project countries can now be used and compared.

One of the results is an overview and a better understanding of, for example, the legal, organizational and curricular framework in the different worlds. In addition, the matrix can be used as an approach to better understand the different worlds in the different project partner countries.

As a result of the above considerations and preparations, the matrix is developed and used. It represents a systematization grid to enable a comparison between "theory" and "practice" based on the specified criteria. This creates a common basis for communication that can be used to place the different perspectives in the project on a common basis. The flexibility of this part of the train-the-trainer seminar will take into account by the possibility of changing or adding some criteria if the project partner group considers it useful.

Presented are concepts and models for courses of study with integrated vocational education and further training:

- Current situation related to permeability of vocational and academic training.
- Possibilities of application of performance results which have been already obtained in one educational system.
- Recognition of academic achievements in the parts of the further vocational examination

- Integral conveyance of further vocational training and bachelor within the framework of studies.
- Alternative options for achieving vocational training and activities.
- Vocational training, further vocational training and field of study.
- Innovation support and R&D projects for SMEs.

Module D: Further Training program “Sustainable Management”

Overview of the contents of the qualification program for further vocational training

- Content of the training program
- Target groups of the vocational further training course
- Alternative methods of implementation
- Specialist qualification in the field of professional training
- Examination and recognized further education qualification

Module E: Three stage dual study program “Business Administration & Sustainable Management of SMEs”

Overview of the contents of the study program

- Structure, procedure and experience with dual Bachelor's programs
- Modules and content of the study program
- Target groups for the implementation of the study program
- Cooperation with SMEs
- Use of the study modules for further education
- Implementation and reflection

Module F: Further Training program “Energy Service Manager”

Overview of the contents of the qualification program for further vocational training

- Content of the training program
- Target groups of the vocational further training course
- Alternative methods of implementation
- Specialist qualification in the field of professional training
- Examination and recognized further education qualification

Module G: Three stage dual study program “Management of Renewable Energy Technology in Buildings”

Overview of the contents of the study program

- Structure, procedure and experience with dual Bachelor's programs
- Modules and content of the study program
- Target groups for the implementation of the study program
- Cooperation with SMEs
- Use of the study modules for further education

Implementation and reflection

Module H: Action and reflection phase (Group work)

- Development of examples for interlocking of theory and practice

In this phase of the seminar, the participants use the previously developed comparison criteria to describe and discuss many examples of how theory and practice can be linked in their educational institutions. Each project group receives a prepared flipchart

for this purpose. On this flipchart, the participants first reflect on the existing criteria and modify them if necessary. They then consider examples for the matrix, which from the point of view of the BA&VET project offer particularly good opportunities to illustrate the interlocking of theory and practice.

- Exchange phase: Finding commonalities and differences

In this phase, the participants are asked to take a tour of the results of the other participants and discuss them. In order to develop a better understanding of the special features of the theory-practice interlocking in the other project partner country, the respective participants present possibilities of a theory-practice interlocking in their qualification and education area based on their presentation on the flipchart.

Through this exchange, all participants from the different project partner countries are able to get differentiated and at the same time project-specific images of the framework conditions, possibilities and limits of the integration of theory and practice in the other participating countries. Similarities and differences become directly visible through this exchange and can be discussed more intensively.

- Presentation and discussion phase: Ideas and Examples for interlocking of theory and practice.

All groups present their examples of the possibilities of interlinking courses or study programs in connection with the BA&VET project. They pay particular attention to highlighting the special features and typical features of their examples. Overall, through these presentations given by the groups, all participants receive an insight and overview of the special possibilities, but also the limits of a criteria-guided theory-practice interlocking of their professional and academic educational institutions in the BA&VET project.

Module I: Pedagogy & Coaching

Effective teaching and training techniques

- Principles of effective teaching
- Training process
- Presentation skills
- Attitude awareness, motivation and engagement
- Evaluation
 - Effective training techniques
- Group work and brainstorming
- Mentoring and coaching
- Effective questioning and appreciative inquiry
- Best practices and worst cases in knowledge creation and sharing
- Creativity and innovations

Coaching processes

- The challenges of training and consulting
- KAIN method
- The preparation of a change process and project clarification
- Concretization of the planning of measures
- Setting objectives with SMART
- Consulting
- Attitudes and Behaviour of Consultants

- The role of consultant

- Dialogue

Differences of concepts

Although mentoring and coaching are commonly used as synonyms, the activities and processes in question are not similar.

- What mentoring is

- voluntary

- supporting

- person-oriented

- situation-specific

- experience-based

- What coaching is

- professional (mostly)

- evidence-based (should be)

- task-oriented

- goal-specific

- When should we talk about training or advising rather than coaching or mentoring?

Module J: Innovation promotion of SMEs

- Promoting innovation and SME needs

- Promotion of innovation in conjunction with further trainings and dual study programs
- Innovation promotion combined with continuing vocational training
- Innovation promotion combined with dual Bachelor study programs

Module K: Completion of the training

- Materials for everyday use
- Contacts for assistance
- Final debate and course evaluation

Conclusion and outlook

An essential and very demanding goal of the 'Train the Trainer' workshop is to improve the mutual understanding of the two multilayered constructions (academic) theory and (business-related) practice by the respective representatives. This is accompanied by the search for one or more connecting elements, how the view of theory (academic education in science with its self-understanding) can be constructively connected with the view of practice (vocational education in practice with its self-understanding) for a joint qualification in study programs. For this connection, the various overarching criteria on theory and practice in particular served in the training, which clarified the differences, commonalities and future potentials of the two qualification systems.

Special mention must be made of the extremely committed cooperation of the participants who had to deal with the other qualification systems and the partly very different requirements in a dialogue exchange several times during the training. The challenges were not small. A good working atmosphere and the creation of a team spirit, which could already be built up in the run-up to the training, are effective for the success of such training. Care should be taken to ensure that all participants first

understand the other perspective from theory or practice, so that they can then recognize and appreciate it. In this way, a common basis can be created to break down any existing hurdles and resistance and to build up or expand a complementary educational offer.

The number of participants depends on the characteristics of the training (e.g. whether the training includes practical modules or not), the goals to be achieved, the care and comfort for participants and lecturers. The standard training group consists of no less than 15 people and no more than 25 people. The optimal number of trainees with active training is approx. 20 people.

The development of the contents of a dedicated training (closed) should be carried out in cooperation with the target customer, whereby the open training program is usually based on economic, social, pedagogical and institutional environment analysis and is developed by corresponding experts.

The critical factors in the preparation and execution of high-quality training can be the selection of a competent trainer and/or the quality of the training materials. A trainer should use different learning techniques (e.g. teamwork, discussion, role play, case analysis) and presentation of content (e.g. lecture, videos, best practice examples).

Evaluation of the training by the trainers and the trainees' perspective can be used to improve both the content and the organization of the training.

To develop the necessary competencies, it is essential not only to impart knowledge, but also to develop analytical skills and positive attitudes among the participants.

To meet these requirements:

- some parts require the active participation of the participants (presentation, flipchart presentation, discussion, feedback to other participants),
- the participants should work individually and in groups,

- the participants should learn on the basis of varied material: case study of a real crafts enterprise, best practices from business practice, secondary data collection and analysis on the basis of critical thinking,
- participants work in and outside the classroom,
- participants receive feedback in the training environment, face-to-face feedback.

The effectiveness of all education systems depends crucially on the quality of teaching and learning in the classrooms, workshops, laboratories and other places where education takes place. While excellent trainers (including tutors, coaches etc.), dedicated students, well-designed courses, appropriate facilities and sufficient resources are required, they alone are not enough to ensure an excellent education.

Specifically, we need to understand more clearly how best to involve certain types of learners so that they can carry out learning to achieve the desired professional results. This is the essence of what can be understood as vocational education. The findings indicate that serious consideration of pedagogy in vocational education and training is largely lacking. In the present train the trainer concept of three most important topics will be analysed:

First, the essence of vocational education and training, further education and higher education is presented. In general, a trainer's teaching is only as good as his/her ability to use the types of learning that reliably lead to the desired results. Without this process of thinking about the relationship between the desired results and teaching design, neither teaching nor learning is good enough. In this approach, decision-making will consider several key areas to be able to guarantee the best possible decisions on pedagogy. Choices to be made are e.g., the role of the trainer, the type of activities, the type of knowledge, the attitude to knowledge, the organization of time, the organization of

space, the approach to tasks, the visibility of processes, the proximity to the trainer and the role of the learner.

Secondly, in all three stages of vocational education, the desired results that vocational training is trying to achieve must be examined. Six results are important in the entire vocational training: a development of work competence, routine experience, ingenuity, functional competence, craftsmanship and other skills for personal and professional development.

Thirdly, it must be argued that trainers need a clear understanding of the diversity of learning methods that lead to different learning outcomes. It is clear that vocational training must be taught in the context of practical problem solving and that high-quality vocational training usually involves a mix of methods. Mostly, the best. By and large, the best vocational learning is practice-oriented, practical, experience-oriented, realistic and often simultaneously with feedback, questioning, application and reflection and, if necessary, with theoretical models and explanations. In the present training, the advantages of effective learning and teaching methods in vocational education and training, further education and higher education should be demonstrated, such as learning through observation, learning through imitation, learning through practice, learning through feedback, learning through conversation, learning through real problem solving, learning through critical thinking, learning through coaching, through simulation and role play.

6.3 Content of the curriculum and schedule

Day one

Topic	Scheduled time	Issues and Notes
Module A Introduction	45 minutes	Welcome Goals and implementation of the training Introduction of the participants: Name? Activity? Experience? Expectations? Questions
Module B Motivation	90 minutes	Why are dual study programs and promoting of innovation for SMEs important? Presentation and consultation of central challenges and the contributions to overcoming the bottlenecks through dual study programs. Discussion and clarification of questions. Bilateral exchange on individual motivation to implement dual study programs.
Coffee break	30 minutes	
Module C Comparison of education systems with regard to interlocking of theory and practice	75 minutes	Presentation of concepts and models for courses of study with integrated vocational education and further training. Explanations of the central idea and the interlocking of theory and practice in study programs using the example of the idea of study-integrated training at the Hamburg University of Applied Sciences (BHH). Discussion and clarification of questions.
Lunch	60 minutes	
Module D Further Training program “Sustainable Management”	60 minutes	Presentation <ul style="list-style-type: none"> • Content of the training program • Target groups of the vocational further training course • Alternative methods of implementation

		<ul style="list-style-type: none"> • Specialist qualification in the field of professional training • Examination and recognized further education qualification <p>Discussion and clarification of questions.</p>
Coffee break	30 minutes	
Module E Three stage dual study program “Business Administration & Sustainable Management of SMEs”	90 minutes	<p>Presentation of the contents of the study program</p> <ul style="list-style-type: none"> • Structure, procedure and experience with dual Bachelor's programs • Modules and content of the study program • Target groups for the implementation of the study program • Cooperation with SMEs • Use of the study modules for further education • Implementation and reflection <p>Discussion and clarification of questions.</p>
Module F Further Training program “Energy Service Manager”	60 minutes	<p>Presentation</p> <ul style="list-style-type: none"> • Content of the training program • Target groups of the vocational further training course • Alternative methods of implementation • Specialist qualification in the field of professional training • Examination and recognized further education qualification <p>Discussion and clarification of questions.</p>

Day two

Topic	Scheduled time	Issues and Notes
Welcome & introduction second day	15 minutes	Reflection on the work of the first seminar day and presentation of the program for the second seminar day
Module G Three stage dual study program "Management of Renewable Energy Technology in Buildings"	90 minutes	<p>Presentation of the contents of the study program</p> <ul style="list-style-type: none"> • Structure, procedure and experience with dual Bachelor's programs • Modules and content of the study program • Target groups for the implementation of the study program • Cooperation with SMEs • Use of the study modules for further education • Implementation and reflection <p>Discussion and clarification of questions.</p>
Coffee break	30 minutes	
Module H Action and reflection phase	105 Minutes	<p>Work in small groups and in plenary in three phases:</p> <ul style="list-style-type: none"> • Development of examples for interlocking of theory and practice • Exchange phase: Finding of commonalities and differences • Presentation and discussion phase: Ideas and Examples for interlocking of theory and practice.
Lunch	60 minutes	
Module I Pedagogy & Coaching	90 minutes	<p>Presentation of</p> <ul style="list-style-type: none"> • Effective teaching and training techniques

		<ul style="list-style-type: none"> • Coaching processes • Differences of concepts <p>Discussion and clarification of questions. Role game: Two pairs, mentor – mentee and coach – coaches present a small real-life case. Rest of the group tries to guess which one is mentoring and which one is coaching.</p>
Coffee break	30 minutes	
Module J Innovation promotion of SMEs	60 minutes	<p>Presentation of the concept</p> <ul style="list-style-type: none"> • Promoting innovation and SME needs • Promotion of innovation in conjunction with further trainings and dual study programs <p>Different forms of implementation and realization in Project BA&VET Discussion and clarification of questions.</p>
Module K Completion of the training	30 minutes	<p>Questions and final discussion Feedback & evaluation</p>

6.4 Schedule for a one and a half day training session

As the testing of the training program takes place with lecturers and advisors of the project partners who already know the CVET programs and trial study programmes well, the testing takes place for one and a half days.

First half day

Topic	Scheduled time	Issues and Notes	Management by
Module A Introduction	30 minutes	Welcome Goals and implementation of the training Introduction of the participants: Name? Activity? Experience? expectations? Questions	PP1 Hanse-Parlament
Module B Motivation	60 minutes	Why are dual study programs and promoting of innovation for SMEs important? Presentation and consultation of central challenges and the contributions to overcoming bottlenecks through dual study programs. Discussion and clarification of questions. Bilateral exchange on individual motivation to implement dual study programs.	PP1 Hanse-Parlament
Module C Comparison of education systems with regard to interlocking of theory and practice	60 minutes	Presentation of concepts and models for courses of study with integrated vocational education and further training. Explanations of the central idea and the interlocking of theory and practice in study programs using the example of the idea of study-integrated training at the Hamburg University of Applied Sciences (BHH). Discussion and clarification of questions.	PP7 Berufliche Hochschule Hamburg

Coffee break	30 minutes		
Module D Further Training program “Sustainable Management”	60 minutes	<p>Presentation</p> <ul style="list-style-type: none"> • Content of the training program • Target groups of the vocational further training course • Alternative methods of implementation • Specialist qualification in the field of professional training • Examination and recognized further education qualification <p>Discussion and clarification of questions.</p>	PP7 Berufliche Hochschule Hamburg
Module F Further Training program “Energy Service Manager”	60 minutes	<p>Presentation</p> <ul style="list-style-type: none"> • Content of the training program • Target groups of the vocational further training course • Alternative methods of implementation • Specialist qualification in the field of professional training • Examination and recognized further education qualification <p>Discussion and clarification of questions.</p>	PP2 Satakunta University

Second half day

Topic	Scheduled time	Issues and Notes	Management by
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<p>Module E Three stage dual study program “Business Administration & Sustainable Management of SMEs”</p>	<p>90 minutes</p>	<p>Presentation of the contents of the study program</p> <ul style="list-style-type: none"> • Structure, procedure and experience with dual Bachelor's programs • Modules and content of the study program • Target groups for the implementation of the study program • Cooperation with SMEs • Use of the study modules for further education • Implementation and reflection <p>Discussion and clarification of questions.</p>	<p>PP7 Berufliche Hochschule Hamburg</p>
<p>Module G Three stage dual study program “Management of Renewable Energy Technology in Buildings”</p>	<p>90 minutes</p>	<p>Presentation of the contents of the study program</p> <ul style="list-style-type: none"> • Structure, procedure and experience with dual Bachelor's programs • Modules and content of the study program • Target groups for the implementation of the study program • Cooperation with SMEs • Use of the study modules for further education • Implementation and reflection <p>Discussion and clarification of questions.</p>	<p>PP2 Satakunta University</p>
<p>Coffee break</p>	<p>30 minutes</p>		

Module I Pedagogy & Coaching	90 minutes	<p>Presentation of</p> <ul style="list-style-type: none"> • Effective teaching and training techniques • Coaching processes • Differences of concepts <p>Discussion and clarification of questions.</p> <p>Role game: Two pairs, mentor – mentee and coach – coaches present a small real-life case. Rest of the group tries to guess which one is mentoring and which one is coaching.</p>	PP2 Satakunta University
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Third half day

Topic	Scheduled time	Issues and Notes	Management by
Module H Action and reflection phase	120 Minutes	<p>Work in small groups and in plenary in three phases:</p> <ul style="list-style-type: none"> • Development of examples for interlocking of theory and practice • Exchange phase: Finding of commonalities and differences • Presentation and discussion phase: Ideas and Examples for interlocking of theory and practice. 	PP7 Berufliche Hochschule Hamburg
Coffee break	30 minutes		
Module J Innovation promotion of SMEs	60 minutes	<p>Presentation of the concept</p> <ul style="list-style-type: none"> • Promoting innovation and SME needs 	PP1 Hanse-Parlament

		<ul style="list-style-type: none"> Promotion of innovation in conjunction with further training and dual study programs <p>Different forms of implementation and realization in Project BA&VET Discussion and clarification of questions.</p>	
Implementations in the BA&VET project	30 minutes	Consultation of the implementations in the BA&VET project by the different partners, the time schedules as well as agreements on the further procedure	PP1 Hanse-Parlament
Module K Completion of the training	30 minutes	Questions and final discussion Feedback & evaluation	PP1 Hanse-Parlament

6.5 Background and teaching material

The teaching material is an example showing how the topics of this course could be presented. Each teacher should adjust this to the circumstances of his/her own country, considering the local regulation the level and skills of the trainers participating to the course, and the level, state and possible study program of their students / trainees / coaches / mentees; are they studying, finishing initial or further vocational training, are they entrepreneurs or working in the enterprise etc. Each program may require different weightings and highlights, and it is on the responsibility of each teacher to consider these special needs.

The following freely accessible background and teaching materials are published on the project website <https://ba-vet.eu/> and can be downloaded free of charge:

- Module B & C: Objectives and strategies for vocational training in the countries of the Baltic Sea Region
- Module B: Strategien für die künftige Gestaltung der beruflichen Aus-, Weiter- und Hochschulbildung
- Module C: Concepts and models for courses of study with integrated vocational education and further training
- Module C: Ausbildungsintegrierende duale Studiengänge
- Module C: Studienintegrierte Ausbildung an der neuen Beruflichen Hochschule Hamburg
- Module D & F: Guide and checklist for the offer and implementation of seminars
- Module D: Further Training program “Sustainable Management”
- Module E: Three stage dual study program “Business Administration & Sustainable Management of SMEs”
- Module F: Further Training Energy Service Manager
- Module G: Three stage dual study program “Management of Renewable Building Energy Technology”
- Module H: National and legal conditions and alternative solution models
- Module I: Effective teaching and training techniques
- Module I: Implementation of coaching processes
- Module I: Pedagogy

- Module J: Technology transfer process and the handling of manageable R & D tasks in SMEs
- Module K: Evaluation of Trainings or Consulting Processes

The implementation report on the practical testing of the Train the Trainer programme and implementation during the project period, the evaluation concept and the evaluation report are presented in Result 2.5 'Qualification of teachers, counsellors and university lecturers of all project partners', which is published on the project website <https://ba-vet.eu/>.

7. Results of the dual study program "Business Administration & Sustainable Management of SMEs"¹⁷

A Bachelor's degree course in "Business Administration & Sustainable Management of SMEs" has been developed, which also integrates initial and continuing vocational training and combines theory (learning at the university) with practice (learning in the company). This "trial" course of study is designed in such a way that

- a) it can also be completed without initial vocational training.
- b) the integrated continuing education program "Sustainable Management" with a recognized continuing education qualification can also be carried out separately without studying.

The Transition from the VET program "Commercial Specialist in Sustainable Management for SMEs" to the Dual Bachelor Study Program "Business Administration and Sustainable Management for SMEs" with recognition of academic achievements is described in the last chapter of the Results.

Main modules of the developed study program were tested, evaluated and the entire study program was finalized based on the evaluation results. The concept and module handbook of the study program including the transition of the VET program form Result 3.3 Concept, curricula and module handbook for three-cycle dual study program "Business Administration & Sustainable Management of SMEs.

The trials, implementation report, evaluation concept and report are listed in Result 3.4 Implementation report, evaluation concept and report for course "Business Administration & Sustainable Management".

¹⁷ Prepared by Berufliche Hochschule Hamburg

7.1 Introduction

The global climate crisis, the advancing environmental destruction and the continuous consumption of the earth's natural resources have led to an intensive discussion about the sustainability of business. Changes in consumer behaviour towards a more conscious consumption of sustainable products as well as the political setting of environmental and climate targets (such as through the European Union's Green Deal) present companies with new challenges. Both climate-neutral and sustainable products must be developed, as well as resource-saving processes along the entire value chain. For small and medium-sized enterprises in particular, this structural change is associated with both challenges and opportunities.

"Green innovations" in products and processes are not automatically sustainable. A holistic understanding of ecological, social and economic sustainability and its implementation in companies is required. Sustainable action affects all functions along the value chain, starting with the development of sustainable products, the management of sustainable supply chains, resource-conserving production, and sustainability-oriented marketing. In order to be able to accompany and evaluate such entrepreneurial innovations and transformation processes, it is necessary to have an understanding of the company's internal service production processes and cross-company value chains. Knowledge about the use of environmentally friendly and renewable resources should contribute to finding the basis for entrepreneurial decisions that make economic and ecological sense as well as being ethically responsible.

This course of study is therefore concerned with the acquisition of interdisciplinary competencies for sustainable management in small and medium-sized enterprises (SMEs). This includes basic education in business administration and sustainability concepts. A consistent sustainability orientation can be an important success factor for SMEs in the future in maintaining and expanding their competitiveness. Since there are

generally polypolistic market structures relevant for SMEs, they must therefore have a sound knowledge of business management contexts that enables them to constantly adapt their own range of products and services to changing market conditions.

7.2 Objectives and didactic concept of the dual bachelor's study program

As part of the dual study program "Business Administration and Sustainable Management for SMEs", students acquire comprehensive business skills for analysing and evaluating entrepreneurial processes. In doing so, they are put in a position to reflect on operational structures, processes and procedures, which they become familiar with from their own perspective within the framework of the dual study program. They learn to do it in a theory-based manner and to apply and transfer their knowledge to these structures, processes and procedures. In this context, they are also qualified to understand the overall entrepreneurial process as part of a complex value creation process that must be designed in a sustainable manner.

As (future) specialists and managers, they therefore also acquire competence during their studies to systematically record, analyse and evaluate complex business situations on the basis of suitable figures, data and facts and to design business performance processes. On a well-founded business management basis, they are thus able to use the results for improvements, further developments and innovations. These competencies form the basis for a holistic evaluation of corporate decisions with regard to economic, ecological and ethical aspects.

The professional qualification of the students also includes the increasing assumption of operational management and leadership tasks. This requires the consideration of comprehensive technical and interdisciplinary aspects.

7.21 Program Objectives

The following is an overview of the central qualification goals of the study program "Business Administration and Sustainable Management for SMEs":

- Imparting business management competence for the analysis and evaluation of business processes and sustainable entrepreneurial action, especially in small and medium-sized enterprises.
- Ability to reflect on business structures, processes and procedures in a theory-based manner, especially with regard to sustainability.
- Ability to apply and transfer business management knowledge to operational structures, processes and procedures.
- Development and expansion of the understanding of responsible entrepreneurial action as a component of a sustainable value chain.
- Imparting comprehensive business management competencies for the assumption of sustainable management and leadership tasks in SMEs.
- Competence to systematically record, analyse and evaluate operating results on the basis of appropriate figures, data and facts, taking sustainability into account.
- Ability to analyse operational performance processes and to design them with a view to sustainability.
- Ability to use the results for improvements, further sustainable developments and green innovations.

- Promotion of personal, methodical and social competence to communicate with relevant operational groups (e.g. business partners, employees, customers, suppliers) to communicate successfully.

7.22 Didactic Concept

The design tasks in SMEs demand not only a broad spectrum of business knowledge from junior executives, but also in particular social-communicative, methodological and action competencies. During the course of study, students are therefore increasingly enabled, in smaller groups and with the help of participant-oriented methods, to develop scientifically sound analyses and solution concepts for business management problems, which can be implemented in management and leadership tasks of medium-sized companies, so that they can assume leadership responsibility with increasing professional experience.

The bachelor's degree program "Business Administration and Sustainable Management for SMEs" is geared towards the specifics of a sustainability orientation and the needs of small and medium-sized enterprises. Since there is no closed theoretical concept of sustainable business management for SMEs that can be built upon, the orientation towards sustainability and SME problems is implemented through the design of subject specific core modules, which also address sustainability as well as SME-specific problems and solution approaches from their respective perspectives. The core modules offer a basic and intensive consideration with common business management contents, which are necessary for the assumption of management and leadership tasks as well as the further development of SMEs in the field of sustainability. Furthermore, the specialization options in the third and fourth year of study are suitable to promote the students' competence with regard to the analysis and evaluation of sustainability aspects

on the basis of a systematic collection and evaluation of essential information on the one hand but also to deepen personal communication competences on the other hand.

As a dual course of study, the didactic concept is geared towards a theory-based as well as application-oriented teaching of competencies in the course of study and is interlinked with a coordinated practical training in the company.

The courses are organized on a part-time basis, thus enabling students to gain practical experience in the company. Between the course phases, the students are active in practice. This form of organization enables students to reflect on what they have learned in practice between courses and to prepare and follow up courses as part of their independent study.

In order to ensure an intensive acquisition of competence, the courses are predominantly held in small groups of approx. max. 30 students. Even in courses that are designed as "lectures" for larger groups (from experience max. 60 students), the interactive teaching discussion still dominates as a rule. In the smaller groups, participant-activating and cooperative methods such as group work and case studies are used. Within the framework of group work, students are encouraged to bring in practical experience from their own training company and thus to relate theory and practice with the help of the lecturer himself.

The relationship of the practical training components to the course of study is ensured and guided by the practice modules in the form of four reflections on practice and a capstone project.

Reflections on practice are student term papers that are written in the course of practical training on subjects that are related to the studies at the University. These practical examinations contain concrete tasks and problems of the operational practice, which are to be worked on with the technical and methodical competences acquired during the studies.

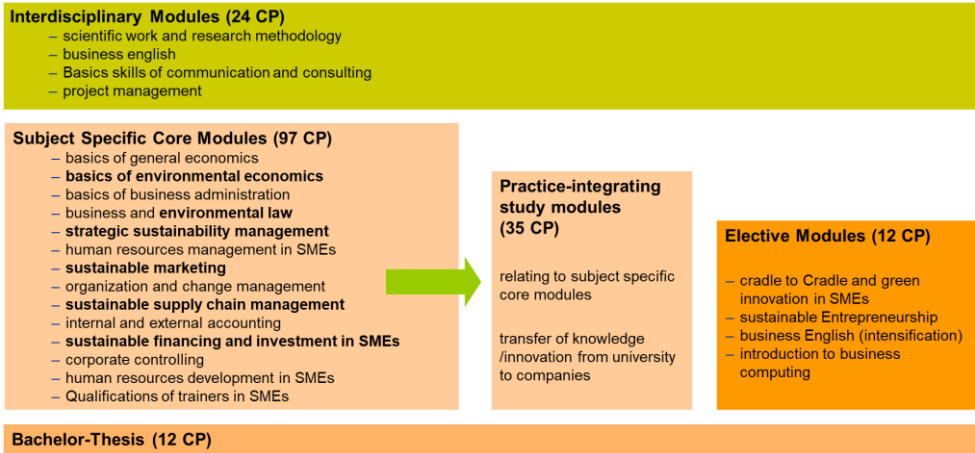
The capstone project comprises a complex operational problem from practice, which is worked on in an application-oriented and, if possible, multidisciplinary manner on the basis of the contents and competencies acquired during the course of study. The work is carried out in student groups (teams) of 4 - 5 participants.

During the preparation of practical modules, students are supervised by teachers from the University.

7.3 Structure and Sequence of Studies

The structure of the curriculum is geared towards both central business management fields of action, decision-making and design as well as consistent process management that takes into account the sustainability of corporate, business and work processes. It provides students with the necessary fundamentals to recognize business structures in the company, to align themselves with customer needs, to organize processes efficiently, to control them in a goal-oriented manner and to constantly improve them, as well as to actively pursue the goal of sustainability.

The structure is characterized by interdisciplinary, subject-specific, practice-integrating modules as well as elective modules. The Bachelor's thesis is the final module. The structure of the modules is shown in the following figure.



In the first year of the program „Business Administration and Sustainable Management for SMEs“, business management qualifications are taught in the core modules "Basics of general economics", „Basics of Environmental Economics“, "Basics of Business Administration", "Human Resources Management in SMEs" and "Sustainable Marketing" and, in addition, interdisciplinary qualifications are taught in the modules "Scientific Work and Research Methodology" and "Business English". By the end of the first year of study, a first reflection on practice must be prepared in accordance with the module description.

In the second year of study, the basic business qualifications are expanded by completing the core modules "External Accounting", "Sustainable Financing and Investment in SMEs", "Basics of Commercial and Environmental Law", "Internal accounting and basics of business taxation" and "Strategic Sustainability Management". The interdisciplinary qualifications are extended by the module "Communication and Consulting". As part of the business part of the program, a practical reflection must be completed in the second year of study in accordance with the module description.

In the third year of study, students complete the core modules and "Sustainable Supply Chain Management", "Human Resources Development in SMEs" and "Qualifications of trainers in SMEs" to further build up business skills and qualifications especially with regard to sustainability. The interdisciplinary qualifications are expanded by the module "Project Management". In addition, the elective module "Cradle to Cradle and Green Innovation in SMEs" must be completed as a specialization to expand and deepen the business management qualifications. Alternatively, a deepening of the qualification in the field of Business English can be chosen (elective module „Business English - intensification “). Furthermore, in the third year of study, further practical reflection and the capstone project must be completed in accordance with the module descriptions.

In the fourth year of study, the modules “Materials management”, "Corporate Controlling" and "Organization and change management in SMEs", must be completed. In addition, one of the two elective modules "Sustainable Entrepreneurship" or "Introduction to business computing“ must be completed as a specialization to expand and further deepen the business management as well as the sustainability qualifications. By the end of the fourth year of study, the fourth practical reflection must be completed in accordance with the module description.

In the fourth year, students write a Bachelor's thesis. This examination performance has a scope of 12 CP.

The company-based part of the dual study program is completed over the entire period of study in the company or organization with which a study contract has been concluded. The companies are given the opportunity to take into account company or industry-specific features in such a way that, in addition to general fundamentals, special e.g. technical knowledge can also be imparted in the respective trade. During the company period, the companies or organizations provide appropriate support for the study content on the basis of the module descriptions provided by the University.

7.4 Curriculum Overview: Module List

Module No.	Module / Study unit	Credit Points (CP) Academic year (AY)				Workload in hours		Total Hours
		1.	2.	3.	4.	Hours Full-time course	Hours Self-studies	
Interdisciplinary modules								
BWÜ 1 Scientific work and research methodology		6				48	102	150
BWÜ 1.1	Scientific work					24	51	
BWÜ 1.2	Research methodology and statistics					24	51	
BWÜ 2 Business english		5				64	61	125
BWÜ 2.1	Business English					64	86	
BWÜ 3 Basics of communication and consulting			6			52	98	150
BWÜ 3.1	Basics of communication and consulting					32	60	
BWÜ 3.2	Presentation					20	38	
BWÜ 4 Project management				5		46	79	125
BWÜ 4.1	Basics of project management					46	79	
Subject specific core modules								
BWM 5 Basics of general economics		5				46	79	125
BWM 5.1	Basics of general economics					46	79	

BWM 6 Basics of environmental economics		5				46	79	125
BWM 6.1	Basics of environmental economics					46	79	
BWM 7 Basics of business administration		5				46	79	125
BWM 7.1	Basics of business administration					46	79	
BWM 8 Human resources management in SMEs		7				72	103	175
BWM 8.1	Basics of Human resources management in SMEs					38	54	
BWM 8.2	Personnel management					34	49	
BWM 9 Sustainable marketing		6				58	92	150
BWM 9.1	Sustainable marketing					58	92	
BWM 10 External accounting			7			62	113	175
BWM 10.1	Accounting					24	43	
BWM 10.2	Annual financial statement, income statement, and balance sheet					38	70	
BWM 11 Sustainable financing and investment in SMEs			6			58	92	150
BWM 11.1	Sustainable financing					20	34	
BWM 11.2	Sustainable investment					38	69	

Module No.	Module / Study unit	Credit Points (CP) Academic year (AY)				Workload in hours		Total Hours
		1.	2.	3.	4.	Hours Full-time course	Hours Self-studies	
Subject specific core modules								
BWM 12 Basics of commercial and environmental law			6			58	92	150
BWM 12.1	Basics of commercial law					30	48	
BWM 12.2	Basics of environmental protection law					28	44	
BWM 13 Internal accounting and basics of business taxation			7			62	113	175
BWM 13.1	Cost and performance accounting					38	70	
BWM 13.2	Basics of business taxation					24	43	
BWM 14 Strategic Sustainability Management			6			52	98	150
BWM 14.1	Strategic Sustainability Management					52	98	
BWM 15 Sustainable Supply Chain Management				6		52	98	150
BWM 18.1	Basics of Sustainable Supply Chain Management					32	60	
BWM 18.2	Sustainable logistics					20	38	

BWM 16 Human resources development in SMEs				6		48	102	150
BWM 16.1	Human resources development in SMEs					48	102	
BWM 17 Qualifications of trainers in SMEs				7		72	103	175
BWM 17.1	Qualifications of trainers in SMEs					72	103	
BWM 18 Materials management					6	52	98	150
BWM 18.1	Basics of materials management and supply					32	53	
BWM 18.2	Basics of warehouse management					20	45	
BWM 19 Corporate Controlling					6	52	98	150
BWM 19.1	Basics of operational corporate planning					16	28	
BWM 19.2	Operational corporate controlling in SMEs					36	70	
BWM 20 Organization and change management in SMEs					7	62	113	175
BWM 20.1	Basics of organizational management and organizational development					28	51	
BWM 20.2	Change-Management in SMEs					34	62	

Module No.	Module / Study unit	Credit Points (CP)				Workload in hours	Total Hours
		Academic year (AY)					
		1.	2.	3.	4.	Hours	

					Full-time course	Hours Self-studies	
Elective modules (two out of four)							
BWM 21 Cradle to Cradle and green innovation in SMEs				6	52	98	150
BWM 21.1	Cradle to Cradle				12	60	
BWM 21.2	Innovation management				40	38	
BWM 22 Sustainable Entrepreneurship				6	52	98	150
BWM 22.1	Basics of sustainable entrepreneurship				16	30	
BWM 22.2	Start-up and succession of sustainable business				36	68	
BWM 23 Business English (intensification)				6	52	98	150
BWM 23.1	Business English (intensification)				52	98	
BWM 24 Introduction to business computing				6	52	98	150
BWM 24.1	Introduction to business computing				28	53	
BWM 24.2	Digitization of business processes				24	45	
Practical modules					Full-time	Time in practice	
BPR 25	Reflections on practice 1	6			28	122	150
BPR 26	Reflections on practice 2		7		4	171	175

BPR 27	Reflections on practice 3			8		4	196	200
BPR 28	Capstone project			7		32	143	175
BPR 29	Reflections on practice 4				8	4	196	200
Bachelor's thesis								
BWM 30	Bachelor's thesis				12			300
CP p.a.		45	45	45	45			
Total hours (contact studies and self-study)						1260	2113	
Total hours of practical elements (practice hours)								827
Total hours of the bachelor's thesis								300
Total hours of the course of study						4500		
Total CP of the course of study		180						

7.5 Transition from the VET program “Commercial Specialist in Sustainable Management for SMEs”

7.51 Introduction

The dual Bachelor's degree program “Business Administration and Sustainable Management for SMEs” was designed as a 3-stage degree program in such a way that the content of the VET program “Commercial specialist in Sustainable Management for SMEs” is an integral part of the degree program and therefore the academic achievements from the VET program can be recognized.

7.52 Scope and crediting potential of the VET program

The VET program “Commercial specialist in Sustainable Management for SMEs” consists of 5 modules, which are listed in the table below. Assuming that each individual hour of lectures requires a further hour of preparation and follow-up work in self-study, this results in a total workload of 600 hours. If one credit point is awarded for 25 hours of workload, this results in a total recognition potential of 48 credit points.

No.	Area of Action	Presence (h)	Self study (h)	ECTS
1	Analyzing and promoting the competitiveness of companies acting sustainably	100	100	8
2	Designing marketing according to a sustainability-oriented strategy	100	100	8
3	Organizing business accounting, controlling as well as financing and investment considering sustainability	144	144	12
4	Designing human resources management and leading employees	140	140	11,2
5	Qualifications of trainers in SMEs	116	116	9
Total		600	600	48

7.53 Transfer of credit points from VET-Program to modules

Academic study programs are generally structured differently from VET programs. They have a more pronounced modularization than VET programs. Therefore, the modules of academic study programs with 5-7 credit points are usually smaller than VET programs, whose modules often have a scope of up to 12 credit points.

As a result, there are no absolutely identical modules for which the credit points can be transferred to 1:1. It is therefore necessary to check which modules of the study program are covered by which learning units of the VET program. In the 3Stage Study Program designed here, 8 Modules of the first 3 years with a scope of 49 credit points can be recognized (see the table below).

	Module / Study unit	Credit Points		Total
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Module No.		(CP) Academic year (AY)				Workload in hours		Hours
		1.	2.	3.	4.	Hours Full-time course	Hours Self-studies	
Subject specific core modules								
BWM 7 Basics of business administration		5				46	79	125
BWM 7.1	Basics of business administration					46	79	
BWM 9 Sustainable marketing		6				58	92	150
BWM 9.1	Sustainable marketing					58	92	
BWM 10 External accounting			7			62	113	175
BWM 10.1	Accounting					24	43	
BWM 10.2	Annual financial statement, income statement, and balance sheet					38	70	
BWM 11 Sustainable financing and investment in SMEs			6			58	92	150
BWM 11.1	Sustainable financing					20	34	
BWM 11.2	Sustainable investment					38	69	
BWM 12 Basics of commercial and environmental law			6			58	92	150
BWM 12.1	Basics of commercial law					30	48	
BWM 12.2	Basics of environmental protection law					28	44	

BWM 14 Strategic Sustainability Management			6			52	98	150
BWM 14.1	Strategic Sustainability Management					52	98	
BWM 16 Human resources development in SMEs				6		48	102	150
BWM 16.1	Human resources development in SMEs					48	102	
BWM 17 Qualifications of trainers in SMEs				7		72	103	175
BWM 17.1	Qualifications of trainers in SMEs					72	103	
CP		11	25	13	0			

The learning content and skills that can be credited from the continuing education program to the Bachelor study program are distributed across different modules and course units due to the structural differences in the structure of the program. In the following table, the VET modules and course units that can be credited are allocated to the Bachelor's modules. The allocation is shown in the table below.

7.54 Recognition of academic achievements in the Bachelor study program for the VET program

The Bachelor study program “Business Administration and Sustainable Management for SMEs” covers all learning content and competencies of the continuing education program, so that the VET program “Commercial Specialist in Sustainable Management for SMEs” can also be obtained as part of the 3 Stage Program through

recognition of the study modules by the examination board of the respective VET Training Institute.

The earliest possible time for acquiring the VET qualification within the framework of recognition would be after 2.5 to 3 years (or 5th or 6th semester), depending on the course of study.

Result 3.3 Concept, curricula and module handbook for three-cycle dual study program "Business Administration & Sustainable Management of SMEs" with the complete module handbook is published on the project website <https://ba-vet.eu/> and can be downloaded there free of charge.

The implementation report on the practical trials and implementations during the project period as well as the concept of quality assurance and evaluations and the evaluation report with information on future applications are also published as Result 3.4 Implementation and evaluation course 'Business Administration & Sustainable Management' and qualified students on the project website <https://ba-vet.eu/>.

Module No.	Module / Study unit	Credit Points (CP) Academic year (AY)			VET Module (M) / Learning Unit (LU)
		1.	2.	3.	
Subject specific core modules					
BWM 7 Basics of business administration		5			M 1: Analyzing and promoting the competitiveness of companies acting sustainably LU 1: Consider the importance of companies in economic performance LU 2: Assess economic relationships and evaluate their influence on corporate goals considering sustainability LU 4: Assess operational functions and interpret their interaction in the context of corporate goals considering sustainability LU 5: Support green business start-ups and various forms of cooperation and take into account corporate legal forms in the further development of the company M 2: Designing marketing according to a sustainability-oriented strategy LU 1: Develop and justify sustainability-oriented marketing goals with the help of market, environmental and company analyses
BWM 8 Human resources management in SMEs		7			M 4: Designing human resources management and leading employees LU 1: Develop concepts for establishing and expanding a sustainability-oriented corporate culture and supporting the implementation processes LU 2: Align and implement personnel requirements planning, considering strategic company goals LU 3: Develop and implement a personnel marketing concept, define criteria for personnel selection, recruit employees LU 5: Carry out personnel deployment in compliance with individual and collective labour law and other legal provisions LU 6: Align personnel development with the strategic corporate goals and thereby recognize and promote the potential of the employees LU 7: Carry out personnel administration, in particular remuneration, considering incentive and remuneration systems as well as the applicable tax and social law provisions LU 8: Implement management models and tools for staff management LU 9: Analyze and optimize human resources and personnel management
BWM 9 Sustainable marketing		6			M 1: Analyzing and promoting the competitiveness of companies acting sustainably LU 2: Assess economic relationships and evaluate their influence on corporate goals considering sustainability LU 3: Support the development and implementation of sustainability-oriented strategic corporate goals M 2: Designing marketing according to a sustainability-oriented strategy LU 2: Prepare sustainability-oriented marketing strategies LU 3: Select marketing instruments for achieving sustainability-oriented marketing goals in the context of price, product, performance, distribution and communication policies, human resources
BWM 10 External accounting			7		M 3: Organizing business accounting, controlling as well as financing and investment considering sustainability LU 1: Design financial accounting in accordance with the principles of proper accounting and prepare it ready for decision LU 2: Design cost and performance accounting and prepare the results ready for decision LU 7: Analyze and optimize business accounting

Module No.	Module / Study unit	Credit Points (CP) Academic year (AY)			VET Module (M) / Learning Unit (LU)
		1.	2.	3.	
BWM 11 Sustainable financing and investment in SMEs			6		M 3: Organizing business accounting, controlling as well as financing and investment considering sustainability LU 5: Carry out investment calculations and develop and explain financing proposals LU 6: Develop liquidity planning and ensure liquidity security, in particular by means of receivables management
BWM 12 Basics of commercial and environmental law			6		M 1: Analyzing and promoting the competitiveness of companies acting sustainably LU 6: Observe and apply the legal provisions of commercial law as well as environmental law in the company and in relationships with customers and suppliers M 4: Designing human resources management and leading employees LU 4: Conclude and terminate contractual relationships to ensure personnel requirements
BWM 14 Strategic Sustainability Management			6		M 1: Analyzing and promoting the competitiveness of companies acting sustainably LU 2: Assess economic relationships and evaluate their influence on corporate goals considering sustainability LU 3: Support the development and implementation of sustainability-oriented strategic corporate goals
BWM 16 Human resources development in SMEs				6	M 4: Designing human resources management and leading employees LU 1: Develop concepts for establishing and expanding a sustainability-oriented corporate culture and supporting the LU 2: Align and implement personnel requirements planning, considering strategic company goals LU 3: Develop and implement a personnel marketing concept, define criteria for personnel selection, recruit employees LU 5: Carry out personnel deployment in compliance with individual and collective labour law and other legal provisions LU 6: Align personnel development with the strategic corporate goals and thereby recognize and promote the potential of the LU 7: Carry out personnel administration, in particular remuneration, considering incentive and remuneration systems as LU 8: Implement management models and tools for staff management LU 9: Analyze and optimize human resources and personnel management
BWM 17 Qualifications of trainers in SMEs				7	M 5: Qualifications of trainers in SMEs LU 1: Check Training requirements and plan training LU 2: Prepare Training and recruit trainees LU 3: Carry out Training LU 4: Complete Training
CP		11	25	13	

8. Results of the further Training program " Commercial Specialist in Sustainable Management"¹⁸

A further training program "Commercial Specialist in Sustainable Management" was developed. This further training program was integrated into the trial Bachelor's degree course "Business Administration & Sustainable Management of SMEs" (see Result 3.3), but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

Result 3.5 Concept, curricula and teaching materials further Training program "Sustainable Management" comprises the completed further training program, which will be carried out regularly by individual project partners in the future.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons are shown as Results 3.6 Evaluation concept and reports training program "Sustainable Management" and prospects of further implementing.

¹⁸ Prepared by Berufliche Hochschule Hamburg

8.1 Introduction

The global climate crisis, the advancing environmental destruction and the continuous consumption of the earth's natural resources have led to an intensive discussion about the sustainability of business. Changes in consumer behaviour towards a more conscious consumption of sustainable products as well as the political setting of environmental and climate targets (such as through the European Union's Green Deal) present companies with new challenges. Both climate-neutral and sustainable products must be developed, as well as resource-saving processes along the entire value chain. For small and medium-sized enterprises in particular, this structural change is associated with both challenges and opportunities.

"Green innovations" in products and processes are not automatically sustainable. A holistic understanding of ecological, social and economic sustainability and its implementation in companies is required. Sustainable action affects all functions along the value chain, starting with the development of sustainable products, the management of sustainable supply chains, resource-conserving production, and sustainability-oriented marketing. In order to be able to support such entrepreneurial innovations and transformation processes, it is necessary to understand the company's internal service production processes and cross-company value chains. Knowledge about the use of environmentally friendly and renewable resources should contribute to finding the basis for entrepreneurial decisions that make economic and ecological sense as well as being ethically responsible.

This further training program is therefore concerned with the acquisition of interdisciplinary competencies for sustainable management in small and medium-sized enterprises (SMEs). This includes a basic education in business administration and sustainability concepts. A consistent sustainability orientation can be an important success factor for SMEs in the future in maintaining and expanding their competitiveness.

Since there are generally polypolistic market structures relevant for SMEs, they must therefore have a sound knowledge of business management contexts that enables them to constantly adapt their own range of products and services to changing market conditions.

8.2 Conceptual foundations of the Curriculum “Commercial Specialist in Sustainable Management”

The legal basis for the course is the ordinance on the examination for the recognized advanced training qualification for a certified commercial specialist in accordance with the crafts regulations in Germany¹⁹.

The further training is primarily aimed at people with commercial dual vocational training who are interested in independently managing commercial-administrative areas of craft businesses or other small and medium-sized companies, in the design of operational processes as well as marketing and personnel management.

The admission requirements are flexible and can be fulfilled through various further education certificates as well as professional experience in relevant fields of activity. Due to the admission requirements formulated across trades and educational sectors, the courses are to be expected to have heterogeneous participant requirements, particularly with regard to formal qualifications, professional experience and age.

¹⁹ https://www.bmbf.de/bmbf/shareddocs/fortbildungsordnungen/de/kaufmaennischer-fachwirt-gepruefter-kaufmaennische-fachwirtin-gepruefte-nach-der-handwerksordnung-bachelor-professional-fuer-kaufmaennisches-management-nach-der-handwerksordnung.pdf?__blob=publicationFile&v=1

8.3 Qualification Objectives of the Further Training Program

8.31 Main Objectives

The course graduate should be able to manage commercial-administrative areas of sustainability-oriented craft businesses or other small and medium-sized companies, to design operational processes as well as marketing and personnel management independently.

The acquired competences form the basis for a holistic evaluation of corporate decisions with regard to economic, ecological and ethical aspects.

8.32 Qualification objectives according to areas of action

The following is an overview of the central qualification objectives of the further training program "Commercial Specialist in Sustainable Management", which are referred to here as areas of action:

1. Analysing and promoting the competitiveness of companies acting sustainably
2. Designing marketing according to a sustainability-oriented strategy
3. Organizing business accounting, controlling as well as financing and investment considering sustainability
4. Designing human resources management and leading employees
5. Qualifications of trainers in SMEs

An overarching and cross-functional objective is the ability to analyse and optimize processes from a business perspective, taking sustainability into account.

8.33 Didactic Concept

The course has a total duration of 600 hours. Divided into 5 areas of action, which are the modules of the course. The duration of the modules is between 100 and 140 hours.²⁰

No.	Area of Action	Duration (h)
1	Analysing and promoting the competitiveness of companies acting sustainably	100
2	Designing marketing according to a sustainability-oriented strategy	100
3	Organizing business accounting, controlling as well as financing and investment considering sustainability	144
4	Designing human resources management and leading employees	140
5	Qualifications of trainers in SMEs	116
	Total	600

Figure 1: Modules of the further training program

²⁰ The duration must be adapted to the different conditions in the partner countries

8.34 Structure of the modules

The idea of action and competence-orientation is implemented in the structure of the modules.

Instead of simply listing specialised content, the practical situations in which the skills, knowledge and abilities are used should serve as the starting point for structuring the learning process.

The Modules are divided in learning units which are described as learning situations. A learning situation contains situations, certain processes or activities which has to be mastered in practice. The situations are thus specified via the activities or the process steps that the participant is enabled to do. As a second step, the competences required to successfully deal with the situation are defined. Competences basically consider the cycle of a complete action (planning, execution, control). In the last step, the relevant learning content for the learning unit is defined. Contents (e.g. relevant knowledge about legal regulations) are necessary for solving the situation or for carrying out the activities. These contents are at the same time the learning content of the examination preparation.



Figure 2: Structure of the curriculum

8.4 Examination requirements

The examination is divided into a written and an oral examination.

8.41 Information on the procedure for the written examination

The written examination consists of four examination components, each of which contains open examination tasks that are derived from the description of operational situations. In detail, the tasks have the following references and characteristics.

Part No.	Reference to areas of activity...	... in combination with	Duration (h)
1	“Analyzing and promoting the competitiveness of companies acting sustainably” and “Designing marketing according to a sustainability-oriented strategy”	Analyzing and optimizing processes from a business perspective	180 min.
2	Organizing business accounting, controlling as well as financing and investment considering sustainability	Analyzing and optimizing business processes	180 min.
3	Designing human resources management and leading employees	Analyzing and optimizing processes from a business perspective	180 min.
4	Qualifications of trainers in SMEs		180 min.

8.42 Information on the procedure for the oral examination

The oral examination consists of two examination components. In detail, the tasks have the following references and characteristics.

Part No.	Reference to areas of activity...	Tasks to be mastered ...	Duration (h)
I	the examinee must choose one of the areas of action I – III	presentation of the solution to a business problem and an expert discussion based on it the task for the presentation is given to him/her by the examination board on the examination date	30 min. preparation, 10 min. presentation, 30 min examination
II	Qualifications of trainers in SMEs	presentation/execution of a practical instruction concept and an expert discussion based on it	Practical part: 15 min. carry out or present a training situation 15 min. reflection/expert discussion

8.5 Materials and information about sustainable management for use in the courses

8.51 Practical guidance and tools on greening SMEs

- Green business guide (Publication 23 May 2023, 94 pg.)
https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_882794.pdf

- SCORE4Climate: Optimising performance through resource efficiency and circularity. The Global SCORE team is launching a new SCORE Training module, SCORE4Climate, which supports SMEs to start their path toward a circular economy. Through presenting key concepts, good practices and practical tools, the module help SMEs identify opportunities and generate innovative solutions to improve resource efficiency, clean production and circularity. https://www.ilo.org/empent/units/boosting-employment-through-small-enterprise-development/smeproductivity/WCMS_868502/lang--en/index.htm
- Environmental sustainability in value chain and market system development for decent work. This guide provides some advice on how to incorporate environmental objectives in Value Chain Development/Market System Development (VCD/MSD) analysis and intervention design. It suggests ways to frame environmental goals and their relation to other objectives, and it outlines entry points and examples on how one can go about it.

https://www.ilo.org/global/topics/green-jobs/publications/WCMS_779348/lang--en/index.htm

8.52 About the challenges of teaching/methods

Sustainability training for SMEs (paper of a research project at the University of Oldenburg, Germany). This paper discusses essential results of a research project at the University of Oldenburg. Under the supervision of the Centre for Lifelong Learning (C3L), the department of Business Informatics/ Very Large Business Application (VLBA) and the ecco consultancy, SME training needs in the context of sustainable management were evaluated and translated into a SME-related qualification concept.

https://www.researchgate.net/publication/283502857_Sustainability_Training_for_SMEs

8.53 The Nature of Sustainability Challenge in SMEs and its Management

(Not only interesting for SMEs in Asia!...) a systematic literature review was carried out to explore the insights of the existing knowledge on the nature of environmental sustainability challenges to small and medium enterprises and its management, particularly in the Asian context.

https://mpr.ub.uni-muenchen.de/98418/1/MPRA_paper_98418.pdf

8.54 Sustainability Practices and Performance in European SMEs

Insights from Multiple Case Studies (textbook)

This paper reports findings from a multiple case study survey aiming to explore new directions for enhancing the sustainability levels demonstrated by European SMEs. Case studies were conducted in SMEs from four European countries (Denmark, Austria, Greece, and the UK) attempting to shed light on the implementation status of sustainability practices within their business core design and suggest ways of transferring such approaches to other SMEs. In this context, three key questions guided the study- What is the current status of sustainability practices by European SMEs? what are the emerging issues, setbacks and opportunities towards sustainability practices in SMEs? and what strategies, resources, and competences may facilitate effective sustainability embeddedness in SMEs?

<https://link.springer.com/article/10.1007/s43615-022-00224-3>

8.54 OECD-Reports

- Sustainable Materials Management - Making Better Use of Resources
- Greenhouse Gas mitigation and materials management
- Resource productivity
- Waste prevention and minimization
- Environmental Policies and Individual Behaviour Change (EPIC) Survey 2022
- Sustainable materials management:
- Case Study on Critical Metals in Mobile Phones
(<https://www.oecd.org/env/waste/49805008.pdf>)
- A Sustainable Material Management Case Study – Aluminium
(<https://www.oecd.org/env/waste/49804871.pdf>)
- A Sustainable Material Management Case Study – Wood Fibres
(<https://www.oecd.org/env/waste/49804908.pdf>)
- Sustainable Management and recovery potential of non-packaging plastic waste from the commercial and private household sectors
(<https://www.oecd.org/env/waste/49804957.pdf>)

These case studies look at the entire life cycle of materials/products and discuss environmental impacts and policy measures at different stages of the life cycle. Source: <https://www.oecd.org/env/waste/smm.htm>

8.55 United States Environmental Protection Agency

- variety of examples, figures, data and facts: <https://www.epa.gov/smm>

8.56 Germany SMEs Digital Strategies for the digital transformation

- (...) A study on SMEs commissioned by the Federal Ministry for Economic Affairs and Climate Action shows that innovative SMEs will continue to drive the success behind the 'Made in Germany' trademark. Provided that they embrace new trends, particularly digitisation, and that they find ways of recruiting the skilled labour they need, even in times of a skills shortage, SMEs have every opportunity to remain successful in their chosen specialised niche markets. <https://www.bmwk.de/Redaktion/EN/Publikationen/Mittelstand/smes-digital-strategies-for-digital-transformation.html>

8.57 Future of Work – What exactly is New Work?

- New Work: Work 4.0, coworking and remote working are just some of the buzzwords associated with changes in our work environments. But what do they mean? And can anyone benefit from New Work? <https://www.wfb-bremen.de/en/page/bremen-invest/what-is-new-work>

8.58 Train the Trainer in Europe - European Alliance for Apprenticeship

The European Alliance for Apprenticeships (EAfA) offers four online training modules that are intended to provide insights into the apprenticeship systems within the European Union.

- EAFA Module 1: Understanding apprenticeships in the EU <https://ec.europa.eu/social/main.jsp?catId=1147&intPageId=5440&langId=en>
- EAFA Module 2: Critical success factors for apprenticeships in the EU <https://ec.europa.eu/social/main.jsp?catId=1147&intPageId=5441&langId=en>
- EAFA Module 3: How to join the European Alliance for Apprenticeships (EAfA) <https://ec.europa.eu/soial/main.jsp?catId=1147&intPageId=5442&langId=en>
- Fourth online training: Supporting in-company trainers in SMEs
- <https://ec.europa.eu/social/main.jsp?langId=en&catId=1475&furtherNews=yes&newsId=9854>

The complete Curriculum of the Further Training Programme ‘Commercial Specialist in Sustainable Management’ is published on the project website <https://ba-vet.eu/> and can be downloaded there free of charge.

The implementation report on the practical trials and implementations during the project period as well as the concept of quality assurance and evaluations and the evaluation report with information on future applications are also published as Result 3.6 Evaluation concept and reports training programme ‘Sustainable



Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



Co-funded by
the European Union

Erasmus+ National Agency German
Academic Exchange Service (DAAD)

Management' and prospects of further implementing on the project website
<https://ba-vet.eu/>.

9. Results of the examination regulations „Sustainable Management" and "Energy Service Manager/Energy Consultant"

Official examination regulations with recognised further vocational qualifications and a procedure for the evaluation and international recognition have been developed for the two further vocational VET programs of the BA&VET project:

- Commercial Specialist in Sustainable Management
- Energy Consultant

9.1 Regulation for the examination “Energy Consultant”

9.1.1 Aspects of examination rules

In the focus of the course “Energy Consultant” there is a specific further training of specialists for the conveyance of selected contents for the improvement of energy efficiency and use of renewable energy in residential buildings. Since on the one hand in already available (often older) buildings which still do not have a modern energy level it is possible to achieve significant savings in energy, especially heating energy, through comprehensive technical measures. And on the other hand, first of all during planning of new buildings a very significant contribution can be made for the avoidance of energy and reduction of energy consumption. Both for older buildings and new buildings it applies equally that every measure for avoidance or for the reduction of energy consumption must be carefully planned and implemented at least equally carefully. Consultations for customers which have a great interest in energy efficiency of their building are of vital importance at the forefront of the development of technical solutions.

That is why specialists are required for various processes, especially consulting, planning, performance and supervision of energy-efficient renovation and construction. Therefore, the further training is oriented basically at all groups of specialists which are involved in consulting, planning, performance and supervision of energy-efficient renovation and construction.

Common for these specialists or experts is among other things the fact that they possess sound vocational education and comprehensive expert knowledge in the sphere of renewable energy for residential buildings. Their professional works and tasks include among other things the occupation with measures for energy-related renovation and for the improvement of energy efficiency of buildings. In addition to the acquired vocational qualification this professional background experience represents a significant prerequisite which is required for further training to acquire the qualification of building energy consultant. Through additional qualification participants in this further training acquire knowledge and skills in order to conduct independent consultations for various private and commercial customers on site. The core of this so-called “On-site consultation” is the demonstration of possibilities of energy-related renovation of buildings on the basis of substantiated numbers, data and facts according to the current energetic situation of the residential building. Consultants present a catalogue of reasonably coordinated measures for the energetic improvement of the building. Thereby also legal and first of all financial aspects are considered. Consultants must possess the following basic competences.

- On the basis of his basic knowledge the consultant can undertake registration and evaluation of the actual state and the identification of energetic weak points of already available residential buildings.
- The consultant can prepare a description of suggested measures for energy-related renovation with information on how an improvement of energy efficiency can be achieved (indication of the renovation roadmap). Thereby he

also provides instructions and information in what order the measures have to be performed and how those measures must be connected with one another.

- On the basis of suggested measures, the consultant can indicate the expected saving of final energy, the expected CO₂ emissions and the expected final energy costs.
- The consultant can determine expected energy-related additional costs. The consultant can provide information related to economic efficiency of renovation over one course or (in case of renovation roadmap) of the first measure on the basis of appropriate parameters.
- The consultant gives a hint at further benefits which are related to energy-related renovation.

These basic competences which can only be acquired through participation in the further training in addition to comprehensive technical knowledge and experience to a very great extent contain business expertise, planning and control skills, knowledge of respective legal conditions and funding opportunities, competences for the preparation of feasibility studies as well as outstanding consulting skills. Therefore, the name “Energy service manager” is chosen for this recognized further training qualification. However, if necessary, without any change of content of the examination regulation also the name “Energy service technician” or “Energy consultant” can be used.

For the evaluation of examination results the following 100-points system is recommended:

- 100 – 92 points for the result which corresponds to the requirements to a particular extent,
- less than 92 – 81 points for the result which fully corresponds to the requirements,

- less than 81 – 67 points for the result which corresponds to the requirements in general,
- less than 67 – 50 points for the result which has shortages but still corresponds to the requirements as a whole,
- less than 50 – 30 points for the result which does not correspond to the requirements but allows identifying that certain basic knowledge is still available,
- less than 30 – 0 points for the result which does not correspond to the requirements and when even basic knowledge is very fragmentary or absent.

The mark is determined on the basis of the weighted arithmetic average of acquired points. Thereby the following points mean the following mark:

- 100 – 92 points equal to the mark: very good (A),
- less than 92 – 81 points equal to the mark: good (B),
- less than 81 – 67 points equal to the mark: satisfactory (C),
- less than 67– 50 points equal to the mark: adequate (D),
- less than 50– 30 points equal to the mark: inadequate (E),
- less than 30 – 0 points equal to the mark: unsatisfactory (F).

9.12 Areas of application

The examination regulations are to be used in countries that have the possibility to install official further education examinations with a recognized qualification and do not yet have a corresponding examination regulation "Energy Service Manager / Energy Consultant".

In countries that do not have the possibility to install official further education examinations with a recognized qualification, the examination regulations are to be used to conduct internal examinations. Although this is not associated with a state-recognized further education qualification, the qualification can nevertheless be recognized internationally after passing the examination.

In countries where official further education examinations with a recognized qualification "Energy Service Manager / Energy Consultant" already exist, these examination regulations are to be applied. Of course, all conditions of the respective examination regulations must be fulfilled, including the admission requirements. In the partner countries Estonia, Finland and Poland, for example, the official examination regulations are based on EQF Level 6 and require a relevant bachelor's degree.

In Germany, "Energy Service Manager / Energy Consultant" trainings are conducted in accordance with the developed curriculum and, in accordance with the examination regulation below, the final exams are accepted and recognized.

The curriculum and examination regulations should also be used in Poland. Here, however, there is the problem that the certified "Energy Service Manager / Energy Consultant" may only issue valid energy performance certificates for buildings if they have relevant university degree. In accordance with the provisions of the Polish Energy Performance of Buildings Act, the energy performance certificate shall be issued by a person who:

(a) have a university degree leading to the award of the designation of engineer, architect, landscape architect, firefighter, master architect, landscape architect, fire-fighter or master engineer; or

(b) have completed higher education and postgraduate programs other than those referred to in (a), whose program includes issues of energy performance of buildings,

the conduct of energy audits of buildings, energy efficient buildings and renewable energy sources.

In Estonia and Finland, the mandatory requirement is that a suitable Bachelor's degree must be available. It is important to note that only the people who already have bachelor's degree can be certified in the field of energy saving under the current legislation.

According to the examination regulations below, the examination ends with the designation "Energy Consultant or Energy Service Manager". The profile of the participants at the end of the qualification measures corresponds rather to a "... Manager", possibly also a "... Consultant / Advisor".

In practice, this designation also makes it clear that the qualification measure does not produce a "super-technician" who can "solve" (in particular) the technical problems with the use of (renewable) energy at the building. Operational work will be continued as before by the craftsmen.

9.13 Regulation for the further training examination "Energy Consultant"

Legal provisions for the further training examination

"Energy Service Manager / Energy Consultant"

§ 1 Objective of the examination and designation of the qualification

(1) For the evidence of occupational competence which has been acquired within the framework of vocational further training in the qualification of Energy service

manager / Energy Consultant, the competent authority can conduct examinations according to § 4.

(2) During the examination to acquire the qualification of Energy service manager / Energy Consultant it has to be determined if the examinee possesses the required skills, knowledge and abilities to conduct qualified building energy consultations. Thereby the examinee has to examine, to evaluate the building (building construction and technical facilities) according to structural-physical, structural-technical, construction law, ecological and economic aspects, and to develop and present concepts which would provide for sustainable improvement of energy balance of the building.

(3) According to the examination it has to be determined if the examinee is skilled to issue a building energy certificate.

(4) The successfully passed examination leads to the recognized qualification “Energy service manager”.

§ 2 Admission requirements

(1) Those persons have to be admitted to the examination which have passed a bachelor, technician or master craftsman examination or a comparable examination in a vocational course which includes structural-physical, structural-technical, construction law, ecological and economic contents in the sphere of building technology or building energy.

(2) Notwithstanding paragraph (1) those persons can be admitted to the examination which possess many years of relevant professional experience and prove to reasonable satisfaction by way of providing certificates or otherwise that they have acquired knowledge, skills and experiences which justify the admission to the examination.

(3) Foreign qualifications and time of occupation abroad have to be considered during the admission to the examination.

§ 3 Outline and conduct of the examination

The further training examination to acquire the qualification of Energy service manager / Energy Consultant includes the following five areas of activity (content areas):

1. Modernization planning
2. Building and structures assessment and selection
3. Taking into consideration structural-physical requirements
4. Technical facilities assessment and selection
5. Use of legal regulations related to energy saving and energy efficiency.

§ 4 Content and duration of the examination

(1) The examination in the area of activity “Modernization planning” is divided into

- a) a case-related project work.

The examinee has to present two different real modernization proposals. The Examination Board determines if the proposals as project work, if this corresponds to the examination requirements of the above-mentioned content areas 1 to 5. The Examination Board shall notify the examinee with the approval of the project work, a description of the tasks, the evaluation criteria, the beginning of the processing time as well as the processing period in writing. The processing of the project work can be supported by computers.

- b) a professional discussion.

The technical discussion in the form of a fictional consultation is no longer than 30 minutes per test.

The duration of project work should not exceed two months. During the case-related project work which has to be performed in the form of modernization planning the examinee has to prove in relation to a building or parts of a building and associated technical facilities, especially energy supply and ventilation facilities, that he can:

1. perform the inventory and documenting of the modernization object,
 2. prepare calculations related to the structural-physical and energy assessment of the inventory,
 3. develop, calculate and present a concept for the improvement of energy balance of the inventory, especially taking into account requirements and evidence of valid legal foundations,
 4. perform a cost-benefit analysis of the measure for the improvement of energy balance of the building taking into account funding opportunities and profitability comparisons,
 5. prepare a disposal concept for the planned modernization measure and
 6. evaluate the modernization measure under building laws.
- (2) The examination in the areas of activity
- a) Building and structures assessment and selection,
 - b) Taking into consideration structural-physical requirements,
 - c) Technical facilities assessment and selection and

d) Using legal regulations related to energy saving and energy efficiency has to be conducted in writing. The duration of the written examination is 4 hours in total. At least one complex and action-oriented task must be processed in each action field.

a. In the area of activity “Building and structures assessment and selection” the examinee should prove that he can select construction materials, components and structures according to structural-physical and structural-technical aspects, that he can verify, evaluate and select them for the modernization planning considering economic viewpoints, environmental protection and construction materials recycling.

b. In the area of activity “Taking into consideration structural-physical requirements” the examinee should prove that he can use heating, humidity, noise and fire protection regulations in an object-related manner and implement them for the planning of components and buildings.

c. In the area of activity “Technical facilities assessment and selection” the examinee should prove that he can select technical facilities, especially heating systems, room ventilation systems, lighting equipment (electrical engineering) and renewable energy facilities taking into account aspects of reasonable and economical energy use, comfort and usability for the intended use.

d. In the area of activity “Use of legal regulations related to energy saving and energy efficiency” the examinee should prove that he can assess energy balance according to legal regulations, evaluate energy efficiency taking into account air tightness and heat bridges, monitor construction measures and consider aspects of protection of historical buildings and monuments and that he also knows legal and technical aspects when issuing building energy certificates.

§ 5 Regulations related to weighing and passing

(1) The project work and the professional discussion in the area of activity “Modernization planning” are weighted in a proportion of 3:1.

(2) The remaining areas of activity have to be weighted as follows:

- “Modernization planning”: 60 %
- Building and structures assessment and selection”: 10 %
- “Taking into consideration structural-physical requirements”: 10 %
- “Technical facilities assessment and selection”: 10 %
- “Use of legal regulations related to energy saving and energy efficiency”: 10 %

- The examination is passed if the performance is evaluated as follows

+ in the overall result with at least “adequate”,

+ in the area of activity “Modernization planning” and in minimum two further areas of activity with at least “adequate”,

+ in the areas of activity “Building and structures assessment and selection”, “Taking into consideration structural-physical requirements”, “Technical facilities assessment and selection” and also “Use of legal regulations related to energy saving and energy efficiency” on average with at least “adequate” and

+ in none of the areas of activity with “unsatisfactory”.

(3) If in one or several areas of activity “Building and structures assessment and selection”, “Taking into consideration structural-physical requirements”, “Technical facilities assessment and selection” and “Use of legal regulations related to energy saving and energy efficiency” in each case at least 30 and less than 50 points are acquired, upon request of the examinee a supplementary examination can be conducted in one of these areas of activity if it is allowed for the passing of the examination. The oral

supplementary examination has to last maximum 20 minutes. The result of the corresponding examination and the oral supplementary examination in this area of activity has to be weighted in proportion of 2:1.

(4) The passing of the exam has to be evidenced by a certificate which should contain information about separate marks for corresponding areas of activity, exemptions specifying the legal basis and also the overall mark for the examination.

§ 6 Exemption from parts of the examination

(1) Upon request the examinee has to be exempted from passing separate areas of activity according to § 3 if he has successfully passed another comparable examination in a public or state-accredited educational institution or before a state examination board and the registration for the further training examination according to this legal provision takes place within three years after the notification about the passing of another examination. Complete exemption from all the areas of activity named 3 is not allowed.

(2) The further training examination board upon request of the examinee also decides about exemptions on the basis of foreign examination results.

§ 7 Repetition of the examination

(1) Examination which has not been passed can be repeated twice.

(2) If in case of an examination which has not been passed the examinee achieves at least adequate examination results in separate areas of activity according to § 3, this examination result does not have to be repeated upon request if the examinee registers for a re-examination within the period of two years starting from the day of determination of the result of examination which has not been passed.

(3) The evaluation of the examination result has to be undertaken within the frame-work of the re-examination.

§ 8 Entry into force

This legislation enters into force on xx.yy.zzzz

9.2 Regulation for the examination “Commercial Specialist in Sustainable Management”

9.21 Areas of application

The examination regulations are to be used in countries that have the possibility to install official further education examinations with a recognized qualification and do not yet have a corresponding examination regulation " Commercial Specialist in Sustainable Management ".

In countries that do not have the possibility to install official further education examinations with a recognized qualification, the examination regulations are to be used to conduct internal examinations. Although this is not associated with a state-recognized further education qualification, the qualification can nevertheless be recognized internationally after passing the examination.

In countries where official further education examinations with a recognized qualification "Commercial Specialist in Sustainable Management" already exist, these examination regulations are to be applied. Of course, all conditions of the respective examination regulations must be fulfilled, including the admission requirements.

9.22 Regulation for the further training examination “Commercial Specialist in Sustainable Management”

Ordinance on the Examination for the recognized Further Training Qualification of Certified Specialist for Commercial, Sustainable Business Management and Certified Specialist for Commercial, Sustainable Business Management

§ 1 Aim of the examination and designation of the qualification

(1) The examination for the recognised further training qualification of Certified Specialist for Commercial, Sustainable Business Management and Certified Specialist for Commercial, Sustainable Business Management is intended to provide evidence of the extension of professional skills, knowledge and abilities (professional competences) aimed at professional advancement. The examination shall be conducted by the competent body.

(2) Through the expansion of the professional ability to act, the person to be examined should be able to analyse and evaluate business management, commercial and legal problems as a manager in craft enterprises and to implement developed solutions operationally while taking into account current/latest developments. The extended professional abilities include in particular:

1. analysing and assessing the potential of a business from a business management point of view,
2. supporting the establishment of craft enterprises,
3. managing and developing craft enterprises from a commercial point of view,
4. acting as an interface between commercial and service-providing areas of the company.

(3) Successful completion of the examination leads to the recognised advanced training qualification "Specialist for Sustainable Management".

§ 2 Admission requirements

(1) Anyone who can prove the following shall be admitted to the examination:

1. a successfully passed journeyman's or final examination in a recognised three-year training occupation or

2. a successfully passed final examination in a recognised two-year training occupation and two years of professional experience.

(2) By way of derogation from subsection (1), admission to the examination shall also be granted to persons who, by submitting certificates or by other means, demonstrate that they have acquired professional skills, knowledge, and abilities (professional competences) which justify admission to the examination.

§ 3 Structure of the examination

(1) The examination components are the three areas of activity and one elective area of activity. The person to be examined shall indicate the chosen elective field of action when registering for the examination.

(2) The three fields' areas of activity are:

1. assessment of the competitiveness of enterprises,
2. preparation, implementation and evaluation of start-up and take-over activities,
and

3. development of business management strategies.

(3) The compulsory elective fields of activity are:

1. usage of information and communication technologies,

2. usage of communication and presentation techniques in business transactions,
3. implementation of bookkeeping in the craft enterprise using customary software in the trade, and
4. implementation of project management in the craft enterprise.

§ 4 Examination contents in the field of activity "Assessing the competitiveness of enterprises

In the field of activity "Assessing the competitiveness of enterprises", the candidate should be able to demonstrate the ability to assess business management, commercial and legal prerequisites for the competitiveness of an enterprise and professional development potential in the skilled crafts sector, as well as the ability to present decision-making necessities. Several of the qualification contents listed under numbers 1 to 6 are to be linked to the task:

1. analyse corporate objectives and classify them in a system of corporate objectives,
2. justify the significance of the corporate culture and the corporate image for the company's performance and competitiveness,
3. analyse the situation of a company on the market and justify the potential for success,
4. analyse account data, in particular; balance sheets and profit and loss accounting, analyse the strengths and weaknesses of a company,
5. use information from internal and external accounting for decision making processes,
6. apply legal regulations, in particular trade and crafts law as well as commercial and competition law, when analysing business objectives and concepts.

§ 5 Examination contents in the field of action "Preparing, implementing and evaluating start-up and takeover activities".

In the field of activity "Preparing, carrying out and evaluating start-up and take-over activities", the candidate should demonstrate the ability to prepare, carry out and evaluate tasks in the context of starting up and taking over a company, taking into account personal, legal and business management framework conditions and objectives, and to be able to justify their significance for a business concept. Several of the qualification contents listed under numbers 1 to 10 are to be linked to the task:

1. explain the importance of personal requirements for the success of professional self-employment,
2. describe and evaluate the economic, social and cultural significance of the skilled crafts sector and the benefits of membership in skilled crafts organisations,
3. point out and evaluate possibilities of using advisory services as well as promotion and support services when setting up and taking over a business,
4. make and justify decisions about the location, size of enterprise, personnel requirements as well as on setting up and equipping an enterprise,
5. develop and evaluate a marketing concept for market introduction,
6. draw up and justify an investment plan and financing concept; draw up a profitability forecast and carry out liquidity planning,
7. Derive the legal form from a business concept and justify the decision made,
8. apply legal provisions, in particular of civil law as well as company and tax law, in connection with the establishment or takeover of craft enterprises,
9. justify the necessity of private risk and retirement provisions, present possibilities of private risk and retirement provisions,

10. Present and justify the significance of personal aspects as well as business and legal components of a business concept in context.

§ 6 Examination contents in the field of activity "Developing corporate management strategies “

In the field of the "Developing corporate management strategies" activity, the skills to be demonstrated revolve around being able to manage a company, identifying operational growth potential and develop corporate strategies, taking into account company-related strengths and weaknesses as well as market-related opportunities and risks. Several of the qualification contents listed under numbers 1 to 11 are linked to the task:

1. assess the significance of the structural and procedural organisation for the development of a company; propose possibilities for adaptation,
2. evaluate developments in product and service innovations as well as market conditions, also in an international context, and derive growth strategies from this,
3. justify possible uses of marketing instruments for sales and procurement of products and services,
4. changes in capital requirements derived from investment, finance, and liquidity planning; present alternatives for capital acquisition,
5. develop and evaluate concepts for personnel planning, recruitment and qualification and present instruments of personnel management and development,
6. consider provisions of labour and social security law in the development of a business strategy,
7. present opportunities and risks of inter-company cooperation,
8. use controlling to develop, pursue, enforce and modify business objectives,

9. present instruments for the enforcement of claims and justify the use of these instruments,

10. present and justify the necessity of planning a company succession, also taking into account inheritance and family law as well as tax law provisions,

11. examine the necessity of initiating insolvency proceedings on the basis of company data; show the consequences for the continuation or liquidation of a company under insolvency law.

§ 7 Examination contents in the elective compulsory activity area "Using information and communication technologies

In the compulsory elective activity area "Using information and communication technologies", the candidate shall demonstrate the ability to present the enterprise and its services or products with the help of information and communication technologies and to introduce a data protection system taking into account legal regulations. Several of the qualification contents listed under numbers 1 to 4 are linked to the task:

1. show and evaluate possibilities of designing and optimising websites,
2. use information and communication technologies, especially for public relations, marketing and personnel recruitment,
3. introduce and accompany a company data protection system for the use of information and communication technologies,

4. conduct online business taking into account the provisions of online law.

§ 8 Examination contents in the compulsory elective activity area "Using communication and presentation techniques in business".

In the compulsory elective activity area "Using communication and presentation techniques in business dealings", the following skills are to be demonstrated; to be able

to advise customers in a customer-oriented and needs-based manner and to present work results in a structured manner. Several of the qualification contents listed under numbers 1 to 3 are linked to the task:

1. conduct counselling interviews in a needs-oriented manner, including the use of computer-assisted communication and presentation techniques,
2. utilize complaints/feedback to improve customer relations,
3. present themselves and the company.

§ 9 Examination contents in the compulsory elective activity area "Implementation of bookkeeping in the craft enterprise using customary software in the trade".

In the compulsory elective activity area "Implementing bookkeeping in the crafts enterprise using software customary in the trade", the abilities to be able to manually and electronically record and check business transactions are to be demonstrated. Several of the qualification contents listed under numbers 1 to 4 are linked to the task:

1. create, check and account for vouchers,
2. create, keep and check cash books,
3. prepare payroll,
4. participate in the preparation of the annual financial statement.

§ 10 Examination contents in the elective compulsory activity area "Implementing project management in the craft enterprise".

In the elective compulsory activity "Implementing project management in the skilled crafts sector", the candidate is to demonstrate the ability to identify possible uses of projects and to structure and implement projects in a process-oriented manner. Several of the qualification contents listed under numbers 1 to 5 are linked to the task:

1. initiate and define a project,
2. plan the project,
3. monitor and control project implementation,
4. assemble and lead the project team,
5. conclude the project.

§ 11 Conduct of the examination and duration of the examination

(1) For the examinations in particular examination components, complex situation-related tasks shall be set. At least one task shall be set for each examination component.

(2) The examination tasks are to be completed in writing.

(3) The examination for each examination component lasts two hours

(4) If no more than two of the examination components were graded "unsatisfactory", a supplementary oral examination may be held in each of these examination components. If one of the examination components was graded "unsatisfactory", a supplementary oral examination is excluded. The supplementary oral examination shall be conducted in a situation-related manner and shall last a maximum of 20 minutes for the person to be examined in each examination component. When determining the result for the examination component in question, the assessment of the written examination performance and the assessment of the supplementary examination shall be assessed at a ratio of 2:1.

§ 12 Exemption from individual examination components

If the person to be examined is exempted from taking individual examination components, these examination components shall not be taken into account for the application of § 13.

For the remaining examination components, the proportions according to § 13, Para-graph 2, Sentence 2 shall increase in proportion to each other. Only these examination components form the basis for the decisions of the examination board.

§ 13 Assessment of the examination performance

(1) Each examination performance shall be assessed with points in accordance with Appendix 1.

(2) The examination performances in the three examination components pursuant to § 3, paragraph 2 and the examination performance in the examination component pursuant to § 3, paragraph 3 shall be assessed individually. The arithmetic average of the individual assessments shall be calculated as the assessment of the examination.

§ 14 Passing the Examination, Overall Grade

(1) The examination is passed if at least 50 points have been achieved in each examination component, this is without rounding.

(2) If the examination has been passed, the scores for the compulsory activity areas and the elective activity areas in which several examination tasks have been set according to § 11 Paragraph 1 shall be rounded to a whole number in each case.

(3) For the formation of an overall grade, the arithmetic average of the evaluations of the compulsory activity areas and the elective activity areas is to be calculated as the overall score. The total number of points shall be rounded to a whole number in accordance with commercial practice. The grade as a decimal number and corresponding mark (please see table below) shall be assigned to the rounded total number of points according to Annex 1. The assigned grade is the overall grade.

§ 15 Certificates

(1) Those who have passed the examination pursuant to § 14(1) shall receive a certificate from the competent body.

(2) On the certificate, the evaluation with points and the overall grade shall be indicated as a decimal number with one decimal place and as a mark (please see table below). Any exemption under § 12 shall be indicated with the place, date and the name of the examination board of the other comparable examination.

(3) The certificate may contain additional non-official remarks for information (comments), in particular

1. about the qualification obtained or
2. at the request of the examined person, on special or additional skills, knowledge and abilities acquired during further training.

§ 16 Repeating the examination

- (1) If the examination is not passed, it may be repeated twice.
- (2) With the application to retake the examination, the person to be examined shall be exempted from the examination of those examination components which were assessed with at least "sufficient". Exemption is only possible if the person to be examined registers for the re-examination within two years from the date of the decision on the failed examination.

§ 18 Entry into force

This Ordinance shall enter into force on

9.3 Evaluation in the Qualifications Framework and international recognition

A qualifications framework for the Baltic Sea Region was designed under the Project Leonardo “Baltic Education”²¹. By means of the European Credit Transfer System of Vocational Education and Training (ECVET), this “BSR-QF” provided the basis for the evaluation of two craft occupations – “carpenter” and “painter”. ECVET is a system which allows students to characterize qualification (knowledge, skills and competence) by transferable and accumulable learning units and to assign credit points to the learning outcomes. The BSR-QF and the applied ECVET process for the two named occupations formed the basis for the evaluation of the designed courses “Sustainable Management” and “Energy Service Manager”.

9.31 EQF and BSR-QF – an introduction

The Maastricht Declaration of 2004, the Lisbon Strategy of 2000 as well as several other European Union initiatives, and in this context specifically dedicated funding to raise the geographical and labour market mobility and to promote lifelong learning, will yield increased employment and economic growth across EU countries. Rapid social, technological and economic changes along with an aging society make lifelong learning a necessity. For that reason, education is a major component to meet and to achieve the ambitious Lisbon goals. Hence, the European Commission has induced to develop a European Qualifications Framework and to establish National Qualifications Frameworks (hereinafter: NQF) by 2010. The modelling of National Qualifications Frameworks lies in the competence of national authorities, whereas the EU-Commission has recommended that the EU Member States implement NQFs. The European Qualifications Framework represents a meta-framework and is considered by the European Commission as crucial in meeting European objectives, set out in the Lisbon Strategy.

²¹ Hanseatic Parliament: Baltic education, Hamburg 2008

The main purpose of a qualifications framework is to improve transparency, quality and comparability of professional and academic qualification levels across differing education systems and European countries. The EQF itself does not constitute a formal recognition of occupational qualifications. A special feature of Europe is the enormous diversity of educational systems. A prerequisite to make this specificity an asset is to foster transparency.

Transparency can be considered as a fundamental prerequisite for the recognition of qualifications, and it improves comparability. Better comparability between countries is a decisive element to increase labour mobility and to ensure permeability of qualifications, whereby permeability constitutes a prerequisite for lifelong learning.

In the near future, qualifications frameworks must meet these criteria with concrete and well-designed concepts. A qualifications framework is an appropriate tool for the development and for classifying qualifications. The European Qualifications Framework was adopted in November 2007.

Under the project “Baltic Education”, constructive and fruitful discussions at European and national levels should be encouraged by a “Baltic Sea Region Qualifications Framework” (hereinafter: BSR-QF). This BSR-QF should be regarded as a supplement and contribution to the ongoing debate rather than a substitute for the shaping of National Qualifications Frameworks. The project “Baltic Education” has delivered a sizeable contribution to this strategy.

The Baltic Sea Region (BSR) is an area with a considerable number of different countries. These countries share common problems as they endeavour to cope with the same economic and demographic challenges and concerns. It is essential for this region to further develop vocational training, to improve quality and to establish transparency and recognition models. To solve these complex issues, the BSR-QF provides an orientation, allowing for classifications across the whole qualification range and also

serving as a common ground for constructive discussions, conceptual considerations and individual progress.

9.32 The Baltic Sea Region Qualifications Framework

The BSR-QF comprises eight qualification levels that take into account acquired skills from the European Higher Education Area (EHEA) plus vocational qualifications and competences.

This concept is consistent with the recommendations of the European Commission. Table 1 shows the elaborated proposal for the BSR-QF. The following presents a brief overview of the respective competence levels of the BSR-QF. The following section provides more detailed information on the methodology and descriptors that have been developed and used for the BSR-QF.

Competence level 1 – Basic education

Skills profiles to be reached at this stage are general basic training skills and they will not be counted to vocational training or academic education. Basic training is a prerequisite to gain access to higher qualification levels. The development of learning skills still requires resolute continued guided support. It is not possible to assign this skills level to a specific domain. Therefore, qualifications in this level are domain in-dependent.

Competence level 2 – No vocational training

Level 2 comprises the first level of vocational training (VET area). Qualifications at this stage are not specifically pronounced, since knowledge and skills are at an early stage of evolving. Methods and social skills are not yet domain specific. 1 to 2-year

qualification programs, training phases and vocational training preparation phases are covered by this stage.

Table 1 Baltic Sea Region-Qualifications Framework

Level	Education Degree	Framework for Qualification of the VET* area and EHEA**
1	<i>Basic Education</i>	-
2	<i>No Vocational Graduation</i> graduation/training after/for 1-2 years, and work and apprenticeship preparation phase (at the age of 15/16)	First cycle VET area
3	<i>Lower Vocational Graduation</i> certificate of apprenticeship (in 2-4 years), and no/limited professional or experience (certificate of apprenticeship + <5 years of profession experience)	Second cycle VET area
4	<i>Middle Vocational Graduation</i> long profession experience as skilled worker (certificate of apprenticeship + ≥ 5 years of profession experience); comprehensive further education; “young master craftsman” with no/limited professional experiences (<3 years of profession experience)	Third cycle VET area

Level	Education Degree	Framework for Qualification of the VET* area and EHEA**
5	<i>Upper Vocational Graduation</i> master craftsman with long profession experiences as master (≥ 3 years); “master craftsman plus”; long profession experiences and further education (certificate of apprenticeship + ≥ 8 years of profession experience); introductory study period	Fourth cycle VET area and short cycle academic area
6	Bachelor (academic bachelor’s degree) and other similar qualifications and competences	Fifth cycle VET area and first cycle academic area
7	Master (academic master’s degree) and other high qualifications and competences	Sixth cycle VET area and second cycle academic area
8	PhD and other very high qualifications and competences	Seventh cycle VET area and third cycle academic area

Competence level 3 – Lower vocational training

Level 3 covers complete vocational training from a training period of 2 to 4 years. Access to the competence level of a lower vocational training is possible after

completion of a secondary school or after reaching the competence level 2. This involves professional skills, equivalent with an expertise level of an initial vocational training. The graduate has no or limited work experience. Qualifications at this level include a broad general education and an initial job specific expertise. Therefore, only specific parts of a domain will be covered in this qualification level. Completion of skill level 3 is a precondition for achieving competence levels 4 and 5.

Competence level 4 – Intermediate vocational education

Compared to Level 3, this level specifies a higher degree of professional and technical expertise. Vocational training qualifications, extensive advanced training, “Young master craftsman”, and long work experience are covered by this stage. The level in this field is relatively high and all parts of a professional domain are covered. Level 4 qualifications indicate great job specific knowledge and skills. In this level, a person can be regarded as a specialist who has the knowledge and skills to relatively independently solve problems. Finally, achieving level 4 along with extensive advanced training, allows a limited number of candidates with ambitious and superb qualifications to access an academic bachelor level, without having previously obtained a general qualification for university entrance.

Competence level 5 – Higher vocational education

At this stage, candidates already have a formal vocational qualification as a master craftsman, including follow-up trainings; they have long professional experience and thus a high degree of technical expertise. Each part of a domain is covered at a high level, but without scientific expertise. Knowledge acquired by candidates at this competence level comprise autonomous learning, broad theoretical and practical knowledge. At this relatively high level of competence basic academic studies are touched upon. Completing of the competence level 5 with comprehensive, previous vocational education and further training (e.g. as “Master Craftsman Plus”) gives access

to competence level 6, without having a general qualification for university entrance. It is possible to obtain credits for university entrance, based upon previously acquired knowledge (maximum 120 credit points). Nevertheless, persons who seek access to the bachelor level, have to pass an individual interview. Competence level 5 covers the short academic cycle with regard to the European Higher Education Area (EHEA). University students with circa 120 credit points are within competence level 5²².

Competence level 6 – Bachelor and other comparable education and skills

Candidates within this qualification range have already completed the first cycle of the EHR and the 5th level of vocational training. The academic bachelor's degree is obtained by students who usually score 180-240 credit points²³. Level 6 qualifications feature advanced theoretical knowledge and skills. This also applies to individuals with completed vocational training and notably domain-oriented knowledge. A precondition for access to competence level 6 is the general qualification for university entrance or similar sophisticated competences and skills within a domain-specific education. Completing qualification levels 4 and 5 also opens up access to competence level 6.

Competence level 7 – Master and other higher qualification and skills

Having an outstanding domain-specific knowledge, candidates are at a significantly high level within this stage. They are highly qualified professionals, with advanced training and skills in a most deeply specific domain. Qualifications at this level include self-determined and theoretical learning. The master's degree is one of the conditions for reaching the third level of the academic cycle. Competence Level 7 is the second highest

²² cf. Ministry for Science, Technology, and Innovation (Eds.) (2005): A Framework for Qualifications in the European Higher Education Area. Bologna Working Group on Qualifikation Frameworks. Copenhagen

²³ Ministry for Science, Technology, and Innovation (Eds.) (2005): A Framework for Qualifications in the European Higher Education Area. Bologna Working Group on Qualifikation Frameworks. Copenhagen

qualification of the EHR and the second highest level of the vocational training cycle.

Competence level 8 – PhD and other first-rate qualifications and skills

A PhD title is one of the highest academic degrees and it is the highest level within the EHR system. An academic person at this proficiency level is a professional and expert. Competence level 8 is the highest vocational training cycle to be reached by individuals. These persons have outstanding expertise and intellectual abilities in a most highly specific domain field. People at qualification level 8 have leadership skills and experience as well as potential for critical, methodical analyses, assessments and presentations.

9.33 Methodology and Descriptors

The proficiency levels measure professional, personal skills, abilities and competences within a specific domain. It is a method to classify and assess qualifications in levels. It is not the acquired diplomas but skills that are subject to assessment in levels. Qualifications are understood as a set of skills. A competence is defined as the ability to meet tough requirements in a specific context. Competent execution or effective actions involve the mobilization of expertise, cognitive and practical skills as well as social and behavioural components such as attitudes, emotions, values and motivations²⁴. Skills are more than school and work-related knowledge. It is therefore a consistent argument that (professional) skills comprehensively include social and personal competence. Skills, as they are set out in the BSR-QF, are not occupation-specific, but

²⁴ D. S. RYCHEN/L. H. SALGANIK (2003): Key Competencies for a Successful Life and a Well-Functioning Society. DeSeCo Project Report Summary, OECD, Paris, p. 2

they are in fact aggregates²⁵. Hence, educational degrees were used in the project to describe, illustrate and classify skills. This increases the legitimacy among stakeholders, builds on familiar ways of thinking and classification patterns and enables easy, transparent and unbureaucratic description and understanding.

Table below shows the descriptors for each skills level of the BSR-QF. The descriptors “expertise” and “competence” are equivalent to the descriptors in the EQF.

The Baltic Sea Region Qualifications Framework contributes to the discussion and advisory debate on the development of the National Qualifications Framework. The design is consistent with the structures and methods of the European Commission²⁶. This BSR-QF contributes to the fostering of education and the economy of the Baltic States as it presents an instrument to reduce cross-border barriers, which limit the work-related mobility and productivity dependent there-on. Accordingly, the BSR-QF has been accepted by the members of the Hanseatic Parliament in the General Assembly on 8 November 2007 in Vilnius as a substantial support and development tool. In

²⁵ cf. BUNDESINSTITUT FÜR BERUFSBILDUNG (BIBB) (Eds.) (2005): Fachlicher Prüfbericht zu den Grundbegriffen und Deskriptoren des Entwurfs für einen Europäischen Qualifikationsrahmen. Bonn; and Hanf, Georg und Volker Rein (2005): Towards a National Qualification Framework for Germany. Federal Institute for vocational Education and Training (BIBB), Bonn.

²⁶ cf. EUROPÄISCHE KOMMISSION (EC) (2005): Towards a European Qualifications Framework for Lifelong Learning. Commission Staff Working Document, SEC (2005) 957, Brussels; EUROPEAN COMMISSION (EC) (2006): Implementing the Community Lisbon Programme. Proposal for a recommendation of the European Parliament and of the Council on the establishment of the European Qualifications Framework for lifelong learning. COM (2006) 479 final, 2006/0163 (COD), Brussels; and Ministry of Science, Technology and Innovation (Eds.) (2005): A Framework for Qualifications in the European Higher Education Area. Bologna Working Group on Qualifikation Frameworks, Copenhagen.

the further work of the present project, the BSR-QF ensures orientation for grading, structuring and evaluation of individual professions.

Level	Expertise*	(Methodological) Competence*	(Formal) education degree	Framework for Qualification of the VET area and EHEA
	<i>In the BSR-QF, expertise is described as knowledge and skills (equivalent with EQF)</i>	<i>In the BSR-QF, competence describes the degree of responsibility and autonomy</i>	<i>The (Formal) education degree describes the degree which can be reached by an individual</i>	<i>The framework VET area and EHEA is a modified and extended EHEA framework</i>
1	Basic general Education: basic skills required to carry out simple tasks	Work under direct supervision in a structured context	–	–
2	Basic factual knowledge of a field of work or study; basic cognitive and practical skills required to use relevant information in order to	Work under direct supervision in a structured context with some autonomy	graduation/training after/for 1-2 years, and work and apprenticeship preparation phase (at the age of 15/16)	First cycle VET area

	carry out tasks and to solve routine problems using simple rules and tools			
3	Knowledge of facts, principles, processes and general concepts, in a domain; a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work; adapt own behaviour to circumstances in solving problems	Certificate of apprenticeship (in 2 - 4 years), and no/limited professional or experience (certificate of apprenticeship + < 5 years of profession experience)	Second cycle VET area
4	Factual and theoretical knowledge in broad contexts within a domain; a range of cognitive and practical skills required to generate solution to specific problems in a domain	Exercise self-management within the guidelines of work contexts that are usually predictable, but are subject to change supervise the routine work of others, taking some responsibility for	Long profession experience as skilled worker (certificate of apprenticeship + ≥ 5 years of profession experience); comprehensive further education; “young master craftsman” with	Third cycle VET area

		the evaluation and improvement of work activities	no/limited professional experiences (< 3 years of profession experience)	
5	Comprehensive, specialised, factual and theoretical knowledge within a domain and an awareness of the boundaries of that knowledge; a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities with unpredictable change; review and develop performance of self and others	Master craftsman with long professional experiences as master (≥ 3 years); “master craftsman plus”; long professional experiences and further education (certificate of apprenticeship + ≥ 8 years of professional experience); introductory study period	Fourth cycle VET area and short cycle academic area
6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles; advanced skills, demonstrating mastery and innovation	manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts take responsibility for	Bachelor (academic bachelor’s degree) and other similar qualifications and competences	Fifth cycle VET area and first cycle academic area

	required to solve complex and unpredictable problems in a specialised domain	managing professional development of individuals and groups		
7	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking; critical awareness of knowledge issues in a field and at the interface between different fields; specialised problem-solving skills required in research and or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams	Master (academic master's degree) and other high qualifications and competences	Sixth cycle VET area and second cycle academic area
8	Knowledge at the most advanced	demonstrate substantial authority,	PhD and other very high	Seventh cycle VET

	<p>frontier of a field of work or study and at the interface between domains; the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and or innovation and to extend and redefine existing knowledge or professional practice</p>	<p>innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research.</p>	<p>qualifications and competences</p>	<p>area and third cycle academic area</p>
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* European Commission (EC) (2006): Implementing the Community Lisbon Programme. Proposal for a recommendation of the European Parliament and of the Council on the establishment of the European Qualifications Framework for lifelong learning. COM (2006) 479 final, 2006/0163 (COD), Brussels.

9.34 Structuring and evaluation

The objective of the Baltic Education Project was to develop, introduce and implement a system for mutual recognition of professional qualifications. This will be achieved by using the European Credit Transfer System of Vocational Education and

Training (ECVET)²⁷. ECVET is a system that enables describing qualifications by transferable and accumulable learning units (in the form of knowledge, skills and competence) and corresponding allocated credit units²⁸.

ECVET also perfectly complements the European Qualifications Framework²⁹. In its guidelines, the European Commission outlined the overall concept as follows:

- a) focus on learning outcomes expressed in terms of knowledge, skills and competence.
- b) based on a process of qualification;
- c) adapted to the demands of lifelong learning and all learning contexts, on an equal footing;
- d) geared towards the mobility of people³⁰.

Further ECVET consultation guidelines and regulations specify:

- a) mobility of people undertaking training;
- b) validation of the outcomes of lifelong learning;

²⁷ EUROPEAN COMMISSION (EC) (2006): European Credit System for Vocational Education and Training (ECVET). A system for the transfer, accumulation and recognition of learning outcomes in Europe. SEC (2006) 1431, Brüssels, p. 3

²⁸ EUROPEAN COMMISSION (EC) (2006): European Credit System for Vocational Education and Training (ECVET). A system for the transfer, accumulation and recognition of learning outcomes in Europe. SEC (2006) 1431, Brüssels, p. 3

²⁹ cf. EUROPEAN COMMISSION (EC) (2006): Implementing the Community Lisbon Program. Proposal for a recommendation of the European Parliament and of the Council on the establishment of the European Qualifications Framework for lifelong learning. COM (2006) 479 final, 2006/0163 (COD), Brüssels.

³⁰ EUROPEAN COMMISSION (EC) (2006): European Credit System for Vocational Education and Training (ECVET). A system for the transfer, accumulation and recognition of learning outcomes in Europe. SEC (2006) 1431, Brüssels, p. 5

- c) transparency of qualifications;
- d) mutual trust and cooperation between vocational training and education providers in Europe³¹.

The experience and methods of ECVET in the project “Baltic Education”, form the basis for the evaluation of the “Energy Consultant”.

9.35 Evaluation further vocational training Energy Consultant

The training for Energy Consultant is subdivided into the following modules:

- Modul 1: Skills required for a consultant with at least 5 hours
- Modul 2: Legislation and regulation with at least 25 hours
- Modul 3: Energy efficiency with at least 200 hours
- Modul 4: Renewable energy with at least 50 hours
- Modul 5: Energy efficiency certificates with at least 40 hours
- Modul 6: Skills required for a consultant with at least 30 hours

All six modules are classified as mandatory modules, in which knowledge and skills have to be acquired.

³¹ EUROPEAN COMMISSION (EC) (2006): European Credit System for Vocational Education and Training (ECVET). A system for the transfer, accumulation and recognition of learning outcomes in Europe. SEC (2006) 1431, Brussels, p. 35

With regard to the assignment of the Energy Service Manager / Energy Consultant training in the BSR-QF, following classification was made:

- a) Minimum competence level 5 “Higher Vocational Education”.
- b) Level 6 “Bachelor and other comparable education and skills”, if there are comprehensive training, for example master training or bachelor's exams.

Depending on the country, the theory course covers 350 lessons.

To a similar extent, guided practical phases should also be implemented, which require intensive cooperation with companies.

In addition, extensive self-learning.

The entire workload is achieved in each case to about 36% by theory lessons and self-learning, and to about 28% in practice guided phases. In the evaluation of the entire training program for the Energy Service Manager / Energy Consultant maximum 28 credit points are possible.

Evaluation by credit points system

<u>Module</u>	<u>Credit Points</u>
Modul 1: Motivation	0,4
Modul 2: Legislation and regulation	2,0
Modul 3: Energy efficiency	16,0
Modul 4: Renewable energy	4,0
Modul 5: Energy efficiency certificates	3,2
Modul 6: Skills required for a consultant	2,4
Total	28,0

The examination regulations were designed and approved, leading to an officially degree “Energy Service Manager / Energy Consultant” (see Chapter 2). In this way, future realization of the course can be completed by an appropriate final exam.

The following procedure was adopted for future application in the involved Baltic Sea Region countries.

International recognition

- a) Lecturers/examiner rates the courses by assigning credit points.
- b) Mutual recognition of completion in the BSR countries follows upon fulfillment of the following conditions:

- The final exam was passed.
- The evaluation of the course has yielded at least 25 credit points out of a total of 28 possible credit points

Skills were acquired in all five mandatory modules

Documentation

Where they do not yet exist, each of the future participants will receive an EU education passport in which the results are documented.

9.36 Evaluation further vocational training Commercial Specialist in Sustainable Management

The further vocational training for Commercial Specialist in Sustainable Management is subdivided into the following modules:

- Modul 1: Analysing and promoting the competitiveness of companies acting sustainably.
- Modul 2: Designing marketing according to a sustainability-oriented strategy.
- Modul 3: Organizing business accounting, controlling as well as financing and investment considering sustainability.
- Modul 4: Designing human resources management and leading employees.
- Modul 5: Qualifications of trainers in SMEs.

All five modules are classified as mandatory modules, in which knowledge and skills have to be acquired.

With regard to the assignment of the Commercial Specialist in Sustainable Management training in the BSR-QF, following classification was made competence level 6 “Higher Vocational Education”.

In the evaluation of the entire training program for the Commercial Specialist in Sustainable Management training maximum 48 credit points are possible.

Evaluation by credit points system

<u>Module</u>	<u>Credit Points</u>
Modul 1: Analysing and promoting the competitiveness of companies acting sustainably	8
Modul 2: Designing marketing according to a sustainability-oriented strategy	8
Modul 3: Organizing business accounting, controlling as well as financing and investment considering sustainability	12
Modul 4: Designing human resources management and leading employees	11

Modul 5: Qualifications of trainers in SMEs	9
Total	48

The examination regulations were designed and approved, leading to an officially degree “Commercial Specialist in Sustainable Management”. In this way, future realization of the course can be completed by an appropriate final exam.

The following procedure was adopted for future application in the involved Baltic Sea Region countries.

International recognition

- a) Lecturers/examiner rates the courses by assigning credit points.
- b) Mutual recognition of completion in the BSR countries follows upon fulfilment of the following conditions:

- The final exam was passed.
- The evaluation of the course has yielded at least 42 credit points out of a total of 48 possible credit points.
- Skills were acquired in all mandatory modules.

Documentation

Where they do not yet exist, each of the future participants will receive an EU education passport in which the results are documented.

10. Results of the dual study program "Engineering in Management of Renewable Energy Technology in Buildings"³²

A Bachelor's degree course in "Engineering in Management of Renewable Energy Technology in Buildings" has been developed, which also integrates initial and continuing vocational training and combines theory (learning at the university) with practice (learning in the company). This "trial" course of study is designed in such a way that

- a) it can also be completed without initial vocational training.
- b) the integrated continuing education program "Energy Service Manager/Energy Consultant" with a recognized continuing education qualification can also be carried out separately without studying.

Main modules of the developed study program were tested, evaluated and the entire study program was finalized based on the evaluation results. The concept and module handbook of the study program includes the transition of the VET program form Result 4.1 Concept, curricula and module handbook for three-cycle dual study program "Engineering in Management of Renewable Energy Technology in Buildings". The trials, implementation report, evaluation concept and report are listed in Result 4.2 Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings".

³² Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences

10.1 Introduction

The climate change, lack of fossil combustibles, and pollution, particularly in the form of the greenhouse gas emissions, and the increasing use of renewable energy and improved energy efficiency as solutions to reach the climate goals of Agenda 2030 of UN, as well as goals of respective Agenda of EU, have been topics of discourse for years. In the beginning of 2022, the Russian attack to Ukraine has brought the dependency of EU on Russian energy products – gas, oil, coal, and electricity – as an emerging topic of European energy discourse. In the spring 2022, the European Commission, as a response to the hardships and global energy market disruption caused by Ukrainian war, launched REPowerEU programme. This programme supports activities aimed to save energy, to produce clean energy, and diversifying energy supplies of the European Union (European Commission, 2023).

In addition to REPowerEU -programme, European Commission has in December 2021 launched a proposal for revision of the Energy Performance of Buildings Directive. This revision has taken effect on 28th May 2024, thus, the revision 2018 of the directive is no longer valid. (European Commission, 2024). The new directive has an ambitious goal to reduce emissions of greenhouse gases caused by buildings with 60 percent by 2030 compared to the year 2015. Directive also sets a binding target to decrease the average energy performance of the national residential building stock by 16% by 2030 in comparison to 2020, and by 20-22% by 2035, based on national trajectories, and defines an enhanced standard for new buildings to be zero-emission and the calculation of whole life-cycle carbon for new buildings. (European Commission, 2024b)

In July 2021, the European Commission launched a proposal to renew Energy efficiency Directive, as part of the 'Fit for 55' package. This proposal was supplemented

by an additional proposal as part of the REPowerEU plan in May 2022. (European Commission, 2023b). The revised directive took effect on 20th September 2023.

The updated energy efficiency directive aims to establish a legally binding goal to reduce the final energy consumption by 11.7% by 2030 compared to the 2020 reference scenario. This includes for each member of the European Union the requirement to define indicative national contribution based on objective criteria which reflect national circumstances. If the national contributions do not match the EU target, an ambition gap mechanism is applied by the Commission. Each country should also increase annual energy savings step by step from 0.8 per cent (at present) to 1.3 per cent (2024-2025), then 1.5 per cent (2026-2027) and 1.9 per cent from 2028 onwards. This means an average of 1.49 per cent of new annual savings during the period from 2024 till 2030. When planning the savings and activities, vulnerable customers and social housing should be prioritized within the scope of their energy savings measures. In addition to this, an annual energy consumption reduction goal of 1.9% for the public sector should be introduced, including the obligatory annual 3% buildings renovation duty extended to all the levels of public administration. Directive also introduces a new approach, based on energy consumption, for businesses to have an energy management system or to carry out energy audits. Furthermore, a new obligation to monitor the energy performance of data centres, with an EU-level database collecting and publishing data, has been launched. Municipalities are enhanced to promote local heating and cooling plans, particularly in larger municipalities, and to increase the efficient energy use in heat and cold supply, also in district heating and cooling systems. (European Commission, 2023b).

As a part of the clean energy for all Europeans package, that aims to help EU to meet the emissions reduction commitments stated in the Paris Agreement, the Renewable Energy Directive (2018/2001/EU) took effect in December 2018. The amending Directive EU/2023/2413 entered into force on 20 November 2023 with an 1,5-year

period to transpose most of the directive's provisions into national legislation, and a shorter deadline of July 2024 for some provisions related to permitting for renewables. The renewed directive sets an overall European renewable energy target of 42,5 per cent by 2030, and an aim to reach proportion of 45 per cent. The directive also contains rules to ensure the use of renewable energy in the transport sector, and in heating and cooling. Common principles and rules for renewable energy support schemes, sustainability criteria for biomass and the right to produce and consume renewable energy and to establish renewable energy communities are set in the directive that, in addition to those, includes rules to remove barriers, to increase investments and to achieve cost reductions in renewable energy technologies, and to empower private citizens and organizations to participate in the move towards clean energy. (European Commission, 2023c)

The Renewable Energy Directive, recent Energy Efficiency Directive and Energy Performance of Buildings Directive are challenging the states, regions, municipalities, enterprises, and private people. The demand for skilled people who could conduct energy audits, advice on energy issues like renovations (European Commission, 2024) and measuring the energy consumption, and design new aerial and municipal cooling and heating plans (European Commission, 2023b) will be increased, and in many of the member states, there may be a lack for skilled energy experts. Furthermore, small and medium-sized enterprises operating in the field of energy technology in buildings need employees with a wide range of qualifications and competences, particularly in the topics of renewable energy and energy saving.

The curriculum presented below will on its part respond to the increasing demand for energy consultants and experts.

Goals and target groups of the study program

The goal of this engineering degree program is to provide students not only with technical knowledge and skills but also with methodological competences and personal practical and communication skills, which are essential professional competences.

In addition, some modules are also aimed at professionally qualified employees in companies who are interested in further high-quality training. For these employees, a qualification as an "energy consultant" would be conceivable. Modules 3.2, 3.3 and 3.7, which are listed later, play a particularly important role in this.

With the help of the competences described above, these target groups can support their company or organization to offer products and services that are competitive from a technical, ecological, and economic point of view, and that will apply to the newest and coming EU requirements. Studying the course described below will give them the capability to prepare analyses and concepts of solutions to technical and business problems based on the latest scientific knowledge, and to take responsibility for their professional, social, and personal implementation.

The course focuses on the production and use of renewable energy and topics approaching energy efficiency in private residential buildings as well as commercial and public facilities. The energy systems in buildings will be approached as technical and functional systems designed to be used and maintained throughout their lifecycle, also considering the economic point of view.

The course approaches the topics, not only from the point of view of technical expertise, but also from the perspectives of supporting and advising customers, designing and finding solutions to improve energy efficiency of buildings, and other respective professional areas and activities. The main benefits for the customer will be identified necessary actions and up-to-date functional knowledge on how to add the use value of the technology. The emphasis is on theoretical and practical process-oriented design,

implementing, and use of installations, as well as on finding and implementing measures to increase energy efficiency.

The study course "Management of Renewable Energy Technology in Buildings" provides the students with the following skills and knowledge:

- Understanding technical, ecological, and economic challenges related to renewable energy and rational use of energy in buildings,
- Ability to develop and market an offer that requires intensive advisory in terms of products and services in the field of “renewable energy technologies in buildings” in an interdisciplinary manner,
- Technical and methodological competences enabling designing, implementation, launching, and the use and maintaining of interdisciplinary renewable energy solutions in buildings,
- Social and communication skills and capability to exchange specialist knowledge with experts, professionally lead employees, and advise clients in an interdisciplinary and professional manner,
- Technical and methodological competence to participate in the strategic development of corporate energy policy,
- Technical and methodological competence to participate in operational company management, and thus to perform economic and technical management tasks,
- Technical and methodological competences in designing operational energy efficient processes, in applying renewable energy technologies, in systematic recording and analysing the obtained results, and in using these analyses in continuous improvement processes.

Interdisciplinary aspects are carried with through the whole course. Both renewable energy, energy efficiency and designing and communication topics are multi-disciplinary containing issues from technical sciences, natural sciences, linguistics, and social sciences. Business competences are implemented mainly in submodules of module 3.1a that is optional and aimed at those whose earlier studies do not cover these issues. The basic skills required for bachelor’s degree in technology are implemented in submodules of module 3.1b and 3.2. Technical competences are implemented in modules 3.3 – 3.9. Practice at workplaces also supports the interdisciplinary nature of studies.

Scientific and methodological competences of students are supported by the basic interdisciplinary module 3.1.9 Research communication). Furthermore, they are promoted and required in modules 3.2 – 3.9. focused on both technical and interdisciplinary aspects.

10.2 Content of the course

The “Management of renewable energy technologies in buildings” course consists of 33 compulsory and elective modules in total as well as a bachelor’s thesis. The modules are grouped as follows (Table 1):

Table 1: Modules of Bachelor's degree

Year	1	2	3	4	Total
3.1a. General basic studies (Optional), 21 cu, see the curriculum below.					
3.1b. General basic studies in engineering	25				
3.2 Professional basic studies	4	7			

3.3 Basics of Energy, Environmental and Process Technology		7	7		
3.4 Fluid Dynamics and Heat Transfer		15			
3.5 Renewable Energy			20		
3.6 Design of Renewable Energy Systems			16		
3.7 Energy efficiency in buildings and structures			15	10	
3.8 Processes and Devices of Energy Production				15	
3.9 Carbon-neutral and sustainable societies				24	
3.10 Work placement 35 cu:s, included to the work at work place	10	10	10	5	
3.11 Bachelor's Thesis				15	
CU:s theory including thesis	29	29	58	59	180
Hours theory	783	783	1566	1323	4455
CU:s total including work placement	39	39	68	64	215
Hours total, out of which, 945 hours included to the work at work place (35 cu)					5670
	1053	1053	1836	1728	

Basic modules

As part of the basic modules, students acquire broad competencies in the field of scientific and application requirements in management and technology (Modules 3.1a (optional, compulsory for those who have not studied the respective topics during their earlier studies), 3.1b and 3.2). The basic interdisciplinary modules allow the acquisition of competences that contribute to the comprehensive understanding of practical solutions to problems. On the other hand, they establish the general foundation of methodological scientific work for the systematization and solving of practical problems.

This contributes to the completion of master's programs possibly taking place after the completion of bachelor's studies.

Occupational modules

The occupational modules 3.3-3.9 give students multidisciplinary knowledge and skills they will need during their professional career. These modules also complete the management and societal skills established in the basic modules.

Specialization modules related to energy (area of elective subjects)

To be able to deepen their knowledge of special issues in the energy field, students are encouraged to participate in optional modules offered (O1 – O4), depending on their individual interests.

Share of the practical part

The practical parts consist of training at the workplace and reflections on practice (Practice reports).

Report on practice

Considering the specific requirements of the company given, four practice reports (one per year) should be prepared, focusing on management and technology, for a total of 35 CUs. The requirements to be met are listed in the preparation instructions for practice reports.

Degree designation: Bachelor of Engineering

After completing the course, a Bachelor of Engineering in Management of Renewable Energy Technologies in Buildings -diploma is awarded (abbreviated as B. Eng.) The engineering qualifications framework was used to help understand the structure of the course. The modules can be assigned to the main areas of the qualifications framework as follows (Table 2).

Table 2: Degree designation of the course

Basic area	Modules1	CUs
Engineering, natural sciences, mathematics (at least 55 ECTS credits)	3.1b, 3.2,3.3 3.1a (optional)	21 50
Economics, law, and social sciences (at least 45 ECTS credits)	3.9 Included to other topics	21 24
Professional topics (Renewable energy and energy efficiency specific issues)	3.4, 3.5, 3.6, 3.7, 3.8	91
Soft skills and foreign languages (at least 10 ECTS)	Included to 3.1a* and to 3.1b	15
Apprenticeships (at least 15 ECTS credits)	Included to the work at workplace	35
Thesis (at least 10 ECTS credits)	Bachelor's thesis	15
Total (Theory + thesis)		180
Total including optional 3.1a (basic general knl.)		201
Total (Theory + thesis + work placement)		215

*) Module 3.1a is an optional module for those who have not gained this knowledge during earlier training.

As can be seen from the module assignment to the main areas of the qualification's framework in industrial engineering presented above, emphasizing occupational topics and requirements, the minimum scope of the basic areas is met. As a result, awarding a new graduation designation, i.e. B.Eng., is justified. Due to the multidisciplinary nature of studies, certain issues are included in many modules, thus, calculating sum of CUs from table above does not give the exact final sum of CUs given by graduation.

Didactic concept

To meet current and future challenges in the field of renewable energy technology in buildings, graduates need a wide range of well-established scientific and practical competences, skills, and knowledge. The concept of dual studies is a didactic approach to the transfer of both practical skills and theoretical knowledge. The application presented below, with theoretical studies at the university of applied sciences, and vocational training in the workplace, is an example of how the studies might be implemented.

Classes take place on average over three weekends per month (apart from periods free from classes). In addition, in the spring and autumn of the academic year, a full-time 14day block takes place at the vocational academy. In between individual classes, students participate in company apprenticeships. In addition, students are required to have self-studies during which they study independently, solve the assignments, and prepare themselves for exams. This form of organization allows students

- to use the knowledge from their classes in practice,
- preparing for the classes,
- and to draw conclusions from both class-learning and learning in practice as part of self-study.

To guarantee an intensive acquisition of competence, the courses are largely conducted in small groups of approx. 30 students. The lectures for larger groups are usually based on interactive discussion too. Lectures of smaller groups use collaborative methods that support participation, such as pair work, group work, and case studies. As a part of pair work and group work, students are encouraged to present and discuss experiences gained during their apprenticeships in the workplace, and in that way combine theory and practice with the help of a lecturer.

The interaction between apprenticeships and learning is largely ensured and guided by reflections on practice, written studies that are prepared as part of workplace learning. Reflections on practice are project work, aimed at discussing specific issues of operational practice, using specialized and methodological scientific competences acquired during the course. While preparing their reflections on practice, students are accompanied by a lecturer.

One part of the didactic concept is seminar classes. Small groups of students facilitate intensive dialogue with lecturers as part of discourse focused on the content related to the students' professional practice. Exercises, either individual or group work, enable the application and exploration of the didactic plan. Furthermore, case studies and related exercises are used to convey complex educational content and to learn holistic thinking that exceeds the borders of individual modules.

Practical training

The practical training at workplaces is an important part of the studies. During the 4 years students are assumed to be able to work a total of 3550 hours. During the first two years the time for working is 1100 hours per year, and for the next two years 750 and 600 hours (Table 1). The decreased number of working hours is due to the increased amount of theory studies.

Table 3: Training at workplace

Year	1	2	3	4	Total
Work and training at workplace	1100 h	1100 h	750 h	600 h	3550 h

Reflections on practice

The study plan also includes the preparation of four reflections on training at workplace (Reports on practice), 10, 10, 10 and 5 credits units (one for each academic year 1-4). These reports should contain a summary of their tasks and what they have learned during the practice. If the schedule allows, each student should give a brief presentation too. In addition to this, the thesis should also be based on practice and, in best case, reflects on practice by solving a problem found during the internships.

Reflections on practice are used to develop transfer and problem-solving competences by applying theory in the workplace and to promote students' social and communication competences through close coordination and cooperation with supervisors and employees, as well as clients in the company. Preparing and presenting the presentation develops students' communication skills.

Unlike the practical projects, a large part of the content/topics from the classes offered up to the exam is available for solving individual work-related problems. Reflections on practice take place in the internships at workplace and provide complementary self-study.

10.3 Entry requirements for training

In common, the entry requirements for training included in dual exam are:

Vocational level

Requirements: Comprehensive school or respective, minimum of 8 or 9 classes / years, depending to country.

Further vocational level

Requirements: Vocational qualification. In some countries and / or trainings certain work experience is required after graduation of vocational level. In some countries and some training courses,

no entry requirements are set for further vocational training.

University of Applied Sciences (UAS-level (Bachelor)

Vocational or further vocational qualification, or other qualifications of upper secondary school, e.g. senior high school, college, upper secondary general school, etc., depending to the education system of the country.

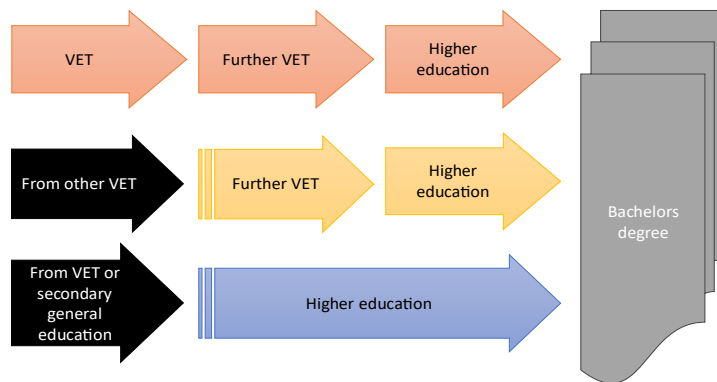
There may be countries, branch- and qualification-specific exceptions, and restrictions.

In our curriculum, the alternatives could look like described in Figure 1. In two lower alternatives, the qualification gained from VET or further VET should be compatible with qualification gained from VET of our curriculum. Furthermore, in the last case, the basic vocational studies learnt in vocational and further vocational studies must be included in the curriculum for those coming from general upper secondary education. On the other hand, basic mathematics, physics, and chemistry are not necessary if they have been taught in secondary school. In topmost alternative, that is a default in our curriculum, we must consider, not only the mathematic, physics and chemistry that belongs to the requirements of bachelor's degree, but also basics of these subjects, commonly belonging to the requirements of general upper secondary school (senior

high school, college, etc., depending to the country and culture), because, in common, topics taught in VET are more limited.

Figure 1: Alternatives for training

In this manual, the curriculum presented will follow the topmost alternative in Figure 1. Each school will be allowed to decide by themselves, following the legislation of their country, whether they will permit students to come following the other two alternatives, and what are the requirements in such cases.



In this case, VET vocational skills are those required by junior electricians (or comparable vocational training), and further VET vocational skills are those required by senior electricians or craftsmen in energy technology (or comparable further training). Due to the fact that common vocational education does not always include necessary studies in nature sciences (Mathematics, physics, and chemistry), communication and languages, nor in liberal arts, these topics have been included into curriculum and put available for those aiming the bachelor's degree (M3.1a).

10.4 Notes for the teachers

The material enclosed is an example showing how the topics of this course could be presented. Each teacher should adjust this to the circumstances of his own country, considering the local regulation, the level and skills of the trainees, and the study programme of the students; are they studying construction, finishing, plumber, some examples to be given. Each programme may require different weightings and highlights, and it is on the responsibility of each teacher to consider these special needs. The number of usable materials is big, and in every module, only some examples have been enclosed, thus, it is recommended that when choosing the final materials, also examples of other modules would be considered.

Target group

The primary target group of the training is young people with exams from lower secondary school having interest in energy branch and energy efficiency. The secondary target group is people who are already working in the branch, and who want to develop their skills and knowledge of energy issues.

During the implementation of the curriculum, a decision should be made: Will there be only beginners in the training or will trainer / school allow students to come straight to the second or even third stage, and if, how could / should we ensure that they have knowledge, skills and qualifications required in the stage they are coming. Furthermore, the programme has been divided into three stages, journeyman's examination, further vocational training, and bachelor's degree. Will only those who gained the journeyman's qualification in this programme, be allowed to continue the next stage, or are other students having the appropriate qualification, allowed to study the next stage too.

Overlapping contents of Module 2 and Module 3

Although the contents of submodule 2.2.2 (Energy consultant) and some submodules of module 3 are partially overlapping, it is on teacher's responsibility to evaluate, whether the knowledge and skills gained in module 2.2.2 and during the work experience are close enough to that required in module 3 so that these parts of module 3 could be replaced by using the accreditation of prior learning -process, if such a process is in use.

Work required

In the curriculum, the average work required by each module is measured in units used in educational level in question to make it easier for teachers to plan the practical application. In VET level, the used unit is ECVET and in higher education level ECTS credit units (abbreviated in this presentation as CU) has been used. 60 ECVETs responds studies of one year, and one ECTS credit unit equals 27 hours workload. The curriculum consists of modules and submodules with various size. Depending to national weightings and requirements, size, order, and weights of submodules can be changed inside each module. However, it is not recommended to change the submodules between modules.

Apprentice / practical parts

It has been assumed that the apprentice periods belonging to the Bachelor's degree will be done during the work at workplace -phases. If this is not possible, e.g., student has come from upper secondary school directly to Bachelor's degree, the work learning periods must be arranged in some other way.

Teaching methods

Teachers are encouraged to use varying methods containing e.g.:

- Self-learning
- Lectures,

- Visiting lecturers,
- Construction site visits,
- On-line studies,
- Videos approaching the topics (Reliability of the source must be evaluated),
- Individual studies,
- Assignments, and
- Reporting and presenting the work done at workplaces.

Cooperation with the local experienced industry practitioners is highly recommended. All modules can be studied individually, so the modules can be offered also via open studies to all companies and organizations operating at the construction and finishing branches, who intend to develop their skills in using the modern information technology in their business.

Contents of the curriculum

The regulations, circumstances and qualification requirements are quite different in different BSR-countries; thus, the curriculum and material have been written as a form of framework inside which the local actors should modify the contents of modules according to their own regulations and local requirements, without forgetting the needs of different study programmes. By using innovative, problem-based, and experiential educational approaches, teachers will be able to help students to become experts who are able to acquire, create, implement, use, and advice effective energy saving methods.

The overall objectives of the curriculum are:

- The student deepens his/her knowledge about sustainability and energy issues.

- The student understands the regulatory framework and knows the essential contents of legislation on the energy sector on the point of view of both industry and consumers.
- The student can explain specific terms that relate to sustainability, energy efficiency, and renewable energy, and their use in the context of buildings,
- The student understands the importance of energy issues and knows how to improve the energy efficiency of buildings and how to utilize renewable energy in buildings,
- The student deepens his/her knowledge about sustainability, energy, and energy efficiency.

The curriculum is divided into modules and submodules. Each submodule and main modules 1 and 2 can be replaced with studies, knowledge and skills gained earlier, although it is not recommended to use this process with modules containing essential skills on point of view of qualification targeted. Teachers and education institutes have the duty and right to evaluate whether the skills and knowledge or studies are adequate considering the requirements of the qualification, and student's capability to participate in further studies basing to this knowledge.

About the links

In the curriculum, there are mostly bookmarks to the topic-specific link lists at the end of the document. These lists are neither absolute nor exclusive. Each teacher can search and use materials that are more compatible with the requirements of his/her country and/or training.

The links to materials have been tested during the period November 2023 – August 2024. However, the links may be changed and deleted very fast; thus, it is recommended that links which will be given to students should be checked at the beginning of each

course. Some of the links may be behind the paywall and require agreement between the educational institute and publisher to be available. In such cases, contact your librarians. Some of the links refer to documents that have been written for commercial or political purposes. The authors of this document do not take a stand for or against any product, and the research results and opinions found in the links are also the responsibility of the original authors of the documents in question.

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Result 4.1 Concept, curricula and module handbook for three-cycle dual study program "Engineering in Management of Renewable Energy Technology in Buildings"

with the complete module handbook and all materials is published on the project website <https://ba-vet.eu/> and can be downloaded there free of charge.

The implementation report on the practical trials and implementations during the project period as well as the concept of quality assurance and evaluations and the evaluation report with information on future applications are also published as Result 4.2 Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings" on the project website <https://ba-vet.eu/>.

11. Results of the further training program "Energy Consultant"³³

A further training program "Energy Consultant" was developed. This training was originally called "Energy Service Manager". However, as part of the development work, the project consortium decided to give this training the title "Energy Consultant".

This further training program was integrated into the trial Bachelor's degree course "Engineering in Management of Renewable Energy Technology in Buildings" (see Result 4.1), but is also carried out independently of the degree course as further training for owners, managers and specialists of SMEs. As part of the project, the most important modules of the continuing education program were tested and evaluated in practice and the continuing education program was finalized on the basis of the evaluation results.

³³ Compiled by Dr Kari Lilja and Dr Sirpa Sandelin, Satakunta University of Applied Sciences

Result 4.4 Concept, curricula and teaching materials further training program "Energy Service Manager/Energy Consultant" comprises the completed further training program, which will be carried out regularly by individual project partners in the future.

The report on the practical testing, the evaluation concept and the evaluation report as well as the number of participating SMEs and qualified persons are shown as Results 4.5 Evaluation concept and reports training program "Energy Service Manager/Energy Consultant" and prospects of further implementing.

11.1 Introduction

The climate change, lack of fossil combustibles, and pollution, particularly in the form of the greenhouse gas emissions, and the increasing use of renewable energy and improved energy efficiency as solutions to reach the climate goals of Agenda 2030 of UN, as well as goals of respective Agenda of EU, have been topics of discourse for years. In the beginning of 2022, the Russian attack to Ukraine has brought the dependency of EU on Russian energy products – gas, oil, coal, and electricity – as an emerging topic of European energy discourse. In the spring 2022, the European Commission, as a response to the hardships and global energy market disruption caused by Ukrainian war, launched REPowerEU programme. This programme supports activities aimed to save energy, to produce clean energy, and to diversify energy supplies of the European Union (European Commission, 2023).

In addition to REPowerEU -programme, European Commission has in December 2021 launched a proposal for revision of the Energy Performance of Buildings Directive. This revision has not yet taken effect, thus, the revision 2018 of the directive is still valid. (European Commission, 2023a). In July 2021, the European Commission launched a proposal to renew Energy efficiency Directive, as part of the 'Fit for 55'

package. This proposal was supplemented by an additional proposal as part of the RE-PowerEU plan in May 2022. (European Commission, 2023b). The revised directive took effect in 20th September 2023.

The updated energy efficiency directive aims to establish a legally binding goal to reduce the final energy consumption by 11.7% by 2030 compared to the 2020 reference scenario. This includes for each member of the European Union the requirement to define indicative national contribution based on objective criteria which reflect national circumstances. If the national contributions do not match the EU target, an ambition gap mechanism is applied by the Commission. Each country should also increase annual energy savings step by step from 0.8 per cent (at present) to 1.3 per cent (2024-2025), then 1.5 per cent (2026-2027) and 1.9 per cent from 2028 onwards. This means an average of 1.49 per cent of new annual savings during the period from 2024 till 2030. When planning the savings and activities, vulnerable customers and social housing should be prioritized within the scope of their energy savings measures. In addition to this, an annual energy consumption reduction goal of 1.9% for the public sector should be introduced, including the obligatory annual 3% buildings renovation duty extended to all the levels of public administration. Directive also introduces a new approach, based on energy consumption, for businesses to have an energy management system or to carry out energy audits. Furthermore, a new obligation to monitor the energy performance of data centres, with an EU-level database collecting and publishing data, has been launched. Municipalities are enhanced to promote local heating and cooling plans, particularly in larger municipalities, and to increase the efficient energy use in heat and cold supply, also in district heating and cooling systems. (European Commission, 2023b).

As a part of the clean energy for all Europeans package, that aims to help EU meet the emissions reduction commitments stated in the Paris Agreement, the Renewable Energy Directive (2018/2001/EU) took effect in December 2018. The directive, that

has been legally binding since June 2021, sets an overall European renewable energy target of 32 per cent by 2030. The directive also contains rules to ensure the use of renewable energy in the transport sector, and in heating and cooling. Common principles and rules for renewable energy support schemes, sustainability criteria for biomass and the right to produce and consume renewable energy and to establish renewable energy communities are set in the directive that, in addition to those, includes rules to remove barriers, to increase investments and to achieve cost reductions in renewable energy technologies, and to empower private citizens and organizations to participate in the move towards clean energy. Due to the Ukrainian war and attempts to break away from dependence on Russian energy, and on fossil combustibles, the Commission has on 2022 proposed to raise the target to 45 per cent by 2030.

On 30 March 2023, a temporary agreement to raise the target to at least 42.5 per cent by 2030 but aiming for 45 per cent was reached. After having completed this process, the new legislation should become formally adopted and take effect.

The Renewable Energy Directive, recent Energy Efficiency Directive and future Energy Performance of Buildings Directive are challenging the states, regions, municipalities, enterprises, and private people. The demand for skilled persons who could conduct energy audits, advice in energy issues like renovations (European Commission, 2023a) and measuring the energy consumption, and design new areal and municipal cooling and heating plans (European Commission, 2023b) will be increased, and in many of the member states, there may be a lack for skilled energy experts.

The latest milestone in mankind's attempt to tackle climate change was COP 28 - UN Climate Change Conference in Dubai, United Arab Emirates (<https://www.cop28.com/>), where the recommendation to abandon the use of fossil combustibles was approved – on a principled level. Even if the declaration does not contain a concrete path to the fossil-free world, it confirms the goals of Agenda2030. (UN Press Center, 2023).

The curriculum presented below will on its part respond to the increasing demand for energy consultants and experts.

11.2 Basic concepts connected to training

Before we can continue with curriculum, we'll have to define the basic concepts. In this case, the basic concepts are at least those behind the following terms: renewable energy, energy services, and energy service manager.

There are plenty of good definitions describing both renewable energy and energy services. However, energy service manager is a much more complicated term, and the definition of concept behind it must be sought from those rare job vacancy announcements, in which employers are searching for a person to do such task, and even more rare trainings stating that they are training or that they have trained energy service managers. The following definitions are compiled from several sources, and should be seen as consensus definitions, further than absolute and only one and correct versions.

Renewable energy

Cambridge Dictionary (2023) defines renewable energy as energy that is produced using wind, photovoltaic panels, geothermal health, waves, etc. Many other definitions contain the same energy sources as examples, and a consensus of the definition could be that renewable energy comes from sources that will not be depleted, i.e., that are renewed all the time.

Energy service(s)

The Energy Encyclopaedia of Calgary University defines energy services are the tasks performed using energy. Such services include e.g., space heating, domestic water heating, cooking food, heating raw products for manufacturing, all kinds of

transportation, lighting, communication, etc. All these can all be achieved by using special energy service technologies. Each energy sector requires certain amounts of energy to accomplish their services. Most modern services require electricity to be able to work. Gasoline and natural gas are used e.g., in industry, transportation, and heating. (University of Calgary, 2023) Another definition states, that Energy Services covers a delivery of useful services to users and habitants of a building. These services can be, for example, heating and hot water, cooling, and providing electricity for the use of e.g., lightning, elevators, all kind of house automation, etc. (Law Insider, 2023)

An important part of energy services is production and delivery or supply of energy. The source of energy effects on greenhouse gas emissions and carbon footprint both directly and indirectly. Direct impact comes from transforming a form of energy to another, e.g., from burning combustibles to produce electricity or health. The indirect effect comes from different activities, like manufacturing devices and instruments that produce, transfer, and use the energy, like generators and solar panels, wires, televisions, etc., and the use of this equipment. (University of Calgary, 2023)

Renewable energy technology in buildings

Renewable energy technology in buildings covers both the technology producing the renewable energy, like photovoltaic panels, solar thermal panels and collectors, geothermal equipment, wind power mills, etc., either integrated in the structures, like photovoltaic cells in the wall or roof material, or geothermal collectors in the piles, or separate structures like photo voltage panels on the roof, or windmills in the garden, and technology enabling to store, transfer and use the produced renewable energy.

In the wider context of sustainable buildings, also the technology that enables us to save energy, like insulation of structures, led lights, etc. can be considered to be a part of sustainable energy solutions in buildings. However, because these solutions can be used both in buildings using conventional energy, and in more sustainable buildings

using renewable energy solutions, and because they as structural solutions require quite different competence, skills, and knowledge, compared to topics of renewable energy, they are not included to these curricula.

Energy service manager

In this task, a person is responsible for monitoring the energy consumption of the building to ensure that energy reduction goals are reached and sustained during the use of the building. A person also develops or assists with the development and implementation of policies and procedures that are consistent with those of the organization (University of New Mexico, 2022), municipal, district, region, country, and European Union to ensure efficient and safe energy use and energy-related operations in the building, organization, or wider context.

Tasks and skills required of the Energy service manager may vary depending to the organization and country where he is working. Let's take the first example outside EU. University of New Mexico defined the tasks and required skills as follows: "Under general supervision, manages the delivery of maintenance, construction and commissioning services for energy management and control system, building HVAC digital controls, alarm systems throughout the main campus and branch campuses. Manage the daily activities of a specialized technical workforce comprising expertise in building HVAC systems, building HVAC controls, and controls logic programming. Develop master plans and manage building energy control expansion projects. Interface with Engineering staff and key clients throughout the UNM system of campuses. Ensure that project technical goals are achieved, and costs are accurately tracked. Oversee system commissioning, remote monitoring and tracking of system energy consumption, implementation of control logic changes, and control system modifications." (University of New Mexico, 2022). This general description is completed with a long list of specified tasks and requirements of skills.

Another example is taken from Finland, where an industrial company in a branch consuming huge amounts of electricity was searching for energy manager. The tasks of the job were to build electricity market capability, to negotiate electricity agreements, to develop IT-tools needed to analyse and forecast markets and to demand responses from markets, to hold an ownership of electricity purchase strategy, to follow the regulation concerning the manufacturing of products the company produces, and ensure that production is in line with regulation, and to find out new opportunities from the electricity markets. The requirements for a person to be nominated were experience in energy market portfolio management and risk assessments, proven success in negotiating electricity agreements, and a good understanding of opportunities of flexibility in the demand response markets as well as a strong knowledge of the regulations in the branch. (Finnish employment services, 2023).

Although the position in latter task was named as “Energy manager” the goal of the tasks was to ensure energy services of industrial company. These two examples were from opposite heads of the potential roles of energy service manager. While the first position was set on a very low level and concentrated on practical tasks defined detailed and strict, the second was at top level with a responsibility on development, planning and following activities including agreements and compliance with regulation. In our training we are approaching the lower, practical level of tasks and responsibilities.

11.3 Existing training in the branch

Training and education in both renewable energy technology in buildings and energy service management is given in several educational institutes, vocational schools, universities of applied sciences and universities. The following examples give a further

view of a contemporary state of studies available, and contents of some examples of curricula.

Local energy manager (LEM)

In Poland, the Mazovian Energy Agency (MAE) had in cooperation with Higher School of Ecology and Management started postgraduate training programme "Local Energy Manager - LEM", in which the target groups were officials, employees, or candidates for employees for municipal offices, local public sector authorities, organizational units of local self-government of the region, and municipal enterprises. The purpose of these postgraduate studies was to collect and develop legal, technical, economic, organizational, and environmental knowledge of the production, distribution, storage, monitoring and marketing of conventional and renewable energy. Improving energy security at local level, covering primarily planning, management and financing of energy in the municipality, was one of the goals too. Each implementation, where 15-20 specialists conducted courses and exercises, last app. 200 working hours. The topics of the course approached e.g.,

- energy markets,
- innovative financial instruments,
- legal conditions of energy sector,
- environmental conditions of the power industry etc.

Three courses of postgraduate studies were conducted within the framework of project EMPOWER, partially funded by the EU. (Project EMPOWER, 2020).

Numerous numbers of training institutes operating with commercial principles are offering courses in energy management, and green and renewable energy. Depending to country and institute, these can be vocational studies or further vocational studies, giving a vocational qualification, or they can be postgraduate studies giving perhaps

some diploma or certificate that authorizes a person to do certain tasks, or they are just to help professionals to develop their vocational skills, without giving any further qualification. In the following paragraphs a couple of them will be briefly presented.

Certified Energy Manager (CEM) by AEE

Association of Energy Engineers offers Certified Energy Manager -training. Training gives skills to optimize the energy performance of a facility, building, or industrial plant, to integrate electrical, mechanical, process, and building infrastructure, and to analyse the optimum solutions to reduce energy consumption in a cost-effective approach. According to AEE, training has gained increased recognition within the energy industry and by companies looking to strengthen their competitive position by having responsible energy strategies and sustainable operational practices.

Knowledge to be gained during the course:

- Codes and Standards,
- Energy Accounting and Economics,
- Energy Audits and Instrumentation,
- Electrical Power Systems and Motors,
- HVAC Systems,
- Industrial Systems,
- Building Envelope,
- CHP Systems and Renewable Energy,
- Fuel Supply and Pricing,
- Building Automation and Control Systems,

- Thermal Energy Storage Systems,
- Lighting Systems,
- Boiler and Steam Systems,
- Maintenance and Commissioning,
- Energy Savings Performance Contracting and Measurement & Verification,

(AEE, 2023). Although the origin of this training is in Anglo-American cultural area, the course has been recognized in many countries all over the world.

Bachelor of Science in Renewable Energy Engineering, Lithuanian

Lithuanian Kaunas University of Technology has a programme “Bachelor of Science in Renewable Energy Engineering” which should start on September 2023, and last 4 years. The programme is motivated by the growing need to maintain balance, to preserve the natural environment, and to restrain climate change. The concept of renewable energy includes in the context of this course solar, wind, water, and other renewable energy sources. Renewable energy technologies are probably the most progressive and rapidly expanding fields of technology at the moment. The Bachelor’s in Renewable Energy Engineering programme at KTU will approach the use of ecological types of energy, and deepen the knowledge of use of photovoltaic, solar thermal, windmills, hydro power, biofuel, and heat pump technologies. When performing the practical tasks, students will learn how to design, develop, and use electricity and heat sources, energy devices and apply information technologies. (Kaunas University of Technology, 2023).

Bachelor in energy technology, Finland

Lappeenranta University of Technology (LUT) has established a new bachelor’s program in energy technology in Lahti campus of LUT. The programme started in August

2023, and the next rolling admission will start in November 2023. Bachelors' studies will take approximately 3 years, and optional master's studies will take approximately 2 years (after a student has graduated bachelor's level). (Lappeenranta University of Technology, 2023).

The content of the training will focus on the most efficient ecological production and distribution of energy and technologies related to it. The training will be based on three key areas of expertise in energy technology:

- Physical phenomena related to energy technology, such as policies that affect the shape and magnitude of energy,
- Energy conversion from one form to another, and
- Machinery and equipment for energy conversion.

The programme leads to the degree of Bachelor of Science in Technology, B.Sc. (Tech.), which is 180 ECTS credits, consisting of

- General studies, 77 ECTS credits, including studies in mathematics, physics, engineering design, mechanics, control systems, programming, and electricity.
- Intermediate specialization studies, 51 ECTS credits, focusing the topics on thermodynamics, heat transfer, nuclear power engineering, power plant engineering and energy economics.
- Minor studies, 20 ECTS credits, including optional studies to be selected from energy economics, sustainability science, practical engineering, innovation and entrepreneurship, and Chinese business, culture, and technology.
- Language studies, 19 ECTS credits, including basics in Chinese, Finnish, and English.
- Elective studies, 3 ECTS credits - any course at LUT.

- Bachelor's thesis, 10 ECTS credits.

Those continuing their studies after a bachelor's degree in energy technology can choose one of LUT's master's programmes in energy technology: Energy Conversion, Nuclear Engineering or Sustainable Energy Systems. (Lappeenranta University of Technology, 2023).

Bachelor of Engineering (Polytechnic), Energy and Environmental Engineering, Finland

Satakunta university of Applied Sciences has Bachelor programme in energy and environmental engineering. Within the framework of this programme, it is possible to specialize in environmental or energy issues, including renewable energy. The programme consists of basic studies required for every Bachelor of Engineering, and professional studies that are partially elective. By choosing certain modules and courses a student defines his / her specialization branch. Summary of curriculum can be found from Appendix A.

Other training courses

In Finland, the topics connected to renewable energy are included in trainings approaching environmental and energy issues both in vocational, further vocational, and higher education (Energieatollisuus ry, 2023). The Finnish directory of studies and examinations lists on 19th September 2023 21 study programmes and courses at different levels approaching the renewable energy and two courses with key words “renewable energy manager” (Finnish National Agency for Education, 2023). However, the issues dealt with vary from level to level and programme to programme, and for example, issues approaching the implementation of low voltage photovoltaic systems are not necessarily paid enough attention (Lilja, 2022).

Renewable energy installer

One example of training, that is solely targeted to renewable energy, is training for renewable energy installers. This training is regulated by the Energy Authority of Finland, and when writing this, there are three trainers approved by the authority:

- Ami-foundation: heat pump systems
- Municipal education and training consortium Tavastia: Solar heat systems and photovoltaic systems
- Sähköinfo Ltd: photovoltaic systems.

The Energy Agency approves organizations that organize training leading to the Certified Installer certificate. The installers' certification system includes small-scale biomass burners and stoves, solar electricity and solar thermal systems, low-level geothermal systems, and heat pumps. The prerequisite for approval by the Energy Agency is the applicant's sufficient teaching staff, facilities suitable for teaching, and the necessary technical equipment and tools. So far, this certification system is voluntary. (Energy Authority, 2023)

Energy manager

Finnish education institution Taitotalo (AEL-Amiedu Ltd) offers Energy manager – training programme for enterprises, stating, that savings a company can achieve by the project works of participants had been 232 897 € / company (average). The goal of the training is to provide the latest methods for improving the company's energy efficiency and reducing energy costs. Training consists of the following topics:

- Energy projects and the basics of energy theory 2 days.
- Energy procurement and management 2 days.
- Building energy efficiency, heating, ventilation, and lighting for 3 days.

- Compressed air, processed heat and steam, combined heat, and power production for 2 days.
- Electricity and cooling for 2 days.
- Energy production - renewable forms of energy, presentation of project work and exam 2 days.

The basic principle of the training is that the learned things are immediately applied in practice. The training consists of face-to-face lessons conducted by experts in the field, practical assignments, and analysis of the energy situation of your own company, as well as a project to improve energy use. After successfully completing the training, you will receive a European Energy Manager (EUREM) certificate for your competence.

During the training a student gets

- ready-made calculation tools,
- best practice checklists,
- expert support for the energy efficiency development project during training, and
- a good basis for coordinating the procurement and use of energy.

According to Taitotalo, the training program serves as good preparation for FISE Oy's Energy Certificate issuer qualification requirements exam. (AEL-Amiedu Oy LTD, 2023).

Other energy-related trainings can be found, for example, from Motiva Ltd (<https://www.motiva.fi/en>).

11.4 Curriculum Energy consultant

The following curriculum is to be developed and tested: Creation of curricula and teaching materials for Further Training program “Energy Consultant”

There is an existing curriculum to be used as a base of a new curriculum: The curriculum for further training course "Energy Service Manager", which was developed within the framework of project VESTE.

The common requirement for curriculum is, that the training programmes meet the legal regulations that exist in some countries concerning the qualification required in certain tasks, e.g., qualification of "Energy Consultant" in Finland, Estonia, Germany, and Poland, and that in the training, the local legislation and regulation is considered. For example, in Germany and Poland, there is a requirement that for energy renovations of buildings applying for public funding, an expert opinion must be provided by a qualified and accredited expert, and in Finland, buildings exceeding certain size, must, before the building permission is granted, have an energy certification provided by authorized energy specialist.

Concerning the curriculum of Energy Service Manager (suggested work name), the following requirements were set in advance:

Graduates should be able to

- assess buildings from an energy point of view,
- plan complete energetic refurbishment measures and to determine the costs for a realization,
- prepare calculations for refinancing the investments, and to
- provide comprehensive advice to investors.

These skills are just a small part of those required from energy service manager in the industry (see examples presented above), thus, even if the curriculum were widened with some other issues like carbon footprint calculations, renewable energy, and energy efficiency, the name that would better describe the contents of training, would be “Energy Consultant”.

11.41 Target group

The course is targeted at further training for specialists to transfer subject-specific contents on improving energy efficiency and on the use of renewable energies for residential buildings. Target group is specialists who have appropriable qualification in fields close to energy efficiency of buildings, e.g., in construction engineering, electrical engineering or environmental engineering. The appropriability of each qualification must be solved considering the country-specific regulation and instructions.

Curriculum “Energy service manager” as a base for training

The curriculum “Energy service manager”, made in the project VESTE, can be taken as a base for new curriculum. In Germany, where the legal requirements differ from many other countries, this can be even recommendable. However, the curriculum “Energy service manager” needs at least the following modifications and updates to match the contemporary requirements of EU-directives, needs of enterprises, and educational purposes:


- In the introduction, the newest revisions of directives and other literature should be considered.
- The target group(s) of the training could be defined considering the country-specific differences.

- In the qualification requirements and teaching materials, the revised versions of directives should be considered.
- The need and permission to make country-specific, regional, and local modifications, i.e., localizations, should be clearly stated.
- Instead of dividing the course into two parts, to be able to consider skills and knowledge possibly gained in earlier experience and training courses, it is recommended that the topics should be divided into modules as presented in the next chapter. Dividing the course into modules enables students to concentrate on topics and issues that they need in addition to their earlier studies to complete the requirements of qualification in question.

It is recommended, that teachers who are going to use the curriculum “Energy service management” as a base for the new course, will proof thoroughly the up-to-dateness of topics, issues and materials proposed in the curriculum.

11.42 Modular curriculum “Energy consultant”

The materials found in the links are examples, suggestions and tips, and can be replaced e.g., with localized material and completed with additional materials. It is also worth noting that most of the materials produced by the EU can be found in all EU languages.

Module	Content	Notes
<p>Motivation 5 hours</p> <p>Goal: Student understands why the energy issues are important and finds a connection between topics of this course, local legislation, directives and programmes of European Union, sustainable development goals and UN Agenda 2030</p>	<ul style="list-style-type: none"> • UN Agenda 2030 and sustainable development goals, • Climate change, • Greenhouse gases, • Lack of fossil energy sources, • European Union, Country-specific, regional, and local issues, • Introduction to renewable energy. 	<p>Depending to the background of the trainees, this can be left away or shortened. However, the students should be aware of the context in which they are practicing their profession as energy consultants.</p>
<p>Examples of sources, materials, and further readings</p>	<div style="text-align: right;">  <p>Why energy issues are important.pptx</p> </div> <p>Basic slide set for introduction:</p> <p>Further information on</p> <ul style="list-style-type: none"> - Climate change - Taxonomy - Biodiversity - Energy efficiency - Greenhouse effect - Optimization - Fossil combustibles - Sufficiency - Programmes of European Union <p>NOTE: These materials can be used also in other modules approaching these topics.</p>	

<p>Legislation and regulation, 25 hours, with following submodules</p> <ul style="list-style-type: none"> - EU-legislation, - Local legislation and regulation <p>Goal: Student knows the framework of the EU, understand the relationship between directives and country-specific regulation, and knows the legislation and requirements applied to qualified energy consultant and to jobs and tasks of QEC.</p>	<p>Content</p> <ul style="list-style-type: none"> • Agenda 2030 and EU, • Directives approaching energy efficiency, climate change and sustainability, latest revisions, • Other directives that are close to the energy issues, • Country-specific legislation, • Regional and local regulation. 	<p>Notes</p> <p>Country-specific topics may take more time, depending to the complexity of legislative and regulative system of the country. However, in countries, where the qualification is required in energy-connected tasks, it is recommended, that local legislation and regulation is weighted, and if necessary, more than 25 hours will be allocated for this module.</p>
<p>Submodule EU-Legislation</p> <p>https://energy.ec.europa.eu/index_en</p> <p>New Energy Efficiency Directive (Entered into force September 2023)</p> <p>Renewable Energy Directive (Entered into force November 20th, 2023)</p> <p>Energy Performance in Buildings Directive 2021, New version is under the work.</p> <p>Electricity Market Directive</p> <p>Critical Entities Resilience Directive</p>	<p>Submodule Country-specific and local legislation and regulation</p> <p>Teachers in each country should include here the legislation and requirements of their own country and region, e.g., rules of each state in Germany.</p>	

Energy Related Products Directive Etc.		
<p>Energy efficiency, 200 hours, submodules</p> <ul style="list-style-type: none"> - Calculations and classifications, - Insulation, avoiding the heat and cool leakages, - Technology in buildings, - Designing the energy-efficient buildings - Other issues <p>Goal: Student knows the issues impacting the energy efficiency of the house, and is capable to do energy calculations, energy classifications, and give energy rehabilitation recommendations in accordance with laws and instructions.</p>	<p>Content</p> <ul style="list-style-type: none"> • Principles of energy efficiency calculations, • Principles of energy efficiency classification, • Energy efficiency calculations, • Tools for energy efficiency calculations. • Envelope of building, new and existing buildings, • Doors and windows, • Technology in buildings, including e.g., heating, cooling, lightning, and equipment, • Other issues, 	<p>Notes</p> <p>If there are country specific, regional, or local exceptions in calculation rules, these should be highlighted.</p> <p>Common information about energy efficiency: Energy efficient buildings Buildings - Energy System Energy efficiency in buildings</p> <p>Research approaching the energy efficient buildings.</p> <p>Holistic approach to energy efficiency (contains lot of interesting research and documents).</p>

<p>Calculations and classifications 25-30 hours depending to the need of calculation exercises.</p>	<ul style="list-style-type: none"> • Principles of energy efficiency assessments and calculations, • Principles of energy efficiency classification, • Energy efficiency calculations, country-specific versions are recommended. • Tools for energy efficiency calculations. <p>Note: Introduce, present and use those calculation models and classification schemas that are valid / legal in your country / region.</p>
<p>Insulation, avoiding the heat and cool leakages 100 hours</p>	<ul style="list-style-type: none"> • Envelope of building, new and existing buildings, <ul style="list-style-type: none"> ▪ Insulation, tightening: materials and technical issues • Doors and windows, • Other structures, • Improving the energy efficiency of constructions, • On point of view of existing building and energy rehabilitation.
<p>Technology in buildings 25-30 hours</p>	<ul style="list-style-type: none"> • Heating, cooling, lightning, appliances, and equipment, • Building Automation and Smart Home concept as tools to improve energy efficiency.
<p>Designing the energy-efficient buildings 25-30 hours</p>	<ul style="list-style-type: none"> • Envelope of building, new and existing buildings, • Doors and windows, • Other structures, • On point of view of designing new energy efficient building.
<p>Other issues 25 hours</p>	<ul style="list-style-type: none"> • Basics of Carbon handprint / Carbon footprint calculations if the optional module (see below) is not included.

<p>Renewable energy 50h, submodules</p> <ul style="list-style-type: none"> - Renewable energy as a concept - Renewable electricity - Renewable heat and cool - Renewable combustibles, - Legislation and regulation - Special issues <p>Goal: Students know the renewable energy sources, can find most suitable solutions for each case, and are ware of the local regulation concerning the implementation of renewable energy systems.</p>	<p>Contents</p> <ul style="list-style-type: none"> • Principles of renewable energy, • Renewable energy sources, • Renewable energy technologies, • Possibilities to use renewable energy in buildings, • Impacts of renewable energy on energy efficiency calculations. 	<p>Notes</p> <p>Key concepts: see the PowerPoint presentation “Why energy issues are important”, slides 6-10</p>
<p>Renewable energy as a concept</p>	<p>Definition</p>	
<p>Renewable electricity</p>	<p>Photovoltaic (Solar electricity) Windmills Wave mills Tidal power Hydroelectric power plant Note: Hydroelectric pump power plants can be used in storing power.</p>	

	<p>Geothermal electricity plants</p> <p>Hydrogen cells</p> <p>Hybrid energy systems</p>
Renewable heat and cool	<p>Solar heat</p> <p>Geotherm heat and cool</p> <p>Heat and cool accumulators</p> <p>Heat pumps</p>
Renewable combustibles	<p>Hydrogen</p> <p>Biofuels</p> <p>Wood</p> <p>Biomass</p> <p>Waste: Although there is a goal that as big part of waste as possible should be recycled or reused, certain part of waste ends up to the waste incineration plant.</p>
Legislation and regulation	<p>Teacher should be able to give clear image of country- and region-specific requirements concerning the installation of renewable energy systems, including fire protection, qualification requirements etc.</p>
Special issues	<p>Country- or region-specific issues or issues that are important for just this group of students. For example, if students are immigrants, special issue could be how to apply these skills and knowledge in their own home countries.</p>

<p>Energy efficiency certificates 40 h, submodules</p> <ul style="list-style-type: none"> - Legal base of certificates, - Reading the plans and collecting data, - Documenting, - Conclusions and recommendations <p>Goal: Student knows the legal requirements and official instructions concerning the certificate, can assess values and information required, makes the correct calculations, and is able to write the certification in the role of impartial and independent expert.</p>	<p>Legal requirements (deepening the lessons of 1st module),</p> <p>The advantages of certificates,</p> <p>How, why, and when to write certificate,</p> <p>How, why, and when to use certificate,</p> <p>Modernization and rehabilitation: general and detailed recommendations, advantages, and risks.</p> <p>Tools for writing certificates</p>	<p>Lot of “calculating and concluding” exercises is recommended.</p> <p>Due to strict connection to national legislation, the material and tools should be country-specific, basing on directives of the European Union.</p>
<p>Special issues (hours depending to topics), submodules according to topics.</p>	<p>E.g., designing energy efficient electricity, lightning, heating, cooling, improving the insulation of building - risks and advantages, etc.</p>	<p>According to needs and interests of trainees, and if locally required to gain qualifications or accreditations.</p>

<p>Carbon footprint (Optional) 60 h, submodules</p> <ul style="list-style-type: none"> - Concepts of carbon footprint and carbon handprint, - Calculations and tools, - Content of certificates <p>Goal: To understand the concept of carbon footprint, to be able to do carbon footprint calculations, and to write carbon footprint certifications if required.</p>	<p>Concept and principles of carbon footprint, Carbon footprint calculations, Impacts of renewable energy on carbon footprint, Carbon footprint certificates, Advantages of carbon footprint calculations and certifications</p>	<p>Including a brief explanation of carbon handprint. Obligatory in Finland in certain cases. Country specific, regional, or local exceptions in calculation rules should be highlighted. Lot of calculating and concluding exercises is recommended.</p>
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The qualification requirements should be adaptable in different countries.

11.43 Additional module: Skills required for a consultant.

Graduates of the "Energy Consultant" training programme must have extensive consulting skills. If the participants have little/no experience and competence in consulting, it is essential that an appropriate additional module is taught, which is listed below.

Introduction

There are three concepts that are often confused with each other: Counselor (US) or counsellor (UK), consultant and advisor. Oxford Dictionary defines a counsellor as a person who is trained to give guidance on personal or psychological problems, e.g. "a marriage counsellor". In many countries, counsellors are considered as practitioners who must have certain qualification and permission or license to be able to practice his

/ her profession. Consultants are defined by Oxford Dictionary as a person who provides expert advice professionally, and an advisor as a person who gives advice in a particular field. According to these definitions, a person giving advice in energy issues can be called either as a consultant or as an advisor.

What kind of skills and personal characteristics should a consultant or advisor have to be successive in his / her work? The answer to this question was approached by searching different kinds of texts describing what people expect a consultant or advisor knows, what he can do, and what kind of person he is. Among the material there were workplace announcements from worldwide consultancy companies, blogs and articles written by HR Managers and leaders of same companies telling what kind of expert according to their opinions could be successive consultant, and biographies and scientific articles telling the stories of more or less successive consulting processes in real business. Out of these texts, 168 terms describing skills and characteristics were identified. These were sorted according to their fundamental sense.

The most important skill was found to be communication, often enclosed to adjective “strong” (Figure 1). This should not be any surprise. Communication skills, both written and oral, with all their variations, are the most important tool for any advisor, consultant and other professionals giving advice, granting certificates, and writing other documents. Language used should be neutral, objective, precise and correct. No reasonable cause for suspect due to carelessly chosen words, to an arrogant tone of voice, or to uncertain habits should be given.

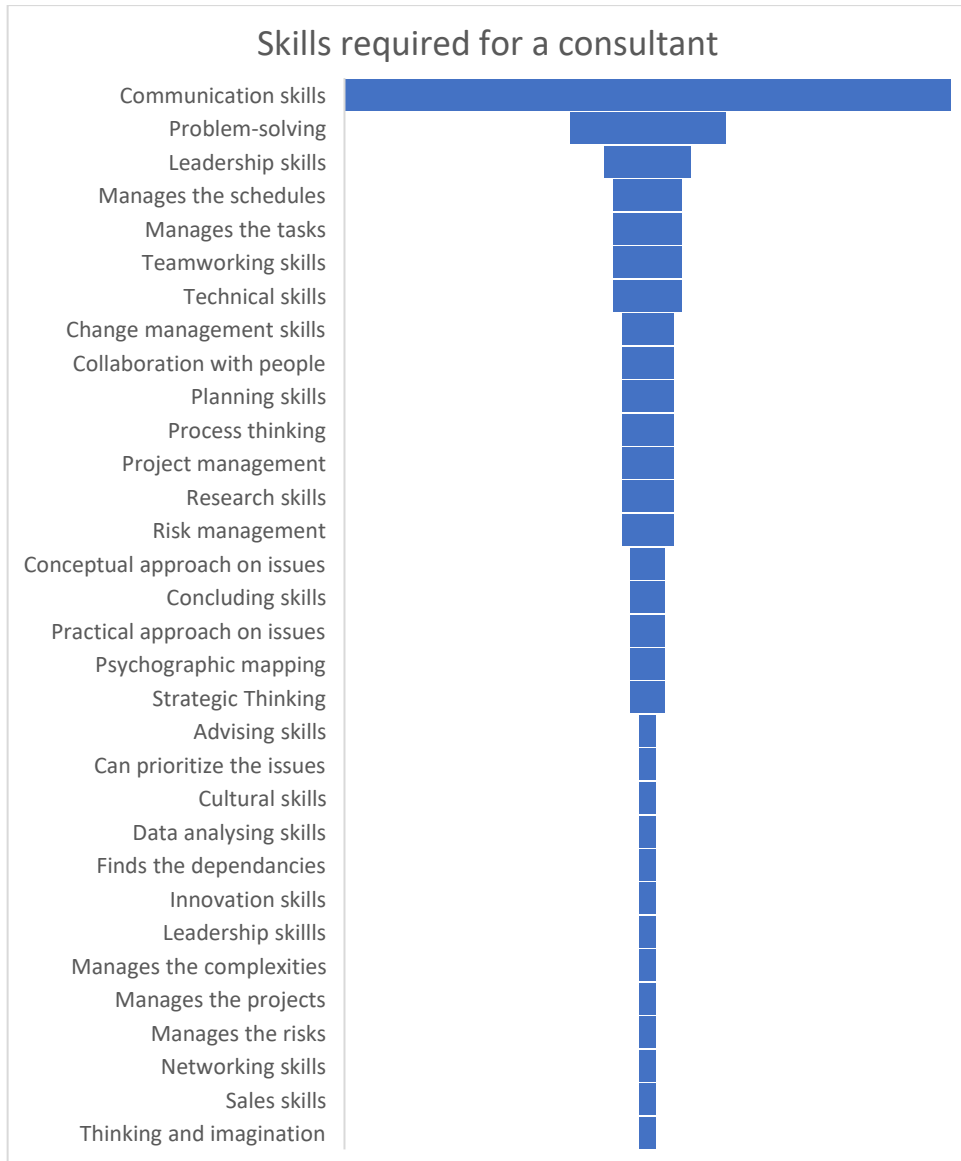
A surprise was that experience, expertise, and knowledge in core topics were not mentioned, at least not directly. Technical skills were among the ten most mentioned skills, but it was difficult to conclude whether this meant particularly skills in certain technology, or technical skills in common. This ambiguity is most probably arisen from the fact that the basic requirement for consultants in the workplace has in common been that those searching for the job have graduated and have adequate experience in

certain branches or tasks. Furthermore, in the results, no references to legislation and regulation nor liabilities and insurances were found. However, the regulation under which the consultant works, and liabilities derived from the legislation may cause a remarkable personal risk for professional advisors and should therefore be included in the training.

In addition to having strong communication skills, consultants and advisors should also be able to find and solve problems, to show leadership, and to manage schedules, tasks, and change (Figure 1). He / she should have teamworking and collaboration skills and be good in project management, process thinking and planning.

Concerning personal characteristics, the difference between the two most named properties and rest of the properties were not as clear as in skills. Analytical and creative nature were mentioned the same number of times, and the number of times the following 8 characteristics were found, was much closer to top than in skills (Figure 2). Combining some properties that are close to each other, successive consultants seem to be analytical and critical, creative, and adaptable but meticulous. He / she is business- and customer-oriented, emphatic, and has emotional intelligence. Good consultants are often system oriented, and they should be enterprising, independent, and unbiased, as well as logical and observative without forgetting social dimension.

In this module, we concentrate on training the most important skills. However, skills and personal characteristics walk hand in hand, thus it is good, in beginning of the module, to introduce the characteristics and discuss about how to recognize own style and development needs, and how to develop certain characteristics. However, it is good to bear in one's mind that intervention in personal characteristics is very sensitive, and is in many countries subordinated under the legislation and regulation concerning psychological counselling and therapies.





Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



Co-funded by
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Erasmus+ National Agency German
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Figure 1: Skills required

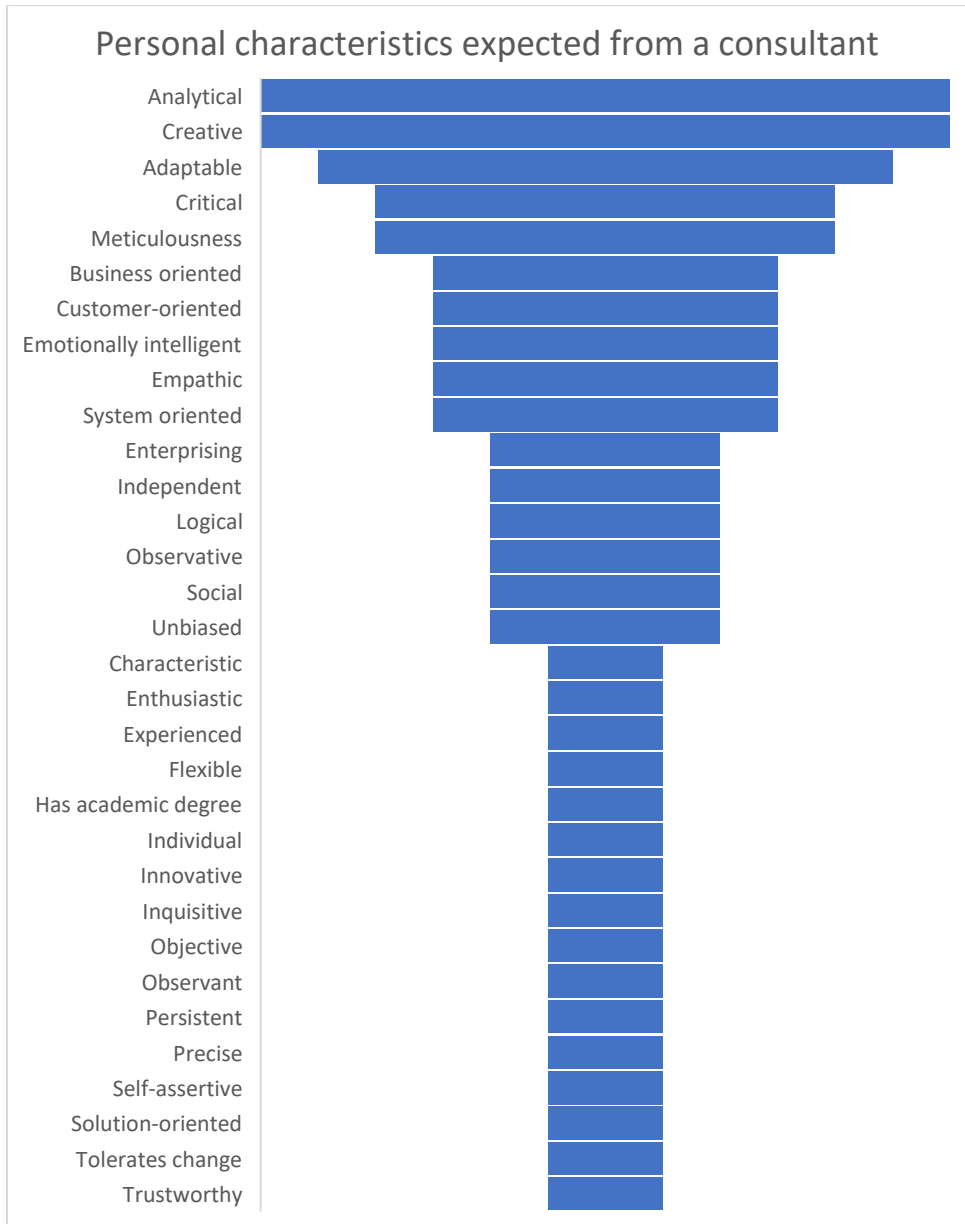


Figure 2: Personal characteristics

11.44 Structure of the module

The length of the module is 30 hours containing:

- Brief discussion about country-specific legislation and regulation that controls the work of consultants and advisors, as well as the rules connected to duties and responsibilities, insurances, liabilities, and third-party liabilities,
- Lessons and assignments on communication skills, oral (verbal) communication, written communication, reporting and writing certificates,
- Lessons and assignments on problem solving, leadership and change management, self-management, i.e., planning and management of schedules and tasks, teamworking and collaboration, and system and process thinking.

It is recommended to have visiting lecturers, like experienced consultants and attorneys who have practical examples for ex. in writing documents and certificates, errors in certificates etc.

Topic	Description	Notes
Legislation, 2 – 3 hours	Local legislation, regulation, insurance rules, liabilities, and third-party liabilities	County-specific material should be chosen by either lecturer, or an attorney specialised in topic
Communication, 15 hours	Oral (verbal) communication 4 hours, written communication 4 hours, other forms of	Communication is very language- and culture-specific, thus, it is

	communication (e.g. body language, social medias, silent messages...) 2 h, Assignments and practical tasks 5 hours	recommended to use local materials. However, below this table you will find some Anglo-American materials as a tip.
Other important skills 1-2 hours per topic, total 12 hours	<ul style="list-style-type: none"> • problem solving, • leadership, • change management, • self-management, i.e., planning and management of schedules and tasks, • teamworking and collaboration, • system and process thinking. 	There is almost unlimited number of ways to approach these issues. Below you will find some examples of different approaches.

11.5 Notes for the teachers

The material enclosed is an example showing how the topics of this course could be presented. Each teacher should adjust this to the circumstances of his own country, considering the local regulation, the level and skills of the trainees, and the study programme of the students; are they studying construction, finishing, plumber, some examples to be given. Each programme may require different weightings and highlights, and it is on the responsibility of each teacher to consider these special needs.

Target group

The course is targeted at further training for specialists to transfer subject-specific contents on improving energy efficiency and on the use of renewable energies for

residential buildings. Target group is specialists who have appropriate qualification in fields close to energy efficiency of buildings, e.g., in construction engineering, electrical engineering or environmental engineering. The appropriability of each qualification must be solved considering the country-specific regulation and instructions.

Work required

In the curriculum, the average work required by each module is measured in working hours to make it easier for teachers to plan the practical application. If the education institute requires ECTS credit units (abbreviated in this presentation as CU) to be used, the hours can be changed to CUs. One credit unit equals 27 hours workload. The curriculum consists of modules totalling 300 – 380 h depending to national weightings and requirements, and whether the optional module is realized corresponding approximately 12 - 14 ECTS credit units containing class lectures, online studies, individual studies, and assignments.

Teaching methods

Teachers are encouraged to use varying methods containing e.g.:

- Lectures,
- Visiting lecturers,
- Construction site visits,
- On-line studies,
- Videos approaching the topics (Reliability of the source must be evaluated),
- Individual studies and
- Assignments.

Cooperation with the local experienced industry practitioners is highly recommended. All modules can be studied individually, so the modules can be offered also via open studies to all companies and organizations operating at the construction and finishing branches, who intend to develop their skills in using the modern information technology in their business.

Contents of the curriculum

The variation in regulations, circumstances and qualification requirements are quite different in the BSR countries, thus the material has been written only as a form of framework inside which the local actors should modify the contents of modules according to their own regulations and local requirements, without forgetting the needs of different study programmes. By using innovative, problem-based, and experiential educational approaches, teachers will be able to help students to become experts who are able to acquire, create, implement, use, and advice effective energy saving methods.

The overall objectives of the curriculum are:

- The student deepens his/her knowledge about sustainability and energy issues.
- The student understands the regulatory framework and knows the essential contents of legislation on energy sector.
- The student can explain specific terms that relate to sustainability, energy efficiency and renewable energy.
- The student understands the importance of energy issues and knows how to improve the energy efficiency of buildings.
- The student deepens his/her knowledge about sustainability, energy, and energy efficiency.

The curriculum is divided into modules and submodules. Each module is possible to be replaced with studies, knowledge and skills gained earlier. Teachers and education institute have the duty and right to evaluate whether the skills and knowledge or studies are adequate considering the requirements of the qualification, and student's capability to participate in further studies based to this knowledge.

The complete Curriculum of the Further Training Programme 'Energy Consultant' is published on the project website <https://ba-vet.eu/> and can be downloaded there free of charge.

The implementation report on the practical trials and implementations as well as the concept of quality assurance and the evaluation report are also published as Result 4.5 Evaluation concept and reports training program "Energy Service Manager/Energy Consultant" and prospects of further implementing on the project website <https://ba-vet.eu/>.

12. Results of the innovation promotion & R&D projects

Within the framework of the project "Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)",

- a) two further training courses
 - Commercial Specialist in Sustainable Management
 - Energy Consultant

are being developed, tested, evaluated, transferred and implemented for SMEs. At the same time, these training courses are intended to promote innovation in the companies.

b) two three-stage dual Bachelor's degree programs with integrated vocational education and further training

- Business Administration and Sustainable Management for SMEs
- Management of Renewable Energy Technology in Buildings

are newly developed, practically tested, evaluated and implemented.

In direct connection with the implementation of further training (a) and Bachelor programs (b), innovation support for companies is to be realised. For this specific support of enterprises, a concept is presented which was applied and evaluated during the project period in connection with the testing of the education programs.

12.1 Promoting innovation and SME needs

Small and medium-sized enterprises are the backbone of the economy. At the same time, they stabilize the development of society. They are anchored in their region and can use the possibilities of international cooperation and strengthen their position without relocating their workplaces abroad. The economy of the Baltic Sea Region will be shaped mainly by small and medium-sized enterprises, which provide over 99% of all services and about 70% of all workplaces. The Baltic Sea Region, with its efficient SME economy, has excellent opportunities for economic strengthening and mastering international competitiveness. The Baltic Sea Region has the best prospects to develop into an innovative and economically strong region with international recognition.

The Baltic Sea Region has excellent potential at its disposal in the field of knowledge economy, university education, as well as research and development. Employees are the most important asset especially in small and medium-sized enterprises. However, in this respect significant shortages are looming for the future. Securing the inflow of

trainees to excellently qualified enterprises, management and labour force, as well as significant innovations decide about the future of small and medium-sized enterprises, and therefore, they are the most important support task for SMEs and crafts.

Mastering the future requires intensive cooperation: “links are more important than products “. Information technologies come as problem solvers when needed. Cooperation’s concentrate strengths, however, they preserve independence. Trust and cooperation management is sought after. Successful enterprises and cooperative cultures have to be based on strengths, encompass integration of employees and use the creative potential of all minds. And indeed, SMEs require specific assistance for the use of opportunities and minimizing the risks.

At the time of the Hanseatic League the Baltic Sea Region was one of the most innovative regions in the world and also today it has distinct innovation potential at its disposal, which have to be generated and used. The international competition can be won only provided that the Baltic Sea Region will be faster and better than other regions, and again, the most innovative territory in the world.

Effective innovation strategies in the Baltic Sea Region have to extend region-specific strengths, support spatial cooperation of strong points and the division of labour, as well as use cultural differences as a potential for creativity.

Excellent fields for innovation for the SME economy apply to all domains which are currently shaped by shortages. Within the shortage areas of energy, climate and environmental protection, health, information processing and problem-solving capabilities, electronic production and communication systems, as well as personal and organizational development, the Baltic Sea Region has distinguished learning and re-search capabilities, as well as large entrepreneurial potential at its disposal, so that especially promising starting points for targeted innovation policy could emerge here.

Support for research and development by universities and colleges has to turn towards the SME economy in a more intensive and consistent way. Promotion of some clusters of high-tech development is an important part of the present innovation policy. However, a specific innovation promotion for small and medium-sized enterprises must be particularly developed and intensively realised. Customer-oriented definition of innovations and a more concise policy of support is therefore important here and it can allow for example for the development of adjusted techniques and new products, new forms of organisation and the involvement of employees in the process of innovation or the transfer of technology.

Colleges and universities have to assume the transfer of innovation, which is an essential task for small and medium-sized enterprises, as a binding and obligatory task. Study and graduation activities should consistently incorporate the development tasks of small and medium-sized enterprises.

Cooperation between colleges and universities, as well as small and medium-sized enterprises has to be strongly improved and expanded. Therefore, chambers and prominent support institutions of the SME economy can assume the economic communication functions.

Promotion of SMEs must be given the highest priority. Particularly important for small and medium-sized companies are long-term strategies that are implemented consistently and reliably. SMEs need a reliable framework in which they can orient themselves and conduct safe planning.

Smaller companies cannot have at their disposal corporate staff functions, as large companies do, that would cover a variety of management tasks. In the case of the medium-sized businesses those staff functions and support functions need to be rendered outside within the framework of universities and economic self-government. Universities are the key innovative service providers, giving small and medium-sized enterprises

the necessary tools and guidance, company specific and reliable, and offering them monetary benefits. Relate the highest policy priorities for the promotion of SMEs:

a) the area of education, innovation and internationalization, since for many regions of the Baltic Sea the largest growth opportunities and resources for the SME sector are found here.

b) any forms of intra-and inter-company and international co-operation of SMEs, which should be systematically sourced from the chambers.

Specific innovation support for small and medium enterprises must be developed and implemented consistently. There is a need for user- and demand-driven innovation and broader support policies that actively take into account, for example, social and organizational innovations, development of appropriate technologies and new products, new forms of organization and employee involvement in innovation processes and the transfer of technology. Companies do not necessarily have to invent something themselves but could take good ideas and new technologies and modify those for themselves. Funding for the implementation of innovations in enterprises should therefore be increased.

There is urgent need for a broad concept of innovation that is geared specifically to the needs of small and medium enterprises. Promotion of innovation should involve development of new technologies, high-tech and appropriate tools, new discoveries and honing, product-, process-, and organizational and social innovations. A very significant added value must be sourced from all innovation subsidies, the one affecting the growth of the "human resources and organizational development" and including education, organization of work, development of partnerships etc.

The promotion of research and development by colleges and universities must turn more intensively and consistently into medium-sized businesses. Colleges and universities need to be given a mandatory task to serve as an important innovation transfer

medium for the economy. In the course of studies and thesis papers the issue of development of small and medium enterprises should be brought up consistently. According to the principle of "region as a living laboratory" research institutions need to achieve a variety of measures to promote innovation with and for the medium-sized businesses, such as tailored research and development projects, effective knowledge sharing, development and transfer of adapted examples of best practice or the implementation of demonstration projects.

In a comprehensive study and survey of SMEs from Germany, Lithuania, Norway, Poland and Russia, the need for innovations in SMEs and their promotion was examined. The results of the study are summarised below.

The role which SMEs play in the economy of the Baltic Sea Region makes creating adequate conditions for their innovation and competitiveness growth a key challenge. For this reason, it is vital to broaden our knowledge of the level of SMEs innovation and to gather data on a demand for innovation support in SMEs.

In the study, the Baltic Sea region entrepreneurs have been asked to specify a kind and a degree of intensity of innovation changes implemented in their companies. It turns out that marketing and product innovations are most frequent. Moreover, an innovative climate based on openness in organization culture in these companies has proved to be an important factor in innovation implementation in the majority of the analysed SMEs. SMEs in general have a bad opinion about the innovative climate in the country in which they operate. A difficult access to financing innovation activities by financial institutions is a common problem with building a friendly innovation climate in all the analysed countries. Major problems which SMEs struggle with within innovation implementation are lack of financial resources, complicated legal procedures, and a deficiency of adequately qualified staff.

Cooperation with scientific and R&D circles and other institutions designed to increase SMEs innovation level is vital on account of the specificity of SMEs, which generally have limited human resources and a low financial potential. The results of the analysis indicate that local authorities including chambers of crafts and commerce and entrepreneurs' associations are major partners in innovation cooperation for SMEs.

As far as an SMEs cooperation with R&D institutions is concerned, a leader-role is generally played by universities. Moreover, the intensity of this cooperation is quite high. The percentage of SMEs cooperating with R&D centres amounts to 50% in the Germany, 64% in Norway, 75% in Lithuania and 90.9% in Russia. Only the Polish SMEs declare a very low intensity of contacts with R&D sphere (only 16.37% of the Polish SMEs can boast of such contacts). The intensity of cooperation with R&D institutions does not translate into R&D projects in the Baltic Sea Region SMEs, however.

In the majority of the Polish, German and Norwegian SMEs, there have not been any R&D activities, when the study was conducted. The Russian and Lithuanian SMEs are exceptions to this rule, because 9 out of 10 analysed enterprises have been involved in R&D projects. Product and service enhancements are the predominant types of R&D activities presented in the Baltic Sea Region SMEs.

Moreover, the study has shown that about 90% of the analysed SMEs can see barriers impeding cooperation with scientific institutions. The major barrier SMEs encounter is insufficient proper funds to finance R&D and difficulties with access to external financing. However, according to the SMEs, the reasons for low intensity of cooperation with R&D sphere are scientific institutions themselves - SMEs report difficulties with initiating cooperation with scientific institutions, a lack of interest of these institutions to involve in such a cooperation, and ignorance of the economic subject matter on behalf of these institutions' representatives.

Barriers preventing cooperation between SMEs and R&D institutions (in %)

	Poland	Norway	Lithuania	Germany	Russia
Substantial costs, financial barriers	41	76	50	38	55
difficulties with starting a cooperation	29	32	33	31	36
lack of interest of R&D institutions to start a cooperation	20	28	42	19	19
legal barriers	18	4	8	X	X
R&D representatives do not understand the issue	18	64	46	25	27
communication problems with R&D representatives	10	36	29	13	X
no barriers	11	8	X	6	18
other (if so, what kind of barriers)	2	x	8		x

An attempt has been made to assess the demand for innovation in SMEs when analysing the Baltic Sea Region SMEs' innovation potential and their cooperation with R&D sphere.

It turns out that SMEs from all countries indicate a high demand for R&D activities. Polish SMEs are an exception in this respect, because only 1 in 3 of the analysed enterprises shows interest in R&D activities. Unfortunately, a high demand for R&D is not accompanied by SMEs' intentions to conduct such research in the future. The study shows a high degree of uncertainty among SMEs as to satisfaction of their R&D needs.

The demand for specific types of support from universities has been much lower than the analysed above demand for periodical R&D. The entrepreneurs have been mostly interested in periodical training and workshops for enterprises which were preparing, or which were involved in innovative projects, as well as information meetings on specific types of and kinds of innovations. Such a low level of demand for support from universities is due to the fact that most analysed SMEs cannot see any potential benefits resulting from cooperation with scientific institutions.

SMEs demand for innovation support from universities (in %)

	Poland	Norway	Lithuania	Germany	Russia
information meetings on types and kinds of innovations	30,7	41,6	37,5	33,3	72,3
periodical trainings and workshops for persons preparing and realizing innovative projects	35,5	58,3	50	20	36,6
allowing access to practical training and didactical materials	22,6	16,7	16,7	20	36,4
individual consulting directly in the company	22,6	37,5	62,5	26,7	18,2
individual consulting by phone	7,3	20,8	16,7	x	x
individual consulting via e-mail	11,5	16,7	16,7	x	x
other	2,94	x	4,2	x	x

The only positive effect of such a cooperation, which a majority of the analysed SMEs from all the countries have agreed upon, is "launching new products and services". However, the analysed SMEs have declared a very high demand for training and consulting services from the scientific environment. Services, products and new technologies are desired fields of possible cooperation

Finally, cluster involvement in innovative projects of the Baltic Sea Region SMEs as well as their intentions to engage in future cluster cooperation have been analysed. It turns out that the majority of companies have not been involved in a cluster so far. Unfortunately, the majority of the analysed SMEs do not have any intention to start cooperation with any cluster.

The above results show that it is necessary to start intense activities destined to increase the Baltic Sea Region SMEs' understanding of benefits resulting from cooperation with scientific institutions, and the involvement in a cluster venture. Moreover, abolishment of the barriers identified in this study (mainly financial barriers) limiting both innovation implementation processes and SMEs' cooperation with scientific sphere is recommended.

Expected benefits SMEs can get as a result of their R&D cooperation with universities (in %)

	Po-land	Nor-way	Lithua-nia	Ger-many	Rus-sia
launching new products/services	38,1	44	62,5	50	81,8
enhancing products/services quality	21,3	60	54,1	50	63,6
optimalization of organization operations	20,1	20	37,5	43,7	45,4
improvement of cooperation with suppliers and customers	30,7	48	25	31,2	27,3
sales increase	33,8	52	58,3	25	27,3
improvement of competitive position	17,7	28	58,3	32,5	45,4
costs lowering	27,1	56	75	31,2	27,3
increase of ecological activity	7,8	24	41,6	18,7	x

increase of company's prestige	27,3	52	45,8	37,5	36,3
access to latest know-how	17,9	44	25	50	27,3
possibilities of new innovations implementations	16,1	16	62,5	31,2	27,3
possibilities of HR development	9,6	16	33,3	25	9,09
gaining new customers/increasing market share	30,2	40	45,8	25	45,4
increase of company's profitability	17,2	52	45,8	25	27,3

In summary, innovative support measures for small and medium-sized enterprises must meet specific conditions of SMEs, in particular:

- SMEs do not have any in-house staff; they require comprehensive services that equal the staff performance of large enterprises, which would offset the size-related disadvantages.
- Services must be provided in closeness to companies and accurately according to specific needs.
- Services must be accessed by the SMEs precisely at the point in time when they are really needed. Services and information on stocks are not really helpful to SMEs.
- SMEs suffer from bureaucracy, they are time- and expense-sensitive. All the necessary services must be provided without red tape, from a single source and must be cost-effective.
- Continuous exchange of information, stable foundation of trust, high reliability and continuity are important. This requires a permanent person in permanent contact.

- Services must be provided in the language of the SMEs and offer financial benefits to enterprises.
- Services must be of outstanding quality, match individual needs and need to be provided exactly at the right time.
- Services must encompass different areas like business administration, engineering, marketing, human resources, sales, etc. Of prime importance are also measures which promote international cooperation, because they create great potential, in particular for SMEs.

When universities and companies cooperate with SMEs within the framework of dual courses of study, this results in particular intensive networking, direct technology and knowledge transfer and excellent opportunities for tailor-made research and development work, which is carried out in the company by students supervised by professors and lecturers.

12.2 Promoting innovation in conjunction with training and study programs

The innovation capacity of SMEs is most limited by the availability and skills of entrepreneurs, managers and professionals. Due to a lack of skills and entrepreneurs and employees, innovation in SMEs is already much lower than it could and should be. With the exception of Sweden, the number of younger people of working age in all Baltic Sea countries will fall by up to 25% over the next 15 years. At the same time, qualification requirements are increasing; human resources and social skills are becoming equally important alongside specialist knowledge. Improving qualifications and eliminating the shortage of skilled workers are the most important promotional tasks and the key to sustainably strengthening innovation, competitiveness and growth in

SMEs. The realization of further training and dual Bachelor's degree programmes, in which the studies are combined with relevant vocational training, makes a decisive contribution to mastering this challenge in order to attract the high demand for junior staff in innovative entrepreneurs, managers and professionals for SMEs and at the same time to emphatically strengthen innovations in SMEs.

12.21 Innovation promotion combined with continuing vocational training

The structural concept KAIN (Knowledge According Individual Needs), which consists of the following elements, is recommended for the implementation of shorter vocational training courses for SMEs:

- 2-3 learning phases with classroom teaching, delivered on two days per week, possibly Fridays and Saturdays.
- in between, longer on-the-job teaching periods at the trainees' workplace with simultaneous realisation of innovative development projects in SMEs, covering three to four months.
- Proposal for teaching periods at the trainee's workplace:
 - a) coaching by the same trainers that are also delivering classroom teaching,
 - b) optional and customized e-learning options,
 - c) implementation of a specific development project within the company, in the topic area of the respective advanced training, involving as many employees as possible, thus ensuring joint team learning.

At the end of the first classroom teaching, one focus is on teaching relevant issues with regard to planning and implementation as well as to (critical) assessment of their own projects that are processed in the second part of the training. Thus, another key objective of this part of the training is to equip the trainee with critical impulses for processing the presented models and instruments in his individual project. In a sense, application and implementation of the presented models and instruments by trainees at their work constitutes the primary focus of the second part of the training concept.

At the beginning of the longer phase of learning on the job, the innovative development project to be realised is defined and prepared in the company. The trainer accompanies the work to realise the development project in the company and involves other consultants and experts as needed. Support by trainers and consultants may vary, from rather simple general advice in the sense of passing on relevant information up to an in-depth assistance-like coaching. Normally, it is advisable to decide on a case-by-case basis which type of support is best suited to enable each trainee to achieve individual project goals.

In another classroom workshop, the third part of the training, experience and insight gained will be presented and exchanged at a joint event, in emphasis on presentation of individual participants' projects. Both the trainees and the trainers will be tasked to review and reflect on projects presented by the participants and to analyse answers with respect to a possible contribution to sustainable training target tracking.

Within the BA&VET project, two longer vocational training programs are being developed and implemented that cannot be carried out using the KAIN method. Nevertheless, these two comprehensive further VET programs can easily be combined with innovative support and the implementation of manageable development projects. The prerequisite, however, is that further VET programs are complemented by a coaching process that accompanies the development work in the companies.

12.22 Innovation promotion combined with dual Bachelor study programs

Under dual study programs, close collaboration between academia and small medium-sized enterprises is achieved. In that regard, further welcome features are active exchanges of knowledge and experience as well as implementation of manageable research and development tasks for and by SMEs. Students will implement their semester or bachelor's theses at companies where they complete their practical training. They will select topics that are particularly business-relevant, thus ensuring notable benefits to SMEs.

A dual bachelor study program is composed of the following basic elements:

- Admission requirement: higher education entrance qualifications (i.e. A-levels) or advanced technical college certificate.
- Duration: 3 to 4 years maximum (depending on subject).
- About 50% of the educational period as practical training or professional activity in a company. Vocational education takes place in dual form in companies and vocational schools.
- About 50% of the educational period takes place at the university.
- Both parts of the training are coordinated with each other and are carried out in parallel. Theory can be taught in longer blocks (e.g. 3 months) or 3 days a week with shorter additional blocks.
- About 60% of the courses offered at the university are taught by full-time professors and lecturers and about 40% by practitioners from companies.
- The participants sign a contract for vocational education/activity with the company and a contract for study with the university.

- Degree: Journeyman/skilled worker and Bachelor.

The bachelor's degree also entitles the holder to follow a master's program at a university at a later date. However, the aim is that at least 80 % of the bachelor's degree holders should remain in the small and medium-sized business sector as entrepreneurs, managers or skilled workers and, building on their initial bachelor's degree, improve their skills within the context of ongoing continuing education.

The excellent qualifications acquired in the dual study programs are also decisive prerequisites for high innovations. In addition, the participating universities/colleges should also take part in practice-oriented research and development projects for medium-sized companies and thus promote innovations in the long-term. The study programs and innovation promotion are aimed at the identical target group, namely high-performing, medium-sized companies and their management personnel. As companies are always included in the dual study programs, there is direct cooperation between companies and universities, which can be used for knowledge and know-how transfer as well as for research and development work by companies. Re-search and development tasks can be carried out in various ways, for example

- Work as part of semester or bachelor theses of the participants/students
- Targeted individual assignments of the companies or consulting/know-how transfer by professors and teachers
- More complex projects with public funding (especially from the EU)
- Joint work on projects with several companies in one industry (industry association projects)

Universities and companies are training partners in dual study programmes. About half of the entire training period takes place at the university and half at companies. Credit points required for the Bachelor's examination is earned both during studies at

the university and to a certain extent during training and work in the company. The change of qualification in the university as well as in the company can take place in block form (e.g. three-month blocks) or in daily form. The dual study programmes are Bologna-compliant and lead to a recognized Bachelor's degree. The qualifications in the company can be combined with vocational training with the degree "journeyman" or "skilled worker".

The close cooperation between universities and companies in teaching offers optimal conditions for the promotion of innovation by SMEs through universities. The following starting points and funding measures are particularly relevant.

a) The professors and lecturers of the universities must see themselves as equal partners of the companies. They must regularly visit the companies, check their innovation needs, provide advice, transfer new technologies, best practices, etc. and accompany implementation in the companies. The more effectively companies experience such innovation support, the greater their willingness to participate as training partners.

b) In addition to personal exchange and transfer, universities shall maintain comprehensive written and electronic transfer. For example, regular publication of newsletters, innovation platforms, publications of prepared research results, dialogue forums, etc.

c) Approximately 60% of the teaching at the university is carried out by the academic staff of the university and about 40% by practitioners from the companies. In connection with this, the practitioners should continuously bring the needs, topics and tasks of the companies for innovation development into the research and development work of the universities, so that an SME-specific orientation can be achieved. At the same time, through the participation of practitioners in teaching, entrepreneurial thinking, modern management methods, etc. can be transferred to the universities and thus future-oriented organization, administration, work processes, etc. in the universities.

d) Since the students spend half of their time in the university and half in the company, a personal transfer of knowledge, new technologies, best practices etc. from the universities to the companies can be optimal. Equally intensively, questions, concerns, tasks, etc. can be transferred from the companies to the universities via the students and the work of the universities in research and teaching can be stimulated and shaped in a way that is close to the company.

e) Topics and tasks for semester or bachelor theses should be formulated by the participating companies according to their innovation needs, which are processed by the students in the companies after review and approval by the university. This work process is accompanied by professors and lecturers in companies who advise both the students and the companies on the development work and subsequent implementations. In this way, innovative tasks and manageable research and development tasks in the companies are realized in a targeted manner and without additional costs.

f) For the realisation of complex research and development tasks of SMEs, additional financial resources must be obtained. National, but also especially the EU innovation support programs, are too bureaucratic for small businesses; the cost of application and project management is in disproportion to the potential outcome of the project and is too much for many companies. Another obstacle to innovation is that SMEs cooperate too little in research and development, in contrast to large companies. Universities must therefore develop their role as an innovative service provider for the SMEs. They can advise companies on formulating project proposals or even serve as applicants' representative and project manager. Industry association projects with several SMEs should also be developed by the universities, applied for funding and carried out by the universities as lead partners.



During the testing of the two dual Bachelor programs in the BA&VET project, the above-mentioned innovation subsidies are to be implemented and tested at the same time. The focus is on the implementation of manageable research and development tasks (see e). During the course of the project, the trials of the study programs as well as the trials of the innovation support measures will be evaluated.

The promotion of innovation and the implementation of R&D projects in SMEs were evaluated on the basis of a specifically developed concept. The results of the R&D

projects are the property of the respective company, must be treated confidentially and can therefore only be published to a limited extent. The results of Innovation promotion & R&D projects have been published on the project website <https://ba-vet.eu/>, namely:

Result 5.1 A coordinated approach to promoting innovation by SMEs

Result 5.2 Evaluation concept and report for innovation support and R&D projects carried out in SMEs

13. Result of dissemination and implementation consulting

All results of the project were transferred to 70 chambers, SME associations and colleges/universities from 13 countries, which received implementation advice and are involved in the project work as associated partners from the beginning of the project.

At the beginning of the project, the following were developed and agreed in the consortium:

- a) A strategic plan for the implementation of the dissemination activities on the project and its results.
- b) A form to plan and record all dissemination activities including activities to be carried out, target groups, target numbers, deadlines, etc.

On this basis each partner made an initial planning of the activities. An update of the planning and a recording of the activities already carried out was made by each partner every year. The results achieved and the further plans were intensively discussed and agreed with all partners at the biannual project workshops.

Result 6.2 Report dissemination activities and implementation consulting includes:

- The strategic plan for the implementation of the dissemination activities.
- Measures and results of dissemination activities and implementation consulting.
- Measures of further dissemination activities of all project partners.

13.1 Dissemination objectives

The dissemination strategy intends to ensure the effective communication and promotion of the project's goals, achievements, and results to the relevant stakeholders. The goal is to increase awareness and understanding of the project, as well as its impact and benefits on regional, national and EU-level. Moreover, the aim is to engage stakeholders in the project's activities and results, and to ensure that the project's achievements are sustained after the end of the funding period. Tailored dissemination measures are designed to disseminate the project activities and results to different target groups.

The concrete dissemination goals are to:

- Promote the ongoing trainings
- Inform about the results that will be publicly available
- Engage the different target groups to join trainings or to receive input and feedback
- Make sustainable all outputs and results also beyond the project lifetime

Overall, the dissemination strategy intends to maximize the impact and reach of the project and its results, both during and after the funding period.

Partner Hanse-Parlament will carry out the leadership for WP6 Dissemination, Implementation Consulting & Securing Permanent Continuation with the Results. All project partners will contribute with dissemination activities to the different stakeholders in their network.

13.2 Dissemination target groups

The BA&VET dissemination strategy plan targets a range of different stakeholders in order to effectively communicate the project's goals and achievements. The following are some of the key target groups that should be considered:

1. Students in VET education, entering VET education and higher education students: These groups are the primary target of the project as they are the direct beneficiaries of the project. The project's results and achievements should be communicated to them through various means such as website, brochures, reports, and articles, etc.
2. SMEs (e.g. members of chambers): The project's results and achievements should be communicated to SMEs as they are the primary target of the project. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.
3. SME managers and employees: The project's results and achievements should be communicated to SME managers and employees as they are the primary target of the project. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.
4. Associated partners (70 partners from 13 countries): The project's results and achievements should be communicated to the project's associated partners as they are the primary target of the project. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

5. Teachers of VET and higher education institutions: These groups are important stakeholders as they are responsible for delivering vocational education and training and will benefit from the project's results.

6. Vocational schools and Universities: These groups are important stakeholders as they are responsible for delivering vocational education and training and higher education and will benefit from the project's results.

7. National authorities: The project's results and achievements should be communicated to national authorities. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

8. Regional authorities: The project's results and achievements should be communicated to regional authorities. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

9. Local authorities: The project's results and achievements should be communicated to local authorities. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

10. General public: The project's results and achievements should be communicated to the general public. This can be done by using existing networks, such as vocational education and training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

11. NGO's: The project's results and achievements should be communicated to NGOs. This can be done by using existing networks, such as vocational education and

training organizations and SME associations, and by organizing events, such as workshops, seminars, and conferences.

It's important to note that the list above is not exhaustive and other stakeholders may be added depending on the specific context of the project activities and outputs. The level of dissemination spans from local, to regional, national, international and European.

13.3 Activities and outputs to disseminate

The following table summarises the main activities and outputs to be disseminated to the identified target groups during the project lifetime:

WP1 Management, Workshops & Conferences	<ul style="list-style-type: none"> • Workshops • Conferences
WP2 Basics & Train the Trainer	<ul style="list-style-type: none"> • Report on results of analyses of the economy, demography, education and labour markets • Report on the results of analyses of skills needs in the green economy • Report on results on national and legal conditions in the partner countries and alternative solution models • Concept, curriculum and teaching materials for a Train the Trainer program • Qualification of teachers, counsellors and university lecturers of all project partners
WP3 Sustainable Management	<ul style="list-style-type: none"> • Solution concepts for the integration of vocational training or in combination with dual study courses • Examination regulations „Sustainable Management"

	<ul style="list-style-type: none"> • Concept, curricula and module handbook for three-cycle dual study program "Business Administration & Sustainable Management of SMEs" • Implementation and evaluation course "Business Administration & Sustainable Management" and qualified students • Concept, curricula and teaching materials further Training program "Sustainable Management" • Evaluation concept and reports training program "Sustainable Management" and prospects of further implementing
<p>WP4 Energy & Climate Protection</p>	<ul style="list-style-type: none"> • Concept, curricula and module handbook for three-cycle dual study program "Engineering in Management of Renewable Energy Technology in Buildings" • Evaluation, reports and qualified students of the degree program "Engineering in Management of Renewable Energy Technology in Buildings" • Examination regulations "Energy Service Manager/Energy Consultant" • Concept, curricula and teaching materials further training program "Energy Service Manager/Energy Consultant" • Evaluation concept and reports training program "Energy Service Manager/Energy Consultant" and prospects of further implementing
<p>WP5 Innovation promotion & R&D projects</p>	<ul style="list-style-type: none"> • A coordinated approach to promoting innovation by SMEs • Evaluation concept and report for innovation support and R&D projects carried out in SMEs
<p>WP6 Dissemination,</p>	<ul style="list-style-type: none"> • Manual with all results • Results Video

Implementation Consulting & Securing Permanent Continuation	
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For the successful dissemination of the project activities and outputs to the different target groups, all project partners will use a variety of channels and tools, both online and offline. It's important to consider that not all the channels and tools will be effective for all the target groups, some will be more effective with one group than others, so it's important to adapt the dissemination strategy accordingly.

13.4 Communication material

In the beginning of the project, a set of communication material has been developed to be used by all partners for dissemination purposes.

1. Project Logo
2. Template for project deliverables
3. Website
4. Project Summary
5. Activity Plan

More material will be developed throughout the project. All communication materials are in English. However, it is crucial for the visibility and impact of the project, that each partner also communicates and dissemination in their national language.

Online dissemination

1. Project website: <https://ba-vet.eu/> is the official project website that provides information about the project, including its objectives, activities, and results, serves as a primary channel for disseminating information. Moreover, all partners are encouraged to use their own websites as a dissemination channel for the BA&VET project.

2. Social media: Social media platforms such as Facebook, Twitter, and LinkedIn are used to share project updates, news, and success stories to increase the visibility of the project and engage with stakeholders. All partners are encouraged to use their own social media accounts as a dissemination channel for the BA&VET project

3. E-mails and E-Newsletters: Regular newsletters and e-mails sent to stakeholders, including associated partners, national and regional authorities, SMEs, and teachers, to keep them informed about the project's progress and results.

4. Online events: Online events such as online trainings and webinars have become very popular in the course of the project lifetime and present a comparatively inexpensive and easy possibility to present the project's results and engage with stakeholders. This can be targeted at specific target groups, such as SMEs, teachers, and students.

5. Reports and publications: Publication of reports, papers and press releases to disseminate information about the project and its results.

6. Erasmus+ Project Results Platform: All project results will be published on the Erasmus+ Project Results Platform.

Offline dissemination

1. Internal and third-party events: Organizing events such as trainings, workshops, seminars, conferences, fairs and internal/external meetings to present the project's results and engage with stakeholders. This can be targeted at specific target groups, such as SMEs, teachers, and students.

2. Networks: Leverage existing networks, such as vocational education and training organizations, SME associations, chambers of commerce and crafts to disseminate information about the project and engage with stakeholders.
3. Printed publication in traditional press such as paper, magazine, newsletter.
4. Consultations and transfer of project outputs with associated partners and external stakeholders.
5. Publication of book with all project results.
6. Press release and conference: Hold a press conference about project activities, objectives and results.

13.5 Expected impact and indicators

The expected impact of the described dissemination strategy comprises:

1. Increased awareness and understanding of the project, its objectives, and results among stakeholders, including vocational education and training (VET) students and teachers, SMEs and SME associations, national and regional authorities, and the general public.
2. Engaged stakeholders in the project's activities and results, for example, through workshops, seminars, and conferences.
3. Improved quality of vocational education and training, resulting in better-trained graduates and more successful SMEs.
4. Fostered collaboration and networking among stakeholders, including VET students, SMEs, national and regional authorities, and associated partners.

It's important to note that, to be effective, the indicators should be realistic, measurable, and representative of the impact of the dissemination strategy, and should be used to continuously monitor and evaluate the dissemination activities to ensure that they are reaching the target groups and achieving the desired impact.

13.6 Monitoring

A dissemination plan template for planned as well as achieved dissemination activities has been created to monitor each partner's achievements. The dissemination plan is updated by each partner on a regular basis and is sent to the lead partner Hanse-Parlament for monitoring at three points in the project lifetime:

1 st planning	Update	Final report
31.03.2023	30.11.2024	30.11.2025

The dissemination strategy and all results of the dissemination activities and implementation consulting, including all individual activities of the individual project partners, were published on the project website <https://ba-vet.eu/> as Result 6.2 Report dissemination activities and implementation consulting.

Towards the end of the project term, an action and financing plan for the continuation of the work after the end of the project was drawn up, discussed and bindingly agreed. This action programme was also published on the project website <https://ba-vet.eu/> as Result 6.3 'Binding action plan with financing plan for the continuation of activities after the end of the project'.



Promoting permeability through dual bachelor's programs with integrated initial and further vocational training (BA&VET)



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Lower Silesian Chamber of Craft and Small and Medium-sized Businesses, Poland

Lund University, Sweden

Marshal's Office of the Pomorskie Voivodship, Poland

Master of Crafts Norway, Norway

Mykolas Romeris University, Lithuania

Nordic Forum of Crafts, Norway

Offensive Mittelstand, Stiftung „Mittelstand – Gesellschaft – Verantwortung“,
Germany

Panevezys Chamber of Commerce, Industry and Crafts, Lithuania

Panevezys University of Applied Sciences, Lithuania

Pomeranian Chamber of Handicrafts for SMEs, Poland

Pomeranian University in Slupsk, Poland

Profesinio mokymo centras "Zirmunai", Lithuania

Russian Chamber of Crafts, Russia

Saint-Petersburg State University of Economics, Russia

Satakunta University of Applied Sciences, Finland

Schwerin Chamber of Skilled Crafts, Germany

Small Business Chamber Warsaw, Poland

St. Petersburg Foundation for SME Development, Russia

Tampere University of Technology, Finland



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The University College for Green Development, Norway

University 21, Germany

University of Bialystok, Poland

University of Latvia, Latvia

University of Warszaw, Poland

VIA University College, Denmark

Vilnius Builder Training Centre, Lithuania

Vilnius Chamber of Commerce, Industry and Crafts, Lithuania

Vilnius Gediminas Technical University, Lithuania

Võru County Vocational Training Centre, Estonia

Vytautas Magnus University, Lithuania

Warmia and Mazury Chamber of Crafts and Small Business in Olsztyn, Poland

Wielkopolska Craft Chamber in Poznan, Poland



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