



**GT VET - Work Package 2
Industry Driven Analysis of Job Requirements**



**NATIONAL REPORT
GERMANY**



**GT VET
Greening Technical VET – Sustainable Training
Module for the European Steel Industry**



**Work Package 2
Industry Driven Analysis of Job Requirements
National Report**

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Germany

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1. Introduction: National Report Germany

The project ‘Greening Technical Vocational and Educational Training – Sustainable Training Module for the European Steel Industry’ (GT-VET) pursues the target of creating a training module for the European steel industry which promotes skilled workers’ “green skills”: qualifications regarding environmental, climate and safety at work issues developed through vocational and educational training or further training. The project is realized by a consortium of steel companies and research institutes in four European countries¹ as well as by European social partners’ organisations of the steel industry.

Therefore, in work package 2 relevant national laws as well as company-specific regulations were identified and workshops with the participating companies were conducted in order to discuss and describe industry-driven job requirements with regard to “green skills” referring to knowledge, abilities, values and attitudes of skilled workers (industrial mechanics and electrical technicians as the two main occupations, including varieties in the participating countries) needed to live in, develop and support the company in reducing the impact on the environment. ThyssenKrupp Steel Europe AG (TKSE AG) as a German project partner was involved in the application of the concept of GT-VET.

This report summarizes all important German laws and regulations concerning environmental, climate and work protection. Subsequently, the company's guidelines and the identified business needs of TKSE AG are listed which were analyzed in a workshop with business professionals for climate and environmental protection, occupational safety and education and training. Concrete ideas and requirements for a training module have been formulated which respond to prospective (vocational) training demands of the steel industry concerning environment, climate and occupational safety. The work package shows the ambition to learn as much as

¹ Germany, Italy, UK, Poland.



possible about necessary green skills and corresponding learning content for skilled workers from an industrial perspective.

2. National directives and regulations in Germany

In this chapter the German legislation for the national steel industry is summarised. It is based on descriptions in the Environmental Management Handbook (Status: April 2010) and the Occupational Safety Management Handbook (Status: April 2010) of TKSE and further research of Sozialforschungsstelle / TU Dortmund on national legislation.

1. Environmental Issues

Due to the increasing environmental pollution and scarce resources, the legislature has enacted far-reaching environmental and climate protection laws. Over time the steel industry has become increasingly sensitized and has involved areas in their company regulations which lie outside the direct product manufacturing process. Meanwhile, sustainable environmental protection strategies (e.g. energy efficiency) are an integral part of the basic central corporate guidelines, along with legally required environmental protection measures.

Generation of Waste

- **Act for Promoting Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Disposal** (German: KrW-/AbfG)

On 30 March 2011 the Federal Government decided on the bill presented by the Federal Environment Ministry on the reorganization of the Closed Substance Cycle Waste Management and ensuring environmentally compatible Waste disposal. The bill will now be forwarded to the Federal Council and then to the German Bundestag. The new circular economy law (KrWG) transfers the EU's Waste Framework



Directive (Directive 2008/98/EC) into German law and will modernize the existing German waste law comprehensively. The aim of the new law is a sustainable improvement of environmental and climate protection and resource efficiency in waste management by strengthening the prevention and recycling of waste.

- Packaging Ordinance
- Battery Directive
- Waste Management Regulation (German: TA Abfall)
- State Waste Law (depends on the Länder)

Generation of Emissions to Atmosphere

- **Federal Emission Control Act** (German: BImSchG), i.e.:
 - **Ordinance on Equipment and Machinery Noise Protection** (32th Ordinance of the Federal Immission Control Law)
 - **TA-Air** (German Technical Guidelines on Air Quality Control)
 - **TA-Noise** (German Technical Instructions on Noise Control)
- **Greenhouse Gas Emissions Act** (German: TEHG)

Generation of Emissions in Water

- **Federal Water Act (Act on Managing Water Resources)** (German WHG)
- **Waste Water Ordinance** (Ordinance on Requirements for the Discharge of Waste Water into Waters) (German: AbwV)
 - i.e. Administrative Regulation on water-polluting substances
- **Promulgation of the Amendment to the Waste Water Charges Act** (German: AbwAG)
- **State Water Supply Laws (depends on the Länder)** (German: Landeswassergesetz)



- **Municipal Wastewater Articles** (German: Abwassersatzungen d. Städte/Gemeinden)

Climate Changes and Energy Efficiency

- **Act on Granting Priority to Renewable Energy Sources (Renewable Energy Sources Act)** (German: EEG)
 - On July the 30th 2011 the Bundestag decided an amendment of the **Renewable Energy Sources Act**. The legislative procedures ended with the decision of the Bundesrat on July 8th 2011.

Contamination of Land and Groundwater

- **Federal Soil Protection Act and Ordinance: Purpose and Principles of the Act** (German: BBodSchG)
 - Federal Soil Protection and Contaminated Sites Ordinance (German: BBodSchV)
- **Land Protection Act** (German: Landesbodenschutzgesetz, depends on the Länder)

II. Health and Safety Issues

The legislation and regulations related to health and safety are of particular relevance for the company. Their implementation ensures the protection of employees against work-related health and safety risks. They are supposed to help create a healthy and safe work environment and serve to reduce and avoid potential accidents and dangers.



The Basis

- **Occupational Safety and Health Act (OSH)** (Act on the implementation of safety and health measures to improve safety and health of workers at work) (German: ArbSchG)

Workplace Requirements

- **Occupational Safety and Health Act (OSH)**
- **Ordinance on Workplaces** (German: ArbStättV)

Dangerous agents at work

- **Chemicals Act** (Law on Protection from Hazardous Substances) (German: ChemG)
- **Ordinance on the Protection against Hazardous Substances** (German: GefStoffV)
 - The Ordinance is based on the **Chemicals Act** and on the **OHS Act**.
- **Ordinance on the Admission of Biocides** (Regulation on the registration of biocide products, chemicals and other legal proceedings on biocides and biocide active substances) (German: ChemBiozidZulv)
- **Chemicals Prohibition Ordinance** (Ordinance on bans and restrictions on the marketing of dangerous substances, preparations and products, under the Chemicals Act) (German: ChemGiftInfoV)

Exposure to chemical agents and chemical safety

- **Chemicals Act**
- **Ordinance on the protection from hazardous substances** (German: GefStoffV)
- **Occupational Safety and Health Act (OSH)**



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- **Federal Immission Control Act**
- **Chemicals Prohibition Ordinance**

Noise

- **Ordinance on Workplaces (German: ArbStättV)**
- **Ordinance on Noise and Vibration Protection and OSH (Ordinance to protect workers against risks arising from noise and vibration) (German: LärmVibrationsArbSchV)**
- **Ordinance on Equipment and Machinery Noise Protection (32th Ordinance of the Federal Immission Control Law)**
- **Occupational Safety and Health Act (OSH)**
- **Technical Regulation on Noise and Vibration protection and OSH (German: TRLV Lärm)**
 - These Regulations are one integrated instrument of the **Ordinance on Noise and Vibration protection and OSH**

Artificial optical radiation

- **Atomic Energy Act (German: AtG)**
- **Radiation Protection Ordinance (German: StrlSchV)**
- **X-Ray Ordinance (German: RöV)**
- **Ordinance on artificial optical radiation (German: OStrV)**



Personal protective equipment

- **Occupational Safety and Health Act (OSH)**
- **Ordinance on Health and Safety in the use of Personal Protective Equipment (PPE) Directive at Work (German: PSA-BV)**
- **Ordinance on the Placing/Marketing of PPE (German: 8. GPGV)**
- **Accident Prevention Guideline (German: BGV)**

Further environmentally relevant regulations

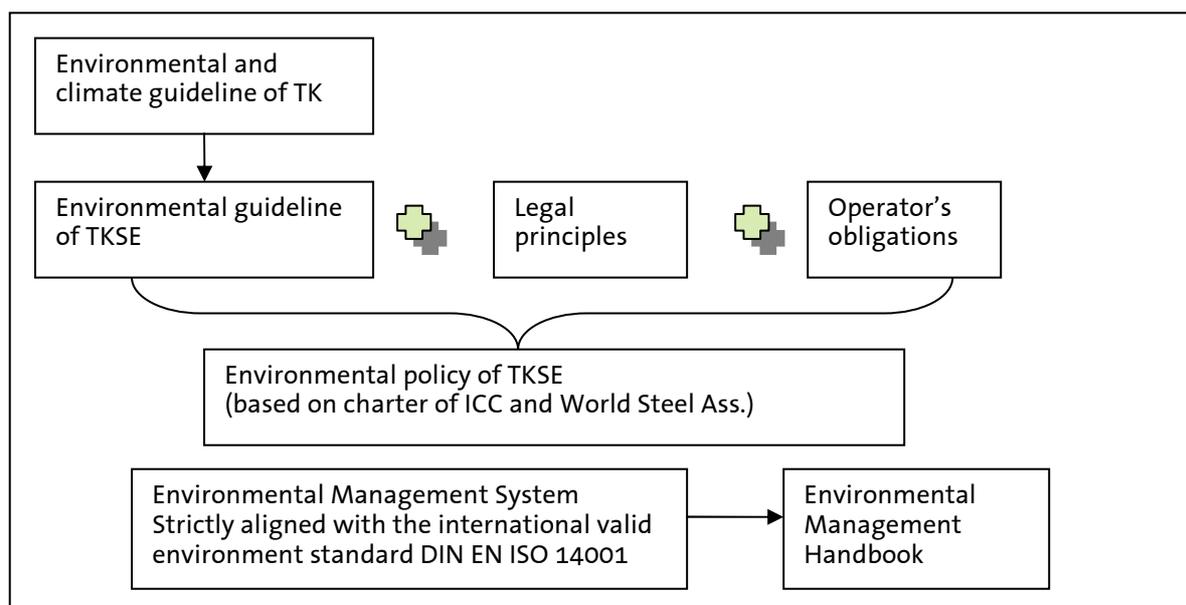
- Environmental Impact Assessment Law (German: UVPG)
- Environmental Liability Law (German: UmweltHG)
- Ordinance on Industrial Safety (German: BetrSichV)
- Building Code (German: BauGB)
- Building Regulation of the Land
- Penal Code (Extracts) (German: StGB):
 - Water Pollution
 - Soil Contaminations

3. Company directives and regulations of ThyssenKruppSteel Europe (TKSE)

1. Environmental Policy Guidelines

For TKSE, the guidelines of environmental policy have a high relevance and long tradition. The organisation and function of climate and environmental protection is based on the parent company's guidelines on environment and climate. The environmental policy comprises ten basic environmental guidelines and focuses on a long-term sustainable development.² The principles were published in the Charter of the International Chamber of Commerce (ICC) and by the World Steel Association (WSA). In addition, the implementation of environmental policy through an environmental management system (EMS) is guaranteed in accordance with DIN EN ISO 14001³ which was first certified in 2001.

Figure 1: Environmental and climate guideline of TKSE



(Presentation of WP2, Veit Echterhoff (TKSE), project meeting in Gliwice, July 2011)

² Environmental Management Handbook of TKSE: Environmental Guidelines (section 1.2). Environmental Guidelines of TKSE, p. 1-2, Status: March 2011.

³ The system follows a “plan-do-check-act” (PDCA-cycle).



Overall, the group environmental targets are components of general corporate objectives in terms of DIN EN ISO 14001 and will be achieved by structural⁴ and organizational⁵ measures. Additionally, specific environmental management procedures (UVA) were formulated but its creation and approval is solely the responsibility of the Directorate for environmental protection (e.g. qualification, procurement, etc.). The same applies to the environmental protection guidelines which include general and technical regulations on environmental protection and management, to be approved by the Board. All arrangements are documented in the centrally accessible Environmental Management Handbook.

II. Occupational safety guidelines

The field of occupational safety is a major issue for the TKSE AG and comprises the areas of occupational health and safety. TKSE formulated ten basic 'guidelines for occupational safety'⁶ which classify the safety and health of employees as a 'corporate objective' among product quality and economic success (first guideline). At the same time these guidelines form the basis of the "Guidelines on occupational safety". Together with the Statement of principles of the Executive Board they form a key document for the formulation of the group's safety goals and the ultimate premise of the 'zero accidents / no fires' approach.⁷ The master plan of occupational safety identifies all the principles, objectives, issues and necessary measures of safety and is designed for continuous improvement of occupational safety levels.

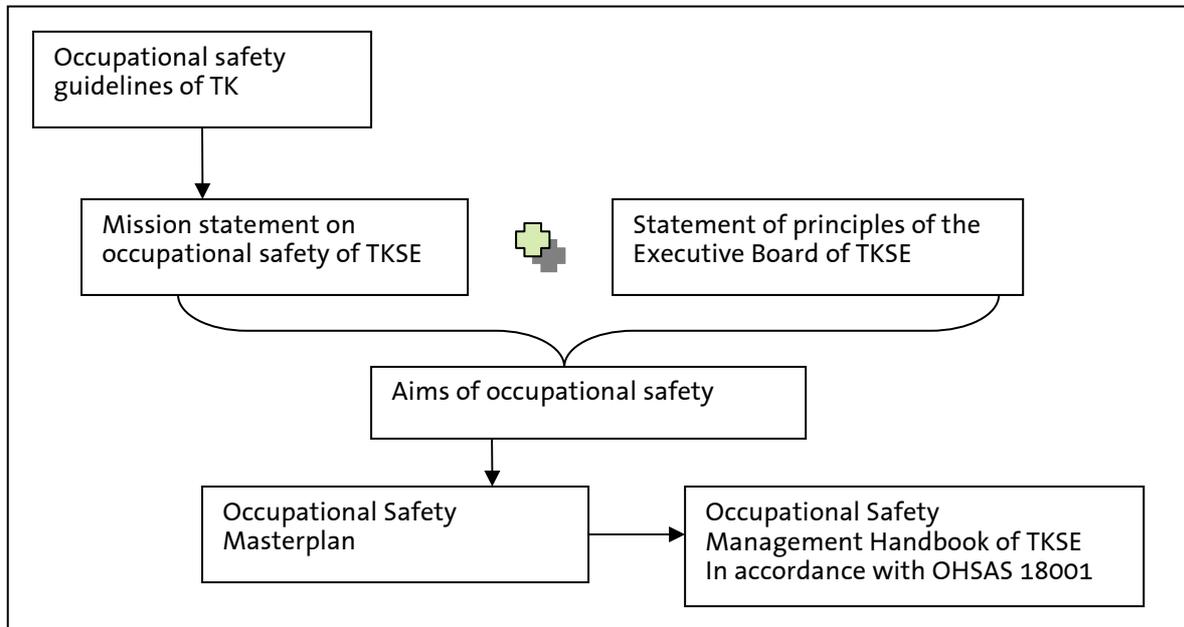
⁴ The measures are quantified and linked to time constraints. They are also set into planning and investment by arrangements. They should contribute to improving the environmental performance.

⁵ E.g. training and instructions in order to improve the EMH (s. EMH, section 1.2, p. 3).

⁶ Occupational Safety Management Handbook: Guidelines for Occupational Safety (section 2), p. 7, Status: April 2011).

⁷ Occupational Safety Management Handbook: Guidelines for Occupational Safety (section 2), p. 8.

Figure 2: Occupational safety guidelines of TKSE



(Presentation of WP2, Veit Echterhoff (TKSE), project meeting in Gliwice, July 2011)

Besides the legal regulations and provisions, internal company policies were added. Those are aligned to the organization of occupational safety, employee behavior and dealing with various products (e.g. basic rules for safe operation, handling of fire extinguishing system / breathing apparatus, fire-hazardous work). All principles and regulations are laid down in the ‘Occupational Safety Management Handbook of TKSE AG’ (OHSAS 18001). This central document is freely accessible and includes all basics, targets and measures of the occupational safety for a ‘target-based control and improvement’. This is intended to guarantee a systematic and proactive management and implementation of occupational safety.



4. Industry driven requirements

The structure of the following chapter is based on the interview guidelines developed for work package 2 within the GT-VET project to determine industry-driven job requirements. This was also the key interest for implementing the German GT-VET workshop with employees of the company's own TKSE AG Training Center in Duisburg on 15 June 2011.

1. Environmental Legislation and Company Implementation

Concerning environmental protection issues, a central contact point is located on parent company level. The parent company also maintains corresponding offices in Brussels. Additionally, there are links to associations (Eurofer, World Steel Ass) covering topics such as environmental and climate protection across sectors. On company level contacts to national authorities are considered important because these are implementing legislation and carry out company inspections. In addition, the company is constantly in contact with the plant operators to discuss environment-related decisions and to keep the Board constantly informed (including the case of larger investments). At organizational level important changes are displayed in the work instructions.

Important Legislation

For the Department of Environment and Climate Change as well as for the engineers, especially CO₂ is an important legislative issue which involves lobbying efforts and for which legislation is continually updated. Maybe this dynamics lead to a situation in which the engineers of the company inadequately prepared for their prospective management tasks by the universities. The TEHG Amendment (Greenhouse Gas Immission Trading Act) constitutes an important law through which an energy management system will be established. In this context the EEG (Renewable Energy Sources Act) is relevant. For the division of hazardous substances the program REACH and the Compliance Program (CLP) are important, especially for the hazardous material labeling and work safety.



Another important area, especially in education, is the issue of hazardous substances (storage, recycling and substitutes). Therefore, important laws have to be “translated” into practical instructions. The high pace of hazardous substances definition and re-definition also requires a permanent operational adaptation. In vocational education the ordinance of disposal rules (e.g. container and waste management, prevention of fires) as well as the handling of hazardous materials is important. Currently a comprehensive ‘white education’ without contact to hazardous substances is available only to a minor extent.

The company implementation - Obligations and guidelines of TKSE

The Environmental Management Handbook is the key instrument to communicate objectives and regulations of the company concerning environmental protection. It contains all requirements and principles decided upon by the management board, described in practical and applicable guidelines to make it understandable for the whole workforce. The higher the corporate level, the more theoretical is the reference to the Handbook.

The Occupational Safety Handbook contains the essential corporate guidelines and all the institutions, programs and processes which are involved in occupational safety. For further development of the handbook, a risk assessment of every workplace is supplied, including corresponding health and safety measures in a very complex procedure. Finally, the staff receives a set of behavioral related core rules and procedures only for its operating areas. In training sessions the employees are regularly instructed concerning these measures. This risk assessment and instruction is required by law; the design of the training is left to the company.

With regard to environmental standards the company moves simultaneously between exercising their duties (‘working rules off’) and individual initiative to be better than legally necessary. On the one hand, the company has to enforce the regulations; on the other hand internal processes have to be analyzed continuously to improve performance independently from legal requirements. A focus was set i.e. on the issue of resource efficiency through an in-depth analysis of the process flow. In this area



seminars have been offered to the workforce. On the operational level an internal or external benchmarking (among companies) is considered important (amount of energy consumption and steel production).

Although the legislature does not require accident-free operations TKSE has set the guideline 'zero accidents' and focuses 'behavioral occupational safety'. In this context the internal 'ADAM program' ("safety through attentive workers") was developed on the premise that 'everyone takes responsibility for everyone' in order to avoid misconduct. Without these extensive guidelines TKSE would not be competitive because this policy is an international 'State of the Art'.

Targets on environmental protection

Targets concerning environmental protection are collected annually from every division. Approximately 150 targets are set per year and are divided into five to six categories (e.g. energy saving). For the year 2009/2010 there were about 146 measures and about 88 (60%) were completed (result of the monitoring). In turn, individual goals (e.g. reduction of emissions), the corresponding action (installation of a water spray) and the required investment are derived from this point. The compliance rate of TKSE in general is 60% and only less than 5% are stopped completely (e.g. not conducive anymore; changing targets; target is identified as unreachable). The remaining measures will be transferred to subsequent years.

The companies define 'its contribution to environmental protection' on their own initiative and have no guidelines imposed from the management level. Only if a company formulates no targets the management will take measures. Then, the figures for environmental protection (operation phase; data from measuring devices, e.g. emissions) will be awarded. Although TKSE is 'at the top' of the competition in environmental protection, it is not the only company worldwide that takes into account environmental issues. It is exposed to a greater competitive pressure and relies more on the initiative of the departments to implement various internal company guidelines. In the context of occupational safety, 'reactive targets' like



accident rates are in the centre of attention. These are also relevant for bonus payments.

Trainees and work instructions

The info-point project has recently been implemented in order to provide the trainees with information on health and safety lines (mind map), a safety manual, and facts about environmental protection, documentation and information about accidents and responsibilities of various persons in the company. The info-point is a clearly visible element of the everyday workplace and therefore easily accessible. This is supposed to encourage everyday learning and interest of the trainees. The project was launched by the personnel department together with the trainees two years ago. According to the workshop participants, it reflects massive changes in the educational approach in the German dual training which started with the new design of the technical training occupations in 2003. The key phrase ‘holistic’ or ‘integrated’ training refers to the ‘business or process orientated provision of training content’.

Cooperation of departments

If a department has a concrete problem (e.g. hazardous substances) and is not able to find a solution on its own, the occupational health and safety department (OHS) will be contacted. Together with the working group the problem is discussed on the basis of operational instructions and procedures. The OHS contacts the responsible hazardous substance officer to further discuss solutions. This happens several times a year. On top of this there is regular communication between the officer and the hazardous substance department. There is also a working group composed of the hazardous substance division, the hazardous substance officer and the company medical officers. Since the beginning of 2011 the working group ‘safety at work’ is part of the education centre Duisburg. Once a month the security officers meet (approximately 15 participants, including the security officer of the trainees) and talk about current events in the education center such as accidents, hazardous substances or environmental issues and formulate action targets promptly. The working group follows the top OHS premise of ‘zero fires, zero accidents’ derived



from the corporate targets. In this context the focus is the learning experience of new trainees.

Conflicts between departments arise more at the level of legislation if European and German law is incompatible. Then the departments need different instructions to react to these requirements. Thus the legislation for the corporate level must 'be practical as possible' and provide alternate instructions for action. Otherwise this will lead to rule violations (e.g. replacement of banned substances). Meanwhile the motivation of employees to use prohibited substances has decreased significantly during the past years.

Increasing competence requirements in the field of environmental and climate protection

At TKSE the competences of the workforce in the fields of climate and environmental protection have increased. This is a common observation of all workshop participants. Management officers for climate and environmental protection have been installed as contact partners for the parent company at operational level. They are supposed to do daily inspections checking and discussing safety issues, and they are responsible for the training and internal audits of employees. The audit was introduced in the course of the "decentralized restructuring" (e.g. reducing the number to five auditors). The management representatives are regularly trained and subject to disciplinary action of the local management. But they complete the audits independently. This system has proven to be very efficient.

II. Skills, qualifications and occupations (Electrical and Mechanical Technicians)

Competences of trainees in the field of environmental and climate protection

The German legislature sets the basis for training occupations in the training plan. The issue of environmental protection is almost identical for all the technical occupations. The training plan provides a general overview of relevant environmental protection laws. But there are no specific environmental objectives or fields of action



(‘The trainee can do...’). The trainees only have general knowledge about the legislation which is just relevant in forms of regulations. The company relies on single projects in order to illustrate legislation in practice. For example, in this context many trainees get to know a lot about REACH (EU directive: **R**egistration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemicals) although it is only relevant for a few employees. However, a distinction must be made which training occupation is involved because a laboratory assistant will have to cope with REACH more often than an electrical or industrial mechanic.

At the beginning of the training several courses are conducted which require initial safety at work instructions. As part of the documentation and compliance with the General Plan, the trainees must confirm their participation by signature. The teaching of basic skills is achieved by a greater orientation on business processes and increased autonomy of trainees. It is less the legislation that is supposed to be the centre of attention but practical communication. Most accidents in the plants are the result of wrong behavior. There are regular meetings to analyze errors and to provide trainees behavior pattern (What is the trainee allowed to do and why?). The trainees of both occupations spend 18 months in the technology center to learn – besides others - skills in environmental protection, occupational safety and management and then progress through various departments in the company.

The workshop participants say that it is sometimes difficult to combine company demands with curricular demands of trainees and satisfy these at the same time. For example, while the trainee will have on-site visits in the company as one part of their occupational health and safety and environment related training; on the other hand, the compulsory content has to be paid enough attention because of its relevance for the intermediate and final examinations. Therefore TKSE has developed its own examination model in the sense of an integrated or holistic education approach. In the course of reorganization of training based on this approach a mere ‘test query’ does not exist anymore. The main goal of education is on the one hand to get the trainees into analyzing the working process (what is to do and what are the options?) and on the other hand to enable the trainee to make a proper assessment of his



actions (Did the trainee acted responsibly according to the guidelines of environmental protection?).

Further education to environmental issues

Altogether there are selected issues which are taught in the course of further training (e.g. German Water Act). In addition, the prevention officer for environmental protection is supposed to communicate developments regularly. For all managers, there is an annual “retraining”. If employees would like to be offered a concrete training topic (e.g. water pollutants), they contact the personnel department. One of the main instruments to keep the employees up to date is an occupational qualification plan assessing systematically what issues are relevant and which offers qualifications are needed at the various workplaces. These areas cover for example legal mandatory qualifications and requirements that arise in the context of commissions (e.g. formal certification for taking office, forklift operating license). Therefore regular votes are taking place in the enterprise (department manager / employee) in order to organize additional training. For further training the company claims measures by the professional association because they work over a wide range of topics. This framework measures are obligatory for the company.

Prospective issues for the training of skilled workers

Conservation of resources is an important issue as well as possible alternatives which are already part of in-house projects. Furthermore, the workshop participants think that issues like energy (wind and solar power) and nuclear phase-out will receive an even higher priority. In turn this has strengthened the work on occupational safety: not only technical skills are important, but the awareness of the possible impact of one’s own actions on the environment.

For skilled workers, operating instructions and operational procedures to cope with hazardous substances or equipment will be of special importance (energy resources, filters, etc.). In addition, the skilled workers have to have a high level of knowledge of product and process characteristics (e.g. replacing a pump: how long is the duration



of a pump? How energy efficient is the product and are there any alternatives?). In this context skilled workers are taught the use of new technologies and techniques to expand and deepen their knowledge. Moreover, machines are changing due to technical progress (e.g. access and safety precautions) demanding new 'creative solutions'. Working with 'conflict cases' and monitoring process will also be challenging for the workers. These aspects are also relevant for vocational training.

III. Core elements of a 'training module' for the steel industry

Review: the most important legislation and developments

In vocational training, the workshop participants consider the development of a deeper understanding of work processes, the awareness of possible impacts of one's own actions and an increased autonomy as central job requirements for trainees. Still, the question concerning concrete training targets remains. A controversial point during the workshop was the discussion about basic skills and elementary knowledge. Despite the fact that new content was constantly introduced into the training plan, there were only few reductions to compensate this. Time to reflect is considered important in order to be able to 'think and act independently'. And furthermore, there appear to be some skills which are required in the steel industry but which are not part of the training plan. So for the trainees, learning on site should be a central objective.

Desirable elements for the training module

The workshop members think that the module should include measurable goals to provide the trainees with options to evaluate their own actions and to become concretely aware of climate and environmental issues (e.g. resource conservation to understand input / output sizes; wasting energy). The cooperation with the German Federal Institute for Vocational Training (BiBB), already foreseen in GT-VET, is appreciated. The comparability and teaching of basic skills could also play an essential role (What is solar energy? What is wind?). The best possible advancement



of basic knowledge seems paramount because it could support the trainees, but also older workers, in increasing their capabilities to reflect upon environmental issues and therefore develop practical “green skills”.

Requirements and outlook

The framework curricula of the VET plan are not static and leave the company some considerable leeway for introducing learning opportunities which also reflect the company’s requirements. However, one central result of the workshop is that there is no way yet to include environmental issues in the VET curricula by means of practical projects. As long as this does not exist, “companies have to act on their own”, as the participants say. Altogether, the issues of energy conservation and scarcity of resources will become more central, as well as the issue of CO₂. The use of new technologies will also become more important to keep up with automation and efficiency opportunities, from blast furnace to hydrogen technology. All in all, specific industry-based case studies are considered necessary to complement existing curricula and provide application-oriented knowledge and awareness in everyday work. These case studies are considered to carry educational values which are not covered by the daily business of education. So the cooperation of the vocational schools and companies should be deepened.



5. Summary

As with all major European steel companies TKSE has a central contact point for environmental issues at the strategic level. Besides networking, e.g. with associations, company related European correspondents in Brussels are significant. European legal changes are ‘translated’ by committees and internally transmitted to the companies. These application-oriented instructions are available in the form of central manuals (Occupational Safety Management Handbook, Environmental Management Handbook) and provide practical instructions for the operational level. The corporate guidelines are clearly formulated (‘no accidents, no fires’) and applied deliberately above the legal norm in order to ensure continuous improvement. There are different target figures collected at the level of the company, departments and plants. Overall, TKSE concludes 60% of its annual 150 environmental protection goals. The responsibilities of the departments of environmental and occupational health and safety are clearly defined. Moreover the institutionalization of hybrid working groups (e.g. safety at work) should contribute to a ‘culture of joint problem solving’ and define implementation pathways, e.g. to ensure compliance with new regulations and training requirements. The ADAM program (“safety through attentive workers”) is also intended to promote the initiative of employees and enhance internal communication. The decentralized structure has been strengthened by the establishment of environmental managers at plant level.

The training at TKSE is based on the German training plan. It pursues an integrative approach to learning which focuses an autonomous problem solving by the trainees. Basic knowledge of environmental and climate protection are mandatory in vocational training. As environmental, climate and safety regulations has affected the daily work enormously, they have been increasingly integrated into education and practical operational instructions manuals. Nevertheless it requires regular updating and reflection on the meaning of educational concepts. The treatment of ‘green projects’ to increase environmental performance in the company is a good example.



Overall four key requirements, mentioned in the workshop, can be highlighted for the design of the planned training module of GT VET. First, a successful implementation needs a profound working and team structure within the company and effective communication. Second an awareness of environment-related structures should be provided to the trainees (e.g. placement of measurable objectives). This requires appropriate pedagogical approaches. Therefore project-oriented and action-focused models are already practiced and preferred. Finally clear learning objectives and prospective topics (e.g. conservation of energy/resources, CO₂) can be formulated and adapted to business requirements. These approaches lead to other key questions to be answered in the course of further development of the module. On the one hand it has to be determined how much knowledge can be assumed by the trainees and on the other hand what can be contributed by vocational colleges in this context. The role of the skilled worker must also be redefined. Is he 'only' a maintenance force or a knowledge manager? A possible solution could be the preparation of sector-specific **case studies** on environmental issues that represent the core of the module. This would enable companies to respond flexible to prospective changes in industry needs. At the same time a continuous adaptation of the module could be provided.