

Tempus158989-Tempus-1-2009-1-BE-Tempus-JPHES
Creation of university-enterprise cooperation networks for education on
sustainable technologies

Annual Quality Evaluation Report of External Expert

1st year

Adam Pawelczyk



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1. Introduction

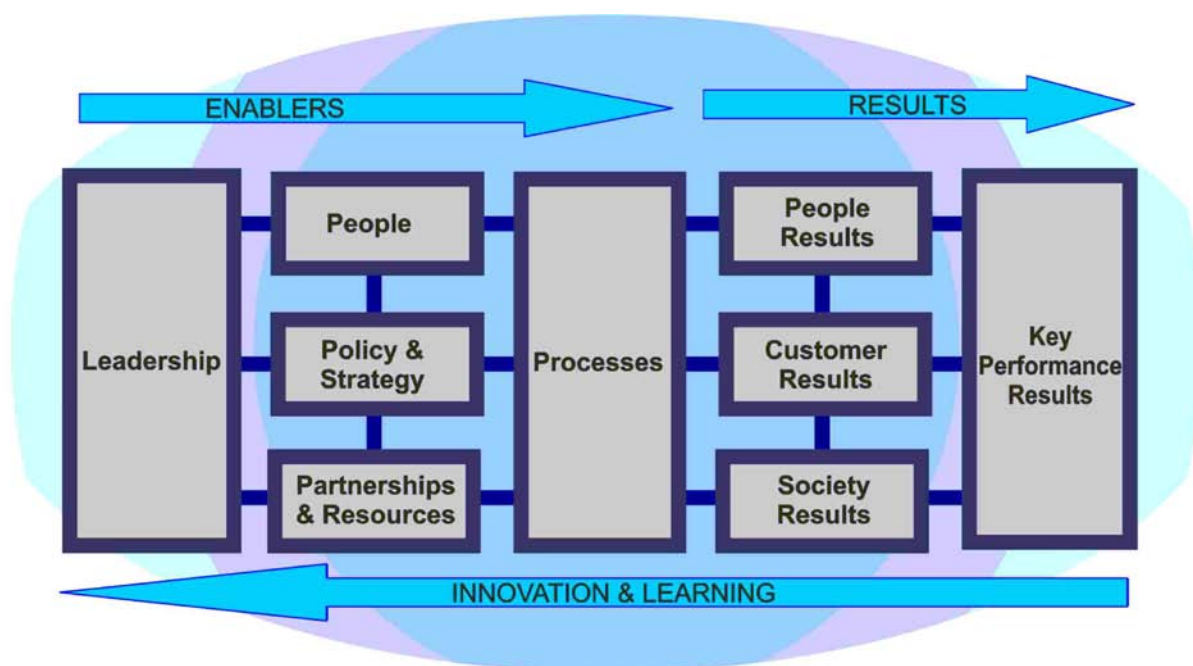
This report prepared within the framework of the tempus project JPHS–159989-1-2009-1-BE presents findings of the external quality expert related to the realization of the first project year and accomplishments achieved by the project consortium. To arrive to his conclusions the expert used different information sources – from talks and direct discussions to electronic version and hard copies of documents. In particular expert's visits to the following events and the following documents were helpful in preparation of the present report:

- starting meeting, Gent 17 - 20 March 2010
- workshop, Novi Sad 20 - 21 April 2010
- report from the workshop Republic of Serbia, April 2010
- report from the retraining in Belgium, September 2010
- report from the retraining in Germany, October 2010
- report from the retraining in Austria November 2010
- review of staff knowledge
- agendas and minutes from the events planned in the frame of the project.
- other documents, presentations and materials developed by the consortium

According to the assumptions of the project specified in the Application Form the report should evaluate the annual project progress as a whole and involvement of particular partners in the process as well. The present document constitutes a kind of comparison of the achieved goals with what was assumed in the Application Form.

EFQM model promoted by the European Foundation for Quality Management has been adapted to perform the evaluation and to reach conclusions. There are 9 criteria in the EFQM model. Five of these are 'Enablers' and four are 'Results'. The 'Enabler' criteria cover what an organization, that is the project consortium, does. The 'Results' criteria cover what an organization achieves. 'Results' are caused by 'Enablers' and feedback from 'Results' help to improve 'Enablers'.

- Leadership
- Policy and strategy
- People
- Partnerships and resources
- Processes
- Customer results (Customer satisfaction)
- People results (People satisfaction)
- Society results (Society satisfaction)
- Key performance results



It has to be stressed that in case of the project concerned, it was not possible at the present stage to derive full benefits from the use of EFQM model. EFQM presented in figure below does not compose the complete, closed loop, because of lack of feedback from results. In normal situation the feedback from the results are used to learn from and to improve activities of the enablers. The full benefit from the EFQM model will be derived when the developed curricula are implemented and realized. Then the people trained could deliver a feedback on usefulness of the trainings, course books and utility of the training offer.

2. Existing environment

The high education sector in The Republic of Serbia, Bosnia and Herzegovina and Macedonia is well developed, nevertheless in some areas it needs substantial reforms. The universities vary greatly in size, subject provision, history and statement of purpose. They have autonomy to determine their institutional mission, and their specific aims and objectives at subject level. The situation of the educational system in these countries, particularly in Bosnia and Herzegovina is still very complex as it emerged in the post-war period on the basis of the system inherited partially from the former Socialist Federative Republic of Yugoslavia.

After a very difficult time period the system started to recover and many restructuring projects in cooperation with international institutions have been successfully accomplished. On the other hand, due to the economy regress, loosening of the university-industry links can be observed, which needs to be restored by the common actions undertaken by both universities and industry. The current project's goal is restoration of the old and establishing new cooperation between universities and industry aiming at development of curricula targeting the industry representatives, with regard to environmental issues and sustainability. The task should take into account the present trend in the EU to approach a zero emission society. The zero emission concept is based on improving technologies and processes to a maximum level of resource productivity and virtually no waste.

3. Quality assessment according to the EFQM Model of Excellence

3.1. Criterion Leadership

The leadership of the project composes a university team controlling all activities of the consortium. It consists of coordinator as well as representatives of co-beneficiaries. The leaders have

great experience in the people's and international project's management as they already participated and successfully coordinated number of European projects in EU and on the area of West Balkan countries.

The leadership representing the co-beneficiaries has great expertise in the environmental issues, didactics, human resources management and university-industry cooperation as he with his co-workers have been working for many years as deans and vice-deans of Faculty of Technology, University of Novi Sad, SR. I would classify the leadership team to an affiliative leadership style of operation who likes to create harmony and build relationships in the workplace.

The leadership likes to communicate with others and shape the future actions accordingly to the work plans established in the application Form, and flexible at the same time, enabling the consortium to react in a timely manner to ensure fulfilling all the tasks allocated. Professional involvement of the leadership guarantees smooth project realization under the condition of the proper engagement of rest of the consortium.

3.2. Policy & Strategy

The project consortium implements its mission and vision by developing a clear stakeholder focused strategy. All plans, objectives and processes are developed and deployed to deliver them a valuable final products in form of new curricula, course books and university-industry relations respecting trends and regulations adapted from the EU area.

The main strategy assumptions implemented by the leadership and all participants are:

- clear mission and vision understood by the university and industry societies
- instant information flow
- clear criteria of selecting people for participation in the project, workshops, retraining sessions and lectures
- efficient financial management
- coherent system of collecting data
- inter-university team work
- relevant curricula contents attracting industry partners
- well organized website
- well organized dissemination activities

The strategy implemented by the consortium accomplishes what was assumed in the application form by organizing all planned events, activities, mobilities, workshops and trainings. The accepted strategy gives the participants room for flexibility in their activities which facilitates completing the project milestone tasks before deadlines.

3.3. People

After my visits and monitoring the activities and performances presented by the project participants it is beyond doubt that the consortium is able to complete all the project establishments and tasks successfully. All the consortium members are strongly motivated and have clear vision of the project goals. Moreover, they have an extensive expertise in teaching, managing of European projects and cooperation with the industry. I realized that they perfectly know what changes and restructuring measures should be taken in their countries to approach European model of university-industry relations with respect to the environmental issues.

The people involved in the project compose a team realizing the plans that allows the mutually beneficial achievement of organizational and personal goals. They developed the capabilities of implementation and promote necessity for law, behaviors and customs changes according to trends that are also supported in the EU area, that is zero emission approach. The people are strongly motivated, and have commitment for using their skills and knowledge for the benefit of the consortium.

3.4. Partnerships & Resources

The project, leadership along with the consortium, planned out activities with many of external partnerships, suppliers and internal resources in order to support strategy and policies and the effective operation of processes within the project. The invited external partners represent the industry ready to undertake actions and measures focused on the environmental issues. This readiness for restructuring among the industry partners has not been measured using appropriate tools but I have

an impression, after talks and discussion that they had awaited an opportunity for the changes offered by the project. The cooperating people are experienced in implementation of new procedures, technologies and solutions aiming at waste minimization and sustainability. One can notice that the industry shows great interest in cooperation with the project consortium in implementation of the tailor-made courses taking into account European environmental regulations and zero emission concept.

The internal resources – the consortium members, auxiliary staff and facilities being to the project disposal enable to fulfill the project goals as planned in the application and they can benefit from the feedback of all project stakeholders.

3.5. Processes, Products & Services

Processes, products & services designed in the frame of the project are clearly defined which enabled to manage easily the tasks allocated to all consortium members. The processes are being steadily controlled and improved to generate increasing value for customers and stakeholders. All planned activities had been realized according to the schedule established and agreed by the consortium at the beginning of the first project year.

From among the processes, products and services the following had been planned for the first project year:

- workshops
- reviews of the staff knowledge
- retraining sessions
- coordination meetings
- preparation of the curricula
- dissemination activities
- equipment purchase
- expert visits
- finance management
- quality control

The processes are monitored by the leadership taking into consideration the assumption and schedule agreed during meetings and under permanent supervision of the outcomes defined in the application form. Below processes, products and services are presented, which took place during the first year of project run.

Starting meeting in Gent, 17 - 20 March 2010.

During the starting meeting all partners had been presented, tasks discussed and all nearest future activities set. The participants discussed aim of the Project, outputs and outcomes, review and analysis the existing knowledge of the staff from industry on sustainable industry issue, organization of retrainings of the staff from WB partner universities in BE, GE and AT, new curricula for the staff from the industry of RS, BA and MK on sustainable industry's strategic plan for education on sustainable industry in cooperation with Chambers of commerce, quality control and monitoring. Furthermore project of the web site was discussed and activities of the 1st year and the next coordination meeting in Novi Sad planned.

Workshop in Novi Sad 20 – 21 April, 2010.

The workshop was devoted to the review and analysis of the existing knowledge of the staff from industry on sustainable industry. It was planned to accomplish the evaluation by tests and via communication with the staff from industry, with their management and on the basis of the available data. The test and its contents was presented by Zoltan Zavargo – the dean of the Faculty of Technology, University of Novi Sad. It comprised 3 parts:

1. The level of management in the company concerning sustainable technologies
 - Basic data of the company
 - HSEQ system (structure)
 - HSE system (structure)
 - Organisational structure of the company concerning environmental protection

- HSEQ, HSE and other documents in the field of environmental protection
 - Training courses in the field of environmental protection
 - Company strategy of education concerning environmental protection
 - Courses and certificates
 - Structure of the employees concerning environmental protection
 - ISO 14001
 - ISO 9001
 - OHSAS 18001
 - HACCP
 - Others
2. The existing level of staff knowledge concerning sustainability
 - List of questions for employees
 3. The level of existing technology in the company concerning sustainability
 - Technology scheme of the company
 - Total balance (raw materials, energy, water, others)
 - Outputs (products, wastes)
 - Processes
 - Capacity
 - Material balance (raw materials, package, products)
 - Energy
 - Water
 - Simplified technology scheme and process features
 - block diagrams of unit operations
 - Washing and maintenance
 - Tanks (reservoirs)
 - Energy units
 - Wastes
 - Monitoring
 - Accidents and risks

Prof. Sokolović presented very interesting results of the review and analysis of the existing knowledge of the staff from industry

During the workshop purchasing of the literature and equipment were discussed> There was decided that the literature must cover:

- literature common for all courses
- specific literature according to the topics of the courses

Short visit of EU experts to West Balkan partner universities, Bosnia and Herzegovina, 31st May – 05th June 2010

The following institutions were visited and activities carried out:

- University of East Sarajevo, Faculty of Technology, Zvornik
- alumina factory GLINICA

The goal of the visit was review and analysis the existing knowledge of the staff from industry on sustainable industry issue. The visits were attended by the Marc Van Acker, EU expert from the Katholieke Hogeschool Sint-Lieven, Gent Belgium, Kathrin Mueller-Hansen, EU expert from the Institute for Applied Material Flow Management (IfaS), Environmental Campus Birkenfeld, Germany and the partners from universities in Bosnia and Herzegovina.

The result of factories visits was review and analysis the existing knowledge of the staff from industry on sustainable industry issue: rating the level of knowledge in the field of sustainable and zero waste technologies.

- Chamber of Commerce and Industry Bijeljina Region

The purpose of the visit was review and analysis the existing knowledge of the staff from industry on sustainable industry issue. The meeting was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert

- University of East Sarajevo, Faculty of Technology, Zvornik

Workshop entitled „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. The Meeting was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from Bosnia and Herzegovina.

- University of East Sarajevo, Faculty of Technology, Zvornik

Dissemination conference entitled „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. The conference was attended by:

Representatives of EU universities' partners
Representatives of Chamber of Commerce Bijeljina
Representatives of the chemical, food industry and energetic sector,
Representatives in the field of development and ecology of the Municipality of Zvornik and Republic of Srpska,
Representatives of University of East Sarajevo
Professors and assistants of Faculty of Technology
Teachers of other faculties and universities
Senior students of Technology University
Representatives of newspapers, radio and TV stations

- University of Tuzla, Faculty of Technology
- Chamber of Commerce

Meetings devoted to the review and analysis of the existing knowledge of the staff from industry on sustainable industry issue. The meeting was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from Bosnia and Herzegovina.

- Solana Factory Tuzla
- Zada Pharmaceutical Factory, Lukavac
- Cement Factory Lukavac
- Fabrika Sode Lukavac

The visits were attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from Bosnia and Herzegovina and partners from universities and industry from Bosnia and Herzegovina. Goal: review and analysis of the existing knowledge of the staff from industry on sustainable industry issue: rating level of knowledge in the field of sustainable and zero waste technologies.

- Tuzla, Faculty of Technology

Workshop and dissemination conference entitled screening and analyzing knowledge transfer from university to industry and formulation of the course scheme. The meeting was attended by:

Representatives of the chemical, food and pharmaceutical industry
Representatives of the Municipality of Tuzla and the Tuzla Canton s responsible for development and ecology
Senior students of Faculty of Technology Tuzla
Professors and assistants of the Faculty of Technology Tuzla
Professors of other faculties and universities.

Short visit of EU experts to WB partner universities in the Former Yugoslav Republic of Macedonia, 21st – 25th June 2010.

- Visit to Factory BOMEX

The topic and goal of the visit was to review and analyze the existing knowledge of the staff from industry on sustainable industry issue. The visits were attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM

- University of Ss Cyril and Methodius, Faculty of Technology and Metallurgy, Skopje

Workshop entitled „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. The visits were attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM who presented their findings on the current environmental issues related to implementation of EU standards in the Former Yugoslav Republic of Macedonia

- Faculty of Technology and Metallurgy, Skopje.

Conference of dissemination „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. Press and TV stations (Alfa; K-15 and Nasa TV) were present at the event.

- Chamber of Commerce of Macedonia

Discussion and workshop on review and analysis the existing knowledge of the staff from industry on sustainable industry issue. The event was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM

Results of the meeting:

1. Review and analyze the existing knowledge of the staff from industry on sustainable industry issue
2. Discussion on the further activities on the project
3. Discussion for the possibilities for future projects.

- University Goce Delcev Faculty of Technology, Stip

Workshop „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. The meeting was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM.

- University Goce Delcev Faculty of Technology, Stip

Conference of dissemination „*Screening and analyzing knowledge transfer from university to industry and formulation of the course scheme*”. The meeting was attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM.

- EUROKOMPOZIT Factory, Prilep

The topic and goal of the visit was to review and analyze the existing knowledge of the staff from industry on sustainable industry issue and estimating the level of their knowledge in the field of sustainable and zero waste technologies.

The visits were attended by Marc Van Acker, the EU expert, Kathrin Mueller-Hansen the EU expert and partners from universities and industry from FYROM

Short visit of EU experts to West Balkan partner universities, visit to Serbia, 04th - 08th July 2010.

- Regional Chamber of Commerce and Industry, Leskovac

The Meeting was attended by Wilhelm Hoeflinger, Vienna university of Technology, Faculty of Technical Chemistry, Philipp Rosenthal - Trier University of Applied Sciences, Institute for Applied Material Flow Management (IfaS), Birkenfeld, Germany and representatives of universities and industry from Serbia.

AGENDA of the meeting:

1. Press conference
2. The words of welcome, Jovan Stepanović, Vesna Djordjević
3. Presentation of the Faculty of Technical Chemistry, Wilhelm Hoeflinger
4. Presentation of the Institute of Applied Material Flow Management, Philipp Rosenthal
5. Presentation of the Project, Creation of university-enterprise cooperation networks for education on sustainable technologies, Milorad Cakić
6. Lifelong learning in the field of sustainable technologies, Goran Nikolić
7. Integrated Management Systems in the Pharmaceutical Company Zdravlje-Activas, Valentina Marinković
8. Situational analysis and the need for education in sustainable technologies in Region of South Serbia, Vesna Djordjević
9. Results of realized questionnaire, Milorad Cakić
10. Discussion
11. Conclusions and defining the course scheme

- Health and Safety Institute, Novi Sad

The Meeting was attended by Katrien Moens, coordinator of environmental management unit VOKA-Chamber of Commerce East-Flanders, Dendermonde, Belgium and representatives of the university and industry from Serbia.

AGENDA

1. Presentation The Health and Safety Institute
Željko Tomić
2. Activities of The Chamber of Commerce East-Flanders
Katrien Moens
3. Discussion
4. Visiting tour of Institution

- Alltech-Fermin, Senta

Meeting in Senta. The meeting was attended by Katrien Moens, coordinator of environmental management unit VOKA-Chamber of Commerce East-Flanders, Dendermonde, Belgium, Wilhelm Hoeflinger, Vienna university of Technology, Faculty of Technical Chemistry, Philipp Rosenthal - Trier University of Applied Sciences, Institute for Applied Material Flow Management (IfaS), Birkenfeld, Germany and representatives of universities and industry from Serbia.

AGENDA

1. The words of welcome, Tibor Ujvari
2. Presentation the Factory, Tibor Ujvari
3. Activities of Factory on environmental protection and sustainable technologies, Vladimir Erdelji
4. Waste water treatment in Alltech-Fermin, Aleksandar Novaković
5. Zero emission, Philipp Rosenthal
6. Discussion
7. Proposals of topics for the courses

The Alltech-Fermin company was very interested to have courses on proposed issues. Especially, The Company was interested in energy reduction and environmental protection issues.

- Sugar factory, Senta

Meeting in Senta. The meeting was attended by Katrien Moens, coordinator of environmental management unit VOKA-Chamber of Commerce East-Flanders, Dendermonde, Belgium, Wilhelm Hoeflinger, Vienna university of Technology, Faculty of Technical Chemistry, Philipp Rosenthal - Trier University of Applied Sciences, Institute for Applied Material Flow Management (IfaS), Birkenfeld, Germany and representatives of universities and industry from Serbia.

AGENDA

1. The words of welcome, Ljubiša Radenković

2. Presentation the Factory, Activities on environmental protection and sustainable technologies
Vanda Došen
 3. Zero emission, Philipp Rosenthal
 4. Discussion
 5. Proposals of topics for the courses, the topics of the main interest for the Sugar factory were:
energy savings and environmental protection.
- Chamber of Economy of Vojvodina, Novi Sad

The Meeting was attended by Geert De Lepeleer, International Relations Officer, Katholieke Hogeschool Sint-Lieven, Gent, Belgium, Katrien Moens, coordinator of environmental management unit VOKA-Chamber of Commerce East-Flanders, Dendermonde, Belgium, Wilhelm Hoeflinger, Vienna university of Technology, Faculty of Technical Chemistry, Philipp Rosenthal - Trier University of Applied Sciences, Institute for Applied Material Flow Management (IfaS), Birkenfeld, Germany and representatives of universities and industry from Serbia.

AGENDA

1. The words of welcome, Jovan Vujičić
 2. Presentation of the Project, Creation of university-enterprise cooperation networks for education on sustainable technologies, Zoltan Zavargo
 3. Zero emission, Philipp Rosenthal
 4. Clean air, Air pollution Control Techniques for, Dust- and Aerosol emissions, Wilhelm Hoeflinger
 5. NIS a.d. and the main environmental issues, Dedovec Stanislav
 6. Activities of Chamber of commerce East-Flanders related to energy/environment Learning networks and seminars, Katrien Moens
 7. Lifelong Learning in Serbia, Pere Tumbas
 8. Review and analyze the existing knowledge of the staff from industry on sustainable industry issue, Slobodan Sokolović
 9. Presentation the first Course scheme, Zoltan Zavargo
- Department for HSE, Novi Sad

The Meeting was attended by The Meeting was attended by Katrien Moens, coordinator of environmental management unit VOKA-Chamber of Commerce East-Flanders, Dendermonde, Belgium and representatives of universities and industry from Serbia.

AGENDA

1. Presentation The NIS and HSE unit, Dedovec Stanislav
2. Activities of The Chamber of Commerce East-Flanders, Katrien Moens
3. Discussion

Retraining and updating of PC universities staff in BE, 12th – 18th September 2010.

During the retraining and updating a very extensive and diverse offer was presented to the participants from the Western Balkan countries covering topics of zero waste concept, environmental law regulations, sustainable energy, waste processing and management etc. The participants visited the university, companies, chamber of commerce, educational institutions etc (Volvo Cars Gent, Breydel, Antonio Vleeswaren BVBA, IVAGO, Waste Water Treatment, AQUAFIN, VOKA). A very extensive report from those visits and trainings are available on the project website.

Retraining and updating of PC universities staff in GE, 10th – 16th October 2010.

- Zero-Emission Campus Birkenfeld (ECB), Institute for Applied Material flow Management (IfaS)

The Meeting was attended by Kathrin Mueller-Hansen, Michael Knaus, Katharina Schlegel and 24 participants from Western Balkan PC. During the meeting the zero emission campus Birkenfeld, was

visited, material flow management (MFM), circular economy and sustainable development as well as several case studies selected from IfaS projects presented. Ecological campus Birkenfeld was presented as a concept of: zero-emission heat and energy, active and passive utilization of solar energy, energy efficient building concept. A new approach of zero-emission water concept was introduced. The projects in the frame of the IFaS were mainly oriented to the MFM and it was presented as a tool for green business development.

- Institute for Applied Material flow Management, OIE AG

Visit in Idar-Oberstein and its field offices in the region, where OIE AG maintains an extensive network of service facilities. The visitors get acquainted with the biomass heat and power plant (Biomass CHP) located in Neubrücke, where a concept based on the regenerative use of wood fuels and biogas in cogeneration plant (wood chips: 29 MW thermal and 8.3 MW electric energy; biogas from anaerobic digestion: 430 kW thermal and 2 X 310 kW electric) has been implemented.

- Zero-Emission Campus Birkenfeld (ECB), Institute for Applied Material flow Management (IfaS)

The Meeting was attended by Michael Knaus, atrin Mueller-Hansen, Katharina Schlegel, and 24 participants from WB PC During the meeting Michael Knaus presented the Global Experiences from a leading German Non-Profit Research Institute. The zero emission approach was explained and its development through the end-of-pipe as well as the cleaner production.

- Juwi Zero-Emission Company

During the visit to “JUWI” company, the visitors from WB countries were presented with the concept of zero-emission technology. The company’s business strategy is based mainly on the utilization of solar and wind power energy. They visited the areas where the company installed solar panels and windmills to generate electricity. In Germany, among others, this company has installed over 400 wind turbines that produce over 600 MW of energy. They use solar energy with 1,400 PV installations, and installed capacity more than 600 megawatts. This means, that annual CO₂ savings is approximately 325,000 tons.

Institute for Applied Material flow Management

Katrin Mullee-Hansen, Thorsten Klaes, Angel Avradiand 24 participants from WB PC Financing of R&D projects in the Clean Technologies Sector by Thorsten Klaus. In *the lecture* the business services, success and future plans were presented. This company was founded in 2000 with the number of 12 employees. This company is a service-oriented with high core competence in the fields of planning, development, construction and support for agricultural and industrial biogas plants which are deployed within a wider concept. With experience in 100 projects in Europe, Canada and China, they offer a global and energetic business view of region all over the world. Today they extend their competences in the area of solid biomasses.

- Carbon Footprinting

Angel Avadi, Thomas Keller. In the lecture presenting the Carbon Footprint the participants from WB got knowledge about the most powerful software tool for modeling, calculating and analyzing carbon footprint of products and companies. Experience with enterprise-university cooperation.

- Areal

Areal is a corporation for sustainable water management. Dr. Bruch presented the company. Clear, clean water stands for nature and health, while fertile earth is the foundation for growth and life. Areal considers the preservation of these precious goods, not only as a question of the consequent utilization of modern technical means, but also one of ecological imagination and long experience.

- Energy Landscape Morbach, Site – visit

The Visit were attended by, Katrin Mullee-Hansen, Michael Grehl and 24 participants from WB PC

Energy landscape Morbach is an example of shaping a future. Biomass, wind power and photovoltaic are here for business, research and citizens. The energy landscape Morbach is a unique concept for the intelligent use of local resources to save costs and resources in the region Morbach.

On the grounds of the former U.S. ammunition depot Rappaerath/Morbach the park for producing renewable energy was built. The produced electricity is fed into a grid; the produced heat is used to supply heat demands. Biogas and wood pellets are produced. The electricity is produced from wind power and photovoltaic.

- ZAK, Company visit

Waste treatment, Sorting and treatment station for all kinds of waste

On October 15, 2010, the TEMPUS participants visited the Waste Management Centre ZAK, Kaiserslautern – Mehlingen, a joint venture of the city and county (Landkreis) of Kaiserslautern. ZAK occupies 88 ha and has 77 employees. Its total asset in 2008 was about 93 million euros. All kinds of waste from the neighbor area (about 250.000 habitants) are sorted, recovered and treated. The waste is subjected to 200 bar pressure to remove any liquids and to compress the remaining solid trash into compact, highly combustible blocks with caloric output. ZAK uses about half of the trash to produce electricity via an incineration process, while the remaining half sends to another heating & power plant for processing.

- Institute for Applied Material flow Management

Peter Heck, Katrin Mülle-Hansen, Clo-Anne Gabriel and 24 participants from WB PC. Summary of the visit in GE, discussion of course schedules, individual talks

Retraining and updating of PC universities staff in AT, 14th – 20th November 2010.

- University of Technology, Institute of Chemical Engineering

The Meeting was attended by Wilhelm Höflinger, Gerd Mauschitz and 14 participants from WB PC. Lecture was presented on Environmental Protection, Dust separation from air and gases by Wilhelm Höflinger. The presentation was focused on the definitions and European regulations. The differences of dust (100µm) and aerosol (10µm) as well as the definition of aerodynamic diameter were defined. EU- Council Directive 1999/30 EC, PM10 and EU - Council Directive 2008/50EC, PM2.5 were briefly explained as environment regulations for emission. Also, dust regulation for working place EN 481, ISO 778 was summarized. Imission and emission sampling was described in the frame of dust sampling and measuring methods. Second lecture by Gerd Mauschitz was on Separation of gaseous pollutants from air and gases. The presentation was focused on dust separators. The attention was paid on the explanation of different kinds of dust separators like: settling chamber, cyclone, bag house filter, wet scrubber and electrostatic precipitator.

As a part of retraining seminar in Vienna Mr. Tobias Proll from Vienna University of technology presented his lecture "Chemical looping combustion for CO2 ready steam generation". First of all Mr. Tobias Proll introduced us with organization scheme of Vienna university of technology and its department for Future energy technology. This department is divided in three parts; zero emission technologies, biomass gasification and gas cleaning and second generation biofuels. In each group they approximately have ten people. One of their basic research activities now is chemical looping combustion (CLC). Carbon capture and storage was recognized as a one of main field of research where EU prepared a lot of funds for projects and research activities.

The next presentation was also given by Tobias Pröll on Advanced energy conversion, Biomass gasification and Chemical Looping Short Power point introduction and Lab-tour at the Institute of Chemical Engineering

- Waste water treatment plant EBS Vienna, Company visit

Visit to the Entsorgungsbetriebe Simmering GmbH (EbS company) in Vienna was realized on Tuesday 16/Nov/2010, from 14 to 18 hours, according to program. The presentation was made by the company's general manager, Mr Gerd Mauschitz.

Entsorgungsbetriebe Simmering GmbH (EbS) was founded in 1976. The city of Vienna is the sole proprietor of EbS, the *Simmering Waste Disposal Facilities*. Vienna's main wastewater treatment

plant and the city's animal disposal plant have formed part of EbS since 2000. Since then the company has also invested in several water technology companies. Top-quality standards and continuously enhanced services have made EbS an environmental competence centre as well as one of the main pillars in the provision of public services. About 160 employees take care of the smooth operation of the EbS facilities and therefore contribute to the top quality of life in Vienna.

- Incineration Plant MVA Pfaffenau in Vienna, Company visit

A multimedia informative presentation was presented to the Tempus participants. In the presentation the participants were informed about how waste collection is carried out in Vienna, the processes involved in efficient partial separation, recycling and incineration of waste, and, in particular, the high-tech Pfaffenau waste incineration / combined heat and power electricity generating and district heating plant. Afterwards, the visitors were given a guided tour through the Pfaffenau plant - one of the most modern in Europe.

- Sugar factory Tulln, Company visit

Sugar factory in Tulln, in Austria, belongs to food company AGRANA; which has three sectors, and Sugar factory Tulln, with other Sugar factory in Leopoldsdorf, is part of company sector for sugar production (AGRANA Zucker GmbH). Sugar factory Tulln (in further text: Factory) is a large plant, in last campaign it processed about 1.5 million tons of sugar beet, and produced about 400 000 tons of sugar. Factory is founded in the year 1937; and the major improvement was installing a plant for obtaining sugar and betaine from molasses, which is in operation since 2002. About half of sugar beet, 47% is received directly from farmers (from distances shorter than 40 km), and another half, 53% from longer distances, is transported to the Factory by railroad. For continuity in production process, in a Factory there is the daily stock with capacity of 10 000 tons sugar beet.

- Visit of the Bioethanol plant in Tulln

The Sugar factory Tulln (Zuckerforschung Tulln Ges.m.b.H.) is also active in the preparation, processing and application of agricultural products, not only in the foodstuffs area, but also in the area of renewable fuels.

The bioethanol plant annually processes up to 620,000 tons of cereals to produce up to 240,000m³ or 190,000 tons of bioethanol as well as up to 190,000 tons of the high-quality, GMO-free, protein-rich animal feed Actiprot.

- Scheuch Company Austria

Fugitive dust emissions, (by Jorg Faschingleitner) gave a clear presentation on danger of long-term exposure to fugitive dust, dust definitions and kinds, EU guidelines as well as methods of dust minimization.

- Lab - tour at the Institute

During lab-tour the participants had possibility to see laboratory filter test equipment with the following main components:

Aerosol generator;
Ageing nozzle;
Filter holder and CYCLE-FID measurement device.

This lab apparatus give possibility to measure: pressure drop, drainage flow, oil concentration, raw gas and clean gas concentration, stored emulsion and oil inside the filter as well as separation efficiency. It was presented that balancing of liquid mass flows of a filter medium allows the calculation of the total holdup, water holdup and oil holdup by Mr. Laminger.

Financial management

This process does not arise any concern of the external expert as the finance are under control of a very experienced partner from KaHo Sint Lieven, Gent BE who already participated and coordinated dozens of European projects. All inquiries related to eligibility of financial activities are

cleared immediately so there were no purchases or expenses that could be doubtful in respect of the European regulations.

Purchasing equipment

According to the application and grant agreement all participants purchased equipment necessary for realization of the project goals. The equipment included literature, computer servers, computers, video beams, laptops, laboratory equipment, literature, software etc. The equipment has been installed in didactic rooms and laboratories of the beneficiary organizations.

Taking into account the number of mobilities, trainings, meetings and conferences in which the WB partners participated, it is obvious that the whole consortium was extraordinarily active in performing the allocated tasks. The reports from these events testify the coincidence of the topics studied with the project subject-matter and purposes. The knowledge and experience gathered was exploited extensively during individual and team work on the course materials, lectures and during meetings the WB partners organized at their home institutions.

3.6 Customer Results

According to EFQM, the customer is the final arbiter of product and service quality. The customer satisfaction is the chief aim of the project consortium. The customers are both universities and the industry as they can benefit the most from the project results. On the present stage of the project the evaluation of the customer results cannot be fully conducted because the final products that are offered by the project are not ready yet. Nevertheless, some attempt of the customer result assessment can be made taking into account progress achieved by the consortium and close cooperation between the university and industry staff members.

Both sides are willing cooperate in establishing the courses curricula offered to the industry. Though, in the present project, the satisfactory feedback does not function yet we can expect a very positive relations between the parties concerned. There is an impression that the industry representatives try to influence the people involved in the curricula creating process and the curricula contents and more feedback will be possible in the future, when the courses start. The customer results achieved in the project are appreciated.

3.7; 3.8 People Results & Society Results

Excellent organizations should develop a set of performance indicators and related outcomes to determine the successful deployment of their strategy based on the needs and expectations of their people. On the one hand the highly motivated people composing the project consortium guarantee good project results and on the other hand, thanks to the good management and evident progress in development of the joint course materials, satisfaction of the project team is apparent. Besides, the mobilities and visits at European partner institutions play also certain role when the people results are concerned as they are very important in self-development of particular participants. This is of great importance for future sustainability of the project.

3.9 Key Results

Excellent organizations develop and agree a set of key results to determine the successful deployment of their strategy, based on the needs and expectations of their key stakeholders. The key stakeholders defined in the project application are universities and industry, as well. Both sides expect some benefits bringing them certain level of satisfaction. The stakeholders agreed to develop and implement the zero emission concept. Keeping this in mind they decided to attract students to universities and create new tailor made curricula addressing the industry.

At this stage of the project the key strategic results cannot be evaluated yet. Only some partial results are possible to assess. However the engagement of both sides, following the pathway set at the beginning of the project, keeping all dates and milestones allows me to state that the key

performance results will be of high quality. The more complete evaluation will be possible after the second and third year of project run when feedback from all stakeholders is available. This will be after the curricula and course materials are ready and available for potential students and teachers who could make first evaluation of the offered courses.

4. Difficulties and Recommendations

No threads and obstacles had been observed during the first year of the project that could affect its completion negatively. There were some minor problems that occurred in this period but they did not influence the performance of the consortium. Following are some remarks related:

1. Some doubts related to financial issues and refunds aroused during the first year which was immediately cleared by the coordinator
2. Some problems emerged with the volume of the course materials which actually started to be very extensive, and in some parts too detailed. The problem was solved after a discussion with participation of the consortium members. Uniform shape of all chapters was agreed.
3. The course materials and their contents had to be reviewed and adapted to the project assumptions which was accomplished during subsequent meetings and sessions.
4. Solution of some problems related to equipment supply was needed.
5. The project website should be updated and completed with key documents produced during the first year of project run.
6. It would be recommended to mention dissemination events on the website.

General remarks and opinion

It is my pleasure to be an external expert in the Tempus JPHS–159989-1-2009-1-BE project entitled “Creation of university-enterprise cooperation networks for education on sustainable technologies”. I appreciate the involvement of a great number of university staff members and industry representatives who showed big interests in facilitating and establishing contacts between both stakeholders. This certainly results from the project leadership contribution who was able to motivate all colleagues to huge work and efforts devoted to the project. The course materials, which are recently under preparation process, are of great value as they help to be aware of the environmental threads and to get more familiar with the zero emission concept, developed in and supported by the European Commission. The project will certainly be an example of sustainable process helping the involved people in future activities in their international cooperation within network of the European Higher Education Area.

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