

# Cleaner Production in Osijek-Baranja County, Croatia



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**Project Title:** Cleaner Production in Osijek-Baranja County, Croatia

**Leader:** Croatian Chamber of Economy-County Chamber Osijek

**Partner:** DekontUmwelttechnik Ltd. – Zlin, Czech Republic

**Associate:** Croatian Cleaner Production Center, Zagreb, Croatia

**Location:** Osijek-Baranja County, Croatia

**Project Duration:** Jan 2000 - March 2001

**EcoLinks Project Investment:** Total EcoLinks Project Investment: \$61,603;

EcoLinks Grant Support: \$47,049; Project Team Cost Share Contribution: \$14,554.

## Best Practice: Transferable Solution

This is a Best Practice for several reasons. It establishes a framework for building the capacity of local government and industry to promote environmental sustainability and economic efficiency through the implementation of Local Agenda 21 and application of the Cleaner Production methodology. The project methodology is highly transferable, and can be easily improved and modified according to the specifics of the site. Case studies, developed as part of the project program, provide a significant source of information on how companies can reduce waste and improve efficiency.

# Project Summary

Croatia was severely affected by war (1991-1995) and is in a stage of recovery and renewal. Local governments and industry are challenged to promote environmental and economic approaches to revitalize the region. It is critical, for example, that companies establish and implement ways to identify and adopt efficiency and pollution prevention measures. The industrial sector in Osijek - Baranja County, Croatia is a significant source of pollution. This sector's activities take place near two rivers, the Drava and the Dunav, that are linked to drinking water sources. Minimizing waste (e.g., waste water, polluted air emissions, and solid hazardous and non-hazardous waste) would alleviate both financial burdens and detrimental environmental impacts.

Supported by an EcoLinks Challenge Grant, the Croatian Chamber of Economy-County of Osijek and DecontUmwelttechnik, a consulting firm based in the Czech Republic, collaborated to design and implement a Cleaner Production program focusing mostly on Osijek-Baranja County. Cleaner production (CP) is an approach that involves establishing cost-effective measures for improving environmental performance. Cleaner Production is a proactive methodology that can be used to implement Environmental Management Systems (i.e., ISO 14000 and EMAS) and Integrated Pollution Prevention and Control (IPPC) systems. A Cleaner Production framework facilitates the implementation of The National Network of Healthy Cities Program (NNHC) that aims to improve local environments and promote sustainability in county and city development efforts. The CP approach, developed as part of this EcoLinks project, included personnel training (especially long-term interactive) and the development of case studies demonstrating environmental benefits and financial savings. It also included the development of local environmental policy and the implementation of Local Agenda 21 addressing wastewater, polluted air emissions, and solid hazardous and non-hazardous waste issues.

## Project Activities

The main goal of this project was to conduct interactive training in Cleaner Production measures and on Local Agenda 21 and to establish case studies. The following is a description of the project activities.

### **1. Conducted preliminary introduction/marketing seminar**

Action: A seminar was held for managers of companies, representatives of local governments, universities, and NGOs located in the County.

Product(s): 1) Promotion materials 2) One-day introduction/marketing seminar.

### **2. Conducted long-term training on Cleaner Production**

Action: Within the framework of a long-term, interactive training course, three seminars were conducted. Local authorities and NGO representatives were trained and prepared to initiate the implementation of Local Agenda 21. In addition to the

seminars, the participants from industry worked with Croatian CP consultants on CP demonstration projects within their companies. Also, a “train the trainer” seminar was organized to teach consultants about the project and to introduce them to participating companies, their products and services, and environmental problems.

A third seminar on all of the activated CP demonstration projects funded by this EcoLinks project was conducted. The third seminar also included final training on 1) Energy Efficiency Auditing and the CP Methodology and Energy Efficiency Case Studies; 2) the financial aspects of environmental protection and CP economic issues; 3) European Union legislation in the field of environmental protection; 4) Integrated Pollution Prevention and Control (IPPC) and Best Available Techniques (BAT); 5) the implementation of CP measures and continuation of CP projects; and 6) CP efforts in the Czech Republic. This was followed by a short evaluation of the Cleaner Production program.

Product(s): 1) Detailed program including time schedule 2) Manuals and other training materials 3) One-day “train the trainer” workshop 4) Three CP workshops.

### **3. Conducted seminar on sustainable development and Local Agenda 21**

Action: This seminar focused on the economic aspects of implementing sustainable development. It involved ten municipal officials (including from municipalities and cities (Osijek, Bilje, Ernestinovo, Našice, etc.) and representatives from high-schools, universities, and NGOs.

Products: 1) Materials and program for seminar on sustainable development and Local Agenda 21

### **4. Held consultations with local government officials for initiating Local Agenda 21**

Action: Two sets of consultations were provided for implementing Local Agenda 21 in the Town of Osijek and the County of Osijek-Baranja. The first set of consultations involved a project trainer, and representatives of cities and municipalities of Osijek-Baranja County. The second set of consultations involved the Head of Osijek - Baranja County and associates from the Environmental Protection Department, and the Deputy Mayor of the Town of Osijek and associates from the Environmental Protection Department. The consultations focused on preparing a sustainable development strategy for the area by identifying needed activities. The consultations promoted the engagement of participants in the European campaign of “sustainable” cities and places. Preparations were made for the signing of the Aalborg Charter encouraging the support and commitment of key community members.

Product(s): 1) Preliminary activities for Local Agenda 21 preparation 2) Preliminary activities and materials for signing the Aalborg Charter.

### **5. Held consultations for case study development and CP project implementation**

Action: Four consultations were held with each participating company to develop CP demonstration projects (case studies) for presentation at the third CP seminar. In order

to assure each company's commitment and approval for implementing CP measures, project presentations were also made to company managers. Participants prepared final reports on their respective CP projects.

Product(s): 1) Project preparation steps: establish CP project time-schedule; conduct analyses (e.g., material and energy flows, setting indicators); generate CP options; evaluate options; assess CP project (feasibility study; and identify problems, obstacles, and barriers to CP implementation) 2) Consultations between CP trainers and CP project coordinators at the various companies 3) Final reports on CP demo projects.

## **6. Developed case studies based on CP projects**

Action: Sixteen experts from six companies participated in initiating a total of eight CP projects. Company representatives developed and approved CP project design and implementation measures.

Product(s): The CP projects as follows:

- 1) Testing Possibilities for the Reduction of Wastewater Emissions and Anion-active Substances in Wastewater in Powder Detergents Production in Saponia d.d. Osijek
- 2) Testing Possibilities for the Reduction of Wastewater Emissions and Anion-active Substance in Wastewater in the Liquid Detergents Production in Saponia d.d., Osijek
- 3) Management of Raw and Secondary Materials, Reduction of Costs for Waste Water Treatment in the Metal Industry Osijek d.d.
- 4) Measures for Reducing Water Consumption in the Thermal Power Plant, Osijek
- 5) Reduction of Losses at Belje Winery, Joint-Stock Company – Unit Beljski Vinogradi
- 6) Reducing Impurities During Unloading, Watering, and Washing Sugar Beats in Sugar Production, Osijek
- 7) Reduction of Suspended Solids in Wastewater in Sloboda, d.d. Osijek at Two Plants at the Bread and Biscuits Factory
- 8) Reducing Material Losses on 'Markins' Nail Polish Packaging in Cosmetics and Toiletries Production in Saponia d.d. Osijek

## **7. Presented results and finalized the signing of the Aalborg Charter**

Action: Participants gave presentations of their CP case studies. Project participants from local government committed to developing Local Agenda 21 in Osijek-Baranja County, and the Aalborg Charter was signed by the Head of Osijek-Baranja and the Deputy Mayor of the City of Osijek. The CP case studies were disseminated in different counties throughout the region in the forms of a publication, a web site, and five seminars.

Product(s): 1) Presentations consisting of: short introduction of the involved company; CP project title; CP project preparation (e.g., focus, plan, objectives, etc.);

analyses; recommendations; feasibility study, achieved or expected results including environmental and economic benefits; and implementation activities 2) Five seminars of the CP projects results held in the Chambers of Economy of different Croatian counties 3) Local Agenda 21 and Aalborg Charter materials 4) Web page and booklet of CP case studies.

## **Project Benefits**

The emphasis of this project is on capacity building to prevent as well as solve environmental problems and to promote economic efficiency. Through extensive training, company representatives and local government officials gained the knowledge and experience necessary to apply Cleaner Production methodology and implement Local Agenda 21. By developing case studies, this knowledge could be shared and the results of Cleaner Production applications measured. These results of each case study project are shared here as part of the overall environmental and economic benefits demonstrated under this EcoLinks grant.

### **Capacity Building Benefits**

This project provided technical expertise and a praxis forum for implementing two major environmental agendas: Cleaner Production approach that promotes economic efficiency as well as a cleaner environment and Local Agenda 21 that emphasizes environmental sustainability in development efforts. As a result of this project,

- Sixteen experts from 6 industrial companies were trained in Cleaner Production methods
- Six companies developed environmental policies and commenced CP implementation
- Eight CP demonstration projects (i.e., case studies) were initiated providing direct site-specific benefits as well as a basis for information sharing on CP practices.
- Ten municipal officials (representing a total of five municipalities) and representatives from high-schools, universities, and local NGOs were trained and began preparations for the implementation of Local Agenda 21
- The Head of the Osijek - Baranja County of and the Deputy Mayor of the Town of Osijek signed the Aalborg Charter, formally recognizing the need for sustainable development in the region.
- Dialogue between industry and the local community was enhanced encouraging the emergence of important networks involving diverse interests.

### **Environmental Benefits**

The implementation of the eight CP projects developed and promoted through the CP training program established in this EcoLinks project collectively generated multiple environmental benefits. They are outlined in the following table.

Waste reduction	72,569 tons/year
Hazardous waste reduction	245 kg/year
Waste water reduction	1,452,000 m <sup>3</sup> /year
Emissions reduction	350 tons/year
Reduction of raw materials consumption	12.8 tons/year
Energy reduction	<ul style="list-style-type: none"> <li>• 8,321 kW</li> <li>• 122,000 m<sup>3</sup>/year of natural gas</li> </ul>

### **Economic Benefits**

Investment needed	\$ 2,060,000
Annual savings	\$1,261,000 - 1,493,000
Payback period – in total	1.4 - 1.6 years

A total financial savings of more than \$1.3 million per year is projected for the eight CP projects conducted as part of this project. According to the projected annual savings listed above, beneficiaries gain 25-30 times more than the EcoLinks grant investment of approximately \$50,000. A total investment of approximately \$2 million with an average pay back period of 1.5 years is asserted.

## **Lessons Learned**

There are both opportunities and challenges in implementing this project. They are listed below to benefit those interested in implementing similar efforts in their regions.

- Need to conduct simple viability assessment of companies intending to participate in the project to avoid “drop-outs” along the way. There was minimal support for implementing Cleaner Production projects within companies due to economic hardship. Two companies had to withdraw from the project due to bankruptcy.
- It was difficult to coordinate training, consultations, and preparation of demo-projects amongst project participants due to full schedules.
- Need to support and encourage company steering committees to overcome a general hesitation to estimate the benefits of the proposed Cleaner Production measures due to fears of underestimating the positive outcomes of the project. Companies can present estimations of benefits as “potential results” and then measure benefits after actual implementation of the cleaner production measures.
- Dialogue amongst the participating sectors (e.g., business, local government, and NGOs) that improves mutual understanding of needs, possibilities, and more effective and productive outcomes is strengthened through cooperative work on the project.
- Management skills and resources are needed to build future capacity building projects.
- The usefulness of the CP approach is affirmed by the fact that all projects achieved economic and environmental benefits from implementing CP principles.

- Need to pay special attention to the top management of participating companies as their commitment is essential. A half-day introductory seminar should be organized for the management of participating companies.

## Contact Information

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