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Background Paper

"UNIDO Programme on Transfer of Environmentally Sound Technologies in CEE and "NIS"

by

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UNIDO

ROUNDTABLE II

International Water Management & Waste Water Treatment Related Technologies

Introduction

The transfer of Environmentally Sound Technologies (EST) is basic to the process of sustainable long-term socio-economic development and has a particular relevance to countries in CEE and NIS in view of the challenges presented by accession to the European Union. Negotiations with the European Union within the context of the accession process, as well as the adoption of EU environmental legislation, create the common ground for joint activities and new forms of regional cooperation among accession countries in the field of environmentally sound technologies, including the development of the environmental industry sector.

The political and economic transformation that has taken place in the former centrally planned Central and Eastern European countries, product driven former state owned enterprises have to be privatized in order to become competitive in the emerged or emerging market economy. The individual enterprises need tailor-made support to do this. The enterprises need to identify their competitive strengths and prepare a strategy to take advantage of them. At the same time, the enterprise management functions have to be upgraded so as to ensure improvements in quality, reductions in costs and enhanced delivery capability.

Any successful effort that addresses the technological transformation of enterprises based on EST also needs to take into account economic and social considerations. Failing to take into account these two factors usually prevents the implementation of the transformation. In particular, failure to deal with employees both in the design and implementation of the technology transformation and the most likely negative effects on employment will prevent significant technology transformations

UNIDO has adopted a new approach for designing technical cooperation programmes that enhance the contribution of industry to sustainable development and would most efficiently utilize the financial resources available for technical cooperation. This new approach is fully reflected in the new UNIDO strategy for disseminating Cleaner Production and in the on-going Regional Demonstration projects for transferring EST in selected Central and Eastern European (CEE) countries and New Independent States (NIS).

The Challenge of transferring Environmentally Sound Technologies

The successful, widespread transfer of environmentally sound technology is dependent upon two factors (i) that the technology needs to be demonstrated and its technical and economic viability demonstrated; (ii) that experience must be accessible to others with at least one institution promoting it to other enterprises. Without an organized effort to disseminate results, the successful technological innovations usually remain confined to the demonstration plants.

UNIDO is currently implementing a regional demonstration project in five selected Central Eastern European Countries (Croatia, Hungary, Romania and Bulgaria) for the Transfer of Environmentally Sound Technologies (TEST). The Project is funded by the Global Environmental Facility (GEF) and has been developed under the umbrella of the Danube River Basin Commission. This project offers enterprises the opportunity to learn how to use environmentally sound technologies to improve productivity whilst at the same time complying with environmental norms and regulations. Such a proactive approach to preventing pollution would also serve as a model for other international river basins and water bodies faced with similar industrial pollution problems.

Economic activities and environmental concerns are not diametrically opposed but can complement one another - providing positive incentives for industry to play its full role in the drive towards sustainable development. The international technical cooperation community has supported only a few practical demonstrations of environmentally sound technology and unfortunately, these have focused exclusively on environmental issues rather than the integration of economic, social and environmental issues. Nor has much effort been made in these demonstrations to enhance technical capacities in the countries to provide the integrated package of technical services that would be more attractive to and helpful for these enterprises.

Although there are capacities in countries with economies in transition to provide many of the services needed by industry to pursue the simultaneous objectives of competitiveness enhancement, social responsibility and environmental compliance, these capacities remain isolated in separate institutions and companies. There is a lack of appreciation in the professional communities of the synergies to be achieved in the collective provision of services to enterprises. These synergies would result in solutions for enterprises that would actually meet their needs and could be provided at a more reasonable cost than if they were provided as individual services.

UNIDOás strategy on environment is to provide integrated services comprising comprehensive packages promoting sustainable industrial development, by introducing cleaner production and transferring environmental technologies. UNIDO promotes sustainable industrial development through integrated services, supported by interdisciplinary teams that encompass the required economic, social and environmental dimensions.

UNIDO has the in-house expertise and historical experience to build capacity in institutions in order to provide the integrated package of services needed for the successful transfer of environmentally sound technology. Some of its relevant experience, with countries in transition, include the establishment of National Cleaner Production Centres in the Czech Republic, Hungary, Slovakia and Croatia.

UNIDO-TEST Regional Demonstration Project in Central Eastern Europe: Transfer of Environmentally Sound Technology in Romania, Croatia, Bulgaria, Hungary and Slovakia.

The countries in transition bordering the middle and lower Danube are facing serious economic and financial problems in responding to the objectives of the Danube River Protection Convention and to implement measures for pollution reduction and for environmental protection like IPPC-EU Directive as required for the accession to the European Union. This shows also the need to assist countries in transition and makes evident the responsibilities of the international community to respond to regional and global concerns of environmental protection.

The UNDP/GEF Pollution Reduction Programme for the Danube River Basin has identified 130 major manufacturing enterprises of concern (known as hot spots); a significant number of these are contributing to transboundary pollution in the form of nutrients and/or persistent organic pollutants.

In April 2001 UNIDO started the implementation of the TEST project taking on the challenge of effectively demonstrating to the industries concerned in the Danubian countries (Bulgaria, Croatia, Hungary, Romania and Slovakia) that it is possible to respect environmental standards and still maintain or even enhance their competitive position. The programme also addresses the need to enhance the cleaner production capacities of the institutions concerned with environmental management issues in these countries thereby enabling them to offer enterprises an integrated package of technical services most adapted to their needs.

The TEST Programme concentrates on building capacity in industrial service institutions to undertake new integrated approaches for Transferring Environmentally Sound Technology, which identify the least costly option for environmental compliance, in countries with economies in transition. Different environmental management tools are applied, including cleaner production, environmental management systems and accounting and environmentally sound technology assessment and investment appraisal preparation. A description of the project strategy is indicated in the flow chart.

The TEST programme, which is being designed for application in different parts of world, uses the terms cleaner production (preventive actions within the production process) and pollution control technology (both pre-treatment before pollutants are discharged into municipal wastewater treatment plants and final treatment/end-of pipe). The DRPC and IPPC-EU Directive requires individual industrial sectors or industries to apply best available techniques (BAT) and best available practices (BEP).

Sustainability of the TEST project will be assured by two mechanisms: a) by building national capacity in providing environmental services that will be made available to the remaining enterprises in the participating countries and in the CEE Region on how to implement the TEST approach.

b) by developing the demand at enterprise level through peer pressure. The successful results that will be achieved through the introduction of the TEST approach in the selected industrial sites will serve a demonstration for other industries, thus generate demand for environmental services.

Replicability of the lessons learned will be assured by cascading through 'train the trainersá mechanism put in place during the TEST project implementation. The experience gained by the local institutions will be made available to other industries within the same hot spot, to other hot spot in the country and to other CEE countries. To promote and support the replicability of the project, a UNIDO-based global support system will be developed for continued information dissemination and for facilitating deployment of EST technologies in other parts of the region.

What is the TEST Project ?

OBJECTIVES

National Level

- TEST project would build capacities in existing national institutions to apply the test integrated approach at a selected number of enterprises;

Enterprise Level

- The aim of the assistance is to bring selected pilot enterprises into compliance with environmental norms of the Danube River Protection Conventions and IPPC-EU Directive, taking into account the their needs to remain *competitive* and deal with the *social consequences* of major technology upgrading.

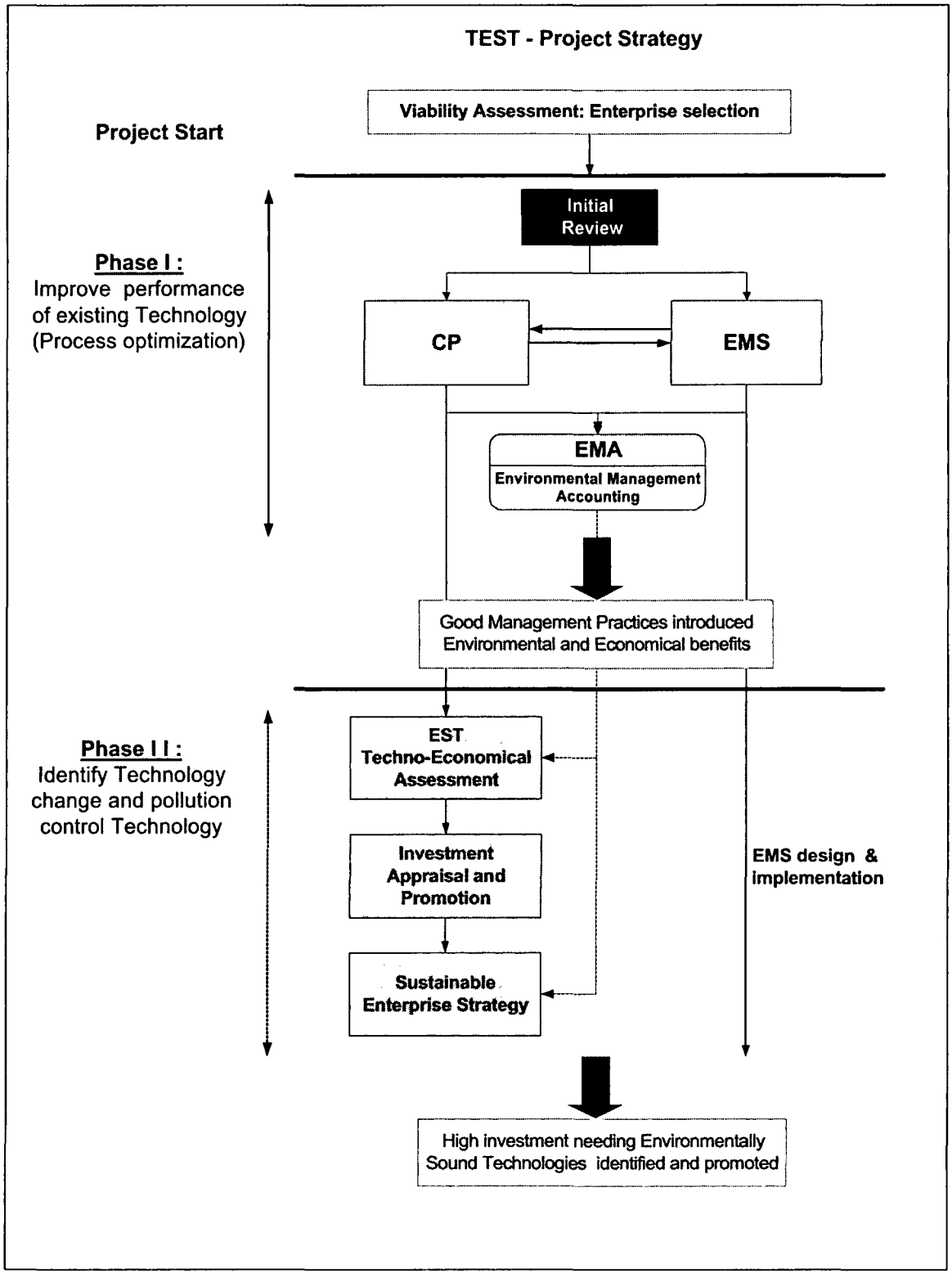
APPROACH & STRATEGY

- **Phase I**: Introducing at company level an integrated model aiming at improving operation of existing technology, which promotes synergies between different and complementary environmental management tools like
  - Cleaner Production (CP);
  - Environmental Management System (EMS);
  - Environmental Management Accounting (EMA);

- **Phase II**: Supporting top management decision-making process for high investment needing in Environmentally Sound Technologies (EST) by:
  - Identification of EST options through *detailed technical and economic assessment;*
  - Preparation of investment appraisal (*identification of possible source of funding*);
  - Preparation of Sustainable enterprise strategy of the company.

IMPORTANT ASSPECTS

- Continued participation of enterprise in TEST programme is contingent upon improving while assessing;
- An integrated assessment and improvement project conducted by enterprise team under the guidance and supervision of outside international and national experts.


TEST - Project Strategy
Project Start
Viability Assessment: Enterprise selection
Initial Review
Phase I :
Improve performance of existing Technology (Process optimization)
CP
EMS
EMA
Environmental Management Accounting
Good Management Practices introduced
Environmental and Economical benefits
Phase I I :
Identify Technology change and pollution control Technology
EST
Techno-Economical Assessment
Investment Appraisal and Promotion
Sustainable Enterprise Strategy
EMS design & implementation
High investment needing Environmentally Sound Technologies identified and promoted

IPPC- EU Directive

Integrated Pollution Prevention and Control (IPPC) is a system following European Community Directive 96/91. This introduces a more integrated approach to controlling pollution from industrial sources across Europe. The main aim of IPPC is to achieve a high level of protection of the environment, taken as a whole, by preventing or, where that is not practicable, reducing emissions into the air, water and land. This means that emissions to air, water (including discharges to sewer) and land, plus a range of other environmental effects, must be considered together.

The system of Integrated Pollution Prevention and Control (IPPC) applies an integrated environmental approach to the regulation of vast range of industrial activities. The directive applies to both existing and new installations. It also means that regulators must set permit conditions so as to achieve a high level of protection for the environment as a whole. These conditions are based on the use of the 'Best Available Techniques' (BAT), which balances the costs to the operator against the benefits to the environment. IPPC also takes the integrated approach beyond the initial task of permitting, through to the restoration of sites when industrial activities cease.

The EU has established an information exchange forum (IEF) and a number of working groups (including representatives from EU Governments and industrial sector) on BAT. Outcomes of this information exchange are the BREFs (Best Available Techniques reference document) reference documents. The purpose of the BREFs is to provide general indications of the emission and consumption levels that could be considered appropriate for a BAT. For this reason they contain relevant technical information concerning BAT for a range of industrial sectors. EU governments are requested to use these emission and consumption levels as a basis for setting quality objectives standards. Operators of installations under IPPC have to apply for a permit from the Regulator (the Environment Agency or Local Authority) prior to operation. The applicant must consider all the environmental impacts associated with the installation when preparing a permit application.

Applications for permits are subject to public consultation. The operator is required to advertise the application in one or more local papers and in an official *Gazette,* and a copy of the application is placed on a public register, which the public is free to view. Statutory Consultees and the public may submit comments during a defined consultation period. Once the consultation period is over the Regulator considers all the representations reviewed and will either grant the permit subject to conditions or reject the application. If an operator is dissatisfied with a decision made regarding an application, an appeal to the Secretary of State can be made.

Best Available Techniques (BAT)

This term is defined as 'the most effective and advanced stage in the development of activities and their methods of operation which indicates the practicable suitability of particular techniques for providing the basis for emission limit values designed to prevent, and where that is not practicable, generally to reduce the emissions and the impact on the environment as a whole'.

This definition implies that BAT not only covers the technology used but also the way in which the installation is operated, to ensure a high level of environmental protection as a whole. BAT takes into account the balance between the costs and environmental benefits (i.e. the greater the environmental damage that can be prevented, the greater the cost for the techniques).

BAT could be classified into 4 categories: preventive (cleaner technologies, green product design, waste minimization, energy efficiency), analytical (identifying problems), managerial (monitoring, EMS) and final treatment (technologies for abating pollution, technologies for clean up or remediation). BAT concept is equivalent to EST as defined both by UNIDO and the UN Commission on Sustainable Development. "Environmentally sound technologies in the context of pollution are "process and product technologies that generate low or no waste for prevention of pollution. They also cover "end of the pipeátechnologies for treatment of pollution after it has been generated. Environmentally sound technologies are just not individual technologies, but total systems which include know-how, procedures, goods, and services, and equipment as well as organizational and management proceduresá(Agenda 21, Chapter 34, Transfer of Environmentally Sound Technology, Cooperation and Capacity Building).

UNIDO project for the Tisza River Basin: Industrial Accident Risk Management and Pollution Control

Recent catastrophic events drew special media attention to the Tisza River. Due to the altered character of the river basin devastating floods followed one another. A series of toxic spills, culminated in the Baia Mare accident when tonnes of cyanides swept along the Szamos, Tisza, the Danube rivers and entered the Black Sea. These are obvious signs of high risk and instability, which should be improved to provide the condition of sustainable development, i.e. safe region for life, nature and investments.

Where predicted impacts on the environment are perceived as being irreversible a long-term view has to be adopted. The improvement of the water quality has to follow a basin approach. Continuing protection and enhancement of the environment has to be ensured through the encouragement of a precautionary approach that engenders the anticipation of environmental risks. The transboundary nature of the problem requires an integrated water resource management combined with the proper capacity building, which can serve the values of all stakeholders. To the proper application of the Water Framework Directive (2000/60/EC), on the Seveso II Directive (96/082/EEC) and the OECD recommendation C (88)/85(Final) special attention will be paid.

UNIDO is currently implementing a pilot project to promote an integrated approach for risk management in the Tisza River Basin. This will be done firstly through the improvement of the emergency preparedness and response to accidental release of toxic substances into the environment. The project also aims at developing tools to support Tisza Basin countries in applying the preventive concept to industrial water pollution, to develop practical examples and make it possible to transfer safety technology with hands-on experience.

The project has 3 elements: prevention, action and communication.

- Prevention is concentrating on industrial sites, promoting to cover water pollution by risk assessment in their Seveso II Safety Reports.
- Actions are planned on the basis of an improved water quality model.
- Risk communication

The immediate objective of the project is to

- perform quantitative risk assessment of water contamination at selected industrial sites,
- identify risk mitigation measures both reducing the frequency of occurrence of a water polluting accident and the magnitude of the associated consequences,
- develop recommendations for external emergency plans and communication,
- training of identified actors and local community,
- assess gaps of the Monitoring and Early Warning System (EWS) respect to the EU regulations.

The project will be executed by a team of experts in the fields of risk assessment, water management, water quality modelling and monitoring, together with industrial accident specialists.

The task is complex and frequently needs involvement of various partners, such as municipalities and water dependent industries. The results will be shared with other

industries and teams, including NGOs, performing other water quality related projects and actions in the region.

The UNIDO pilot project is focusing on selected demonstration sites in the Hungarian portion of the Tisza River Basin. In a second (planned) stage the scope of application will be extended to other economic segments, such as agriculture, tourism and beyond the country border to the other Tisza Basin countries of Romania and Ukraine.

UNIDO Regional Programme in NIS (Ukraine, Russia Federation and Belarus): Preparation of Strategic Action Programme (SAP) for the Dnieper River Basin and SAP Implementation Mechanisms

The Dnieper River is the third largest in Europe (after Volga and Danube). It drains an area of 509,00 square kilometers and has a length of 2,200 km. It is a transboundary system: 20% of the river basin is within the territory of Russian Federation, 23% in Belarus and the largest portion, 55% is in Ukraine. The Dnieper is also the second largest river emptying every year into the Black Sea, carrying 99,640 tons of BOD, 86 tons of phenols, 1,305 tons of oil products, over 20,000 tons of nitrogen and similar amount of heavy metals.

The Dnieper River has been described as the "classic example of unsustainable developmentá as a result of previous attempts to convert a traditionally agricultural region into a major industrial one in the space of a few decades. The situation has been complicated by the extreme social and economic difficulties all three riparian countries are facing in the transition to market economies.

In 2000, UNDP started the implementation of a regional programme involving the three countries as part of the GEF International Waters portfolio. This is a self-standing GEF project designed to develop a programme of measures and their respective implementation mechanisms in order to protect, the Dnieper and through this, to contribute to the protection of regional and global international waters. The management capacity both at the level of individual countries and at the regional level is to be strengthened; and wider global benefits will accrue to the basin countries as well as those of the Black Sea.

The long-term objectives of the project are to remedy the serious environmental effects of pollution and habitat degradation in the Dnieper River Basin, to ensure sustainable use of its resources, and to protect biodiversity in the basin. The implementation of the project is sub-divided into five operational components:

Component I : Project co-ordination
Component II: The strategic action programme process
Component III: Facilitating investment in reducing transboundary pollution
Component IV: Biodiversity conservation
Component V: Improving stakeholder participation in transboundary issues.

UNIDO has been assigned to implement Component III: Facilitating investment in reducing transboundary pollution, for improving financial/legal/operational mechanisms for pollution reduction and sustainable resource use. To facilitate investment reducing transboundary pollution UNIDO will:

- Design a multi-criteria methodology for identification and ranking of major transboundary industrial pollution hot spots in the Dnieper River basin
- Identify and rank industrial hot spots in the Dnieper River Basin
- Prepare Priority Investment Portfolio at selected industrial hot spots for transferring EST

UNIDO Cleaner Production Programme

In 1994 the United Nations Industrial Development Organisation (UNIDO) joined forces with the United Nations Environment Programme (UNEP) in a global venture to promote Cleaner Production strategies in developing countries and countries with economies in transition. These strategies operate within industrial production cycles to reduce pollution and to generate substantial cuts in raw material, water and energy consumption with concomitant reduction in operating costs. It follows that Cleaner Production can deliver attractive benefits both for the environment and for manufacturing competitiveness and thus underpins progress towards sustainable industrial development.

The joint UNIDO/UNEP venture has established a network of National Cleaner Production Centres (NCPC). These centres that raise awareness of Cleaner Production methodologies in industry, and provide training and practical technical assistance to enterprises and their service providers. In many cases, the centres also advise national and local authorities of how best to support and promote Cleaner Production initiatives through the evolution of industrial and environmental policies and associated regulations.

The network of NCPC now has 23 members around the world and is still expanding. Real environmental and economic advances achieved by the centres and their industry partners demonstrate the value of the programme. Recently, UNIDO has reviewed progress and introduced strategic changes in order to take advantage of the considerable experience gained since 1994, and to increase the impact of the NCPC at enterprise and sector levels.
The new strategy will:

- Develop a more flexible, modular, CP methodology to meet the specific needs of client countries.
- Move beyond 'good housekeepingá to stimulate technological change in manufacturing by developing sector specific initiatives.
- Improve the financial viability of the NCPCs by extending the range of services they can provide.
- Adopt a holistic approach to industry emissions and their management through linkages between CP and treatment initiatives at enterprise level, and between industry work and UNIDOás solid waste management work with national and municipal authorities.

While marking a significant change in the programme, we believe the changes adopted in this strategy will deliver important improvements, encouraging the positive engagement of industry in efforts to secure sustainable development within the context of the targets set out in the Millennium Declaration.

UNIDO will attempt to spread the experience gained and bring the benefits of cleaner production centres to another 25 countries over the next 10 years. This is expected to contribute to an optimisation of enterprises performance both from an economic and environmental point of view, enhancing competitiveness of local enterprises while at the same time benefiting the environment.