

*PRODUCTIVITY, VIABILITY AND IMPROVED ENVIRONMENTAL PERFORMANCE*

**Introducing  
Environmental Management Accounting (EMA)  
At Enterprise Level**

**Methodology  
And  
Case Studies From Central and Eastern Europe**

**A contribution of the UNIDO project  
“Transfer of Environmentally Sound Technology (TEST)  
in the Danube River Basin”**

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## FOREWORD

In the Millennium Declaration of 2000, the United Nations General Assembly asserted that current unsustainable patterns of production and consumption had to be changed, and that no effort should be spared to free all of humanity, particularly future generations, from the threat of living on a planet irredeemably spoilt by human activities, and whose resources would no longer be sufficient for their needs. They codified this in the Seventh Millennium Development Goal of Ensuring Environmental Sustainability.



In their Plan of Implementation, the delegates to the World Summit on Sustainable Development of 2002 reaffirmed the necessity for sustainable patterns of consumption and production, calling inter alia for an enhancement of industrial productivity and competitiveness as well as an intensification of efforts in cleaner production and the transfer of environmentally sound technologies.

The UNIDO Corporate Strategy responds to these challenges, affirming that for development to be sustainable environmental concerns must be systematically incorporated into the paradigms of economic development. This way the achievement of high levels of productivity in the use of natural resources becomes a central concern both in the developing countries as well as in the advanced industrial nations. As stated in the Strategy, “in the process of industrialization there has to be a shift from end-of-pipe pollution control to the use of new and advanced technologies which are more efficient in the use of energy and materials and produce less pollution and waste; and finally to the adoption of fundamental changes in both production design and technology represented by the concept of ‘natural capitalism’ and the ‘cradle-to-cradle’ approach.”

This Series on *Productivity, Viability and Improved Environmental Performance* has been conceived as one of UNIDO's tools to promote the message that increased levels of productivity by enterprises in their use of natural resources enhances their environmental performance while assuring them a greater viability when affronting the challenges of the future. In particular, this volume "Introducing Environmental Management Accounting at Enterprise Level" presents the experience gained in the application of environmental management accounting (EMA) as a valuable tool to assist the corporate and organisational managers, accountants and engineers of the developing and transitional countries, in understanding how environmental issues influence accounting business practices.



Carlos Magariños  
Director-General

## NOTES ON THE AUTHORS

Roberta De Palma is an industrial engineer with a specialization in Cleaner Technology. She has worked for UNIDO since 1998, and has been responsible for the implementation of various technical cooperation programmes in the field of industrial environmental management and transfer of environmentally sound technologies. Since 2001, Ms. De Palma has been the Programme Manager of the UNIDO TEST project in five countries of the Danube River Basin, developing an innovative approach to integrate industrial competitiveness with environmental responsibility—a methodology that includes the introduction of Environmental Management Accounting (EMA) as a management tool. She is the designer of the conceptual framework of this publication and co-author of the introductory and methodology chapters, being also responsible for reviewing and assembling the four EMA case studies presented in this document.

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## EXPLANATORY NOTES

ABC	Activity Based Costing
Al <sub>2</sub> O <sub>3</sub>	Aluminium Oxide
ASPEK	Association for Industrial Ecology
BAT	Best Available Technology
BDtpd	Bone-dry tons per day
BOD	Biological Oxygen Demand
CC	Cost Centres
CEE	Central and Eastern European countries
COD	Chemical Oxygen Demand
COMFAR	UNIDO Accounting Software ( <a href="http://www.unido.org/doc/3470">http://www.unido.org/doc/3470</a> )
CP	Cleaner Production
CPA	Cleaner Production Assessment
ECOIND	Institute for Industrial Ecology (Romania)
EM	Environmental Management
EMA	Environmental Management Accounting
EMAN	Environmental Management Accounting Network
EMS	Environmental Management System
End-of-Pipe	Pollution treatment or abatement technology
EPA	U.S. Environmental Protection Agency
EST	Environmentally Sound Technologies
EU	European Union
euro	European Union Currency
EUROSTAT	European Statistics Organization
GEF	Global Environment Facility
HERBOS	Chemical producer (mainly pest control products) based in Croatia
HTS	Hygienic and Technical Safety
HUF	Hungarian Forint (1 HUF = 0.003881 euro) <sup>1</sup>
IAS	International Accounting Standards

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<sup>1</sup> Conversion as of 22 August, 2003. For current rates see [www.oanda.com/convert/classic](http://www.oanda.com/convert/classic).

ICPDR	International Commission for the Protection of the Danube River ( <a href="http://www.icpdr.org">www.icpdr.org</a> )
IDs	Identification numbers
ISO 14001	International Standards Organization— Environmental Management System Standard
IRR	Internal Rate of Return
KAPPA STUROVO	Pulp and paper plant in Slovakia
HRK	Croatian Kunas Currency as of May 2001 (1 HRK is approximately 0.139 euro)
MFG/PRO	Software for accounting purposes
NCPC	National Cleaner Production Centre
NITROKÉMIA 2000	Chemical producer in Hungary
NGO	Non-Governmental Organization
NPV	Net Present Value
NSSC	Neutral Sulphite Semi-Chemical
PBP	Pay Back Period
PR	Public Relations
PSA	Anhydrous phthalic acid
RAS	Romanian Accounting Standard
SSK	Slovak Crown (1 euro is approximately 41 SKK) <sup>1</sup>
SAP/R3	Business application software ( <a href="http://www.sap.com">www.sap.com</a> )
SO <sub>2</sub>	Sulphur Dioxide
SOMEŞ	Romanian Plant, Member of the HOVIS Group producing sulphate pulp (kraft) and wrapping paper
TEST	Transfer of Environmentally Sound Technology
UNCED	United Nations Conference on Environment and Development
UNDS	Uniform National Discharge Standards
UNDSD	United Nations Division for Sustainable Development
UNDP	United Nations Development Programme ( <a href="http://www.undp.org">www.undp.org</a> )
UNEP	United Nations Environment Programme ( <a href="http://www.unep.org">www.unep.org</a> )
UNIDO	United Nations Industrial Development Organization ( <a href="http://www.unido.org">www.unido.org</a> )
USD	United States Currency (1 USD is approximately 0.893 euro) <sup>1</sup>
WWTP	Waste Water Treatment Plant