Cleaner Production: A Guide to Sources of Information

United Nations Environment Programme
Industry and Environment

UNEP

Cleaner Production Programme



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Cleaner Production: A Guide to Sources of Information

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INTRODUCTION

Obtaining information on cleaner production can be a challenging task of sifting through the seemingly endless amount of resources that are constantly changing. Not only is new information being made available every day, but the terminology used to describe cleaner production and preventive environmental activities is evolving. Terms such as pollution prevention, waste minimization, green productivity, source reduction, eco-efficiency and clean technologies are also used to refer to the Cleaner Production concept. Hence, searching available information can be a lengthy process.

This is why, as part of its Cleaner Production Programme, UNEP IE has decided to publish this booklet, which presents a number of information sources that can be of assistance in obtaining further information about cleaner production.

- **Cleaner production centres and activities**. These activities are going on worldwide and can offer users experience and expertise in the practical implementation of cleaner production. Activities usually include training and technical assistance, demonstration projects, sectoral approaches, outreach and awareness raising efforts and policy studies. Therefore they can be a resource of materials and methodologies that can be adapted to other situations.

- **Publications**. Documents highlighting experience and technical insights are available from many sources. This section provides an annotated listing of cleaner production documents available from UNEP IE as well as regular periodicals from other cleaner production activities.

- **Databases**. With the emergence of more widespread use of computer technologies and the Internet, databases and WWW sites of cleaner production information are flourishing. This section provides an annotated listing of available resources.

- **Audio Visuals**. Critical to training and awareness raising, videos can be key elements to cleaner production activities. This section provides an annotated listing of many of the available videos which range from general awareness raising to technically specific topics.

- **Training Courses, Institutes, and Training Support Materials**. These sections provide a brief listing of the cleaner production courses and available training curricula that exist worldwide.

This is by no means an exhaustive listing as this dynamic topic generates new information every day. It is meant to give those interested in cleaner production a basic foundation as to the types of information available. We nevertheless hope that this document will help governments, officials and industry managers to find contacts and information sources useful for their everyday work.

We welcome all comments to help us improve further editions of this booklet. Please contact us with any suggestions.

NOTE: All telephone numbers in this booklet are shown in the internationally agreed format. The plus sign indicates the code for international dialing from the country you are in; these codes are generally different for each country. The next group of figures is the unique code for the country into which you are dialing. If you are telephoning from the same country the international code is not required but you may need a national code, often a zero.

CLEANER PRODUCTION CENTRES AND ACTIVITIES

Centres

Cleaner Production Centres have been established in various countries independently or with outside assistance. In general, they are set up to develop national or regional capacity to implement cleaner production and are open to the public. All of these centres list information collection and dissemination as one of their main activities to promote cleaner production. Below are brief descriptions of some of the international efforts underway followed by a listing of cleaner production centres themselves, divided by region.

UNIDO-UNEP National Cleaner Production Centres (NCPCs) have been established in ten countries since 1994, and ultimately there will be up to twenty over a five-year period. The ten centres are located in: Brazil, China, the Czech Republic, Hungary, India, Mexico, the Slovak Republic, Tanzania, Tunisia, and Zimbabwe. The centres promote cleaner production at the national level through: (1) conducting in-plant demonstrations and various training programmes for governments and industry to show cleaner production at work; (2) analyzing policy initiatives in the country and making recommendations to improve the policy framework for cleaner production; and (3) acting as a focal point of cleaner production through information collection/analysis/ dissemination activities. Centres are managed by professionals from the country, and hosted in an existing industry or environmental institution. Interested individuals and organizations are encouraged to contact the centres to obtain information. The organizational contacts follow:

UNIDO: Industrial Sectors and Environment Division
P. O. Box 300 A-1400, Vienna, Austria
tel: +43 1 21131 4696
fax: +43 1 21131 6803
email: ncpc_env@unido.org
www: http://www.unido.org

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Environmental Pollution Prevention Project, EP3, is a five-year programme sponsored by the U.S. Agency for International Development (USAID) to address urban and industrial pollution and environmental quality in developing countries. The programme was established with the following three objectives:

1. to establish sustainable pollution prevention programs in developing countries;
2. to transfer urban and industrial pollution prevention expertise and information; and
3. to support efforts to improve environmental quality.

Since its inception in 1993, the EP3 programme has established centres in eight countries: Bolivia, Egypt, Ecuador, Indonesia, Jamaica, Mexico, Nicaragua and Paraguay. Information clearinghouses have been (or will be) set up to disseminate pollution prevention related information. These national clearinghouses are supported by the EP3 headquarters clearinghouse, which responds to information requests from industrial facilities and governments in EP3 countries and from USAID missions throughout the world. The organizational contact follows:

USAID EP3 Headquarters Clearinghouse
RCG/Hagler Bailey, Inc.
1530 Wilson Blvd., Ste. 900
Arlington, VA 22209-2409, U.S.A.
tel: +1 703 351 4004
fax: +1 703 351 6166
email: apenderg@habaco.com

World Environment Center's Waste Minimization Program, funded by the United States Agency for International Development (USAID), has introduced the concepts of waste minimization through a series of demonstration projects in ten countries of Central and Eastern Europe: Bulgaria, Estonia, Hungary, Kazakstan, Latvia, Lithuania, Poland, Romania, Slovakia and Uzbekistan. For further information contact:
World Environment Center
419 Park Avenue South, Suite 1800
New York, NY 10016, USA.
tel: +1 212 683 4700
fax: +1 212 683 4745

US Asia Environmental Partnership, funded by the US Agency for International Development (USAID), has individual country programmes which provide information and assistance on how to incorporate pollution prevention approaches into industrial management. There are two project offices located in the Phillipines and Singapore. For more information contact:
Ms. Julie Haines, US Asia Environmental Partnership
1720 Eye Street, Suite 600
Washington, DC 20006
tel: +1 202 835 0333
fax: +1 202 496 9720
email: jhaines@usaep.org

Cleaner Production Activities

In addition to Cleaner Production Centres, there are other cleaner production activities at all levels going on throughout the world. Below is a partial listing of such initiatives and programmes and points of contacts, divided by region.

Cleaner Production in Africa

EGYPT

USAID EP3 Clearinghouse
Energy Conservation and Environmental Protection (ECEP/EP3)
Contact: Mostafa Elissa, Project Manager
19 Ahmed Heshmat St.
Zamalek, Cairo 11211, Egypt
tel: . . . . . +20 2 342 4735/8/9
fax: . . . . . +20 2 341 3436
e-mail: . . ep3@idso.gov.eg

Technical Cooperation Office for the Environment (TCOE)
Contact: Ms. Dahlia Lotayef,
Program Manager
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UNEP Regional Office of Africa
Contact: Dr. Stephen G. Kionga-Kamau, Industry Officer
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Mr Gottlieb Arendse
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South Africa
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TANZANIA

UNIDO/UNEP NCPC
Tanzania National Cleaner Production Centre
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Dar es Salaam, Tanzania
tel: . . . . . +255 51 668 979/105
fax: . . . . . +255 51 668 147
e-mail: . . cpct@udsm.ac.tz

TUNISIA

UNIDO/UNEP NCPC
Centre de Production Plus Propre
Director: Rachid Nafti
Colisée Soula, Escalier D, 2ème étage
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tel: . . . . . +216 1 872 688
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ZIMBABWE

UNIDO/UNEP NCPC
Cleaner Production Centre of Zimbabwe
Coordinator: Mr. Lewin Mombemuriwo
7th floor, Takura House
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P.O. Box BW 1635
Borrowdale, Harare
Zimbabwe
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fax: . . . . . +263 4 731 1779
e-mail: . . cpczim@harare.iafrica.com

Cleaner Production in North America

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Hull, Quebec
K1A 0H3 Canada
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fax: . . . . +1 819 953 7253

CETAC
855 rue Pepin, Office 310
Sherbrooke, Quebec
J1L 2P8 Canada
tel: . . . . . +1 819 823 2230
fax: . . . . . +1 819 823 6632

Canadian Centre for Pollution Prevention
265 North Front Street Suite 112
Sarnia, Ontario N7T 7X1
Canada
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fax: . . . . . +1 519 337 3486
e-mail: . . c2cp2@sarnia.com

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N7T 1A4 Canada
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e-mail . . uneprolac@igc.apc.org

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Centro Mexicano de Producción
Más Limpia
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Unidad Profesional "Adolfo Lopez Mateos"
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Environmental Defense Fund
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United States
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Environmental Defense Fund
44 East Avenue, Suite 304
Austin TX 78701
United States
tel: . . . . . +1 512 478 5161
fax: . . . . . +1 512 478 8140
e-mail: . . alvarez@edf.org

Global Environmental Management Initiative (GEMI)
Contact: Ms. Jane McGuire, Communications Program Manager
1090 Vermont Ave. NW Suite 3
Washington, DC 20005-4905
United States
tel: . . . . . +1 202 296 7449
fax: . . . . . +1 202 296 7442
e-mail: . . !gemi@attmail.com

INFORM
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120 Wall Street
New York NY, 10005-4001
United States
tel: . . . . . +1 212 361 2400
fax: . . . . +1 212 361 2412
e-mail: . . inform@igc.apc.org

Lowell Centre for Sustainable Production
Contact: Dr. Ken Geiser, Director
1 University Avenue
University of Massechusetts, Lowell
Lowell, MA 01854
United States
tel: . . . . . +1 508 934 3275
fax: . . . . . +1 508 934 3050
e-mail: . . jluskin@woods.uml.edu

UNEP IE Cleaner Production Working Groups: Leather Tanning
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Leather Industries Research Laboratory
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fax: . . . . . +1 513 556 2377
e-mail: . . corynj@ucunix.san.uc.edu

UNEP IE Cleaner Production Working Groups: Policies, Strategies and Instruments
Contact: Mr. Jerry Kotas
U.S. Department of Energy
Golden National Field Office
Golden, Colorado
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tel: . . . . . +1 303 275 4714
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UNEP Regional Office for North America (RONA)
Contact: Director
Room DC2-803
2 United Nations Plaza
New York, N.Y. 10017
tel: . . . . . +1 212 963 8138/8139
fax: . . . . . +1 212 963 7341/4146
e-mail: . . hart@un.org

USAID WEC Pollution Prevention Centre, Central Asian Republic Section
Contact: Thomas Higgins
CH2M Hill
P.O. Box 4400
Reston, VA 22190-1483

United States
tel: . . . . . +1 703 471 6405
fax: . . . . . +1 703 471 0980

Many states have cleaner production programmes and clearinghouses. To obtain more information about state-specific activities contact:

National Pollution Prevention Roundtable
Contact: Ms. Natalie Roy
2000 P Street, NW #708
Washington DC 20036
United States
tel: . . . . . +1 202 4667272
fax: . . . . . +1 202 4667964
e-mail: . . . . 75664.3520@compuserve.com
web page: . http://es.inelgov/nppr

USEPA Pollution Prevention Clearinghouse
c/o EPA Library
EPA 401 M Street SW
Washington DC 20460
United States
tel: . . . . . +1 202 260 1023
fax: . . . . . +1 202 260 0175
e-mail: . . ppic@epamail.epa.gov

Cleaner Production in South America

ARGENTINA

Association for the Development of Environmental Management (ADEGA)
Argentine Cleaner Production Centre
Contact: Carmen Longa Virasoro, President
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fax: . . . . . +591 2 319 903
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BRAZIL

UNIDO/UNEP NCPC
National Cleaner Production Centre-SENAI
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Av. Assis Brasil, 8450
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USAID EP3 Clearinghouse
Contact: Jorge David, Director
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COLUMBIA

Ministry of the Environment
Contact: Director
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Bogota
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tel: . . . . . +571 281 0600
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ANDI
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e-mail: . . rocio@oikos.org.ec

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UNEP IE Cleaner Production Working Groups: Biotechnology for Cleaner Production
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Instituto de Investigaciones
Universidad del Valle de Guatemala
18 Avenida 11-95 zona 15, Vista Hermosa III
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fax:. . . . . +502 364 0212
e-mail: . . crolz @uvg.edu.gt

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USAID EP3 Clearinghouse
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Also:

USAID EP3 Clearinghouse
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Jamaica Hotel and Tourist Association
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Kingston 10
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NICARAGUA

USAID EP3 Clearinghouse
Contact: Dr. Margaret Harrid, Project Officer
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New South Wales Environmental Protection Authority
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tel: . . . . . +86 10 62588146
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HONG KONG

Hong Kong Productivity Council
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Hong Kong Productivity Council Building
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Kowloon
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INDIA

Cleaner Technology Information Network
National Environmental Engineering
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National Productivity Council
5-6 Institutional Area
Lodi Road
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India
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UNEP IE Cleaner Production Working Groups: Textiles
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India National Cleaner Production Centre
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Development Alternatives
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INDONESIA

Environmental Impact Management Agency (BAPEDAL)
Directorate for Technical Development
Cleaner Production Coordinator
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Indonesia
tel: . . . . . +62 21 251 2459
fax: . . . . . +62 21 251 2459
e-mail: . . bangtek@bapedal.go.id

USAID EP3 Clearinghouse
(formally ASEAN Environmental Improvement Project)
Contact: Mr. Achmad Djani
Mashill Tower – 20th floor, Jl. Jend. Sudirman Kav. 25
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JAPAN

Asian Productivity Organization
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Environment Agency of Japan
Global Environment Department
1-2-2 Kasumigaseki, Chiyoda-ku,
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Global Environment Centre Fondation (GEC)
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KOREA

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Ministry of Environment
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Technology Promotion Division
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Korea
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UZBEKISTAN

USAID WEC
Pollution Prevention Center in Uzbekistan
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e-mail: . . tashkent@usaid.gov

CLEANER PRODUCTION PUBLICATIONS AVAILABLE FROM UNEP

The following publications are selected from the UNEP IE publication list available from: SMI (Distribution Services) Limited, P.O. Box 119 Stevenage, Hertfordshire SG1 4TP, England – Fax: +44 (1438) 748844

Audit and Reduction Manual for Industrial Emissions and Wastes. UNEP IE and UNIDO. Technical Report n°7. The manual is a practical working document intended for use within industry. It can be used by: factory personnel at all levels interested in upgrading their own processes, consultants reporting to an industrial client, government personnel reviewing existing factory operations. 127 p., 1991. FF 200/US$ 40.

Cleaner Production - A Training Resource Package, is a basic resource kit on cleaner production for persons who wish to teach on the subject. 1996, 110 p. *FF 600/US$ 120.*

Trainers Workbook on Cleaner Production in Leather Tanning, 1996, 120 p. *FF 600/US$ 120.*

Trainers Workbook on Cleaner Production in the Brewing Industry, 1996, 75 p. *FF 500/US$ 100.*

Trainers Workbook on Cleaner Production in Textile Wet Processing, 1995, 140 p. *FF 600/US$ 120.*

Cleaner Production in China: A Story of Successful Cooperation publicizes the results and benefits of a pioneering joint project between China and many international organizations with the objective of stimulating and encouraging similar partnerships in other parts of the world. 1996, 10 p. FF 40/US$ 8.

Cleaner Production in the Asia Pacific Economic Cooperation Region. This is a regional issue of the popular Cleaner Production Worldwide series, and includes 18 case studies from the APEC region, prepared under the sponsorship of the United States Environmental Protection Agency. 1994, 41 p. *FF 100/US$ 20.*

Cleaner Production Newsletter, a twice yearly bulletin distributed only as a supplement to the *Industry and Environment* review. Also available in French, Spanish and Chinese.

Cleaner Production Worldwide. This publication aims to show through examples that by applying cleaner production, industry and consumers anywhere in the world can gain environmental benefits while reducing costs. Volume I, 1993, 36 p. *FF 100/US$ 20*

Cleaner Production Worldwide, Volume II, In addition to "production process" examples, this publication contains case studies on product development and descriptions of several innovative programmes which promote cleaner production, 1995, 48 p. FF *100/US$ 20.*

Climate Change and Energy Efficiency in Industry, a joint UNEP IE/IPIECA publication, 1991, 64p. Free.

Company Environmental Reporting: A Measure of the Progress of Business and Industry Towards Sustainable Development, Technical Report n° 24, 118 p., 1994. Also available in French. Price FF 250/US$ 50.

Ecodesign: A Promising Approach to Sustainable Production and Consumption is a joint project by UNEP, Rathenau Instituut and Delft University of Technology. This manual helps companies incorporate ecodesign into their business and product design. 1997, 346p. FF 750/US$ 150.

Eco-Efficiency and Cleaner Production, Charting the Course to Sustainability. A joint UNEP/WBCSD publication, described the linkages of the cleaner production and eco-efficiency concepts, presents case studies from various countries and companies, and a list of recommendations to industry and governments. 1996, 17p. FF 100/US$ 20.

Environmental Codes of Conduct for Tourism, Technical Report n° 29, 70 p. 1995. FF 150/US$ 30.

Environmental Management in the Brewing Industry, Technical Report n° 33, 1996, 108 p. *FF 200/US$ 40.*

Government Strategies and Policies for Cleaner Production, provides guidance and information on the strategies and policies that governments can use to stimulate cleaner production in developing countries and economies in transition. This primer describes an effective overall strategy for starting a cleaner production programme. 1994, 32 p. *FF 100/US$ 20.*

The Industry and Environment Review: Quarterly review, which provides a forum for the exchange of research and experience, presenting articles written by and for industry managers, government officials and researchers in the field

of sustainable development. Subscription: US$45/year (Surface mail), US$60/year (air mail). UNEP IE. For subscription, write to UN Bookshop/Sales Unit, Palais des Nations, CH-1211 Geneva 10, Switzerland.

Transport and the Environment. Volume 16, no. 1-2. Price: FF 100/US$ 20.

Cleaner Production, highlights the findings of the Third UNEP High Level Advisory Seminar on Cleaner Production (Warsaw, Poland, October 1994), and includes a selection of written contributions. Volume 17, no. 4. 1994. FF 100/US$ 20.

Food Processing and the Environment. Volume 18 no.1. FF 50/US$ 10.

Environmental Management Tools, encompasses the search for innovation and cost-effective ways to improve industry's environmental performance. Volume 18, no. 2-3. 1995. FF 100/US$ 20.

The Construction Industry and the Environment. Volume 19, no. 2., 1996. FF50/US$ 10.

Environmental Management of Industrial Estates. Volume 19, no. 4. 1996. FF50/US$ 10.

Product Development and the Environment. Volume 20, no. 1-2. 1997. FF100/US$ 20.

Industrial Accidents: Prevention and Preparedness. Volume 20, no. 3, 1997. FF 100/US$ 10.

Life Cycle Assessment: What it is and How to do it, This publication is composed of two parts: the first is concerned with the concept, current practices and development of LCA; the second, examines the steps involved in makeing a LCA in a simple, systematic manner. 1996, 92p. *FF 200/US$ 40.*

The Textile Industry and the Environment. Technical Report no. 16. 120pp.1994. FF 175/US$ 35.

Other Journals And Newsletters

Because many cleaner production activities publish newsletters to disseminate information about their activities, you may wish to inquire about publications available from centres listed above. Below is a limited selection of newsletters and journals.

The ASEAN Quarterly on Pollution Prevention. The quarterly is published by the ASEAN Environmental Improvement Project, funded by the U.S. Agency for International Development. It highlights pollution prevention activities in the region including topics such as LCA, ISO 14000, and provides examples of success stories. For more information contact: Ms Julie Haines, US AEP, 1720 Eye Street, Suite 600, Washington DC 20006, tel: +1 202 835 0333, fax: +1 202 496 9720, email: jhaines@usaep.org

At the Source. This newsletter published by the Great Lakes Pollution Prevention Centre, highlights various pollution prevention activities in the North American region. For more information contact: GLPPC, 265 N. Front Street, Suite 112, Sarnia, Ontario, N7T 7X1, tel: +1 800-667 9790, fax: +1 519 337 3486, email: sarnia@glppc.org

Cleaner Technology. Published by the Danish Environmental Protection agency, the newsletter provides examples of successful policies for implementing cleaner technology, including topics such as "green" procurement. For more information contact: Danish EPA, Council for Recycling and Cleaner Technology, Strandgade 29, DK 1401 Copenhagen K, tel: +45 32 660100, fax: +45 32 66 04 79.

Cleaner Production in Central and Eastern Europe. Published by the OECD Non-Member Countries Branch of the Environment Directorate, this newsletter highlights on-going cleaner production activities, publications and upcoming events. For more information contact: EAP Task Force, Non-Member Countries Branch, Environment Directorate, OECD, 2 rue André Pascal, 75775 Paris CEDEX 16, France, fax: +33 01 45 24 96 71.

CSD Update. The UN Commission for Sustainable Development produces this newsletter which highlights national and international activities devoted to sustainable development. Activities related to the specific Agenda 21 chapters are also presented. For more information contact: CSD Room DC2-2252, United Nations, New York NY, 10017, tel: +1 212 963 3170, fax: + 1 212 963 4260, email: alvarez-rivero@un.org

Ecocycle. This newsletter on life cycle tools, management and product policy, is published bi-annually by Environment Canada. For more information contact: Environment Canada, Hazardous Waste Branch, Ottawa, Ontario, Canada K1A 0H3, tel: +1 819 997 3060, fax: +1 819 953 6881, email: kbrady@synapse.net (http://www.doe.ca/ecocycle)

Environmental Pollution Prevention Project News. Newsletter for the US AID-US EPA Environmental Pollution Prevention Project, providing updates on the EP3 centres and information on the overall program. Subscription information: EP3, 1530 Wilson Boulevard Suite 900 Arlington, VA, 22209-2406, U.S.A. Tel. (1 703) 351 4004. Fax. (1 703) 351 6166.

Environmental Technology Assessment. Newsletter of the Environmental Technology Assessment (EnTA)

Programme of UNEP IE. The newsletter is produced twice a year. For further information: UNEP IE, Paris, France.

Green Design. A quarterly newsletter published by the Sustainable Development Association, links sustainable development issues with product design. For more information: SDA, 4560 Mariette, Montreal Quebec H4B 2G2, tel: + 1 514 482 5033, fax: +1 514 482 6823, email: sda@grndsn.login.qc.ca

Green Product Design. Newsletter of the section for environmental product development, Faculty of Industrial Design Engineering, Delft University of Technology. Subscription information: Green Product Design, Jaffalaan 9, 2628 BX, Delft, The Netherlands. Tel. (31 15) 782 738. Fax. (31 15) 782 956. email: vos@io.tudelft.nl

Journal of Clean Technology and Environmental Sciences. A quarterly international journal devoted to pollution prevention and clean technology. Published by the International Association for Clean Technology, which aims to promote the research and application of clean technologies and methodologies. Annual membership of IACT includes a subscription to the journal of Clean Technology and Environmental Science, the IACT Newsletter, and access to the IACT Information Network (85 US$ to 250 US$). Further Information: IACT Secretariat, Rechte Wienzeile 29/3, A 1040 Vienna, Austria. Tel. (43 1) 567 487. Fax. (43 1) 314 182.

Journal of Cleaner Production. Quarterly journal, which is devoted to technologies, concepts, and policies for pollution prevention, waste minimization and cleaner production. Subscription: £ 125 (Europe), £ 135 (rest of world). Further information: Elsevier Science Ltd., The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB United Kingdom. tel: (44) 1865 843479/843781, fax: (44) 1865 843952

Loss Prevention Bulletin. Appears six times per year. Contains articles and case histories from process industries throughout the world. Subscription: £ 50 per year for universities. Subscription information: The editor, Loss Prevention Bulletin, Institute of Chemical Engineers, 165-171 Railway Terrace, Rugby, CV21 3HQ, England.

P2OST. A journal of the US National Pollution Prevention Roundtable. It highlights pollution prevention activities from around the United States and the latest national initiatives. For more information: The National Pollution Prevention Roundtable, 2000 P street, NW, Suite 708, Washington DC, 20036, tel: +1 202-4667272, fax +1 202-4667964. (http://es.inel.gov/nppr)

Pollution Prevention, European Edition. A journal for the protection of the Environment, which is published seven times a year. Published by MacDonald Communications, Inc. Subscription 90 US$ a year. Further information: Pollution Prevention, 90 Long Lane, Rickmansworth, Herts WD3 2YG, United Kingdom.

Pollution Prevention News. Quarterly newsletter of US Environmental Protection Agency. To be added on the mailing list, write: Pollution Prevention News, US EPA, 401 M Street SW (MC 7409), Washington, DC 20460, USA.

Pollution Prevention Review. Quarterly journal aimed at a wide range of readers. Each issue contains topics of current interest in pollution prevention, covering such areas as education, model programs, implementation techniques, and regulatory developments. Subscription information: Executive Enterprises Publications Co., Inc., 22 West 21st Street, 10th floor, New York, NY 10010 6904. Tel. (1 212) 645 7880, extension 208.

The Hazardous $ Solid Waste Minimization & Recycling Report. Monthly Newsletter on pollution prevention published by Government Institutes, Inc. Subscription: 252 US$/year. Subscription information: Government Institutes, Inc., 4 Research Place, Suite 200, Rockville, MD 20850, USA.

Technology Partnership Initiative News Bulletin. The newsletter highlights on-going activities of the UK initiative to promote cleaner technologies worldwide. Includes case studies of technology applications. Contact: Technology Partnership Initiative Secretariat, 151 Buckingham Palace Road London, SW1W 9SS, United Kingdom, tel: +44 171 215 1037, fax: +44 171 215 1089.

Waste Notes. A publication of the center for Waste Reduction Technologies (CWRT) of the American Institute of Chemical Engineers. Subscription information: Center for Waste Reduction Technologies, 345 East 47th Street, New York, NY 10017-2395 USA. Fax. (1 212) 752 3297.

Waste Reduction Bulletin. A monthly periodical for industry promoting hazardous waste reduction. Subscription information: Ontario Waste Management Corporation (OWMC). 2 Bloor St. West, 11th floor, Toronto, ON, M4W 3E2, Canada.

ELECTRONIC INFORMATION SOURCES: DATABASES AND WWW SITES

Cleaner production information is available electronically. Databases, for example, exist in a number of forms, including diskette. Others are hosted in an institution, which accepts requests to access information and responds to requests. Others can be accessed on the World Wide Web. To access "the web" one needs a subscription to Internet and a searching programme such as *Netsearch*, *Yahoo*, or *Lycos*. There are more than 700 servers dealing with environmental issues and every week new "pages" are set up, so check the web regularly for new and updated information.

Below are some examples of cleaner production databases, www servers, and software.

International Organizations

- ***Centre for Sustainable Design.*** (http://www.cfsd.org.uk) The goal is to facilitate discussion on environmental issues that affect design of products. It covers activities of the centre and highlights of international efforts.

- **Cleaner Production in Central and Eastern Europe**. (http:/www.oecd.org/env/eap) EAP Task Force, Non-Member Countries Branch, Environment Directorate, OECD, 2 rue Andre Pascal, 75775 Paris CEDEX 16, France, fax: +33 01 45 24 96 71.

- **Institute for Local Self-Reliance (ILSR)** (http://gopher.great-lakes.net:2200/0/partners/ILSR/ILSRhome.html) A nonprofit research and educational organization that provides technical assistance and information on environmentally sound economic development strategies, ILSR has information and publications on issues such as replacing petrochemicals with biochemicals and "green taxes."

- **International Institute for Sustainable Development.** (http://www.iisd.ca/linkages/) Information about conventions, conferences, and activities. Publications. Virtual Policy Dialogue.

- **Industrial and Technological Information Bank (INTIB)**. (http://www.unido.org/) INTIB is the United Nations Industry and Development Organization's (UNIDO) clearinghouse. Among other subjects, it contains information on cleaner production, clean technology and industrial energy saving efforts.

- **International Cleaner Production Information Clearinghouse (ICPIC),** UNEP IE. The ICPIC network includes a diskette version of cleaner production databases (case studies, publication abstracts, expert institutions, and resources available from UNEP IE). For availability contact UNEP IE. An email address, icpic@unep.fr allows users to pose questions to the Programme. Information about UNEP IE and selected ICPIC data is available on Internet at http://www.unepie.org

- **International Environment Technology Centre**. (UNEP IETC) (http://www.unep.or.jp) UNEP's Japan based IETC offers descriptions of environmental sound technologies (ESTs), institutions and experts in the field, other WWW EST sources, and case studies.

- **International Institute for Sustainable Development (IISD)** (http://iisd1.iisd.ca) A site containing various information on sustainable development, including a database.

- **International Register of Potentially Toxic Chemicals (IRPTC),** UNEP operates a Persistent Organic Pollutants (POPs) homepage (http://irptc.unep.ch/pops/) which provides status reports on POPs, activities of UNEP and other organizations. Also available are: a factsheet on Pollutant Release Transfer Registers, an OECD guidance manual on the same subject, and prior informed consent information. General information and the IRPTC Chemicals database is located at: http//irptc.unep.ch/pops.

- **Regional Environmental Centre** (http://www.rec.org/default.shtm) Focused on the needs of Central and Eastern Europe, the centre provides information on publications, training opportunities, research services, and other information sources.

- **Sustainable Product Development – UNEP Working Group**. (http://unep.frw.uva.nl) The page contains information about the Working Group's programme (including LCA and Eco-design issues), on-going activities in the field, examples of products, and a listing of relevant websites.

National Efforts

Australia

- **Environet Australia** (http:/www.erin.gov.au/net/environet.html). This is a network of databases available in Australia. It contains a listing of Australian environmental organizations, pollution prevention research and development activities, education opportunities and technology case studies.

- **Cleaner Production Case Studies Directory.** (http://www.erin.gov.au/portfolio/epg/environet/ncpd/ncpd.html) Provides case studies from various Australian industry sectors.

Austria

PREPARE (PReventive Environmental Protection AppRoches in Europe)
(http://www.rtc-cork.ie/rd/cleant/CleanTech/NETBACKU/PREPARE/Default.htm)
The overall objective of PREPARE is to identify the need for, and stimulate the initiation of new international, industry-oriented R&D; projects in the field of cleaner process technologies and cleaner product development. It is a group of experts from industry and research in 18 countries. They also conduct workshops.

Canada

- **Ecocycle** (http://www.ec.gc.ca/ecocycle)

- **Environment Canada's P2 Home Page** (http://www.ns.doe.ca/epb/index)

- **Canadian Centre for Pollution Prevention (C2P2),** formerly, the Great Lakes Pollution Prevention Centre. (http://c2p2.sarnia.com) This page, available in English and French, presents pollution prevention information in the North American region. Email: c2p2@sarnia.com

- **Canadian Pollution Prevention Information Clearinghouse (CPPIC)** (http://www.ec.gc.ca/cppic) Environment Canada's page will provide the latest information on pollution prevention technologies and sector-specific information.

- **Great Lakes Pollution Prevention Information Clearinghouse VENDINFO/TECHINFO** (http://es.inel. gov/cgi-bin/vendinfo.pl) (http://es.inel.gov/cgi-bin/techinfo.pl)

- **Great Lakes Information Network (GLIN)** (http://www.great-lakes.net) GLIN is a collaborative project of agencies and organizations in the binational Great Lakes region to link data, information, and people via the Internet. Includes a list of cooperating agencies and organizations, regional news, and a Great Lakes Reference Desk.

- **Great Lakes Regional Environmental Information System (REIS)** (http://epawww.ciesin.org/glreis/GLREIS-home. html) This is a regional environmental directory and data access system being developed with support from U.S. EPA. It features a directory search and data set guides.

- **P2Tech - Pollution Prevention Archive** (http://www.great-lakes.net) Provides access to P2 files on a variety of subjects. However, these are not in hypertext.

France

- **ARIST - Bourgogne.** (http://bourgogne.arist.tm.fr) Cleaner Production information from the Burgundy region of France. The web page, maintained by the Burgundy Regional Chamber of Industry and Commerce (CRCI), contains industry-specific cleaner production information and references for "centres of expertise" in the cleaner production field. The page is in French.

- **Office Internationale de L'eau.** (http://www.oieau.fr) The page contains a number of cleaner production databases. The page is in French.

Ireland

- **Clean Technology Centre Homepage: Clean Technology, Cleaner Production.** (http://www.rtc-cork.ie/rd/cleant/ CleanTech/NETBACK/About.htm) The CTC's main objective is to advise and assist industry, public authorities and governments on the adoption of waste minimization techniques, clean technologies and cleaner production methods. This site develops case studies of the Clean Technology Centre and gives other useful environmental internet sites.

Thailand

- **Thailand Environment Institute.** (http:\\www.tei.or.th) The non-profit Institute covers a number of projects that promote cleaner production.

The Netherlands

- **IVAM Environmental Research.** (http://www.ivambv.uva.nl)

United States

- **Center of Excellence for Sustainable Development.** (http://www.sustainable.doe.gov)

- **Center for Technology Transfer and Pollution Prevention (CT2P2)** (http://ingis.acn.purdue.edu: 9999/cttpp/cttpp.html) The CT2P2 has developed a series of over 30 PC-based computer programs on various aspects of the environment and pollution prevention. These programs can be downloaded and include topics on groundwater education, management of domestic wastes, and pesticide storage.

- **CERES Global Knowledge Network** (http://www.cerc.wvu. edu/ceres/ceres_index.html)

- **Envirofacts** (http://www.epa.gov/docs/enviro/html/ef_home. html) A U.S. EPA relational database that integrates data from four major EPA program systems: permit compliance system (PCS), CERCLIS, TRIS, RCRIS.

- **Envirogate (Environmental Technology Gateway)** (http://iridium.nttc.edu/environmental.html) As part of the National Technology Transfer Center (NTTC) home page, Envirogate contains news, programs, technologies, and resources – including Web links to many other environmental sites.

- **Envirolink.** (http://www.envirolink.org/index1.html) Based in the United States, it is a major source of information on environmental issues including sustainable development. Provides access to various databases and clearinghouses. Full publications are also available.

- **Enviroene**, (http://es.epa.gov) maintained by U.S. Environmental Protection Agency and the Strategic Environmental Research and Development Program contains information on cleaner production (pollution prevention), such as descriptions of state and federal (U.S.) programmes, technical case studies, and information on related national and international initiatives. It is also accessible via Bulletin Board System (BBS). For further information on Enviroene, contact Kevin E. Twitchell at (1 208) 526 6956, or email: twi@inel.gov.

- **Enviroene International Cooperative for Cleaner Production**. (http://www.envirosense.com/cooperative/ international) This page is part of the USEPA sponsored Envirosense web site. It is a collection of information on international cleaner production activities. It includes activity descriptions, links to other relevent pages and listings of experts.

- **Hazardous Waste Research and Information Center** (HWRIC) (http://www.inhs.uiuc.edu/hwric/hmlhome.html) A division of Illinois' nonregulatory environmental agency, the Department of Energy and Natural Resources, HWRIC services include clean manufacturing and pollution prevention technical assistance. An online publications listing is available.

- **National Pollution Prevention Center for Higher Education** (NPPC) (http://www.umich.edu/~nppcpub/nppc.html) Created by US EPA and based at the University of Michigan, NPPC collects, develops, and disseminates educational materials on pollution prevention. The target audience is primarily academia.

- **National Pollution Prevention Roundtable Homepage**. (http://es.epa.gov/nppr) The U.S. Roundtable's homepage has information on pollution prevention experts, a "yellow page" of national activities, (with links), publications and highlights of state and national level activities.

- **Pacific Northwest Laboratory's Design for Environment Page** (http:/p2.pnl.gov.2080/DFE)

- **Pacific Northwest Laboratory's Guide To Buying Green** (http://www.pnl.gov:2080/esp/greenguide)

- **SAGE – Solvent Alternatives Guide** (http://clean.rti.org) Maintained by the US EPA, the page provides information on solvent and process alternatives for parts cleaning and degreasing. Includes a comprehensive listing of existing and new cleaning technologies, ideas for minimizing waste, listing of state technical assistance providers, and a process conversion checklist.

- **Tellus Institute** (http://www.tellus.com/) A non-profit research and consulting organization devoted to resource management and environmental issues. Includes P2 information on total cost assessment and life-cycle assessment.

- **Toxic Use Reduction Institute (TURI) P2GEMS** (http://www.uml.edu/turi)

- **UC Berkeley's Center for Green Design and Manufacturing** (http://euler.berkeley.edu/green/cgdm.html) Provides up-to-date information on UCB's Green Design program, which focuses on software and other design tools for the manufacturing industry. Summaries of past publications, current work and upcoming papers are provided.

- **UCLA's Center for Clean Technology (CCT)** (http://cct. seas.ucla.edu) This site provides an overview of CCT's research programs. Pollution prevention research includes a strong focus on process industries and chemical engineering.

- **US EPA Office of Air Pollution Prevention Programs** (Green Star, etc) (http://www.epa.gov/docs/GCDOAR/OAR-APPD.html)

Industry Initiatives

- **Chrysler** (http://inhs.uiuc.edu/wmrc/gov/1995/chrysler.html) Provides information on Chrysler's recycling & conservation programs, and on the company's efforts in building flexible-fuel vehicles.

- **Ciba-Geigy** (http://es.inel.gov/elp/ciba.html) Provides a policy statement about the company's commitment to environmental responsibility.

- **Global Environmental Management Initiative (GEMI).** (http://www.gemi.org/gemi/index.html) GEMI is a group of companies dedicated to helping business achieve environmental, health and safety excellence.

- **Green Sources of Construction Materials** (http://www. ran.org/ran/ran_campaigns/rain_wood/wood_con/wood_sources.html) A directory of listings for suppliers of innovative building materials and recycled/salvaged lumber, certification of "sustainably" produced lumber, and alternative housing builders.

- **NORTEL Habitat (Northern Telecom)** (http://www.nortel.com:80/home/search/toc.html) An online platform for corporate environmental issues. Browsers can obtain information ranging from international environmental standards to measuring a company's environmentalism.

- **United Technologies** (http://www.utc.com/) Provides information on the corporation's environmental policies and programs, and applications of P2 in its manufacturing programs.

Software

- **SimaPro.** (http:www.pre.nl)(email: info@pre.nl) This software is a tool to analyze and develop environmentally sound products. Using a life cycle approach, the software provides a methodology to weigh environmental effects that can be used at the product design level. For more information contact: PRe - product ecology consultants, Plotterweg 12, 3821 BB Amersfoort, The Netherlands, tel: +31 33 4555022, fax: +31 33 4555024.

Additional information about UNEP in general

UNEP Headquarters. (http://www.unep.no) The main source of information about UNEP. Publications. Gopher. Routed by Norway.

UNEP Geneva Center. (http://www.unep.ch) A reference for publications and convention. Full documents and user statistics available.

UNEP Collaborating Centre on Energy and Environment. (http://www.risoe.dk/ sys/syshom3.html)

AUDIOVISUALS

There are a number of videos on cleaner production and waste prevention available today. Most of these have been produced to introduce national programmes, such as those in Canada, The Netherlands, the USA, the United Kingdom, and elsewhere. Their use in general programmes on cleaner production should take these national origins into account.

Title: Application of Clean Technology in Small Electroplating Shop in Bangkok
Language: English
Year: 1993
Length: 33'00"
Producer: Asian Institute of Technology
Distributor: Asian Institute of Technology, Environmental Engineering Division; GPO Box 2754, Bangkok 10501, Thailand. Summary: This video presents a project on industrial pollution control applications for small and medium scale electroplating enterprises. The environmental problems in the current systems are presented as well as several clean solutions. A study lasting 10 days was carried out and the results are presented. Every solution is highlighted as well as the resultant savings. Suitable for a semi-specialized audience.

Title: Cleaner Production Technology for Electroplating Industry
Language: English
Year: 1997
Length:
Produced by: The Hong Kong Productivity Council
Distributed by: The Hong Kong Productivity Council. 78 Tat Chu Ave. Kowloon. TST P.O. Box 99027. Hong Kong. Tel: +852 2788 5678. Fax: +852 2788 5900.

Title: Cleaner Production – The bottom line
Language: English
Year: 1994
Length: 15'00"
Produced by: the Australian National University, Instructional Resources Unit for the Commonwealth Environmental Protection Agency
Distributed by: Public Affairs & Education Section. 40 Backall Street, Barton ACT 2600. P.O. Box E305 Queen Victoria Terrace ACT 2600 Australia. Tel. (63-06) 274 1999. Fax. (63-06) 274 1666.

Title: Cleaner Technology – The way to a better environment
Language: English
Year: 1992
Produced by: Lars Brydesen Film
Distributed by: Lars Brydesen Film, Lochersvej 15, 3100 Hornbaek, Denmark. Tel. (45-45) 22 002 84
Fax. (45-45) 87 27 05.

Title: The Competitive Edge
Language: English
Length: 17'00"
Produced by: OWMC Canada
Distributed by: Ontario Waste Management Corporation (OWMC). 2 Bloor St. West, 11th floor, Toronto, ON, M4W 3E2, Canada.
Summary: This video explains the purpose and the major steps in a waste audit. Good teaching material. Specialist audience.

Title: Cleaner Production Highlights in Developing Countries
Language: English
Length:
Produced by: United Nations Industrial Development Organization (UNIDO)
Distributed by: UNIDO, Vienna International Center, P.O. Box 300, A-1400 Austria.
Summary: Included with video, which highlights cleaner production in developing countries, are manuals on cleaner production and the final report of the D.E.S.I.R.E. (DEmonstration in Small Industries for Reducing WastE) project.

Title: Ecoprofit, Ecological Project For Integrated Environmental Technology, Graz, Austria
Language: German, English
Year:
Length: 15'00"
Producer: Hadler Film, Graz, Austria,
Distributor: Magistrat Graz - Amt für Umweltschutz, Griesgasse 11, A - 8011 Graz
Austria, tel: + 43 316 872 43 02
Summary: This short film is part of a promotional project for integrated environmental technology which includes cleaner production. Based on three case studies from three different sectors (printing industry, garage, office work), it illustrates that pollution prevention can pay. Designed for a general audience.

Title: Generating Options For Tomorrow, Clean Coal Technologies
Language: English
Year: 1995
Length: 28'00"
Producer: Paul Ellis Associates
Distributor: The World Coal Institute, 3 Logan Place, Kensington, London W8 6QN, United Kingdom, tel: + 44 171 373 0799, fax: + 44 171 835 1408
Summary: This video examines the current status of the Clean Coal Technologies available for the production and utilization of coal. Topics covered include: flue gas clean-up – covering particulates and SOx & NOx, conventional and advanced pulverized fuel combustion, fluidised bed combustion – including CFBC/PFBC, coal gasification - covering integrated gasification combined cycle (IGCC).

Title: Going Green Makes Cents: Environmental Management in Hotels
Language: English
Year: 1995
Length: 15'00"
Produced by: International Hotels Environment Initiative, Prince of Wales Business Leaders Forum; 5 Cleveland Place, St James's, London, SW1Y 6JJ, UK, tel: +44 171 321 6407, fax: +44 171 321 6480.

Title: Greenbucks, the Challenge of Sustainable Development
Language: English
Year: 1995
Length: 55'00"
Producer: Gabriel Kelly and Nick Hart-Williams
Distributor: Nexus Television Ltd, 24 Scala Street, London W1P 1LU, United Kingdom, tel: + 44 71 580 2312, fax: + 44 71 580 2308.
Summary: This video is designed to sensitize industry, legislators and the public to the cleaner production applications. It gives a very good up-to-date survey of the environmental problems industry is facing today. It features interviews with industry experts and leaders from all over the world (Asea Brown Bovery, Volkswagen, Du Pont etc). Emphasis is made on shifting the end of pipe paradigm to cleaner production in order to find solutions for small, medium and big enterprises. Suitable for a general audience.

Title: Les fluides de coupe, fabrications métalliques
Language: French
Year: 1995
Length: 8'00"
Producer: A.C.C.I.W.
Distributor: Association des Chambres de Commerce et d'Industrie de Wallonie, Place de Rijkmans 28, 5000 Namur, Belgium, tel: + 32 81 74 18 98, fax: + 32 81 74 18 99.
Summary: This video explains what cutting fluids are and how they are used. It provides an overview of the Wallonian Region regulations on these oils and gives advice which highlights cleaner production applications, primarily good housekeeping. This video is designed to sensitize industry leaders to the problems of the cutting fluids. Promotional video for a general audience.

Title: L'eau, industrie agro-alimentaire
Language: French
Year: 1995
Length: 8'00"
Producer: A.C.C.I.W.
Distributor: Association des Chambres de Commerce et d'Industrie de Wallonie, Place de Rijkmans 28, 5000 Namur, tel: + 32 81 74 18 98, fax: + 32 81 74 18 99. Belgium.
Summary: This short video provides an overview on ways to reduce water consumption in the agro and food processing industry. It also briefly presents the water regulations in the Wallonia Region of Belgium. It is designed to sensitize industry to the water over consumption problem in this sector and to promote cleaner production. Promotional video for a general audience.

Title: Milieuborging bij hoogovens
Language: Dutch, English
Year: 1989
Length: 21'30"
Producer: Mark & Remark Communications BV.
Distributor: Mark & Remark Communications BV, Adviesburo, Voor Reklame & PR.
Summary: This video provides a short overview of the environmental problems facing Dutch industry. It highlights cleaner production applications, primarily good housekeeping, in typical Dutch industries. It briefly presents some case studies. Promotional video for a general audience.

Title: Money Down the Drain
Language: English
Year: 1986
Length: 17'00"
Produced & Distributed by: Ontario Waste Management Corporation (OWMC). 2 Bloor St. West, 11th floor, Toronto, ON, M4W 3E2, Canada.
Summary: This video presents 4 examples of cleaner production initiatives that also reduce costs. Suitable for a technical audience.

Title: National Cleaner Production Centres
Language: English
Year: 1996
Length: 9'00"
Produced & Distributed by: UNIDO Environment and Energy Branch
P.O. Box 300 A-1400 Vienna, Austria
Summary: This video presents an overview of the UNIDO-UNEP National Cleaner Production Centre (NCPC) programme and its activities.

Title: Pollution Prevention : a) PPRB Research Programmes, b) Less is More: Pollution Prevention is Good Business, c) In Partnership with Earth: The Future of the Environment, d) Beyond Business As Usual: Meeting the Challenge of Hazardous Waste, e) Rinsing Process Modifications for Metal Finishers
Language: English
Year: 1993
Length: a) 23'00", b) 23'00", c) 60'00", d) 28'30", e) 30'00"
Produced & Distributed by: USEPA, Cincinnati, Ohio 45268
Summary: This videotape containing 5 pollution prevention films produced by various EPA organizations, was put together by the Pollution Prevention Research Branch (PPRB) of the US EPA's Office of Research and Development. The films promote pollution prevention by highlighting selected success stories from both industry and the public sector.

Title: Pollution Prevention – The Swedish Experience
Language: English, Swedish
Year: 1993
Length: 21'00"
Producer: TEM.
Distributor: Foundation of Technology, Environment and Management (TEM), University of Lund, Asumsgatan 38, S-275 37 Sjöbo, Sweden, tel: + 46 41 627 300, fax: + 46 41 62 7312
Summary: This video is designed to sensitize the public to cleaner production applications. It describes some results from the Landskrona project, a pilot project for the implementation of pollution prevention in small and medium-sized enterprises. Suitable for a general audience.

Title: PREPARE for Tomorrow
Language: English
Length: 15 min.
Producer: Dutch Ministry of Economic Affairs, The Netherlands Organization of Technology Assessment
Distributor SDU/DOP, Rooseveltstraat 52-56, 2321 BM Leiden, The Netherlands.

Title: Recyclage des materiaux, construction
Language:French
Year: 1995
Length: 8'00"
Producer: A.C.C.I.W.
Distributor: Association des Chambres de Commerce et d'Industrie de Wallonie Place de Rijkmans 28, 5000 Namur, Belgium, tel: + 32 81 74 18 98, fax: + 32 81 74 18 99
Summary: This video provides a short overview on recycling in the construction sector. It briefly presents the regulations in Wallonia, highlights the advantages of recycling and finishes with advice for the people who work in this field (cleaner production). Promotional video for a general audience.

Title: Second Victory at Yorktown
Language: English
Year: 1992
Length: 31'00"
Producer: U.S. EPA
Distributor: U.S. Environmental Protection Agency, Office of Pollution Prevention & Toxics, 401 M Street, S.W. (PM-222B), Washington, DC 20460, United States, tel: + 1 202 260 27 26, fax: + 1 202 260 01 78.
Summary: This video presents a project conducted by Amoco Oil Company and the U.S. Environmental Protection Agency. It shows how the Yorktown Amoco Oil Refinery turned to cleaner production technologies and applications in order to reduce emissions. The whole process from measurements to installation is followed. It is an interesting general film. Suitable for a general audience.

Title: Training course: Practical Pollution Prevention and Control Options for the Electroplating Industry
Language: English
Year: 1991
Length: 80'00"
Producer: Asian Institute of Technology
Distributor: Asian Institute of Technology, Environmental Engineering Division; GPO Box 2754, Bangkok 10501, Thailand.
Summary: This is a video program on practical pollution prevention for the electroplating industry. It is a comprehensive training module composed of four parts. The first part provides general information about the metal finishing processes and the environmental impact of electroplating industry. The second part presents clean technologies and waste minimization techniques. The third part focuses on waste water treatment. The last part highlights special metal recovery and disposal technologies. Effective training course, suitable for a semi-specialized audience.

Title: The Value of Cleaner Production
Language: English
Year: 1995
Length: 47'00"
Produced and distributed by: the Legal Resources Trust, P.O. Box 11 248, Wellington, New Zealand, tel: +64 4 801 7066.

TRAINING COURSES AND INSTITUTES

The following organizations offer cleaner production courses. They were compiled in conjunction with the UNEP Working Group on Education. (For more information contact: Prof. Dr. Michael Sogaard Jorgensen, Department of Technology and Social Science, Building 322, DK 2800 Lyngby, Denmark. Tel: (45 45) 93 66 77, Fax: (45 45) 88 12 91.

Asian Institute of Technology (AIT). The Continuing Education Center conducts short-term training programmes for career professionals, academics and executives of public and private organizations. Among others they organize a course on Waste Avoidance and Minimization in Industry (Clean Technologies). This course aims to help the participants relate the concept of and introduce clean technologies in the practice of industrial waste management. Further information: Continuing Education Center, Asian Institute of Technology. GPO Box 2754, Bangkok 10501, Thailand. Tel. (662) 524 5244/5270. Fax. (662) 516 1418/2126.

Erasmus Centre for Environmental Studies. This centre has an international PhD programme in cleaner production and sustainability. It also organizes a course on cleaner production. Further information: Erasmus University, Erasmus Centre for Environmental studies, P.O. Box 1738, Burgermeester Oudlaan 50, 3000 DR Rotterdam, The Netherlands. Tel. (31-10) 408 2050. Fax. (31-10) 212 0834.

European Postgraduate Course in Environmental Management (EPCEM). The EPCEM is a one-year full-time course. It is organized by the inter-disciplinary departments of environmental science of the Agricultural University of Wageningen, Leiden University, the Free University of Amsterdam, and the University of Amsterdam. The EPCEM provides its participants with knowledge and insight in the different interests and aspects which play a role in the development and evaluation of potential solutions for environmental problems. Further information: EPCEM secretariat, IVAM, Interfaculty Department of Environmental Science, University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ, Amsterdam, The Netherlands. Tel. (31-20) 525 6232/6206. Fax. (31-20) 525 6272.

Hanoi University of Technology. The University offers a number of cleaner production activities in the Environmental Engineering Department. For more information contact: Centre of Environmental Science and Technology, Contact: Dr. Prof. Dinh Van Sam, DHBKHN, 1 Dai Co Viet Rd, Hanoi, Viet Nam. Tel: (84 4) 691 466, Fax: (+84-4) 692 006/693 551.

International Institute for Industrial Environmental Economics. The institute in conjunction with Lund University offers a one-year Master of Science degree in Cleaner Production. Further information: IIIEE, Lund University, PO Box 196 Tegnersplatsen 4, S -221 00 Lund, Sweden, Tel: (46) 46 222 0200, Fax: (46) 46 222 0210. Email: iiiee@envecon.lu.se.

International Association for Clean Technology (IACT). The IACT promotes research and application of cleaner technology and methodology. It convenes workshops and congresses to demonstrate the technical, environmental, and economic aspects of cleaner production. IACT International Secretariat. Rechte Wienzeile 29/3. A-1040 Vienna, Austria. Tel. (43-1) 56 74 87. Fax. (43-1) 31 41 82.

Johannes Kepler Universitat Linz. The University provides ecologically oriented business strategies and product design, industrial material flow management, and ecologically oriented accounting and control. For more information contact: Department of Ecology and Politics, Prof. Dr. Adolf H. Malinsky, Altenbergerstrasse 69, A-4040 Linz, Austria. Tel: (43) 732 246 8833, Fax (43) 732 246 88 22, Email: malinsky@oeko.uni-linz.ac.at.

Kaunas University of Technology. Offers environmental engineering and environmental systems courses. For more information contact: Institute of Environmental Engineering, Prof. Dr. Jurgis Staniskis, K. Donelaicio 20, 3000 Kaunas, Lithuania. Tel: (370) 7 209372, Fax: (+370) 7-209372.

Lund University. Offers graduate courses leading to a M.Sc. in Environmental Management and Policy. There is a 100% emphasis on Cleaner Production. For more information contact: International Institute for Industrial Environmental Economics. P.O. Box 194. Tegnersplatsen 4. S-221 00 Lund, Sweden.

Nankai University. The faculty offers courses in environmental science including environmental chemistry and biology. For more information contact: Department of Environmental Science, Mr Zhu Tan, 300071 Tianjin, China, (86 22) 350 1512, Fax: (86 22) 334 4853, Email: fengcb@bepc2.ihep.ac.cn.

National University of Malaysia. The University offers courses in environmental and chemical engineering. For more information contact: Engineering Faculty, Dr. Rakmi Adb. Rahman, 43600 Bangi, Malaysia. Tel: (60) 3 825 1000, Fax: (60) 3 825 2546.

RMIT. Faculty of Engineering. A three-year part-time course, leading to the title of Master of Engineering in Cleaner Production, is provided at the RMIT. Further information: Faculty of Engineering, RMIT, GPO Box 2476V, Melbourne 3000, Australia. Tel. (61 3) 660 3261. Fax. (61 3) 663 7873.

Technical University of Denmark. The University offers a postgraduate certificate programme within environmental management. For more information contact: Department of Technology and Social Science, Prof. Dr. Michael Sogaard Jorgensen, Building 322, DK 2800 Lyngby, Denmark. Tel: (45 45) 93 66 77, Fax: (45 45) 88 12 91.

Technical University of Graz. The university offers courses on cleaner production out of the chemical and process engineering departments. For more information contact: Abteilung Grundlagen der Verfahrenstechnik, Prof. Dr. Hans Schnitzer, Inffeldgasse 25, A-8010 Graz, Austria. Tel: (43 316) 873 7461, Fax: (43 316) 873 7469.

Training Centre for Sustainable Management. The Centre, in conjunction with the University of Delft provides training in the areas of cleaner production, sustainable product development, and total cost accounting. Further information: Mr. Raoul de Wijn, TRIA, Grote Markstraat 24, 2511 BJ The Hague, The Netherlands. Tel: (31 70) 3464422. Fax: (31 70) 3623469, E-mail: tria@knoware.nl

Tufts University. There are cleaner production courses offered within the civil and environmental engineering departments. For more information contact: Department of Civil and Environmental Engineering, Dr. Robert B. Pojasek, 1021 Main Street, MA 02155 Medford, Massachusetts, USA. Tel: (1) 617 721 4097, Fax: (1) 617 721 4073.

University of Amsterdam. The European Postgraduate Course in Environmental Management (EPCEM) is a one-year full-time course organized by the Agricultural University of Wageningen, Leiden University, the Free University of Amsterdam. The EPCEM provides its participants with knowledge and insight in the different interests and aspects which play a role in the development and evaluation of potential solutions for environmental problems. Further information: EPCEM secretariat, IVAM, Interfaculty Department of Environmental Science, University of Amsterdam, Plantage Muidergracht 14, PO Box 18180, 1001 ZB Amsterdam, The Netherlands. Tel.(31-20) 525 5918. Fax. (31-20) 525 5850.

University of Bremen. The university offers courses on industrial environmental management. For more information contact: Faculty of Economics, Department of Production Management, Prof. Dr. Hans Dietrich Haasis, P.O. Box 330440, Bibliothekstrasse, D-28334 Bremen, Germany. Tel: (49 421) 218 2044, Fax (49 421) 218 7422.

University of California. Courses are available from the chemical engineering, environmental reaction, engineering, pollution prevention, life cycle analysis, and environmental policy departments. For more information contact: Department of Chemical Engineering, Pollution Prevention, Education Research Centre, PPERC, 5531 Boelter Hall, 405 Hilgard Ave, CA 90024 Los Angeles, California, USA. Tel: (1) 310 206 0300, Fax: (1) 310 206 4107.

University of Dundee. The University offers cleaner production oriented courses from the accountancy and business finance perspective. For more information contact: Accountancy and Business Finance, Prof. Robin Hugh Gray, DD1 4HN Dundee, United Kingdom, Tel (44) 382 344789, Fax: (44) 382 244 19.

University of Massachusetts, Lowell. Courses offered cover toxic use reduction, as well as other environmental areas. For more information contact: Centre for Sustainable Production, Dr. Jack Luskin, 1 University Ave., Lowell, Massachusetts 01854, USA. Tel: (1) 508 934 3262, Fax: (1) 508 934 3050.

WRITAR – Waste Reduction Institute for Training and Application Research. WRITAR is a non-profit waste reduction research and training organization. It has a training center dedicated to the dissemination of pollution prevention information and techniques. Includes training in "train-the-trainers" techniques. Further information: Writar, Center for Excellence in Pollution Prevention Training, 1313 5th Street SE, STE 325, Minneapolis, MN 55414-4503, USA. Tel. (1-612) 379 5995. Fax. (1-612) 379 5996.

TRAINING SUPPORT MATERIALS

Also see available publications which include training materials. *The United States Environmental Protection Agency (US EPA) has published many cleaner production (US EPA uses pollution prevention) documents. Further information: Pollution Prevention Information Clearinghouse, US EPA. 401 M Street, SW. PM-211A, Washington, D.C. 20460. USA. Tel. 1 202 260 1023. Fax. 1 202 260 0178.*

Cleaner Production: Theories, Concepts and Practice, Reader 1992. Editor Prof. Dr. D. Huisingh. Published by Stichting Syllabi, Erasmus University (1993); Burgermeester Oudlaan 50, 3062 PA Rotterdam, The Netherlands.

Curriculum for Toxics Use Reduction Planners. Sixth Edition. The curriculum is designed to encourage participants to re-examine conventional approaches to production management and environmental protection. The manual is intended to serve as the basis for an advanced educational program for the training of Toxics Use Reduction Planners. The targeted audience are technically experienced professionals and production managers. Published by the Toxic Use Reduction Institute, University of Massachusetts at Lowell (1994). One University Ave., Lowell, Massachusetts 01854, USA.

Demonstration in Small Industries for Reducing Waste (DESIRE) From Wastes to Profits: Experiences, Guidelines, Film. This project carried out by UNIDO and the NCPC in India, is the result of various cleaner production demonstrations projects carried out in small- and medium-sized industries. The written materials outline the project and what works and what does not in promoting cleaner production. There is also a video with good examples of SMEs in developing countries. For more information contact: Industrial Sectors and Environment Division, UNIDO, P.O. Box 300, A-1400 Vienna, Austria. Tel: +431 211310, fax: +431 21131 6803.

Environmental Assessment of Products. A Course on Life Cycle Assessment. Editor: Bo Pedersen. This book is an introduction to the practical application of product life cycle assessment to be used for the education of engineers and other practitioners in training courses and institutes of higher education. Published by UETP-EEE. The Finnish Association of Graduate Engineers TEK Ratvartijankatu 2, SF-00520 Helsinki, Finland (1993). ISBN 951-9110-83-6.

Facility Pollution Prevention Guide (1992). This guide is written for those responsible for implementing pollution prevention in their facilities. It is intended to help small- to medium-sized production facilities develop broad-based, multimedia, pollution prevention programmes. It describes how to identify, assess, and implement opportunities for preventing pollution and how to stimulate the ongoing search for such opportunities. Published by US Environmental Protection Agency, Office of Research and Development, Washington, DC 20460. Document number: EPA/600/R-92/088.

Hazardous Waste Minimization. H. M. Freeman. This book is designed to assist individuals in private companies and public agencies in identifying and pursuing options for waste minimization. Publisher: McGraw-Hill Publishing Company, 1990. ISBN 0 07 022043 3.

ICHEME. The Institution of Chemical Engineers developed a slide training package on environmental auditing (see section 4.4). Further information: Safety Health and Environmental Department, Institution of Chemical Engineers, Davis Building. 165-171 Railway Terrace, Rugby CV 21 3HQ, UK. Tel. (44 788) 578 214. Fax. (44 788) 560 833.

Pollution Prevention: Homework & Design Problems for Engineering Curricula. By D. T. Allen, N. Bakshani and K. Sinclair Rosselot. The book is designed to be integrated into existing courses leading to chemical and other undergraduate engineering degrees. However, the manual has proved useful to others in industry and environmental fields as well. Published by American Institute of Chemical Engineers Center for Waste Reduction Technologies (1992). ISBN 0-8169-058-1-9. Copies can be ordered through the AIChExpress Service Center, 2345 East 47th Street, New York, NY 10017-2395, USA. ALChemE; fax. +1 212 705 8400.

Pollution Prevention Implementation in Developing Countries. J.S. Hirschhorn. Duke University Center for Tropical Conservation. P.O. Box 90381. Durham, NC 27708-0381, USA. Tel. (1 919) 490 9081. Fax. (1 919) 419 1433.

Prepare. Editors: S. de Hoo, H. Brezet, M. Crul, H. Dieleman. The PREPARE box includes a video, a manual, worksheets, and the PREPARE Experience binder. The package focuses on exploring the opportunities to prevent waste and emissions that are present within existing companies. It is a source of ideas for the development and bringing into practice of a waste and emission prevention programme. Published by the Dutch Ministry of Economic Affairs (1991). ISBN 90 346 2565 6. Available from

SDU/DOP, Rooseveltstraat 52-56, 2321 BM Leiden, The Netherlands. Tel. (31 71) 352 500.

Project Casework on Waste Minimization in Textile Dyeing Industry, 1993. This training material has been developed to support the Project on Industrial Pollution Control Applications for Small and Medium Scale Industries (IPCA) in Bangkok, Thailand, and to find suitable case material that can illustrate to factory owners the benefits and incentives of waste reduction, reuse, and recycling in their own workplaces. Further information: Carl Duisberg Gesellschaft, South East Asia Program Office, Bangkok, Thailand.

Prosperity without Pollution. The prevention strategy for industry and consumers. J. S. Hirschhorn, K.I. Oldenburg. This book explains why only the preventive environmental strategy can work, because growing population, consumption, and industrialization cripple current remedial efforts. Published by Van Rostrand Reinhold (1991); 115 Fifth Avenue, New York. NY 10003, USA. ISBN 0 442 00225 4.

Teaching those Humans to Learn. Creative Approaches to Pollution Prevention Training. The manual contains descriptions of interactive pollution prevention problem-solving exercises. These can be used to train public policy staff and/or regulators about the concepts of pollution prevention and at the same time heighten participants' awareness of the challenges of implementing prevention activities industry. Published by US EPA, Office of Pollution Prevention (1991). 401 M Street S.W., Washington, D.C. 20460, USA.

Training Course: Ecologically Sustainable Industrial Development. This training kit contains 10 separately bound Learning Units, a video cassette with seven films, two floppy discs, an audio cassette and, for supplementary reading, two booklets and a manual. The training course is designed for UNIDO staff, but it is suitable for all staff of the United Nations as well as for anyone interested in industrial development. Available from UNIDO, Environment Coordination Group, P.O. Box 300, A-1400 Vienna, Austria.

United Nations Environment Programme Industry and Environment Centre

The United Nations Environment Programme's Industry and Environment Centre (UNEP IE) was established by UNEP in 1975 to bring industry and government together to promote environmentally sound industrial development.

The mission of UNEP IE is "to encourage the development and implementation of industrial policies, strategies, technologies and management practices that contribute to sustainable development by making efficient use of natural resources as well as by reducing industrial pollution and risk".

The goals of UNEP IE are to:

- build consensus for preventive environmental protection through cleaner and safer industrial production and consumption;
- help formulate policies and strategies to achieve cleaner and safer production and consumption patterns, and facilitate their implementation;
- define and encourage the incorporation of environmental criteria in industrial production;
- stimulate the exchange of information on environmentally sound technologies and forms of industrial development.

To achieve these goals, UNEP IE has developed seven work programme areas: Cleaner Production, Safer Production (Awareness and Preparedness for Emergencies at the Local Level – APELL), Industrial Pollution Management, Environmental Technology Assessment (EnTA), Energy, Tourism and protection of the ozone layer (OzonAction).

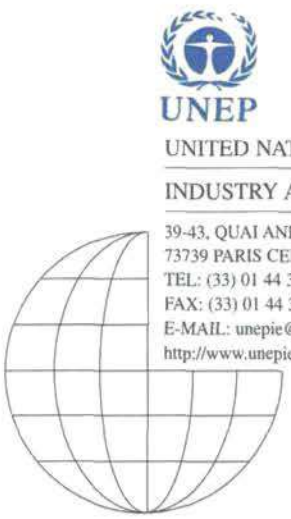
UNEP IE organizes conferences and seminars, undertakes training activities and demonstration projects, and produces practical supporting publication, such as the *Industry and Environment* quarterly review and the technical report series, as well as other handbooks and training materials which provide practical information to decision-makers throughout the world. UNEP IE also uses new delivery mechanisms (diskettes, WWW), to render the information more accessible.

UNEP IE develops partnerships with industry, government, non-governmental, and other international organizations, organizes consultative meetings between industry, NGOs and other partners on issues of mutual interest.

What to do next?

There is a variety of information and advice available from the United Nations Environment Programme at:

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Fax: +33 1 44 37 14 74
Email: unepie@unep.fr
Telex: 209 997F
Cables: UNITERRA PARIS
http://www.unepie.org



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http://www.unepie.org/home.html