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Elizabeth Dowdeswell,
United Nations Under Secretary General and Executive Director, UNEP

When we met in the thought-inducing environs of Oxford, one idea was paramount in my mind: we must be prepared to challenge the legitimacy of our social, economic and political institutions wherever they militate against life on earth. Building sustainable development is a task of immense complexity. There is a growing consensus that a change in production and consumption patterns is necessary, and that an increase in productivity in the use of energy and raw materials by a factor of 5 to 10 is imperative if the goal of sustainable development is to be achieved. This presents an enormous challenge to us all.

The Fourth High Level Advisory Seminar builds on the conclusions of the previous Cleaner Production Seminars, held at Canterbury, Paris and Warsaw. Since we last met, in Warsaw in 1994, much has happened. UNEP has developed a productive partnership with the World Bank and China's NEPA, where real progress in implementing cleaner production has been achieved. The ongoing partnership with UNIDO has resulted in an expanding worldwide network of National Cleaner Production Centres. The task of information dissemination has been well served

by the development of cleaner production diskettes and a Worldwide Web homepage, and UNEP has worked closely with Dutch institutions to produce a primer on Life Cycle Assessment. Many other "good news" stories could be told.

So, much has been achieved. But we cannot afford to be complacent. In spite of all of our good work, we have still not reached critical mass. We are still leading only a minor uprising rather than a major revolution, and developments continue elsewhere.

One of the most significant parallel developments has been the progress of ISO 14000 to a fully fledged international standard on environmental systems. This raises an interesting question. How does this standard relate to cleaner production and vice versa? The answer, I think, is that environmental management tools will have to be used to achieve cleaner production. The standard encourages the concept of continuous improvement, but implementation of a management system is no guarantee that goods and services produced will be more environmentally benign. Our task is to ensure that the standard is interpreted as the need to make the transition from end-of-pipe compliance to preventive, precautionary and proactive approaches, in other words to cleaner production.

Our purpose for the future should not be to simply spread the cleaner production message. There is a pressing need for us to move beyond defining cleaner production and merely acknowledging it as a good idea. Our challenge is to enlarge the frontiers of cleaner production; to seek out innovative approaches in new and untried sectors; to identify innovative new financing mechanisms; and to explore new methods of building and enhancing capacity. We need to share our success stories, to discover new ways to tear down persistent barriers.

Our discussions must also go beyond just the technical aspects. No matter how many successes we have in cleaner production, they will amount to nothing if we fail to address fundamental issues of consumption and to promote sustainable consumption patterns. The challenge of environmental problems and sustainable development require sound science, good public policy and social consensus. All three of the elements of the formula will require our continued thoughtful consideration, creativity and persistence if we are to progress on the road to sustainable development.

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**James Clappison MP,
Parliamentary Under Secretary of State for the Environment, United Kingdom**

The UK had the privilege of hosting the first in this series of UNEP Cleaner Production seminars, at Canterbury in 1990. When UNEP established the Cleaner Production Programme in 1989, the UK was quick to respond. The UK Department of the Environment had then recently embarked on its own programme to help promote innovation in environmental technology.

Many of you deal at first hand with the pressures confronting developing countries as they work for essential economic growth. Industrialization is essential, but, combined with population growth, it threatens our "global village" with resource depletion and catastrophic climate change, as well as with serious pollution at more regional and local levels.

These concerns were of course central to the agreement on sustainable development reached at the Rio Earth Summit in 1992. This committed the international community to work for more

sustainable patterns of consumption and production, for the benefit of present and future generations alike. The UK was one of the first countries to translate this into a national strategy, making the concept of sustainable development the touchstone of our policies. Working to make industry and commerce inherently cleaner is an integral part of that strategy.

In the world of environmental policy there are many prophets of doom. But the message of Cleaner Production is an optimistic one. By careful attention to process design and management, industry can reduce its environmental impact and improve productivity at the same time. Rather than cleaning up waste, we can prevent it. Rather than using resources unproductively on elaborate "end-of-pipe" techniques of pollution control, we can reduce or eliminate waste and pollutants at source.

The role of governments singly and collectively is to create the conditions in which industry is encouraged to adopt cleaner production methods. How can they do this? I will mention three important areas.

An appropriate and effective framework of environmental regulation is one prerequisite to achieving cleaner production. In the UK, the newly created Environment Agency has, since April this year, taken over from its predecessors the task of applying our system of Integrated Pollution Control (IPC).

IPC sets up a steady but firm pressure on the regulated industries to reduce and ultimately eliminate releases of the most polluting substances.

We must all be ready to exchange our experience of environmental regulation. For example, I am very pleased that the UK has established excellent contacts with the National Environmental Protection Agency of China.

Direct regulation is essential, but the UK government believes that this should be kept to a minimum. Where possible, economic forces should be harnessed to achieve policy objectives. There is a balance to be struck, and different countries will take different views on just where it should lie at any point in time.

Another essential factor in achieving cleaner production is information on the techniques available. Not just information in any form. A crucial need is for objective information in a simple, easily assimilated form appealing directly to key decision makers. Well presented case studies and simple guidance material can seize the attention of the hard pressed decision makers in industry, where text books will not. Once busy decision makers are convinced of the potential business benefits of cleaner production, they can be signposted to sources of fuller information.

The UNEP Cleaner Production Programme responds to this need for information, both in encouraging member countries to develop national programmes, and by providing information direct to industry. In the UK, two years ago, my Department and the Department of Trade and Industry launched our Environmental Technology Best Practice Programme, to promote techniques for waste minimization and cleaner technology. We see the programme as forming the UK's Cleaner Production Centre.

In considering your recommendations for the future of the programme, you will need to think about the right balance - within the available resources - between direct outreach to industry and indirect action through national centres or in other ways.

One measure of the success of the seminar will be realistic but cogent recommendations for the

future of the Cleaner Production Programme that can be fed into the 19th Governing Council. The Council will need to consider the way forward on the Cleaner Production Programme as part of the larger context of the Programme of Work for the 1998/99 biennium. Another important measure of success will be the new contacts established in Oxford, between people with similar issues to confront but with interestingly different ways of tackling them.

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Fourth High Level Cleaner Production Seminar

Report by Clare Cocault

Abstract

The UNEP Fourth High Level Seminar on Cleaner Production, hosted by the UK Government, was held in Oxford from 23 to 26 September 1996. Some 170 delegates from more than 50 countries reviewed and evaluated progress on cleaner production initiatives, and identified obstacles to further progress and measures to overcome them. Plenary and parallel sessions provided evidence of significant cleaner production progress in all walks of life, and also reported on regional cleaner production needs. Topics discussed included the role of engineers to promote cleaner production, implications for cleaner production activities in the greening of the development banks and the service industries such as tourism, education and training, and innovative financing for promoting cleaner production. Some important conclusions from the Seminar were: stronger emphasis on consumption, promotion of instruments for promoting cleaner production and closer links between the National Cleaner Production Centres. The UNEP working groups were advised to develop benchmarking tools for cleaner production. A full report on the three-day event is given in the following pages.

Résumé

Le quatrième séminaire de haut niveau du PNUE sur la production plus propre s'est tenu à Oxford du 23 au 26 septembre 1996, à l'invitation du gouvernement britannique. Quelques 170 délégués de plus de 50 pays ont fait le bilan des progrès réalisés dans ce domaine, constaté les obstacles empêchant de plus grandes avancées, et déterminé les mesures permettant de les surmonter. Séances plénières et parallèles ont apporté la preuve d'un progrès sensible de ce type de production dans tous les domaines d'activité et ont fait le point des besoins régionaux en la matière. Parmi les sujets abordés figuraient le rôle des ingénieurs et techniciens pour promouvoir la production plus propre, les effets d'une orientation environnementale de plus en plus marquée des banques de développement et des secteurs de service tels que le tourisme, l'éducation et la formation, ainsi que les modes de financement novateurs encourageant la production plus propre. Des conclusions importantes ont été tirées des travaux de ce séminaire, notamment : une approche plus nettement orientée sur la consommation, la promotion des instruments favorisant la production plus propre et une plus grande communication entre les centres nationaux de production plus propre. En outre, il a été proposé que les groupes de travail du PNUE élaborent des instruments de référence de la production plus propre. On trouvera un rapport complet de cette manifestation de trois jours dans les pages qui suivent.

Resumen

El Cuarto Seminario de Alto Nivel de la UNEP sobre la producción más limpia, organizado por el gobierno del Reino Unido se celebró en Oxford del 23 al 26 de Septiembre de 1996. Asistieron aproximadamente unos 170 delegados de más de 50 países que analizaron y evaluaron el progreso de las iniciativas en la producción de limpiadores e identificaron los obstáculos que pudieran surgir en el futuro y las medidas para superarlos. Las sesiones plenarias y paralelas evidenciaron un progreso significativo en la producción de limpiadores en todas las esferas sociales y también ofrecieron información sobre las necesidades de la producción de limpiadores a nivel regional.

Los temas de debate incluyeron el rol de los ingenieros en la promoción de la producción de limpiadores, las implicaciones de las actividades de producción de limpiadores en los bancos de desarrollo y en las industrias de servicios como el turismo, la educación y el aprendizaje y las novedosas financiaciones para promocionar la producción de limpiadores. Algunas importantes conclusiones del Seminario han sido: fomentar un mayor énfasis en el consumo, la utilización de medios para promocionar la producción de limpiadores y lazos más estrechos entre los Centros de Producción de Limpiadores Nacionales. A los grupos de trabajo de la UNEP se les aconsejó que desarrollaran herramientas que marquen un hito en la producción de limpiadores. En las próximas páginas ofrecemos un informe completo de los tres días que duró el evento.

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National Cleaner Production Centres: their establishment and growth

Surya Prakash Chandak, Director, National Cleaner Production Centre, India

Abstract

A joint initiative of UNIDO and UNEP has resulted in the establishment of nine National Cleaner Production Centres in Brazil, China, the Czech Republic, India, Mexico, the Slovak Republic, Tanzania, Tunisia and Zimbabwe. These NCPCs have been in operation from a few months to two years, but even during this short time they have had an impact through activities including demonstration projects, training, and creation of awareness. Continued and extended technical and financial support of these Centres is vital for the widespread adoption of CP Principles.

Résumé

Une initiative conjointe de l'ONUDI et du PNUE a abouti à l'établissement de neuf centres de production plus propre, au Brésil, en Chine, en République tchèque, en Inde, au Mexique, en République slovaque, en Tanzanie, en Tunisie, et au Zimbabwe. Certains de ces centres fonctionnent depuis quelques mois, d'autres depuis deux ans. Bien qu'il s'agisse là de courtes périodes, elles ont été suffisantes pour que ces centres aient un impact à travers les activités qu'ils ont menées, notamment les projets de démonstration, les sessions de formation et les opérations de sensibilisation. Si l'on veut que l'adoption des principes de production plus propre se répandent, il est vital que ces centres bénéficient de soutiens techniques et financiers continus et élargis.

Resumen

Una iniciativa conjunta de UNIDO y UNEP ha dado como resultado el establecimiento de nueve Centros Nacionales de Producción Más Limpia en Brasil, China, la República Checa, India,

Méjico, la República Eslovaca, Tanzania, Tunizia y Zimbabwe. Algunos de estos CNPLs funcionan desde hace unos pocos meses y el más antiguo lleva dos años funcionando. Incluso durante este breve período de tiempo estos Centros han sido capaces de producir un efecto a través de sus actividades que incluían los proyectos de demostración, de formación y de concienciación. El prolongado y sostenido soporte técnico y financiero de estos centros es de vital importancia para conseguir que se adopte de forma mayoritaria los Principios de la CP (producción más limpia).

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Environmental protection and Asian economic development

**Environmental protection and Asian economic development Ungush K. Park,
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Abstract

Five stages can be identified in the evolution of ecologically efficient corporate management: 1) general indifference; 2) the dawning of public awareness; 3) the beginning of corporations' taking initiatives beyond what is legally required of them; 4) the stage at which eco-efficiency becomes the main factor in corporate decision-making; and 5) the stage (still only theoretical today) at which environmental costs are internalized in corporate accounting. Most east Asian countries are at the second stage, but there is wide awareness of the importance of moving into the third and fourth stages as rapidly as possible.

Résumé

On peut distinguer cinq stades dans l'avènement et la mise en place d'une gestion environnementale efficace au sein des entreprises : 1) indifférence générale ; 2) prise de conscience dans la population ; 3) lancement, par les entreprises, d'initiatives allant au-delà de leurs obligations légales ; 4) stade auquel l'éco-efficacité devient le facteur qui prime dans les décisions des entreprises ; et 5) prise en compte (encore théorique, à l'heure actuelle) des coûts du respect de l'environnement dans la comptabilité interne des sociétés. La plupart des pays d'Asie en sont au deuxième stade, mais il existe une réelle prise de conscience en ce qui concerne la nécessité de passer aux troisième et quatrième stades dès que possible.

Resumen

Es posible identificar cinco etapas en la evolución de la gestión corporativa ecológicamente eficiente: 1) indiferencia general; 2) comienza a formarse una conciencia pública; 3) las corporaciones comienzan a desarrollar iniciativas que exceden los requisitos legales; 4) la etapa en la que la eco-eficiencia se transforma en el factor principal en la toma de decisiones corporativa; y 5) la etapa (aún teórica) en la que los costes medioambientales son incluidos en la contabilidad corporativa. La mayoría de los países asiáticos se encuentran en la segunda etapa pero existe una amplia conciencia de lo importante que es desplazarse hacia la tercera y cuarta etapas lo más rápidamente posible.

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APO's efforts for sustainable development of the environment

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Abstract

The Asian Productivity Organization (APO) promotes sustainable socio-economic development at all levels in agriculture, industry and the service sectors in the Asia and Pacific region. APO seeks to achieve environmentally sound operation at a factory/farm level by organizing demonstration projects whose aim is to show that products and services can be profitably produced through the application of clean technology, particularly in small and medium-sized enterprises.

Résumé

L'Organisation asiatique pour la productivité (APO) favorise le développement socio-économique durable à tous les niveaux des activités agricoles, industrielles et des services, dans la zone Asie et Pacifique. Elle s'efforce d'instaurer une exploitation respectueuse de l'environnement dans les usines et les exploitations agricoles en mettant sur pied des projets destinés à démontrer qu'il est possible de produire des biens et des services de façon rentable tout en recourant aux technologies propres et ce, particulièrement dans les PME-PMI.

Resumen

La Organización de Productividad de Asia (APO) promueve un desarrollo socio-económico sostenido en todos los niveles para la agricultura, la industria y los sectores de servicios en Asia y en la región del Pacífico. La APO busca alcanzar una operación ambientalmente acertada a nivel fábricas/granjas, organizando proyectos de demostración cuyo objetivo es probar que los productos y servicios pueden ser producidos de una manera rentable a través de la aplicación de una tecnología limpia, en particular en las pequeñas y medianas empresas.

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Promoting cleaner production in Thailand: integrating cleaner production into ISO 14001 Environmental Management Systems

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Abstract

Cleaner production programmes and Environmental Management Systems, of which the ISO 14000 EMS series will be the international standard, have been identified as potentially powerful instruments for promoting pollution abatement in Thai industry. This article examines both the

cleaner production approach and the ISO 14001 EMS approach to determine possible relationships between the two, as well as the potential impact of ISO 14001 on the promotion of cleaner production in Thailand.

Résumé

Les programmes de production plus propre et les systèmes de gestion environnementale, dont la série EMS de l'ISO 14000 constituera la norme internationale, ont été reconnus comme des instruments à fort potentiel pour promouvoir la lutte contre la pollution dans l'industrie thaïlandaise. Cet article examine la démarche de production plus propre adoptée et l'approche des systèmes de gestion environnementale de la norme internationale ISO 14001, afin de déterminer les rapports éventuels entre les deux ainsi que l'impact possible de cette norme pour promouvoir la production plus propre en Thaïlande.

Resumen

Los programas de la producción más limpia y los Sistemas de Gestión del Medio Ambiente, de los cuales la serie ISO 14000 EMS será la norma internacional, han sido identificados como instrumentos potencialmente convincentes para promocionar la disminución de la contaminación en la industria tailandesa. Este artículo examina tanto el acercamiento a la producción más limpia como el enfoque de la ISO 14001 EMS para determinar las posibles relaciones entre ambos, así como el impacto potencial de la ISO 14001 en la promoción de la producción más limpia en Tailandia.

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Cleaner production regional perspectives: Africa region

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Abstract

This article reviews cleaner production-related activities in several African countries. Awareness creation, management commitment, changing of attitudes, and in-plant demonstrations are crucial to the successful promotion of the cleaner production concept in the region. The UNEP Regional Office for Africa (ROA), as well as other institutions and organizations, need to be increasingly active in creating opportunities for exchanging views and experiences related to cleaner production.

Résumé

Cet article examine les activités liées à la production plus propre, dans plusieurs pays d'Afrique. Elaboration de moyens de sensibilisation, engagement des dirigeants d'entreprises, changement des comportements ainsi que démonstrations dans les usines constituent des éléments cruciaux pour promouvoir efficacement le concept de production plus propre dans la région. Il est nécessaire que le Bureau régional du PNUE pour l'Afrique (ROA), mais aussi d'autres institutions et organisations, redoublent d'efforts afin de créer de nouvelles possibilités d'échanges de vues et d'expériences dans le domaine de la production plus propre.

Resumen

Este artículo analiza las actividades relacionadas con la producción más limpia en diversos países africanos. La concienciación, el compromiso de gestión, el cambio de actitudes y las demostraciones en fábrica son cruciales para la promoción exitosa del concepto de producción más limpia en esta región. La Oficina Regional de UNEP para Africa (ROA) así como otras instituciones y organizaciones deben ser cada vez más activas con el fin de ofrecer oportunidades para el intercambio de puntos de vista y de experiencias relacionadas con la producción más limpia.

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Cleaner production in the Mediterranean region

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Abstract

This article summarizes several reports on the importance that cleaner production has as a tool to combat the environmental degradation of the Mediterranean region. An analysis is provided of activities being carried out at the national and international levels. The importance of certain organizations (such as UNEP, UNIDO) play in spreading and disseminating cleaner production is stressed.

Résumé

Cet article résume plusieurs rapports traitant de l'importance de la production plus propre comme moyen de lutte contre la dégradation de l'environnement méditerranéen. Il analyse les activités menées actuellement aux niveaux national et international. Par ailleurs, il souligne le rôle considérable que jouent certaines organisations (telles que le PNUE, l'ONUDI) dans l'extension et la diffusion de la production plus propre.

Resumen

Este artículo resume diversos informes sobre la importancia que tiene la producción más limpia como una herramienta para combatir la degradación ambiental de la región del Mediterráneo. Se ofrece un análisis de las actividades que se realizan a nivel nacional e internacional. Se destaca la importancia de ciertas organizaciones (tal como UNEP, UNIDO) en la divulgación de la producción más limpia.

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Cleaner production perspectives in Latin America and the Caribbean

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Abstract

In November 1995, a Workshop on Waste Minimization and Cleaner Production in Latin America and the Caribbean was held in Mexico City. This article describes the context in which the Workshop was planned and developed, the most relevant outcomes, and the progress made since then by Mexico in promoting waste minimization and cleaner production.

Résumé

Un atelier sur la minimisation des déchets et la production plus propre en Amérique latine et dans les Caraïbes s'est tenu à Mexico, en novembre 1995. Cet article décrit le contexte dans lequel il a été planifié et élaboré, ses résultats les plus pertinents, ainsi que les progrès que le Mexique a accomplis depuis, dans le domaine de la minimisation des déchets et de la production plus propre.

Resumen

En Noviembre de 1995, se organizó en la ciudad de Méjico un Taller sobre Minimización de los Desechos y la Producción Más Limpia en Latinoamérica y en el Caribe. Este artículo describe el contexto en el que se planificó y desarrolló el Taller, los resultados más relevantes y el progreso que Méjico ha realizado desde entonces fomentando la minimización de los desechos y la producción más limpia.

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Product life cycle management at Nortel

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Abstract

In 1992, Nortel initiated a Product Life Cycle Management (PLCM) programme that commits the company to factoring resource efficiency into all stages of the product life cycle. Nortel s PLCM programme addresses supplier management, builds environmental improvement into the design phase of new products, implements process and materials innovations and alternatives in manufacturing, and provides alternative solutions for product disposition.

Résumé

En 1992, l'entreprise Nortel a lancé un programme de gestion de la durée de vie des produits (PLCM) par lequel elle s'engage à mesurer l'efficacité des ressources utilisées à tous les stades de la vie des produits. Ce PLCM couvre la gestion des fournisseurs, inclut des améliorations à caractère environnemental dans la phase de conception des nouveaux produits, met en oeuvre des procédés et des matériaux novateurs et de substitution au stade de la fabrication, et procure des

solutions de remplacement en matière d'élimination des produits.

Resumen

En 1992, Nortel inició un programa de Gestión del Ciclo de Vida de los Productos (PLCM) que compromete a la compañía a descomponer la eficiencia de los recursos en todas las etapas del ciclo de vida del producto. El programa de PLCM de Nortel se dirige a la gestión de proveedores, introduce una mejora del medio ambiente en la fase de diseño de los nuevos productos, pone en práctica procesos y materiales novedosos y ofrece alternativas en la fabricación y soluciones alternativas para la disposición de los productos.

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The forests of Tierra Del Fuego: the need to support sustainable ecotourism

**Daslav Ursic Vrslovic, Consultant for Natural Resources and the Environment,
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Abstract

In the south of the Chilean part of Tierra del Fuego are found the last intact forests of southern fagaceae. A large timber- felling project threatens to bring an end to the pristine nature of this vast region, whose lakes, rivers and wild forests have a great potential for development of ecotourism. It is expected that there will be an increasing conflict of commercial interests.

Résumé

Dans le sud de la partie chilienne de la Terre de Feu, se trouvent les dernières forêts de fagacées demeurées intactes dans l'hémisphère sud. Or, un projet d'abattage à grande échelle menace l'intégrité de la nature primitive de cette vaste région dont les lacs, rivières et forêts sauvages recèlent un potentiel considérable pour l'éco- tourisme. On s'attend à voir éclater un conflit d'intérêts commerciaux.

Resumen

En el sur de la parte chilena de Tierra del Fuego se encuentran los últimos bosques intactos del fogáceo sureño. Un importante proyecto de tala de árboles amenaza con acabar la prístina naturaleza de esta vasta región, cuyos lagos, ríos y bosques silvestres representan un enorme potencial para el desarrollo del ecoturismo. Es esperable que se desate un conflicto or intereses comerciales.

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