



# Conference on Resource Efficiency

23-25 April 2008



## Conference Notes

Objectives

Panel  
discussions

Policy  
modules



OECD Conference Centre  
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ENVIRONMENTAL SERVICES ASSOCIATION



OAKDENE HOLLINS

Research and Consulting





## Conference Notes

The Conference is a multi-stakeholder event that brings together governments, businesses, international organisations and civil society to discuss resource efficiency issues in an international context.

### Background

Growing global demand for materials, increasing trade flows and a new geography of supply and demand are changing the **international markets** for materials. Global and domestic **resource use**, volatile raw material **prices**, and risk of **supply** disruptions have become important issues. Valuable **materials** contained in waste **are lost** for the economy. All this adds to the concerns about the sustainability of resource use and negative **environmental impacts** of production and consumption of resources. Improving **resource efficiency** has thus become critical for governments and businesses alike.

### Objectives

The conference explores how improved **resource efficiency** can reduce negative environmental **impacts** of resource exploitation, transportation, use and disposal, while at the same time securing adequate supplies of materials to sustain economic growth. It focuses on **economic** efficiency and **environmental** effectiveness of resource use, as well as the related **development** and **governance** aspects. More specifically, the conference will review:

- ◆ **Knowledge** and information about material flows and resource productivity and their economic and environmental implications.
- ◆ **Policies**, measures and instruments that help reduce environmental impacts from the production and consumption of resources, and avoid waste of resources.
- ◆ The **framework conditions** for markets and public policies to play their role in improving resource efficiency and ensuring sustainable resource use, considering the related development and governance aspects.

The conference will contribute to international debates on resource efficiency and sustainable resource management, and support activities steered by **the G8, the OECD and UNEP** in these areas.

## PLENARY RESOURCE EFFICIENCY IN THE GLOBAL CONTEXT

The plenary session focuses on issues and challenges related to (i) developments in world markets and trade (trade and supply security, international flows (causes and drivers), globalisation and foreign outsourcing (supply of raw materials, diversification of sources, material substitution); (ii) policy implementation (link to the 3Rs, the circular economy, sustainable materials management (SMM), sustainable consumption and production (SCP), sustainable value chain, natural resource management, environmental impacts); (iii) development and governance (link to development co-operation, MNEs, investment frameworks, etc.).

### Keynote speeches

The keynote speeches will dwell upon resource efficiency issues from two perspectives: the perspective of sustainable management of natural resources, and the perspective of circular approaches to waste and materials management as promoted by the 3R (Reduce, Reuse, Recycle) initiative. The keynote speakers are expected to address:

- ◆ What is the nature of the resource efficiency issue? What are the opportunities?
- ◆ How can resource efficiency be fostered?
- ◆ Why people should be concerned about resource efficiency?
- ◆ How to get key audiences and sectors to pay attention to resource efficiency? How to convince people to take the necessary actions?

## Conference Notes

### PANEL DISCUSSIONS

#### Panel A Government Perspective

This Panel will discuss how governments perceive the challenges and opportunities related to resource efficiency in the global context. It will focus on:

- ◆ The role and responsibilities of governments in resource efficiency in the short and long term
- ◆ The relationships of governments with the private sector
- ◆ The specific measures that governments have in place to encourage resource efficiency and the results achieved

The panellists are invited to address:

- ◆ What is your overall assessment on resource efficiency, both for your government and governments more generally?
- ◆ What is the government's role and responsibility in resource efficiency, both short and long term?
- ◆ How does the role of government in resource efficiency and the relationship of government to the private sector in your country compare to the way things work in other countries?
- ◆ What are the respective roles of national, provincial and local governments (relative to resource efficiency), both generally and in your country?
- ◆ What specific policy measures to encourage resource efficiency have been tried in your country? What has been their impact?
- ◆ How should countries cooperate in the pursuit of resource efficiency?

#### Panel B Business Sector Perspective

This Panel will discuss how the private sector perceives the challenges and opportunities related to resource efficiency in the global context. It will focus on:

- ◆ The responsibilities of the business sector, including small and medium size enterprises as well as multinational corporations, in the area of resource efficiency
- ◆ The specific measures that businesses have in place to encourage resource efficiency and the results achieved
- ◆ The government actions that would best support enterprises in using resources more efficiently

The panellists are invited to address:

- ◆ What is your overall assessment on resource efficiency, both for your industry and industry more generally?
- ◆ Does this assessment vary across countries (e.g. developing vs. industrialised countries)?
- ◆ What is the business sector's responsibility for resource efficiency? Do global companies have special responsibilities, roles or opportunities?
- ◆ How can governments best encourage the business sector to use resources more efficiently? What should governments avoid doing?

## Conference Notes

### Panel C Civil Society Feedback and Perspective

This Panel will discuss how the non-profit sector/NGOs/trade unions perceive the challenges and opportunities related to resource efficiency and to the related development and governance aspects. It will focus on:

- ◆ The roles of NGOs and trade unions in encouraging resource efficiency and sustainable resource use
- ◆ The specific actions that NGOs and trade unions have in place and the results achieved
- ◆ The expectations of NGOs and trade unions from governments and businesses in the area of resource efficiency and sustainable resource use, building on the earlier discussions in the Conference

The panellists are invited to address:

- ◆ What is your overall assessment on resource efficiency?
- ◆ Does this assessment vary across countries (e.g. developing vs. industrialised countries)?
- ◆ What roles should NGOs and trade unions play in encouraging resource efficiency? What is the role of your organisation?
- ◆ What should citizens expect from governments and business?

### Panel D Trade, Investment and Governance

This Panel will discuss the framework conditions for markets and public policies to play their role in improving resource efficiency and ensuring sustainable resource use now and in future, and the related development and governance aspects. It will focus on:

- ◆ How trade and investment issues can best be reconciled with issues of resource efficiency and environmental sustainability
- ◆ The role of corporate responsibility and of the OECD Guidelines for MNEs and other tools (e.g. EITI\*), in promoting resource efficiency and sustainable resource use at the various stages of the supply and process chains
- ◆ How developing countries can best access the technologies they need to improve resource efficiency and to address related environmental concerns

The panellists are invited to address:

- ◆ The importance of supply security, investment climate, access rights, market instruments for advancing resource efficiency
- ◆ How to ensure that trade and resource efficiency are mutually supportive (e.g. non-tariff barriers)?
- ◆ How trade and economic issues can be reconciled with environmental sustainability concerns and environmental and health & safety standards (including their enforcement)?
- ◆ Which trade barriers should be eliminated in order to ensure environmentally sound management of waste and international movements of recyclable materials?

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\* Extractive Industries Transparency Initiative.

## Conference Notes

### Module 1 Improving knowledge: material flow analysis and indicators

#### Background<sup>1</sup>

Worldwide use of many significant materials has been rising over many years, causing recurrent concerns about shortages of natural stocks, the security of supply, and the environmental effectiveness of their use. A good understanding of the material basis of the economy and of its relation to productivity and environmental risks should therefore underpin the formulation of economic, trade, natural resource and environmental policies. The aim of Material Flow Analysis (MFA) is to contribute to that understanding.

MFA comprises two main elements: material flow accounts that provide a structure for information about material flows and material flow indicators that are derived from these accounts to inform a non-expert audience. It encompasses a variety of tools that range in scope from economy-wide to substance or product-specific analysis, and input-output analysis.

MFA can show how economic performance can be improved by reducing inefficiencies in energy and material use, which would go undetected in conventional economic or environmental information systems. Although MFA is only one approach to improve knowledge on resource efficiency, it is the only tool that can:

- ◆ Provide an integrated view of resource flows through the economy;
- ◆ Capture flows that do not enter the economy as transactions, but that are relevant from an environmental point of view<sup>2</sup>; and
- ◆ Reveal how materials flow within and among countries, and how this affects the economy and environment within and beyond national borders.

These characteristics make MFA a useful tool for examining trade-offs between policies and for understanding the implications of decisions that depend on interrelationships in the economy and the environment. It can be used to analyse issues that cut across different media and policy areas and support decisions that have economic, environmental and social implications. A wide range of government agencies, ministries and departments, businesses and industry associations, find use for these types of analysis.

A considerable amount of work on MFA has been carried out in the past decade, much of it focusing on the development of methodologies and the necessary "spade work" to set up accounts required for calculating material flow (MF) indicators and carrying out the analysis. About two-thirds of OECD countries have developed MFA initiatives. Countries have focussed on their economically and environmentally most important resources and materials. Guidance by international institutions has helped countries to harmonise their methodologies to an extent. The remaining differences highlight the need for further clarification and that some economy-wide indicators are not yet widely understood.

Despite significant advances, systematic use of MF information in policy debates and decision-making is still limited. This is likely to change, however, as countries include MF indicators in their national indicator sets, often associated with broad goals or even time-bound targets; and as businesses increasingly use MFA to monitor their environmental and economic performances.

Further work on MFA should aim at better explaining MFA's specific value-added and at improving the understanding of environmental impacts and costs of resource use throughout the lifecycle of materials and products that embody them (i.e. from natural resource extraction, manufacturing, use/consumption to end-of-life management). Required also are the implementation of compatible databases for key material flows (e.g. flows of importance to the 3R initiative, flows of particular importance to the environment and the economy), the further development and promotion of MF and resource productivity indicators, and the sharing of good practices within countries, among countries and among enterprises<sup>3</sup>. OECD governments should co-operate with industry and with developing countries to strengthen their capacity on measurement and analysis of material flows and the associated environmental impacts.



## Conference Notes

### Focus of the Module

This Module focuses on information for decision-making (macro, micro); business sector applications and the relation to cost analysis; and scientific knowledge (impacts, costs). It will review:

- ◆ The role of material flow analysis (MFA) and indicators in improving knowledge about resource efficiency, and its economic and environmental implications, building on OECD work and on other international work, including by UNEP.
- ◆ The opportunities presented by using MFA and indicators to guide decision making, and
- ◆ The role of governments in filling information gaps and promoting the dissemination and uptake of existing experience.

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ What are the recent developments in the MFA information base? What type of information is needed by different parties? Where are the international data and knowledge gaps?
- ◆ In your experience, how useful is material flow analysis (MFA) as a policy tool (at national level, at business level, at international level)?
- ◆ How can the public awareness and understanding of MFA be increased?
- ◆ How can the use of material flow and resource productivity indicators in decision making be encouraged (at national level, at business level, at international level)?
- ◆ What is your view on the role of international work, in particular work by the OECD and by UNEP?

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<sup>1</sup> Adapted from OECD (2008). *Measuring material flows and resource productivity: Synthesis report*, Organisation for Economic Co-operation and Development, France.

<sup>2</sup> This includes *unused* flows associated with extraction (e.g. mining overburden, by-catch from fishing, harvest losses), in other words on materials that do not enter the economy as products, but whose displacement can affect the environment, and *indirect* flows associated with traded commodities (pollution and waste generated upstream in the production process) that are not physically embodied in the commodities. These flows are hidden and not seen in economic accounts or in trade and production statistics.

<sup>3</sup> UNEP's Life Cycle Initiative activities for example advance the global availability of life cycle approaches to enable users around the world to use these tools and to allow them to put resource efficiency into practice. UNEP (2006). *Background Report for a UNEP guide to Life Cycle Management: a bridge to sustainable products*, United Nations Environment Programme, France. <http://www.unep.fr/scp> , <http://www.setac.org/> .

## Conference Notes

### Module 2. From waste to resources: Government policies

#### Background<sup>1</sup>

The amount of waste generated by economic activity has been rising in line with continuously growing global demand for raw materials. Consequently, many valuable material and energy resources are being wasted and disposed of, and thus lost to the economy. This affects both the efficiency of material use and environmental quality in terms of land use, water and air pollution, and greenhouse gas emissions and may threaten the attainment of the Millennium Development Goals.

Conventional waste policies have successfully diverted many valuable materials from landfills and promoted further use, remanufacturing and recovery. Existing policies, however, may not be sufficient to improve material efficiency and to offset the waste-related environmental impacts of materials production and use in the longer term. Broader approaches, considering the whole lifecycle of materials, are needed.

It became evident already in the late 1990s that waste policies which addressed only the end-of-life products and materials were not effective in reducing the increasing amounts of waste. This stimulated a new emphasis on integrated waste and materials policies, and integrated product policies addressing environmental impacts along the whole life-cycle of products and materials, such as the OECD approach to sustainable materials management ([www.oecd.org/env/waste](http://www.oecd.org/env/waste)), and UNEP's work on waste ([www.unep.fr/pc/pc/waste/waste.htm](http://www.unep.fr/pc/pc/waste/waste.htm))<sup>2</sup>. Other examples of "new generation" waste and materials management policies, such as Japan's 3R-approach (Reduce, Reuse, Recycle), China's Circular Economy, the European Union's Thematic Strategy on Sustainable Use of Natural Resources and on Waste Prevention and Recycling (recycling society), and the US's Beyond RCRA: Waste and Materials Management in the Year 2020<sup>3</sup>.

These integrated policies target the most environmentally harmful products, materials and activities. They place strong emphasis on material efficiency, redesign and reuse of products, recycling of end-of-life materials and products (i.e. considering end-of-life materials and products as resources rather than waste), and environmentally sound management of residues (management standards). They also take the "carbon agenda" into account. Other common elements<sup>4</sup> are that these policies put wastes into the material balance context of societies, that they make greater use of economic instruments, such as taxes and tradable permits; and that they build partnerships with stakeholders, including industry, rather than using command-and-control approaches.

Governments have an important role to play in establishing the frameworks conditions that help move from waste to resources, and encourage economically efficient and environmentally sound recovery of waste materials and reuse of manufactured goods. Further action should focus on addressing the continuous increase in waste flows and their international movements, on strengthening the implementation of existing waste management policies, and on promoting circular economy approaches. This would require wider use of instrument mixes containing economic, regulatory and information instruments, as well as public-private partnerships. Concerning municipal waste, policy instruments such as extended producer responsibility programmes can considerably improve recovery rates and efficiencies, in particular when associated with variable "unit-based waste collection charges".<sup>5</sup>

In many developing countries, the main challenge remains the implementation of conventional waste policies and the development of the waste management infrastructure. The finance and transfer of new waste management technologies and approaches to these countries is supported by international programmes such as the UNIDO/UNEP National Cleaner production Center (NCPC) programme ([www.unep.fr/scp](http://www.unep.fr/scp)) and the Basel Convention's Regional Centers ([www.basel.int/centers.html](http://www.basel.int/centers.html)). See Module 6.

## Conference Notes

### Focus of the Module

This Module focuses on materials management; market-based instruments; legal and institutional frameworks; and product policies. It will review:

- ◆ The role of government policies in encouraging the move from waste to resources; and
- ◆ Policies, measures and instruments that governments have put or plan to put in place, and the results achieved.

Particular attention is given to integrated, life-cycle oriented approaches, such as 3R related measures and the circular economy.

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ Where are the biggest opportunities for government policies? Where should actions concerning the reduction of life-cycle wide environmental impacts of materials and products focus first?
- ◆ Which policies and instrument mixes are most effective in addressing life-cycle impacts of materials and products, and in moving from waste to resources?
- ◆ What are the main obstacles to implementing integrated, life-cycle oriented approaches to waste and materials management? How does this vary across countries (e.g. developing vs. industrialised countries)?
- ◆ Who should take the lead in addressing material and product-related environmental impacts and in putting in place integrated, life-cycle oriented approaches to waste and materials management? Governments, private sector, international organisations, non-governmental organisations?
- ◆ What is your view on the role of international work, in particular work by the OECD, work by UNEP, and work steered by the G8?

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<sup>1</sup> Adapted from OECD (2008), *OECD Environmental Outlook to 2030*, Organisation for Economic Co-operation and Development, France.

<sup>2</sup> The UNEP waste programme is based on integrated waste management and waste minimisation, and structured around the actions of waste prevention, and improving waste collection, disposal and recycling. ISWA & UNEP (2002). *Industry as a partner for sustainable development: Waste Management*, International Solid Waste Association & United Nations Environment Programme.

<sup>3</sup> 3R and circular economy initiatives aim at closing materials loops and extending the lifespan of materials through longer use and the increased use of secondary raw materials. These initiatives also aim at material substitution: the use of materials with smaller environmental impact, and replacing the environmentally most damaging materials.

<sup>4</sup> OECD (2001). *Sustainable Development – Critical Issues*, Organisation for Economic Co-operation and Development, France.

<sup>4</sup> OECD (2001). *Policies to Enhance Sustainable Development*, Organisation for Economic Co-operation and Development, France.

<sup>5</sup> OECD (2006). *Impact of Unit-based Waste Collection Charges*, ENV/EPOC/WGWPR(2005)10/FINAL, Organisation for Economic Co-operation and Development, France, [www.oecd.org/dataoecd/51/28/36707069.pdf](http://www.oecd.org/dataoecd/51/28/36707069.pdf).

## Conference Notes

### Module 3 Technologies and innovation

#### Background<sup>1</sup>

Technology developments and innovation are important drivers for growth and productivity in an economy. They are important for managing material flows successfully and have a bearing on policies intended to preserve natural resources and materials and minimise the pollution burden. Innovation in new technologies is important to support moves towards more integrated and result-oriented approaches to materials production and management (e.g. clean-, bio-, nano- technologies; information and communications technology - ICT). Innovation in education and governance structures plays an important role in supporting shifts toward new management methods, greater transparency in decision-making, the adoption of co-operative approaches and partnerships, and the diffusion of knowledge.

Instead of "End-of-the-Pipe technologies", which just limit the environmental pressure or shift it in time or towards another environmental medium, new clean technologies, including products, services, and processes, improve both resource efficiency and reduce environmental impacts. Clean technologies use energy, water and raw materials more efficiently, create less waste or toxicity, improve productivity (through cost reduction and/or increased revenues), while delivering equal or superior performance.

ICT applications can significantly help achieve environmental goals enhanced across a large number of areas. Examples include improved environmental monitoring and management systems for pollution control; intelligent traffic control, e-business models that by-pass traditional distribution networks, which decrease material inputs and energy consumption. However, increasing production and consumption of ICT have led to higher energy consumption as well as problematic hazardous waste streams.

A range of policy tools and instruments, such as procurement; financing incentives; economic and voluntary initiatives, are required for successful implementation of technology innovation and sustainable resource management. Using an appropriate mix of policy instruments is essential to foster innovation and the use of new technologies in production and to encourage the uptake of these technologies by consumers.

Further efforts should focus on identifying and disseminating best practices and fostering comprehensive entrepreneurship and partnerships. On a global level countries need assistance to transform their sectoral needs assessments into a holistic identification of innovation priorities. Transfer of technologies and diffusion of knowledge play important roles in fostering resource-efficient societies around the world.

Capacity building and technology transfer are critical tools without which developing countries and transitional economies will remain disadvantaged and unable to make a shift to resource efficient technologies. Thus, the co-ordination of disparate efforts by various multilateral institutions and the fostering of South-South co-operation are indispensable for developing and strengthening existing regional and global capacities. Implementing and enhancing country-ownership is essential for enabling developing countries to experience progress through sustainable technologies and innovation.

While technology and innovation have a huge potential, one should not forget that new technologies can also generate additional environmental pressures or strain material availability. New technologies often involve new or substituting materials, the consequences of which need to be known. The same applies to the development and marketing of new products that affect air pollution, chemical safety, recyclability and waste disposal.



## Conference Notes

### Focus of the Module

This Module focuses on clean technologies in key sectors; new (bio-, nano-) technologies; information technologies; and organisational innovation (partnerships, cooperative arrangements, institutional set-up, etc.) It will review:

- ◆ The opportunities presented by technology development and innovation in improving resource efficiency (e.g. opportunities to reduce primary resource use and wastes, and use alternative materials),
- ◆ The role of the private sector (corporate cases, specific actions put in place, results achieved), and
- ◆ The role of governments in establishing proper framework conditions.

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ How do the opportunities for resource efficiency presented by technology development and innovation compare? What are the net benefits from the economic and the environmental point of view?
- ◆ Where do we need technological innovation for resource efficiency that we are not yet seeing? Where do we need organisational innovation for resource efficiency that we are not yet seeing?
- ◆ What is the business perspective on key instruments used by governments to support eco-innovation (public funding for R&D, standards for eco-efficiency, ...).
- ◆ What is the right balance between protecting inventors (IPR) and supporting the deployment of technologies (e.g. Eco-Patent Commons initiative).
- ◆ What is your view on the role of international work, in particular work by the OECD and by UNEP?

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<sup>1</sup>. OECD (2006). *Science, Technology and Industry (STI) Outlook 2006*, Organisation for Economic Co-operation and Development, France. [www.oecd.org/sti/outlook](http://www.oecd.org/sti/outlook)  
COM (2004). Communication from the Commission to the Council and the European Parliament. *Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union*, Commission of the European Communities, Brussels. [http://ec.europa.eu/environment/etap/index\\_en.htm](http://ec.europa.eu/environment/etap/index_en.htm)  
Rennings, K., R. Kemp, M. Bartolomeo, J. Hemmelskamp & D. Hitchens (2004). *Blueprints for an Integration of Science, Technology and Environmental Policy (BLUEPRINT)*, STRATA project, Zentrum für Europäische Wirtschaftsführung GmbH, Mannheim. <http://www.blueprint-network.net/>  
The World Watch Institute (2008). *State of the World 2008: Innovations for a Sustainable Economy*, The World Watch Institute, Washington. <http://www.worldwatch.org/>



## Conference Notes

### Module 4 Sustainable mining and recycling

#### Background

The mining industry is prospering due to the growing global demand for materials. Mining also receives increasing attention: concerns are expressed about limited reserves and social and environmental impacts of mining. Mining can contribute to economic growth, poverty reduction and sustainable development. But this will not happen unless adequate framework conditions, sound governance systems, capacity to manage and monitor the sector, and better linkages between the natural resources sector and other manufacturing and service sectors of the local economy are in place. However, weak governance may cause poverty, corruption and conflict. Tools such as the Kimberley Process Certification Scheme, the OECD Guidelines for Multinational Enterprises, and the Extractive Industries Transparency Initiative (EITI) are important safeguards to ensure good practice by host governments and investors.<sup>1</sup> EITI aims to improve transparency and accountability and thereby strengthen governance. It is equally important to address the artisanal and small-scale mining sector, as mining may be the only way to earn a living under some circumstances.

The International Council on Mining & Metals (ICMM) has published, in co-operation with the Global Reporting Initiative, guidelines on how to report on sustainable development efforts from an economic, environmental and social point of view<sup>2</sup>. These voluntary guidelines are aimed for mining companies and interested organisations.

In line with the 3R approach, there are three ways to increase resource efficiency: reducing the consumption of material, reusing a product and recycling to provide a secondary source for material. The latter is becoming more and more important. Landfills cause environmental pressures and loss of scarce metals. In principle, metals can be used and reused as long as they remain as resources in the economy. "Closing the loop" in the mineral and metal lifecycle via reuse and recycling programmes both reduces environmental impacts and decreases overall resource consumption.<sup>3</sup>

End-of-life regulations exist, for example, for automobiles<sup>4</sup> and electronic products in some parts of the world. The purpose of this kind of legislation is to increase recycling rates and protect the environment. The automobile and information and communication technology (ICT) industry are important consumers of metals. Together with the metal industry, they are faced with part of their products and materials leaving their regional sphere of consumption for reuse, which then cannot be recovered for recycling. Cars as well as ICT products are shipped throughout the world for reuse and refurbishment, also to and within regions where adequate facilities for environmental sound waste management are lacking.<sup>5</sup> In some countries, metal recovery takes place almost exclusively in the informal sector, without any ecological and environmental considerations. They use extremely hazardous recovery processes and techniques, resulting in very dangerous working conditions and widespread air, water and soil contamination. At the same time, the informal recycling sector recovers precious metals and materials from waste which would have otherwise ended in landfills, while also providing employment to thousands of mostly unskilled workers<sup>6</sup>.

Recycling efforts have become increasingly important. This is especially true for ICT sector, whose demand for metals like copper, silver and tin accounts for about one third of the world-production, and where E-waste is one of the fastest growing waste streams. Efforts to keep the material within the life-cycle are necessary, as are worldwide e-waste management programmes and activities from the industry and international community<sup>7</sup>.

The material stewardship concept allows to take a holistic life-cycle approach to ensure that key impacts of material use are adequately identified and addressed. Material stewardship is a key factor for achieving sustainable material performance. The ICMM, for instance, promotes material stewardship, thus getting its members and suppliers to contribute to sustainable mining performance. Companies should foster material stewardship cultures and implement effective measures that ensure the stewardship of their products<sup>8</sup>.

## Conference Notes

### Focus of the Module

This Module focuses on metals stewardship, material recovery and recycling, governance and the EITI. It will review:

- ◆ The contribution of the mining and recycling sectors to improved resource efficiency, including measures in place to reduce environmental impacts, and the results achieved (corporate cases, sharing of good practices, role of government policies);
- ◆ The role of corporate responsibility and of the OECD Guidelines for MNEs and other tools (e.g. EITI), in promoting resource efficiency at the various stages of the supply and process chains; and
- ◆ How the mining and recycling sectors perceive the challenges and opportunities related to resource efficiency at micro, macro and global levels.

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ What are the best cases for resource-efficiency related to mining and recycling and where are the major opportunities for the future? What are the best ways to share best practices?
- ◆ How do mining and recycling practices vary across countries (e.g. developing vs. industrialised countries)?
- ◆ What materials are important for cutting-edge industries and sustainable technologies? What are their availability prospects?
- ◆ What are the most relevant impacts due to mining and how can we overcome them? To what degree can the environmental implications of mining from virgin sources be offset by recycling?
- ◆ What are the barriers for higher recycling rates and what are ways to overcome them? How could the socio-economic conditions in developing countries be used to promote recycling?
- ◆ What is your view on the role of international work, in particular work of the OECD and of UNEP?

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<sup>1</sup> UNECA, ADB (2007). *The 2007 Big Table - Managing Africa's Natural Resources for Growth and Poverty Reduction*, Addis Ababa, Ethiopia.

<sup>2</sup> Hentschel, T., F. Hruschka and M. Priester (2002). *Global Report on Artisanal & Small-Scale Mining*, International Institute for Environment and Development, United Kingdom.

<sup>3</sup> UNEP (2007). *Outline and timeline for the development of the 10 Year Framework of Programmes on Sustainable Consumption and Production*, United Nations Environment Programme, France.

<sup>4</sup> EC (2000). *Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles - Commission Statements*, European Commission, Belgium

<sup>5</sup> Buchert, M., A. Hermann, W. Jenseit, H. Stahl, B. Osyguß and C. Hagelüken (2007). *Optimization of Precious Metals Recycling: Analysis of Exports of Used Vehicles and Used Electrical and Electronic Devices at Hamburg Port*, German Federal Environment Agency and Oeko-Institut, Germany

<sup>6</sup> UNEP (2005) *Basel Convention: Minimizing Hazardous Wastes: A Simplified Guide to the Basel Convention*, United Nations Environment Programme, Switzerland

<sup>7</sup> UNEP (2005). *E-waste, the hidden side of IT equipment's manufacturing and use*, United Nations Environment Programme, Environment Alert Bulletin, Switzerland

<sup>8</sup> ICMM (2007). *Materials Stewardship: Eco-efficiency and Product Policy*, International Council on Mining & Metals, United Kingdom

## Conference Notes

### Module 5 Sustainable manufacturing and distribution

#### Background<sup>1</sup>

Manufacturing industries play a key role in achieving a sustainable economy. Even with a falling share of GDP, manufacturing industries account for about 30 percent of the world's energy consumption, 36 percent of global CO<sub>2</sub> emissions<sup>2</sup>. They are also responsible for a broad range of other emissions to air, soil, and water.

Although interest in sustainable production has risen among industry in recent years, environmental protection and social responsibility are in most cases perceived as cost to business and a trade-off with competitiveness and economic growth. In most cases, efforts to engage in sustainable manufacturing have suffered from under-investment and industry opposition, rather than been seen as a business opportunity. Thus, current market structures appear unable to foster substantial and timely reductions of environmental burdens. Even under current best case scenarios, for example, global CO<sub>2</sub> emissions are still projected to increase 25% by 2030<sup>3</sup>. Also, despite a large number of approaches to go "greener", often referred to as corporate social responsibility (CSR) initiatives, a recent survey of 45 European companies shows that such activities do not necessarily lead to real improvement in their sustainability performance and that they are often used more as tools for public relation.<sup>4</sup>

The UN Global Compact (GC) principles promote corporate environmental and social responsibility (CSER) and stresses the triple bottom line of sustainability. The environment-related standards of the GC principles (precautionary approach, environmental responsibility and technology development) are particularly relevant. A significant potential for green technology innovation in the manufacturing sector lies in small and medium-sized enterprises (SME's), which receive special assistance through the Global Reporting Initiative (GRI). The common framework for sustainability reporting is applicable to all types of organisations. It enhances the credibility, comparability, value-added and comprehensiveness of corporate sustainability reports. It also enables global benchmarking on resource efficiency<sup>5</sup>.

The move towards sustainable manufacturing<sup>6</sup> based on a holistic, system-based approach is timely. Companies need to view the manufacturing process as an integral part of a greater system, as opposed to an independent activity, implying taking certain responsibility for the economic, environmental and social effects of *all* company operations, not just limiting concerns to immediate manufacturing processes.<sup>7</sup> This is particularly important in the context of globalisation because polluting and socially problematic activities may be outsourced to subcontractors in developing countries with lower regulatory standards, making companies appear more sustainable than they really are.

As sustainable manufacturing addresses the economic, environmental and social impact associated with all nodes in the manufacturer's value chain (including material acquisition, distribution, product use and disposal/recycling), it also offers great potential for new business opportunities. Considerations of how to reduce resource consumption throughout the product life-cycle, for instance, can lead to innovation of genuinely sustainable products and services and creation of new markets. Furthermore, it could help identify novel product applications that could improve overall resource efficiency through new ways of fulfilling "demand areas" (e.g. nutrition, housing, mobility) and product/service distribution (e.g. e-shopping, online delivery).

Integrating eco-design and cleaner production concepts in manufacturing and distribution sectors helps to foster greener product-services systems while sustaining economic growth. The cleaner production concept is widely recognised as a cost-effective win-win approach that increases overall efficiency with a minimum environmental impact.<sup>8</sup>

Since product design largely determines a product's total impact, companies need to take into account sustainability aspects from the very beginning of product development and co-ordinate different internal departments and business partners. This, however, is very challenging as companies may be locked into a variety of physical, social and institutional conditions that make radical innovation difficult (vis-à-vis incremental changes). Examples of such conditions include regulations, technological and capital infrastructure, industry structures, business cultures and consumer attitudes/behaviours. The absence of systematic ways to capture and monitor sustainability performance may also have been hindering moves towards sustainable manufacturing.

## Conference Notes

### Focus of the Module

This Module focuses on Product stewardship; Closed-loop manufacturing, remanufacturing and servicing; and Retailing and large-scale distribution. It will review:

- ◆ The contribution of the manufacturing and distribution sectors to improved resource efficiency, including measures in place to reduce environmental impacts, and the results achieved (corporate cases, sharing of good practices, role of government policies, collaboration with other sectors and stakeholders); and
- ◆ The role of corporate responsibility and of the OECD Guidelines for MNEs and other tools, in promoting resource efficiency at the various stages of the supply and process chains; and
- ◆ How the manufacturing and distribution sectors perceive the challenges and innovation/business opportunities related to resource efficiency at micro, macro and global levels.

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ What drives successful implementation of sustainable manufacturing at the firm level? What have been the success stories to date? Where are the big opportunities?
- ◆ What are the roles of government and companies in encouraging sustainable manufacturing and distribution?
- ◆ What are the barriers to influencing the value chain and how can companies overcome them?
- ◆ Which policies and instrument mixes have been successful in advancing sustainable production?
- ◆ How can companies innovate with new products and services that improve total resource efficiency?
- ◆ How can good practices be best shared on the global level?
- ◆ What is in your view the role of international work, in particular work by the OECD and by UNEP?

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<sup>1</sup> Adapted from OECD (2008). *Sustainable Manufacturing and Eco-innovation: Some preliminary thoughts*, DSTI/IND(2008)7, OECD, France.

<sup>2</sup> IEA (2007). *Tracking Industrial Energy Efficiency and CO2 Emissions*, International Energy Agency, France.

<sup>3</sup> IEA (2007). *World Energy Outlook*, International Energy Agency, France.

<sup>4</sup> In the 2007 study by RARE (*Rhetoric and Reality: Corporate Social Responsibility in Europe*, Institute for Applied Ecology, Germany), most companies stressed the importance of complying with mandatory legal requirements, as opposed to going beyond such regulation. The study also found that companies tackle CSR issues at a relatively low organisational level despite declaring them of "high strategic relevance", and that only few companies conduct systematic measurement of their CSR performance.

<sup>5</sup> UN Global Compact (2007). *Making the Connection: The GRI Guidelines and the Global Compact Communication on Process*, The Global Compact & Global Reporting Initiative. <http://www.unglobalcompact.org/>

<sup>6</sup> The eight key areas affecting the sustainability of manufacturing are: (i) *Use of resources*: Efficiency, toxicity, and renewability; (ii) *Nature of the product*: Design, durability, quality, packaging, usage, and reuse/recycling potential; (iii) *Emissions/effluents*: Waste generation and pollutant emissions to soil, air and water; (iv) *Economic performance*: Profitability, value added, growth, fair competition and investment; (v) *Employment*: Health and safety, training, education, benefits and wages, and freedom of association; (vi) *Society*: Equality, social justice and community involvement; (vii) *Product responsibility*: Safety, after-care and marketing; (viii) *Eco-innovation*: Products/services that help to reduce overall resource use and environmental impacts.

<sup>7</sup> Maxwell, D. and W. Sheate (2006). *Enabling Sustainable Development through Sustainable Consumption and Production*, International Journal of Environment and Sustainable Development, Vol. 5, No. 3.

<sup>8</sup> UNEP, inWent & Centro de Produccion mas Limpia (2006). *Environmental Agreements and Cleaner Production*, United Nations Environment Programme, France, Capacity Building International, Germany, Centro de Produccion mas Limpia, Costa Rica. <http://www.unep.fr/scp>.



## Conference Notes

### Module 6 International co-operation and partnerships

#### Background

The Johannesburg World Summit on Sustainable Development<sup>1</sup> stressed the need to attain the Millennium Development Goals (MDGs)<sup>2</sup> and the importance of decoupling economic growth from environmental pressures. Improved resource efficiency and sustained economic growth are central to achieving the eight MDGs, within the earth's carrying capacity. Resource efficiency can contribute to poverty reduction, in particular through more resource and cost-efficient products and processes and growing markets. Especially clean technologies can help promote economic growth, while ensuring environmental sustainability.

The 3R Initiative<sup>3</sup> (reduce, reuse and recycle) aims to build a sound-material-cycle society globally through the effective use of resources and materials. This G8 initiative promotes the principle of reducing waste, reusing and recycling resources and products. It aims at promoting science and technology through capacity development, technology co-operation and multilateral policy dialogue.

The promotion of resource efficiency is also one of the objectives of the International Panel for Sustainable Resource Management<sup>4</sup>, which provides coherent and authoritative scientific assessments on the environmental impacts of resource use over the full life-cycle. The Resource Panel aims at decoupling economic growth from resource use and from environmental degradation, and in particular developing a better understanding of the ways to increase resource-efficient economic growth.

Several other initiatives promote resource efficiency in the development context, such as the Life Cycle Initiative<sup>5</sup> launched by the United Nations Environment Programme (UNEP) and the Society for Environmental Toxicology and Chemistry (SETAC). The initiative enables users around the world to implement life-cycle approaches that reduce a product's resource use and environmental emissions, while improving its socio-economic performance throughout the life-cycle.

The development of the 10-Year Framework on sustainable consumption and production (SCP), known as the Marrakech Process<sup>6</sup>, includes a Co-operation Dialogue. This Dialogue is a platform to engage development agencies, regional banks, and SCP experts from both developing and developed countries on the promotion of SCP and its benefits for poverty reduction.

The Marrakech Process is supported by various partnerships and initiatives, and by the UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)<sup>7</sup>. The CSCP provides support in the development, testing, implementation and monitoring of concrete projects, especially in developing countries, which enables these countries to leapfrog to resource efficiency using life-cycle thinking and regional perspectives as guiding principles.

A long-standing initiative to help introduce Cleaner Production in developing countries and countries in transition is the UNIDO/ UNEP Programme for National Cleaner Production Centres (NCPCs)<sup>8</sup>. This unique capacity development programme helps countries to adopt and further develop the Cleaner Production concept at the national level. Another capacity development programme on hazardous waste management is run by the Secretariat of the Basel Convention through its Regional Centers.

Promoting innovative small and medium-sized enterprises (SMEs)<sup>9</sup> is an important step to foster clean technologies and resource efficiency in a globalised world (see also modules 3 and 5 on innovation and manufacturing). Innovative SMEs are the source of new processes or products and contribute to productivity improvements in the economy as a whole. In particular in developing countries, SMEs are faced with important international competition. The lack of adequate policy frameworks, technology transfer and financial incentives hamper the wide-spread use of resource-efficient technologies in SMEs in developing countries. International co-operation and partnerships along the supply chain can help SMEs to innovate and to leapfrog to more resource efficient technologies.

UNEP's forward looking Mid-Term Strategy, which aims at strengthening and focusing UNEP's response in a changing world and was adopted at the 10th Special Session of Governing Council/ Global Ministerial Environment Forum this year, includes as one of six priorities resource efficiency/ sustainable consumption and production. The new strategy will ensure that international cooperation and partnerships in the field of resource efficiency will be fostered by UNEP.

## Conference Notes

### Focus of the Module

This Module focuses on the (key) role of international co-operation and partnerships in achieving the following aims: development and MDGs; sharing good practices; capability development; and institution building. It will review:

- ◆ benefits of international co-operation and partnerships for improved resource efficiency at global level.
- ◆ synergies from development co-operation and regional or international networks and initiatives (e.g. the Marrakech process; the UNEP/ SETAC Life Cycle Initiative, the G8 3R initiative).

### Questions to be addressed

Presenters and other participants are invited to address the following questions:

- ◆ Why is resource efficiency so important and so challenging as a topic for international collaboration?
- ◆ Which are the main barriers for resource efficiency which international collaboration should address? What are the most important points that partnerships could address?
- ◆ Through which partnerships and co-operations a proactive, preventive approach for resource efficiency can be internalised in business operations and integrated into relevant policies?
- ◆ How can resource-efficient technology transfer and capacity building, in particular for SMEs, be fostered by international collaboration?
- ◆ Which actions are needed in addition to the current OECD and UNEP activities at the international level?

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- 1 UN General Assembly (2000). *United Nations Millennium Declaration*, United Nations. <http://www.un.org/millenniumgoals/>
  - 2 UN DESA (2002). Johannesburg Plan of Implementation. [http://www.un.org/esa/sustdev/documents/WSSD\\_POI\\_PD/English/POIToc.htm](http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIToc.htm)
  - 3 Ministry of the Environment Japan (2005). *Japan's Experience in the Promotion of 3R: For the Establishment of a Sound Material-Cycle Society*, Japan. <http://www.env.go.jp/recycle/3r/en/index.html>
  - 4 UNEP (2007). Inaugural meeting of the International Panel for Sustainable Resource Management, United Nations Environment Programme, France. <http://www.unep.fr/scp/rpanel/>
  - 5 UNEP (2006). *Background Report for a UNEP guide to Life Cycle Management: a bridge to sustainable products*, United Nations Environment Programme, France. <http://www.unep.fr/scp>
  - 6 UNEP DTIE/UN DESA (2007). *Marrakech Process on Sustainable Consumption and Production: Project Brief*, United Nations. <http://www.unep.fr/scp>
  - 7 UNEP/Wuppertal Institut CSCP, Wuppertal Institut for Environment, Climate, Energy GmbH & GTZ (2006). *Policy Instruments for Resource Efficiency: Towards Sustainable Consumption and Production*, United Nations Environment Programme, France/Wuppertal Institut & Gesellschaft für Technische Zusammenarbeit, Germany. <http://www.scp-centre.org/HOME.786.0.html>
  - 8 UNEP, inWent & Centro de Produccion mas Limpia (2006). *Environmental Agreements and Cleaner Production*, United Nations Environment Programme, France, Capacity Building International, Germany, Centro de Produccion mas Limpia, Costa Rica. <http://www.unep.fr/scp>
  - 9 OECD (2004). *Networks, Partnerships, Clusters and intellectual property rights: opportunities and challenges for innovative SMEs in a global economy*, Organisation for Economic Co-operation and Development, France.