



ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE

Working Group on Environmental Information and Outlooks

Work on Material Flows and Resource Productivity

Priority areas and work plan for 2009-2010 and beyond

24-26 November 2008
OECD Conference Centre, Paris, France

This document, prepared by the Secretariat:

- i) describes results achieved since 2004 in support of the implementation of the 2004 OECD Council recommendation on material flows (MF) and resource productivity (RP);*
- ii) proposes next steps (outputs, events) to implement the 2008 Council Recommendation on RP and to respond to the request by G8 Environment Ministers to monitor progress with resource productivity (G8 3R Action Plan).*

The focus is on activities that lie within the mandate of the WGEIO and that provides the factual basis for policy work, i.e. the development of a knowledge base on MF and RP (data, indicators, accounts, and subsequent analyses and reporting). The document establishes a link with work on policy analysis, evaluation and guidance that lies within the mandates of other OECD bodies.

It is submitted for discussion under item 2 of the agenda.

Contact: Ms. Myriam Linster, Environmental Performance and Information Division
tel: +33 (0)1 45 24 97 44, e-mail: edi-contact@oecd.org

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Note by the Secretariat

This document, prepared by the Secretariat, includes proposals for OECD work related to material flows (MF) and resource productivity (RP) in 2009-2010 and beyond.

Because of the horizontal and cross-sectoral nature of work related to MF and RP, the document gives an integrated overview of the different work areas that are relevant, considering both activities related to the development of a knowledge base on MF and RP (data, indicators, accounts, and subsequent analyses and reporting) lies within the mandate of the WGEIO and activities related to policy analysis, evaluation and guidance that lie within the mandates of other OECD bodies. The focus is however on work that lies within the mandate of the WGEIO and that provides the factual basis for policy work.

The document:

- i) describes the results achieved since 2004 in support of the implementation of the 2004 OECD Council recommendation on material flows and resource productivity;
- ii) identifies concrete next steps to implement the 2008 Council Recommendation on RP and to respond to the request by G8 Environment Ministers to monitor progress with resource productivity (G8 3R Action Plan).

The implementation of the proposed work elements will be closely co-ordinated with other relevant OECD activities (in particular sustainable materials management, but also sustainable manufacturing, eco-innovation, trade and the environment), with other international activities, and the private sector, including BIAC. It will be subject to countries' active support and to the availability of extra-budgetary resources.

Action required: for discussion

Delegates are invited to discuss the proposals for work in 2009-2010 and beyond, and in particular:

- Review the proposed outputs, and related time lines for implementation, and identify those outputs and events that should be given priority over the next two years.
- Indicate the intention of their country to contribute to the next stages of the work in 2009-2010 and to support individual outputs or events (by providing secondments and/or grants to the OECD Secretariat, by carrying out pilot work or case studies, by hosting seminars, by preparing and/or commissioning papers, etc.).
- Inform the Secretariat about any relevant activities or events planned in their country in 2009-2010 (workshops, seminars, publications, studies, etc.) that could contribute to the implementation of the OECD work programme.

They should bear in mind the following principles:

- ♦ mutual benefit: i.e. work carried out should serve the purposes of joint work in the OECD while also being of use to individual countries;
- ♦ cost-effectiveness: i.e. work carried out should contribute to minimising costs and duplication of work, while at the same time maximising benefits for member and partner countries, the OECD, and other international bodies.

Further written comments should be sent to the OECD Secretariat before **Monday 15 December 2008**. The document will be subsequently revised and finalised.

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OECD WORK ON MATERIAL FLOWS AND RESOURCE PRODUCTIVITY

I. Background

1. Natural resources, and the materials and products derived from them, are fundamental for the economy and for human welfare. Their production and use have many economic, environmental and social consequences that extend beyond the borders of single countries and that have a bearing on decisions cutting across many policy areas. Managing these resources in an efficient way all along their extraction, processing, use, reuse, recovery and end-of-life disposal is of strategic importance to governments and businesses alike. It contributes to economic growth and to the reduction of pressures on the environment, and hence to improved resource productivity.

2. In recent years, international markets for materials have changed with increasing international flows and a new geography of supply and demand, reflecting growing demands from OECD countries and emerging economies. This has prompted recurrent concerns about the environmental impacts and costs of resource use, the security of supply of certain materials and the overall resource productivity of economies. At the same time, many valuable materials contained in waste continue to be disposed of and are potentially lost for the economy.

3. A good understanding of the material basis of the economy and high quality information on the associated material flows should therefore underpin the formulation of economic, trade, technology, natural resource and environmental policies.

II. Objective

4. The purpose of OECD work on material flows and resource productivity is to (i) gain a better understanding of the physical resource base of member countries' economies, including its international and environmental dimensions, (ii) monitor progress with resource productivity, and (iii) foster the implementation of effective policy mixes that improve resource productivity, reduce negative environmental impacts of materials and product use, and promote integrated life-cycle oriented approaches to natural resource, waste and materials management (e.g. 3R policies (Reduce, Reuse, and Recycle), sustainable materials management, sustainable manufacturing).

III. Foundations

5. The work on MF and RP is rooted in two recommendations by the OECD Council:

- The recommendation on material flows and resource productivity adopted in April 2004 (Annex 1). This recommendation recognises the need for concerted efforts by member countries to improve information on material flows and establish common measurement systems and indicators to assess the sustainability and efficiency of material resource use. The focus is on the development of common methodologies and material flow accounts, tools to measure resource productivity and economy-wide material flows, the development and use of material flow analysis and derived indicators, and related data collection efforts.
- The recommendation on resource productivity adopted in March 2008 (Annex 2). This recommendation recognises the need for concerted efforts by member countries to improve resource productivity and reduce negative environmental impacts of materials and product use, by encouraging environmentally effective and economically efficient uses of natural resources and materials at the macro, sectoral and micro levels. The focus is on policies concerning the improvement of resource productivity, on the analysis of material flows and their environmental impacts and on the further improvement of data, accounts and indicators.

6. It responds to requests by Heads of State and Government and Environment Ministers of G8 countries who asked the OECD to help better understand material resource flows and develop common approaches for resource productivity indices (Evian and Paris, 2003), and to monitor progress with resource productivity (Hokkaido Toyako and Kobe, 2008). (Annex 3).

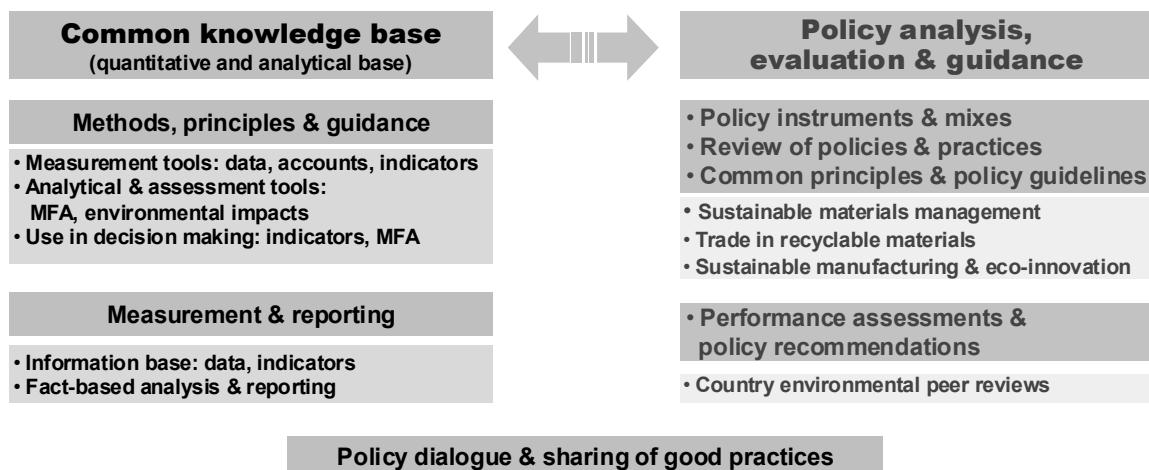
IV. Scope

7. The work is put in the context of ongoing international debates and initiatives concerning sustainable resource management, resource productivity and the circular economy (Annex 3). It considers both the economic efficiency and the environmental effectiveness of resource use, as well as related trade and supply security issues. In line with the OECD Council recommendations, it encompasses two streams of work:

1. The establishment of a common knowledge base on material flows and resource productivity to support policy analysis, evaluation and guidance. This is done by developing and implementing accounts and indicators, analysing material flows and their environmental impacts, and providing methodological and practical guidance to countries. It builds on OECD experience with environmental information, indicators and accounting. It is steered by the WGEIO in co-operation with other relevant OECD bodies and international partners.
2. Policy analysis, evaluation and guidance concerning resource productivity and sustainable materials management. This is done by reviewing existing policies and practices, providing recommendations and elaborating policy guidelines. It builds on OECD experience with waste management policies (transboundary movements, waste prevention, extended producer responsibility, environmentally sound management of waste), economic analysis, policy instruments and country environmental performance reviews. It is steered by the GWPR (sustainable materials management) and the WPEP (environmental peer reviews), in co-operation with other relevant OECD bodies and international partners.

8. The work is supported with official OECD meetings and technical workshops, and a multi-stakeholder dialogue giving it a global reach by bringing together governments from OECD countries and non-Member economies, the private sector, research and other NGOs.

Material flows and resource productivity – Main streams of work and building blocks



ACHIEVEMENTS SO FAR – MEASURING MATERIAL FLOWS AND RESOURCE PRODUCTIVITY

9. The first phase of work (2004-2007) has been supporting the implementation of the 2004 Council Recommendation and contributed to the G8 3R initiative. It has concentrated on the measurement of MF and RP with the development of harmonised guidance and the establishment of an information base to enable sound, fact-based material flow analysis. It paid attention to both:

- the “supply side”, i.e. how material flow accounts and related indicators can be constructed in a coherent framework that countries can easily implement and further adapt to their own needs, and
- the “demand side”, i.e. how material flow indicators can be selected to suit policy needs and how they can be interpreted and used in different contexts.

I. Main outputs

10. Main outputs include a series of guidance documents on “Measuring material flows and resource productivity”, an inventory of country activities, and a pilot data set.

Guidance documents

11. The guidance documents have been drafted in a joint effort by a group of experts from OECD countries led by the OECD Secretariat¹. They have benefited from contributions by members of the WGEIO and the Working Group on Waste Prevention and Recycling, the Eurostat Task Force on Material Flows, and the London Group on Environmental Accounting. The documents reflect the state of the art concerning experience with material flow analysis and related indicators in member countries. They are expected to evolve in future as ongoing efforts on methodologies and measurement systems will show results and as more feedback from policy uses will become available (Box 1).

Inventory of country activities

12. The inventory of country activities, released as part of the guidance documents, was compiled from various sources, including: (i) replies by countries and experts to a global survey of MF activities carried out jointly with the European Environment Agency (EEA) in 2004, and updated in 2007, and (ii) country and expert contributions to OECD workshops and to the annual Round Table on Environmental Information of the WGEIO.

Pilot data set

13. The pilot data set² has been compiled from existing national and international sources. It includes a first estimation of material inputs into national economies of OECD countries, building on an original Eurostat data set covering 15 EU countries, and using international statistical sources for primary production activities (agriculture, forestry, fishing, mining and quarrying) and for foreign trade. It also includes data on selected materials compiled from national geological surveys, business and industry associations, and production statistics. First results are presented in a new section on material resources of the OECD Compendium of Environmental Data, and have been used in the OECD Synthesis report on “Measuring MF and RP”.

II. Main events

Workshops and seminars

14. The work has benefited from a sequence of workshops and seminars bringing together environmental administrations, statistical services, material flow experts and researchers. The workshops were organised by the

¹ Experts and consultants: Mr. Derry Allen, Mr. Stefan Bringezu, Mr. Aldo Femia, Mr. Tomas Hak, Mr. Jan Kovanda, Mr. Yuichi Moriguchi, Mr. Heinz Schandl, Mr. Karl Schoer, Mr. Eric Turcotte, Ms Aya Yoshida. OECD Secretariat: Ms Myriam Linster. Financial and in-kind support: Czech Republic, Finland, Germany, Italy, Japan, Luxembourg, the United States.

² Consultants: Mr. Heinz Schandl, Ms Nina Eisenmenger, Mr Eric Turcotte.

WGEIO in co-operation with the OECD Working Group on Waste Prevention and Recycling (WGWPR) and hosted by member countries:

- OECD Helsinki Workshop on Material Flows and Related Indicators (June 2004) initiated OECD work to support the implementation of the 2004 Council Recommendation, and helped define the scope and level of ambition of joint work within the OECD.
- OECD Berlin Workshop on Material Flow Indicators and Related Measurement Tools (May 2005) helped develop guidance on how to construct material flow accounts and indicators in a coherent framework that countries can easily implement and further adapt. The focus was on methodological and measurement issues.
- OECD Rome Workshop on Material Flow and Resource Productivity Indicators – Interpretation and Use (May 2006) discussed the interpretation and use of MF and RP indicators and helped develop related guidance and common principles.
- OECD-Japan Seminar on Material Flows and Resource Productivity – From Knowledge to Policies (September 2007) helped prepare the move from the establishment of a knowledge base on MF and RP to integrated approaches towards natural resource, waste and materials management. It closed the first 3 years of work on MF and RP, and identified desirable developments and next steps. It also provided a basis for preparing the 2008 Council Recommendation and the OECD-UNEP Conference on Resource Efficiency.

Multi-stakeholder conference

15. The OECD-UNEP Conference on Resource Efficiency (April 2008³) provided an opportunity to share the results of three years of OECD work with a broader audience, and to support the G8 3R (reduce, reuse, recycle) initiative and the UNEP International Panel on sustainable resource management.

16. The Conference was organised as a multi-stakeholder event with worldwide coverage. It brought together over 250 participants from government, research, businesses and business associations, international organisations and civil society. It was sponsored by BIAC and selected industrial partners, and initiated a close co-operation with UNEP on resource efficiency issues.

17. The Conference reviewed resource efficiency issues taking a broad environmental and economic perspective, and building on expertise in various OECD Directorates⁴ and in UNEP, including the Resource Panel. It addressed the following aspects: i) improving knowledge: the role of material flow analysis and indicators; ii) from waste to resources: government policies; iii) technology and innovation; iv) sustainable mining and recycling; v) sustainable manufacturing and distribution; vi) international co-operation and partnerships. (Annex 4; www.oecd.org/environment/resourceefficiency).

III. Areas for progress concerning knowledge and information

18. The first three years of work are a first step towards achieving greater convergence of existing activities and facilitating wider dissemination and uptake of existing experience and guidance. More is needed to:

- Promote the use of MF analysis and indicators in decision making, gain feedback from practical applications at government and business level, and identify a balanced set of MF and RP indicators for international use.
- Tailor the information base to the needs of analytical and policy work and improve its quality and scope, paying special attention to data on physical trade flows, and data on flows of materials and products raising environmental concerns, and flows of importance to the 3R Action Plan, including flows of recyclable materials and waste.
- Gain a better understanding the environmental impacts and costs of resource use throughout the entire life cycle of materials and the products that embody them (i.e. from natural resource extraction, manufacturing, use/consumption to end-of-life management). (Annex 5).

³ Conference held on 23-25 April 2008, just before the meeting of OECD Environment Ministers on 28-29 April 2008.

⁴ Environment Directorate, Directorate for Science, Technology and Industry, Directorate for Financial and Enterprise Affairs, the Heiligendamm Dialogue Process.

Box 1 Measuring Material Flows and Resource Productivity A series of guidance documents by the OECD

The guidance documents on Measuring material flows and resource productivity are part of the OECD work programme on material flows (MF) and resource productivity (RP) that supports the implementation of the OECD Council recommendation on MF and RP adopted in April 2004. They provide guidance on methodological and measurement issues related to material flow analysis (MFA), including the development of accounts and indicators. Emphasis is on tools that can be used by governments to support the development and implementation of national policies and related international work. They include:

- **Volume I. The OECD guide.**

Volume I describes the full range of MF approaches and measurement tools, with a focus on the national level and emphasis on areas in which practicable indicators can be defined. It is targeted at a non expert audience. It includes (i) an overall framework for material flow analysis (MFA), (ii) a description of different kinds of measurement tools, (iii) a discussion of those issues and policy areas to which MFA and material flow indicators can best contribute, and (iv) guidance on how to interpret material flow indicators. It includes examples from countries' experience and a glossary.

- **Volume II. The accounting framework.**

Volume II provides a theoretical description of the concepts and methodologies of MF accounting. It is targeted at an expert audience. It draws upon the SEEA handbook⁵, and on the guide published by Eurostat in 2001⁶. It has benefited from consultations with Eurostat, the London Group on Environmental Accounting, and the UN Committee of Experts on Integrated Environmental Economic Accounting. Volume II is seen as work in progress. It contributes to the SEEA revision by providing a basis for discussion and further development. It may evolve as ongoing efforts on methodologies and classifications will show results, and as work on the SEEA revision led by the UNCEEA will progress.

- **Volume III. Inventory of country activities.**

Volume III takes stock of activities related to the measurement and analysis of natural resource and material flows in place or planned in OECD countries and in selected non members. It describes the main features that characterise such activities and the extent to which information on material resources is used in environmental reporting and in decision making. It is designed to provide a factual basis for the further exchange of experience and information, and for sharing lessons at international level.

- **Volume IV. Implementing national MF Accounts** (forthcoming, prepared jointly with Eurostat).

Volume IV provides practical guidance to assist countries in implementing national material flow accounts. It is targeted at practitioners of MF accounting. It is constructed in a modular way to reflect several levels of ambition and completeness of accounts, and is being developed stepwise. The first edition will focus on simple MF accounts building on a set of core tables tested and used by Eurostat.

The guidance documents are complemented by a **synthesis report** that summarises the work carried out, takes stock of progress made, and adds selected examples from applications of MFA. They are published on the responsibility of the Secretary General of the OECD.

⁵ Handbook on national accounting - Integrated Environmental and Economic Accounting, United Nations, European Commission, IMF, OECD, World Bank, 2003

⁶ Economy-wide material flow accounts and derived indicators – A methodological guide, Eurostat, 2001.

PROPOSALS FOR WORK IN 2009-2010 AND BEYOND - MONITORING PROGRESS WITH RESOURCE PRODUCTIVITY

19. In 2009-2010 and beyond, the work will support the implementation of the 2008 OECD Council Recommendation on Resource Productivity (Annex 2) and contribute to the monitoring of the G8 3R Action Plan⁷. It will entail an observation role of the OECD on resource productivity with a fact-based analysis of major trends and changes, and reviews of current policies and practices, thus strengthening the OECD monitoring function in this field.

20. The work will consolidate and expand the knowledge base on material flows and resource productivity, with the further development of the information base and of analytical work, and greater emphasis on indicator applications and on the environmental impacts of resource use (work steered by the WGEIO).

21. It will support and benefit from policy analysis and evaluation work steered by other OECD bodies, and in particular work on sustainable materials management (steered by the GWWR - Working Group on Waste Prevention and Recycling), and work on environmental peer reviews (steered by the WPEP - Working Party on Environmental Performance).

22. It will benefit from work on trade in recyclable materials (steered by the JWTE - Joint Working Party on Trade and Environment), and from work on sustainable manufacturing (steered by the Advisory Expert Group on Sustainable Manufacturing and Eco-innovation of the Committee for Industry, Innovation and Entrepreneurship). Synergies also exist with work on eco-innovation, on globalisation and the environment, and on productivity.

23. The work will be supported with official OECD meetings and with technical workshops and seminars that could be hosted by member countries or partner organisations. It could further entail the organisation of another multi-stakeholder conference in 2011, following on the 2008 OECD-UNEP Conference on Resource Efficiency and following up on the G8 3R Action Plan. This would be an opportunity for bringing together the results from various work streams across the OECD and for sharing these results with a global audience.

I. A common knowledge base on material flows and on resource productivity

24. The purpose of further work on the knowledge base is to (i) provide a factual basis for informing OECD policy work, (ii) monitor progress with resource productivity, and (iii) assist countries with the further development and implementation of appropriate measurement systems (data, accounts, indicators) and their use in decision making.

Lead body: WGEIO

Co-operation with: GWWR

25. The proposals for work in 2009-2010 and beyond are structured along the following lines:

Measurement and reporting

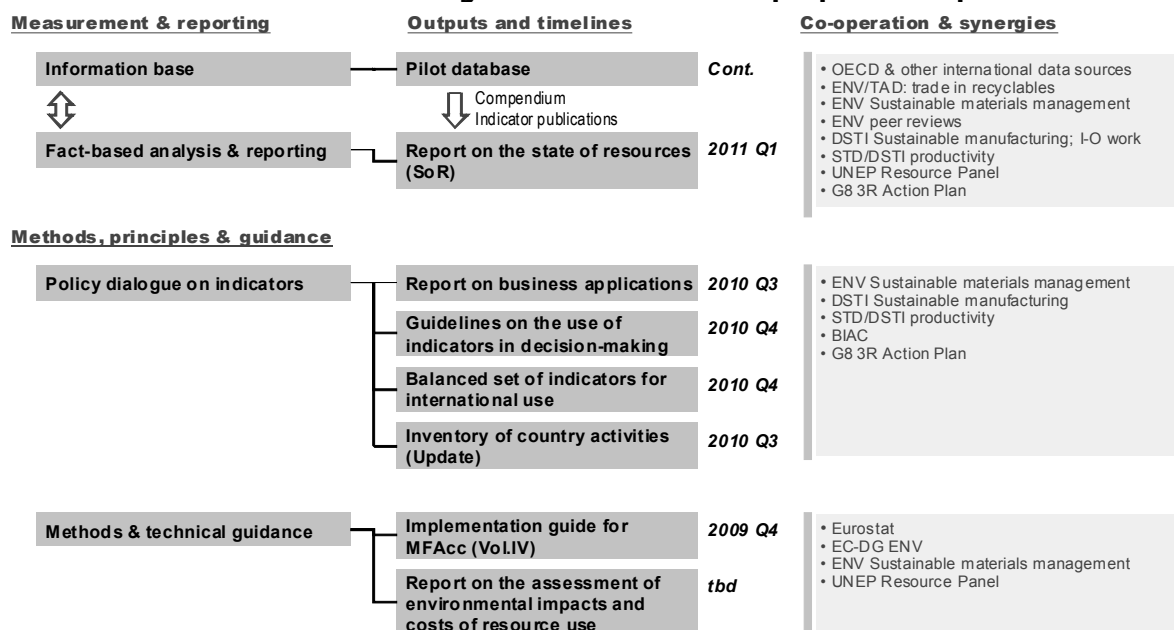
- The further development of the information base, paying particular attention to selected materials and products, to physical trade flows and to flows of environmental significance.
- Fact-based analysis of material flows and resource productivity, including the preparation of a report on the state of resources.

Methods, principles and guidance

- A policy dialogue on MF and RP indicators, including a review of government and business applications and the identification of a balanced set of indicators for international use.
- The further development of methods and technical guidance for monitoring MF and RP, paying particular attention to the compilation of MF accounts and to assessment of environmental impacts and costs of resource use.

⁷ 3R (reduce, reuse, recycle) Action Plan adopted by Environment Ministers of G8 countries (Kobe, 24-26 May 2008) and endorsed by the Heads of State and Government of G8 countries (Hokkaido Toyako, 7-9 July 2008).

A common knowledge base - Overview of proposed outputs



I.1 Measurement and reporting

The further development of the information base

26. The proposed work includes the establishment of an internationally compatible database building on existing international and national data sources. The purpose is to support analytical and policy work by the OECD and the calculation of MF and RP indicators.

27. Emphasis will be on key materials⁸ that are internationally-significant, in both economic and environmental terms and on products embodying them, on physical trade flows, indirect flows, and on flows of importance to the 3R Action Plan, including flows of recyclable materials and waste.

Information base

Proposed outputs

- ◆ Internationally compatible database (OECD pilot MF database)
- ◆ Inclusion of data on material resources in the OECD Compendium
- ◆ Inclusion of MF and RP indicators in OECD environmental indicator publications

Supporting events

- ◆ WGEIO meetings

Timelines

- ◆ Continued activity (as part of the development of the SIREN⁹ database)
- ◆ To be aligned with information needs and timelines for analytical and policy work

Synergies with other activities

- ◆ Database: co-operation with Eurostat; STD (trade database); others
- ◆ Selection of key materials and related data compilation: co-ordination with OECD work on SMM (case studies); co-ordination with UNEP Resource Panel (e.g. metal working group)

Comments

- ◆ Database to be populated with data from existing OECD and other international sources
- ◆ Extra-budgetary support may be needed to develop database (grant, secondment)

⁸ Examples include: aluminium, copper, iron & steel, rare metals, heavy metals, plastics, paper, food related materials.

⁹ System of Information on Resources in the Environment.

Fact-based analysis and reporting

28. The proposed work includes a fact-based analysis of MF and RP in important areas, paying particular attention to structural changes and shifts in material resource flows in the global context, their environmental consequences (impacts, costs, benefits), and interactions with supply security, commodity prices, resource productivity and competitiveness. The analysis will take into account the diversity of countries as regards their geographical and socio-economic context, their endowment in natural resources and related trade patterns.

29. Emphasis will be on key materials⁸ that are internationally-significant, in both economic and environmental terms and on products embodying them, on physical trade flows, indirect flows, and flows of importance to the 3R Action Plan, including flows of recyclable materials and waste.

30. It is proposed to present the results of this work in a report on the state of resources in OECD countries and beyond. Such a report would be prepared in the same spirit than the SoE reports prepared earlier by the WGEIO (former Group on the State of the Environment). It would draw on the OECD pilot database, on national reports on the resources and the environment, and on expertise in the OECD Secretariat and in countries.

Fact-based analysis and reporting*Proposed outputs*

- ◆ Report on the state of resources (SoR) in OECD countries and beyond

Supporting events

- ◆ WGEIO meetings

Timelines

- ◆ Start: Q1 2009 → draft report: Q1 2010 → final report: Q1 2011

Synergies with other activities

- ◆ Report could benefit from expertise in various OECD Directorates, including Environment (SMM case studies, trade in non-hazardous recyclable materials), DSTI (e.g. input-output tables, sustainable manufacturing), STD (productivity measurement, trade statistics).
- ◆ Report could benefit from experience in the private sector and from work by the UNEP Resource Panel.
- ◆ Report would provide inputs into the monitoring of the G8 3R Action Plan.

Comments

- ◆ Drafting process to be led by Secretariat with the support of a small group of experts and consultants (drafting team);
- ◆ Extra-budgetary support needed to carry out first analysis and draft report (papers, case studies, grant, secondment)
- ◆ First results could feed into the Global Forum on Environment dedicated to sustainable materials management (planned to be held in October 2010, hosted by Belgium).

1.2 Methods, principles and guidance***Policy dialogue on MF and RP indicators***

31. The proposed work includes:

- A review of government and business applications for indicators that assess the efficiency of material resource use at various scales and for various materials or products (e.g. wastes, reusables, recyclables), including applications in planning or target setting.
- A policy dialogue on the benefits and implications of pursuing various methods for developing and adopting a balanced set of common MF and RP indicators. Such a set would include, beside material specific indicators, a few more comprehensive and easily understandable indicators for policy makers and other stakeholders.

Policy dialogue on indicators

Proposed outputs

- ◆ Report on business applications of MF and RP indicators
- ◆ Common principles and guidelines concerning the application of MF and RP indicators in decision making, including applications in planning or target setting
- ◆ Guidelines for a balanced set of MF and RP indicators for international use
- ◆ Updated inventory of country activities

Supporting events

- ◆ WGEIO meetings
- ◆ Seminar(s) on business (and government) applications of MF and RP indicators

Timelines

- ◆ Seminar(s): Q3/Q4 2009
- ◆ Report and updated inventory: Q3 2010

Synergies with other activities

- ◆ Seminar(s): co-operation with the WGWPR
- ◆ Work on business applications: co-operation with BIAC and businesses, co-operation or joint activities/events with DSTI (project on sustainable manufacturing and eco-innovation)
- ◆ Could contribute to the monitoring of the G8 3R Action Plan

Comments

- ◆ Host country or organisation to organise seminar; extra-budgetary support needed to draft report (papers, case studies, grant)

The further development of methods and technical guidance

32. The proposed work includes (i) practical guidance for compiling material flow accounts (to complete the series of OECD guidance documents), and (ii) a review of tools for assessing the environmental impacts and costs of resource use (scientific knowledge, economic valuation, other methods, indicators).

Methods, principles and guidance

Proposed outputs

- ◆ Implementation guide for national MF accounts (Volume IV of the series of OECD guidance documents, prepared jointly with Eurostat)
- ◆ Report on the assessment of environmental impacts and costs of resource use

Supporting events

- ◆ WGEIO meetings
- ◆ Workshop on the assessment of the environmental impacts and costs of resource use

Timelines

- ◆ Implementation guide: draft Q2 2009 → final Q4 2009
- ◆ Environmental impacts: workshop: Q2 2010; report: to be defined

Synergies with other activities

- ◆ Implementation guide: joint work with Eurostat
- ◆ Environmental impacts: co-operation with WGWPR; co-ordination/joint work with the UNEP Resource Panel and EU work.

Comments

- ◆ Implementation guide requires inputs from MF experts and NSOs having practical experience with MF accounts.
- ◆ Environmental impacts: added value of OECD work to be reviewed in the context of work done in other fora (EU, UNEP Resource Panel); extra-budgetary support needed to organise workshop and draft report (host country or organisation, grant, papers).

II. Policy analysis, evaluation and guidance

33. The purpose of work on policy analysis, evaluation and guidance is to (i) elaborate common principles and policy guidelines concerning resource productivity and sustainable materials management, (ii) assist countries with the development and implementation of policies, action and framework conditions that will contribute to enhanced resource productivity, and (iii) monitor results achieved.

Lead bodies: WPEP, GWPR
Co-operation with: WGEIO

34. The work will include:

- A review of existing policies and practices in the field of resource productivity, including sustainable materials management
- The elaboration of common principles and policy guidelines concerning resource productivity and sustainable materials management
- The assessment of countries' performance with respect to resource productivity and the implementation of related policies as part of country environmental peer reviews.

35. The work will cover new technologies and innovations, framework conditions that improve resource productivity including through economic instruments, and trade and development aspects.

36. It will build on the common knowledge base, including information and analysis, on the OECD framework for effective and efficient environmental policies, and on work on international trade in non-hazardous recyclable materials and waste. It will benefit from work on sustainable manufacturing and on eco-innovation.

Policy analysis, evaluation and guidance

Proposed outputs

- ◆ SMM case studies on the management and life-cycle of selected materials (aluminium, critical metals, fibres, plastics)
- ◆ Policy studies on (i) the pros and cons of using targets in sustainable materials management, (ii) policy principles for SMM, and (iii) policy instruments for SMM
- ◆ Chapter/section on resource productivity in country environmental peer reviews

Supporting events

- ◆ GWPR and WPEP meetings, other meetings
- ◆ A Global Forum on Environment (GFE) dedicated to Sustainable Materials Management with emphasis on policies and instruments to implement SMM (lessons from experience so far, best practices, etc.). Planned to be held in October 2010; to be hosted by Belgium.

Comments

- ◆ Work steered by other OECD bodies
- ◆ Results to feed into the monitoring of the G8 3R Action Plan.

Box 2 Overview of relevant activities and responsible bodies

A COMMON KNOWLEDGE BASE

Lead body: WGEIO

Joint events and co-operation with GWPR (link to sustainable materials management, waste prevention indicators)

Other relevant OECD activities*:

- WPEP (link to country peer reviews)
- WPNEP and WPGSP (link to eco-innovation indicators, to indicators on globalisation and the environment)
- STD (link to productivity measurement, to OECD-UN trade data base.)
- DSTI (link to input-output tables, productivity and innovation indicators, indicators for sustainable manufacturing, globalisation indicators)
- BIAC (link to waste management, raw materials, technology and competition)

Other international activities* of relevance:

- EC-Eurostat-EEA (link to material flow accounts, indicators, environmental impacts of MF, thematic strategy on sustainable use of natural resources, other related strategies and actions plans)
- G8 (link to 3R initiative and action plan)
- UNSD-UNCEEA (link to MF accounts, to the SEEA)
- UNEP Resource Panel (link to assessments of environmental impacts of resource use, to working group on metals)

POLICY ANALYSIS, EVALUATION AND GUIDANCE

Lead bodies: WPEP (peer reviews) and GWPR (sustainable materials management)

Co-operation with WGEIO (link to knowledge base on MF and RP)

Other relevant OECD activities*:

- WPNEP (link to eco-innovation, to policy instruments)
- WPGSP (link to globalisation and eco-innovation)
- JWPTE (link to trade in non-hazardous recyclable materials)
- DSTI (link to sustainable manufacturing, eco-innovation)
- BIAC (link to waste, raw materials, technology and competition)

Other international activities* of relevance:

- EC (link to thematic strategy on sustainable use of natural resources, and to other related strategies and actions plans: environmental technology; sustainable consumption and production, sustainable industrial policy)
- G8 (link to 3R initiative and action plan)

* Includes activities that are expected to generate outputs of relevance to work on MF and RP; activities that are expected to guide and orient work on MF and RP; activities that could benefit from outputs generated by work on MF and RP; activities that could lead to joint work

ANNEXES

ANNEX 1.

Recommendation of the OECD Council on Material Flows and Resource Productivity

Adopted on 21 April 2004 - C(2004)79

THE COUNCIL,

Having regard to Article 5 b) of the Convention on the Organisation for Economic Co-operation and Development of 14th December 1960;

Having regard to the Recommendation of the Council of 8th May 1979 on Reporting on the State of the Environment [C(79)114];

Having regard to the Recommendation of the Council of 31st January 1991 on Environmental Indicators and Information [C(90)165/FINAL];

Having regard to the Recommendation of the Council of 20th February 1996 on Implementing Pollutant Release and Transfer Registers [C(96)41/FINAL] amended on 28th May 2003 [C(2003)87];

Having regard to the Recommendation of the Council of 3rd April 1998 on Environmental Information [C(98)67/FINAL];

Having regard to the Communiqué of the OECD Council meeting at Ministerial level of 17th May 2001 which stated that "that OECD countries bear a special responsibility for leadership on sustainable development worldwide, historically and because of the weight they continue to have in the global economy and environment" and which asked the OECD to "continue to assist governments by: developing agreed indicators that measure progress across all three dimensions of sustainable development, including decoupling of economic growth from environmental degradation";

Having regard to the OECD's Environmental Strategy for the First Decade of the 21st Century endorsed by MCM in May 2001;

Having taken note of international work on Integrated Environmental and Economic Accounting (commonly referred to as SEEA);

Considering the need for better information designed to integrate more fully environmental and economic decision-making;

Convinced of the need for intensified efforts by OECD member countries to establish and use indicators of progress concerning the implementation of national and subnational policies on the environment, eco-efficiency and sustainable development; and to systematically compare achieved results with relevant objectives of environmental policies and, where appropriate, related international commitments;

Taking into account the close co-operation on environmental matters between OECD and other international organisations;

On the proposal of the Environment Policy Committee (EPOC):

I. Recommends that member countries:

1. Take steps to improve information on material flows, including its quality and relevance for environmental management, in particular:
 - develop methodologies to enhance knowledge of material flows within and among countries;
 - consolidate and improve data collection concerning material flows within and among countries;
 - develop tools to measure resource productivity and economy-wide material flows, including appropriate estimation methods, accounts and indicators;
2. Further develop and use indicators to better integrate environmental and economic decision-making, and to measure environmental performance with respect to the sustainability of material resource use;
3. Promote the development and use of material flow analysis and derived indicators at macro and micro levels;
4. Link environmental and economic related information through work on material flows, stocks and flows of natural resources, environmental expenditure, and macro-economic aspects of environmental policies;
5. Co-operate to develop common methodologies and measurement systems of material flows, with emphasis on areas in which comparable and practicable indicators can be defined, drawing on work already done at national and at international level.

II. Instructs the Environmental Policy Committee:

1. To support and facilitate member countries' efforts to improve information on material flows and related indicators, including through exchange of information on national and international innovative experiences;
2. To continue efforts to improve methods and indicators for the assessment of the efficiency of material resource use in important areas;
3. To develop a guidance document to assist member countries in implementing and using common material flow accounts;
4. To carry out these tasks in co-operation with other appropriate OECD bodies and other international organisations to prevent duplication and reduce costs;
5. To report to the Council on progress achieved by member countries in implementing this Recommendation, within three years of its adoption.

ANNEX 2.

Recommendation of the OECD Council on Resource¹⁰ Productivity¹¹

Adopted on 28 March 2008 [C(2008)40]

Noted and welcomed by OECD Environment Ministers on 28 April 2008

THE COUNCIL,

Having regard to Article 5 b) of the Convention on the Organisation for Economic Co-operation and Development of 14 December 1960;

Having regard to the Recommendation of the Council of 26 May 1972 on Guiding Principles concerning International Economic Aspects of Environmental Policies [C(72)128];

Having regard to the Recommendation of the Council of 28 September 1976 on a Comprehensive Waste Management Policy [C(76)155/FINAL];

Having regard to the Recommendation of the Council of 31 January 1991 on Environmental Indicators and Information [C(90)165/FINAL];

Having regard to Decision C(2001)107/FINAL of the Council (of 14 June 2001 and 25 February 2002, as amended by C(2004)20 and C(2005)141) Concerning the Control of Transboundary Movements of Wastes Destined for Recovery Operations;

Having regard to the Recommendation of the Council of 21 April 2004 on Material Flows and Resource Productivity [C(2004)79];

Having regard to Recommendation of the Council of 9 June 2004 on Environmentally Sound management of Waste [C(2004)100];

Having regard to the Communiqué of the OECD Council meeting at Ministerial level of 17th May 2001 which stated that "that OECD countries bear a special responsibility for leadership on sustainable development worldwide, historically and because of the weight they continue to have in the global economy and environment";

Having regard to the OECD's Environmental Strategy for the First Decade of the 21st Century endorsed by the OECD Council in May 2001;

Having taken note of OECD work on material flows and resource productivity, waste prevention and recycling, sustainable materials management, natural resource management, and trade and the environment;

Having taken note of international work on the 3Rs (Reduce, Reuse, and Recycle) steered by the G8, on sustainable resource management steered by the International Panel on Sustainable Resource Management and on energy efficiency steered by the International Energy Agency;

Considering the need for intensified efforts by OECD Member countries (both domestically and in the international context) to improve the productivity of natural resource use at all stages of the life-cycle of these resources (extraction, transposition, transportation, consumption, and disposal) so as to avoid waste of resources and reduce the associated negative environmental impacts;

Considering that increasing this productivity will also reduce demand pressure on natural resources more generally, thereby contributing to more secure supplies of natural resources for everyone;

Taking into account the close co-operation on environmental matters between OECD and other international organisations;

¹⁰ For the purposes of this Recommendation, the term "resource" is understood to include natural resources (and the materials and products derived therefrom) whose extraction, processing, use and disposal are internationally-significant, in both economic and environmental terms. The scope of the Recommendation is limited to minerals (metallic and non-metallic industrial minerals), and biomass. Energy resources (e.g. coal, oil, gas), water resources and fishery resources are excluded and are only covered to the extent that they are part of an integrated approach to the entire resource cycle.

¹¹ For the purposes of this Recommendation, the term "resource productivity" is understood to contain both a *quantitative* dimension (e.g. the quantity of output produced with a given input of natural resources) and a *qualitative* dimension (e.g. the environmental impacts per unit of output produced with a given natural resource input). Energy efficiency is excluded, although it is recognised that energy efficiency and resource productivity are interrelated.

On the proposal of the Environment Policy Committee (EPOC):

I. Recommends, with regard to the analysis of the material flows and their environmental impacts, that Member countries:

Promote resource productivity by strengthening their capacity for analysing material flows and the associated environmental impacts, and work to improve measurement systems for material flows and resource productivity, drawing on the expertise of all relevant ministries and departments of government, research and other non-governmental organisations, on OECD guidance and experience on measurement and analysis of material flows and resource productivity and on other international work; and to this effect:

1. Improve the scientific knowledge concerning the environmental impacts and costs of resource use throughout the entire life cycle of materials and the products that embody them, from natural resource extraction and manufacturing to end of life management (as wastes, reusables and recyclables), including from resources that have been imported.
2. Upgrade the extent and quality of data on material flows within and among countries and the associated environmental impacts, giving particular attention to the availability and international comparability of data on physical trade flows, including flows of recyclable materials and waste, and selected material flows that are of economic and environmental importance.
3. Work to improve and use soundly based, relevant and internationally compatible material flow accounts that track natural resource stocks and flows and link them to critical environmental cycles.
4. Further develop and promote the use of indicators for the assessment of the efficiency of material resource use, having carefully considered the uses and purposes, practical arrangements, costs, benefits and statistical basis for such indicators, including:
 - indicators to measure resource productivity and decoupling of resource use from economic growth, at relevant macro, sectoral and/or micro levels, considering both: overview indicators for monitoring natural resource use, resource productivity and the associated environmental impacts; and specific and disaggregated indicators for monitoring resource use, resource productivity, 3R (Reduce, Reuse, and Recycle) related flows and the associated environmental impacts concerning particular resources, materials or activities;
 - indicators to inform about the availability, quality and deterioration of natural resource stocks, in particular renewable resource stocks;
 - indicators to track the flows and environmental impacts of materials, taking account of their entire life cycle from natural resource extraction and manufacturing to end of life management.
5. Co-operate with non-Member Economies to strengthen their capacity for analysis of material flows and the associated environmental impacts.
6. Share OECD guidance and experience on measurement and analysis of material flows and resource productivity with all relevant ministries and departments of government, research and other non-governmental organisations, and members of the private sector.

II. Recommends, with regard to the policies concerning the improvement of resource productivity, that Member countries:

Take appropriate actions to improve resource productivity and reduce negative environmental impacts of materials and product use, by encouraging environmentally effective and economically efficient uses of natural resources and materials at the macro, sectoral and micro levels and by involving all relevant ministries and departments of government as well as research and other non-governmental organisations. To this effect:

1. Consider the use of information about material flows and their environmental impacts for planning purposes, as appropriate in a national context, including, for instance, using such information for target setting, and share these experiences and best practices with other Member countries.
2. Promote integrated life-cycle-oriented approaches, such as 3R policies (Reduce, Reuse, and Recycle), sustainable materials management and sustainable manufacturing as an input to decision-making and to increasing coherence among policies.
3. Further develop and promote the use of new technologies and innovations aimed at improving resource productivity.
4. Encourage co-operation and sharing of best practices among enterprises.

5. Contribute to the establishment of framework conditions that improve resource productivity through economic instruments.
6. Co-operate to ensure that policy measures taken to improve resource productivity are efficient in economic terms, effective in environmental terms and equitable in social terms;
7. Co-operate with non-Member Economies to strengthen their capacity for developing and implementing policies concerning the improvement of resource productivity.

III. Instructs the Environment Policy Committee:

1. To review existing policies and practices and contribute to elaborating common principles and policy guidelines on resource productivity and sustainable materials management.
2. To strengthen its capacity for material flow analysis at the international level, with particular focus on key materials, on direct and indirect flows and their environmental impacts, including possible development of relevant databases in co-operation with other international organisations and non-Member Economies.
3. To further develop and where appropriate promote the use of material flow analysis, resource productivity indicators, and methods for assessing the environmental impacts of resource use.
4. To support Member countries' efforts in developing and implementing integrated policies for managing natural resource and materials throughout their life cycles, by facilitating the exchange of experience and best practices in the field of resource productivity, including sustainable materials management and sustainable manufacturing.
5. To assist non-Member Economies in developing and implementing policy frameworks and measurement systems that contribute to the achievement of the objectives of this recommendation both domestically and internationally.
6. To carry out these tasks in co-operation with other appropriate OECD bodies, other international organisations such as UNEP (including the Resource panel) and G8 (including the 3R initiative) and the private sector.
7. To report to the Council on progress achieved in implementing this Recommendation, within five years of its adoption.

ANNEX 3.

International references to material flows and resource productivity issues

G8 Summits

In 2003, the Heads of State and Government of G8 countries, at their summit in France adopted an Action Plan on "Science and Technology for Sustainable Development" stating that G8 members "will enhance their understanding of resource material flows and continue work on resources productivity indices, notably in the OECD". (Evian, 1-3 June 2003)

This followed on the communiqué by G8 Environment Ministers who recognised "that it is essential to improve resource productivity" and noted with interest "Japan's proposal to launch an international joint research project on economy-wide material flow accounts to develop a common measurement system of material flow, building on existing work at the international level", and "that a common approach has to be elaborated in order to identify and develop indicators and indices to monitor the shift in consumption and production patterns". They invited "the OECD to play a supportive role in that respect". (Communiqué adopted by G8 Environment Ministers, Paris, 25-27 April 2003).

In 2004, the Heads of State and Government of G8 countries at their summit in the United States endorsed the "Reduce, Reuse and Recycle" (3Rs) initiative proposed by Japan as part of the follow-up to the Action Plan on "Science and Technology for Sustainable Development" adopted in 2003. (Sea Island, 9-10 June 2004).

In 2006, the Heads of State and Government of G8 countries at their summit in Russia adopted a Plan of Action on Global Energy Security emphasising the importance of energy efficiency and stating that "As part of an integrated approach to the entire resource cycle we reaffirm our commitment to comprehensive measures to optimize the resource cycle within the 3Rs Initiative (Reduce, Reuse, Recycle). In furthering these efforts, we will set targets as appropriate taking account of resource productivity." (St Petersburg, 15-17 July 2006).

In 2007, the Heads of State and Government of G8 countries at their summit in Germany agreed to increase transparency and good governance in the raw materials sector as a contribution to sustainable growth, and stated that "based on sound life cycle analyses, we will ... encourage conservation, recycling and substitution of raw materials, including rare metals, for sustainable growth." (Heiligendamm, 6-8 June 2007).

In 2008, the Heads of State and Government of G8 countries at their summit in Japan (Hokkaido Toyako, 7-9 July 2008) endorsed the 3R Action Plan adopted by Environment Ministers of G8 countries (Kobe, 24-26 May 2008). In the Kobe 3R Action Plan, Environment Ministers of G8 countries recognise "the value of the work done by OECD to develop tools for the 3Rs, including ... Material Flows Analysis, resource productivity, and sustainable materials management", "welcome the adoption of the OECD Council Recommendation on Resource Productivity", and "request the OECD to follow up on the progress of work related to resource productivity" as part of the follow-up on the Action Plan.

OECD

The Council of the OECD has adopted several policy and legal texts of relevance to sustainable resource use and resource productivity and concerning actions that Member countries agreed to carry out in the framework of the Organisation.

In 2001, OECD Environment Ministers and the OECD Council at ministerial level adopted the OECD Environmental Strategy for the First decade of the 21st Century that includes two objectives related to the efficiency of resource management:

- maintaining the integrity of ecosystems through the efficient management of natural resources with a focus on renewable resources such as freshwater and biodiversity.
- decoupling environmental pressure from economic growth and making integrated efforts to address consumption and production patterns, including by encouraging more efficient resource use and hence increases in resource productivity.

This follows on the recommendations formulated in 1997 of the High Level Advisory Group on the Environment to the Secretary General of the OECD: "... it is now time for the OECD to concentrate on increasing resource productivity with the same effectiveness it applied to labour productivity. This should be done not just for environmental reasons, but also for economic and social reasons" (OECD, 1997).

In 2004, the Council of the OECD adopted a Recommendation on material flows and resource productivity asking OECD countries to improve information and knowledge on material flows and resource productivity, and to develop common methodologies and measurement systems, with emphasis on areas in which comparable and practicable indicators can be defined.

In 2008, the Council of the OECD adopted a Recommendation on resource productivity asking OECD countries to strengthen their capacity for analysing material flows and associated environmental impacts, further improve measurement systems (data, indicators, accounts); and take action to improve resource productivity and reduce negative environmental impacts of materials and product use.

European Union

The European Union, as part of its 6th Environmental Action Programme (6 EAP), has developed a thematic strategy on the sustainable use of natural resources for "ensuring that the consumption of resources and their associated impacts do not exceed the carrying capacity of the environment, and breaking the linkages between economic growth and resource use" (COM(2005)670/Final). It is complemented with a strategy on the prevention and recycling of waste and with integrated product policies (IPP) aiming at improving the environmental performance of products through their entire life-cycle. Other EU texts of relevance include an Environmental Technology Action plan and the renewed EU sustainable development strategy.

United Nations

The plan of implementation of the 2002 Johannesburg World Summit on Sustainable Development aims at changing unsustainable patterns of consumption and production. Governments, relevant international organisations, the private sector and all major groups should "Encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes and reducing resource degradation, pollution and waste."

In 2007, UNEP established an International Panel on Sustainable Resource Management to provide independent scientific assessment on environmental impacts due to the use of resources over the full life cycle.

ANNEX 4.

OECD-UNEP Conference on Resource Efficiency – Conclusions by the co-chairs

Mark Mwandosya, Minister for Water and Irrigation of Tanzania
Masayoshi Namiki, Vice Minister for Environment of Japan

The OECD and UNEP co-organised this international Conference on Resource Efficiency on 23-25 April 2008 in Paris. We are very grateful for their initiative. This conference was particularly timely, as many countries (e.g. China, Germany, Japan), the international community (e.g. OECD, UNEP, G8), and key leading companies (e.g. mining, manufacturing, recycling, distribution companies) are aiming to improve resource efficiency, at a time of changes in international materials markets (e.g. increasing international flows, new geography of supply and demand, increasing prices, recycled materials trade) and related environmental concerns.

The Conference explored 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 and reduce poverty. The meaning of resource efficiency in the context of developing countries was highlighted, including the implications of changing material flows in our global village. The conference addressed economic efficiency and environmental effectiveness of resource use, corporate environmental responsibility as well as the related development aspects. The Conference emphasised the need for systemic thinking and approaches. This is of utmost importance to help reach environmental, economic and social goals.

Interest in resource efficiency and resource related trade is growing and there is an increasing body of knowledge and information to draw on at the national, regional and international levels. There is also much innovation and the different concepts and approaches are converging: 3Rs (reducing, reusing, recycling waste), sound material-cycle society, circular economy, integrated or sustainable waste management, sustainable consumption & production, life-cycle management and sustainable materials or resource management, all aim at similar objectives and require similar action by the various stakeholders.

Capacity building and awareness raising are needed to improve resource efficiency. Differentiated solutions are called for at the local, regional and global levels. Developing countries have specific needs. In addition to capacity building they need access to technologies, information, financing, and enhanced institutional capacity. They also need improved skills in resource-related assessments, management and governance. Poor people should be involved as partners in waste management and recycling.

There is a need to develop a common vision about resource efficient societies, and communicate this vision to broader groups of stakeholders. There is a need to advance work on decoupling, indicators and statistics, development and dissemination of best practices in both industrialised and developing countries. This applies, inter alia, to recycling, "urban mining" and waste management, including e-waste. Target-oriented approaches should also be developed at company and territorial levels, possibly in association with action plans and voluntary initiatives.

The conference stressed the need to move towards sustainable manufacturing based on a holistic, system-based approach. Good practices in the private sector are growing, as are industry led voluntary initiatives. More efforts are needed to spread these good practices to the SMEs (small and medium sized enterprises).

Resource efficiency is now higher on the policy agenda than ever before. Improving resource efficiency is a shared responsibility of governments, the private sector, IGOs/NGOs and citizens/consumers. Resource efficiency information is already being used in policy design. Further action is now feasible and needed to ensure that appropriate framework conditions are in place, including those related to markets, competition and innovation. The use of economic instruments should be encouraged more broadly. Wider use of benchmarking could also provide an incentive for progress.

The conference highlighted the importance of information and education as powerful policy instruments for both producers and consumers. Governments need to explore drivers for consumption patterns, the rebound effect and to better understand how to influence the demand side of the market.

Next steps

We as co-chairs, listening to presentations and debates, have perceived a sense of urgency and a commitment to immediate action. Many presentations indeed reported on action taken, conveying confidence in the availability of solutions. Our conclusions may serve as an input to the G8 Environment Ministers' Meeting (24-26 May 2008, Kobe). We would also like to transmit our conclusions to the OECD Environment Ministers' Meeting (28-29 April 2008, Paris), the next meeting of the UNEP International Panel for Sustainable Resource Management (19-20 May 2008, Rome) and the Governing Council of UNEP.

Regarding the way forward, we consider that the following is important. Measuring resource efficiency requires operational indicators. There is a need to support statistical agencies in setting up the monitoring systems. Governments need to expand the use of economic instruments. Efforts on sustainable mining, waste management and recycling need to be strengthened, including through international co-operation. Continuing support is needed for the UNEP/UNIDO network of National Cleaner Production Centers, which assist SMEs in addressing resource efficiency. There is finally a need to foster co-operation and partnerships on resource efficiency: (i) among relevant ministries and government departments, members of the private sector, and representatives of the civil society; (ii) at the international level involving the OECD, UNEP, the G8, and others.

ANNEX 5. Looking ahead: Extracts from the OECD Synthesis report on Measuring Material Flows and Resource Productivity

A **considerable amount of work** on MFA has been carried out in the past decade, More is needed to achieve **greater convergence** of already existing initiatives and to facilitate wider **dissemination and uptake** of existing experience and guidance. More is also needed to explain the added value of MFA compared to other monitoring and measurement tools and to **promote the use** of MF analysis and indicators. The work carried out since 2005 by the OECD and its member countries ..., is a **first step** in this direction.

Improving knowledge on the environmental impacts and costs of resource use

In order to address the widely held environmental concerns associated with resource use, the priority for further improving the MFA **knowledge base** is for a better understanding of environmental impacts and costs of resource use throughout the entire life cycle of materials and the products that embody them (i.e. from natural resource extraction, manufacturing, use/consumption to end of life management). This includes:

- **Scientific knowledge** about environmental impacts, and methodologies for assessing environmental impacts and costs considering both downstream effects (e.g. toxicity by pollution), and upstream effects (e.g. on biodiversity by resource extraction/harvest) with links to (i) the quality/deterioration of natural resource stocks, (ii) critical environmental cycles, and (iii) the effects of trade and globalisation on the geographical distribution of environmental burdens.
- **Methodologies for calculating indicators that reflect environmental impacts.** In the case of aggregated indicators, further exchange of experience among countries active in this area of work would help develop a consensus about the validity of the methodologies and conversion factors to be used and a broader acceptance of the weighing methods to be used (to assess the toxicity or potential environmental pressures associated to each materials).
- **Methodologies for estimating indirect and unused flows** of materials that are of environmental importance. Further exchange of experience among countries, research institutes and joint international work would help develop a consensus on the conversion factors to be used

Implementing compatible measurement systems and upgrading data quality

Required also is the actual implementation of **compatible measurement systems and associated databases** for material flows and resource productivity, giving particular attention to:

- The availability and international comparability of **data** on physical trade flows, including flows of recyclable materials and waste, and data on particular flows that are of economic and environmental importance, including flows of metals, plastics, paper, 3R "Reduce, Reuse, and Recycle" related flows.
- Internationally compatible MF **accounts and databases**, which provide a factual basis for international and global material flow studies and that countries can further adapt to their own circumstances.
- Disaggregated accounts and databases, which provide **industry-level and material specific** information that can serve as an early warning tool, and indicate opportunities for improved performance and efficiency gains.

Promoting the use of material flow and resource productivity indicators

Though many countries have incorporated MF and RP indicators in their national sets, feedback on the policy relevance of the indicators in use is still seen by some as insufficient and further insights are needed to guide their refinement and to promote their systematic use. Required is:

- A **policy dialogue** on the benefits and implications of pursuing various methods for developing and adopting a balanced set of common MF and RP indicators. Such a set would include, beside material specific indicators, a few comprehensive and easily understandable indicators for policy makers and other stakeholders, which could complement key macro-economic indicators such as GDP.
- A **review of applications** for indicators that assess the efficiency of material resource use at various scales and for various materials (e.g. wastes, reusables, recyclables), including applications in planning or target setting.

Fostering co-operation and sharing of good practices

As to the **provision and uptake of guidance**, OECD governments should co-operate with **industry and non-member economies** to strengthen their capacity on measurement and analysis of MF and the associated environmental impacts. OECD countries should also encourage co-operation and sharing of good practices among **enterprises** in order to promote the development and use of MFA at business level. They should encourage co-operation among all **institutions** involved, including research institutes, policy departments and statistical offices, to promote the use of MFA in national policy debates and policy making.

Inter-governmental organisations play an important role in addressing the international aspects of MF and RP, raising awareness about the importance of resource efficiency, sharing information on R&D concerning MFA, and fostering the convergence of the methodologies used. ... sharing good practices and elaborating common principles and guidelines concerning resource productivity.

In this context, it is important that the **synergies** between OECD work on MF and RP and other relevant international activities, such as the 3R initiative ... , the International Panel on Sustainable Resource Management established by UNEP and initiatives by the European Commission, are used.

Source: Measuring Material Flows and Resource Productivity – Synthesis report, OECD, Paris, 2008

ANNEX 6. Overview of relevant PWB output areas and results

Overview of related ENV PWB 2009-2010 output areas and results

2.3.1. Environmental Peer Reviews, Indicators and Outlooks

1. Environmental Performance Reviews and derived products
2. Data and indicator reports, and updating statistical databases concerning Environment and Resources
 - 2.4. OECD Resource productivity (follow-up of the Council Recommendation): publications and seminars on principles, data, indicators

2.3.4 Decoupling Environmental Pressures from Economic Growth

2. Efficient Management of Materials/Waste
 - 2.1. Reports and a Global Forum event on Sustainable Materials Management and Environmentally Sound Management of Waste
 - 2.2. Report on opportunities for GHG mitigation related to waste/materials management

2.3.6 Environment in the Global Economy

2. Globalisation and Environment (including trade and investment): Synthesis Report
 - 2.3. Report on trade in non-hazardous recyclable materials

For reference: other output areas and results of relevance

2.3.4 Decoupling Environmental Pressures from Economic Growth

1. Eco-innovation
 - 1.2. Indicators of eco-innovation in nine areas of environmental policy
 - 1.4. Report on diffusion of eco-innovation in the global economy

2.3.6 Environment in the Global Economy

1. Eco-innovation: Synthesis Report on national policies (input into the OECD Innovation Strategy)
2. Globalisation and Environment (including trade and investment): Synthesis Report
 - 2.7 Set of indicators on environment-globalisation linkages (inputs into the OECD Globalisation indicators)
 - 2.8 Report on modelling environment and globalisation linkages

Overview of other PWB 2009-2010 output areas and results of relevance

1.2.1 Entrepreneurship, Industry and Local Development

1. Productivity and Innovation Analysis and Indicators (Working Party on Industry Analysis-WPIA)
 - 1.8. Update and extension of OECD databases relating to structural analysis: Input-Output tables (I-O), Bilateral Trade by Industry (BTI). linking I-O tables with trade data; linking I-O tables with environmental data.
8. Two Reports on Promoting Sustainable Manufacturing and Eco-innovation (Committee on Industry, Innovation and Entrepreneurship-CIIE and Advisory Expert Group on Sustainable Manufacturing and Eco-innovation)
 - 8.1. Report on sustainable manufacturing
 - 8.2. Report on how innovation can help meet environmental challenges

1.2.5 Steel

3. Report on the environmental challenges facing the steel industry (Steel Committee)

6.2.2 Statistical Research, collection and dissemination (Committee on Statistics)

6. Productivity
 - 6.2. Publication on productivity (annual – jointly with STI)
 - 6.3. Research on methodology and data issues, including productivity and industry structure