OECD-Japan Seminar

Material Flows and Resource Productivity
From Knowledge to Policies

26-27 September 2007, Tokyo, Japan

Ministry of the Environment

This seminar was co-organised by the **OECD** and the **government of Japan**, as part of as sequence of events[1] that support the implementation of the **OECD Council recommendation** on material flows (MF) and resource productivity (RP) adopted in April 2004[2], and the "Reduce, Reuse and Recycle" (**3Rs**) initiative endorsed by **Heads of State and Government of G8** countries (Sea Island, June 2004).

It was attended by more than **100 participants** from OECD countries, the European Commission, UNEP, industry, research institutes, non OECD countries (e.g. China, Russia, India, Thailand).

The seminar was **chaired** by Yuichi Moriguchi (Japan) with the support of **session chairs**: Stefan Bringezu (Germany), Hidetoshi Kimura (Japan), Derry Allen (USA), Atsushi Inaba (Japan).

The seminar helped prepare the move from the establishment of a **knowledge base** on material flows and resource productivity to **integrated approaches** towards natural resource, waste and materials management. It took stock of 3 years of work on Material Flows and Resource Productivity, and identified **desirable developments and next steps**. The seminar results will further feed into the **G8 3R process**, and help prepare an OECD Council Recommendation on Resource Efficiency, and a high-level **International Conference** on resource efficiency organised jointly with UNEP (Paris, April 2008).

Overview and major outcomes[3]

ANALYSING MATERIAL FLOWS: A TOOL FOR DECISION MAKING

Main outputs of 3 years of work on Material Flows and Resource Productivity

The seminar closed three years of work carried out by the OECD with the support of its member countries, a team of experts and international partners. To assist countries in the measurement and analysis of material flows, the OECD has prepared a series of guidance documents, among which the "**OECD Guide on measuring material flows and resource productivity**". It identifies and categorizes different types of tools for material flow analysis (MFA), including MF and RP indicators, and describes their functions for measuring progress of policies. A step-wise guide for establishing the information base is being developed jointly with Eurostat.

National experiences: the use of indicators

Many countries have initiated MFA work or carry out closely related work with varying degrees of completeness and coverage. Practical applications of MFA and related information have progressed, mainly in areas where the demand for information on MF and RP is linked to specific policy questions and/or to associated indicator development.

In many countries indicators on materials use and RP are used to evaluate past trends and to monitor progress towards targets for future MF and RP. Several countries have set such targets as part of their integrated economic-environmental policy planning and of sustainability strategies, or under national laws on waste and materials management. Other countries use the indicators for broader reporting or policy purposes. Targets in use aim at reducing inflows, increasing cyclical flows, reducing outflows (emissions, waste) and enhancing resource productivity.

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1 The seminar followed on from the 2006 Rome workshop, the 2005 OECD Berlin Workshop and the 2004 OECD Helsinki Workshop. It was hosted by the Ministry of the Environment of Japan and organised by the OECD Working Group on Environmental Information and Outlooks (WGEIO) in co-operation with the OECD Working Group on Waste Prevention and Recycling (WGWPR).

2 It also responds to the request by Heads of State and Government of G8 countries who invited the OECD to support the elaboration of common approaches and indicators to monitor resource material flows (Evian, June 2003).

3 Preliminary version based on the draft Chair's summary of the Seminar

Trends in resource productivity: progress in member countries

Simple MF indicators are capable enough for capturing different trends of progress in resource productivity. OECD member countries show a variety of resource productivity levels and trends ranging from absolute decoupling of materials use from economic activity (growing GDP while material use decreases), relative decoupling (GDP grows faster than materials use) to strong coupling (materials use grows faster than GDP).

Advanced methodologies for analysing material flows

Significant progress has been made in applying advanced MFA methodologies to study key materials like metals, and to carry out comparative sectoral analysis.

For better understanding of key material flows or material flows in key sectors like the metal industry, it is necessary to dispose of more precise information than that provided by simple MFA. Also, information about future developments of MF and RP was identified as a necessary prerequisite. It was pointed out that evidence-based scenarios for future resource use based on stocks and flow models would be valuable information for policy planning.

IMPROVING RESOURCE PRODUCTIVITY: POLICIES, MEASURES AND TECHNOLOGIES

Private sector initiatives

The private sector, along with other stakeholders, plays a significant role in improving resource productivity, e.g. by (i) investing in R&D and using advanced technologies to increase materials and energy efficiency, (ii) enhancing environmental management, (iii) promoting eco-design, and (iv) using by-products and secondary materials through their domestic as well as global supply chain networks. In the mining and metals industry the concept of materials stewardship is used to maximise the performance and utility of the metals considering the social, environmental and economic impacts of materials throughout their life cycle. Business-level material flow analysis and material flow cost accounting help consider all stages of the materials or product's life cycle together with the associated environmental impacts and economic costs.

Government initiatives

Governments play an important role in facilitating voluntary actions and technological developments by the private sector, e.g. by (i) putting in place appropriate legislative frameworks, including specific recycling laws, (ii) supporting national R&D projects, (iii) implementing economic and industrial policies that integrate economic, environmental and social aspects, and that help link innovation, employment and environmental policies. They also play an important role in promoting partnerships and fostering institutional co-operation.

Government actions are supported by international work, including work by the OECD on sustainable materials management that promotes integrated approaches to waste and materials management, considering the whole life cycle, and aiming at reducing negative environmental impacts.

Challenges in non-member countries

Due to the rapid increase in global demands for raw materials and natural resource extraction along with the economic growth of developing countries, increasing resource productivity in countries outside the OECD area has become one of the keys for sustainable production and consumption. A few countries have started to develop national laws on integrated waste management or the circular economy and have introduced national targets for resource productivity, energy efficiency or pollution intensities. The “vicious circle of capacity underdevelopment” has been identified as a key concern for many developing countries.

FROM KNOWLEDGE TO POLICIES: DESIRABLE DEVELOPMENTS AND DIRECTIONS FOR NEXT STEPS

Monitoring international trade and hidden flows

Participants agreed that further work on material flows and associated environmental impacts related with international trade including hidden flows are particularly important. Domestic material flow accounts need be supplemented by data and information on international trade and related indirect material flows, in order to assess the balance of foreign trade and allow detecting and minimizing unintended burden shifts.

Monitoring the environmental impacts of different material flow categories

Since targeted resources vary depending on policy priorities of each country, concerns on the environmental impacts from material flow can be evaluated differently among countries. Current knowledge about the environmental impacts material flow is insufficient. In this context, both downstream effects (e.g. toxicity by pollution), and upstream effects (e.g. on biodiversity by resource extraction/harvest) of direct material use as well as structural changes such as changing patterns in consumption of products and services should be considered.

Indicators for resource productivity

Several participants stressed the need for indicators for resource productivity or a package of indicators related with various material flows. In relation to this, it was mentioned that there is a need for comprehensive and easily understandable indicators for policy makers and for other stakeholders, which can compete with GDP. It was recognized that the development of indicators for RP should lead to the effective implementation of policies encourage more efficient use of resources including setting targets for resource productivity, as appropriate, taking account of national circumstances.

Disaggregated accounting for improved assessment of structural changes

A disaggregated accounting by sectors and material categories should be pursued in order to support the various actors in production and consumption with information on their material flows, resource productivity, and the associated environmental impacts. The information may serve as early warning and should also indicate opportunities of improved performance.

Monitoring the economic and environmental performance of 3R-related activities

The economic and environmental performance of 3R-related activities including 3R-related technologies, recycling activities, or trade of recyclables, and the effectiveness of policies to enhance resource productivity should be assessed while considering the actual and potentially more efficient use of both non-renewable and renewable resources.

Data Development

It is necessary to upgrade the extent and quality of date on material flows within and among countries, giving particular attention to the international comparability of the data so as to provide a basis for global MF studies. Internationally harmonized environmental data provision is an evolving field, important for integrated assessments, especially the questions of embedded environmental pressure and the consumer perspective needs consideration.

THE WAY FORWARD

Fostering collaboration among research, policymaking and statistics

To effectively support and inform natural resource, materials and environmental policies, through the use of MFA and environmental accounts, it is essential that the institutions involved collaborate closely and that information is shared between research, policymaking and official statistics both during the planning and the results stages. This is key for constructing a "virtuous" circle for national capacity development in issue identification, issue interpretation, and solution providing.

Cooperation in the international context

International organisations play an important role in addressing the global environmental and development aspects associated with material flows and resource efficiency. They can promote and facilitate capacity building as well as the involvement of and cooperation with developing countries and fast growing economies. They play a special role in making the case for material flows and indicators, raising awareness about resource efficiency, sharing information on research and development concerning MF and environmental accounts, and fostering the convergence of the methodologies used.

Considering the dynamics of international trade and production, an expansion of the application of MFA as a policy tool, including in non-member countries, has been identified as a priority to provide an evidence base for a global approach to improving resource productivity and reducing negative environmental impacts from resource use.

In this context, it is important that the synergies between OECD work and other relevant international initiatives, such as G8's 3R initiative, UNEP initiatives such as the Life Cycle Initiative, the Marrakech Process, and the Resource Panel proposed by the EC, and EC's work on Economy-Wide MFA and impact indicators,, are used.

Towards the 2008 G8 Summit

The results of the OECD-Japan seminar will be used as inputs into the following international process on sustainable resource management; (i) the OECD-UNEP International Conference on Resource efficiency (Paris, April 2008), (ii) a recommendation of the OECD Council on resource efficiency, and (iii) the G8 3R Initiative process with the 3R Senior Officials Meeting (Bonn, October 2007), the G8 Environmental Ministers Meeting (Kobe, May 2008), and the G8 summit (Hokkaido, Japan, 2008).