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**ENVIRONMENT DIRECTORATE  
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## **Working Group on Waste Prevention and Recycling**

### **OUTCOME OF THE FIRST OECD WORKSHOP ON SUSTAINABLE MATERIALS MANAGEMENT**

**Seoul, Korea, 28-30 November 2005**

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## FOREWORD

For the last 20 years the OECD Working Group on Waste Prevention and Recycling (WGWPR) has been developing and promulgating international waste policies aiming at preventing and reducing waste generation and managing the residues in an environmentally sound manner. However, looking only at wastes, i.e. end-of-life materials resulting from human activities, is no longer sufficient. To date, waste minimisation policies have not kept pace with the increasing waste generation that is associated with economic growth and increasing materials consumption. This concern has given rise to a need for more creative and far-sighted solutions that employ life-cycle thinking to reducing in a cost-effective manner the negative environmental impacts (or externalities) associated with the increasing use of materials. As a response, OECD introduced a new work area in 2005 on Sustainable Materials Management (SMM).

Natural resources are a foundation of economic activity and human welfare. They provide raw materials, energy, as well as environmental and social services. Governments and international organisations are increasingly confronted with their management and efficient use which is key to economic growth and sustainable development. This topic is of emerging importance to most of the OECD member countries, since many of them are trying to move away from a heavily waste-oriented view and develop materials-based approaches.

This new work was started with a workshop to: i) set the scene for this work area; ii) explore the present understanding and status of activities towards sustainable materials management in member countries and international organisations; iii) define the needed terms; and iv) determine the most pressing areas for future work.

The SMM work is carried out in close collaboration with the OECD Working Group on Environmental Information and Outlooks (WGEIO) which is working towards the establishment of a common knowledge base on material resource flows and resource productivity, to enable sound fact-based material flow analysis and to inform related policy discussions, such as SMM.

This document presents the outcome of the first workshop on Sustainable Materials Management that was held on 28-30 November 2005 in Seoul, Republic of Korea. The Working Group on Waste Prevention and Recycling recommended declassification of this document in December 2006. It is published on the responsibility of the Secretary-General of the OECD.

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## SUMMARY OF THE MAIN POINTS

### ***Definition:***

The workshop participants agreed to the following ***working definition*** of Sustainable Materials Management (SMM):

“Sustainable Materials Management is an approach to promote sustainable materials use, integrating actions targeted at reducing negative environmental impacts and preserving natural capital throughout the life-cycle of materials, taking into account economic efficiency and social equity.”

The participants also agreed to the following ***explanatory notes*** to the working definition:

“*Materials*” include all those extracted or derived from natural resources, which may be either inorganic or organic substances, at all points throughout their life-cycle.

“*Life-cycle of materials*” includes all activities related to materials such as extraction, transportation, production, consumption, material/product reuse, recovery and disposal.

An *economically efficient* outcome is achieved when net benefits to society as a whole are maximized.

A variety of policy tools can support SMM, such as economic, regulatory and information instruments and partnerships.

SMM may take place at different levels, including firm/sector and different government levels.

SMM may cover different geographical areas and time horizons.”

### ***Main Areas of the Discussion:***

The focus of SMM should be on environmental impacts on a life-cycle basis of the materials flows, rather than on volumes or weights of materials. There was a consensus that it is too early to start work on indicators of SMM, but that appropriate coordination with ongoing work on Material Flow Analysis (MFA) should be ensured. In addition, the identification of the most pressing areas that an SMM approach should target, the instruments and policies addressing SMM and the international dimension of SMM were discussed.

### ***Next Steps:***

OECD should:

- Provide an inventory of activities relevant to SMM in different international forums.
- Undertake meta-analyses of existing methodologies used in the context of SMM to explore possible complementarities and to assess which ones would best serve the purposes of SMM.
- Consider organising a second workshop in 2007, with global players to learn from them, raise their awareness about SMM and explore ways forward for contribution by industry to SMM. The workshop could be organised in co-operation with OECD Working Party on National Environmental Policies (WPNEP).

- Prepare an intermediate progress report on the SMM project in 2007.

A Programme of Work and Budget for 2007-08, *inter alia* regarding SMM was agreed by the OECD Council in December 2006.

**OUTCOME OF AN OECD WORKSHOP ON SUSTAINABLE MATERIALS MANAGEMENT  
(Seoul, Korea, 28-30 November 2005)**

**1. Introduction**

1. An OECD Workshop on Sustainable Materials Management, hosted by the Korean Ministry of Environment and the Korean Environment Institute, was held in Seoul, Republic of Korea, 28-30 November 2005. The workshop was chaired by Dr. Young-Woo Park, Director General of the International Cooperation Bureau of the Korean Ministry of Environment. This Document provides the summary of the major outcomes of the workshop.

**2. Working Definition of Sustainable Materials Management**

2. The workshop participants agreed to the following *working definition* of Sustainable Materials Management (SMM):

“Sustainable Materials Management is an approach to promote sustainable materials use, integrating actions targeted at reducing negative environmental impacts and preserving natural capital throughout the life-cycle of materials, taking into account economic efficiency and social equity.”

3. The participants also agreed to the following *explanatory notes* to the working definition:

“*Materials*” include all those extracted or derived from natural resources, which may be either inorganic or organic substances, at all points throughout their life-cycle.

“*Life-cycle of materials*” includes all activities related to materials such as extraction, transportation, production, consumption, material/product reuse, recovery and disposal.

An *economically efficient* outcome is achieved when net benefits to society as a whole are maximized.

A variety of policy tools can support SMM, such as economic, regulatory and information instruments and partnerships.

SMM may take place at different levels, including firm/sector and different government levels.

SMM may cover different geographical areas and time horizons.”

4. In the presentations and discussions leading in to the debate of the definition of SMM, it was *inter alia* emphasised that there is a need for life-cycle approaches. Material flow analyses (MFA) can provide important background information and data for life-cycle approaches. However, it was underlined that the focus of SMM should be on *environmental impacts* of the materials flows, rather than on volumes or weights of materials. It was therefore suggested that the work in the Working Group on Environmental

Information and Outlooks (WGEIO) on MFA should be broadened to address such environmental impacts. The participants had a preliminary discussion on whether the term "materials" included energy sources. There was general acceptance that this was appropriate but it was felt that further discussion would be necessary on which particular energy sources should be included. There was also discussion on whether the term "materials" included water and air, and while the general thinking was that they should be excluded, further discussion was also deemed necessary.

### **3. Which are the most pressing Areas that an SMM Approach should target?**

5. It was emphasised that the work on MFA is not sufficient by itself: it needs to be complemented by the use of a range of methodologies, for example Life-cycle Assessment (LCA), Cost-benefit Analysis (CBA) and other economic and non-economic methodologies, such as "Ecological Footprint Accounting", to assess the environmental and other impacts of material uses.

6. Different methodologies could complement each other and give a better understanding of environmental impacts. It was emphasised by several speakers that it would provide an improved basis for decision-making to complement LCA and similar approaches with CBA, thus allowing different environmental impacts to be judged against each other, and the costs and benefits of the approach to be compared.

7. Several methodologies for assessing environmental impacts were also presented. Those specific studies often identified some common materials with large negative environmental impacts, *inter alia* steel, petroleum products, plastics, mineral products and food products. The scope, feasibility, relevance and possible complementarities of these methodologies should be analysed along with the outcome of their common or unique outcomes and the recent SMM survey and a review of other studies, in order to assess how they could 1) best contribute to the SMM work; 2) help prioritise the materials which have the greatest environmental impacts; and 3) identify critical phases of their life-cycle.

8. It was emphasised in the discussion that caution should be exercised in drawing conclusions through the outcome of the survey on SMM approaches in OECD countries.

9. Specific materials with large negative environmental impacts, and critical phases of their respective life-cycle, should be singled out through appropriate methodologies. It is also necessary to identify possible policy gaps (such as the poor integration that presently exists between waste policies and resource management) and what additional information/knowledge may be required.

10. The need to integrate SMM into other policies was emphasised by many speakers. A joint WPNEP/WGWPR workshop could possibly be useful in this context, once the objectives of the SMM work are further defined.

11. Some speakers also suggested that the SMM work should cover the phase of consumption and use of materials, and stressed the need to identify drivers of consumption in order to design the appropriate policies with a view to change consumption patterns.

### **4. Which Instruments or Policies could best help to manage Materials in a Sustainable Way?**

12. Regulatory instruments and voluntary (partnership) approaches were mentioned most frequently in the responses regarding policies addressing SMM in the context of the survey on SMM approaches that had been conducted among OECD countries in the preparation of the workshop. Informational and economic approaches were also mentioned in some responses and were discussed in the workshop.

13. The discussion did, however, make it clear that the questions in the survey questionnaire on policy instruments were interpreted differently by different countries when they responded to the survey, and there might be a certain waste-bias in some of the responses. That is, instruments that might affect the whole life-cycle of some materials, but that are applied not primarily in order to manage wastes – such as the CO<sub>2</sub> trading schemes now applied in all EU countries – could seem to have been over-looked in the responses. This may reflect the fact that SMM originated within the WGWPR and was perceived as an extension of waste policies.

14. It was also emphasized that the responses should not be used for any ‘ranking’ of the countries responding.

15. It was emphasized that there is a need to target *environmentally significant* rather than primarily *weight-or volume significant* materials. It was also underlined that there is a need for better indicators to highlight the environmental impacts of different materials, but that this work was premature at this point of time.

16. It was further pointed out that there is a need to take non-waste environmental impacts of waste policies into account. It was in this connection mentioned that it would be of little help if one managed to limit waste amounts related to a certain product (e.g. motor vehicles) if that in turn leads to larger CO<sub>2</sub> emissions at another stage of the product’s life-cycle.

17. One speaker expressed the view that, in principle, all instruments or policies may help to better manage materials in a sustainable manner, depending *inter alia* on the material, the point of intervention in the chain and national circumstances.

18. It was also pointed out that it would be useful to identify existing instruments or policies that are counterproductive to SMM.

19. Finally, it was mentioned that there may be a need to explore further the potential for using economic instruments, both at a national and international level.

## **5. The International Dimension of SMM**

20. This issue and the subsequent one were discussed in two break-out groups. The rough summary presented here seeks to highlight some of the points made – across the two groups, and in the final plenary session.

21. MFA, Life-cycle analyses and similar approaches show that (1) there are substantial material flows in countries exporting, importing and using materials, processed materials and products; and (2) these flows can be associated with negative environmental impacts in the countries of origin. This is for example the case for food products, raw materials, etc. It was also mentioned that exports of materials may lead to negative environmental impacts in the country of destination during the use and waste phases. Also the transport of materials can cause negative environmental impacts.

22. It was underlined that a life-cycle approach requires an international view; we have to assess environmental impacts that our production and consumption patterns and our national policies could have in other countries.

23. The transformation of the economies of many OECD countries towards service economies means that manufacturing industries are increasingly located in non-OECD countries. This phenomenon can be

associated with a transfer of negative environment impacts to those countries – which may not possess the capacities to adequately address these impacts.

24. Competitiveness and trade issues related to international markets exert pressures on national environmental policies. Conversely, national policies may exert pressure on international markets in the cases where national market shares are large, for example through design requirements, greening of public procurement, etc.

25. A need for international acknowledgment of existing labelling schemes for *e.g.* organic food and sustainably managed forests was mentioned in this connexion. A problem in this regard can be that for certain materials and products, it can be difficult (or impossible) for the importer to know the exact origin. It was also mentioned that policies aimed at limiting imports based on the way certain materials or products are produced can be in conflict with the rules of the World Trade Organisation (WTO), and can lead to increased economic and social problems in the countries of origin.

26. There are indications of awareness of these issues by OECD countries, as many use life-cycle methodologies to assess environmental issues and national strategies take this international dimension into account. In some cases national legislation addresses issues in other countries: for example, from the EU, no waste materials can be exported, unless they will be managed in the importing country as environmentally sound manner as in the EU.

27. For some time now, international approaches and agreements have been developing that seek to address material use and its management, reflecting the globalisation of environmental policies. Also, some globally operating companies have SMM-type approaches, since customers of raw materials, manufacturers of products or investors require them to address such environmental issues.

28. It was also mentioned that the European Commission plans to set up a panel in co-operation with UNEP on decoupling of environmental impacts from materials use.

29. There also appears to be a lack of information about materials when moved from business to business for further processing or production (“history of a material”).

30. Finally, it was pointed out that there are limited, if any, national and international incentives to achieve hazardous material substitution. The “EU Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)” is one attempt to provide such an incentive.

## **6. What could the OECD usefully do to help Member Countries ensure that Materials are managed in a Sustainable Way?**

31. As a first priority, it was suggested that OECD would provide an inventory of activities in different international forums which may contribute to SMM. It was further mentioned that OECD could inform UNEP, the 3R meeting, the UN CSD and other organisations concerned, on the OECD work on SMM. OECD could also use the opportunities provided by its outreach strategy to discuss SMM with major non-OECD economies (Russia, China, Brazil, etc.)

32. As another priority, OECD could undertake meta-analyses of existing methodologies used in the context of SMM, including MFA, LCA, ecological footprints, CBA, and other economic or non-economic methodologies, to explore possible complementarities between them and to assess which combination of these would best serve the purposes of SMM. In this context, approaches building on the results of studies

using different methodologies should also be taken into account. This should be done in co-operation between the WGEIO and the WGWPR.

33. As a further priority, OECD could conduct an additional SMM survey and organise a further exchange of views of member countries experiences as regards SMM.

34. In this context, OECD could organise a workshop in 2007 with global players to learn from them, raise their awareness about SMM and explore ways forward for contribution by industry to SMM. At such a workshop, *inter alia* the results of an additional survey, methodologies and new experiences in member countries could be discussed. In this connection, it was mentioned that OECD could be better suited to raise awareness at the political level than among the public at large – while others added that OECD should also co-operate more closely with the private sector and ‘civil society’ on this issue.

35. A number of other suggestions were also made. For example, it was suggested that OECD could do meta-analyses of existing cost-benefit analyses, exploring the underlying reasons for any major differences in their results, highlighting any differences in the assumptions and/or economic valuations applied. It was also suggested that OECD could undertake case studies of environmental impacts from the use and transboundary movements of materials or products, and then make the results available to interested parties at international level, in order to shed light to the questions: Where are the hidden flows? How much do they matter? Do specific national policies cause environmental impacts in other countries?

36. OECD could also explore the potential of particular instruments to internalise negative environmental impacts and make suggestions for policy makers. In this regard, taxes on extraction of resources and transport of certain materials could be studied.

37. It was further suggested that life-cycle assessments could be used to determine the magnitude of environmental impacts and where these impacts occur in the life-cycle. Reference was also made to the requirement for prior impact assessments of all new EU regulations. OECD could prepare guidelines for assessments of policies addressing SMM.

38. Several speakers emphasised that an inventory of policies addressing SMM would not be enough – there is also a need for an assessment of these policies. Do they, for example, in practice really take a life-cycle approach? It was suggested that this often was not the case for policies currently presented under an SMM heading. What would happen if waste policies really were transformed into policies supporting SMM - with a life-cycle approach? Such assessments could, *inter alia*, help indicate where important ‘policy gaps’ might exist.

39. Work on indicators was considered premature, but should be prepared by carefully thinking about what is expected from indicators. It was questioned by one speaker whether OECD could help standardise information on environmental impacts of material flows. Others suggested OECD should instead develop guidelines and methodologies for how member countries could prepare indicators, rather than preparing new indicators themselves.

40. On the other hand, it was pointed out that once the underlying data for an indicator are available, it may be relatively easy to ‘play around’ with them. It is, however, costly to produce data, and there is need for more thought at present on which indicators we might need in the future and on what we can expect to obtain from different SMM indicators – that should measure environmental impacts on a life-cycle basis. This would also make it clearer which data we would need to collect. In this context, it was underlined by several speakers that the work should focus on the materials believed to have largest environmental impacts.

41. It was considered important by one country to understand the overall structure of policies related to SMM issues, and what specific value added the SMM initiative will bring.

42. Several speakers emphasised a need for better co-ordination of the work on SMM and the work on MFA within OECD. The WGWPR should therefore inform the WGEIO on the outcome of this workshop and seek to have the issues related to data and methodologies considered by the WGEIO. It would also be relevant to co-operate closer with other OECD bodies, for example in the chemicals or energy areas. In this context, some speakers also said that member countries themselves could better co-ordinate the opinions they express in relevant OECD Working Groups.

43. Reflecting on this lengthy list of possible OECD activities in support of SMM and the need to set priorities, several speakers expressed support for the following four priorities: (1) further survey work and analysis; (2) development of methodology for SMM analysis; (3) workshop with stakeholders; and (4) report to policymakers on SMM options.

## **7. Next steps**

44. It was considered that the SMM project would benefit from a continuation of the work of the SMM Steering Group, and that an intermediate progress report on the SMM project should be prepared in 2007.

45. The OECD Secretariat understood to inform relevant colleagues within the Organisation on the outcomes of the workshop and to explore possibilities for enhanced co-operation with relevant bodies in the future, for example in the form of back-to-back meetings.

46. It was also agreed that a Programme of Work and Budget for 2007-08, *inter alia* regarding SMM, will be prepared for the meeting of the OECD Environment Policy Committee (EPOC) in early March 2006. This document will provide a summary of the priority areas, and WGWPR will, subsequent to EPOC meeting, have time to discuss how it intends to deliver the detailed outputs that fall under its responsibility.

**OECD WORKSHOP ON SUSTAINABLE MATERIALS MANAGEMENT**

**Hosted by the Korean Ministry of Environment**

**Seoul, 28-30 November 2005**

*Chaired by Mr. Young-Woo Park*

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