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## Working Group on Waste Prevention and Recycling

# FRONT-RUNNERS' EXPERIENCE ON SUSTAINABLE MATERIALS MANAGEMENT (SMM)

**Report of the 2nd SMM Workshop**

**Tel-Aviv, Israel, 7-9 April 2008**

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## FOREWORD

The OECD introduced work on Sustainable Materials Management (SMM) in 2005, which has emphasis on integrated material, product and waste policies and addresses environmental impacts over the whole life-cycle of materials and products.

This work started with a workshop exploring current understanding and status of activities aiming at sustainable materials management in OECD countries and developed a working definition for SMM.

It was also considered useful to organise a second Workshop on SMM focussing mainly on the contributions by the private sector to SMM, but also by NGOs and international organisations. This Workshop was held on 7-9 April 2008 in Tel-Aviv, Israel, and this report summarises the main results that emerged from discussion.

This report has been prepared by the OECD Secretariat in close co-operation with the Steering Group on SMM. The Working Group on Waste Prevention and Recycling recommended declassification of this report on 12 December 2008.

The document is published on the responsibility of the Secretary General of the OECD.

## INTRODUCTION

### Workshop Opening

1. The Minister of Environmental Protection for Israel (Mr. Gideon Ezra) opened the Workshop by describing recent achievements in the area of environmental protection in Israel, and the rapid progress made in waste management during the last 10-15 years. SMM is a priority environmental area for Israel, and much effort is already underway, aimed at SMM goals.

2. The opening remarks from the OECD (Mr. Tom Jones) emphasized the importance and timeliness of the SMM work. Currently, there is a lot going on in the international community related to SMM: UNEP has established its International Panel on Sustainable Resource Management, the G8 is actively looking at how to implement the 3R concept and most recently, the OECD Council adopted a new Recommendation on Resource Productivity [C(2008)40].

3. The Chair (Dr. Miriam Haran) briefly summarised the Workshop context and objectives. She noted that this is the second OECD SMM Workshop. The first Workshop (Seoul, Korea, 2005) focused on defining SMM and scoping out the SMM problem. This second Workshop will take stock of the existing initiatives within the private and public sectors and international organisations, as well as discussing how the OECD could support the future development of SMM activities within OECD countries.

### Context for the 2nd SMM Workshop

4. Since early 1980s, OECD has been developing and promulgating international policies aimed at preventing and reducing waste generation, as well as managing the remaining waste in an environmentally sound manner. It has, however, become evident that waste minimisation policies which address only end-of-life products and materials are not effective in reducing the increased volumes of waste associated with expanding economic activity and material consumption. This accentuates the need for creative, far-sighted and integrated solutions over the whole life-cycle of materials, to be able to reduce their negative environmental impacts in a cost-effective manner.

5. The OECD Environmental Strategy for the 1st Decade of the 21st Century, adopted by Environment Ministers in May 2001, clearly outlined the need for governments to look for integrated management solutions such as SMM, to address current environmental concerns (http://www.oecd.org/env/).

6. Against this background, OECD initiated in 2005 new work on Sustainable Materials Management (SMM), with emphasis on integrated material and waste policies and addressing environmental impacts over the whole life-cycle of materials from "cradle-to-cradle".

7. As a starting point for this work, a **first OECD workshop on SMM** was held in November 2005 in Seoul, Korea, to take stock of existing understandings on and approaches towards SMM; to explore the potential elements of SMM; and to provide guidance for OECD's future work in this area. The Seoul Workshop developed, among other things, the following working definition for 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".*

**Scope and Objectives of the 2nd SMM Workshop**

8. The private sector, which produces, distributes and markets goods and services, plays a fundamental role in the management of materials. Society therefore heavily depends on the private sector for "sustainable" management of materials. Various non-governmental organisations (NGOs), regardless of whether they aim at protecting the environment, human health or consumer's interests, are also invested in SMM. It was therefore of great interest to investigate the private sector's and NGOs' awareness of SMM, including their perception of the concept, the kind of initiatives they have actually put into practice, and the advantages they may have derived from SMM, not only from an economic, but also from an environmental, point of view.

9. The main objectives of the 2nd workshop were to: i) Present the results of the OECD work carried out in 2006-2007 on SMM; ii) Learn from the private sector's and NGOs' SMM experiences; iii) Identify possible barriers and challenges when developing SMM strategies and policies; and iv) Explore what role the OECD can play in supporting this process. Conclusions were then drawn on how to increase awareness of SMM, and on how the OECD can assist its member countries to develop SMM policies.

10. More specifically, the workshop:

- Took stock of major existing initiatives related to SMM within:

  i) The public sector, through a survey;
  ii) The private sector, through representative case studies; and
  iii) International organisations, through an inventory;

- Identified and analysed methodologies or combinations of methodologies to assess environmental impacts of materials use, aimed at revealing which materials or activity sectors should be targeted firs by policies; and

- Discussed the potential contribution of the OECD Working Group on Waste Prevention and Recycling (WGWPR) to the future development of SMM activities within OECD countries and beyond.

## RECENT DEVELOPMENTS IN SMM

### Introduction

11. Since the 2005 Workshop, the SMM concept has evolved rapidly in many OECD countries. A much clearer understanding of what SMM means has emerged, including what types of activities/elements are covered by this concept. The following major steps have also been experienced:

- There are many existing SMM-related initiatives underway at all levels of government, industry and international organisations. Some of these are still at a relatively conceptual level (*e.g.* gathering information, developing methodologies, designing possible strategies), while others contain more concrete actions;
- SMM, the life-cycle concept and a shifting management paradigm (from "cradle-to-grave" to "cradle-to-cradle") are becoming better embedded, directly or indirectly, in the way of thinking at all levels (government, international governmental organisations (IGOs), private sector and non-governmental organisations (NGOs); and
- There has been a shift towards more focus on how we can use materials, including waste, in the most sustainable way in our economies, taking into account economic efficiency and social equity, but also looking at upstream factors, such as sustainable chemistry, design for environment and underlying production and consumption patterns.

### Private Sector Experiences

12. The Workshop discussion made it clear that there has been a lot of activity recently at the level of business in moving toward more sustainable management of material flows and production processes. Particular points of interest included:

- Firms are very active in trying to embed the "social" dimension (*i.e.* in addition to the environmental and economic dimensions) into their SMM practices;
- The consumer side of the SMM process is poorly understood and needs additional work, especially since firms are increasingly recognizing the important role played by consumers in demanding more "sustainable" elements in the products they buy; and
- The importance of studying the environmental effects of materials along the full life-cycle of production and consumption was clearly well-embedded in the minds of all Workshop participants.

13. Recent developments in SMM have considerably changed the management of products and materials by companies, in particular, when assuming the holistic life-cycle approach and incorporating all three pillars of sustainability into business practices:

- Moving from an emphasis on the management of their own operations to more focus on the management of extended supply chains;
- Shifting the focus from "organisations/sites" to "ingredients/products"; and
- Increasing expectations for management information (transparency) and performance data (benchmarking).

14. **The keynote presentation** (Prof. Michael Braungart) emphasised the important role of sustainable materials in supporting SMM. This implies the need for products to be thought of in terms of the full range of services that they provide – including health protection, environmental quality, consumer satisfaction, etc. For example, a well-known US-based carpet company has recently rethought its products in these terms. This company does not sell carpets, but the service that carpets provide, including the need

to design the original carpet for health and environmental protection ends, as well as to recycle the carpet after its useful life as a product is over. This company has therefore made particular efforts to guarantee that its carpets only consist of substances that are compatible with indoor use. In the future, if products could be made of single, preferably bio-based, materials without harmful chemicals, it would be possible to "close" material cycles in a more sustainable way (www.epea.com).

15. **The International Council on Mining & Metals** (Dr. John Atherton) has developed a sustainability framework for the metals industry, based on the concept of materials stewardship. This means responsibly providing materials and supervising material flows, in order to create maximum societal value and minimum impact on humans and the environment. There are four main themes to the ICMM guidance on Materials Stewardship: i) Taking a systems perspective on minerals and metals (i.e. gaining a better understanding of the full life-cycle of mineral and metal products); ii) To do this effectively will require building new (and strengthening existing) relationships with a variety of actors along the value chain; this includes commodity associations, fabricators, product manufacturers, scrap merchants, recyclers and many other players who can affect the mineral and metal life cycle; iii) The sustainable use of minerals and metals will also require taking steps to optimize the production and application of materials; this implies action to improve the eco-efficiency of production; and iv) Achieving the above goals will require access to a robust, accessible base of information to support decision-making that will reduce or eliminate risks along the material life-cycle, and which will support the most sustainable applications of minerals and metals (www.ICMM.com).

16. **Philips** (Mr. Maarten ten Houten) started to integrate the concept of sustainability into its business strategy as early as the 1970s, in response to the report of the "Club of Rome". For Philips lighting products, the three pillars of sustainability are translated into: i) Protecting the climate (environment); ii) Increasing people's comfort (social); and iii) Decreasing energy costs (economic). They perform life-cycle analysis (LCA) in order to make benchmarking possible. Lighting is responsible for 19% of world-wide electricity use. With current technologies, this can be reduced by 40% (for instance, by using light saving bulbs, by replacing street lights, and by replacing electromagnetic ballasts with electronic ballasts). The introduction of light saving bulbs was a major step forward in these directions. The amount of mercury used in bulbs has also decreased by a factor 20 during the past 25 years. Philips has also incorporated life-cycle and long-term thinking into its core business strategy, and it is raising awareness of energy saving opportunities through its sponsorship of Live Earth and by launching its SimpleSwitch.com online platform (www.ASimpleSwitch.com/global/) – a platform which inspires (and enables) consumers to make a simple switch by offering practical solutions to a global audience that are aimed at reducing energy consumption (http://www.lighting.philips.com/gl_en/).

17. **Unilever's** mission (Mr. Henry King) is to add vitality to life, and to do it in a sustainable way. Unilever has a long-standing commitment to sustainability and responsible business practice. The long-term growth and success of its business goes hand-in-hand with ensuring a sustainable future for the planet and its people. Increasingly, they are finding that they can only achieve these objectives if they find more sustainable ways of doing business and if they establish partnerships with their suppliers and communities in which they operate. The most important ways in which Unilever makes a contribution to SMM is by: i) Enhancing the health and well-being of consumers through their products and brands; ii) Addressing the sustainability challenges related to climate change, water, packaging and the sourcing of agricultural raw materials; and iii) Creating wealth in the communities where they operate and bringing benefits to their stakeholders. Unilever has had pollution reduction targets since 1995. They also put a strong emphasis on the sustainability of their supply chain, since they have thousands of suppliers around the world. They have also found that it will take considerable time to implement more sustainable life-cycle management of their products (www.unilever.com).

18. **Nissan** (Mr. Kazuya Shishido) has a Green Programme (NGP) 2010. The Nissan corporate vision is "to enrich people's life and to be a sincere eco-innovator". Nissan's environmental strategy aims at reducing $CO_2$, other emissions and recovering resources (*i.e.* promoting the 3R activities), the ultimate goal being 100% recovery (the rate for end-of-life vehicles is already 95.2% in Japan). Collection of end-of-life vehicles remains a problem, especially in Japan, due to increasing exports of used cars. All new models are designed for recyclability (current rate in EU & Japan is 95%). Application of bio-based plastics is currently under research (http://www.nissan-global.com/EN/ENVIRONMENT/).

19. For the **Environmental Excellence Programme of the Israel Aerospace Industries** (Dr. Dan Lando), the main SMM challenge is to avoid the use of hazardous substances and reducing the amount of water used and the amount of greenhouse gases emitted. In this respect, implementation of the ISO 14001 - environmental management system - at IAI's manufacturing plants has helped the IAI to gain a good understanding of its environmental burden. A concrete result of identification and prioritisation of the environmental impacts was that the IAI should concentrate on the reduction of the use of hazardous chemicals and materials. During the past few years, considerable efforts have been made in the aerospace industry to make progress in these domains (http://www.iai.co.il/Default.aspx?FolderID=12011&lang=en).

20. The **World Business Council for Sustainable Development** has a project underway called "Cement Sustainability Initiative (CSI): Concrete Recycling" (Mr. Josep Bernat Carcia). Ten cement companies are engaged in this work; and a final report (with indicators and recommendations) will be published shortly. The major message is that 100% of old concrete could be used to make new concrete or used as new aggregates for road construction. The quality of the new concrete will depend largely on the quality of old concrete, but a proportion of 20 % of recycled aggregates in new concrete causes no problem. This recycling is already well developed in many countries; the most advanced already recycle all the demolition concrete. The carbon footprint for concrete is already low, and concrete recycling will not have an important impact on this. The carbon footprint is more pronounced in cement production, and the Cement Sustainability Initiative is focused on reducing this through usage of clinker substitutes, alternative fuels and raw materials, and improving energy efficiency by utilizing best available technologies. Energy consumption remains an issue that may not be lowered by recycling alone. The costs and benefits of concrete recycling are also being addressed in the CSI work (http://www.wbcsdcement.org/).

**OECD Country Experiences**

21. Responses to the 2nd **Survey on SMM initiatives** (Ms. Soizick de Tilly) suggested that the SMM concept continues to evolve rapidly in most OECD countries. Compared to the first Survey (2005), a much clearer understanding of what SMM means is emerging, including what types of activities/elements are covered by this concept. All responses (15 OECD countries and the European Commission) referred to general policies on waste, material/products, consumption, pollution prevention and energy. Several also incorporate a broader spectrum of policies into this concept, such as resource management, industry, transport and even specific areas of environmental policy (climate change, biodiversity, air, water and soil protection) on which materials use has an impact.

22. The responses also indicated that policies which address only "end-of-life materials" have their limitations. To make these particular policies more effective, they especially need to be supplemented by policies which target material flows upstream, involving a wide range of economic actors (producers, consumers and other stakeholders sharing responsibility in materials use), and use of a "mix of instruments", including regulatory, economic, voluntary and information-based approaches. As Finland pointed out, "there is a need for innovative policies which focus on a life-cycle philosophy, implemented by all stakeholders". The United Kingdom also considered the sustainability of materials as a key area of future growth and endeavours "to bring together the design and material technology communities to look at key issues linking product design and manufacture".

23. Expanding the policy approach to cover the whole life-cycle of materials will clearly complicate the development of a single SMM policy and it may well be the reason why most countries still have no specific definition of, or policy related to, SMM. In fact, many of the policies or initiatives cited by respondents in this survey as being relevant to SMM (as well as the policy instruments currently being used to reduce the environmental impacts of materials use) have already been in place for several years and have roughly the same scope and orientation in most OECD countries. It is also apparent that the co-existence of many "scattered" policies/initiatives related to SMM is placing increasing emphasis on the need for better co-ordination of these policies.

24. Ten out of 15 responding countries indicated that they measure environmental impacts which result from SMM or SMM-like policies/programmes. However, similar to the evolution of other environmental policies that have been in place over the years, the evaluation of SMM policies is still at an early stage and will likely develop over time. Only 20% of responding countries indicated that they measure the *economic efficiency* of SMM or SMM-like policies/programmes, while 26% indicated that they measure the *environmental effectiveness* of these policies. The EC has undertaken a number of studies to assess both the environmental effectiveness and economic efficiency of their SMM or SMM-like policies. For the future, it might be interesting to explore why some countries indicate that they strive to reduce environmental impacts of material use through SMM initiatives, but have not yet measured the efficiency and effectiveness of these policies. It might also be interesting to have more detailed information about the use of particular methodologies to assess environmental impacts.

25. More specifically at the national level:

- The **US** (Ms. Angie Leith) published a 2020 Vision in 2002 which suggested the need to shift from a waste management approach ("cradle-to-grave") to materials management ("cradle-to-cradle"). Waste is seen as a "missed opportunity". The target is to move beyond end-of-pipe controls and to consider impacts throughout the entire life-cycle of materials. By looking at the entire life-cycle, materials management will achieve two key objectives: 1) Reducing the environmental impacts (pressure) of material use; and 2) Reducing the amount of materials used (throughput). A Vision Workgroup is currently developing a roadmap to move towards materials management. The goal is to identify key material/product groups in terms of flows and their environmental impact, as well as key actions by government that would be needed to realize the vision; and

- In **North Rhine-Westphalia**, **Germany** (Mr. Andreas Kunsleben), a centre of excellence (Effizienz-Agentur, EA) was established with government funding. This Centre is aimed at increasing the material efficiency of small and medium-sized companies. Together with consultants, EA organises audits in SMEs, to uncover potential decreases in environmental impacts. In particular, EA tries to detect ways to speed up the development of greener products by SMEs. EA also supports SMEs in their search for funding to finance investments in green technology. SMEs have proven to be very interested in increasing their material efficiency, as long as they are able to see tangible results. Approximately 500 SMEs have already been audited under this Programme.

26. The **European Action Plan on Sustainable Production and Consumption** (Mr. Jakub Wejchert). The starting point of this Action Plan is that major changes are needed to production and consumption practices, because the environmental impact of these practices is much bigger than what our planet can support. Several system failures make existing production and consumption patterns unsustainable: i) Market prices that are not reflecting real environmental costs; ii) Lack of consumer information; iii) Irrational consumer behaviour; iv) Imperfect markets for sustainable products; etc. The EU Action Plan is based on life-cycle thinking. The Plan contains obligatory (*e.g.* product standards) and

voluntary measures (*e.g.* eco-labelling). Minimum product standards will not allow the worst environmentally performing products on the market and labels will provide a stimulus for better products. Adapted value added tax rates (VAT) could also stimulate "greener" consumption. The establishment of an EU-forum for retailers is foreseen, covering a significant portion of the of the European retail market. This forum will develop the sharing of "good practices". Resource productivity will be the main indicator of progress. The roadmap includes a first set of actions in 2008 (*e.g.* revised Eco-design Directive) and further actions in 2008-2009, *e.g.* revised Energy Efficiency Labelling Directive (http://ec.europa.eu/environment/eussd/pdf/com_2008_397.pdf).

27. It seems that a relatively small group of OECD countries is at the forefront of SMM policy development. These are the countries which have explored the SMM concept in greater depth, may have elaborated a definition and/or have begun to systematically assess the environmental impacts of SMM policies. In general, these countries are trying to widen the scope of traditional waste management policies to include policies that simultaneously address the use of natural resources and production of materials in more sustainable ways. These countries are also thinking about consumption patterns, leading to the use of less quantity of materials and more sustainable materials (e.g. Japanese "sound material-cycle society"), To achieve this goal, they fund research and development programmes for new technologies. Conscious of problems associated with globalisation of the economy, reduction of environmental impacts of materials is also of concern to these countries, not only within national borders, but at the global level as well.

28. These countries also tend to highlight the necessity for all stakeholders or actors involved in the product chain (producers, retailers, consumers, recyclers and disposers) to closely co-operate toward developing a long-term vision and innovative solutions for a sound material society. Some governments are already sponsoring such partnership initiatives (e.g. for the construction and housing sector, as well as for particular products, such as electronics, carpets, paints, tyres and mercury-containing products).

29. The Survey responses also revealed that many individual SMM initiatives are taking place within the private sector, in large enterprises as well as in SMEs. Since the respondents to this survey were national/central government representatives, they may not be fully aware of all SMM work implemented by private companies, which suggests that private sector initiatives are probably much more numerous than is suggested in the responses that were received. It would therefore be useful to further explore the potential of enterprises with respect to SMM implementation (as Belgium is already doing for SMEs, for example) and whether current SMM experiences are succeeding. In this way, the appropriate role of governments in promoting private sector-based SMM could be further elaborated. Governments could also learn from private enterprises regarding the assessment of economic and environmental benefits derived from SMM initiatives.

**Non-OECD Country Experiences**

30. During the past 20 years, **Chinese Taipei** (Dr. Harvey Houng) has shifted its waste policy, from one focussing on landfilling and incineration, to one focussing on recycling and the "zero waste" concept. Two concrete projects have been undertaken in support of this shift. One has sought to increase the traceability of hazardous waste by using global positioning system (GPS) for tracking hazardous waste transports. The end result is that it is today possible to monitor continuously (on-line) hazardous waste transportation activities. In this way, illegal dumping of hazardous waste can be controlled. A second project has been the establishment of 4 eco-industrial parks. In these parks, companies try to lower their environmental impact by co-operation (*e.g.* maximising energy recovery) and by creating a critical mass of innovative talent. The intention is to engage 75 companies in these parks by 2011. Recycling of municipal waste is projected to increase in Chinese Taipei considerably (from about 25% in 2007 to a targeted level of 75% in 2020). After 2007, no municipal waste has been buried in landfills, except in certain rural areas. Chinese Taipei has also a good example of applying SMM principles (mainly life-cycle analysis and good

management practices) to a semi-conductor producing company: the recycling rate increased to 88% (in 2006) from 74% (in 2002) and waste reduction reached 29% in 2006. Also the economic benefits for the company were considerable.

**International Organisation Experiences**

31. An OECD study tabled at the Workshop (Mr. John Wante) provided a **summary of international initiatives** that are relevant for sustainable materials management [ENV/EPOC/WGWPR(2007)4/FINAL]. "Initiatives" were defined in this report quite broadly, comprising information gathering, development of methods, networking, exchange of experience and generation of ideas, as well as policy measures (development of policy tools, programmes and strategies). Such initiatives were classified at either the level of Global International Organisations (e.g. UN and UN-related organisations); Regional International Organisations (e.g. G8, EU and OECD); International Business and Industry Associations, International Standard Associations, environmental NGOs (selected initiatives only) and Research organisations (again, selected initiatives only).

32. The 68 initiatives that were inventoried are presented as datasheets in the Annex of the Report. These datasheets give a concise description of each initiative's goals and results, as well as providing more specific information related to documents, websites, contact persons, types of materials, products and environmental impacts. The usefulness of these initiatives for SMM is also briefly discussed.

33. This inventory shows that, at the international level, there are many on-going activities related to SMM. Most of these initiatives are meant to improve information, to promote network building or to learn from other experiences. Rather few IGO initiatives seem to have been developed for policy-making or policy formulation purposes and only a few have so far led to new policy measures. In particular, the Marrakesh process and the International Panel for Sustainable Resource Management (both initiated by the UN), the European thematic strategies on waste prevention and recycling and on the sustainable use of natural resources, the Japanese 3R and the Chinese "Circular Economy" all seem to be worth of additional study in the future.

34. **The Life-Cycle Initiative** (Ms. Sonia Valdivia) is a joint programme of the United Nations Environment Programme (UNEP) and the Society of Environmental Toxicology and Chemistry (SETAC). This Programme responds to the call from governments for a life-cycle economy in the Malmö Declaration (2000). It aims at enhancing information exchange among experts and stakeholders in three key LCA work areas, and contributes to the development of the 10-year Framework of Programmes (Marrakesh Process) to promote sustainable consumption and production (SCP), as requested at the World Summit on Sustainable Development in Johannesburg in 2002. The objectives of this Programme are to develop methodologies to work with life-cycle thinking, stimulate the use of these methodologies and increase the capacity of countries to apply them. One of the methodologies developed in 2002 is USETOX, a model for evaluating the environmental impact of chemicals. SETAC is now working on a methodology for making a "social" life-cycle analysis that will take into account all social impacts that occur throughout the life-cycle. Life-cycles are now analysed from "cradle-to-grave". In future SETAC hopes to evolve to a "cradle-to-cradle" approach.

35. From the perspective of international programmes, it seems that there is still a gap (both in knowledge and in experience), on how life-cycle thinking can be incorporated into existing international environmental policies.

**Non-Governmental Organisation Experiences**

36. The Workshop was attended by three non-governmental organisations that have experiences with the use of the SMM concept. All three presentations emphasized the rapid increase in the environmental impacts associated with increased use of materials.

37. **Clean Production Action's** mission (Dr. Lauren Heine) is related to: "designing and delivering strategic solutions for the movement to green chemicals, sustainable materials and healthy products". Their focus is on product design and innovation, including green chemistry, "cradle-to-cradle" design, and design for environment. This was a recurring message throughout the Workshop: "sustainable materials management will not be fully accomplished without sustainable materials".

38. The major concern of the **International Initiative for a Sustainable Built Environment** (Mr. Ronald Rovers) is related to the extensive use of materials, especially for construction purposes. Mankind is currently the biggest "flattener" of the earth's surface, excavating annually an estimated 42 billion metric tonnes of minerals. Only water erosion is moving bigger masses of soil and rock (53 billion tonnes/year). The key challenge is therefore to "close" the material cycles, by increasing reuse and recycling of materials, since "no new building will lower the absolute environmental burden". The Dutch practice was suggested as a good way forward: i) Ban landfilling of construction materials and/or introduce a landfill tax; ii) Make primary and secondary construction materials identical in relation to standards, certifications, etc.; and iii) Finally, make C&D waste sorting mandatory and provide instruments for prevention, reuse and recycling of C&D waste.

39. **Friends of the Earth's** key concern (Dr. Michael Warhurst) is related to increasing production and consumption. FoE welcomed the UNEP International Panel for Sustainable Resource Management and the European Action Plan on Sustainable Production and Consumption, while arguing that more effort is still needed. Their recommended priorities for the EU Action Plan were: i) Measurement of resource use and associated environmental impacts; ii) Policy measures to improve eco-efficiency; and iii) Targets for reducing environmental impacts from resource use. It was argued that the crucial starting point is to be able to measure the scale of the problem. For example, climate policies are driven by ppm CO2-equivalents; similar, simple indicators are also needed to monitor resource use. Resource use must become much more efficient, thereby preventing harmful impacts on the environment. Finally, targets are needed, to ensure reductions both in resource use and associated environmental impacts.

**Methodologies for Evaluating Environmental Impacts**

40. The OECD report **"Methodologies Relevant to the OECD Approach on SMM"** provided an overview (Mr. Tom Gloria) of ten methodologies that are used to assess material use in terms of its potential impacts on the environment, benefits to society and value for the economy [ENV/EPOC/WGWPR(2007)5/FINAL]. The purpose of the study was to promote understanding of the strengths and limitations of each of the methodologies, in terms of their potential application as part of a strategy to promote more sustainable management of materials. The study presents an overview of each methodology according to its type and scope, points in the part of the life-cycle it covers, data and skills required to apply it and potential links to other methodologies.

41. Two of the methodologies that were examined can be used to assess *social* issues, five to assess *economic* issues and nine to assess *environmental* issues. All ten methodologies can be used to conduct screening level assessments, while nine can also be used to conduct full extensive assessments. Eight of the methodologies can be applied to cover all phases of the life-cycle of the product, material, or system that is being assessed. Basic data is relatively easy to acquire for all methodologies, with the exception of Cost-Benefit Analysis and Environmental Impact Assessment. All of the methodologies require general

expertise to conduct a screening level assessment, which can be a useful first step (and may actually be all that is necessary to help set priorities for further investigation). More extensive assessments require specific expertise, in particular to interpret and apply results and to determine the geographic scope of impacts. This requires significantly more time and cost, in order to conduct the detailed analysis that is part of the more extensive assessments.

42. The combination of Cost-Benefit Analysis, Total Cost Assessment and Life-Cycle Analysis is useful for setting policy priorities. The combinations which may contribute most to SMM include Economic Input-Output Analysis, Life-Cycle Analysis and Material Flow Analysis. Of the ten methodologies examined in this study, only two (Cost Benefit Analysis and Total Cost Assessment) are able to assess social, economic and environmental issues associated with the life-cycle of materials. However, in practice, both these methodologies require a life-cycle perspective on the part of the study practitioner, in order to incorporate this broader scope.

43. For all ten methodologies, there is an element of uncertainty and a degree of subjectivity involved in generating the results. Choosing the appropriate methodology to apply in a given situation clearly depends on the scope of the underlying objectives (*e.g.* whether the objective is to understand a material, a product or an economy).

44. It is clear that a combination of methodologies will be necessary to gain the most comprehensive picture of social, economic and environmental impacts across the life-cycle of materials, and to foster improved sustainable materials management. No one methodology alone will be sufficient to promote SMM.

## CHALLENGES FOR FUTURE DEVELOPMENTS ON SMM

### Overview

45. The **Panel discussion** at the end of the Workshop (Mr. Tom Jones, Mr. Ross Bartley, Dr. Lauren Heine, Mr. John Wante and Mr. Marco Buletti) revealed that:

i) There has been a lot of activity towards SMM at the level of both government and business;

ii) There was a shared view across many delegations that they were finding it difficult to re-engineer their organisations and programmes in order to move from waste to sustainable resource thinking;

iii) There seemed to be general consensus that the problem could be addressed by creating a "*working group on sustainability co-ordination*" within their administrations, with a mandate to review waste policy proposals to help ensure alignment with sustainability thinking; and

iv) There was also a strong perception that the OECD has a continuing role to play in this process.

### Key Challenges for Industry

46. The Workshop clearly indicated that SMM is still in its infancy at the level of industry. Some front-runners have made impressive progress, but for industry as a whole, SMM is still rather unknown. On the positive side, front-runners are clearly seeking new profits from better management of materials that once were regarded as waste. These initiatives are being driven by concerns about reducing costs, but also about increasing revenues – because consumers are also demanding more environmentally friendly products, associated with sustainable management of materials over their whole life-cycle.

47. On the other hand, business continues to need clear and simple targets and indicators, as well as simpler models and cost-effective tools (measure not only what is "easy" but what is "needed"). Business could also benefit from the wider dissemination of "good practice" examples. However, information transfer through life-cycles and supply chains of materials and products remains challenging. Social aspects and underlying consumer paradigms are already to a large extent part of "fore-runner" business practices. Broadly, the SMM concept still needs to be translated into concrete actions, covering the entire life-cycle and supply chain of materials and products in a more globalised world.

**Key Challenges for Governments**

48. Traditional "command-and-control" approaches are unlikely to be sufficient on their own to promote SMM. Market-based instruments, as well as information and other "soft" policy approaches will also have important roles to play. Governments need to raise awareness and share knowledge about SMM, with the goal of translating the SMM paradigm into understandable policy messages. There is also considerable uncertainty about governments' ability to deliver integrated solutions that cover the full life-cycle of materials, given the policy integration problems that this will imply. Policy integration is likely to be improved by a more structured "partnership" approach, involving all actors in the materials life-cycle (especially business, NGOs, and consumers). To promote both the economic efficiency and environmental effectiveness of SMM, governments should also systematically analyse the benefits and costs of proposed SMM-related policies. Obviously, recycling will play an expanded role in achieving SMM, so this phase of the materials life-cycle needs special attention.

**Key challenges for the OECD**

49. To support future progress towards SMM, the OECD should i) Examine the framework conditions (policy principles) needed for SMM, including the possibilities of applying specific policies (*e.g.* SMM targets) and/or instruments (*e.g.* economic approaches); ii) Carry out case studies on priority materials (*e.g.* metals, transport, food, building materials), aimed at developing a better understanding of "good practices" in these areas and facilitating exploration of policy opportunities and barriers for SMM, as a way of demonstrating the utility of the SMM concept for policy-making; and iii) Continue to develop solid indicators (*e.g.* resource efficiency, resource productivity, use rate of recycled materials) that will help those involved in SMM to measure progress toward this goal.

50. Workshop participants also felt very strongly that it would be useful to build on the momentum established by this Tel-Aviv meeting, and to work toward holding a 3rd OECD SMM Workshop in 2010, focussing on "policies for implementing SMM" (in priority sectors, materials, and products).

**ANNEX 1**

# AGENDA

## 2nd OECD Workshop on Sustainable Materials Management (SMM):

## Front-runners' experience on SMM

**7-9 April 2008**
**Tel-Aviv, Israel**

## Monday 7 April 2008

**9:30 – 10:00: Registration**

**Opening Session – Background for the Workshop**

10:00-11:00

Welcome by **Mr. Gideon Ezra**, Minister of Environmental Protection, Israel and by **Mr. Tom Jones**, Head of National Policies Division, Environment Directorate, OECD.

The Chair (**Dr. Miriam Haran**, Head of M.B.A. Environmental Management Specialisation at ONO Academic College) will present the Workshop context and objectives.

Keynote speech by **Prof. Michael Braungart** (Environmental Protection and Encouragement Agency, EPEA). He will present current environmental challenges and reasons for moving toward sustainable use and management of materials.

## Session 1: Taking Stock of Major Current Initiatives related to SMM

11:00-12:00 **1-1: SMM Initiatives by the EU and UNEP/SETAC**:

Sustainable Consumption and Production: the EU Action Plan (20min) (**Mr. Jakub Wejchert**, European Commission), followed by key questions from the floor (5min).

The UNEP/SETAC Life-Cycle Initiative – Bringing science-based life-cycle approaches into practice worldwide (20min) (**Dr. Sonia Valdivia**, UNEP, Division of Technology, Industry and Economics), followed by key questions from the floor (5min).

12:00-13:00 **1-2: SMM Initiatives by some OECD Member and Non-member Countries**

Presentation by some member and non-member countries (15min each) on their SMM initiatives, followed by discussion:

- **Dr. Andreas Kunsleben** (Efficiency Agency of the German State North Rhine-Westphalia, EFA): Resource Efficiency Strategies for Small and Medium-sized Enterprises - Experiences of public funding in North Rhine-Westphalia, Germany;
- **Dr. Harvey J. Houng** (Environmental Protection Agency, Chinese Taipei): SMM in Chinese Taipei;
- **Ms. Angie Leith** (US Environmental Protection Agency): Moving from Waste Management to Materials Management.

13:00-14:15 Lunch

14:15-14:50 **1-3: SMM Initiatives by the OECD Member Countries**:

Report by the OECD Secretariat (**Ms. Soizick de Tilly**) on the outcome of the in-depth survey on the development and implementation of SMM policies or programmes in OECD member countries (20min presentation, 15min discussion)

The survey is expected to:

- Provide information on the scope of existing SMM policies/programmes, the instruments used, etc.; and
- Report on the implementation of SMM policies/approaches, barriers met, and the environmental effectiveness and economic efficiency of these policies.

14:50-15:30 **1-4: Inventory of SMM Activities in International Organisations**

Report by **Mr. John Wante** (Flemish Public Waste Agency, OVAM, Belgium) on the inventory of international SMM activities (20min presentation, followed by 20min discussion).

The report is expected to:

- Provide information on the nature and scope of identified activities, and instruments currently having applied to promote SMM;
- Identify overlaps and gaps between the different initiatives;
- Assess how OECD can learn from these initiatives for its own SMM programme; and
- Identify opportunities for co-operation with particular organisations.

15:30-16:00 Coffee

16:30-17:45 **1-5: SMM Initiatives in the Private Sector**

To what extent is the SMM approach pursued within the industry, with special reference to metal industry;
Opening presentation (20min) by **Dr. John Atherton** (International Council on Mining and Metals, ICMM), followed by key questions from the floor (5min).

Case study on Electric and Electronic Equipments (25min) (e.g. electric appliances, personal computers, portable phones, etc.) (**Mr. Maarten ten Houten,** Philips Lighting), followed by key questions from the floor (5min).

- Discussion (20min).

END OF DAY 1

17:45-18:15

On the basis of 1st day's discussions, the Chair, the Secretariat, and the Session 1 Rapporteur (Mr. John Wante, Belgium) will prepare a draft summary of the 1st day discussions.

# Tuesday 8 April 2008

## Session 1 (cont...): Taking Stock of Major Current Initiatives related to SMM

9:00-10:30 **1-5 (cont.): SMM Initiatives in the Private Sector**

Presentation of two case studies:

- Food industry case study (25min) by **Mr. Henry King**, Sustainability Manager, UNILEVER), followed by key questions from the floor (5min).

- Cement Sustainability Initiative (CSI): Concrete Recycling (25min) (**Mr. Josep Bernat Garcia**, Cementos Portland Valderrivas), followed by key questions from the floor (5min).

- Discussion (30min).

10:30-11:00 Coffee

11:00-12:30 **1-5 (cont.): SMM Initiatives in the Private Sector**

Presentation of two case studies:

- Aviation industry case study (25min) by **Dr. Dan Lando**, Project Manager Environmental Excellence Programme, Israel Aerospace Industries Ltd, followed by key questions from the floor (5min).

- Automobile industry case study (25min) by **Mr. Kazuya Shishido**, NISSAN, followed by key questions from the floor (5min).

- Discussion (30min).

12:30-14:00 Lunch

14:00-15:30 **1-6: NGO Initiatives and Views relevant to SMM**

Presentation of NGO initiatives and views:

- Sustainable construction (15min) by **Mr. Ronald Rovers** (International Initiative for a Sustainable Built Environment, IISBE), followed by key questions from the floor (5min)

- Environmental NGO (15min) (**Dr. Lauren Heine**, Clean Production Action), followed by key questions from the floor (5min)

- Environmental NGO focussing on consumption (15min) by **Dr. Michael Warhurst (**Friends of the Earth), followed by key questions from the floor (5min).

- Discussion (30min).

15:30-16:00 Coffee

## Session 2: Methodologies to Assess Environmental Impacts of Materials Use

16:00-17:00

Presentation (20min) by **Dr. Tom Gloria** (eQuilibrium Solutions Corporation) on a study of different methodologies which are relevant to the OECD SMM approach. The report is expected to:

- Identify methodologies relevant to the OECD approach on SMM; and
- Describe advantages, disadvantages and complementarities between the various approaches and the areas of their application.

Discussion (40min) would then focus on the applicability and practical experiences on the use of these methodologies and how they could satisfy particular needs of the OECD approach to SMM.

END OF DAY 2

17:00-18:00

On the basis of 2nd day's discussions, the Chair, the Secretariat and the Session 2 Rapporteur (Ms. Josée Lanctôt, Canada) will prepare draft summary of the 2nd day discussions.

# Wednesday 9 April 2008

## Session 3: Where do we go from Here on SMM?

9:00-12:00

Panel discussion (15min per panellist followed by 1 hour general discussion). The panellists will focus mainly on future directions for SMM work.

Panel members:

- Panel moderator (**Mr. Tom Jones,** OECD)
- Industry representative (**Mr. Ross Bartley**, Bureau of International Recycling)
- NGO representative (**Dr. Lauren Heine**, Clean Production Action)
- OECD member country delegate (**Mr. John Wante**, Belgium)
- WGWPR Chair (**Mr. Marco Buletti**, Switzerland)

Coffee (30min from 10:30 to 11:00)

12:00-12:30

Chair's summary of the Workshop, Closing remarks and Adjournment.

12:30-13:45 Lunch

14:00-evening Excursion to Jerusalem

(Note: the Chair, the Secretariat, and the Session 3 Rapporteurs (Mr. Tom Jones and Mr. Henrik Harjula, OECD) will meet at the end of the day to finalise a draft Chair's Summary, to be presented to the WGWPR).

# Technical Visits and Social Events

## Sunday 6 April 2008:

SMM within the private sector:
2 visits of concrete examples of facilities: Hiria LF – Transfer station and the INTEL facility.

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| 09:00 | leaving the Hotel by bus. |
| 09:30-12:00 | Hiria Transfer station and recycling park (presentation by Attorney Doron Sapir, Chairman of the Dan Region Association of Towns and Deputy Mayor of the Municipality of Tel-Aviv – Jaffa.<br>Visit to the new installations and the landfill site being rehabilitated (biotechnological and hydro-mechanical technology).<br>http://www.hiriya.co.il/hiriya/default_e.asp |
| 12:00-13:00 | Journey to Kiryat-Gat where the INTEL facility is located. |
| 13:00–14:00 | Lunch |
| 14:00–15:30 | INTEL-Israel overview presented by the factory manager.<br>INTEL's environmental management presented by INTEL-Israel Environment Manager |
| 15:30- 16:30 | Visit to the plant. |
| 16:30–17:30 | Journey back to Tel Aviv |

## Monday 7 April 2008 (19:00-21:30):

Guided tour to two famous touristic sites close to Tel-Aviv: Neve Tzedek and Jaffa (old city and harbour). Possibility for a light dinner during the tour.

## Wednesday 9 April 2008 (14:00-21:00):

Excursion to Jerusalem:

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| 14:00 | Leaving the hotel by bus. |
| 15:30–20:00 | Tour in Jerusalem and dinner offered by the Ministry. |
| 20:00-21:00 | Journey back to Tel-Aviv. |

**ANNEX 2**

# Participants list

# Workshop on Sustainable Materials Management

**Tel Aviv, Israel**

**7 - 9/4/2008**

**Chaired by**
**Dr. Miriam HARAN**

## INVITED SPEAKERS

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| **HASVIVA** | Ornit PARKETOBNIK<br>NGO - Hasviva |
| **HESCHEL CENTER** | Avi BLAU<br>NGO - Heschel Center |
| **IUED** | Gilad OSTROVSKY<br>NGO - IUED |
| **LIFE AND ENVIRONMENT** | Noga LEVZION-NADAN<br>NGO - Life and Environment |

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