Workshop proceedings

Fourth annual Eionet workshop on waste and material flows

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A great deal of additional information on the European Union is available on the Internet.
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1. Introduction

On 11 and 12 October 2001, the European Topic Centre on Waste and Material Flows — ETC/WMF — held its fourth annual Eionet workshop in Bratislava, Slovak Republic.

It was the first ETC/WMF workshop with participants from the new member countries of the European Environment Agency (EEA), and they were represented by 18 experts from 12 countries. All together 54 experts attended the workshop from 25 countries as well as from EU and international bodies including the EEA, Eurostat, the JRC and the Secretariat of the Basel Convention.

In the following sections, the proceedings of the workshop are presented. Section 2 gives a short summary of the proceedings, whereas in Section 3, the detailed proceedings are found, divided according to the sessions of the workshop.

Due to the participation in the workshop for the first time of the new member countries, a pre-meeting was held on 10 October 2001. Section 4 presents the proceedings of this meeting.

Finally, a number of appendices give more detailed information on the workshop programme, list of participants and minutes of group discussions. Additional materials handed out to participants during the workshop are available at Circle.

2. Summary and conclusions

2.1. Main workshop

In *Session I*, EEA concepts and visions were outlined. An introduction to ETC/WMF, its work programme and organisation of work were given. Subsequently, the key element of networking and the features of Eionet were explained and the future challenge relating to the enlargement of the network elucidated.

To terminate session I, a presentation of Eurostat work and objectives, including the process around the draft EU regulation on waste statistics, was given.

Session II focused on data collection and reporting, especially in relation to the upcoming pan-European (Kiev) report, for which the ETC/WMF is drafting the chapter on waste and material flows. The Kiev report will be indicator-based, and the waste chapter structure will reflect the flow of materials through the economy, attempting to link material flow to waste generation. The problems of, for example, data availability, reliability and comparability and lack of baselines for measuring progress were subject to group discussions. It was seen that the problems experienced in the new EEA member countries are shared to a large extent in all member countries.

In *Session III*, waste minimisation, waste prevention and resource management came into focus. The need for a clear understanding of processes causing waste generation was highlighted, and the link between resource consumption (input) and waste generation (output) was clarified. Furthermore, practical examples of waste management practice in EEA countries were presented, so as to support and inspire work on waste minimisation, recycling and cleaner technology.

Session IV focused on the ETC/WMF database 'WasteBase', giving a presentation of the current version and an outline of the further development of WasteBase. The objectives of WasteBase were also elucidated. A detailed presentation was given of the WasteBase section on hazardous waste management facilities. The importance of making WasteBase a useful tool for the Member States in relation to their reporting obligations was highlighted.

In *Session V*, work on indicators was presented and discussed. Much EEA information is based on indicator reporting. The development of indicators in the field of waste and material flows is rendered difficult by the lack of data, their reliability and comparability. The session was completed with group discussions where participants had the opportunity to comment on the proposed core set of indicators, their relevance and feasibility.

2.2. Pre-meeting

Due to the participation in the workshop for the first time of the new EEA member countries a pre-meeting was held on 10 October 2001.

In *Session I,* general information and presentations were given on the ETC/WMF, the EEA and the Basel Convention. Furthermore, the proposed EU regulation on waste statistics (Eurostat) and the toxic mining waste project (JRC) were presented.

Session II focused on data collection and reporting with special emphasis on the upcoming pan-European (Kiev) report. At the end of the session, participants were given the opportunity to present and discuss some of the difficulties they have with data availability in their country.

Conclusions
The workshop was a good and fruitful occasion to get acquainted with the new members of the network around the ETC/WMF. The pre-meeting arranged exclusively for the 'new' countries was highly appreciated.

The atmosphere which prevailed during the workshop gives good prospects for a constructive and productive cooperation in future. Once again it became evident how important the annual workshop is for the development of Eionet, a development that will in the near future focus on visits from the ETC/WMF to the 'new' countries.

The workshop was furthermore an important occasion to present the draft outline of the Kiev report and to get an impression of data availability and limitations to data availability in the different countries.

Finally, the workshop hosted the first dialogue in the network on the proposed framework of a core set of indicators on waste and material flows. The discussion that also provided an outline of the use of indicators in the different countries was most interesting and profitable for the further work of the ETC/WMF.

3. Proceedings

3.1. Session I: ETC/WMF

On behalf of the host country of the workshop and the Slovak Environmental Agency, Deputy-General Director Jozef Dupej (JD) welcomed the participants to the workshop. JD appreciated that the enlargement process will render the EEA more European, and he wished all participants a fruitful workshop.

Chairman of the first session EEA Programme Manager Gordon McInnes (GM) appreciated that an accession country hosted this fourth Eionet workshop on waste and material flows. GM welcomed the 10 new EEA member countries and the three coming members (end 2001) to the network.

GM gave an introduction to the 'Envision' (vision for the environment) and the concepts of EEA work. First, he mentioned Eionet from which the EEA derives all information. The importance of Eionet cannot be underestimated, both in its role as deliverer of data and supplier of directions and guidelines for EEA reporting. GM explained two general frameworks used in EEA and EIONET work. The concept of DPSIR stands for: driving forces — pressure — state of the environment — impact and response. GM underlined the need to link the processes between the D, P, S, I.and R with the development of indicators. The MDIAR concept (monitoring — data — information and indicators — assessment — reporting) was also presented, and GM stressed the importance of keeping this information pyramid in mind in all work.

Birgit Munck-Kampmann (BMK), ETC/WMF Manager, presented the work programme of ETC/WMF included in the implementation plan. BMK explained how work is organised in the consortium of ETC/WMF and how the network plays a crucial role in the reporting on waste and material flows. In the coming years the main activities will be concentrated on reporting based on indicators, evaluation of assessment tools relevant for waste and material flows and further development of scenarios for the outlook reporting. Further, BMK emphasised the information pyramid and the need for targeting information for different audiences.

BMK presented a list of projects in which ETC/WMF will need the active participation of national reference centres (NRC) for waste and material flows, first of all in relation to the Kiev report, the Environmental signals report and the TERM report. Further, ETC/WMF will need NRC response on the development of a core set of indicators for waste and material flows and the development of assessment tools.

Other major projects are the development of WasteBase, further development of the IT tool for waste electrical and electronic equipment (WEEE), and support to Eurostat in the implemention of the new waste statistics regulation (WSR).

Finally, BMK stressed that the good results of work achieved so far to a large extent are the fruits of member country contribution. She expressed her hope that the ETC/WMF will continue to benefit from this valuable contribution.

Rikke Carlsen (RC), ETC/WMF core team, gave a presentation on the 'Eionet aspect of waste and material flows'. The challenge for the next years will be to work with 31 member countries — so far we have covered a network of 18 countries. RC expressed her hope that all countries will be open for collaboration to carry forward this process. Future ETC/WMF country visits will focus on new member countries.

RC emphasised the role of NRCs, as ETC/WMF will not be able to deliver any output without the input from member countries. RC admitted the need to streamline the flow of

information from member countries to EU institutions, including the reporting obligations and the upcoming waste statistics regulation. Networking is an important element of the 'Eionet aspect of waste and material flows', of which the present workshop, country visits and the coordination of up to four NRCs in a member country are some of the key constituents.

RC referred to the work plan handed out to the participants, stating the involvement and input expected from member countries. The use of Circle as a communication tool is expected to be a vehicle for further collaboration and information exchange. RC promised that the Circle interest group on waste and material flows would be organised in a logical way so as to facilitate communication. In case of problems in using Circle, ETC/WMF Copenhagen will be of assistance.

Huib Verhagen, NRC of the Netherlands, raised the question of coordination of responses from up to four NRCs in a member country. BMK recognised that the task will not be easy, hoping the national focal points (NFPs) will do the needed coordination within the countries. ETC/WMF will communicate with all NRCs with a copy to NFPs. GM emphasised the need for communication directly to the NRCs to avoid a possible bottleneck at NFPs in case of indirect communication.

Cees van Beusekom, Eurostat, gave a presentation of Eurostat work on statistics and indicators. The objective of Eurostat's activities is to provide the EU with high-quality, reliable and harmonised statistics.

The Eurostat network consists of the national statistical institutes and services of EU Member States. Main areas of work of Eurostat F3 (environment statistics unit) are waste, water and environmental expenditure statistics, sustainable development and 'integration' indicators. Eurostat cooperates with the EEA, the Environment DG and the OECD, the latter in the joint questionnaire on the state of the environment (JQ). Eurostat supports accession countries in the improvement of their statistical systems (a pilot project on municipal waste statistics is ongoing).

Eurostat (F3) work on indicators concentrates on four activities:

- environmental pressure indicators;
- sustainable development indicators;
- headline indicators;
- structural indicators.

The basis for EU and OECD statistics on the environment is the JQ. The JQ contains a separate chapter on waste generation and treatment. In spring 2002, JQ 2002 will be sent as pre-filled tables to the Member States for updating and correction (response deadline: June 2002).

For the spring Council 2002 in Barcelona, the Commission is preparing a synthesis report with structural indicators on the sustainable development of EU Member States.

For 'waste', the indicator will be municipal waste collected, proportion landfilled and proportion incinerated. Eurostat is responsible for the production of the structural indicators, and F3 has asked Member States to update their data on municipal waste before the end of October 2001.

To improve the information on waste in the EU, the Commission has proposed an EU regulation on waste statistics. From this regulation, Member States will be asked to provide statistics on waste generation and treatment. Statistics will provide a breakdown of waste generation by NACE sectors (20) and by approximately 50 waste types, according to the waste classification (an aggregate of the European waste catalogue (EWC)). Further, Member States will deliver statistics on waste treatment by type of treatment and type of waste. The proposal for the regulation is still under co-decision procedure for adoption. One of the main topics for discussion is the frequency of data provision (need for a compromise between annual and three year statistics). Adoption of the regulation is expected in the first half year of 2002.

3.2. Session II: Data collection and reporting (Kiev report)

Matt Crowe (MC), ETC/WMF-Irish EPA, presented upcoming work relating to the Kiev Report that is under preparation in the EEA for the Kiev Ministerial Conference, 2003. The ETC/WMF is drafting the chapter on waste and material flows. The report will be the third pan-European report published by the EEA following on from Europe's Environment: the *Dobris assessment*, published in 1995, and *Europe's environment: The second assessment*, which was reviewed at the pan-European conference of Environment Ministers in Aarhus, 1998. At this conference, the ministers requested a regular update of the information in *The second assessment* and, for future conferences, a presentation of the findings based on indicators to support decision-making. Several ministers also mentioned the need for prospective analyses, or outlooks, on environmental quality, to be included in future reports.

An outline of the chapter on waste and material flows has been prepared, and MC presented it to the participants. The structure of the chapter will reflect the flow of materials through the European economy and will attempt to link material flow to waste generation.

Chapter headings are:

- material flow and sustainability;
- waste generation and management;
- hazardous waste;
- waste management facilities;
- responses and future perspectives.

The ETC/WMF is currently collecting available statistics from international bodies and is in the process of selecting indicators for the various themes covered in the chapter. MC explained that member countries may be contacted and asked to clarify details in relation to their country-specific data. Both the draft chapter and indicator factsheets will also be circulated to member countries for comment and clarifications in spring 2002.

After MC's presentation, group sessions were held on the subject of data availability and reporting. These sessions followed on from the round-table discussion held the previous day involving the 'new' countries (see proceedings in Section 4). At this session, several common issues were identified and these issues guided the discussions. The issues were:

- problems with data availability;
- data proofing and reliability;
- duplication;
- changing classification systems (and comparability of data);
- lack of baselines for measuring progress;
- implementation of new laws (laws into action);
- communication.

Proceedings of these discussions are enclosed as Appendix 3.

3.3. Session III: Waste minimisation, waste prevention and resource management

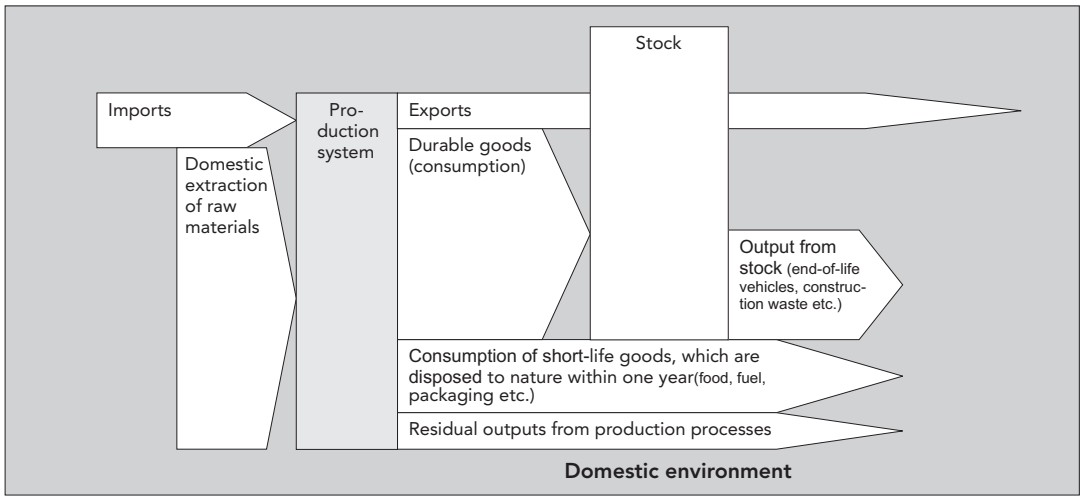
Stephan Moll (SM), ETC/WMF-Wuppertal Institute, gave a presentation on 'Resource management, waste prevention and future waste generation'. SM focused on four parts in his presentation: firstly the policy development at the European level, secondly the perspective of the industrial metabolism, thirdly the Material Flow Account and fourthly empirical findings.

SM emphasised the waste hierarchy from the EU waste strategy and the sixth environment action programme as the policy background in the field of resource management and waste prevention. Prevention has top priority in the waste hierarchy, and one of four priority areas within the 6EAP is sustainable use of natural resources and management of waste.

To focus on prevention, there is a need to integrate analysis of the output (waste) with the input (resource consumption).

SM pointed out the need for a clear understanding of processes causing waste generation, and he explained the concept of Industrial Metabolism that is based on the physical law that material cannot disappear — 'what goes in must come out'. The link between the consumption of resources (the input) and the generation of waste (the output) is illustrated in the figure below.

Figure 1 **Material flow analysis**



SM presented material flow analysis (MFA), which is a tool to measure the industrial metabolism in order to identify major material (resource) flows. MFA describes national economies in a physical way; in other words, MFA is an account in physical units.

SM presented the general accounting scheme for MFA with the number of input indicators and the number of output indicators: direct material input (DMI) and total material requirement (TMR) as well as the hidden flows and total material outputs (TMO).

SM presented several empirical findings: one of the results is that de-coupling of resource consumption and waste generation versus economic growth is possible.

The second presentation in Session III was made by Henrik Jacobsen (HJ), ETC/WMF core team, and dealt with a survey of waste minimisation practices in the EEA countries prepared by ETC/WMF.

The objective of this survey was to support and inspire work on waste minimisation by introducing a catalogue of successful examples on waste minimisation, recycling and cleaner technology.

HJ first gave an outline of the waste situation in the EEA countries followed by a presentation on selected case studies.

40 cases were compiled: 13 on waste prevention and 27 on recycling. Out of the 40 cases, 10 cases were selected for detailed study. From the 10 cases HJ presented three cases from Austria, Germany and Denmark.

The case in Austria was on reduced landfilling of biodegradable municipal waste. By the use of, for example, mandatory separate collection of organic household waste, the introduction of a landfill tax and producer responsibility for packaging materials, Austria has succeeded in increasing recycling of organic waste and incineration, and as a result the landfilling of waste was halved from 1989 to 1996.

The Danish case was about the levy of a landfill tax on construction and demolition waste. Partly due to the tax and partly due to the use of other instruments, the rate of recycling of construction and demolition waste increased from less than 20 % in 1990 to about 90 % in 1999.

The case from Germany was about producer responsibility on packaging waste. A packaging ordinance was introduced in 1990 imposing mandatory take-back of packaging materials. The system is financed by the producers, and Duales System Deutschland organises the collection and separation of the recyclables. Since the introduction of the system, the separate collection of packaging materials has increased from about 1 million tonnes/year to about 5.5 million tonnes/year.

HJ drew the following conclusions: waste arisings are continuously increasing; two thirds of waste generated is landfilled, and the increase in the recycling rate is limited.

From the survey it was clear that solutions encouraging source separation, reducing landfilling, increasing recycling, and furthering waste prevention have been developed in several EEA countries.

There is a need for continuous cooperation and exchange of technological and organisational experience, if progress in waste management practices shall be reached.

Patrick Wheeler (PW), NRC-UK, presented successful waste minimisation practices in the UK in the form of the waste minimisation programme 'Envirowise' and strategic waste management assessments.

Envirowise helps companies in the UK to improve their environmental performance while saving money. Envirowise is financed by the Department of Trade and Industry (DTI) and the Department of the Environment, Transport and the Regions (DETR). The programme is promoting the establishment of regional and local waste minimisation clubs.

Envirowise helps to change management attitudes by demonstrating the financial benefits of reducing waste at source. Envirowise advises companies through publications and seminars on how to reduce waste at source, and a telephone helpline has been set up. Additionally, companies with less than 250 employees can get free visits from advisors. This is a one-day fast-track waste minimisation visit which, after having gone through the facility, provides a report that states where costs can be reduced and actions taken to reduce waste. Advisory publications are provided to the companies, consisting of good practice guides, environmental performance guides and case studies. Case studies are used as examples of successful activities to demonstrate what companies have actually done to reduce waste.

Envirowise uses a wide range of marketing methods to reach companies. It puts considerable effort into direct marketing through mail and e-mail. Other marketing measures include seminars, conferences and workshops for companies already taking action.

A key feature of the promotion of the waste minimisation message is the way the programme works with other organisations that provide support to enterprises.

PW pointed out the successes of Envirowise:

- GBP 125 million savings in industry each year;
- 240 000 tonnes less raw materials;
- millions of tonnes less waste;
- waste-minimisation clubs up from 4 to 100.

In conclusion, PW stressed that Envirowise has been very successful in applying waste minimisation to industrial waste, and one of the key lessons to be learned is the importance of publicity and marketing efforts.

The session was completed with a discussion and questions, focusing mainly on the product — process issue, producer responsibility, and use of the tax instrument.

3.4. Session IV: WasteBase

Henrik Jacobsen (HJ), ETC/WMF-core team, presented the development of the database WasteBase. Firstly, he presented the current version of WasteBase, secondly the internal evaluation of WasteBase was presented and finally the further development of WasteBase was outlined.

The evaluation of WasteBase was concluded in the following main points:

- merging of WasteBase and the ETC/MWF homepage;
- WasteBase as a European web portal for waste;
- 'cleaning up' in the sections waste authorities (focus on authorities at national level) and waste management plans (focus on national plans);
- considering the section 'Clean technologies and instruments' and waste minimisation and clean technology institutions' (moved to another institution);
- improving the user friendliness of WasteBase;
- better graphical presentations in WasteBase.

Based on the evaluation the following objectives for WasteBase have been defined:

> *ETC/WMF in the period 2001–03 will develop WasteBase to a user-friendly web site containing data, indicators and assessments on different aspects of waste and material flows, thus serving the purpose of providing all relevant stakeholders and the general public with information on waste, waste management and material flows in Europe.*
>
> *The core activity of WasteBase is the presentation of data and information 'produced' through the ETC/WMF activities.*
>
> *In order to avoid duplication and to improve the dissemination of waste data provided by ETC/WMF, other EU databases and other institutions, ETC/WMF will strengthen the electronic network between waste data providers in Europe. Thus, WasteBase will function as an 'Internet portal' linking/guiding the users to other useful databases and institutions producing relevant information on waste and material flows.*

HJ presented the proposed interface of WasteBase and went through the proposed site map and services of WasteBase.

Thomas Weissenbach (TW), ETC/WMF — Austrian EPA, presented a part of WasteBase — the database on hazardous waste management facilities. The history of the database, the current situation, and the further development of the database for waste management facilities were outlined.

TW expressed his satisfaction that although data sets are not always complete, the database represents one of the best sources of overall information on facilities for management of hazardous waste in the European Union. Data were collected from all 18 EEA member countries from April 1999–October 2000. Only a few countries have updated their data since October 2000.

As to the future development of WasteBase, TW emphasised the key step of making the database a reporting tool for the Member States to be able to fulfil their reporting obligations. ETC/WMF will develop the database even further to be more user-friendly and easy to use by the countries in the reporting to the Commission. This further development will be in close cooperation with the Environment DG which is positive on this development.

A challenge for work with WasteBase will be the extension of the database to cover the 13 new EEA member countries.

The session was completed with a discussion and questions, where Klaus Rosenbusch (NRC-Germany) was satisfied with the less ambitious database, and he expressed his support for the further development of the database on Waste management facilities to be a tool for the reporting obligations.

Giovanni Biodoglio (JRC) emphasised the need for crosscutting issues, as it is important not only to focus on waste.

Birgit Munck-Kampmann (ETC/WMF) gave information on the review process that the Environment DG has started as a result of the awareness of the reporting burden in the countries and the awareness of the kind of data collected. These data do not always support the Commission in the evaluation of the effectiveness of the policies. As a result, the Environment DG will initiate a review of reporting with a pilot study on waste. EEA and ETC/WMF will participate in this pilot study. Currently ETC/WMF is considering how to assist in the further development of an electronic infrastructure for directives other than the standardised reporting directive.

Cees van Beusecom (Eurostat) stressed that the future waste statistics regulation will be part of the future reporting obligation.

3.5. Session V: Indicators

The following day was devoted to indicators development, the key focus of the workshop. It was chaired by Prof. Bernd Bilitewski, (Technical University of Dresden, Germany), member of the EEA Scientific Committee.

Dimitrios Tsotsos (DT), EEA waste topic team leader, presented the EEA work on indicators and development of waste and material flows environment mechanism.

DT presented the policy context of the development of indicators by giving a short introduction on how sustainability has been integrated in environmental thinking. This was first done at the Cardiff Council meeting of June 1999 and continued at the Gothenburg Council meeting in 2001. Here, it was decided that at each spring Council meeting the Commission will evaluate the implementation of the sustainable development strategy in an annual 'synthesis' report on the basis of headline indicators.

EEA provides information based on indicator reporting on a regular basis: the annual indicator report 'Environmental signals' and the TERM report, which is the sector integration report on transport and the environment reporting mechanism.

DT also emphasised the importance of cooperation between the different EU institutions in the development of indicators to avoid duplication of work and secure the best indicators in the future.

DT stressed some principles in the production of indicators:

- be linked to policy questions;
- report progress over time;
- be accompanied with an explanation of the reasons for their development;
- address quantitative targets and/or describe qualitative objectives in quantitative terms;
- provide 'condensed' information;
- describe the topic addressed to the required level.

DT pointed out that in the development of indicators in the field of waste and material flows it is important to focus on waste prevention and waste minimisation as well as on the assessment of environmental impacts caused by the emission of dangerous substances into the environment. Furthermore, he recalled the difficulties relating to the lack of data and

information in the waste field and pointed out the importance of the forthcoming waste statistics regulation in data collection/provision.

Maria Gabriella Simeone (MGS), ETC/WMF — Italian EPA, presented the framework for indicators on waste and material flows. She presented the policy background for the development of a core set of indicators on waste and material flows and the framework of the proposed set of indicators.

MGS emphasised the waste hierarchy of the waste strategy and the 6EAP as the policy background for the development of a core set of indicators. The framework of the proposed set of indicators consists of three categories, each of which corresponds to an overall objective of the EU environmental policy as contained in the 6EAP and the waste hierarchy:

1. Conserving natural resources
2. Preventing waste generation
3. Sustainable management of waste

For each of the three criteria, a 3-level hierarchy of policy questions has been used leading to:

- main policy question(s) and corresponding key indicators
- second- and third-level policy questions and corresponding core indicators.

MGS presented for all three categories the main policy questions formulated under the criteria and the subsequent corresponding indicators (refer to background paper, available at Circle, for detailed information).

MGS also mentioned that the insufficiency of data availability in the field of waste and material flows is a well-known fact. Current data collection systems in the EU Member States differ and derived indicators are often not comparable.

MGS finally made an outline of the further steps in developing a core set of indicators. First step is the initial dialogue with the member countries at the Eionet workshop on the draft framework and the proposed core set of indicators. Second step will be in dialogue with other EU institutions and international organisations. A draft report will afterwards be delivered to the EEA when a formal consultation with Eionet is expected to take place.

The session was completed with group discussions. Proceedings of these discussions are enclosed as Appendix 4.

3.6. Closure of workshop

Gordon McInnes (EEA) expressed his hope that all participants had had a productive workshop and had become more familiar with the EEA and the ETC/WMF. In relation to indicators he called for more focus on the 'State' part in the DPSIR. In his view, it is important to focus on the concerns for the environment, as these are the core issues for the European Environment Agency.

Huib Verhagen (NRC — The Netherlands) expressed his satisfaction that ETC/WMF had made some clear choices in the development of the 'new' ETC/WMF.

Birgit Munck-Kampmann (ETC/WMF) closed the workshop by thanking all contributions from the member countries and inviting all member countries to contact the ETC/WMF for any kind of support or help.

The fourth annual Eionet workshop on waste and material flows was completed with a site visit to Volkswagen, Bratislava. The initial idea for this visit was to focus on waste minimisation and waste prevention. Unfortunately, this was not possible due to misunderstanding with the organiser at Volkswagen.

4. Proceedings of pre-meeting

Due to the participation in the workshop for the first time of the new EEA member countries a pre-meeting was held on 10 October 2001. In the following, the new EEA proceedings of the two sessions of this meeting are presented.

4.1. Session I: General information

Vladimir Benko (VB), Slovak Environmental Agency, welcomed the participants to the workshop. VB expressed how much he was pleased by the fact that the Slovak Environmental Agency has now become a partner of ETC/WMF. The Slovak Environmental Agency has a number of activities in relation to nature protection and Unesco protected areas. VB underlined that the exchange of information between EEA countries will be a great help to the Accession Countries in the process of becoming members of the EU.

Birgit Munck-Kampmann (BMK), ETC/WMF manager, also welcomed the participants and explained that the purpose of the meeting was to get acquainted with each other and discuss issues of mutual interest. Special focus should be put on the data collection for the Kiev report, which is one of the most important tasks in advance of the Kiev meeting in 2003. BMK explained that the ETC/WMF and the EEA rely on other institutions to provide the Topic Centre with information in the future work. BMK also welcomed the external speakers from the Basel Secretariat, Eurostat, and Joint Research Centre.

Dimitrios Tsotsos (DT), the EEA topic team leader, afterwards gave a general presentation of the EEA. DT stressed that the topic centres are part of the EEA and work together with the EEA in a close cooperation. The EEA is not an EU environmental protection agency. The task is to provide Europe with data and information for policy-making. The EEA does not develop monitoring or statistical surveys itself, and therefore the work of the EEA relies on the provision of reliable data from the countries to the international programmes. The main products of the EEA are the 'State and outlook reports' (every four to five years), 'Environmental signals' (every year), topic reports and technical reports.

A general presentation of the European Topic Centre on Waste and Material Flows (ETC/WMF) was made by Birgit Munck-Kampmann (BMK), Matt Crowe (MC) and Rikke Carlsen (RC).

BMK explained that topic centres are consortiums of national institutions under contract with the EEA. ETC/WMF consists of eight partners. There are currently five topic centres.

The purpose of the topic centres is to provide objective, reliable and comparable information. BMK underlined that the ETC/WMF is very focused on avoiding duplication of work.

MC presented one of the recent outputs of the ETC/WMF: the report on 'Biodegradable municipal waste management in Europe: Strategies and instruments'. According to the report, a total of 13 millions tonnes of biodegradable municipal waste (BMW) is landfilled, and the report presents strategies and instruments to reduce the landfilling of BMW.

RC gave an introduction on the Eionet network. Eionet is an information network of EEA countries that includes:

- national focal points
- national reference centres
- European topic centres.

From 2002 the geographical coverage of the EEA includes the following countries as members:

- EU-15
- Iceland, Liechtenstein and Norway
- 12 accession countries plus Turkey.

In addition, several Balkan countries are also participating in the work programme.

RC explained that the objectives of the Eionet workshops are to inform on the work programme, future activities and involvement of NRCs. Furthermore, the workshops are forums for expert discussions on selected items and general networking.

The waste statistic regulation was presented by Cees van Beusekom (CB), Project Manager at Eurostat. CB presented the development of the EU regulation on waste statistics including the WSR-matrix. A detailed summary of the state of affairs is given in Section 3.1, proceedings of main meeting, Session I.

Helle Husum (HH), Secretariat of the Basel Convention, presented the work of the Basel Convention and focused on the role of the regional centre of the Basel Convention in Bratislava. The convention has regional centres around the world and one of them is located in Bratislava. The objective of the centres is to facilitate improved hazardous waste management and waste minimisation through capacity building in the different countries. The regional centre in Bratislava is to be a central partner for the EU accession countries.

HH encouraged all participants to contact the Director of the centre, Mr Juraj Silvan or the centre facilitator, Mr Adam Ostrowski of the regional centre to discuss how the Centre can contribute to their work. The regional centre in Bratislava can be contacted in the following ways: http://www.basel.int or silvan@sazp.sk or: adamostrowski@stonmail.sk

An important question in the subsequent discussion related to the database on hazardous waste management and best available practices. HH explained that the database at the moment contains a list of responsible persons and a list of best available practices regarding treatment only.

Giovanni Biodoglio (GB). The JRC presented an inventory on toxic mining waste.

The main objective of the project is to involve the EU accession countries in an EU research action on the environmental impact of mining waste in collaboration with the Environment DG and the EEA.

4.2. Session II: Data collection and reporting (Kiev report)

Matt Crowe (MC), ETC/WMF — Irish EPA, presented the general overview of the Kiev report and gave a brief outline of the history of the earlier reports. The overall issues of the presentation were also repeated at the workshop Thursday 11 October and details may be found in the proceedings of this session, see Section 3.2.

Matti Visiimaa (MV), ETC/WMF — Estonian Environment Information Centre, presented the countries that will be included in the report and data available from these countries.

After the presentation each country was given the opportunity to present some of the difficulties they have with data availability. The presentations were summarised and are enclosed in Appendix 5. MC ended the session by concluding that the problems the participants expressed are similar to those experienced in the rest of Europe. He expressed his hope that participants would use the occasion of the present workshop to discuss bilaterally some of the problems and solutions.

Appendix 1: Programme of the fourth Eionet workshop on waste and material flows

Programme

Eionet workshop on waste and material flows

11 and 12 October 2001

Thursday 11 October

Chairman:
Gordon McInnes, Programme Manager, EEA

9.00–11.15	Session 1 ETC/WMF

Registration

9.20	Welcome by Jozef Dupej, Deputy-General Director of Slovak Environmental Agency
9.30	Welcome by Gordon McInnes, Programme Manager, EEA
9.40	Presentation of the annual work programme (2001/02) and the involvement of the NRCs by Birgit Munck-Kampmann, ETC/WMF Manager and Rikke Carlsen, ETC/WMF
10.25	Presentation of Eurostat's work on waste statistics by Cees van Beusekom, Eurostat
10.45	Coffee

11.15–12.30	Session 2 Data collection and reporting (Kiev report)

11.15	Presentation of the waste chapter of the Kiev report by Matt Crowe, ETC/WMF-Irish EPA
	Presentation of the outline for the chapter on waste and material flows in the Kiev report as well as status on data collection. The Kiev report will be indicator-based and cover the EEA accession countries, the new independent States (NIS) as well as the present EEA member countries. It will be published at the end of 2002 and presented by the EEA at the next European environment ministerial conference in Kiev, spring 2003.
	Discussion
12.30–14.00	Discussion

Chairman:
Gerry Carty, ETC/WMF, Irish EPA

14.00–15.30	Session 3 Waste minimisation, waste prevention and resource management
14.00	Resource management and future waste generation by Stephan Moll, ETC/WMF-Wuppertal Institute
14.30	Presentation of 'Case studies on waste minimisation — practices in Europe' by Henrik Jacobsen, ETC/WMF-DK
15.00	Presentation of 'UK experience in the field of waste minimisation', by Patrick Wheeler, NRC-UK
15.15	Discussion
15.30	Coffee

16.00–17.00	Session 4 WasteBase
16.00	WasteBase by Henrik Jacobsen ETC/WMF-DK and Thomas Weissenbach, ETC/WMF-Austrian EPA • Presentation of the findings in the internal evaluation of WasteBase • Proposal for the further development of WasteBase • Database on hazardous waste management facilities
17.00	Adjourn of meeting
18.30	Evening programme

Friday 12 October

Chairman:
Bernd Bilitewski, Technische Universität Dresden
Member of Scientific Committee, EEA

9.00–12.30	Session 5 Indicators
9.00	Presentation of EEA work on indicators and development of waste and material flows environment mechanism by Dimitrios Tsotsos, EEA.
9.30	Presentation of the ETC-framework for indicators on waste and material flows by Maria Gabriella Simeone ETC/WMF-Italian EPA and Stephan Moll ETC/WMF-Wuppertal Institute
10.00	Group session on development of a core set of indicators, including coffee break.
12.00	Plenary session
12.30	Closing of the workshop by Birgit Munck-Kampmann, ETC/WMF Manager
12.30–13.30	Lunch

13.30–16.00	Session 6 Site visit at Volkswagen, Bratislava

Programme

10 October 2001

Pre-meeting for new Eionet member countries

Wednesday 10 October

Chairman:
Leo Saare, ETC/WMF Estonian Environment Information Centre

13.30–17.30	Session 1 General information
13.30	Welcome by Vladimir Benko, Slovak Environmental Agency
13.40	Welcome by Birgit Munck-Kampmann, ETC/WMF Manager
13.50	General presentation of EEA by Dimitrios Tsotsos, topic team leader, EEA
14.20	General presentation of the ETC/WMF by Birgit Munck-Kampmann and Rikke Carlsen
14.45	Presentation of the regional centre of the Basel Convention (Bratislava) and future cooperation between ETC/WMF and the Regional Centre by Helle Husum, Secretariat of the Basel Convention
15.10	Presentation of the waste statistic regulation by Cees van Beusecom, Eurostat
15.20	Cooperation with JRC — inventory on toxic mining waste *by* Giovanni Biodoglio, JRC
15.30	Coffee

16.00	**Session 2** **Data collection and reporting (Kiev report)**
16.00	Presentation and discussion on the Kiev report with focus on the involvement of the new member countries. A general overview of the Kiev report, with focus on its main objective and its relevance for the new countries, by Matt Crowe, ETC/WMF-Irish EPA A presentation on the information available in the new countries and the challenges ahead in relation to collection and reporting of information, by Matti Viisimaa, ETC/WMF-Estonian Environment Information Centre Discussion
17.30	Adjourn of meeting

Appendix 2: List of participants

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Appendix 3: Minutes from group discussions, Session II (Kiev report)

The participants were divided into four groups where the following questions were discussed:

- data availability;
- data proofing and reliability;
- duplication;
- changing classification systems;
- lack of baselines for measuring progress;
- implementation of new laws;
- communication.

Table 1

Group A	Group B	Group C	Group D
Austria	Bulgaria	Belgium	Cyprus
Denmark	Ireland	Croatia	Latvia
Finland	Netherlands	Hungary	Slovakia
Germany	Norway	Iceland	Slovenia
Italy	Poland	Romania	Sweden
Lithuania			United Kingdom
Turkey			

Report from group A

Participants:
Brigitte Karigl (Austria)
Berit Hallam (Denmark)
Kirsi Merilehto (Finland)
Klaus Rosenbusch (Germany)
Ingrida Kavaliauskiene (Lithuania)
Betül Dogru (Turkey)
Mikael Szudy (Swedish Statistical Office)
Henrik Jacobsen (ETC/WMF)
Roberto Zoboli (Italy)
Matti Viisimaa (ETC/WMF — Estonian EIC, rapporteur)
Maria Gabriella Simeone (ETC/WMF — Italian EPA, Chairman)

The main discussion pertained to data collection practices in EU Member States and 'new' countries. Often the problems were very similar in both groups of countries.

Changes in EU and national legislation in 'old' countries, as well as changes in waste classification systems (introduction of EWC) have had a large influence on waste data collection systems in some countries, e.g. Germany. It is very difficult to compare waste data collected according to national classification systems and European waste catalogue, especially concerning industrial waste. Some countries have no adequate system for collection of data including all categories of waste.

In smaller countries, as in Denmark or Finland, it has been easier to manage problems. Systematic approach, control over main waste flows, communication, feedback and additional work with data producers contribute to confirming the reliability of data.

In the discussions about possible duplication of some data in the process of data collection and presentation, it has been explained that duplication can happen in different ways:

- by collecting data by different authorities with no clear borders between data sets;

- by questioning different actors in the process of waste movement between companies generating, collecting, transporting, treating waste and registering the same amounts of waste several times;
- by making no differences between primary and secondary waste.

For this reason it is very important how to question primary (virgin) data sources, especially when the EU waste statistics regulation will be enforced. It is the competence of countries how to get waste data needed for fulfilling requirements of WStatR and reporting obligations. Still, the 'new' countries are very interested in having good examples from 'old' counties in this field thus drawing on their experience. There are large disparities between existing data collection practices in 'new' countries, e.g. between Turkey and Lithuania.

The 'new' countries are hoping that the time between legal enforcement of the WstatR and factual implementation (delivery of data) will be used very rationally by EU Member States to establish new data collection systems and undertake pilot projects etc. The result should be experience that could be shared also between 'new' countries.

Report from group B

Participants:
Huib Verhagen (The Netherlands)
Gerry Carty (Ireland)
Izabela Drelich (Poland)
Ekatarina Kulisheva (Bulgaria)
Øivind Brevik (Norway)
Giovanni Bidoglio (JRC)
Jacob Juul (ETC/WMF, rapporteur)
Thomas Weissenbach (Austrian EPA, Chairman)

Thomas Weissenbach explained the objective of the discussion: to initiate a dialogue to explore data collection. The NRC from Bulgaria who did not participate in the pre-meeting on Wednesday was asked to say a few words on the state of data collection in Bulgaria.

The experience of Bulgaria
Bulgaria has experience in producing indicators, but does not report anything to the EEA at the moment. There are technical and organisational problems because of the many institutions that collect data in different formats and ways. There are no data or information at State level in Bulgaria for the Kiev report. There is a need for help from consultants or experts to provide such data. There is a lack of coordination and a problem of understaffing. At the moment a project on packaging, PCB and landfills is being developed. A database is being established.

Data collection problems due to split-up of institutions
In the discussion in the working group other countries also mentioned problems with data collection due to the split-up of institutions. An example was given from the Netherlands where they have several different institutions. Sometimes it is the National Statistical Office that gathers data and sometimes it is RIVM. Information is available, but there are difficulties in gathering it from separate institutions and from the industry. It would be preferable with one institute to have an overview of the whole field.

In Ireland information is gathered from different sources. It is believed that there is a need to create a network to get cooperation going between national environmental authorities and statistical offices.

It was emphasised that no country has all the data for the indicators and that very few countries have developed indicators. It would be good if especially the new countries could provide basic data. It is important to note that it is a long list of indicators and that the old countries cannot provide data for all indicators either.

It came to the attention of the group that most countries do not have experience in making indicators.

- It is the opinion of the group that it should be emphasised that countries are not to make indicators for the Kiev report. The indicators will be produced by the ETC/WMF.
- It should also be emphasised that the countries are not expected to provide data in all areas. Even some of the 'old' countries are not able to do so.
- The new countries should concentrate on basic data needs not to overburden the new NRCs.
- Basic data needs should be identified and outlined by the ETC/WMF.

General comments

- It seems to be a problem in both old and new countries that there is a split-up between institutions. There is a need to secure that experts on waste are involved in the collection of data on waste. This is also necessary to ensure that the data is interpreted correctly.
- It is recommended that each country consider comparing data from different parts of society. For example, comparing data on waste as informed by landfill sites and incineration plants with information from collectors.
- There seems to be a tendency that waste arisings are underestimated when companies are to respond on waste arisings. Only a low number responds. There is a need to make estimates and not just report data as informed.

Report from group C

Participants:
Vladimir Tonkovic (Croatia)
Luminita Stefanescu (Romania)
Marta Kosaras (Hungary)
Mike van Acoleyen (Belgium)
Cornelis Aart Meyles (Iceland)
Cees van Beusekom (Eurostat)
Despo Fatta (ETC/WMF — Greece)
Jens Brodersen (ETC/WMF, rapporteur)
Hans Jörg Krammer (ETC/WMF — Austrian EPA, Chairman)

Some countries or regions have data available for the requested variables. This is the case for Austria, Belgium and Romania. Austria and Belgium have 1980/1 as baseline, while Romania has 1995 as baseline for statistics based on EWC.

In Iceland small communities rely on landfilling as the only waste treatment option, and waste going to landfill is not weighed. Iceland has statistics for hazardous waste from 1980 and for municipal waste from 1992. In Hungary, some statistics are available from 1981, while statistics based on EWC are not yet available. Croatia recently has introduced a comprehensive system for information on the environment; the baseline year will be 2000, and statistics are not yet available.

Summary table on availability and baseline years Table 2

Baseline years	1980/1	1992	1995	2000
Total waste by categories	Belgium and Austria		Romania	Croatia and maybe Hungary?
Municipal waste		Iceland		
Hazardous waste	Iceland			
Some waste streams	Hungary			

Romania is facing the problems of transfer from the old EWC to implementation of the amended version. Data collection is based on the detailed level of EWC, and the problems are therefore numerous. Mike van Acoleyen, Belgium, offered his assistance based on his own experience from transfer of data from national classification to EWC (The descriptive Matrix system).

The problem of reliability was considered as mainly a problem of resources and in some cases confidentiality of companies.

Austria and Belgium found the issue of communication important and mentioned that good and valid statistics had been available for 15 years, but only recently the institutions have realised the need for communication with the public.

Report from group D

Participants:
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Partrick Wheeler (United Kingdom)
Annmari Blom (Sweden)
Matti Viisimaa (Estonia)
Juris Fridmanis (Latvia)
Costas Papastavros (Cyprus)
Jozef Lehota (ETC/WMF — Slovakia)
Brian Meany (ETC/WMF — Irish EPA, rapporteur)
Leo Saare (ETC/WMF — Estonia, Chairman)

One of the principal conclusions drawn was that many of the difficulties faced by 'new' countries are also faced by 'old' countries. For example, information to waste generators, proofing of data, etc. Certain waste streams, for example, construction and demolition waste, are difficult to quantify in all countries. Other waste streams, for example, municipal waste, are easier to quantify. In all countries, total waste data will generally be a mixture of measured and estimated data.

On the implementation of new laws, one difficulty identified is the coordination of the different organisations involved in waste management: legislators, finance managers, administrators, local authorities, private companies. In particular there are difficulties in communicating with local authorities, waste management companies and between policy makers.

On duplication, it was stated that different organisations (environment ministries, industry ministries, agencies etc.) will collect the same information but for different reasons and will present that information in different contexts. In addition, the effect of regional governments reporting via national governments adds another layer between the source of the data and its compilation.

On questionnaires, most countries will have some information, but usually not all of the information. The availability of information varies between countries. For example, no data on packaging waste is likely to be available where a country has no packaging waste legislation. Similarly, where the EWC has not been adopted, it can be difficult to transpose national classifications for the purpose of responding to questionnaires.

The reliability of data from the countries of the NIS was questioned. However, it was stated that a number of countries have produced state of the environment reports which contain good information. Ukraine, Belarus and Moldova were specifically mentioned in this regard.

Appendix 4: Minutes from group discussions, Session V (indicators)

The participants of the workshop were divided into four groups and the following subjects were up for comment and discussion in each group:

1. General approach: Starting from the policy questions
2. Deriving three criteria from policy context: Something important missing? (not covered?)
3. Information hierarchy: three levels of policy questions and indicators
4. List of questions and indicators
5. Your experiences with indicator frameworks.

Table 3

Group A	Group B	Group C	Group D
Austria	Bulgaria	Belgium	Cyprus
Denmark	Ireland	Croatia	Latvia
Finland	Netherlands	Hungary	Slovakia
Germany	Norway	Iceland	Slovenia
Italy	Poland	Romania	Sweden
Lithuania			United Kingdom
Turkey			

Report from group A

Participants:
Brigitte Karigl (Austria)
Berit Hallam (Denmark)
Kirsi Merilehto (Finland)
Klaus Rosenbusch (Germany)
Ingrida Kavaliauskiene (Lithuania)
Betül Dogru (Turkey)
Mikael Szudy (Swedish Statistical Office)
Henrik Jacobsen (ETC/WMF)
Roberto Zoboli (Italy, rapporteur)
Maria Gabriella Simeone (ETC/WMF — Italian EPA, Chairman)

1. General approach: Starting from the policy questions
In general, it is considered to be a good approach as the policy question can guide in prioritising data collection and production.

Main issues raised:

- 'are there relationships between the framework of indicators and the production of EC regulation on waste statistics? How should they be linked or made coherent, and how can the framework influence the directive?' (Germany and Finland). Debate: the nature of the framework and its relation with regulation was highlighted by Austria, Dimitrios (EEA) and others in the general session; significant differentiation is represented by emphasising conservation and using MFA indicators.

2. Deriving three criteria from policy context: Something important missing? (not covered?)
Overall, the criteria are very general. This can be accepted, but it will not be easy to develop indicators on this basis.

Main issues raised:

- 'Are there similar or other criteria at the basis of OECD work and/or Eurostat work?' (Germany). Debate: not so relevant to be in line with other exercises given the aim of the framework which will be the reference for reporting and policy evaluation of EEA.
- 'Is it possible to analyse prevention in relative terms as in the case of conservation of natural resources (criterion 1)?' (Denmark). Debate: different kind of decoupling compared to that on criterion 1 as it is between economic activities and waste production, indicators less easy but possible also in relation to some policy objectives.

3. Information hierarchy: three levels of policy questions and indicators
In general, agreed to have an information hierarchy with different levels of indicators having a different function in reporting and evaluation.

Main issues raised:

- 'Is there enough consideration of the target groups for the framework and different indicators? Are they mainly addressed to EU policy makers or national policy makers' (Denmark and Germany). Debate: mainly addressed to EU policy makers but also useful for national policy-makers.
- 'Is it strictly necessary to have a so large number of indicators at the third level? what can be the relationship between the three levels in their use in reporting and evaluation?' (Italy). Debate: the three levels can be used interdependently and the second and third levels can serve as explanation of the observed changes at the level of headlines/core indicators, especially when the latter suggests bad performance.

4. List of questions and indicators
In general, the number of questions and indicators is very high and it can create problems in practice.

Main issues raised:

- 'What is the meaning of 'addressed by policies' in the criterion 2?' (Germany). Debate: it should be referred to priority waste streams but, in this case, the number of indicators should be multiplied by a factor e.g. 10.
- 'Tax revenues or other similar indicators on policy measures/instruments cannot be considered as indicators of effectiveness per se as their application does not guarantee results' (Germany, Denmark, Italy). Debate: true, and it remains an open issue to be carefully considered by finding some other solution, e.g. by combining indicators of action and those about observed results.
- 'There are some possibly missing indicators: changing attitudes of consumers and their behaviour, the actual use of BATs, biodegradable waste, innovation'. Debate: can be taken into account but some cannot be represented by numbers, and the problem of a great number of indicators is still there.

5. Your experience with indicators and indicator frameworks
In general, little experience except in some countries.

- Denmark: experience starts now, so far mainly simple indicators; now experiences in MFA and TMI; ongoing discussion on prevention indicators; the production of 'state of the environment' reporting accelerated work on indicators.
- Germany: personally not involved; in Germany now the German environmental indicator which includes annual targets and measures of distance from targets; but it is very general and does not include specifically waste.
- Sweden: not involved personally; not so much work in Sweden and not specifically on waste; more work on sustainability indicators.

- Turkey: there is not any work, only economic indicators and not on waste.
- Lithuania: not involved personally in the issue.
- Finland: not involved personally; ongoing work on sustainability indicators.
- Austria: there is production and use of indicators but not yet standardised in ways similar to the framework.

Report from group B

Participants:
Huib Verhagen (Netherlands)
Gerry Carty (Ireland)
Izabela Drelich (Poland)
Ekatarina Kulisheva (Bulgaria)
Øivind Brevik (Norway)
Thomas Weissenbach (ETC/WMF-Austrian EPA)
Dimitrios Tsotsos (EEA)
Gordon McInnes (EEA)
Bernd Bilitewski (EEA scientific committee)
Jacob Juul (ETC/WMF, rapporteur)
Stephan Moll (ETC/WMF-WI, Chairman)

1. General approach: Starting from the policy questions
General comments on the policy questions
It was asked if the ETC/WMF in the technical report has taken into consideration that the scope of policy questions has a tendency to change over time. We have to be aware that the policy questions might change when politicians become aware of policies that are not effective.

Comments to this are that in the end the indicators and policy questions need to have a good foundation in science. If this is the case change in policy will not have great influence on policy questions or indicators. It might still be good and useful indicators that are developed. It was emphasised to remember that a scientific/environmental point of view should be included since this is what is important from the expert point of view.

A comment from the participants was that it was believed that both the scientific and policy approach would end up with same result.

2. Deriving three criteria from policy context: Something important missing? (not covered?)
3. Information hierarchy: three levels of policy questions and indicators

All in all, the criteria and the hierarchy were welcomed.

Keeping the 1st and 2nd criteria separated
The group was told that the ETC/WMF had considered merging criteria 1 and 2. The group commented that they could see the rationality behind the criteria and there was a general agreement that the criteria should be kept separated, also because of different drivers standing behind resource use and waste prevention respectively. If the ETC/WMF group needs arguments for not merging the two criteria it was suggested to a look at the indicators behind the criteria and then it should be obvious that there is no reason to merge the criteria. In the group there was consensus on the criteria.

Material flow analysis (MFA) should have its own criterion. MFA might not be directly policy relevant but scientifically necessary. It is a support to the idea of MFA by including its own criterion. Another argument for keeping criteria 1 and 2 separated.

The ETC/WMF should be aware that waste prevention is difficult to measure.

Ratios need to be included
The idea of the indicator group must be to look for indicators that are useful to both politicians and others. It has to be assured that indicators are meaningful. For example, total

waste generation has to be related to something, so that it becomes a ratio. This would provide a both nationally and internationally useable indicator. Ratios are needed since it gives the kind of answer we are looking for — an indication of something. This is not the case if data is not related to something. In general we should prevent ourselves from just presenting figures — it is meaningless.

The group discussed the possibility to build a ratio, i.e. relating total waste generation e.g. to GDP and/or TMR. At least, the GDP inclusion should be moved somewhat higher up the hierarchy. With regard to which denominator should be used, the group proposed a pragmatic approach (availability).

Clarification was given that 'total' waste generation encompasses also waste from agriculture.

Show the linkage between prevention of waste and conservation of natural resources
An idea that also came up during this discussion was to couple the prevention of waste with the conservation of natural resources — show how there is a connection. It is important to find a way of coupling these criteria.

Indicators should be connected to economic and physical elements
It was discussed whether we should make a connection to economy or to physical elements. The recommendation was to find a way of showing de-coupling between physical elements — and not only financial elements. Show dematerialisation in physical terms.

Pilot study to find useful indicators
It was suggested that a kind of pilot study should be done on the usefulness of the indicators. The idea is to ensure that the indicators chosen tell us what we want them to do. This pilot study could also be used to evaluate if one indicator has advantages over another.

Avoiding discrepancies
Be open-minded to the fact that there might be a totally different societal structure in some countries — avoid comparing pears to apples. It should be taken into consideration that when we talk about total waste generation it is normally waste from
industrial + municipal + hazardous. If agriculture or mining waste were included they would cause great discrepancies. Data must be harmonised. This is and should be the first task of the ETC/WMF. Ensure whether residuals for reuse are included as waste or not. Define when something is a merchandise and when it is waste.

Further work needed on 3rd level indicators
In the structure the 2nd level should be the policy level and 3rd level should be the more sophisticated and scientific level. The 3rd level has to be made more concrete. A suggestion was to consider the structure of the schemes once more as the details of the indicators need to be pinpointed.

Comments on the 3rd criteria
In the 3rd criteria it would be an idea to leave out 'generation' from the 1st key indicator. 3.c and 3.e. will be very difficult. An idea for 3.e. on the 2nd level — Average cost per tonne by treatment option.

TFS-notes on transboundary movement of waste might be a possible starting point for deriving an indicator. A way of making this indicator might be to make an indirect indicator. Example: percentage of population within a certain distance of a treatment facility. The group discussed the possibility of figuring out what the ratio of waste transport of all transport is. An indicator on share of waste transport to the total transportation (an additional indicator). A survey in Norway shows that 10 % of all lorries to Sweden carry waste. So this may be an important indicator.

The statistical implications
The ETC/WMF should also consider the statistical implications of the indicators. We should try to make some consistent framework.

4. **List of questions and indicators**
5. **Your experiences with indicator framework and indicators**

Little or no experiences in making indicators
None of the countries in the group has done any comprehensive work on indicators. Some countries had experiences on what is equal to our 3rd level indicators but mainly on the treatment of waste. In the countries the starting point has been taken in the data and not in specific policy questions.

Division of work
The Chairman asked the group what would be the right division of work? What should the EEA do and what should member countries do? The answer from the group was that the Agency would have to make the aggregations.

Priority waste streams
The reporting should according to Dimitrios Tsotsos (EEA) be on main (major) waste streams. The ETC/WMF should work on what is the major impacts (priority waste streams). Each 2nd and 3rd level policy question should be asked to each waste stream to find out which are the priority streams. It is necessary to be aware that some countries have priority waste streams that are not the priority of the EEA or the Commission.

Report from group C

Participants:
Vladimir Tonkovic (Croatia)
Luminita Stefanescu (Romania)
Marta Kosaras (Hungary)
Mike van Acoleyen (Belgium)
Cornelis Aart Meyles (Iceland)
Cees van Beusekom (Eurostat)
Hans Jörg Krammer (ETC/WMF — Austrian EPA)
Despo Fatta (ETC/WMF — Greece, rapporteur)
Jens Brodersen (ETC/WMF, Chairman)

The general thoughts that stand behind the development of the indicator framework on waste and material flows and especially the information pyramid as well as the key criteria for the development of indicators were presented and explained by Jens Brodersen.

Different levels of information can be determined, mainly depending on the users addressed by the respective information. This is presented by the information pyramid. Mike Van Acoleyen noticed that sometimes in order to develop some core indicators, primary data must be used in combination with basic statistics.

A major issue for the development of the indicators is the identification of the data sources in each country. Cornelis Aart Meyles noticed that an important information source can be the department that issues permits and licenses for the operation of various treatment plants and other waste facilities. In Iceland most of the information needed can be found in the permits.

Mike Van Acoleyen highlighted the fact that sometimes policy makers do not use the appropriate information required for a particular issue because they do not know exactly what the available information is.

Hans Jörg Krammer emphasised the fact that the indicators have to be designed in such a way that they will take into account the various policy questions that have to be addressed. It is a mistake to design the indicators based on the available information.

All participants agreed that the indicators to be produced by the ETC/WMF will be valuable for all individual countries.

Many of the core indicators have to address issues stated in the various directives. The indicators are considered to address issues in a 20-year perspective. Also we have to bear in mind that some of the key indicators may cease being such in the future.

The participants from the new EEA member countries stated as a fact that they are not very familiar to indicator issues and therefore it is not very easy for them to judge 2nd and 3rd policy questions at this stage. Nevertheless, some of the 2nd level indicators may need further clarification, since they may be related to impact of waste generation on water, land use, greenhouse gases etc.

Some indicators such as the number of landfills may be rather vague and lead to no important conclusions, since other parameters like the hectares covered by landfills or their vicinity to inhabited areas may also be necessary to draw conclusions.

Cornelis Aart Meyles noticed that the indicators must be related to each other and used in combination to draw more integrated conclusions.

The problem of data confidentiality on behalf of the industrial sector was also highlighted especially relating to hazardous waste.

Hungary and Romania already collect statistical data and produce relevant reports.

Report from group D

Participants:
Katja Buda (Slovenia)
Partrick Wheeler (United Kingdom)
Annmari Blom (Sweden)
Matti Viisimaa (Estonia)
Juris Fridmanis (Latvia)
Costas Papastavros (Cyprus)
Jozef Lehota (ETC/WMF — Slovakia)
Brian Meany (ETC/WMF — Irish EPA, rapporteur)
Leo Saare (ETC/WMF — Estonia, Chairman)

1. General approach: starting from the policy questions
The future validity of indicators was discussed. It was questioned how to ensure that indicators will allow for forward planning and remain valid as policies develop. A time series of indicators is essential to indicate trends; single indicators are of limited use. It was considered likely that the three top-level questions (criteria) will remain valid. However, the core indicators may change as new directives are implemented. The core indicators that provide the answers to the criteria should be flexible to allow for changing priorities and policies.

2. Deriving three criteria from policy context: something important missing? (not covered?)
The questions must be simple and understandable to all readers, including policy-makers. It was considered that the 'impacts' are hidden in the core indicators; it was questioned whether the impacts should be more obvious as questions. It was questioned whether we are tracking waste generation without looking at the impacts — despite the fact that legislation distinguishes between generation and impact.

The relationship between the indicators and the DPSIR was questioned. For example, indicator 1(b) — reducing impacts (I) and measuring acidifying emissions in the context of the state of forests (S) — appears to cover both I and S. What is the true message? It was questioned whether the questions should be structured according to DPSIR.

It was considered that new countries are often at a different stage of development and may often still be considering end-of-pipe solutions. Hence different questions or criteria may be required. However, it was further commented that the longer term should be considered and new countries are quickly implementing new approaches to waste management. It was

questioned whether short term criteria should be added to allow new countries to gain experience in the use of indicators and to reflect current but changing practices.

On the relevance of total material requirement (TMR), it was stated that material balances at individual enterprise level had proved a useful and effective tool but that practical use of TMR will require detailed preparation in countries. It was considered that while TMR might prove useful for a year-on-year analysis within individual countries, it may not be applicable for comparison between countries because of different circumstances, e.g. mining of iron in one country for export and use in another — such activity will distort national figures. It was questioned whether this consideration was true, or whether it is a problem.

3. Information hierarchy: three levels of policy questions and indicators

The information pyramid allows for flexibility in lower level indicators. To get a good time series it was suggested that future policy may need to be second guessed — that is, to 'future proof' the indicators.

The link between the questions and waste directives was questioned. For example, how do the questions and core indicators link to the proposed waste statistics regulation, NACE classifications, etc. It was questioned whether the questions should be separated out as per the source directives instead of according to the main policy questions.

Units are required on the core indicators so as to indicate exactly what is being measured. It was stated that the core indicator level was a work in progress.

4. List of questions and indicators

- The following comments were made:
- 3(d) is a scenario — what units are to be used and how will it be measured?
- Indicators may or should be quantitative even though some appear to be descriptive (e.g. 3(f) can be quantified by % implementation of directives).
- Core indicators should be definitive (with units and a precise description and title), not themes.
- The policy questions are well developed. However, development of the core indicators is in progress and needs further work.

5. Experience with indicator frameworks

The transfrontier shipment (TFS) of waste was identified as a concern, and TFS indicators are important in identifying the economies of scale, particularly in smaller countries, in their striving for self-sufficiency in waste management, in accordance with the waste directive. TFS indicators were identified as being particularly important for accession countries. Upon accession to the EU, there is potential for waste to again flow in their direction, an activity currently limited by the Basel Ban.

Most countries stated that indicators are fitted to available data. The benefits of having all data flowing to one organisation were described — it can allow for relative ease of collection and collation of data (in small countries).

Appendix 5: Minutes from country presentations, pre-meeting (Kiev report)

Each of the delegates from the 'new' countries was given an opportunity to summarise any difficulties with data availability, collection and quality in their respective countries. The following countries responded: Croatia, Cyprus, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Turkey. In the following some of the common issues that arose from the comments are summarised:

- problems with data availability: if basic data is not available the task of tracking waste flows and waste management becomes very difficult, if not impossible;

- data proofing and reliability: this is a common issue mentioned by nearly every country. Many countries rely on estimates and question the reliability of data collected and reported. This problem is common to all European countries. At the European level, the problem extends to comparability of data between countries;

- duplication: the main issue is when more than one State agency is involved in data collection and reporting. This can lead to duplication of work and also different reports issued on the same topic;

- changing classification systems (and comparability of data): as Europe moves towards a more harmonised system of classification, individual countries need to change from country-specific systems to, for instance, the European waste catalogue. This can lead to problems of comparability of data for different years where different classification systems have been used;

- lack of baselines for measuring progress: this is an issue arising out of poor data quality and reliability. If the basic data is not reliable then how can a country measure progress towards specific targets such as the one set by the landfill directive for biodegradable municipal waste;

- implementation of new laws (laws into action): the issue here is that while many countries might have very well developed legislation, the necessary steps are not being taken to implement the legislation. This can happen for a variety of reasons such as inadequate infrastructure, inadequate administrative arrangements and inadequate resources;

- communication: a general issue mentioned by many countries that is linked to implementation. If a country wishes to implement legislation in a thorough and meaningful way so that good quality and reliable information is available, then it must put resources into communication strategies which would include public information campaigns, provision of advice and assistance to data providers etc.