EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Prospective Technological Studies (Seville)
Sustainable Production and Consumption Unit

KICK-OFF MEETING OF THE TECHNICAL WORKING GROUP FOR THE REFERENCE DOCUMENT ON BEST ENVIRONMENTAL MANAGEMENT PRACTICES IN THE CONSTRUCTION SECTOR

under article 46(1) of Eco-Management and Audit Scheme, EC regulation 1221/2009

Brussels, 30 March 2011

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1. Introduction

The Community Eco-Management and Audit Scheme (hereafter EMAS) was originally established in 1993 by Regulation (EC) No 1836/93. This voluntary scheme was originally restricted to companies from industrial sectors. EMAS was revised in 2001 by Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing participation by organisations from all economic sectors, which is currently in force. Now, a second revision of EMAS has been undertaken, called EMAS III. This new regulation foresees the development of sectoral reference documents on best environmental management practice (Article 46). The goal of this workshop was to bring stakeholders together to initiate the information exchange process, establishing a technical working group (TWG), that will provide information on sectoral best environmental management practices to be used to develop the reference document for the construction sector. As a starting point, the German-French Institute for Environmental Research (DFIU), from Karlsruhe Institute of Technology, prepared a background document that was sent to working group members in advance of the workshop. All the presented slides during the meeting were also sent in advance to the working group.

2. Opening of the workshop and Introduction to EMAS Sectoral Reference Documents

The chairman, Harald Schoenberger, opened the session and welcomed the participants. After a brief explanation of the meeting procedure, an introduction was given. Working group members presented themselves and summarised relevant experience in environmental assessment, the Construction sector, and EMAS. The meeting agenda (Annex 1) was accepted without changes. One participant wished to make a presentation that he considered relevant for the workshop. He was asked to make the most relevant points during the meeting.

3. Presentation.1: Purpose and goals of the meeting

The EMAS III regulation framework, under which the document is being developed, was presented. Article 46 states that the European Commission will elaborate sectoral reference documents in which best environmental management practices, indicators and, where appropriate, benchmarks of excellence will be developed. The Construction sector was identified as a relevant sector for development of one of the first EMAS reference documents. The scope of the documents will be technical, in order to describe what companies can do to improve their environmental performance in a given sector. Environmental Indicators and Benchmarks of Excellence will be developed at the process level and will be derived from the best performers, but should be achievable by all companies.

In the policy context, it was also stated that the document goes beyond EMAS, as an instrument for other EU policies, existing or upcoming.

Discussion. The document adoption process was explained in detail. After the acceptance by EMAS committee, the document will undergo an adoption procedure. Other questions to the chairman were focused in the scope of the meeting, as some participants thought these documents will be a guide for EMAS certification and verification. It was stressed that the purpose of the document is to help companies in the development of their environmental management system, better focusing on the more relevant aspects and environmental performance improvement by:

i. identifying significant environmental aspects;
ii. providing benchmarks that can be used to establish objectives under EMAS;
iii. providing a guide for verifiers for a better focus on sector specific indicators and relevant aspects; and
iv. helping to link with other policies by providing common benchmarks.

4. Presentation 2: Lessons learnt

Information on how the documents were developed, and the structure of the documents, was presented. The template used for the retail sector reference document will be used again. This template is based on the systematic and technically-oriented technique description used in the best available technique reference documents (BREFs) developed by the so-called Sevilla

Process. Contact with front-runner companies and site visits are important to collate best practice data. Questionnaires proved ineffective As well, the role of the working group was defined: some flexibility in the membership to the group is foreseen, as future contacts in the development of work will be made and more experts may join the group.

Discussion. The document is not an exhaustive guide for verifiers, but a guide to explore how best environmental performance can be achieved. Although EMAS is a voluntary scheme, the document has a legal status, as it will be adopted by EMAS committee. The wording used in the regulation to define the document may be vague, but it is clear that specific sector indicators proposed in the document, if applicable, must be used to obtain EMAS registration.

It was noted that an integrated view of the sector is required, with a special focus on the design phase, as this phase has a strong influence on the more relevant environmental impacts. Some proposals about the layout and scope of the document were made. For instance, the use phase should be called stage and may be not considered in the document The Commission also reminded participants that any suggestions would be well received, as it is an open and transparent process.

5. Presentation 3: Overview of the Construction Sector

The Construction sector was defined based on appropriate NACE codes. The environmental impact of construction activities occur in the use phase, but are strongly influenced by the design phase and land use planning that may affect, for example, biodiversity. It was again noted that the document is not focused on the EMAS "world" but also relates to any company with or without certified environmental management system that wants to improve their environmental performance.

Discussion. There was no discussion or feedback about this point. Polish Green Building Council offered to contribute a chapter on the need for integration of different stages, including architects at the design stage.

6. Presentation 4: Content of the Background Document

DFIU (KIT) presented a summary of the content of the background document, developed by his institution for IPTS. Information on the contract to develop this background document was given. Key environmental impacts were summarized per construction stage and environmental aspects. Most of the information gathered refers to the design of buildings, with clearly identified gaps in other sections. Described techniques are available in the market and some emerging techniques were also identified.

Discussion. The part referring to civil engineering constructions is too short and its weight should be increased for the final document. FCC stated that it is impossible to make an exhaustive list of best practices (many specific activities are missing) in the construction sector and asked for a better identification of actors in the document. AENOR also maintained a strong position: he suggests that the document will not be taken by the market because it is not focused on EMAS. He also remarked that the timeframe is tight relative to the scope of the document. To this, it was replied that the Commission staff in charge of the development

of the document will appreciate recommendations on techniques during the workshop and during document development, but the final version is intended to offer easy access to information on environmental performance improvement for relevant actors, based on an actor-oriented structure is comprehensive but balanced with respect to environmental improvement potential.

Referring to the scope of the background document, it was recommended to drive best practices in terms of achievable and realistic benchmarks. This will be challenging, taking into account the limited timeframe and resources available for the development of the background document.

To improve the accessibility of collated information, it was proposed to produce separate pdf chapters focused on different actors, also in electronic versions with active cross-links.

Main recommendations to add or to amend for the final document (taking the background document as the starting point) are:

- To expand chapters about construction works, industrial and civil engineering
- To include transport, logistics, green procurement management and concepts on lifecycle costing to compare actual performance.
- To emphasize the role of construction activities in biodiversity impacts
- To enhance the part related to Indoor Environmental Quality in relation to material selection and building design.
- It was recommended to link the document to CEN350 and indicators already developed and available, and also to BREEAM, LEED, etc. As well, links should be established to Green Procurement toolkit for the construction sector and also to the Green Logistics Initiative.
- In order to include land planning, it is important to link the document to the Public Administration reference document (to be developed in 2012) and refer only to construction activities for the construction reference document.

It was also recommended to refer to existing labels and schemes on sustainable buildings, maybe as starting points, but also it has to be taken into account that they are business-driven by the certifying companies. The Commission has the opportunity, with the reference document, to remove these commercial interferences.

7. Presentation 5. Environmental Aspects of the Construction Sector

Environmental aspects of the construction sector are mainly influenced by the design phase. Best environmental performance comes from best design and best land use planning, although they are not directly related to the construction works and use phase. Environmental aspects, and associated environmental impacts, arising from construction activities were listed using the preliminary table shown in the background document.

Discussion. It was recommended to use biodiversity indicators explicitly, and some examples will be provided. Biodiversity is a broad issue and it is quite significant for large scale projects. Apart from this initial suggestion, three main points drove the discussion:

Definition of aspects. Most of the participants suggest that a life cycle perspective should be used in order to identify best practices. Others, mainly EMAS verifiers, suggested that the document should focus only on constructors and only as an EMAS guidance to help registration, but, again, the broad scope of the document was emphasized (see Purpose and Goals). The document should address significant aspects, but the environmental impact should be focused using a life-cycle perspective, also in order to propose best environmental management practices.

Used indicators. There is no intention to develop new indicators but to use the more suitable existing ones to measure the environmental performance. It was suggested to limit the number of indicators (to around 15). It was reminded that Indicators and Benchmarks, backed up with detailed information, are the main result of the process and they are agreed in the final meeting with the working group. A conclusions chapter on indicators and benchmarks will be drafted in the reference document.

Scope of the Document. The balance between the lifecycle perspective of the document and actors involved according to the EMAS role of the document was not clear for some participants. Some participants addressed the need to "acknowledge the limitations" of actors, e.g. constructors can not redesign a building. For this, the Commission clarified that the document looks for best practices to reduce the environmental impact, has a wide perspective and considers the role of every actor, stating the applicability of each technique. In this sense, it is necessary to emphasize the importance of feedback for the development of the document As well, some stakeholders recommended a separate document for architects and designers, as their contribution to the environmental impact of the final product is highly relevant. An important link is that lifecycle costs may be 7 times greater than construction costs, and this link could be a good starting point to encourage eco-design and its integration into the document. The importance of public tender criteria on the environmental performance of public buildings was also noted. The possible misuse of the document by policymakers (e.g. enforcing rules based on the document) should be discouraged.

8. Presentation 6: Techniques used in the construction sector

Techniques are the core of the document, as they describe what can be done by companies in order to reduce their environmental impact. The purpose of the meeting during this section was to discuss the scope, content and structure of techniques individually. Relevant discussion for each technique is summarized below:

Land Use Planning

Maybe it is not possible to set a benchmark on habitation density, as it varies across Member States. The availability of resources and other environmental constraints should be considered. Green zones should also be considered in the formulation of indicators. Soil sealing is also a main concern in several European countries.

Building design stage

Several techniques were presented for building design. Discussion as focused mainly on this issue.

Design for Deconstruction. Several items were proposed in addition to this: reuse of buildings and flexible design (partitions, etc.). Design should be considered as procurement itself and the different planning of building uses may be considered as a separate technique. Landlord/tenant and durability issues should also be mentioned. Deconstruction should be not focused only on demolition but also in maintenance and retrofitting practices.

Higher thickness of insulation materials

The type of insulation and installation should be also considered. Toxicity for IAQ, end-of-life and embodied energy should be also considered for insulation. The applicability regarding climates is very important to consider in the description. The indicator on the energy performance was the object of discussion, as energy per m^2 and year seems not to be good for assessing the performance of an insulated element (e.g. walls). Nevertheless, an integrated view may be necessary and kWh/m^2yr may be the most appropriate indicator. Correction of heat demand for each climate and depending also on the height (to consider the volume of air) of the building. As well, it has to be differentiated among refurbishment and new buildings. Low U-values are good in general, but may be not a good indicator of the environmental impact. Zero energy consumption can mislead the objective of a better energy performance (because of high loads of renewable energy).

The specific energy consumption is the best indicator but a harmonised methodology should be proposed (primary/final energy, how to weight renewable energy, etc.). Examples should be provided in the document. Some stakeholders remarked that an integrated approach is always needed and Heating Degree Days may not be enough to refer applicability (e.g. internal gains and others should be considered).

The use of energy performance classifications for buildings should not be used, as the requirements for buildings are really different from one country to another and an "A" classification may have worse performance than a "B" in other countries. Although legislation is reflecting what to achieve as a "minimum" requirement, the reference document should be better than legal benchmarks.

Building design: walls, roof, windows, heating and integrative concepts. Not many comments on this issue. The most important is about energy modelling and, regarding windows, their placement, light transmission and use of windows as a way to control heat gains of the building. In building design for better energy performance, the optimum depends on many factors and it was recommended to use environmental design addressing integrative concepts.

District heating, ventilation, air conditioning, best lighting devices, natural lighting

District heating can be a efficient way of making profit from municipality wastes. Air exchange rate in buildings and its relation to national legislation should be considered for the document.

Further comments

Contributions from the group relating to other issues of building design (which were skipped in order to save time for other construction aspects):

- Piping and transportation of hot water.
- Reuse of grey water
- Some best practice documents already published will be sent by stakeholders to IPTS staff.
- Use of rainwater
- Health and IAQ related to construction materials

The words "sustainability" or "sustainable" should be used carefully, as many of the techniques are related to environmental issues and are not related to social or economical aspects.

There were some questions about the process for document development, which was explained by the chairman. It was proposed to hold an intermediate working group meeting, that will be considered. IPTS prefers bilateral contacts but the option to organise meetings of subgroups with different expertise will be also considered.

Building Construction

It was remarked that there are still gaps and the weight of construction works section is still very small compared to other sections. The document lacks information on environmental management of construction sites. Some information will be provided for this issue by TWG members.

Reducing the impact on water sources and construction soil

Some inputs were offered for this section. The choice of environmentally friendly construction materials will be covered (but not their production). Several companies producing these materials are working on biodiversity aspects and some information on this will be provided. Aspects to be considered, assessed and/or added to the document are:

- Activities on monitoring of construction sites.
- Civil engineering activities: there was discussion on which indicators to include and how to use them to monitor the environmental management of construction sites, especially for construction of civil works (e.g. roads)
- Complaints management can be an indirect indicator.
- Estimations on emissions from construction sites needed for the licensing process (the example of Norway was offered during the meeting).
- Waste Management and integration in recycling schemes.
- Impact on soil and soil compaction.
- Timing of construction works with different peaks on waste, emissions and effluents generation.
- Y/N indicators on the use of best practices

Reducing the impact of energy consumption

The use of eco-labelled machinery and timing of use will be considered in the development of construction works (regarding energy consumption). It was remarked that many environmental aspects are already regulated by legislation.A strong point was made for the development of indicators, as the comparability depends on the "denominator".

It was recommended to add to the existing document:

- Relative impacts to the atmosphere and air quality
- Standardisation of construction materials and elements
- Regional management of wastes at different sites. They can have common waste management and/or transport sourcing. Then site management is not only covered by local aspects but also supra-management issues.
- Habitat compensation.

Operation, Maintenance and Refurbishment

Some group members felt that the activities of service providers for building operations are, maybe, out of the scope for the document, especially when the service is provided by an external contractor. It will be difficult to have non-operational indicators. Some examples on public building management will be provided.

There was a discussion on waste management in the operational phase. Some voices proposed to remove this part of the document, as it is out of the scope but, also, some members stated that if the link to occupants of buildings is missing, environmental performance improvement may not be achieved. It was also reminded that education and training are a very important part of management systems. Central waste management systems are forbidden by law in some MS.

Refurbishment operations should be separated from this chapter. As well, the scope of operation and maintenance should be carefully considered (e.g. by excluding chemical agents for cleaning).

Building Deconstruction

Some examples from London 2012 Olympics deconstruction processes may be provided for the document. Also, best practice for selective demolition will be provided from the Basque Country.
Destination of recyclable materials, presence of hazardous materials and the share of recovered materials in construction works should be also taken into account for the reference document.
Deconstruction activities may produce very similar impacts to construction activities and the same rationale should be used for both activities. Measurement of CO_2 equivalent emissions is not an accurate indicator and may mislead public awareness. Energy demand reduction may be a better way to indicate real improvement. It was proposed to consider the way that legislation is asking for measurement of these indicators.

Industrial and Civil Construction

The document has a huge gap in this chapter and should be developed further. Information on best practices regarding biodiversity will be provided (green bridges, green corridors, etc.). Some environmental impacts are missing in the current background document (e.g. acoustic barriers).

It was recommended not to develop many new indicators, as the EMAS regulation already proposes more than 15 indicators. DG Environment remarks that, where appropriate, core indicators need not be used (it has to be properly justified). The same applies for sector

specific indicators gathered in the reference documents. According to some participants, all core indicators are usually not relevant for an individual company.

9. Final remarks

The document should focus on main environmental impacts and less important aspects should not be considered. As well, the document will provide best practice information and exclude presentation of bad practices (although they can be used to reflect what is a best practice). Information may be gathered also from outside Europe.

The chairman remarked that the process is open and the list of best practices is not closed at all. Bilateral contacts will be maintained and the group will be informed regularly about the document development.

10. Conclusions

Due to timing constraints, it was not possible to have a final presentation on the conclusions of the workshop. Consequently, they are sent along with these meeting minutes:
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Regarding purpose and goal
The Commission is developing the reference document as a technical source on how to achieve best environmental performance through application of best practices also identifying benchmarks of excellence and indicators that may be used or linked with other policies and providing a guide for verifiers for a better focus on sector specific indicators. The only requisite that may arise from the reference document to the EMAS registration process is the use of sector specific indicators.

Regarding the content of the background document as the starting point for the reference document
There are important gaps in the background documents. Chapters and sections to improve are:

- Industrial and civil construction should have a higher weight in the document. As well, construction and refurbishment activities should be covered more extensively in the final document.
- Transport, logistics, green procurement, lifecycle costing and land planning issues.
- The impact on biodiversity made by the construction sector.
- Increase the part on Indoor Environmental Quality, especially regarding building design.
- Links with other initiatives.
- Links with legislation.
- Links to other reference documents to avoid overlapping (e.g. *public administration*).

Regarding environmental aspects

- The whole chain should be covered. The life cycle perspective is essential to address significant aspects with really relevant environmental impacts.

- The role in the management of such aspects will be clarified in the document (direct/indirect; significant/insignificant; etc.)

Regarding techniques

Techniques to be described in the reference document are the core of the document and many comments and inputs were received during the meeting, which are highly appreciated. Main points during discussion are already covered in the minutes.

As the document will focus on the whole chain of construction products, the basic structure of the document will be maintained. Nothing from the existing document was recommended to be removed, but many amendments and additions will be performed.

The possibility of an intermediate meeting will be explored.

Table 1 lists the information and contacts that participants offered to provide to the IPTS after the meeting.

Table 1. Summary of contributions offered during the meeting

Offered Contribution
- Chapter on the need for integration of different stages, including architects at the design stage - Building management systems examples.
- Examples on the integration of biodiversity as an environmental aspect for environmental management systems - Data from European capital of biodiversity. 450 cities applied and data are available for this. Good examples on biodiversity in land use planning. - Examples on biodiversity indicators for green and brown roofs - Info on construction materials - Info on air quality requirements in Germany for construction works - Info on habitat compensation - Examples on old buildings as animals refuge (Frankfurt?) - Info on industrial and civil constructions best practices regarding biodiversity
- Identification of relevant environmental aspects for construction companies (procedures and any other relevant info on this issue)
- References on site selection, regarding land planning and habitations density. - References or info on the deconstruction design for London 2012 Olympics - Information on environmental management of construction sites - Info on building management in public contracts - Examples on indicators linking with the overall performance (e.g. GHG emissions).
- List of Best Practices (provided during the meeting) - Database of Sustainable products for construction (in Barcelona?)\ - Roca design to reuse grey water - Info on centralized organic waste management examples
- GPP criteria on guidance for construction products
- Info about Concerto initiative for municipalities
- Contacts with companies (and architects?) about environmental design in France - Info on waste management HQE setting benchmarks of 27% recycling - Info from partner about building management system
- Best practices guidance in the Basque Country, guidance on selective demolition, … - Information on reducing impact on soil and soil compaction
- References on best practices

Annex 1: Agenda

1. Opening and welcome by chairperson	**Harald Schönberger (IPTS)**	**0900 – 0915**
2. Introduction of experts		**0915 – 0930**
3. Purpose and goals of the meeting	**HS**	**0930 – 0945**
4. Lessons learnt from previous experiences	**HS**	**0945 – 1000**
5. Overview of the Construction Sector	**José-Luis Gálvez (IPTS)**	**1000 – 1015**
6. Content of the Background Document	**Michael Hiete (DFIU)**	**1015-1030**
Coffee Break		**1030 – 1100**
7. Environmental aspects of the construction sector	**JLG**	**1100 – 1130**
8. Techniques used in the construction sector to address environmental aspects	**JLG**	**1130 – 1300**
Lunch Break		**1300 – 1400**
9. Techniques used in the construction sector to address environmental aspects	**JLG**	**1400 – 1530**
10. Environmental Indicators and Benchmarks of Excellence	**David Styles (IPTS)**	**1530 – 1600**
Coffee Break		**1600-1630**
11.Way forward and information gathering	**JLG**	**1630 – 1700**
12. Conclusions and close of workshop	**HS**	**1700 – 1730**