



Final meeting of the technical working group for the EMAS sectoral reference document on best environmental management practice in the food and beverage manufacturing sector

Minutes of the meeting

Brussels, 2-3 December 2014



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1 INTRODUCTION

The European Commission's Joint Research Centre (JRC) is developing a sectoral reference document on best environmental management practice in the food and beverage manufacturing sector. The document will describe best environmental practices that food and beverage manufacturers can implement to minimise their environmental impact. The elaboration of this document is part of the European Commission's work to implement the EU Eco-Management and Audit Scheme (EMAS) Regulation¹. EMAS is a voluntary framework for companies and other organisations to evaluate, report and improve their environmental performance. Within this framework, the EU decided in 2009 to develop Sectoral Reference Documents (SRDs) on Best Environmental Management Practice for different sectors. These are documents that EMAS registered organisations must take into account when assessing their environmental performance, but can also be used by others looking for guidance on how to reduce their environmental impact. The food and beverage manufacturing sector is one of the priority sectors for which these documents are developed. Further information on this background is available in the JRC report "Development of the EMAS Sectoral Reference Documents on Best Environmental Management Practice"² and on the following website: <http://susproc.jrc.ec.europa.eu/activities/emas>.

For the development of the food and beverage manufacturing SRD, the JRC established a European technical working group (TWG), comprising experts in different aspects of environmental sustainability within the sector. The TWG assists the European Commission in identifying the best practices to be described and then validate the final findings. Two meetings of the technical working group were held: the first one on 20-21 February 2014 (kick-off meeting) and the second one on 2-3 December 2014 (final meeting), both in Brussels. This report describes the discussions and conclusions drawn at the final meeting. The goal of the final meeting was to refine the list of best practises and draw conclusions on environmental performance indicators and benchmarks of excellence. A draft final report was sent to the TWG members few weeks prior to the meeting.

2 OPENING OF THE WORKSHOP

The JRC opened the session and welcomed the participants. After a brief explanation of the meeting procedures, an introduction to the workshop and overall exercise was given. The meeting agenda (attached in Annex 1) was presented and agreed by the participants. The TWG members introduced themselves and summarised their experience in environmental sustainability in food and beverage manufacturing and their up-to-date contribution to the development of the SRD (the list of participants is attached in Annex 2). It was agreed to use first names to refer to the different TWG members and the same convention is adopted in these meeting minutes.

¹ Regulation (EC) 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC, OJ L 242/1, 22.12.2009

² Available on-line at: <http://susproc.jrc.ec.europa.eu/activities/emas/documents/DevelopmentSRD.pdf>

3 PURPOSE AND GOALS OF THE MEETING

During the first session, the JRC presented the legal basis for the development of the SRDs, the meaning of BEMP and the workflow for the finalization of the food and beverage manufacturing SRD. After this introduction, the JRC outlined the goal of the TWG final meeting, which was essentially to draw conclusions on environmental performance indicators and benchmarks of excellence. Moreover, the meeting aimed at refining the list of best practises, identify gaps and information needs and obtain feedback and inputs to finalise the document.

4 INTRODUCTION TO THE CONCEPT OF ENVIRONMENTAL PERFORMANCE INDICATOR AND BENCHMARKS OF EXCELLENCE

The JRC introduced the concept of environmental performance indicator as a specific expression that allows measurement of an organisation's environmental performance. The SRDs focus on sector-specific environmental performance indicators, i.e. indicators that go beyond the six general core indicators described in the EMAS Regulation, which can apply to all kinds of organisations. Environmental performance indicators deal with the following key environmental areas (defined for the core indicators in the EMAS regulation): energy efficiency; material efficiency; water; waste; biodiversity and emissions.

Sector-specific environmental performance indicators can be defined at different levels: at the level of the whole organisation or company, at the level of a certain site or at the level of a specific process or activity. Indicators can be relevant and useful at all these levels, but the main focus is on the process/activity level since this level allows for better and more meaningful comparability across organisations and against benchmarks.

Benchmarks of excellence instead reflect exemplary environmental performance. Benchmarks of excellence, however, do not simply refer to the best of the best but, as a rule of thumb, to the performance of the ten or the 10% to 20% best performers within the sector overall, or within a good or best performing organisation of the sector. The benchmark of excellence can be derived from a frequency distribution of a quantified environmental performance indicator or, when this is not possible, they can simply be a yes or no criterion or a percentage of implementation of a certain technique. Benchmarks of excellence are used to provide information to users of what is potentially achievable and to form an opinion whether an organization/process is performing well.

5 ENVIRONMENTAL PERFORMANCE INDICATORS AND BENCHMARKS OF EXCELLENCE FOR THE FOOD AND BEVERAGE MANUFACTURING SECTOR

5.1 BEMPs for the overall food and beverage manufacturing sector

5.1.1 Performing an environmental sustainability assessment of products and/or operations

The TWG agreed in general with the text of the BEMP and suggested distinguishing the tools presented for performing an environmental sustainability assessment between product and organisation tools. The TWG agreed on the environmental performance indicators proposed and the benchmarks of excellence for this BEMP will be:

- Company-wide environmental sustainability assessment covering all operations
- Environmental sustainability assessment for all new products

5.1.2 Sustainable supply chain management

The TWG agreed in general with the text of the BEMP and the environmental performance indicators proposed. The benchmarks of excellence for this BEMP will be:

- 100% of ingredients meeting existing sustainability standards or company-specific sustainability criteria
- Develop recipes to avoid, where possible, unsustainable ingredients, carrying out a systematic assessment for all new products

5.1.3 Improving or selecting packaging to minimise environmental impact

During the discussion it was recommended to mention the issues caused by the ink and resins used in packaging labels to the recycling of glass. Moreover, the text of the BEMP could also mention the possibility of introducing messages on the packaging in order to reduce the environmental impact generated by the consumer while preparing and consuming the product. Clarification between the meaning of primary and secondary packaging should also be added and eco-design tools publicly available should also be mentioned in the text. The TWG agreed on the proposed environmental performance indicators and the benchmark of excellence for this BEMP will be:

- Use an eco-design tool when designing packaging to identify options with low environmental impact

5.1.4 Environmentally friendly cleaning operations

The TWG recommended investigating the energy consumption of ice production for the ice pigging method, moreover, using the next batch of ingredients as cleaning agent is also an option deemed to be mentioned in the text of the BEMP. Henning will provide information on dry cleaning operations. The TWG agreed on the proposed environmental performance indicators and recommended not to introduce any benchmark of excellence for this BEMP.

5.1.5 Improving transport and distribution operations

The discussion focused on the need to add, among the environmental benefits, the reduction of food waste when transport and distribution operations are optimised. Moreover, also the transport

of by-products, when carried out by the food and beverage manufacturer, can be mentioned in the text of the BEMP.

Time-temperature indicators (for perishable food) during transport can also be an aspect to add in the BEMP and Malco will send some material in order for the JRC to take this into consideration when developing the final draft of the document.

The proposed environmental performance indicators were agreed and the TWG proposed to add two more indicators:

- % of truck empty runs
- % of deliveries carried out through back-hauling

The benchmarks of excellence agreed for this BEMP will be:

- for 100 % T&L operations (including 3PL), the following indicators are reported: %age transport by different modes ; kg CO₂eq per m³ / pallet etc. delivered.
- for in-house T&L operations , the following indicators are reported: truck load factor (% weight or volume capacity); kg CO₂eq per tkm.
- temperature-controlled warehouse insulation is optimised
- HGV average fuel consumption ≤ 30 L/100 km

5.1.6 Improving freezing and refrigeration

TWG members mentioned that the use of sub-cooling temperatures can extend the shelf life of products and Josep can send some information on this process.

The TWG agreed on the environmental performance indicators proposed and the benchmark of excellence for this BEMP will be:

- Use 100% natural refrigerants in all sites

5.1.7 Deploying energy management and energy efficiency throughout all operations

During the discussion the TWG highlighted the need of mentioning the EN 50001 standard in the description of the BEMP and also the importance of adapting the production schedule with the aim of increasing the energy efficiency. In addition, synergies with neighbouring facilities (industrial symbiosis) can also be mentioned among the measures which can be adopted. Finally, the TWG recommended to include in the description of the technique sub-metering (smart metering) of energy consumption and to consider this as a potential benchmark of excellence for this BEMP. Among the environmental performance indicators proposed, the TWG recommended to add:

- Net energy use per unit, weight or volume of output product (e.g. annual kWh / tonne output product) i.e. overall minus recovered and renewable energy

The TWG agreed that the benchmarks of excellence for this BEMP will be:

- put in place a comprehensive energy management system (EnMS) such as ISO 50001, which can be part of an environmental management system like EMAS
- deploy regular energy auditing and monitoring to identify the main drivers of energy consumption
- implement appropriate energy efficiency solutions to all processes in a facility

- exploit synergies in heat / cold / steam demand across processes, within the facility and neighbouring ones.

5.1.8 Integrating renewable energy in the manufacturing process

Since the use of waste heat is addressed in the previous BEMP, the TWG recommended removing it from this BEMP. The text of the BEMP should also be amended using the wording "onsite and nearby renewables" instead of "onsite renewables". Juergen will review the text of the BEMP to amend some text. The TWG agreed on the proposed environmental performance indicators and the benchmarks of excellence for this BEMP will be:

- Implement on-site or nearby renewable energy generation for specific suitable manufacturing processes.
- Process technologies are adapted to better match the supply of heat from renewables

5.1.9 Avoid food waste in food and beverage manufacturing

The TWG, after an exchange of different views, agreed on referring to the waste hierarchy framework used by UNEP in the introductory text of the BEMP. Furthermore, the BEMP should also include redistribution, animal feed and other high grade industrial uses under the food waste prevention measures. In addition, the BEMP should include more information for food and beverage manufacturers on ways of reporting to the public about food waste generated. Barbara will provide examples of SMEs reducing food waste generated at reception due to pre-sorting (e.g. fruit and vegetables) which the JRC could include in the text of the BEMP. Aintzane instead will provide info on an initiative (ECOSCAN) covering waste prevention measures for SMEs. The TWG agreed on the proposed environmental performance indicators and recommended not to introduce any benchmark of excellence for this BEMP.

5.1.10 Link to the Reference Document on Best Available Techniques in the Food, Drink and Milk Industries (FDM BREF)

The TWG agreed with the proposed formulation of the text of the BEMP and the proposed environmental performance indicators. It was also agreed that for this BEMP the benchmark of excellence will be:

- Achieve a level of environmental performance which is within the best 10% of each of the BAT-AE(P)L ranges defined in the FDM BREF.

5.2 Sector specific BEMPs

5.2.1 Processing of coffee

The TWG suggested updating some data in the introductory part of the chapter and Roel will send some material. The JRC will consider also the appropriateness of adding a box highlighting the specific challenges of coffee packaging.

Reduction of energy consumption through the use of green coffee pre-heating in batch coffee roasting

The TWG agreed with the text of the BEMP and the proposed environmental performance indicators. The benchmark of excellence for this BEMP will be:

- Green coffee pre-heating system is in place.

5.2.2 Manufacture of olive oil

The TWG pointed out the need of using the wording malaxing instead of beating in the text of the BEMP and to stress more that the 3-phase systems offer more leeway to reduce water usage rather than the 2-phase systems.

Minimising water consumption in olive oil separation

The TWG agreed in general with the text of the BEMP and with the proposed environmental performance indicators but recommended to reword the benchmark of excellence as follows:

- 50 litres of water (5%) per 1,000 litres of oil manufactured

Reduced washing of olives upon reception

The discussion highlighted the need of mentioning that reduced washing of olives depends, apart from soil, dust, etc, also on the amount of pesticides used while growing olives on trees. Moreover, the BEMP can include other measures for reducing washing water e.g. settling, filtering and recirculation of water instead of single use. The TWG agreed on the proposed environmental performance indicator and the benchmark of excellence for this BEMP will be:

- For olives collected clean, 0 litres of water to wash olives upon reception

5.2.3 Manufacture of Soft Drinks

The discussion focused on the importance of water use in this sector and its environmental impact. Soft drinks manufacturers are increasing their awareness on this issue and water governance has become more relevant, therefore, the TWG suggested adding either a specific BEMP or a reference (e.g. box) in the BEMP sustainable supply chain management on this. Geert will provide some material on this topic.

Use of blowers in the drying stages of bottles/cans

The TWG expressed some concerns about the high energy savings achieved by implementing this technique (87%). Geert will check this figure and provide a feedback. It was recommended to change the environmental performance indicator as:

- Energy consumption in blowing per litre of product (KWh/l)

5.2.4 Manufacture of beer

Use cross-flow rough beer filtration

The TWG agreed with the text of the email and on the proposed environmental performance indicators. The benchmark of excellence for this BEMP will be:

- 0 kg of kieselguhr used in beer filtration

Reducing energy consumption in wort boiling

The discussion focused on the resistance of companies (especially SMEs) in changing their production process, because of the risk of altering the final product. This aspect can be highlighted in the applicability section of this BEMP. Moreover, Barbara and Juergen can provide some material

on the evaporation rates during wort boiling. The TWG also recommended modifying the proposed environmental performance indicator as follows:

- Energy consumption per hL of beer produced (MJ/hL)
- Evaporation rate (%) in wort boiling (clarifying if calculated in 1-phase or 2-phase processes)
- Energy consumption per hL of beer produced (MJ/hL)
- Energy consumption in wort pre-heating (MJ/hL)
- Number of brews before a new cleaning of the boiling system

The technical working group agreed on the following benchmark of excellence:

- Install a wort pre-heating system with recovered heat from vapour wort condensing.

While Barbara and Juergen can elaborate a proposal for a second benchmark of excellence of this BEMP which could be expressed as:

- Evaporation rate during wort boiling is < X% (where the X% will be defined precisely in the final document in cooperation with the figures sent by Barbara and Juergen)

Moving from batch to continuous beer production systems

The TWG expressed some concerns on the applicability of this technique for SMEs and Juergen will provide examples of small brewers switching from batch to continuous. Moreover, among the environmental benefits, the reduction of water and chemicals used during cleaning can also be added. The agreed environmental performance indicators for this BEMP were:

- Energy consumption per hL of beer produced (MJ/hL)
- Water consumption (hL/hL of beer produced)

The TWG group agreed not to define any benchmark of excellence for this BEMP.

CO₂ recovery in beer production

The discussion focused on concerns about the applicability at full scale and the economic viability of this technique. Juergen will provide material on few pilot plants and the amounts of CO₂ recovered and, in light of this feedback, the JRC will consider how to amend or, if it is more appropriate, remove or consider an emerging technique this BEMP.

5.2.5 Production of meat and poultry meat products High pressure processing for decontamination of meat

The TWG highlighted that this technique can be potentially used also for sterilization of the products even if currently it has not yet been used for this purpose. Applicability for SMEs can be problematic due to the cost of the equipment, however, the process can be outsourced. The TWG agreed on the proposed environmental performance indicators and the benchmark of excellence for this BEMP will be:

- Use high pressure processing (owned or outsourced) to treat suitable meat products (cooked products, cured and cooked products and raw cured etc.)

5.2.6 Manufacture of fruit juice Energy production from fruit waste AD

The TWG recommended rewording the title of the BEMP in order to allow choosing more options for reusing fruit residues. The text of the BEMP should also be amended using the wording "fruit residue" instead of "fruit waste", moreover, the BEMP can mention more explicitly the valorisation cascade: e.g. fruit residue can be used for prior recovery of pectin, essential oils (e.g. D-limonene) then as animal feed and finally for AD. The TWG agreed that this BEMP should leave flexibility to fruit juice manufacturers in order to choose the most appropriate process (e.g. depending on local conditions) for their fruit residues.

The appropriate environmental performance indicator for the modified BEMP will be:

- % of fruit residue which is used as animal feed /sent to an AD plant.

Maurizio Petruccioli and Aintzane will formulate a proposal for the benchmark of excellence.

5.2.7 Cheese making operations

The TWG suggested adding water consumption among the environmental pressures generated during the coagulation/moulding phase of cheese manufacturing. Whey is the main by-product of cheese manufacturing and needs to be properly managed in order to reduce the environmental impact it can generate.

Recovery of whey

The TWG suggested to include details on down-cycled uses of whey e.g. bioplastics and Juergen will send information on lower energy whey dehydration technologies.

The TWG agreed the following environmental performance indicator:

- % (weight) of dry matter recovered for use in products intended for human consumption per weight of whey generated

The agreed benchmark of excellence for this BEMP will be:

- Recover whey and further treat it in order to obtain other products for human consumption based on market demand. Employ excess instead for animal feed and/or AD biogas production. (Y/N)

5.2.8 Manufacture of bread, biscuits and cakes Reducing unsold bread and pastry waste schemes

The TWG recommended to stress more in the text of the BEMP the need of reducing waste generation and not to encourage surplus production (referencing also to the retail trade SRD). Moreover, the BEMP should also mention the aspect of ensuring appropriate hygiene measures when handling the unsold bread and Juergen will send information on reuse of unsold bread into dumplings. The TWG agreed on the proposed environmental performance indicators apart from the following one which will be amended as:

- Segregation of non-compatible ingredients (e.g. products and/or ingredients of animal origin, highly perishable products (e.g. salad)) (Y/N)

The benchmark of excellence agreed for this BEMP will be:

- For bakeries: 100% retail outlet participation in appropriate collection schemes for the unsold bread and other pastry products

Minimising energy consumption for baking

The TWG recommended rewording the environmental performance indicators of this BEMP as follows:

Energy consumption in the baking process: in kWh per

- t of baked product, or
- t of input flour used, or
- m² of baking area (oven surface)

The TWG agreed that no benchmark of excellence can be set for this BEMP.

5.2.9 Manufacture of wine

The discussion firstly focused on the need to stress more in the text the relevance for wine makers of two of the BEMPs for the overall food and beverage manufacturing sector: sustainable supply chain management and improving or selecting packaging to minimise environmental impact. Afterwards, the TWG recommended developing one BEMP presenting six measures able to reduce the energy consumption in wineries:

- Selection of the suitable orientation of the winery such as avoid high sun exposure (avoid SE orientation), integrate the building into the landscape, design the building exploiting gravity systems.
- Selection of the proper construction materials e.g. cement blocks, wood or other suitable materials with high U-values (thermal transmittance) and thermal inertia.
- Locate the storage room in the basement of the building and not on the ground floor (especially for new wineries).
- Carry out a thermo physical study of the storage room, calculating its energy needs and thus select the appropriate equipment for maintaining the desirable conditions (e.g. the optimum temperature is between 12-16°C and humidity level ~60-70%) in the aging room e.g. select energy efficient equipment and define precisely its capacity.
- Improve the cold stabilisation process by improving energy efficiency e.g. improvement of the insulation, repair the leaks (if any), precise sizing of the equipment, replace pumps and valves etc.
- Improve the grape drying processes by using natural drying and avoiding conditioned storage (Stefano will send information)

In addition the TWG suggested developing another BEMP on CO₂ recovery from fermentation and Stefano will send some material.

6 OTHER REMARKS

At the end of the meeting, the TWG discussed about the next steps in the development of the SRD and plans for its dissemination.

ANNEX 1 – AGENDA

BRUSSELS, 2-3 December 2014 - Albert Borschette Conference Centre, room 3.C Final Agenda

2 nd December 2014		
Arrival and registration of participants		09:30 – 10:00
Opening and welcome		10:00 – 10:30
Introduction of experts		10:30 - 10:45
Purpose and goals of the meeting		10:45 - 11:00
Introduction to the concept of Environmental Performance Indicator and Benchmark of Excellence		11:00 - 11:30
Cross-cutting best environmental management practices: - <u>environmental sustainability assessment</u> of products and/or operations - sustainable <u>supply chain management</u>	Chapter 3.2 Chapter 3.3	11:30 - 12:30
Lunch Break		12:30 - 13:45
Cross-cutting best environmental management practices: - Improving or selecting <u>packaging</u> to minimise environmental impact - Environmentally friendly <u>cleaning</u> operations	Chapter 3.4 Chapter 3.5	13:45 - 14:45
Cross-cutting best environmental management practices: - Improving <u>transport and logistics</u> operations - Improving <u>freezing and refrigeration</u>	Chapter 3.6 Chapter 3.7	14:45 - 15:45
Coffee Break		15:45 - 16:15
Cross-cutting best environmental management practices: Deploying energy management and <u>energy efficiency</u> Integrating <u>renewable energy</u> in the manufacturing process	Chapter 3.8 Chapter 3.9	16:15 - 17:15
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>manufacture of beer</u>	Chapter 7	17:15 - 18:15
Wrap-up and close of the day		18:15 – 18:30

BRUSSELS, 2-3 December 2014 - Albert Borschette Conference Centre, room 3.C
Final Agenda

3 rd December 2014		
Arrival and registration of participants		08:45 - 09:00
Opening of the day		09:00 - 09:15
Cross-cutting best environmental management practices: Avoid <u>food waste</u> in food and beverage manufacturing	Chapter 3.10	09:15 - 10:00
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>processing of coffee</u>	Chapter 4	10:00 - 10:30
Coffee Break		10:30 - 11:00
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>manufacture of olive oil</u>	Chapter 5	11:00 - 11:45
Best environmental management practice, environmental performance indicators and benchmarks of excellence for <u>manufacture of soft drinks</u>	Chapter 6	11:45 - 12:15
Lunch Break		12:15 - 13:30
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>production of meat and poultry meat products</u>	Chapter 8	13:30 - 14:00
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>manufacture of fruit juice</u>	Chapter 9	14:00 - 14:30
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>cheese making operations</u>	Chapter 10	14:30 - 15:00
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>manufacture of bread, biscuits and cakes</u>	Chapter 11	15:00 - 15:30
Best environmental management practices, environmental performance indicators and benchmarks of excellence for <u>manufacture of wine</u>	Chapter 12	15:30 - 16:30
Conclusions		16:30 - 17:00
Wrap-up and close of workshop		17:00 - 17:30

ANNEX 2 – LIST OF PARTICIPANTS

Surname	Name	Organisation
Abad	Aurora	Comité Europeen des enterpries vins
Alava	Juan Manuel	Grupo Siro (I+dea)
Antonopoulos	Yiannis	EC - JRC
Barrucand	Pierre	Actalia
Canfora	Paolo	EC - JRC
Caspar	Benjamin	EC - DG ENV
Cellura	Maurizio	Universita' di Palermo
Chivite Lopez	Fernando	Private consultant
Comaposada	Josep	IRTA - Research and Technology Food and Agriculture
Conti	Barbara	Luigi Lavazza SPA
Cruz Romero	Malco	University College Cork
Delage	Kathleen	IFOAM EU
Demleitner	Roland	Associations of Private Brauereien Deutschland e.V.
Derden	An	VITO - Flemish Institute for Technological Research
Dri	Marco	EC - JRC
Eatherley	Dan	Private consultant
Esturo	Aintzane	SGF International e.V.
Fluch	Jürgen	AEE - Institut für Nachhaltige Technologien
Gassin	Anne-Laure	EC - DG SANCO
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Radway	Alex	EC - DG ENV
Rau	Guenther	REFCCO Rau Enviroment Food & Communications Consulting
Samaras	Petros	Alexander technological education institute of Thessaloniki
Snidersich	Maurizio	Illy caffe'
Stefanucci	Stefano	Unione Italiana Vini
Sturm	Barbara	Kassel University
Sulzer	Georg	Umweltgutachterbuero Dr. Sulzer
Tramontin	Francesco	Mondelez International
Vaessen	Roel	European Coffee Federation
Vainikainen	Anna	Finnish Food and Drink Industries' Federation
Vallin	Benjamin	EC - DG ENTR
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