

Kick-off meeting of the technical working group for the EMAS sectoral reference document on best environmental management practice in the car manufacturing sector

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Contents

1	Introduction	2
2	Opening of the workshop.....	2
3	Day 1, Session 1: Purpose and goals of the meeting	2
4	Day 1, Session 2: Introduction of the sectoral reference documents on best environmental management practice (BEMP) and lessons learnt.....	3
5	Day 1, Session 3: Overview of the Car Manufacturing sector and definition of the scope of the sectoral reference document	5
6	Day 1, Session 4: Environmental aspects of the Car Manufacturing and ELV sector ..	6
	Identification of Best Environmental management practice for the car manufacturing and ELV sector.....	8
7	Day 1, Session 5: Cross-cutting operational BEMPs	8
7.1	Advanced Environmental Management Systems	8
7.2	Detailed energy monitoring and management systems	9
7.3	Waste prevention and management	9
7.4	Water use strategy and management.....	10
7.5	Ecosystem management reviews and strategy	10
8	Day 1, Session 6: Vehicle design and supply chain management BEMPs.....	11
8.1	Integrating life cycle assessment (LCA) into vehicle design decisions	11
8.2	Integrating environmental requirements into supply chain management.....	12
9	Day 1, Session 7: BEMPs on key manufacturing processes.....	12
9.1	Overview of initial proposed BEMPs.....	12
	Day 2.....	14
10	Day 2, Session 1: Plant utilities and infrastructure BEMPs	14
10.1	Overview of initial proposed BEMPs	14
10.2	Biodiversity management	15
11	Day 2, Session 2: Designing for end-of-life BEMPs	15
11.1	Material selection with end-of-life considerations	15
11.2	Design for dismantling	16
12	Day 2, Session 3: ELV logistics and operations BEMPs	17
12.1	Component and material take-back networks	17
12.2	General best practices for remanufacturing components	18
12.3	Overview of other potential BEMPs	18
13	Day 2, Session 4: ELV treatment for specific components BEMPs	19
13.1	General best practices for ELV treatment of various components – overview.....	19
13.2	General best practices for plastic and composite parts.....	19
	ANNEX A – AGENDA.....	21
	ANNEX B – LIST OF PARTICIPANTS	22

1 INTRODUCTION

The European Commission's Joint Research Centre (JRC) is developing a **Sectoral Reference Document (SRD)** on best environmental management practice in the car manufacturing sector. This document will describe best environmental practices that relevant stakeholders can implement in order to minimise their environmental impacts.

The development of this document is part of the European Commission's work to implement the EU Eco-Management and Audit Scheme (EMAS) Regulation. EMAS is a voluntary tool to promote continuous improvements in the environmental performance of organisations across all sectors of economic activity.

The revision of the EMAS Regulation in 2009 (EC No. 1221/2009) introduced a particular focus on environmental performance. To support this aim, the European Commission's Joint Research Centre (JRC) is producing SRDs to provide information and guidance on **best environmental management practices (BEMPs)** in several priority sectors, including the car manufacturing sector. These documents are developed in close collaboration with the stakeholders of the different sectors and under the guidance of a Technical Working Group (TWG) comprising experts from the sector. Further information on the SRDs and their development process can be found in the guidelines on the ***"Development of the EMAS Sectoral Reference Documents on Best Environmental Management Practice"*** (European Commission, 2014)¹. SRDs 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 improve their environmental performance.

The kick-off meeting of the Technical Working Group (TWG) for the car manufacturing sector was held in Brussels on 20-21 October 2014. The goal of the workshop was to establish the information exchange between the members of the TWG and to assist in steering the development of the document, its scope and the preliminary best environmental management practices identified.

Ricardo-AEA Ltd, along with Cardiff Business School, were contracted by the JRC to prepare a background document to be used as a basis for the development of the sectoral reference document and a draft version of this background report was sent to the TWG members prior to the workshop.

2 OPENING OF THE WORKSHOP

The JRC opened the session and welcomed the participants.

- The meeting agenda was presented (see Annex A) and adopted without amendments.
- The TWG members introduced themselves and summarised their experience in environment and car manufacturing (the list of participants is attached in Annex B).
- Participants were informed and agreed that the meeting would be recorded.
- It was agreed to use first names to refer to the different TWG members.
- The JRC emphasised that at the stage of the kick-off meeting it would not be necessary to agree on every point, as the document will continue to be developed over the following year.

3 DAY 1, SESSION 1: PURPOSE AND GOALS OF THE MEETING

The JRC presented the framework of the EMAS Regulation and of the SRDs.

¹ <http://susproc.jrc.ec.europa.eu/activities/emas/documents/DevelopmentSRD.pdf>

- It was explained that EMAS is a voluntary environmental management tool available for any kind of organisation aiming to improve its environmental and financial performance and communicate its environmental achievements to stakeholders and society in general.
- According to Article 46 of the EMAS Regulation (EC No. 1221/2009), the European Commission must develop Sectoral Reference Documents comprising (i) best environmental management practices, (ii) environmental performance indicators and (iii) benchmarks of excellence. These documents aim at promoting best environmental performance and are developed in consultation with stakeholders and Member States.
- The aim of the documents is to describe concrete measures that organisations can take in order to improve their environmental performance and minimise their environmental impact.
- It was also explained that the documents are targeted at EMAS-registered organisations and beyond, by also aiming to offer support and information for all organisations that wish to improve their environmental performance.
- The JRC gave an overview of other sectors for which SRDs are being developed.
- A key objective is to ensure that the TWG members are able to contribute their expertise as far as possible to the development of the Sectoral Reference Document.
- Over the coming months, further research will be conducted by the JRC based on the discussions in the kick-off meeting and further inputs from the TWG, leading to the preparation of a draft Best Practice report.
- This draft will be discussed at the final meeting of the TWG, to be organised in the summer of 2015.

Discussion:

- Experts questioned how the SRDs should be interpreted for EMAS organisations, as this may have a negative impact on these organisations at the time of verification (i.e. whether in the extreme case the verifier could ask to justify for every single BEMP how it has been adopted or why it has not).
 - It was recalled that the legal text of the EMAS Regulation states that the registered organisations should “take the SRD into account” and that verifiers should check that organisations had done this.
 - It was stressed that there is no legal requirement for organisations to *implement* the best practices described in the SRDs – organisations can use the guidance as a source of information and inspiration to improve their environmental performance.
 - The JRC shared the introduction to the retail trade sector SRD (the first SRD that is in the process of adoption), which contains the relevant text to clarify the requirements for EMAS-registered organisations.

4 DAY 1, SESSION 2: INTRODUCTION OF THE SECTORAL REFERENCE DOCUMENTS ON BEST ENVIRONMENTAL MANAGEMENT PRACTICE (BEMP) AND LESSONS LEARNT

The JRC gave an overview of how the previous Sectoral Reference Documents for other sectors had been developed, as well as their structure.

- The presentation focused on the meaning of specific terms used in the context of the SRDs, along with examples from the retail trade sector document.
- The approach and general structure will be the same for the document covering the car manufacturing sector. The approach is also similar to that used for the “BREF” documents (Best Available Technique Reference Documents) according to the Industrial Emissions Directive.
- The definition of best practice was elaborated in detail, emphasising that they should be fully implemented by best performers and technically/economically feasible. It was stressed that both obsolete and emerging techniques are not considered BEMP.
- BEMPs are therefore techniques that:
 - Go well beyond common practice;
 - Are already fully implemented; and
 - Are widely applicable.
- **Environmental indicators.** The indicators are required to allow organisations to measure their performance. The focus is on:

- Indicators or at least measurements that are already in use, in order to minimise administrative burdens;
 - Environmentally meaningful;
 - Can be a proxy – as long as it is still environmentally meaningful – and not necessarily measured in the same units as the benchmarks of excellence
- The approach used to identify best environmental management practices, by analysing the measures implemented by frontrunners, was also presented.
- Benchmarks of excellence: Although there is no explicit definition in the EMAS text, it is interpreted to mean:
 - A level of performance that is very ambitious, e.g. top 10 or 20%;
 - Achieved by “frontrunners” – i.e. companies that go beyond the minimum in terms of environmental performance.
 - A measure of what is possible – not necessarily a target.
- The BEMPs do not aim to be completely comprehensive, rather the references are provided to allow access to further information.
- The outputs of the process were outlined:
 - The background document (**best practice report**) is intended to be a detailed technical guide that contains full details of the BEMPs that were developed in collaboration with the TWG.
 - The final **SRD** is a short synopsis of the best practices, indicators and benchmarks. This is the official document that EMAS companies can refer to.

Discussion:

- Questions were raised about the mechanisms for monitoring/feedback, language coverage, and also the issue of BEMPs becoming obsolete (i.e. regarding any plans for revisions).
 - **Feedback/monitoring:**
 - The monitoring of the effects of the documents is not currently formalised, but anecdotal feedback has been collected on the first SRDs produced e.g. tourism, retail. The JRC has discussed the potential of introducing monitoring within the EC. The JRC recognises that the length of the documents can be a challenge for users, but the shorter summary (SRD) should help to overcome this barrier.
 - In other sectors, feedback from stakeholders has been very positive and it is believed that the SRDs have had an influence on the adoption of techniques in industry.
 - **Language:**
 - The Best Practice report is produced only in English
 - The SRD will be available in all official EU languages.
 - **Revisions and updates of the SRDs:** Due to the rapidly evolving nature of the state of the art and “best practice” in all sectors covered by the SRD, the need for revisions is recognised and has been implemented in other legislation e.g. the regular update of the BREFs under the Industrial Emissions Directive. Currently there are no concrete schedules for updating (beyond the completion of the SRDs for the initial priority sectors) but they are under discussion.
- Stakeholders requested clarification of why the retail sector document had been published as a Commission decision as opposed to a recommendation or other sort of publication:
 - Although EMAS itself is voluntary, the establishing legislation is a Regulation and requirements on the EC itself (to prepare secondary legislation) are mandatory. The type of publication is determined by the legal framework, but the binding nature of its content is only voluntary as defined in the regulation.
- Stakeholders asked about how the anonymous collection of the environmental data from the retail sector was organised? This aspect could be more challenging for the automotive sector, particularly given the timescales involved.
 - The data collection was completely voluntary and the anonymised graph was shared with stakeholders to ensure that it was representative. This was coordinated by the JRC directly and conducted informally.
 - The JRC could act as a consolidator and anonymiser of data. If industry associations e.g. ACEA are in a better position, there could be a role for them in this capacity.

5 DAY 1, SESSION 3: OVERVIEW OF THE CAR MANUFACTURING SECTOR AND DEFINITION OF THE SCOPE OF THE SECTORAL REFERENCE DOCUMENT

The JRC presented a brief overview of the car manufacturing industry in Europe:

- This included high-level figures on production, employment and the structure of the industry based on the most recently available public data at the time of writing.
- The presentation emphasised that the BEMPs are relevant to the passenger car (M1 *products*) manufacturing sector, but since the focus is at the *process* level, many of the identified BEMPs may also be applicable to other vehicle segments e.g. N1 or other categories.
- Furthermore, it was emphasised that EMAS is designed for *organisations* – one of the challenges is catering to a wide range of organisations.

An initial proposal for the scope of the document was presented:

- This was framed around the NACE² codes, which are a standardised classification system of professional activities used in Europe.
- However it was recognised that the car manufacturing industry is highly complex and the NACE codes do not necessarily capture the complexity of the industry. The initial definition is flexible and the definition of the scope should be based on reaching the relevant stakeholders in the sector while addressing key environmental impacts, rather than sticking to statistical or administrative boundaries.
- It was outlined that the focus of the BEMPs was therefore envisaged to be on major impacts during the later stages of automotive-specific manufacturing, as well as end-of-life vehicle processing.

Discussion:

- The precise scope of the document was discussed in further detail.
 - Repair, maintenance, warranty and recall issues.
 - Currently the whole 'use phase' was considered out of scope but these environmentally relevant aspects should be included
 - Inclusion of the shredding sector.
 - JRC clarified that shredding/recycling are not covered as activities in and of themselves (there is also a BREF on most aspects of the industry). However, the automotive-specific aspects of shredding and recycling which impact the upstream value chain (e.g. closed loop recycling, input into design and material selection) should be considered in scope.
 - While some aspects of the use phase may be relevant (see above), the in-use vehicle emissions (CO₂ and air pollutants, noise...) aspects were agreed to be covered by other legislation and therefore out of scope.
 - If the industry in question is already covered under other guidance (e.g. BREFs, other SRDs), the question would be whether the techniques could be differentiated far enough to be automotive-specific.
 - Other sectors, e.g. plastics, textiles etc:
 - If the industry is already covered largely by other work then it will not be included. The processes also need to be specific enough to the automotive sector to warrant additional coverage.
- Stakeholders requested additional explanations of how the scope would be aligned with legal requirements. Car manufacturers stressed that the limited influence they have on the ELV treatment stage should be recognised.
 - Best practice would go beyond the minimum that is mandated by legislation (e.g. ELV Directive, 'RRR' Directive), but also national implementation can vary substantially, so there

² *Nomenclature statistique des Activités économiques dans la Communauté Européenne* (Statistical classification of economic activities in the European Community)

- may be scope for guidance on best practices that would be complementary. It was emphasised that this document is not about being a precursor to mandatory requirements.
 - The current proposal is to cover limited aspects of ELV, in particular, the minimum requirements on shredding and recycling are extensively covered under existing regulations and therefore excluded as standalone activities.
- It was noted that the linkages between in-use phase and production will become increasingly complex, particularly for advanced powertrain technologies
 - It was emphasised that the scope of the document is on organisations rather than products. The use phase is extensively considered in terms of the lifecycle aspects, but the focus of the document is not to focus on product-level issues. Although some of the manufacturing aspects described in the SRD will be useful as a basis for further work (e.g. on LCA and the trade-offs between manufacturing emissions vs. in-use emissions) this is not the purpose of the BEMPs.
- Potential conflicts of interest between the ELV stage and manufacturing were highlighted, such as choices between materials for lighter weight and recyclability. More broadly, experts asked whether there was a chance for discussions in these sessions to influence the ELV Directive?
 - JRC clarified that this theme is beyond the scope of the document and this is not the goal of the process; meanwhile, the ELV Directive revision process is not yet started. However, the Commission will aim not to work in silos and if the work of the TWG raises suggestions which are supported by evidence, they may be fed into the relevant processes and communicated to the stakeholders directly in charge.

Actions:

- **JRC:** Vehicle emissions from the use phase are still largely to be excluded from direct consideration, but the JRC will re-examine the potential to include additional BEMPs related to the use phase, particularly with respect to repair/warranty issues.
- **Ricardo-AEA:** Amend the scope diagram to represent the circular rather than linear flow of materials.

6 DAY 1, SESSION 4: ENVIRONMENTAL ASPECTS OF THE CAR MANUFACTURING AND ELV SECTOR

Ricardo-AEA presented the main environmental impacts that would be discussed over the coming days:

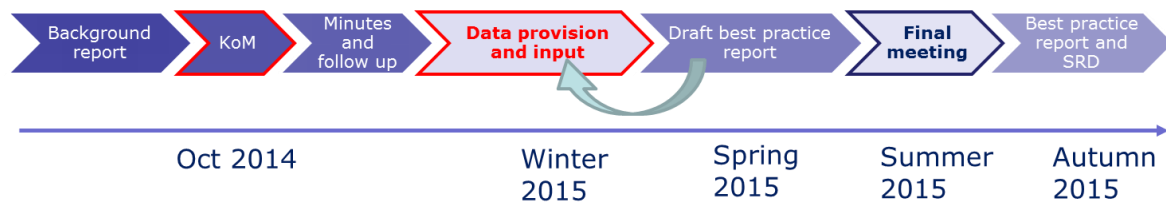
- The broad environmental categories include: energy consumption and CO₂; resource use and waste; water use and consumption; emissions to air, water and soil; and ecosystems and biodiversity.
- It was recognised that all of these impacts are important over the lifecycle of cars, but some impact categories are typically dominated by the in-use phase, which is not considered directly as part of the scope of the document.
- The environmental aspects have been prioritised on the basis of their significance, or alternatively whether particular BEMPs may affect environmental impacts in other areas – a typical example being that decisions at the design stage can often affect later impacts.
- The potential for overlaps with other areas was recognised, but the procedures to avoid this as far as possible were outlined – namely, that BEMPs aim to provide guidance and can therefore complement existing policies and initiatives.
- A high-level proposal for the main environmental aspects to be included, linked to specific process stages, was presented. The main overlaps with existing guidance were highlighted – the background document refers the reader to the relevant documents for these stages.
- The structure of the automotive industry, with its complex supply chains and the use of many components/materials, means that cross-cutting BEMPs are particularly important for this sector.

Discussion:

- In EMAS there is reference to SRDs but not BREFs. Experts asked if it might be worth bringing in the key points to this BEMPs? If so, how can organisations demonstrate compliance that they have taken these larger BREF documents into account?

- The plan is to reference these documents in the best practice report, but not to repeat the guidance. It could be considered that there is added value in making reference to specific sections of these documents. The intention is not to impose additional legal obligations on organisations.
- Ultimately the EMAS is a voluntary scheme – the reference to BREFs provides guidance on technical possibilities that can be taken (or not) – there is not intended to be any additional requirements.
- Experts sought clarification on the content of BREFs vs BEMPs.
 - JRC clarified that the idea is to provide organisations with guidance by cross-referencing the BREFs.

➔ NB. As an introduction to the discussions on day 2, the JRC gave an overview of the timescales planned for the project:



- **New BEMP ideas** and comments on the **scope** of the document should be communicated by the end of 2014.
- Additional information for existing BEMPs will take place over the next 6 months.
- Final meeting will be planned for summer 2015.
- Final report planned for autumn 2015.

IDENTIFICATION OF BEST ENVIRONMENTAL MANAGEMENT PRACTICE FOR THE CAR MANUFACTURING AND ELV SECTOR

7 DAY 1, SESSION 5: CROSS-CUTTING OPERATIONAL BEMPS

Ricardo-AEA gave a presentation covering the main cross-cutting BEMPs outlined in the draft background document, including the initial proposals for what might be considered “best”, environmental achievements, applicability, economics and environmental indicators.

7.1 Advanced Environmental Management Systems

It is recognised that uptake of Environmental Management Systems (EMS) is already high; therefore the key focus of the discussion was on how to identify and implement the best-performing EMS.

Discussion:

- Stakeholders felt that since most organisations already had ISO14001 and / or EMAS in place, these could not be considered best practice.
 - It was emphasised that the standards themselves provided a framework for environmental management, but the ambition of verified/certified systems varied greatly and therefore further concrete evidence was being sought from members of the TWG on what really constituted “best”.
 - JRC stressed that it is not best practice just to have an EMS. It must be a verified/certified EMS, and must be **effective**. This means that the EMS is implemented across a high % of production sites, or is rolled out to dealers and other facilities. The question for stakeholders is therefore, what extra criteria would qualify an EMS as being ambitious enough to be considered?
 - Some experts felt that EMAS is already best practice, because it represents only 2-3% of organisations that go to this extra effort to get EMAS... It was simply noted that EMAS verification already includes the requirements of ISO14001 but goes beyond, with additional requirements – therefore it can be considered to be more than ISO14001.
- The cost estimates were presented to experts and more relevant numbers were requested, as those used were taken from a general study³ that was not specific to the automotive sector
 - Stakeholders felt the costs were underestimates. The estimation of costs depends on the scope (internal costs vs external costs). Potentially, the costs could be five times higher than those presented if internal costs are included. If sites must be audited, the costs increase further.
 - It was clarified that “economics” did not usually include social costs, only financial costs. To the extent that e.g. pollution or CO₂ reduction might result in reductions in societal costs, this might be mentioned but not normally quantified.
- Different possible aspects of BEMP were suggested
 - The rollout of a **global** system might be BEMP.
 - For instance, Renault has a global system cascading to every site. BUT most companies have a global system for cost reasons, with common systems and practice, so therefore not a BEMP. This was supported by other experts.
 - It was suggested that enforcing transparency and greater reporting, including broader communication efforts, is needed and could be an aspect of best practice.
- Ricardo-AEA took the action to investigate these suggestions further, as the implementation and ambition of schemes was clearly very different across organisations.

³ N.B. the figures quoted in the draft report are based on those made available in the EMAS user's guide. See *Commission Decision of 4 March 2013 establishing the user's guide setting out the steps needed to participate in EMAS (...) (notified under document C(2013) 1114)*

Actions:

- **EMAS registered members** – to provide further information on implementation and ongoing costs of EMAS.
- **R-AEA**: to consider reorienting the BEMP to include the suggestions of having a global system and updating the financial data.

7.2 Detailed energy monitoring and management systems

Similarly to EMS, uptake of energy monitoring and management is already high, but some systems are clearly more advanced and it was outlined that energy savings had been achieved by organisations that had already considered their operations to be optimised. The suggested reason for this is the combination of very detailed monitoring (real-time or very high frequency), along with an energy management strategy.

Discussion:

- Industry stakeholders expressed concerns about the inclusion of this BEMP:
 - Resources may be a serious constraint. It was clarified that due to the *voluntary* nature of BEMPs, if resources are a constraint then it would not have to be implemented.
 - In many cases cost drivers are secondary. Energy is not a big issue in the automotive industry compared to other industries: energy costs in manufacturing are between €80 and €150 per vehicle – this is very small compared to e.g. raw material costs of typically around €2,500 per vehicle. There is information on OEMs' websites that can be used.
 - Experts raised the issue of potential overlap with the energy efficiency directive. Could we then go beyond an audit every four years?
 - When implementing a monitoring system, it is very important to find out who is responsible for energy consumption. There are different contributors – for example, first a process planner whose inputs go to the infrastructure planner, and then on to the construction design planner. So, the question of who is responsible for the total overview on energy consumption is important if you want to make a difference.
- The inclusion of ISO50001 as BEMP was questioned.
 - It was felt that this will probably not be a BEMP in three years' time because so many companies are applying for it now.
 - The context also depends on the country – e.g. in Germany there is currently a tax break which can bring about savings of more than 2m Euro in a year for implementing ISO50001, driving a rush to adopt the standard and making it mainstream.
- The economics were also discussed – with stakeholders noting that local tax incentives had a major impact on the financial benefits. The savings also depend greatly on the starting point.

Actions:

- **TWG members** to contribute more concrete information in order to help define this BEMP as needed.

7.3 Waste prevention and management

The high performance of the automotive industry in terms of lean production was recognised, but it was also noted that these techniques may have “blind spots” and there could be scope for improvement in terms of focussing on prevention of waste and techniques that focus on “hard-to-treat” fractions.

Discussion:

- Regarding zero waste to landfill – there are some production processes where it is easily possible to achieve zero waste to landfill. Even the environment is not a concern as in many sites there are benefits in going to zero waste from a cost perspective (landfilling fee). A lot of people claim to be “zero waste” but isn't the case in reality, this should be defined more strictly.
- It was suggested that **prevention** is more important than other measures to be proposed as best practice.

- → This is already a key feature of the discussion in the draft text, but the emphasis could be made even stronger.
- Different terminology was recommended specific to the automotive sector – for example, **introducing “remanufacturing” into the waste pyramid** instead of only repair / reuse.
- More differentiation between process waste (i.e. rejects) and packaging waste is needed. The two issues could be addressed separately with specific best practice for each (e.g. reverse logistics)

Actions:

- **Ricardo-AEA** will amend the diagram to suggest remanufacturing as an example of reuse/repair.

7.4 Water use strategy and management

Water use strategies were covered at a high level, focussing on aspects that would typically be covered less comprehensively in a standard environmental monitoring system. Since many of the most important impacts occur in the supply chain (water footprint of materials), an overarching strategy that included collaboration with suppliers was suggested as a BEMP. Many tools and frameworks are available, although their applicability and usefulness for the automotive sector vary, so views were sought from stakeholders on which might be considered the most suitable.

Discussion:

- The local nature of water issues was emphasised.
 - This is already strongly referred to in the draft text, but the emphasis could be made even stronger.
 - The use e.g. of a local water scarcity index could be used to modulate the impact.
- Experts suggested that linkages to **recycling** could be relevant for water savings, as the avoided impacts in the supply chain/downstream would be large.
- Water could also be linked with **eco-system service performance**. An example was given regarding VW’s plant in Mexico, which has a system that contributes more water than the plant is using. This would be a positive benefit that could be allocated to such activity.
- Several possible indicators were suggested:
 - % of water that is internally recycled. It was suggested that this is a figure that is easy to get for most plants.
 - The use of rainwater harvesting can contribute to a reduction in flooding.

Actions:

- **Ricardo-AEA** to include linkages to recycling impacts and ecosystem services.

7.5 Ecosystem management reviews and strategy

Ricardo-AEA discussed the challenges of the emerging area of ecosystems strategies - understanding of ecosystem services and their relevance has developed much more recently compared to other environmental areas; hence relying on standard environmental management systems may miss some important aspects.

Discussion:

- Like water, ecosystems are also very local impacts although the strategy can be global.
- It was questioned whether risks from shipping ballast should be included; this could be part of a more global set of requirements for suppliers.
- The indicators are a challenge in this area. GRI tried to do this but the process has failed to come up with indicators. Suggested that Nissan may have information on this topic and it may require a more qualitative approach. There are lots of tools available, and the World Business Council for Sustainable Development published a report on this topic (Eco4Biz).

Actions:

- **GNF** to review the ecosystem chapter and work with Ricardo-AEA to amend/clarify the indicators
- **Ricardo-AEA** to review whether shipping/transport should be included.

8 DAY 1, SESSION 6: VEHICLE DESIGN AND SUPPLY CHAIN MANAGEMENT BEMPS

8.1 Integrating life cycle assessment (LCA) into vehicle design decisions

The presentation noted that many of the major environmental impacts occur during the use phase of the vehicle; however with the increasing introduction of advanced low carbon technologies, the manufacturing stages are becoming more important. LCA is also important to understand any trade-offs between different environmental impact categories and/or lifecycle stages. The focus of the BEMP is therefore how to integrate LCA into vehicle design in an economical and effective manner, particularly considering the complexity of the data requirements.

Discussion:

- LCAs are inherently complicated because they entail trade-offs between impact dimensions which are not comparable.
- Most OEMs are already doing LCAs, but these are usually very much driven by the **use phase**. There is a range of generic data in the calculations; however there is great variety between OEMs, which limits the comparability. The functional unit must be very clear.
 - It was clarified that the objective was not to compare *between* OEMs. LCA is very complex and every car company has different environmental impacts. Rather, the idea is that it is best practice to conduct LCA in order to inform internal decisions/comparisons. For instance, while an LCA taken in isolation will not drive a decision, Renault's general policy is to *improve from one model to the next* and this could be a relevant indicator.
- The use of LCAs can be considered common practice in the industry today rather than best. Therefore **more stringent criteria have to be laid out going above and beyond current procedures**.
 - Noted by one TWG member that OEMs used to ask for LCA data but recently this demand has dropped. Suggested that a thorough LCA would take 9 months for one person, but that with sensible methodology using good quality generic data a 'good enough' result within +/- 20% could be achieved in hours. Therefore the fall in demand for LCA data may be because other factors are currently a greater concern, or because the additional data requirements cost more for little added precision.
 - Some OEMs confirmed that indeed they do not request full LCA data from their suppliers in order to avoid excessive burdens on them – rather they use standardised reference databases. But not requesting upstream data from suppliers should not be best practice as it also fails to incentivise and recognise good performance from the suppliers.
 - While it is true that LCA is standard in the industry now, gaining raw data for each new product would not make sense.
- Discussion of relevant indicators:
 - Regarding the 1st proposed indicator: the use of LCA on new prototypes was questioned, as many do not become public.
 - Proposal: Improvement from one model to the next comparable one (cf. above)
 - Noted that qualitative issues are not usually incorporated very well, such as “detox” of materials. Suggested increasing focus on positive goals using cradle-to-cradle approaches, and complementing the scope. Suggested that “reutilisation score” would be relevant.
 - PEF (product environmental footprint) / OEF (organisational environmental footprint) may be a potential source of metrics. These could also form a better indicator.
 - However it was noted that these standards are still a work in progress and therefore may not be suitable to use as an indicator, but could be mentioned.

- It was also noted that the objective of PEF was to improve comparability, while highlighting that PEF may be creating uncertainty for some organisations, especially when operating globally.
- Work of TWG should go on and not be held up by PEF/OEF pilot.
- The multiple dimensions of LCA should be kept because the focus for the future may be on one aspect e.g. reduce lifecycle energy/CO₂ rather than the overall LCA. For example, burden shifting of energy use towards battery manufacture. The new Tesla factory might be an extreme example: renewable energy powers the factory to dispel concerns over manufacturing energy usage; but it may not be considered sustainable on other grounds such as water usage in the desert.

Actions:

- **Ricardo-AEA** to consider how to revise BEMP and reformulate indicators. Some element of LCA must be covered in the document, but the coverage should be reviewed and possibly combined with some of the later BEMPs on design decisions.

8.2 Integrating environmental requirements into supply chain management

The majority of environmental impacts from the production stage of a vehicle are found in the supply chain; hence considering the environmental impacts is extremely important. The presentation gave a brief overview of aspects that were believed to contribute to high supplier environmental performance, with specific examples from the automotive sector.

Discussion:

- The discussion mainly focussed on the issue of risk and how this should be accounted for. This aspect is already mentioned in the BEMP but the emphasis should be strengthened and explained further.
 - Environmental requirements on suppliers are usually integrated into CSR. For instance Renault have two levels – firstly a questionnaire sent to all suppliers, and second a face-to-face visit (around 500 assessment with Renault and a third party, covering all CSR issues and including environment) for suppliers that are considered at risk or in high-risk countries. A balance is needed to avoid overburdening suppliers.
 - JRC summarised that the best practice should be clarified to cover how to identify risks in terms of environment.
- Risk assessment will become a core part of the revision to ISO 14001 (and ISO 9001) rather than the current focus on preventive action, so the BEMP could become standard practice in a short period.

Actions:

- **JRC:** Consider how to integrate risk assessment into this BEMP.

9 DAY 1, SESSION 7: BEMPS ON KEY MANUFACTURING PROCESSES

9.1 Overview of initial proposed BEMPs

Ricardo-AEA presented the initial proposals for the scope of BEMPs to be covered in this area, recognising that car manufacturing involves many other industries, but the scope of the document is largely on the later stages. As such, the proposed BEMPs included the press shop machinery; increasing the efficiency of energy-using processes; and water-saving opportunities in automotive plants. Views were sought on whether additional BEMPs should be included, or alternatively whether any of the proposed BEMPs should be removed.

The specific overlaps with existing or planned guidance were presented and views were sought from the TWG on whether any additional guidance would be beneficial.

Discussion:

- General points on manufacturing process BEMPs
 - It was noted that some of the very specific processes are already excluded as they are covered under BREFs (e.g. paintshops). It was discussed at length that the manufacturing processes are very close to the BREF activities. However, any process specific to the car industry (paint finish, engine manufacture?) should be considered as it would not be covered elsewhere.
 - Experts were of the view that process- or technology-specific BEMPs should be ruled out (i.e. the focus should be on impact rather than the use of specific technology) to avoid cherry-picking.
 - Processes in the supply chain are quite different, including e.g. electroplating, but these are also covered under BREF notes or other BEMP guidance.
 - Experts emphasised that old equipment managed well can have a lower impact than new equipment managed poorly.
 - Applicability: Support was expressed for some form of check list or ideas for companies to choose how to improve their performance. However, it was also noted that some ideas cannot be transferred to other plants, due to issues of e.g. scale, local conditions.
 - Several industry experts pointed out that specific examples of best practice are numerous e.g. most environmental statements / annual reports of companies contain lots of illustrations often with operational data as well.
 - It was suggested to set up e.g. an online repository of best practices, possibly incentivised by an award scheme.
 - JRC recalled that the point is not to draw an exhaustive list of best practice but rather to list some key representative examples to inspire individual improvement by adapting these.
 - Sharing best practices **between industries** was highlighted and the potential for a more **cross-cutting BEMP document** was discussed. For example, precision assembling used in the pharmaceutical industry could be useful for application in the automotive industry
 - JRC agreed that cross-cutting BEMP document should be considered, albeit in a separate forum.
- **Servo press BEMP:**
 - The servo drive is only a small part of the total energy consumption, vs. for instance HVAC.
 - Questioned the relevance of the press chapter due to the economic restrictions. The decision to replace presses by servo ones will almost always be driven by economic considerations and, if it is time to replace an old press, the odds are that it will be replaced by a servo press. Therefore the additionality of the recommendation as best practice would be questionable.
- **Water-saving opportunities**
 - It was suggested that water-saving opportunities may already be covered in cross-cutting issues.
 - There is an SMMT document on input/output of water in manufacturing
 - Audi are working towards wastewater-free production. Goal is available in Audi's environmental statement. This could be envisaged as a benchmark.
 - It was mentioned that Renault also do this in Morocco.
 - Other stakeholders supported that the cross-cutting side is important.
 - Confirmed that paint processes are the most significant with respect to water consumption.
- **Airbags:**
 - The relevance of the airbag chapter was questioned. It could also be considered product- rather than process-oriented. It was agreed that this should probably be removed.

Actions:

- **Participants** agreed to contribute several documents including:
 - on water balance (SMMT document).
 - other potential areas to be covered.
- Consider switching the ordering section with the infrastructure/utilities section to reflect relative importance.

- Remove chapter on non-pyrotechnic airbags
- Consider merging chapters in this section with related cross-cutting issues.
 - Water-saving opportunities could be merged with cross-cutting water strategy
 - Press shop and general energy-saving opportunities could be merged and integrated into the plant utilities/infrastructure chapter
- **ACEA** to address its members on creating a list of potential best practices or case studies that could be used, bearing in mind the issues of competitiveness.

DAY 2

10 DAY 2, SESSION 1: PLANT UTILITIES AND INFRASTRUCTURE BEMPS

10.1 Overview of initial proposed BEMPs

Ricardo-AEA presented the initial proposed scope for BEMPs in this area, which included water recycling and rainwater harvesting; green roofs; alternative energy sources; optimisation of lighting; and biodiversity management. Views were sought from the TWG on whether these were relevant and whether any important BEMPs were missing, as well as whether any should be removed. An overview of the scope of the SRD on BEMPs for the construction sector was provided in order to demonstrate the potential overlaps.

Discussion:

- **Water recycling and rainwater harvesting:** Agreed that this BEMP should be included.
 - It was suggested recycling of water- (and oil-)based coolants should be included.
- **Green roofs:** Agreed that this could be included.
 - Suggested to include a discussion of situations under which these could be considered
 - the trade-off with other resources (e.g. PV, natural lighting) could be highlighted
 - Issues may also include extensive sprinkler systems, climate and structural issues.
 - It was suggested that key indicators could include biodiversity indicators.
- **Alternative energy sources** – agreed that this should be included
 - Energy efficiency needs to come first in the energy strategy.
 - Agreed it is important to include this. Audi has a goal to move to zero CO₂ mobility across the whole lifecycle and in order to achieve that the OEMs need to be an example for their suppliers.
 - Distinction between nuclear being low CO₂ and “alternative” or “renewable” energy.
 - The inclusion of buying green tariffs was questioned in terms of relevance
 - Examples of closed loop renewable energy sources – examples from Renault available e.g. (waste) steam bought from local industrial source, Audi plant with ground source heat pump.
 - Noted that heat can be a very important part of production – integration of renewable heat at the process level could be considered BEMP. Examples could be considered in terms of (renewable) CHP. Use of waste heat in other processes and trading (using heat from or provided to) local community.
 - Tri-generation may also be considered, use of adsorption chillers when cooling is needed as well as heat.
 - Holistic approaches to whole building energy management.
 - The use of renewable energy may be cross-cutting rather than auto-specific. However the focus should be on specific processes e.g. how to match a demand (low-grade heat) with available resources: example of the use of solar heat in the low temperature forming of nylon brake lines.
 - Some factories have specific processes that emit waste heat. There is potential for certain factories can reach a very high level – Audi gave an example of their plant in Hungary.
- **Optimisation of lighting:** Agreed that this should be included.

Actions:

- Review the coverage of water-based coolants in the water recycling BEMP.
- **Schäffler** to refer internal experts to Ricardo-AEA to discuss the inclusion of green roofs.
- **Ricardo-AEA** to ensure that indicators that cross over with other SRDs are consistent.

10.2 Biodiversity management

The presentation of the proposed BEMP focussed on direct impacts, i.e. where companies can directly affect biodiversity on their premises. While many impacts are in the supply chain, these are considered as part of the overarching ecosystems strategy discussed earlier. Views from the TWG on concrete actions that would be beneficial were sought.

Discussion:

- Other benefits are possible that can be elaborated in the report – one example given regarding prevention of pigeon nesting (and the associated damage they cause to vehicles), natural mowing by sheep.
- Potential EU level certification is upcoming
- Key not to compromise key business
- “Biodiversity in good company” was discussed. Current indicators may be considered weak. There might be a potential for learning from agriculture. The issue of cross-cutting BEMPs was brought up again, since biodiversity impacts are not specific to auto activities and most companies are not expert in this field.
- Benchmarks / indicators could be based on %land made available to foster biodiversity

Actions:

- **Fiat** could provide information about its work on biodiversity indicators

11 DAY 2, SESSION 2: DESIGNING FOR END-OF-LIFE BEMPS

11.1 Material selection with end-of-life considerations

Ricardo-AEA gave an overview of the importance of material choice in determining the potential for recycling and reuse options at the ELV stages. Although it was recognised that many organisations consider this, particularly due to the ELV Directive, it is a highly complex area and therefore views on what an appropriate definition of “best practice” might constitute were sought. Initial high-level proposals comprised relatively simple principles that could be extended depending on the priorities of the organisations involved, namely that: material contamination should be minimised, recyclability should be considered explicitly and these considerations should be updated depending on development of recycling technology/infrastructure.

Discussion:

- ELV experts highlighted that the people involved in design do not necessarily have a complete appreciation of the ELV treatment processes. An example of Mitsubishi in Japan (white goods) requiring their design employees to work at a recycling facility to ensure this.
 - For example, simple inherent issues such as the inability to sort black plastic with infrared sorters because the material is black. Glass fibre makes the plastic material strong but wears out the plant equipment for extrusions.
 - Older cars are typically considered to be much easier to recycle than modern cars due to the advancements in design aimed solely at consumer appeal with no regard to recyclability. Newer cars are not getting easier to recycle, quite the opposite.
 - At the design stages, there is a need to think about whether the material choice is going to contribute to the amount (yield) of material that can be reclaimed at the ELV stage.

- → this could be crystallised in a best practice regarding the training of designers and engineers.
- An aspect that is limiting the market for dismantling is the dismantler's understanding of how to use the materials.
 - For example, they may not understand the market for high impact high temperature polycarbonates.
 - May also not know where the valuable materials (e.g. rare earth metals) are in the vehicle (example of high end vehicles with lots of servo motors everywhere). Hence they need to have this knowledge in order to recover them so that they can be reused. Marking of components would be a huge step...
 - From an ELV processor's perspective it seems the incentive is simply not there to make the cars more recyclable / easy to dismantle. The biggest effort is to create a scheme where all actors alongside the chain are somehow incentivised – otherwise the weakest link makes it unworkable.
- Questioned the use of “contamination” in the indicators – clearly there is a very rapid evolution in the technologies in products and also in ELV treatment processes. Contamination is a notion that is more suited for PST – sorting and recovering pure components is much easier through dismantling.
- Post-shredder treatment technologies are in their infancy and this will be important going forward.
 - In most cases, the technologies are less than 10 years old (and mainly they are less than five years old). PST is quite recent – it is projected to be able to deal with 10-15% of the car in the coming years.
 - It is very difficult to consider ELV aspects at the design stage because of technological developments in recycling: e.g. should the goal be to design for dismantling or design for PST?
 - Volkswagen were mentioned as a potential best practice case study.
 - Noted that there should be a good balance between shredding and dismantling because technologies are not developing in all Member States at the same rate.
- The comment that technologies will change is well in line with the current structure we have for this BEMP. The BEMP doesn't go into how to technically achieve results. While there is a time lag which can limit design choices, at least we can try so that the car manufacturers do their best to integrate their thinking into the BEMP.
- Issues of recycling vs downcycling:
 - Issue of the quality of recycling car steel was important (copper contamination).
 - Plastics always have some element of down-cycling in them, but the more contamination, the more the down-cycling will be.

Actions:

- **Ricardo-AEA** to discuss with **Axion** about capacity training for staff and “intelligent nugget picking”
- Consider reformulating the chapter title and blending into LCA chapter, although this material-select aspect is perhaps additional – to be discussed further.
- Issues of how to create the right incentives for all of the actors in the chain need to be carefully considered.

11.2 Design for dismantling

The focus of this proposed BEMP is on the potential to improve dismantling in general, whereas specific design considerations for components would be considered under later sections. It was recognised that dismantling would not always be the environmentally preferred option, but that where it was considered to be preferable there were actions that could be taken to make it more effective. Thus, the scope of the proposed BEMP was on principles of design for dismantling for cases where it was considered to be relevant and useful. In such cases, suggested approaches were on designs that included the use of different fasteners, improved accessibility and visibility and other designs. The importance of the role of Authorised Treatment Facilities (ATFs) was also highlighted and views from the TWG on how to increase their participation were sought.

Discussion:

- Toyota discussed their strategy on dismantling. In 1999, they applied a “green mark” to highlight components that can be taken out to help dismantlers achieve better recycling. They also made it easier to remove copper from the car – unfortunately, this wasn’t used in practice.
 - They need certain materials back in order to produce cars – but the alignment of incentives is a key issue – currently they cannot get the materials back, so what could the dialogue be between the car industry and the recycling industry so that both parties benefit from the discussion?
 - Now they are changing their strategy to align both with their needs and the recycling industry. They discussed needs through questionnaires with suppliers. The lack of uptake was considered to be a key issue and understanding this better is critical – communication appears to be important.
- Example of ADEME report in France given
- Renault have also attempted to recover rare earth metals, particularly when the price spiked three years ago. They attempted to dismantle magnets from speakers, but the economic viability was completely dependent on the prices for these materials (prices for rare earth metals have subsequently dropped significantly).
 - Stressed the importance of collaboration and took a share in INDRA in order to access the network in order to understand how to make it profitable to all the actors along the supply chain.
- Current methods are predominantly by hand or using cutting tools – migration to different techniques should be considered. ICARRE-95 (Life+) project looks at more destructive methods that still allow very pure PP recovery. Other trials have been undertaken to demonstrate that dismantling of parts can be profitable.
- Design for dismantling is already incorporated into design for serviceability – hence additional guidance in this area may not be useful and it is very difficult to define indicators. This aspect is considered relatively old.
- Design guidance in the packaging industry to guide designers through based on a scoring system was mentioned as a good example.
- IDIS was mentioned as a potential tool but views on its effectiveness were mixed. ELV stakeholders viewed IDIS as insufficient in terms of coverage of vehicles, completeness and correctness. Vehicle manufacturers are legally required to input data in this system.
- A more productive approach to this BEMP could be to examine why approaches proposed many years ago were not successful. Looking at newer materials, rare earths etc might also be more useful.
- The indicator relating to “ease of dismantling” could be further differentiated between the ease of removing a part as a whole vs removal of materials within a part.

Actions:

- **Renault** to share information on ICARRE95 project and activities to develop closed loops.
- Consider removing this as a separate BEMP and incorporating the guidance into a chapter on overall “design for sustainability” – also consider merging with chapter on LCA and other design BEMPs.
- **Keith** to send link to EU packaging recycling guidance
- **ARN** have developed a dismantling course on hybrid and electric vehicles – the basis of their knowledge has been training and knowledge from IDIS. They state that they have trained hundreds of dismantlers in the Netherlands – further information on this aspect to be shared.

12 DAY 2, SESSION 3: ELV LOGISTICS AND OPERATIONS BEMPS

12.1 Component and material take-back networks

Ricardo-AEA gave a brief presentation on the initial proposed scope of a BEMP covering this area, recognising that national and local infrastructure/regulations could affect its implementation. The proposed scope was to focus on industry-led initiatives that increased the level of collaboration and management of ELV components/materials.

Discussion:

- Suggested that EPEAT (electrical products environmental tool) set up in the US could be an interesting case study.
- Existence of non-authorised ATFs in Europe is a significant problem.
 - DG-ENV explained the work that is being done in the Commission to address this issue in the context of the ELV Directive.
- Suggested by several stakeholders that ATFs may be aware of requirements – this sentence should be reviewed in the report.
- Discussion of implementation issues to do with the ELVs, e.g. missing ELVs and monitoring, and whether it would be relevant to target a BEMP at administration
 - This is clearly an implementation and enforcement issue. Artemis mentioned that guidance had been discussed with Member States recently in a different forum.
 - The Commission clarified that issues related to administration, enforcement and monitoring of the ELV Directive are out of scope and should be the subject of specific action under that Directive. A BEMP aimed at administration would not have added value.

Actions:

- **Keith Freegard** to share information on EPEAT.

12.2 General best practices for remanufacturing components

Ricardo-AEA gave an overview of the potential environmental savings from remanufacturing and noted that some organisations have already started to look at this area for aftermarket components. The TWG was asked about its views on the potential to expand these activities in terms of the components and stakeholders involved.

Discussion:

- It was questioned whether remanufacturing might not always be the environmentally best option? The consultants gave an example of situations where parts must be shipped very large distances and therefore it would not make sense to remanufacture in every situation.
- It was mentioned that most OEMs have remanufacturing operations.
 - The use of certain remanufactured parts in new vehicles is constrained by legislation in the RRR Directive
 - Bosch was remanufacturing injector parts recovered from warranty claims in their own factories.
- Discussion on indicators:
 - The first indicator of remanufactured weight per component (%) was questioned; the second indicator may also suggest the poor quality of the original parts.
 - A potential indicator is to use the CO₂ reduction potential and raw material. The weight is less relevant depending on the type of component, so an alternative is the remanufacturing value.
 - Another suggested indicator is the rate of remanufacturing of non-metallic components, but this may be difficult to implement in practice as dismantlers do not currently have this information.

Actions:

- **APRA** to share data and additional examples.

12.3 Overview of other potential BEMPs

The main candidate that had been suggested was the potential for SME networks, given the importance of these actors in the ELV sector and the current challenges with respect to improving their knowledge of and participation in BEMPs. Views from the TWG were sought on whether and how knowledge and resources for ATFs could be improved.

Discussion:

- Dismantlers among themselves are thought to be very competitive, and therefore there is not a lot of willingness to share knowledge with others.
- Limited added value foreseen in sharing knowledge between SMEs, as national associations should be doing this already.
- E-MULT scheme was not considered to be a good example.

Actions:

- Low levels of support for this BEMP – consider removing.

13 DAY 2, SESSION 4: ELV TREATMENT FOR SPECIFIC COMPONENTS BEMPS

13.1 General best practices for ELV treatment of various components – overview

The current background document proposed that BEMPs should be developed for a selection of specific components, namely: plastics and composite parts; wiring harnesses; glazing and tyres. These were selected due to the specific challenges involved in treating them at the ELV stage, and given the increasing importance of achieving high recovery and reuse rates. Views from the TWG were sought on whether additional BEMPs should be introduced and/or whether all of these BEMPs were relevant. Overlaps with other guidance documents related to the recovery and treatment of specific materials, fluids, batteries etc. were highlighted.

Discussion:

- It was mentioned that traceability of reused/remanufactured parts is generally important.
- Discussed that the economics (value of materials) are most important to consider.
- General agreement on components covered.
- Need for monitoring of the treatment of the ELVs is important.

Actions:

- **UCA** to share study on recycling/shredding system in Japan.
- **Ricardo-AEA** to add link to SRD on electronic and electrical components.

13.2 General best practices for plastic and composite parts

Ricardo-AEA gave a brief presentation of the current state-of-play with respect to plastic/composite recovery and reuse and identified that this fraction was likely to become an increasingly important part of ELVs in future. The suggested BEMP included starting to considering ELV treatment at the design stage using LCA, and subsequently moving on to help develop markets for separated products. The feasibility of such actions is an important consideration and the views of experts were sought.

Discussion:

- **Depollution:**
 - Possible indicator → amount of fluids left in the vehicle
- **Plastics and components:**
 - Largest parts are bumpers and fuel tank. Engine covers were also mentioned, and some of the issues were attributed to a lack of information and knowledge. A large part of the plastic proportion does lend itself to post-shredder recovery.

- A concern is the growing complexity of plastics in vehicles.
- In the case where the vehicle is baled it is not possible to remove the plastic parts, but this only affects a fraction of the industry
- **Wiring harness:**
 - Should be of sufficient intrinsic value to justify recovery, but it is often not the case.
- **Glazing:**
 - The economics are the most challenging part, as well as logistics.
 - It was questioned whether there were any examples of companies that implement glass recycling.
 - In the Netherlands, the system no longer systematically removes glass, which affects the weight and handling of the vehicle hulk.
- **Tyres:** Agreed to include.

Actions:

- **EFR** can provide more information on the issues related to the copper content in ELVs (in particular from wiring harnesses).
- **Tyre/reman stakeholders** to share information on best practices for tyres

ANNEX A – AGENDA

Monday 20 October 2014 - Albert Borschette Conference Centre, meeting room 4 D		
Arrival and registration of participants		09:15 – 10:00
Opening and welcome		10:00 – 10:15
Introduction of experts		10:15 – 10:45
1- Purpose and goals of the meeting		10:45 – 11:00
2- Introduction of the sectoral reference documents on best environmental management practice (BEMP) and lessons learnt so far		11:00 – 11:15
<i>Coffee break</i>		11:15 – 11:30
3- Car Manufacturing and ELVs : Overview of the sector Definition of the scope of the sectoral reference document		11:30 – 12:15
4- Major environmental aspects of the Car Manufacturing and ELV sector		12:15 – 12:45
<i>Lunch break</i>		12:45 – 14:00
5- Techniques used in the Car Manufacturing sector to address environmental issues: Cross-cutting operational BEMPs		14:00 – 15:30
6- Techniques used in the Car Manufacturing sector to address environmental issues: Vehicle design and supply chain management BEMPs		15:30 – 16:30
<i>Coffee break</i>		16:30 – 16:45
7- Techniques used in the Car Manufacturing sector to address environmental issues: BEMPs on key manufacturing processes		16:45 – 17:45
Wrap-up and close of the day		17:45 – 18:15

Tuesday 21 October 2014 – Venue: Berlaymont building (room 3)		
Opening of the day		09:00 – 09:15
1- Techniques used in the Car Manufacturing sector to address environmental issues: Plant utilities and infrastructure BEMPs		09:15 – 11:00
<i>Coffee Break</i>		11:00 – 11:30
2- Techniques used in the Car manufacturing / ELV processing sector to address environmental issues: Designing for end-of-life BEMPs		11:45 – 12:45
<i>Lunch break</i>		12:45 – 14:00
3- Techniques used in the Car manufacturing / ELV processing sector to address environmental issues: ELV logistics and operations BEMPs		14:00 – 15:00
4- Techniques used in the Car manufacturing / ELV processing sector to address environmental issues: ELV treatment for specific components BEMPs		15:00 – 16:00
5- Summary of the working group discussions		16:00 – 16:45
Wrap-up and close of workshop		16:45 – 17:00

ANNEX B – LIST OF PARTICIPANTS

Name	Organisation	
Ioannis Antonopoulos	Joint Research Centre- European Commission	EU
Tobias Bahr	ACEA	EU
João Bolina	DG CLIMA- European Commission	EU
Geoffrey Bridges	G.W. & G. Bridges Ltd	UK
Manuel Burnand	EFR / Derichebourg	EU
Paolo Canfora	Joint Research Centre- European Commission	EU
Frederic Coene	Aisin Europe	BE
Ronny Dennis	Toyota Motor Europe	EU
Marco Dri	Joint Research Centre- European Commission	EU
Stefan Dully	Continental AG	DE
Baptiste Durand	Dorel	FR
Paul Fox	Motor Vehicle Dismantlers Association of Great Britain	UK
Keith Freegard	Axion Polymers	UK
Olivier Gaudeau	INDRA SAS re-source engineering solutions	FR
Pierre Gaudillat	Joint Research Centre- European Commission	EU
Georgina Gibson	Ricardo-AEA	UK
Pedro Grossinho	Federal Mogul	DE
Artemis Hatzil- Hull	DG ENV- European Commission	EU
Stefan Hoermann	Global Nature Fund	DE
Steve Hope	Toyota Motor Europe	EU
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