Final Report

Methodology for Ecodesign of Energy-related Products

MEErP 2011

Project Report

Contractor:

COWI Belgium sprl -in association with- Van Holsteijn en Kemna B.V. (VHK)

Prepared for the European Commission, DG Enterprise and Industry
Unit B1 Sustainable Industrial Policy

under specific contract SI2.581529, Technical Assistance for the update of the Methodology for the Ecodesign of Energy-using products (MEEuP),
within the framework service contract TREN/R1/350-2008 Lot 3

René Kemna

Brussels/ Delft, 28 November 2011

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Introduction

The present report has been prepared by COWI Belgium in association with Van Holsteijn en Kemna (VHK), as member of the COWI Consortium, under the Multiple Framework Contract for Technical Assistance Activities in the field of energy and transport policy (TREN/R1/350-2008 lot 3), and in response to the Terms of Reference included in the Contract No. SI2.581529 "Technical assistance for an update of the Methodology for the Ecodesign of Energy-using Products (MEEuP)".

Sustainable industrial policy aims in particular at developing a policy to foster environmental and energy efficient products in the internal market. The Ecodesign Directive 2009/125/EC is the cornerstone of this approach. It establishes a framework for the setting of ecodesign requirements for energy-related products with the aim of ensuring the free movement of those products within the internal market. Directive 2009/125/EC repealed the original Directive 2005/32/EC for the setting of ecodesign requirements for energy-using products.

The Methodology for the Ecodesign of Energy-using Products (MEEuP)\(^1\) was developed in 2005 to contribute to the creation of a methodology allowing evaluating whether and to which extent various energy-using products fulfil certain criteria that make them eligible for implementing measures under the Ecodesign Directive 2005/32/EC.

Against this background the objective of the underlying study is twofold:

1.) To review the effectiveness and update, whenever necessary, the Ecodesign Methodology after having been applied for 5 years in ecodesign studies and contributed to the evaluation of implementing measures on energy-using products.

2.) To extend the Ecodesign Methodology to Energy-related Products to evaluate whether and to which extent new energy-related products fulfil certain criteria for implementing measures under the Ecodesign Directive 2009/125/EC.

The study is conducted according to the four tasks specified in the tender specifications, including public stakeholder involvement:

1. Information sourcing and publicity
2. Extension of the Methodology to Energy-related Products
3. Update of the Methodology Report
4. Update of the EcoReport Tool

The present Project Report covers Task 1.

A separate Methodology Report covers Tasks 2 and 3. The updated EcoReport tool, Task 4, is contained in a separate spreadsheet file.

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Task 1
Information sourcing and publicity

Draft Report
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Total report: ca. 195 pages
1 Task 1: Information sourcing and publicity

*This is the report of Task 1 of the contract. Each paragraph covers a subtask. The 5 Annexes included give more details on several subtasks.*

1.1 Preliminary list of stakeholders

In co-operation with the Commission, the contractor compiled a list of contact data for the following relevant stakeholders:

- 138 European industry associations, including SMEs and craft industry;
- 2 EU consumer organisations and 3 groups of environmental NGOs;
- 39 Member States’ representatives;
- 31 organisations or individual experts having carried out/which are conducting ecodesign preparatory studies' or related ecodesign studies and/or projects and
- 35 surveillance authorities

At the end of January 2011, at the launch of the project website, each of these 245 stakeholders received an e-mail from the contractor with a follow-up e-mail by the European Commission to the Ecodesign Consultation Forum and Working Group. The e-mail invited the stakeholders to register at the project website in order to receive all updates on the progress of the study and pointed out the opportunity to contribute through the feedback form.

It was announced that, at registration on the website, registered stakeholders would receive a questionnaire as an ulterior means to contribute (see subtask 1.3). Finally, the opportunity of a stakeholder meeting in the summer of 2011 was pointed out.

So far (22 March 2011) around 110 stakeholders have registered. A list of registered stakeholders, as of 22 March 2011, can be found in Annex I.

1.2 Project website

A project website [www.meerp.eu](http://www.meerp.eu) was launched end of January 2011. The site contains 13 pages, including a welcome page, an introduction on the project and the methodology (including a section on Frequently Asked Questions), a registration form, a feedback form, contact data, document list, time plan and useful links. All pages can be found in Annex II.

The site design was checked for browser compatibility and —after a 2 day trial period— performed without flaws.

Retrieval of registration and feedback form, as well as the sending of the previously mentioned questionnaire was automated through scripts. All other items on the website are and will be updated as appropriate.

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1.3 **Questionnaire**

As mentioned, a questionnaire was sent to each stakeholder at registration and could also be downloaded from the website.

The questionnaire, in MS Excel format, contained a request for rating of the ‘usefulness’ of each of the elements of the existing MEEuP methodology on a scale of 1 (=not useful) to 5 (=very useful). Furthermore there was the opportunity for open questions/remarks at the end of each of the 8 sections of the MEEuP methodology. Closing date for the questionnaire was 28 February 2011.

The MEEuP 2005 structure, which was the basis for the questionnaire is given below:

**Section 1. Definitions, standards and legislation**

1.1. Product Definition(s)  
1.2. Legislation (EU, Extra-EU and Member State level)  
1.3 Test standards (EU, Extra-EU and Member State level)

**Section 2. Economic and market analysis**

2.1. Generic economic data (Eurostat)  
2.2. Market and stock data (from sector specialist sources)  
2.3 Market trends  
2.4 Consumer expenditure base data (prices and tariffs)

**Section 3. Consumer behaviour and infrastructure**

3.1. Real life efficiency (actual demand, following behavioural aspects and infrastructure)  
3.2. End-of-Life behaviour (product life, repairs, second-hand use, etc.)  
3.3 Local infrastructure (installation restraints, energy supply reliability, communication restrictions, etc.)

**Section 4. Technical analysis existing products**

4.1. Production phase  
4.2. Distribution phase  
4.3 Use phase (product)  
4.4 Use phase (impact on surroundings)  
4.5 End-of-Life (materials flows for recycling, waste, etc.)

**Section 5. Definition of Base-Case**

5.1. Product specific inputs (Bill-of-Materials, volume, weight, energy and resources use, EoL scenario);  
5.2. Base-Case Environmental Impact (VHK EuP Ecoreport)  
5.3 Base-Case Life Cycle Costs  
5.4 EU-totals (of environmental impact and LCC)  
5.5 EU Total System Impact (compare above with other studies, e.g. EIPRO)

**Section 6. Analysis Best Available Technology (BAT)**

6.1 State-of-the-art in applied research  
6.2 State-of-the-art at component level  
6.3 State-of-the-art BAT outside the EU

**Section 7. Improvement Potential**

7.1 Design Options (identification and description)  
7.2 Impacts per option  
7.3 Design option costs (price increase)  
7.4 Analysis of Least LCC (LLCC) and BAT
Section 8. Scenario-, policy-, impact- and sensitivity analysis

8.1 Policy- and scenario analysis
8.2 Impact analysis industry and consumers
8.3 Sensitivity analysis of the main parameters

Over 50 stakeholders answered the questionnaire, of which 35 gave specific ratings. The respondents’ origin (industry, national contacts, individual companies) was fairly evenly distributed, but with a relatively high share of associations from the insulation industry and the metals industry. The share of contractors that worked on past and ongoing preparatory studies was small, reason for which the Commission extended the deadline for this group to the 4th- of April 2011.

The average score for the ‘usefulness’ of the MEEuP methodology was 3.75 (corresponding to 75% on a scale with 5=100%). Regarding the scores for the 8 sections, Task 1 (Definition, standards and legislation) was found relatively the most useful (score 83%) and Task 6 (BAT and BNAT) relatively the least useful (score 68 %). As regards the latter, several industrial stakeholders –especially the ones that had not been actively involved in preparatory studies thus far—feared that the BAT and BNAT proposals would not be realistic commercially. Overall the differences in task scores were small (see figure 1).

The questionnaire and full outcomes of the ratings, also per subtask, are given in Annex III.

![MEEuP Tasks ‘Usefulness’ score from Questionnaire](image)

**Fig. MEEp questionnaire ‘usefulness’ scores per task**

The 50 respondents generated over 300 questions/remarks in response to the open questions. These questions/remarks and the response of the contractor are listed in a feedback-log in Annex IV and will be released on the website.
Main improvement potential for the existing Methodology, following stakeholder comments, is in:

- More guidance in general
- Better consistency between (data in ) sections of the methodology
- Improved comparability between the (outcomes of) the different preparatory studies
- Review of the recycling methodology, i.e. fair playing field between metals and plastics (concern of the metals industry)
- Guidance on how especially construction products and other products with a long product life can be taken into account; and on how environmental characteristics can be identified in construction components embedded in the ‘system’ of buildings (concern of the insulation industry).
- Impression of several stakeholders that non-energy aspects are not or insufficiently taken into account (i.e. provide more background data to that effect)
- Poor quality of Prodcom data; necessity to obtain reliable market data

The key message from the stakeholders is that MEEuP is in fact a proven and effective methodology. The new MEErP can and should now focus more on the ‘how’ instead of the ‘why’.

1.4 Desk research

Subtask 1.4 entails a desk-research on the following subjects:

1. Retrieval of methodology-related comments in the preparatory studies and conception of a systematic report of these comments.
2. International review and analysis of public methodologies for assessing the improvement potential of a product’s environmental performance;

1.4.1 Methodology comments in the preparatory studies

As regards the methodology-related comments in the preparatory studies, there have not been any fundamental criticism on the methodology.

But there have been a few comments on the data—or lack of data— in the EcoReport tool:

- In the preparatory study ENER Lot 5 on televisions the authors found a difference between the Global Warming Potential of the 32” LCD tv display module from the Environmental Product Declaration by LG philips (326 kg CO2 equivalent) and the GWP data in the VHK EcoReport (52 kg CO2 equivalent. The writer states that VHK does not include the upstream processes for raw material. In reality, the VHK data are based on a later generation LCD plant, i.e. the Sharp Green Factory in Japan. ³

³ Related to this, the EEB (European Environmental Bureau, a green NGO) has issued a paper on alleged methodological flaws in the MEEuP methodology. The first flaw relates to the perceived omissions in the TV data mentioned above. The second flaw was found in the fact that in its Product Cases VHK had assumed a product life of 5-6 years for laptop computers, whereas a more recent Japanese study found that—although it may be true that consumers keep the laptop in the house for 5 or 6 years—in reality the laptop was actually used only 3-3.5 years. VHK finds the latter not a “flaw”, but just a case where new data has become available. It does not affect the fundamental methodology.
In the preparatory study ENER Lot 15 on solid fuel boilers, the consultant found that the Ecoreport did not contain all the necessary data for solid fuel combustion. Consequently the consultant had to perform his/her own analysis/retrieval of LCA data for the missing processes. However, the data and sources were not documented and could not be used in the new MEErP methodology report and EcoReport tool.

1.4.2 International review

Introduction
As regards the use of LCA-methodology in mandatory public legislation: The main conclusion is that EU is unique in applying an integrated ‘cradle-to-grave’ instrument like MEEuP that can lead to measures both for resources efficiency and environmental impacts. In other countries there is a strict division between MEPS (Minimum Efficiency Performance Standards) addressing the product design on one hand and end-of-pipe ELVs (Emission Limit Values) on the other hand.

However, the MEEuP is not unique in its approach of setting standards through Least Life Cycle Costs. In this respect the methodology is very much inspired by the US Dept. of Energy (DoE) approach for Appliance and Equipment Efficiency Standards (hereafter ‘Appliance Standards’).

Furthermore, MEEuP is not unique in assessing BAT levels as an input to product-related legislation. This is the core of - amongst others - the Japanese Top Runner program.

Both the US and Japanese programmes relate only to energy efficiency in the use phase of products, nevertheless they are presented hereafter as an illustration, with more details in Annex V.

Methodology applied by US Department of Energy’s Appliances and Commercial Equipment Standards Program
This programme started in the mid 1980’s and was developed originally in California (LBNL).

The analyses that DOE performs for rulemaking includes:

- **Market and Technology Assessment** to characterize the market (including manufacturers, shipments and trends) and to review technologies and approaches for making the covered product more efficient;
- **Screening Analysis** to evaluate technology options for improving efficiency that should not be considered further in the rulemaking because of issues with safety, utility, manufacturability or other defined criteria;
- **Engineering Analysis** to study the relationship between manufacturing a product to be more efficient and associated increases in the cost;
- **Energy Use and End-Use Load Characterization** to generate energy use estimates for the covered product in service and end-use load or consumption profiles;
- **Markup Analysis** to convert manufacturer prices to retail / installed customer prices;
- **Life-Cycle Cost (LCC) Analysis** to calculate, at the consumer level, the discounted operating cost savings over the average life of the product, compared to any increase in the retail / installed costs likely to result from the efficiency standard;
- **Shipments Analysis** to estimate shipments of the product over the time period examined in the analysis;
• **National Impact Analysis** to assess the aggregate impacts at the national level of consumer payback, net present value (NPV) of total consumer LCC, national energy savings (NES), and national employment;

• **Life-Cycle Cost Subgroup Analysis** to evaluate impacts on identifiable subgroups of customers who may be disproportionately affected by a national efficiency standard;

• **Manufacturer Impact Analysis** to estimate the financial impact of standards on manufacturers of the covered product and to calculate impacts on competition, employment at the manufacturing plant, and manufacturing capacity;

• **Utility Impact Analysis** to estimate the effects of proposed standards on the installed capacity and generating base of electric utilities (i.e., reduction in electricity sales);

• **Employment Impact Analysis** to estimate the impacts of standards on net jobs eliminated or created in the general economy as a consequence of increased spending on the more efficient products and reduced customer spending on energy;

• **Environmental Assessment** to evaluate the impacts of proposed standards on certain environmental indicators including CO$_2$; and

• **Regulatory Impact Analysis** to present major alternatives to proposed standards that could achieve comparable energy savings at a reasonable cost.

These analyses are all conducted over the three-year rulemaking period.

Preparatory studies for the US Appliance Standards follow more or less the same time-path (3-4 years) as the Ecodesign studies and cover more or less the same product groups. Only recently these product groups also include plumbing fixtures (toilets, showerheads, etc.). The average budget per preparatory study is between $3 and $5 million, roughly 10-fold the Ecodesign projects’ budgets. Studies are conducted by either national laboratories or private consultants, whichever is the most knowledgeable in a particular sector. The total US DoE budget for the Appliance Standards programme is around $40 million annually.

In **Annex V** the latest US developments in this field are discussed in more details.

**Methodology applied by the Japanese Top Runner programme**

Also included in Annex V in more detail is the approach of the Japanese Top Runner programme, The Top Runner programme is similar to the US Appliance Standards programme (and dissimilar to the EU Ecodesign) in its focus on technology and the way it deals with test standards.

In most other ways, Top Runner differs from both the US and the EU approaches. The preparation of target levels, based on current BAT levels and a projection of how long it will take for most of industry to reach these levels, is the almost exclusive domain of a subcommittee with 8 of the foremost technical experts from industry and research institutes. Reporting, i.e. the rationale for a decision, is limited, as is the involvement of stakeholders outside the Subcommittee.

**Comparison to the MEEuP EU Ecodesign Methodology**

A similar approach to the US Appliance Standard methodology was introduced in the EU for preparatory energy labelling studies (SAVE program) in the beginning of the 1990s. The main pillars of the approach are the market analysis, the economic Life Cycle Cost calculation, the technical analysis of BAT and BNAT and scenario analysis. This approach was successful in producing product-related legislation at both sides of the Atlantic and in 2004-2005 the MEEuP used as much as possible elements of this approach. However, there are some differences:

In the US Appliance Standards methodology, compared to the MEEuP, there is less focus on existing standards and legislation (MEEuP Task 1) and more emphasis on the economics for the consumer
(MEEuP Task 3 and 5) and on the technology (MEEuP Tasks 4 and 6). The DoE environmental analysis is very limited compared to the MEEuP effort, which is based on a holistic LCA approach. Finally, the DoE methodology includes a ‘Utility Impact Analysis’, whereas in the EU approach a specific study on the effects for utilities is not part of the assessment.

The Japanese Top Runner methodology, compared to the MEEuP, is based on the expert-assessment of the BAT level and an expert-assessment of when it would be feasible to set this BAT level as a minimum requirement for the market. The experts may be aided by some short studies, but essentially the selection of the technical top-experts, with their networks, is the crucial part. In this sense, it is completely different from the formal EU and US procedures that are primarily process oriented.

1.5 Stakeholder meeting

On the 9th of September 2011, at the Centre Borschette in Brussels, VHK organised a stakeholder meeting. Invitations were sent to all registered stakeholders and eventually the meeting was attended by 44 participants.

At the meeting the draft reports (project report, methodology reports Part 1 and 2) were presented. Overall, most stakeholders reacted positively to volume and quality of the work. Specific stakeholders addressed concern e.g. over the recycling approach (metal industry, DG JRC-IES), the primary energy factor for power generation (Norway), the presentation and role of product life extension and convergence of product functions (UK, consumer associations), the REACH indicator (Germany), the product pricing model (EEB, CLASP). Also there were requests for extending the work regarding a full LCI documentation of the unit indicators, a full Excel scenario tool, etc. (Germany).

The minutes, feedback log and slided documents pertaining to this meeting can be found on the project website www.meerp.eu and in the following Annexes:

- **ANNEX VIII**: Minutes, Stakeholder meeting 9.9.2011
- **ANNEX IX**: Written comments following Stakeholder meeting 9.9.2011, Feedback log
- **ANNEX XII**: Slides hand-out, Stakeholder meeting 9.9.2011

1.6 Other issues

One of the requirements in the study contract is that the MEErP reports should be self-standing, i.e. there would be no need to refer back to parts of the MEEuP report. To this end, an updated version of the MEEuP 2005 report on the Domain of Eco-design (Chapter 2 of the MEEuP 2005 Methodology Report) and the ECCP 2003 tables (Appendix II of the MEEuP 2005 Methodology Report), which both are considered valuable but not fitting the current MEErP 2011 format, are included in **ANNEXES VI and VII** respectively.

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4 In that sense, DoE experts consider the (development of) test standards as much part of the legislation as the official Bill.
ANNEX I

List of stakeholders (1.7.2011)
<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
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<tbody>
<tr>
<td>ADEME - French Environmental and Energy Management Agency</td>
<td>Government</td>
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<td>AEA</td>
<td>Expert / Consultant</td>
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<td>AIRWELL Group</td>
<td>Manufacturer / importer</td>
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<td>AMD</td>
<td>Manufacturer / importer</td>
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<td>AMDEA</td>
<td>Industry / trade association</td>
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<td>Andreas STIHL AG &amp; Co. KG / EGMF</td>
<td>Manufacturer / importer</td>
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<td>ANEC/BEUC</td>
<td>NGO</td>
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<td>ArcelorMittal</td>
<td>Manufacturer / importer</td>
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<td>ARGE European Association of Lock- and Hardware Manufacturers</td>
<td>Industry / trade association</td>
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<td>ATLANTIC</td>
<td>Manufacturer / importer</td>
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<td>BAM Federal Institute for materials research and testing</td>
<td>Member State - surveillance auth.</td>
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<td>Bayer MaterialScience AG</td>
<td>Manufacturer / importer</td>
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<td>BDEW</td>
<td>Industry / trade association</td>
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<td>BEUC, The European Consumers' Organisation</td>
<td>NGO</td>
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<td>Bio Intelligence Service</td>
<td>Expert / Consultant</td>
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<td>Bosch Thermotechnik GmbH</td>
<td>Manufacturer / importer</td>
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<td>Boverket</td>
<td>Expert / Consultant</td>
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<td>BRE</td>
<td>Expert / Consultant</td>
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<td>British Water</td>
<td>Industry / trade association</td>
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<td>BSH Bosch und Siemens Hausgeraete GmbH</td>
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<td>Bundesverband Elektrogroßhandel</td>
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<td>CECED</td>
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<td>CECOF European Committee of Industrial Furnace and Heating Equipment Associations</td>
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<td>CENELEC TC 17B</td>
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<td>CLASP</td>
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<td>Confederation of Norwegian Enterprise (NHO)</td>
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<td>Dell Inc</td>
<td>Manufacturer / importer</td>
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<td>DIHK - Association of German Chambers of Industry and Commerce</td>
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<td>Enertech AB</td>
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<td>Expert / Consultant</td>
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<td>EUROFER</td>
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<td>Europäische Feuerstätten Arbeitsgemeinschaft</td>
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<td>European Aluminium Association</td>
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<td>European Climate Foundation</td>
<td>Environmental organisation</td>
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<td>European Copper Institute</td>
<td>Industry / trade association</td>
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<td>European Garden Machinery industry Federation (EGMF)</td>
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<td>European Heating Controls Alliance</td>
<td>Manufacturer / importer</td>
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<td>Industry / trade association</td>
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<td>Eurovent</td>
<td>Industry / trade association</td>
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<td>FEA Zurich</td>
<td>Environmental organisation</td>
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<td>FGK Fachverband Gebäude-Klima e.V.</td>
<td>Industry / trade association</td>
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<td>Finnish Association of Mechanical Building Services Industries</td>
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<td>Fraunhofer IZM</td>
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<td>HKI - Industrial Association</td>
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ANNEX II

Website
MEErP 2011 PROJECT REPORT FINAL

Welcome

Welcome to the website of the study for the Update of the Methodology for the Ecodesign of Energy-usingProducts (MEErP). This study will provide the European Commission with an update and an extension of the existing methodology of MEErP to arrive at a Methodology for the Ecodesign of Energy-related Products (MEErP). To be used in future preparatory studies for measures under the recast of the EcoDesign Directive 2009/125/EC.

The study is being carried out for the European Commission, under the Framework Contract TREN/2009/1000-2008 Lot 3, Specific Contract No. T2009/1000, by TCE. Begun in 2009 and due to be delivered September 2011.

The study started in January 2011 and is expected to deliver final results in

Task description

Task 1 actively solicits input from stakeholders and experts. The output of the project website will be complemented by a general questionnaire and evalutation is to be published. Registered stakeholders will be invited to post comments through the website. The study involves a questionnaire, inputs to its on line form in February 2011.

Task 3 and its aim to improve the structure and effectiveness of the methodology. The study involves a review of the framework, activities, and results in that context. The existing methodology (MEErP) will be reviewed and ongoing work will be assessed.

The focus of Task 2 is to develop an approach that allows stakeholders to assess environmental and technical impacts of products, to which the existing methodology would be applied. The task will include a discussion on the link between the existing methodologies and ongoing work in the field.

FAQ

What is the structure of the MEErP mentioned in Task 3?

What are Energy-related products?

The MEErP report that has been used is a consensus study over the last 5 years, developed in 4 project-specific sections:

1. Product Performance and Environmental Impact of Energy-Related Products
2. Energy and Market Analyses
3. User Requirements and Systems Environment
4. Technical Analysis Existing Products
5. Environmental and Economic Assessment of New Products
6. Technical Analyses with and without Taxation
7. Ecodesign Improvement Options

The project involves a focus on the analysis of Task 2, but, in addition, may also occur as a result of the underlying study.

Why should stakeholders be involved?

The Commission is determined in engaging stakeholders in the opportunity to provide input into the study thereby covering a fully transparent and open process. This project is a test innovation exchange platform between the stakeholders, the Commission and the other leading stakeholders.

All data on the website will be freely available through the website, but if you register as a stakeholder, you will receive further information, updates, and networking opportunities. As stakeholders, you can provide direct feedback to draft reports published on this website and provide suggestions for energy-related products and services. The information from your comments and suggestions may be made public on this website.

When most of the task reports are available, it will be a meeting with stakeholders who will take place in the coming months. The meeting will be a closed meeting at the European Commission.

(* See also the forthcoming Methodology study, Ecodesign of energy-using products (MEErP), published in... Final Report, September 2011.)
**Planning**

The study has started in January 2011 and will run for approximately 19 months. The table below gives an indicative timeline for the coming tasks. Please note that the timeline is subject to change and may be updated during the course of the study. Those who have registered through this website will be informed of website updates, meetings and availability of (draft) documents.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description Task/Result</th>
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<tbody>
<tr>
<td>Jan 2011</td>
<td>Project start</td>
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<tr>
<td></td>
<td>Launch website <a href="http://www.meerp.eu">www.meerp.eu</a>.</td>
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<td>General notifications/invitations to register.</td>
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<td>Registration of stakeholders.</td>
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<td>May 2011</td>
<td>Draft report Task 1-3.</td>
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<td>Jul 2011</td>
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<td>Minutes of stakeholder meeting published on website.</td>
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<td>Sep 2011</td>
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**Meetings**

During the study, stakeholders will be invited to a stakeholder meeting discussing draft final results. According to the current time plan, which may be subject to change, the meetings are tentatively planned for July 2011 (subject to room availability at the Commission’s premises).

To open PDF documents a PDF reader is required.

Current status: The exact dates of Meetings have not been announced yet.

**Working documents**

This section presents the working documents published so far. We welcome your comments and suggestions on these working documents as this will help us improving them and will allow the Commission to take note of your views.

Please use the feedback form to relay your comments to the project leader. Note that your comments can be included in draft and final reports.

To open PDF documents a PDF reader is required.
ANNEX III

Questionnaire & Rating
Questionnaire

Evaluation of the existing Methodology (MEEuP)/ suggestions for change nr. 000

Registered Stakeholder:

Name: 

Organisation: 

E-mail address: 

The Methodology for Ecodesign of Energy-using Products (MEEuP) consists of 8 sections and -- per section-- 3 to 5 subsections.

Please give your score on the usefulness of each subsection (1=not useful; 5=very useful) by filling in an 'x' in the appropriate box. Filling in the whole questionnaire (without remarks) takes under 10 minutes.

After filling in the questionnaire, please send the Excel file as an attachment to an e-mail with subject 'MEERPQ’ to m.van.der.voort@vhk.nl

Detailed comments and suggestions may be placed in the 'Remarks' textbox per main section (maximum 255 characters) and/or in the 'Extended remarks' textboxes at the end of the questionnaire.

Stakeholders wishing to add pictures, diagrams, etc. may do so by separate e-mail to m.van.der.voort@vhk.nl

The questionnaire runs from until 1 March 2011. Questionnaires received after this date cannot be taken into account in the draft Task 1 report

Please note that comments may be quoted in the public domain (i.e. in the draft reports) and that the identity of the sender or its affiliation may be disclosed at the discretion of the researchers, i.e. when it may serve a better understanding of the message. By sending in this questionnaire you agree to these conditions.

Section 1. Definitions, standards and legislation

1.1. Product Definition(s) 

1.2. Legislation (EU, Extra-EU and Member State level) 

1.3 Test standards (EU, Extra-EU and Member State level) 

Remarks (max. 255 characters)
Section 2. Economic and market analysis

2.1. Generic economic data (Eurostat) 1 2 3 4 5
2.2. Market and stock data (from sector specialist sources) 1 2 3 4 5
2.3 Market trends 1 2 3 4 5
2.4 Consumer expenditure base data (prices and tariffs) 1 2 3 4 5

Remarks (max. 255 characters)

Section 3. Consumer behaviour and infrastructure

3.1. Real life efficiency (actual demand, following behavioural aspects and infrastructure) 1 2 3 4 5
3.2. End-of-Life behaviour (product life, repairs, second-hand use, etc.) 1 2 3 4 5
3.3 Local infrastructure (installation restraints, energy supply reliability, communication restrictions, etc.) 1 2 3 4 5

Remarks (max. 255 characters)

Section 4. Technical analysis existing products

4.1. Production phase 1 2 3 4 5
4.2. Distribution phase 1 2 3 4 5
4.3 Use phase (product) 1 2 3 4 5
4.4 Use phase (impact on surroundings) 1 2 3 4 5
4.5 End-of-Life (materials flows for recycling, waste, etc.) 1 2 3 4 5

Remarks (max. 255 characters)
Section 5. Definition of Base-Case

5.1. Product specific inputs (Bill-of-Materials, volume, weight, energy and resources use, EoL scenario) 1 2 3 4 5

5.2. Base-Case Environmental Impact (VHK EuP Ecoreport) 1 2 3 4 5

5.3 Base-Case Life Cycle Costs 1 2 3 4 5

5.4 EU-totals (of environmental impact and LCC) 1 2 3 4 5

5.5 EU Total System Impact (compare above with other studies, e.g. EIPRO) 1 2 3 4 5

Remarks (max. 255 characters) 

Section 6. Analysis Best Available Technology (BAT)

6.1 State-of-the-art in applied research 1 2 3 4 5

6.2 State-of-the-art at component level 1 2 3 4 5

6.3 State-of-the-art BAT outside the EU 1 2 3 4 5

Remarks (max. 255 characters) 

Section 7. Improvement Potential

7.1 Design Options (identification and description) 1 2 3 4 5

7.2 Impacts per option 1 2 3 4 5

7.3 Design option costs (price increase) 1 2 3 4 5

7.4 Analysis of Least LCC (LLCC) and BAT 1 2 3 4 5

7.5 Long term targets (BNAT: Best Not yet Available) 1 2 3 4 5
Technology, incl. system effects)

**Remarks** (max. 255 characters)

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<td>8.3 Sensitivity analysis of the main parameters</td>
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**Remarks** (max. 255 characters)

*If needed: Extended remarks* (max. 255 characters per cell; add cells as necessary)

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average score (1-5)  | **4.48** | **3.97** | **4.03** | **4.38** | **4.13** | **3.81** | **3.32** | **3.58** | **3.84** |

average score (5=100%) | 90% | 79% | 81% | 70% | 83% | 76% | 66% | 77% | 75% | 72% | 69% | 63% | 85% | 83% | 72% | 72% | 77% | 75% | 74% | 72% | 65% | 65% | 74% | 77% | 77% | 76% | 79% | 62% | 75% | 82% | 79% | 75% | 3.74

0
ANNEX IV

Feedback log
(Q&A from questionnaire)
### MEErP Feedback Log.

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<th>Section</th>
<th>Name</th>
<th>Stakeholder Comment</th>
<th>Study team reaction</th>
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<td>Section 1. Definitions, standards and legislation</td>
<td>Member state</td>
<td>Legislation must be taken at the appropriate level (principle of subsidiarity)</td>
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<td>Section 1. Definitions, standards and legislation</td>
<td>Member state</td>
<td>The scope of the tender should be clear so that the study cover the intended product groups = more effective study. There have been some misunderstanding in previous studies</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Member State - surveillance auth.</td>
<td>Definitions should be tailored to be directly usable in legal texts. Analysis of the legislation outside EU should include the benchmark of minimum requirements.</td>
<td>Noted, a preliminary definition will be provided in task 1, a consolidated definition in task B.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Member State - surveillance auth.</td>
<td>Generally very good, but needs explicit extension to the affected energy systems, as follows: RE 1.1: In the extension to ERP, the definition of the Functional Unit / System performance will be of outstanding relevance. The quantified performance of the product is related to the overall system, i.e. the ERP and the changes of the specific energy system. It needs reproducible rules to quantify these changes and to ensure comparability of the qualitative and quantitative aspects of the functional unit. The ERP-energy system relationships must be defined per ERP group and reflected in EcoReport tool. The &quot;ILCD Handbook - General guide for LCA&quot; provides concept and basic guidance on this (search for &quot;system-system relationship&quot; and &quot;part-system relationship&quot;). In the MEErP method report this needs a new, own sub-section after 1.1. RE 1.2: needs addition of legislation on the affected energy-systems. RE 1.3: should include those test standards for the energy systems that are affected by the ERP.</td>
<td>In the extension to ERP, we will take into account the definition of the ERP system and the ERP system relationship between ERp and EuP.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Environmental organisation</td>
<td>Link as much as possible the product definition(s) with the possible scope(s) of the implementation measures, providing arguments to group or consider separately the different product types belonging to the concerned category.</td>
<td>We will address the subject of product grouping in MEErP.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Environmental organisation</td>
<td>very important in order to harmonize with existing instruments (legislative and voluntary). In some sectors it becomes difficult to keep the entire picture over pre-p studies and regulation under the Eco design Directive (e.g. motors; cooling). Can MEErP and thus individual prep studies help to keep track (or only on higher level - e.g. COM)? Scope, definitions and measurement methods should ideally be prepared for copy-paste into regulations.</td>
<td>Agreed, but consistency could be problem. MEErP will try to provide as much as possible background/reference info to harmonize reporting</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Environmental organisation</td>
<td>Definition - describe with clearest coverage possible; Legislation - explicitly look for harmonisation opportunities, consult with other regulators; Test standard - complete test method before the preparatory study, so efficiency metric is known</td>
<td>Noted. (though in practice not always possible due to flaws in standards)</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Expert / Consultant</td>
<td>Already the product definitions should as far as possible focus on the function of a product, in order to pave the way for more technologically independent requirements.</td>
<td>Agreed, but the definitions trend to change as the study progresses</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Industry / trade association</td>
<td>It would be more accurate to title 1.1 ‘Existing Product Definitions’ since the work involved here entails listing definitions from existing categorisations, e.g. Prodcom, standards, labelling schemes, etc. Regarding section 1.3, we believe that there should be far more dialog between consultants and ESOs, preferably including discussions with relevant technical committees. Staying with section 1.3, this should not just be limited to test standards; there may, for example, be standards pertaining to performances management systems or production/supply chain practices that could be drawn upon. A further section, Section 1.4 Scope, should be introduced, on the basis of the work-plan and in the tender document, to clearly establish the products the consultants have decided to focus upon and their reasoning for this. Reasons should also be given when certain products are considered out of the scope of the study. Test standards should be developed by competent standardization bodies. Mandates should be timely provided to ESOs to avoid that the consultants face situation where no standards is available to assess the impact of the product and develop requirements/policy proposals. Any quick and dirty drafting of standard by the consultants.</td>
<td>Noted.</td>
</tr>
</tbody>
</table>
without previous discussion and agreement by product experts should be avoided.

<table>
<thead>
<tr>
<th>Section 1. Definitions, standards and legislation</th>
<th>Industry / trade association</th>
<th>Accelerate Entry in Force of ErP Lot 1, Lot 10 DG TREN and Lot 6 DG ENT</th>
<th>No comment on MEErP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Industry / trade association</td>
<td>1.1. The product definition seems more like a &quot;guideline&quot; and is not treating individual products in a right manner. A more precise product definition would be better. 2.2+2.3 Problem: There is no harmonization and for most products the test standards contains not yet measuring methods for energy consumption or efficiency.</td>
<td>Unless products have undergone a legal scrutiny in another context in the past (e.g. in labelling under 92/75/EC) the existing definitions in test standards, PRODCOM, handbooks, etc. are very often not 'precise' enough for application in Ecodesign measures. As a result, the definition evolves during the prep. study in an iterative process, as all actors get a clearer idea of the shortcomings, legal pitfalls, exceptions, etc.. Nonetheless, Task 1 should at least provide a very good starting point of this process.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Industry / trade association</td>
<td>National test standards should not be permitted in the context of Eco design. The NACE code helps to cluster products.</td>
<td>The existence of national test measures might be of interest for certain product groups. NACE provides statistics of economic activities. Prodcom is preferred, because product statistics.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>1.1 - We find the product definition essential in providing clear and robust definitions for eventual implementing measure.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>1.2 - Although we recognize the merit existing voluntary schemes might have in view of the study, we would like to caution that their objective can be quite different from the objective of an eventual implementing measure</td>
<td>Noted</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>1.1. Should read &quot;Product Scope&quot;</td>
<td>OK</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>Standardization activities shall be started very early (by means of Mandates from the EU Commission). There must be a close coordination between Lot-Studies and standardization work. We fully support the way forward by the EU Commission in 2010 related to the so called &quot;horizontal mandate&quot;.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>Legislation and standards at EU level are very useful, but not so much at member state / extra EU level, since they may not have been adopted with as much balanced stakeholder consultation and/or consideration for other member states.</td>
<td>Legislation and standards at Member State and third country level can inspire future EU standards or legislation and can provide an inside on current activity in the Member States/Third Countries.</td>
</tr>
<tr>
<td>Section 1. Definitions, standards and legislation</td>
<td>Manufacturer / importer</td>
<td>Extra-EU legislation is of lesser importance</td>
<td>See above</td>
</tr>
</tbody>
</table>
1.1 follow hEN's, harmonised product standards, for the product definitions.

1.2 We have, even overlapping legislation, on EU level: HOWEVER sustainability/environmental performance for products s not well understood: it is not able to capture these performances in 1 figure and certainly not for intermediate products!

MEErP does, in as much as they are accurate, unbiased, non-contradictory, realistic, etc.

MEErP does not weight environmental impacts in one figure, but presents results on several environmental impacts. The Ecodesign Working Plan defines the list of priority product groups (to which a CE mark may be affixed).

The customer benefit of a product or products group might be a helpful way of defining products. The NACE code helps to cluster products

See above

1.1: Product definitions should follow harmonised product standards.

See above

1.2: EU Legislation exists, but performances of construction (intermediate) products cannot be simplified.

Noted

1.3: Standards (CEN, ISO) exist for CONSTRUCTION PRODUCTS and WORKS (BUILDINGS)

We are aware of the existence of these standards

The method is written for EuP's but less usable for ErP's. There are too many factors influencing the energy consumption and influencing environmental impact that generalisation will lead to wrong conclusions.

The current methodology is written for energy using products and will be updated and adjusted, to make the methodology suited for energy related products

Eurostat data are often out-dated or it doesn't answer the right questions. Regular market monitoring instead of market snapshots are needed to make the proposed requirements adequate and to explore the efficiency potential as far as possible.

Eurostat data is indeed often out-dated, incomplete or not congruent with the scope. We agree that additional market information is needed.

Most of the data is inaccurate because the grouping of the collected data is not congruent with the scope of the lot (e.g., prodcom / lot scope). Attention: B2C - consumer, B2B - customer

Eurostat data is indeed often out-dated, incomplete or not congruent with the scope. We agree that additional market information is needed.

RE 2.1-2.3: fine with us. RE 2.4: should explicitly cover the affected energy systems. General: We underline the role of the "average product life", whose relevance should be underlined. Assumptions about the product life strongly influence all the following estimations and common rules should be defined.

We will take this into account

Reliable data collection is difficult, the idea should be to establish here some methodology to ensure a continuous monitoring and update of data to avoid data obsolescence and enable market analysis without launching a new study each time.

Continuous monitoring of all Ecodesign products will produce more reliable data, however it is more a budget matter than a methodological matter

Systematic market monitoring (based on Energy label classes, on Europe- and on country-level) is needed to base decisions upon and to monitor the success of implemented measures. This however does no need to be conducted within the study, but the existence of such analysis would be crucial.

Continuous monitoring of all Ecodesign products will produce more reliable data, however it is more a budget matter than a methodological matter

assumptions between prep studies vary regarding electricity prices, discount rates, etc. This makes comparison and overall analysis difficult. (Harmonisation?) Within prep study assumptions should be made more clear and easy to find (e.g. standardised table) on e.g. replacement rates of the different product subgroups, growth of stock of the different product subgroups, rebound effects and other influencing factors. Options to be discussed how crucial data may be updated after finalisation of prep study (for political process of drafting IM).

We will try to provide harmonized& standard data/ rates/reporting tables, to be used throughout all studies as much as possible

Other factors influencing market trends in the future (e.g. EPBD and its implementation at MS level) should be considered; identify major manufacturers; discuss supply-chain, how product is specified / selected; discuss energy label (if applicable)

Noted, but already largely foreseen
<p>| Section 2. Economic and market analysis | Consumer organisation | Eurostat data are sometimes inaccurate/out-dated. Data from industry should be cross-checked (e.g. catalogues). Solutions should be provided and put in place with the EU Commission to ensure a continuous (or regular) market monitoring instead of just at the time of the study (very important pb of obsolescence of market data when discussing implementing measures) | Indeed data from the industry should be used to refine the Eurostat data. |
| Section 2. Economic and market analysis | Expert / Consultant | The data used in this section should be made available in a public database. Not the results, but the source data, including names of the specific sources. | Objective is to write a report for policy makers, following the normal procedures for traceability of the origin, unless copyright prohibits. |
| Section 2. Economic and market analysis | Manufacturer / importer | 2.4 - Prices and tariffs can vary strongly between Member States. Furthermore, in a fastly evolving and globalizing market the prices and tariffs are ever changing. | Agreed. But for EU we will try to present single standard data-sets as much as possible. |
| Section 2. Economic and market analysis | Industry / trade association | The data gathered is a fundamental aspect. An objective and comprehensive assessment of the market under examination needs to be carried out by the consultant using reliable sources. | We agree that reliable sources need to be used. |
| Section 2. Economic and market analysis | Industry / trade association | Eurostat Sources are not always enough to carry out the requested study; therefore, the Commission before awarding the Study Contract should ensure that the consultant has access to comprehensive and accurate data, either purchased from a reliable source or acquired through an in depth investigation. | Agreed. |
| Section 2. Economic and market analysis | Industry / trade association | The 200.000 units in the Ecodesign Directive is indicative. | |
| Section 2. Economic and market analysis | Industry / trade association | sometimes a bit overloaded with data’s not really helpful | It is the task of the consultant to limit the economic and market analysis to the necessary data. |
| Section 2. Economic and market analysis | Industry / trade association | It is our experience, Eurostat data concerning capital goods sometimes are inconsistent and do not match the data available within the relevant industry associations. Therefore the data should be verified in an early stage of the application of the MEEUP before proceeding with the methodology. | Agreed. Stakeholder involvement is vital. |
| Section 2. Economic and market analysis | Industry / trade association | Concerning stock data (chapter 6.6.) it has to be said that the market behaviour of private consumers differs significantly from the behaviour of industrial clients. This is not adequately reflected in the methodology. | We will mention this in the MEEUP |
| Section 2. Economic and market analysis | Industry / trade association | 2.1 No real-life scenario. Often these data are totally misleading. 2.3 A description of current trends is useful. Future trends are often not foreseeable and to focus on these not foreseeable trends to describe BNAT can be misleading and constrain the free choice of technology for future R&amp;D. 2.4 Average values or prices for the whole EU are far away from reality as they often differs enormous from MS to MS especially in comparison of the western and eastern MS. | 2.1. A real life scenario is essential and --with all help from stakeholders-- should be assessed. 2.3 BAT is used to calculate the savings potential in the base cases. BNAT is not used for calculations and is mentioned for further insights into long term possibilities. 2.4. Deviations to average prices are subject of the sensitivity analysis. |
| Section 2. Economic and market analysis | Industry / trade association | Eco-design is shaping the market. It is critical to have good data so that measures proposed are adequate and proportionate. | Noted |
| Section 2. Economic and market analysis | Industry / trade association | Very difficult to address. Example: MEEUP document states that copper scrap demand is low, price is falling and thus scrap refineries closing down. This is very wrong information and should not be used as basis for policy making. | Agreed. The copper scrap demand is indeed not low, this will be corrected in the new MEEUP. |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | It is essential to gain understanding of the market before initiating regulatory proposals. | Agreed. |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | Knowledge of the inventory of products in use (or post-use stored) in society is important to estimate the material flows available for end-of-life valorisation. | Agreed. |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | 2.1 handle with care; Eurostat data do not go down to the level of product groups / do not align necessarily with the standardised product families | This is a known problem, the consultant of a preparatory study should handle this. |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | It is essential to gain as much market data as possible before adopting legislation. Indeed, if insufficient market data is available, no legislation should be adopted. Life cycle Costs data will be very helpful. | Indeed it is essential to gain enough market data, but the consequence that no legislation is allowed without it, goes too far (e.g. data based on stakeholder consensus can also be sufficient if there is no other option). |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | No unit of measure defined for ErP but it clearly is not a piece. For insulation it might be one m2 with an insulation value of R=1. No reliable statistics are available based upon this Um. | The unit of measurement will of course depend on the product, e.g. m2. |
| Section 2. Economic and market analysis | Manufacturer / importer | Manufacturer / importer | Manufacturer / importer | Eurostat data do not go down to product group level / do not always correspond with the standardised product families (same for 2.2). | That is indeed a problem, therefore data is needed from stakeholders |
| Section 3. Consumer behaviour and infrastructure | Member State - surveillance auth. | Member State - representative | Member State - surveillance auth. | The dependence on industry data is a problem and it would be good to complement them with data from, e.g., monitoring, consumer and energy authorities/agencies. End of life behaviours is important, but this is not exclusively the responsibility of Eco design studies. Real-life consumption is extremely important in order to verify/develop testing procedures, etc. | Noted. In fact, one of the practical results from section 3 could be, if applicable, a clear mandate to the standardisation authorities to bring the test and measurement standards closer to real life, e.g. using specific load profiles and real-life oriented calculation methods (instead of simple steady-state). Several studies have addressed this issue. |
| Section 3. Consumer behaviour and infrastructure | Member State - representative | Member State - surveillance auth. | Member State - surveillance auth. | The local conditions and building infrastructure have not been taken into consideration in some of the studies e.g. lot. 1 and 2. Attention: B2C - consumer, B2B - customer | Task 3 of the Lots mentioned makes an extensive study of local infrastructure, but the translation into measures is outside the MEErP scope. |
| Section 3. Consumer behaviour and infrastructure | Member State - surveillance auth. | Member State - surveillance auth. | Member State - surveillance auth. | Generally very good, but needs extension to affected energy systems. User’s behaviour and operational conditions are decisive for the assessment of ER P: it is generally not possible to directly measure the efficiency of ER P (e.g. a window, insulation material) as this is related on how and where the product is installed and used. This means also that e.g. climate and other factors are to be added (designed for use in EUROPE), preferably differentiated between e.g. Greece and Finland (thinking of insulation materials, windows), while acknowledging that this relates to the entire EU market. The product life time mentioned earlier should be coordinated with the one here. | Noted. As mentioned, we will try to provide standardised data also on climates, e.g. like the ones used in ENER Lot 1, 2 and 10. |
| Section 3. Consumer behaviour and infrastructure | Environmental organisation | Environmental organisation | Environmental organisation | Again, the reliability of data and representativeness is a challenge here, we need more continuous monitoring rather than a “one time collection”. When assumptions are needed, do not systematically consider a full implementation and respect of existing related legislation (such as WEEE, RoHs for EuP), as this creates flaws in the final conclusions about potentials. | Noted. See answer to earlier similar question. |
| Section 3. Consumer behaviour and infrastructure | Environmental organisation | Environmental organisation | Environmental organisation | More emphasis is needed on Task 3. Many studies only poorly develop this chapter. MEErP could give more guidance. | Noted |
| Section 3. Consumer behaviour and infrastructure | Environmental organisation | Environmental organisation | Environmental organisation | Understanding how products are used ‘in the field’ is critical for good analysis and MEPS, including operating hours, peak-coincidence. Energy prices and price projections must be part of 3.3. | We will make the subject of load profiles and other possible outcomes of Task 3 more explicit in the new methodology. |
| Section 3. Consumer behaviour and infrastructure | Expert / Consultant | Expert / Consultant | Expert / Consultant | In principle important but value is determined by reliability of data sources and there is no reflection of the wide range of actual user demands for most products | Noted |
| Section 3. Consumer behaviour and infrastructure | Expert / Consultant | Data for energy price need to be handled more comparable between prep. studies. Assumptions should be added about the possible developments for the next 5 to 10 years. If the usage patterns differ significantly from country to country, this should be investigated for the following tasks. | Agreed. We will provide standardised data as much as possible. |
| Section 3. Consumer behaviour and infrastructure | Consumer organisation | Task 3 of studies are usually weak and too much dependant on industry data. More time and guidance needs to be put here. End-of-life behaviour is often neglected. Issues such as extending product lifetime, planned obsolescence... are not questioned. | Noted |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | These are all very useful items to consider in a study. The limitations of behavioural investigations need to be clearly stated, however, as do any constraints experienced in gathering data (e.g. limited test runs, little previous research to draw upon). | Noted |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | Real life behaviour, as much as market data, should be assessed on the basis of reliable investigation covering the largest possible number of countries, specificities and product categories. No conclusion and measure should be drafted on the basis of consumer behaviour assumptions, which are not backed by accurate surveys. | Agreed, but for some sectors no (reliable) data are available and budgets do not allow active market research |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | In the case of Industrial Furnaces, life expectancy, real life efficiency etc. are very difficult to outline because of the extremely large diversity of furnaces and processes they are installed on. | Noted, but the sensitivity analysis can take these issues into account (Task 8) |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | More public promotion is needed | It is not clear what is intended; if the comment relates to the publicity around the prep. study then suggestions on extended stakeholder consultations are welcome. At the moment the efforts constitute of website, notification of known stakeholders, publication of draft reports, feedback logs and review reports, registration stakeholders &amp; follow-up, 2 to 3 plenary meetings, sometimes also several smaller committee meetings with stakeholder technical experts, etc.. |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | Consumer behaviour have a huge impact on energy use during use phase. It is important to properly assess behaviour and bring forward solution that minimise their impacts | Agreed. |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | First and foremost a product has to meet demand in terms of performance, convenience and safety. The environmental impacts are usually the most important during the use phase, hence the lesser importance given to end-of-life behaviour | Agreed. |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | Current methodology is inconsistent and discriminatory since EoL credits are applied to plastics but not to metals. Please refer to ILCD handbooks to review the LCA methodology. | As in MEErP also long-life plastic products (e.g. window frames and sewage pipes) come into play we will adjust the standard scenario's for plastics to accommodate the stock effect (--&gt; limitation in specific recycling because the products are still in use). This should create level playing field between plastics and metals |
| Section 3. Consumer behaviour and infrastructure | Industry / trade association | Integrating recyclability dimension in the product environmental assessment is essential. | Recycling is fully integrated in MEErP/MEEuP. |
| Section 3. Consumer behaviour and infrastructure | Manufacturer / importer | The previous Eco design studies have demonstrated that the majority impacts occur in the use phase. Therefore it is essential to gain as much information as possible for this phase, including aspects of installation, operation and repair. | Noted. But there will be products where energy is not the main concern (e.g. water-using products) |
| Section 3. Consumer behaviour and infrastructure | Manufacturer / importer | Analysis of consumer behaviour versus these applied as scenario applied in the modelling are important for revealing the margin of error on the models outcome or conclusions. | Sensitivity analysis shows how measures impact real-life use |
| Section 3. Consumer behaviour and infrastructure | Manufacturer / importer | Majority impacts occur in the use phase. Therefore it is essential to gain as much information as possible for this phase, including aspects of installation, operation and repair. For sectors and products PCR, product category rules help to normalize comparable life cycle stages. | The current methodology doesn't concern construction products. The new methodology will consider these comments. |
| Section 3. Consumer behaviour and infrastructure | Manufacturer / importer | Hard to connect these issues to ErP's like insulation. | User behaviour may play less a role, but local infrastructure, climate, etc. will be important also for insulation |
| Section 3. Consumer behaviour and infrastructure | Manufacturer / importer | This section lacks guidance. | Noted. The update of the MEEUP will provide more guidance on this section. |
| Section 4. Technical analysis existing products | Member State - surveillance auth. | All kind of products (in the scope) need to be analysed | Noted. The update of the MEEUP will make clear that task 4 is not only focussing on life cycle phases but also on the technical description of products in the scope. |
| Section 4. Technical analysis existing products | Member State - representative | Generally mostly good, but again explicit inclusion of affected energy systems needed and more differentiate material and EoL data necessary. And: RE 4.1 Data about production should be, as far as possible, supported by direct measures of different production process and technologies. Differentiated materials and partly more processing levels should be added in the EcoReport. | We will stress this again in MEErP, but data availability and the proportionality of the analysis are also explicitly factors to be taken into account |
| Section 4. Technical analysis existing products | Member State - surveillance auth. | RE 4.2: more guidance elements about the relevant retail phase should be added. | Noted |
| Section 4. Technical analysis existing products | Environmental organisation | RE 4.3 and 4.4: The outstanding role of assumptions for the use phase has been previously described. | Task 3 aims to retrieve all available information on the subject of user demand and behaviour; Task 4 discusses the technical side, i.e. the current state of product resources-efficiency and emissions in meeting the user demand. Both tasks should be based on the best data available. But in the real world, data availability is never ideal and therefore compromises, assumptions and estimates are unavoidable. This is recognised and confirmed by various stakeholder comments. For that reason, the MEER study will therefore try to provide, within budgetary limits of the project, to provide as many as possible default data on important and recurrent issues such as housing statistics. |
| Section 4. Technical analysis existing products | Environmental organisation | As above, do not use “misleading” assumptions about respect of end of life legislation, or production stage constraints (at least develop alternative scenarios) | The comment is not clear. But in the MEERP we will give more background info about the actual state of the art and the trends e.g. in waste management and other environmental indicators |</p>
<table>
<thead>
<tr>
<th>Section 4. Technical analysis existing products</th>
<th>Environmental organisation</th>
<th>Given the assumptions, simplifications and limitations of the current EcoReport tool, the data input and analysis is biased towards energy consumption during use phase. Non-energy aspects and non-use phase should be represented better in the methodology. Very limited transparency of the EcoReport tool. Often EcoReport and its results are considered solid based scientific and equivalent to LCAs. Misleading!</th>
<th>In the MEEIP we will give more background info about the actual state of the art and the trends e.g. in waste management and other environmental indicators. This will allow stakeholders to check, not only from the point of the LCI data for the materials but also from the side of the main emission etc. source whether this statement is true or false</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Environmental organisation</td>
<td>Conducting a Life Cycle Assessment is important to ensure environmental aspects including energy, water, air, etc. are taken into consideration. Energy in use has been the main issue for most studies to date, but shouldn’t be exclusive focus. See below.</td>
<td>See answer above. All indicators (and more ) are taken into account in the Ecoreport</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Expert / Consultant</td>
<td>As scope extend to energy-related products, indirect impacts (for energy at least) become important - and are likely to be very application-dependent. Where is installation covered?</td>
<td>The comment is not clear. The impact of the activity of ‘installation’ is covered if it is significant. ‘Installations’, such as heating, ventilation, etc. installations are also covered.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Consumer organisation</td>
<td>This section lacks guidance and is usually insufficient and biased by the consultant specialty. Production and end-of-life phases assumptions are not thoroughly described and questioned.</td>
<td>We will try to improve the guidance, but the directive Annexes also prescribes that analyses should be proportional. E.g. in products analysed so far, even at the worst case scenario, the impact of all indirect effects outside the use phase is smaller than 1-5%.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>It would seem that the technical analysis is an analysis of product environmental aspects and impacts; this should be clear to Task Report readers. As regards end-of-life, although important from an environmental perspective we would not wish to see an overlap with, for example, the Waste Framework Directive, the WEEE Directive, the Batteries Directive and the RoHS Directive.</td>
<td>The analysis in Task 1 should identify the relevant legislation for the product group. Overlapping measures should not occur, but complementary measures may exist.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>End of life is usually a separately treated subject, handled by other local regulations</td>
<td>Noted, but there is definitely also an EU dimension (WEEE, Packaging Directive, RoHS, etc.)</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>Again due to the wide diversity of industrial furnaces, life cycles depend on the type of furnace/process. They can range from 6 months to 20 years!</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>Very useful and absolutely necessary but often not easy to reflect reality.</td>
<td>Agreed.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>Following life cycle approach, it is clear that the focus on the use phase is the most relevant.</td>
<td>For MEEUP this has so far been the case, but may change with certain ErP</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>The use phase is the most important. Production, distribution and end-of-life are less relevant, and they are already largely regulated already. Full life cycle thinking should be taken into consideration.</td>
<td>See above</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>Please use a &quot;cradle to grave&quot; LCA in order to avoid the transfer of burdens. Please refer to ILCD Handbook for details.</td>
<td>Cradle-to-grave is what is used in MEEeP/MEErP. The LCA is shaped in accordance with its goal of helping to meet policy goals and --as much as possible-- with good practice. For the latter many good sources exist, amongst which the ILCD may be one.</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Industry / trade association</td>
<td>The use phase is most important. However, the importance of each life cycle stage should be determined for each product group to identify most relevant impacts.</td>
<td>OK</td>
</tr>
<tr>
<td>Section 4. Technical analysis existing products</td>
<td>Manufacturer / importer</td>
<td>4.2 - In general the impact of the distribution phase seems to be marginal in comparison to the other stages. Next to that distribution will be highly dependent on specific business models and circumstances. It is not an area where general measures can be easily implemented or enforced.</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 4. Technical analysis exisitng products</td>
<td>Manufacturer / importer</td>
<td>The use phase is most important. Since products are internationally traded, production, distribution and end-of-life are less relevant, and they are already largely regulated already by EU and local legislation.</td>
<td>See above</td>
</tr>
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<td>------------------------------------------------</td>
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<tr>
<td>Section 4. Technical analysis exisitng products</td>
<td>Manufacturer / importer</td>
<td>LCA is a powerful tool to assess impact of system under study and to avoid 'burden shifting'. However from a policy point of view, it still remains limited tool that can often not provide a solution to the issues on a more holistic perspective.</td>
<td>LCA is not the only tool in the MEErP nor the prep. studies. Furthermore, the prep. study LCA is not the only issue that the policy makers will take into account.</td>
</tr>
<tr>
<td>Section 4. Technical analysis exisitng products</td>
<td>Manufacturer / importer</td>
<td>In current MEEUP methodology this information is very insufficient and bad. Sources are old and contain inadequate and wrong data. No correct evaluations on the total life cycle of products can be made according to this information. Information used should be real life inventories originating from industry itself.</td>
<td>Unbiased stakeholder input is always welcome. By the way, most LCI data in MEEuP come from industry.</td>
</tr>
<tr>
<td>Section 4. Technical analysis exisitng products</td>
<td>Manufacturer / importer</td>
<td>warning for the interpretation: construction products are intermediate products, The ranking &quot;useful&quot; depends in all stages depends on the interlinkage with other products, with systems, use and function. Analysis can NOT be done ON PRODUCT LEVEL.</td>
<td>Noted. But construction products cannot be a priori excluded from further analysis.</td>
</tr>
<tr>
<td>Section 4. Technical analysis exisitng products</td>
<td>Manufacturer / importer</td>
<td>The methodology from CEN TC 350 seems to offer a good framework for these aspects. Doublure or different methodology will only lead to additional administrative burden and confusion.</td>
<td>The LCA is shaped in accordance with its goal of helping to meet policy goals and –as much as possible– with good practice. For the latter many good sources exist, amongst which the CEN TC 350 may be one.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Member State - surveillance auth.</td>
<td>The analyses generally tends to come out too simplified. LCC is important, but given the number of uncertainties of future production costs, energy prices, etc., too much emphasis should not be placed here.</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Member State - surveillance auth.</td>
<td>The text is very good, but the EcoReport - even though its general approach is also very good - is insufficient in some aspects e.g. in material differentiation, recycling rates etc., as mentioned also under 4. Also: RE 5.2: The definition of a base case it is not univocal for ERP. It should be introduced the multi-scenario analysis. Detail of BOM should be improved, either with a further differentiated material/energy list (e.g. not simply ‘glass’ but &quot;optical glass&quot;, &quot;container glass&quot; etc.; same for ceramics, silicon and others with very different environmental profiles depending on purity/alloy application) or a detailed description of product’s composition. It should be foreseen a procedure/requirements to insert data not available in the EcoReport for materials/component not classified; so far this was done ad hoc (or not at all), depending on the consultants expertise and his specific data availability</td>
<td>For products where the production phase and/or Eol is dominant this will certainly be the case. But with the product groups so far this has not been the case. If the total impact is in the range of 1-5% it would be disproportional to make these types of assessments. As regards the BOMs, the consultants will depend on literature and industry, because there is no budget within the preparatory studies to dismantle and analyze the materials composition of a representative sample of products. Having said that, the collection of BOMs that has come from most prep. studies is unique; never before has the scientific world see such a wide range of products analyzed. As regards the input of new materials data in EcoReport, the new EcoReport 2011 version will provide such a facility.</td>
</tr>
</tbody>
</table>
RE 5.2: High quality (preferably reviewed) and consistent inventory data should be used; EC data such as the ELCD and reviewed quality data such as in the ILCD Data Network should be used in preference wherever available. IMPORTANT: a generally applicable EcoReport tool for ERPs will not work, unless detailed guidance is given how to define and quantity the ERP’s effects on the affected energy system (see comments especially on section 1). Finally: To revise and slightly extend the considered impact categories. Some of the categories are not common practice, even though commonly used impact categories could work with the same emissions used in the EcoReport tool. An extension to other emissions following the same approach as in the original MEEUP is necessary. The use however of commonly used and recommended impact categories and methods/ emissions such as under ILCD is recommended. This would help towards coherence of Eco design, Eco label and other product-related environmental policies. The EcoReport could partly be simplified by identifying for each ERP group which e.g. emissions, aspects are relevant and not require to provide individual data for the other, not relevant ones.

Guidance, consistency and quality are essential for any tool. Guidance has been provided in MEEUP 2005 report, within the various constraints of the assignment. And if it is true that only those tools ‘work’ that provide sufficient guidance to the items mentioned, than it is proven that MEEUP data have done a good job as it has worked satisfactorily over the past 5 years in a very challenging policy context. And there is no other LCA-related tool or database that can say that...

As regards the reviewed data: A review that is restricted to compliance with ISO standards but otherwise does not pose any requirements on the choices made by business associations within the various allowed ISO standard options is not a guarantee for quality and certainly not a guarantee that the results of such an analysis are effective in contributing to policy goals.

In that context, and with all due respect for its merits in attracting business association data input, the ELCD is not compatible with the MEErP principles and therefore its transfer to the MEErP-format will require a substantial amount of work. As regards the impact categories: they are given in the Directive and we have to work by the principle that Community legislation takes priority over the ILCD. The suggestion for further simplification of the Ecoreport, which is already the simplest LCA tool around, as suggested opens the gate for serious stakeholder/consultant bias which is not in the interest of the ultimate goal of the tool.

<table>
<thead>
<tr>
<th>Section 5. Definition of Base-Case</th>
<th>Member State - surveillance auth.</th>
<th>RE 5.3-5.5: good but needs extension to affected energy systems.</th>
<th>Noted.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Member State - representative</td>
<td>How to define the base-case if the lot scope is broad. Eco-design is on products; How to define correct system impact?</td>
<td>The definition of the system boundaries of a product is not easy to capture in generic methodology guidelines, whereas - if the product is known-- it is much more tangible.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Member State - representative</td>
<td>Consumer life-cycle costs and regional impacts are critical, however regional Net Present Value is not calculated (see extended remarks comments below).</td>
<td>It is not feasible to demand an LCC calculation for each of the 27 Member States. The subject can be part of the sensitivity analysis</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Environmental organisation</td>
<td>Do not neglect extraction stage and “environmental rucksack” when analysing production stage, do not focus too much on one environmental dimension at the expenses of others (even where availability of data explains this focus).</td>
<td>Mining etc. is taken into account in LCI data. Furthermore the LCI analysis takes into account all material and energy flows, also when taking place outside the EU</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Expert / Consultant</td>
<td>But this assumes that a single base case is appropriate, which is not always so</td>
<td>The number of Basecases depends on the product. In past prep. studies it has almost always been more than one.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Environmental organisation</td>
<td>Environmental impacts are based on many assumptions and simplifications, several impact categories are underrepresented and the focus is clearly on the impacts of energy use during use phase (see Task 4.). EcoReport should not be only source. Comparison with other studies is important, but done to different extent in prep studies.</td>
<td>The MEErP (as did MEEuP) encourages that LCA experts in prep. studies make their own assessments, apart from the list of LCI data, as long as they apply the multipliers given in the MEErP. However, so far, only one study has generated some new LCI data.</td>
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<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Consumer organisation</td>
<td>Technical analysis in this section has too many simplifications and flaws to be considered a credible LCA and comparison of impacts. Conclusions are very rough and some impacts underestimated. It usually does not bring more (or even less) than what can be known from the literature. EcoReport should either be improved or replaced by a discussion of the available thorough LCAs and academic studies. LCC calculations should be more transparent and standardised (discount rates...)</td>
<td>In the MEErP we will give more background info about the actual state of the art and the trends e.g. in waste management and other environmental indicators. This will allow stakeholders to check for completeness, not only from the point of the LCI data for the materials but also from the side of the main emission etc. source. The discount rate will be standardised at 4%, in line with the impact assessment guidelines of the Commission.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Governmental organisation</td>
<td>Score reflects usefulness of the level of detail, i.e. for a number of items the results need not be that detailed.</td>
<td>Indeed. Analysis should be proportional to the impact/potential saving.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Expert / Consultant</td>
<td>Modelling of the system in EcoReport should be more transparent, as mainly applied by experts. As planned, the ErP EcoReport needs to be advanced in order to take resource efficiency better into account.</td>
<td>Noted. See also comments above</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Base cases needs to be identified to evaluate the average product performance, characteristics, environmental impacts but also improvement potential. No good base case can be identified without a good database/knowledge of the existing market. Some product categories have several subcategories. A deep assessment needs to be made to ensure a good coherence between product types and base cases that will be studied for improvement potentials and eventually legislative measures.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Requirements should not address product that have not been studied comprehensively and of which relevant base cases have been identified.</td>
<td>Analysis should be as complete as possible, and clearly indicate where there is no data availability. The decision whether the lack of data prohibits requirements is with the policy makers, not the MEErP</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Additionally, it would be very helpful adding a section (5.6) that states what the principal environmental impacts of the 'average' product are together with life cycle cost information. We see difficulties in considering BoMs since these are confidential, manufacturer and technology specific. Consequently, it would be important that a first proposal on the BoM comes from the Consultant.</td>
<td>Noted. It is indeed a good idea, in case initially no BOM comes forward from industry, to have the consultant present an estimated BOM. If this still does not trigger reactions this means that the BOM is accepted by all stakeholders</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>the huge data collection does not bring a lot of advantages , but create a risk of loosing focus</td>
<td>This is contrary to some comments from others. It will be important to find a right balance between too much and too little information.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Base cases are impossible to be selected and outlined due to the variety of Industrial Furnaces/processes, type of fuel used, pressures, job changes... Bill of Material would not have any impact on the energy balance of Industrial Furnaces operating for a long time (e.g. 10 years).</td>
<td>Base cases are defined in &gt; 30 preparatory studies. In principle it should be possible for every product group. Whether or not the indirect (production, EoL) part of the impact is insignificant cannot be taken on face value, but should be analysed in the prep. study.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>The concept of creating base cases is necessary but it is not applicable for all product groups. Especially if you find in one product group individual products which are not comparable. Industry would welcome a more flexible approach with reliable data for the different products.</td>
<td>It will be a challenge for the authors of the prep. study to distinguish appropriate categories and subcategories in such a case. But so far (in &gt;30 studies) they have managed.</td>
</tr>
<tr>
<td>Section 5. Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Critical review of the methodologies used is necessary. Life cycle costs and Total system impact are very challenging. State of the art of the methodologies is still not good enough to be used in policy</td>
<td>We don't agree. The MEEuP is already basis for 12 adopted Commission Regulations.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>Life-cycle environmental impact and costs based on EU methodology should be compared with other available studies as a benchmark. The focus should clearly be on the use phase. Defining base-case only on the basis of input scenarios will not lead to right conclusions.</td>
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<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Industry / trade association</td>
<td>LCA Data Base should be updated.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>5.3 - As there is a strong correlation between energy efficiency and costs there is little added value making.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>5.5 - As like for like comparisons are often difficult, their usefulness is questionable</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>Life-cycle environmental impact and costs based on EU methodology should be compared with other available studies to determine whether apparent impacts/costs are consistent, or whether they are artefacts generated by the methodology.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>If MEE/P criteria are not only use phase-related, then such criteria should be based on a full LCA “Cradle to grave” approach including scenarios and benefits related to the EoL phase.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>Life-cycle environmental impact and costs based on EU methodology should be compared with other available studies as a benchmark. The whole dimension of using this products should be shown in a EU wide level to show the significance of the evaluated product system. Costs and environment should be merged to a guiding overall factor.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>USE harmonised methodologies for assessment and communication of environmental (and sustainable) performance for construction products and works.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>see considerations for using ISO21903/21931 and CEN TC350's EN15804 and EN15978.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>Product specific would not be of any help to anybody. A system approach on building level would be worth while considering. In this approach life cycle analysis should be key, including the use phase. Impact of insulation would be rather small compared to the impact of the use phase.</td>
</tr>
<tr>
<td>Section</td>
<td>Definition of Base-Case</td>
<td>Manufacturer / importer</td>
<td>USE harmonised methodologies for assessment and communication of environmental (and sustainable) performance for construction products and works.</td>
</tr>
<tr>
<td>Section 6.</td>
<td>Analysis Best Available Technology (BAT)</td>
<td>Member State - surveillance auth.</td>
<td>BAT must also take into consideration the local conditions and the building infrastructure.</td>
</tr>
<tr>
<td>Section 6.</td>
<td>Analysis Best Available Technology (BAT)</td>
<td>Member State - representative</td>
<td>Analysis of the BAT is fundamental to identify possible improvement requirement. Beside the BAT, the analysis should focus on the BAT economically viable in the market, to identify minimum performances that products should achieve. More guidance would be beneficial for this section, drawing on experiences made with the preparatory studies.</td>
</tr>
<tr>
<td>Section 6.</td>
<td>Analysis Best Available Technology (BAT)</td>
<td>Governmental organisation</td>
<td>Especially useful when data are from an independent source, i.e. not directly from manufacturers, to counteract claims from manufacturers that certain requirements can not be met (in the future).</td>
</tr>
<tr>
<td>Section 6.</td>
<td>Analysis Best Available Technology (BAT)</td>
<td>Environmental organisation</td>
<td>While difficult to get from industry, the data enabling to document BAT’s are crucial. BAT’s should also be presented as future requirements for medium term Tiers.</td>
</tr>
<tr>
<td>Section 6.</td>
<td>Analysis Best Available Technology (BAT)</td>
<td>Environmental organisation</td>
<td>BAT information needs to be up-to-date when decisions on measures are taken. Often on <a href="http://www.topten.eu">www.topten.eu</a> much better products can be found than what had been found as BAT in the study.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Environmental organisation</td>
<td>Important task.</td>
<td>Agreed.</td>
</tr>
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</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Environmental organisation</td>
<td>Structurally, it is unclear why the analysis of BAT can't simply be part of the improvement potential - one complete analysis starting with the base-case and improving the product right through to BNAT. It would enhance flow and presentation of findings.</td>
<td>Noted, but BAT and BNAT do not have to be representative for the EU. For Base case and options this should ideally be the case; so there is not only a technical dimension but also a market dimension.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Expert / Consultant</td>
<td>Clearer definition of BAT might be helpful - does it have to be on the market or simply demonstrated as practically, or theoretically possible?</td>
<td>BAT must be available on the market. BNAT not necessarily.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Expert / Consultant</td>
<td>In some prep. studies it is not possible to understand which energy efficiency can be achieved at he product level with the improvement options at the component level. It is important to investigate if the BAT is available throughout the whole scope or only single products.</td>
<td>OK</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Consumer organisation</td>
<td>This section should explore more the existing barriers to deploying BAT and the solutions to remove these obstacles.</td>
<td>The subject of barriers is treated in Tasks 7/8</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>The state-of-the-art in applied research may not always become mainstream; the methodology should ensure all relevant caveats are highlighted when it comes to these analyses.</td>
<td>Agreed, BAT will not always become mainstream or is technically viable, but it allows the consultant to assess the future possibilities.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>It is questionable whether the real information and trends to be disclosed</td>
<td>Indeed, if the consultant simply asks industry and other stakeholders what innovations they plan, they will usually not get a valid answer. So questionnaire is not the right means. Better is to have consultants with (past) engineering background, in the sector at hand or adjacent, to propose BAT, BNAT and design options and then wait for feedback on these first proposals</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>6.3 Only useful if you find anything better outside EU.</td>
<td>Indeed. But this should be explored first, before such a conclusion can be drawn.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>Focusing on research does not give sufficient insight on economical viability. Focusing on the component does not allow proper assessment at the finished product use phase performance</td>
<td>Noted. In the new MEErP structure we will propose a more generic approach, with a focus on the best products on the market rather than concepts at the research stage.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>If criteria should address production and recycling, then a full LCA approach is needed, including end of life phase in order to avoid a shift of burdens.</td>
<td>If known, possible drawbacks/advantages should be discussed</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Industry / trade association</td>
<td>6.1 - State-of-the-art in applied research doesn’t necessarily translate into a market wide acceptance and implementation</td>
<td>Noted. In the new MEErP structure we will propose a more generic approach, with a focus on the best products on the market rather than concepts at the research stage.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>Research/component level BAT is not necessarily technically and/or commercially viable for the regular production. Bringing this BAT into the discussion could generate an over optimistic improvement potential, leading to unachievable targets.</td>
<td>That is why the possible drawbacks etc. need to be discussed.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>State of the art research may not lead to commercially viable products. Components are less important than the finished product, which may require compromises between components</td>
<td>That is why the possible drawbacks etc. need to be discussed.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>BAT technology for other regional might be based on specific local circumstances that are not generally applicable in EU (e.g. Water use in arid vs. wet regions)</td>
<td>That is why the possible drawbacks etc. need to be discussed.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>see above: product criteria may lead to sub-optimal and adverse impacts. Holistic approach on the building (works) level is a must. BAT for the building should be leading; not for the product</td>
<td>That is why the possible drawbacks etc. need to be discussed.</td>
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<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>Research/component level BAT is not necessarily technically and/or commercially viable for the regular production. BAT on a technical level does not necessarily mean an optimum of overall sustainability along the life cycle and supply chain.</td>
<td>That is why the possible drawbacks etc. need to be discussed.</td>
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<td>That is why the possible drawbacks etc. need to be discussed.</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>State of the art or BAT-technology will not have big impact in a mature market like insulation materials. BAT should be sought at building level =&gt; near zero energy buildings.</td>
<td>We think that even in a market like insulation innovation is possible</td>
</tr>
<tr>
<td>Section 6. Analysis Best Available Technology (BAT)</td>
<td>Manufacturer / importer</td>
<td>See above: product criteria may lead to sub-optimal and adverse impacts. Holistic approach on the building (works) level is a must. BAT for the building should be leading; not for the product.</td>
<td>Holistic approach is correct, but the extend of the system boundaries should also be manageable and it will thus be appropriate to refer to generally accepted reference values for buildings. We will try to provide these values (from e.g. past prep. studies) as much as possible.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Member State - surveillance auth.</td>
<td>This section needs more guidance. It may be useful to look into non-energy benefits that could make the products more appealing to buy for users. The link between Eco design requirements, labelling, other support schemes and BNATs should be explored further. Methods to more accurately analyse potential price relations with design options should be investigated.</td>
<td>Correct. In the MEEuP study we will provide as much general guidance on the subject as possible, as required by the SIC/SCP action plan. The SIP/SCP action plan and ENTR tender specifications for preparatory studies require to recommend minimum requirements complemented, where appropriate, with (dynamic) labelling and benchmark categories linked to possible incentives, relating to public procurement or direct and indirect fiscal instruments. However, a large part of this assessment will have to be done on a case-by-case basis, because the effects may vastly differ e.g. between consumer goods and professional (B2B) products.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Member State - representative</td>
<td>Does the consultants have enough of expertise and practical experience for this task?</td>
<td>Holistic approach is correct, but the extend of the system boundaries should also be manageable and it will thus be appropriate to refer to generally accepted reference values for buildings. We will try to provide these values (from e.g. past prep. studie)</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Member State - surveillance auth.</td>
<td>General good, but could have more guidance based on experience with preparatory studies, e.g. on calculation of LCC and LLCC. It should also be clarified that this excludes so-called &quot;external costs&quot; via environmental impacts (as this is covered separately, but this can be misunderstood). And: explicit extension to the affected energy system is necessary; see also the comment on section 1, stressing the relevance of guiding the quantification of the overall ERP+ energy system performance. RE 7.2: EcoReport will be good for ERP if the before-mentioned improvements are made and guidance is given for quantifying the overall ERP+ energy system performance/parameters (see earlier comment). RE 7.5: Assessment of BNAT and of boundary effect is inherently very difficult/uncertain. Results are strictly dependent on the initial assumptions. The assessment of viable design options is therefore very important.</td>
<td>This is correct. The &quot;external costs&quot; (&quot;internalising external costs&quot;) are excluded from the LCC analysis. When relevant, this aspect can be taken into account in Task 8. System approach --with a pragmatic border of what is still relevant-- should be part of analysis. More guidance for preparatory studies will be given in the update of the MEEuP.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Governmental organisation</td>
<td>Since cost discussion is very difficult, LLCC should not get too much emphasis, i.e. it is no good having LLCC analysis very detailed if the input data (costs) are uncertain (which they are in any case more or less regarding cost developments)</td>
<td>The LLCC analysis is required in Annex II of the Ecodesign Directive (method for setting specific eco-design requirements). Its limitation will be made clear, namely that in many/most cases the LCC analysis can only – given the underlying data uncertainties – give an order of magnitude and trend. It is no use to expect exactness of 2 digits behind the comma. Unfortunately, even to arrive at such a rough analysis the authors of the preparatory study have to make a series of calculations/assumptions/etc. which – in the interest of transparency – should be traceable and thus documented. But perhaps that sort of exercise can be done in a separate Annex and not in the main report.</td>
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<tr>
<td>Section 7. Improvement Potential</td>
<td>Environmental organisation</td>
<td>Again (sorry for insisting) do not take for granted that current legislation is perfectly applied to identify improvement potentials (chemicals, EoL). Try to combine different options and different environmental impacts, rather than focusing on most significant only. Assess embedded energy, water footprint more thoroughly.</td>
<td>The Ecodesign Directive requires the analysis of any significant environmental impact.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Environmental organisation</td>
<td>This section needs more guidance. In some studies a part of the information is missing (or replaced by intuitions or extrapolation). Improvement potential is often focused only on energy in the use phase and not addressing other aspects e.g. resource efficiency or embedded energy. BNAT are often poorly addressed.</td>
<td>We will try to be as concrete/explicit as possible. And again, analysis should be proportional to impact.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Environmental organisation</td>
<td>very much dependent on selection by consultants. Cost calculations and environmental impact very much depend on assumptions made (replacement rate, electricity price, user behaviour, etc.). (see task 3)</td>
<td>True, and that is why results should be traceable.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Environmental organisation</td>
<td>Organisationally, easier to follow if BAT (section 6) is combined with Design Options and BNAT in one focused discussion of improvement potential and cost impacts. Then, in a separate chapter, candidate MEPS levels, LCC results, EU energy savings &amp; NPV.</td>
<td>OK. We will try to follow this suggestion.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Expert / Consultant</td>
<td>But LCC is only for idealised end-user perspective. End-users can differ a lot. And policy decisions commonly take into account the societal perspective. (And why is it usual to use a lower discount rate than end-users cost of capital?)</td>
<td>True, but we have no better approximation than a model. A 4% discount rates will be used, in line with the Impact Assessment Guidelines of the Commission.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Expert / Consultant</td>
<td>Additionally the case, which provides the same life-cycle-costs (SLCC) as the base case shall be identified. Requirements need to aim at this efficiency.</td>
<td>Design options beyond LLCC point will be considered (up to BAT), so the policy maker can base its decision also on that point if there are reasons to do so.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Consumer organisation</td>
<td>This section needs more guidance. It may be useful to look into non-energy benefits that could make the products more appealing to buy for users. The link between eco design requirements, labelling, other support schemes and BNATs should be explored further. Methods to more accurately analyse potential price relations with design options should be investigated.</td>
<td>See above.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>Option identification is very important and clearly links to the setting of eco-design requirements. It is right that options are listed and related to impacts and costs.</td>
<td>The update of the MEEuP will provide guidance on option identification.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>The LLCC point is the tool used to identify the threshold for setting eco-design requirement. However, it is important to use such tool with some flexibility. In principle, starting from a base case, the LLCC point is reached adding several improvement potential that will eventually deliver some saving in the long term. If such savings are limited and only reachable at high cost for consumers (due to a high purchase cost increase) or for manufacturers (due to major modifications of the production lines), the consultant should carefully evaluate all these impacts before making a proposal simply based on the LLCC.</td>
<td>This is exactly the definition of LLCC. So it is taken into account.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>With respect to BNAT it is very important to have a clear understanding of the market situation and trends. The setting up of requirements on products shall be based on real products and not on BNAT.</td>
<td>True. The BNAT’s main purpose is to show that, even after certain measures, there will be enough perspective on disparity between products to guarantee a healthy and competitive market (→ No negative impact on industry)</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>Central to the whole idea</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>gap between theory and reality due to rapid change in development, supply and use of products</td>
<td>This depends on the sector and the ‘normal’ improvement rate for a specific sector should be taken into account in the scenario analysis. But we also see an accelerated improvement, also and especially in the more conservative sectors, between the start of the prep. study and the entry into force of measures. In the MEErP study we will try to give some guidance as to how account for this effect quantitatively in the scenario analysis.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>Current technology for the design of Industrial Furnaces is already using BAT and BNAT. Users of the equipment are not always ready to pay the higher costs involved because of too long pay-backs.</td>
<td>If the environmental impact is significant, ecodesign requirements should be set at the LLCC point. It is the task of the preparatory study to analyse this LLCC point and its relation to BAT and BNAT.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>7.1 Useful but often there are limits to improvement by changing the design as the design is already restricted due to the foreseen use of the product</td>
<td>The preparatory study of a product group should analyse these limitations.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>Integrating “design for recycling” benefits into the assessment/criteria is essential.</td>
<td>This is true for those products where benefits exist. In many cases recycling is shredder-based and things like design-for-disassembly are hardly relevant anymore.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>Very difficult aspects to tackle with policies and legislation. The information needed is company specific and requires deep knowledge of the applications in question. This information cannot be revealed because of competition legislation.</td>
<td>The preparatory study should be carried out by technical experts, next to ecodesign experts.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Industry / trade association</td>
<td>The improvement potential must be assessed by relating mainly to the use-phase. For intermediary products, the impact on the end-product must be evaluated. For BNAT and design options it should be clear, that this is largely speculative and must be assessed very carefully. Options for the future based on data today are uncertain and must be evaluated with different models and scenario analysis.</td>
<td>Noted.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>7.5 - Due to the high speed of technological progress as well as societal changes it is very difficult to define long term targets</td>
<td>Noted. However, the product design cycle and hence implementation of BNAT also depends on the product group (e.g. consumer electronics vs industrial equipment).</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>BNAT should not be addressed in any way, since this is largely speculative and could lead to false hopes and targets for improvement potential.</td>
<td>The BNAT’s main purpose is to show that, even after certain measures, there will be enough perspective on disparity between products to guarantee a healthy and competitive market (→ No negative impact on industry)</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>BNAT is too speculative to be taken into account</td>
<td>See above</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>BNAT is too speculative to be taken into account</td>
<td>See above.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>LCC carries an important social dimension: the affordability of the function of the ErP to society. Promoting superior technical solutions that could be only afforded by the ‘happy few’ is not acceptable.</td>
<td>True and is/will be taken into account</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>Criteria should integrate also “design for recycling” benefits</td>
<td>See above.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>For BNAT and design options it should be clear, that this is largely speculative and must be assessed very carefully. Options for the future based on data today are uncertain and must be evaluated with different models and scenario analysis.</td>
<td>For best not available technology it is clear that they are speculative and therefore there are no conclusions or calculations based on these technologies.</td>
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<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>Meeting BWR related requirements in CPR requires solutions contributing to the technical and functional requirements of WORKS. Construction products are INTERMEDIATE products and their contribution (options for –, impacts from –, costs by –) depend on interaction of products and system performance related to the holistic goals.</td>
<td>See above</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>Door insulation this can only be assessed at the building level, taking into account technical performance of the product determining the choice of the product. Improvement potential here lies again on the building level –⇒ near zero energy buildings. The logical incentives here logically are to be expected rather through EPBD implementation then through Eco design.</td>
<td>EPBD and Ecodesign should be complementary here.</td>
</tr>
<tr>
<td>Section 7. Improvement Potential</td>
<td>Manufacturer / importer</td>
<td>Meeting BWR from the CPR requires solutions contributing to the technical and functional requirements of WORKS. The contribution of construction products depends on interaction of products and system performance related to the holistic goals.</td>
<td>See above</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Member State - surveillance auth.</td>
<td>This is a key section but often not providing enough guidance for legislation. (e.g., assumptions between the scenarios are not always provided). Proposed policy options need a more thorough analysis. Impact and sensitivity analysis are often weak.</td>
<td>The update of the MEEuP will give more guidance for developing policy recommendations. On the other hand, the preparatory study is the start of a process; further analysis will take place in the Commission’s Impact Assessment studies</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Member State - surveillance auth.</td>
<td>As previously underlined, the relevance of the sensitivity analysis for ERP case-studies is much higher than that related to EUP. More guidance on this policy Impact Assessment is needed.</td>
<td>OK</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Governmental organisation</td>
<td>In most cases these analyses are done by the Commission services, related to their proposal for an implementing measure</td>
<td>That is true. However, the preparatory study must deliver a first policy recommendation.</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Environmental organisation</td>
<td>When developing policy recommendations, also combine different alternatives and different policy instruments (requirements, bonus/malus, optional versus mandatory dimensions…)</td>
<td>See above</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Environmental organisation</td>
<td>This most key section is often disappointing: too short, not practical enough for legislation, incl. black box scenarios without providing the assumptions. The proposed policy requirements are often not well substantiated and not enough elaborated and discussed. Impact analysis and sensitivity analysis are often very weak. Main reason is probably the insufficient remaining budget at end of the study and lack of policy skills of consultants. This is a priority issue to address</td>
<td>See above.</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Environmental institute</td>
<td>Task 8 should deliver the starting point for the stakeholder consultation towards implementing measures. However, often this chapter lacks substance and does not refer back enough to the results of the precedent Tasks.</td>
<td>See above</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Environmental agency</td>
<td>Section 8 should present clear guidance to policy-makers on possible MEPS. Would benefit from consideration of multiple candidate MEPS (more than just LLCC &amp; BAT) and clearer presentation of MEPS and impacts. Manufacturer impacts are under-represented.</td>
<td>We will give clearer guidance on manufacturer impacts (turnover) and socio-economics (employment)</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Expert / Consultant</td>
<td>Would be more useful if the same perspectives were used for areas other than the ErP (EPBD, for example)</td>
<td>Noted</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Expert / Consultant</td>
<td>The sensitivity analysis need in any case take into consideration increasing energy prices for up to 5 to 10 years. Already done by some but not all prep. studies. A general framework for the scenario analysis should be given to make the results comparable and comprehensible.</td>
<td>Noted. We plan to supply long-term price indicators in MEE/R if possible, but very often the usual policy studies are not univocal on what is going to happen.</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Consumer organisation</td>
<td>This most key section is often disappointing; too short, not practical enough for legislation, incl. black box scenarios without providing the assumptions. The proposed policy requirements are often not well substantiated and not enough elaborated and discussed. Impact analysis and sensitivity analysis are often very weak. Main reason is probably the insufficient remaining budget at end of the study and lack of policy skills of consultants. This is a priority issue to address</td>
<td>See above</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>If anything, more could be made of these considerations. Industry and consumer impacts could be studied to a far greater degree. In keeping with references made to SMEs in the Framework Directive, it would also seem appropriate to make more of SME impacts in Task 8 work.</td>
<td>SMEs will be addressed more explicitly</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>Task 8 is an important tool to kick off the discussion in view of adoption/non-adoption of regulatory measures. However, we feel that Task 8 proposals must be backed up by comprehensive assessment of the impacts that the proposed policies would have on consumers, industry and the overall system. In drafting any conclusion and policy proposals the Consultant should consider the short, medium, long term evolutions and trends regarding the product and the system.</td>
<td>There should be a balance here. In part the preparatory study should provide analysis, but it is the task of the Commission (in its IA analysis and WDs) to reach conclusions on legislation.</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>study should be updated periodically</td>
<td>Indeed.</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>The impact of the results on consumers and industry should be addressed in detail. Policy decisions should take the above into consideration, rather than taking precedence</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>The sensitivity of the results and their impact on consumers and industry is probably the most relevant for decision makers to ensure proportionate measures only are considered.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Industry / trade association</td>
<td>The sensitivity of the results and their impact on consumers and industry should be addressed in detail. The function and comparability of products and possible solutions must be made clear. Different parameters can have different impacts in an overall evaluation. It must be clear, how to generate a summary and final results out of the single parameters.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>The sensitivity of the results and their impact on consumers and industry should be addressed in detail: when making decisions, policy makers need to be aware of the reliability of the expectations and their impact on the market.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>Sensitivity analysis is crucial for highlighting how the accuracy of available data and the assumptions in modelling result in an uncertainty range engulfing the conclusions. This aspect should be clearly documented to help decision makers.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>High risk of implementation of goals at the wrong level. The only right level would be to formulate targets for minimisation of the environmental impact categories according to CEN TC 350 EPD’s.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>8.1 once again: how does PRODUCT policy fit into the BUILDING policy? How are the objectives behind setting criteria on product characteristics covered already by other regulations, directives and policies? And of are they aligned?</td>
<td>This will be subjects addressed in the specific Ecodesign studies.</td>
</tr>
<tr>
<td>Section 8. Scenario-policy, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>The sensitivity of the results and their impact on consumers and industry should be addressed in detail. The function and comparability of products and possible solutions must be made clear. Different parameters can have different impacts in an overall evaluation. It must be clear, how to generate a summary and final results out of the single parameters.</td>
<td>Agreed</td>
</tr>
<tr>
<td>Section 8. Scenario-, policy-, impact- and sensitivity analysis</td>
<td>Manufacturer / importer</td>
<td>8.1 How does PRODUCT policy fit into the BUILDING policy? How are the objectives behind setting criteria on product characteristics covered already by other regulations, directives and policies? And are they aligned?</td>
<td>This is not a subject for MEEuP</td>
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<tr>
<td><strong>Extended Remarks</strong></td>
<td>Member State - representative</td>
<td>The methodology have to take into consideration if the product is a B2C or B2B product and adapt to the situation. There are different requirements if it is a consumer product or a business to business product (e.g. material selection, specific design options, modularity etc.).</td>
<td>Agreed</td>
</tr>
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<td>The Eco design directive is a framework for setting requirements for products, but in the study often the system (or concept) is taken into account. =&gt; wrong conclusions =&gt; incorrect product requirement. Is the practical expertise of the consults enough? =&gt; More active cooperation with stakeholders. Stakeholders need to widely cover the scope of the study, otherwise the accuracy of the study suffer.</td>
<td>Agreed that active cooperation with the stakeholders is needed.</td>
</tr>
<tr>
<td><strong>Extended Remarks</strong></td>
<td>Governmental organisation</td>
<td>Note: I am new in Eco design but I am involved in policy preparation/follow-up concerning LCA-based tools in product policy in general. The MEEuP dates back quite a while now and it would be assuring to have at least a “technical update”. A revision to improve it seems most useful. Non the less, the elements for extension to ERP already seem to be largely present. To me, the last 3 sections (7 to 8) seem to be the least developed.</td>
<td>The Methodology will have a technical update, including more guidance in task 7 and 8.</td>
</tr>
<tr>
<td><strong>Extended Remarks</strong></td>
<td>Governmental organisation</td>
<td>Here following a summary of most aspects; details, rationale and proposals for further improvement see above: General comment: good in most sections, but it is necessary to explicitly address the specific energy system that is affected by an ERP is dispensable in most sections and sub-sections, therefore the “useful” rating is set in the middle box “3” in most cases. Some aspects in some section require substantial extension/improvement.</td>
<td>See above</td>
</tr>
<tr>
<td><strong>Extended Remarks</strong></td>
<td>Member State - surveillance auth.</td>
<td>Overview of comments per section:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Relevance of FU definition and system boundaries. Generally it is not possible to define a univocal FU. System-system relationships must be defined per ERP group and reflected in EcoReport tool. The ILCD Handbook - General guide provides basic guidance on this.</td>
<td>The subject of multiple Functional Units (Fus) will be addressed in MEEuP. In past prep. studies the general rule has been to address each FU singularly. E.g. combi-boiler (space- and water heating) --&gt; 1 FU for space heating and 1 FU for water heating (latter with possible credit for the combined energy transfer). E.g. airco (space heating, space cooling, (de)humidification, etc.). A special case is a product group definition that is so broad (e.g. machine tools) that there are so many and different FUs that in fact the MEPS have to be set at an aggregated level, e.g. for motors and drives, instead of the machining of a piece of metal.</td>
</tr>
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<td>2. Not only a single base-case but different scenarios are desirable to obtain robust (and hence better defendable) results.</td>
<td>See above</td>
</tr>
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<td></td>
<td></td>
<td>3. - (needed extension to affected energy system).</td>
<td>See above</td>
</tr>
</tbody>
</table>
4. BOM should be more detailed, respectively materials more differentiated where needed because of big differences in environmental impacts per kg (e.g. container glass vs. optical glass factor 10+ difference). Recycling rates to be differentiated better.

| Member State - surveillance auth. | 5. EcoReport tool must be accompanied with clear rules/defaults per ERP on overall ERP+ energy system performance (see under section 1). High quality life-cycle inventory data should be used. It is recommended to use/refer to available data from ELCD and ILCD Data Network (that need to meet minimum criteria on review, documentation, consistency). EoL scenario more based on current EoL practices more than best practices in the EU. Recycling rates need to be differentiated per product type and size class (i.e. much higher recycling rates for big products/parts, very low for small parts/products); a commonly to be used table could be used, substantially improving the accuracy and precision. It should be foreseen a procedure/requirements to insert data not available in the EcoReport for materials/component not classified; so far this was done ad hoc (or not at all), depending on the consultants expertise and his specific data availability. The same procedure could later be used also for the next EcoReport update with new data. And: To revise and slightly extend the considered impact categories. | See above |

| Extended Remarks | Member State - representative | The use of primary energy factor (PEF) discriminates electricity and favours distributed gas and, hence, is inconsistent with low-carbon targets for 2050 | The use of the PEF is inline with EU policy |

| Extended Remarks | Member State - surveillance auth. | The primary/final energy use factors may not be optimal, but we worry that too much discussion is focused on this part rather than looking for improvement of product performance based on the technical potential. The final task 8 is extremely important and much more effort must be placed on this. This should act as the real "instruction" for the Commission to draft its working documents. It appears to be | OK |

| Extended Remarks | Member State - surveillance auth. | The methodology is already comprehensive. However, many environmental aspects, although in some cases are foreseen in the methodology, lack parameters in order to assess their environmental impact. These include chemicals, resource efficiency, sustainable materials, measures to facilitate reuse and recyclability etc. One practical case is the generation of silver ions in washing machines, which was not assessed in the preliminary studies. | See above |

| Extended Remarks | Environmental organisation | We clearly need a EC structure that can keep "alive" the outcomes of the preparatory studies, to be able to complete the data, keep them up to date, monitor the revision and future Tiers definition more smoothly. Prep studies could help identifying how to maintain this data monitoring dynamic (even if not that good for consultancy?) | The preparatory studies are supposed to systematically show their data sources and are thus already contributing to the assessment of such an activity. |

| Extended Remarks | Environmental organisation | Policy recommendations should be based on synergistic & trade off possibilities between different environmental dimensions, not only on the sole most significant one. | OK |

| Extended Remarks | Environmental organisation | The gathering of expertise to prepare Eco design measures is probably too much outsourced to external consultants, which then leads to serious lack of dynamism and updating. Not enough consistency is found between these studies and the ones under other product policy instruments (Eco label, RoHS...) | Outsourcing or not is not a methodology issue. But quality will surely depend on who is doing the work, internally or externally. |

| Extended Remarks | Environmental organisation | The European Commission needs to rely more on in-house experts able to address this consistency issue and to provide a continuous and up-to-date technical assistance to the desk officers in charge. This role could for instance be devoted to the JRC who could be charged of some of the sections of the MEEuP (especially on LCAs and market monitoring) | Not a MEeRP issue. |
Many more guidance should be provided on how to draft final task 8, especially the way to build more standardised and comparable policy scenarios, to draft minimum requirements (e.g. how many tiers to include, etc.) and the way to address issues that are cross-cutting (e.g. how to address chemicals, refrigerants, resource efficiency aspects...) Such an 'Eco design implementation guidance' could help save a lot of time and avoid repetitive debates under each lot.

Some stakeholders may want to question (again) the conversion factor from primary to final energy used in the MEEuP. Our opinion is that this is a dangerous and unnecessary thing to do, since it would probably lead to a regrettable and unsolvable deadlock. Better to keep the factor as it is and focus on more important improvements.

**Extended Remarks**

<table>
<thead>
<tr>
<th>Environmental organisation</th>
<th>The procedure should be speeded up; I propose a simplified methodology as the Environmental NGOs suggest. Minimum efficiency requirements should be set in two steps: a first tier aiming at the least life cycle cost for the consumer and a second tier setting the BAT as the future minimum requirement - with enough time for manufacturers to adapt their production. With the current methodology, BAT values mentioned in the study usually are very much out-dated once implementing measures are discussed and decided upon. It however is important that ambitions MEPS are chosen - otherwise they only lead to more administration but no added value to the consumer and the way towards the energy saving targets. So it is crucial to include up-to-date information on the BAT into the decision making process. Secondly, objective and independent information on the market development is crucial: TIS proposes a systematic monitoring of the appliance market (based on the Energy label classes; in Europe and on country-level). Decisions could be based on market development facts, and the success of introduced measures could be monitored. TIS has proposed such a market monitoring project together with GfK (but is yet looking for funds).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Remarks</td>
<td>Setting requirements is probably the least time-consuming step. So standardising this step in MEEuP will not speed up the process and denies that every product group (and group of stakeholders) has their own specific characteristics. Agreed: Funds are critical. Not a MEEuP issue</td>
</tr>
</tbody>
</table>

**Extended Remarks**

<table>
<thead>
<tr>
<th>Environmental organisation</th>
<th>As mentioned for task 5 above, the EcoReport has many limitations at the moment. Generally, &quot;spurious accuracy&quot; should be avoided, i.e. relying only on numbers which are based on many assumptions. Therefore, it could be considered to deviate from the EcoReport tool for non-energy aspects and find other ways to assess related impacts, e.g. through the analysis of existing LCAs and studies. The structure of this questionnaire is very much focused on the improvement of details of the existing methodology and does not really encourage more fundamental considerations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Remarks</td>
<td>After 20 years of trying by various parties, the Ecoreport method is so far the only LCA-like tool that has ever made it to the level of being used in mandatory EU-wide legislation and has worked satisfactorily (according to most) for 5 years in &gt;30 studies. Perhaps one should be careful to throw that away? We would welcome more specific information on where the tool does not take into account properly the environmental indicators and which specific LCA tools give a simpler, better, more accurate, unbiased outcome. Otherwise these suggestions cannot be taken on board. Evaluation of MEEuP 2005 is a key task. However, the 'free comment' cells, as well as the feedback form or any other type of communication to the study team are available to provide input.</td>
</tr>
</tbody>
</table>

**Extended Remarks**

<table>
<thead>
<tr>
<th>Environmental organisation</th>
<th>Global Dialogue – we believe it would be a beneficial initial task to contact regulators working on products around the world and get input on approaches, scopes of coverage, test methods, etc. This should expedite work in subsequent stages. Strategic scope definition – merging/separating groups of products can have tremendous consequences in the following discussions - as illustrated by lot 1. We believe the impacts of possible options should be very carefully considered in the study.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Remarks</td>
<td>This is part of Task 1 and experienced consultants do have those contacts. Definitions and product grouping will be addressed in MEEuP. However the fundamental principle of judging products on the basis of their FU will continue to be a guiding principle.</td>
</tr>
<tr>
<td>Test Standards</td>
<td>more study of the test standards should be conducted, considering the effectiveness of enforcement and having globally harmonised test standards wherever feasible.</td>
</tr>
<tr>
<td>Consider the impact of simple requirements</td>
<td>to facilitate enforcement, we believe the study should also, where appropriate, suggest simple Eco design requirements and assess their impact – example: presence of doors for display cabinets.</td>
</tr>
<tr>
<td>Consistency Across Preparatory Studies</td>
<td>– due to the diversity of contractors used, there can be inconsistencies in assumptions used as well as MEEuP methodology followed. Consultants would benefit from more guidance, improving analytical quality.</td>
</tr>
<tr>
<td>Data reliability</td>
<td>– Consultants should be more critical of the data they collect, and the Commission should be cognisant of any potential data issues, particularly from Consultants based in member states where the covered product is an important industry.</td>
</tr>
<tr>
<td>Beyond Energy Impacts</td>
<td>– in Task 4, the Commission would benefit by ensuring Contractors address other aspects besides energy consumption in the use phase. A screening methodology may be used to determine in-depth study areas.</td>
</tr>
<tr>
<td>Task Sequencing</td>
<td>- difficultly interpreting MEPS in the absence of a finalised test method. Try to finalise test methods prior to (or in parallel with) Preparatory Studies. Test method must be complete before first draft of Chapter 8 in Preparatory Study</td>
</tr>
<tr>
<td>Impacts on Product</td>
<td>- when considering design options, analysis should take into account impacts on product utility, health and safety, manufacturability and availability of materials / resources necessary to meet market demand.</td>
</tr>
<tr>
<td>Manufacturer Impacts</td>
<td>- the Directive calls for consideration of manufacturer impacts (e.g., retooling costs). Analysis could be improved by some quantification / assessment of these impacts, including elasticity of demand and lessening of competition.</td>
</tr>
<tr>
<td>Price Projection</td>
<td>– for rapidly evolving products, consideration of price projections may be warranted. For example, use of a price reduction forecast for light-emitting diodes in the context of directional lamps (Lot 19) would have improved the analysis.</td>
</tr>
<tr>
<td>Multiple MEPS Levels</td>
<td>- the Preparatory Studies would likely be more helpful to policy-makers if they had more candidate MEPS levels (more than LLCC and BAT). These could include a level between base-case and LLCC, change in LCC=0, maximum EU-wide NPV…</td>
</tr>
<tr>
<td>Performance Projection</td>
<td>– consider projecting product performance forward 10 years, based on historical trends and known BAT &amp; BNAT. This will assist in developing A to G labelling, and make manufacturers aware of the EU’s longer-term view on energy savings</td>
</tr>
<tr>
<td>EU NPV</td>
<td>- calculate the EU-27 regional net present value (NPV) on consumers of various candidate MEPS levels, taking into account estimated incremental costs (i.e., purchase, operation and maintenance) and discounted net benefits (i.e., energy savings).</td>
</tr>
<tr>
<td>Two-tier Standards</td>
<td>- requirement that the Preparatory Study team always generate a two-tiered MEPS level, one taking effect 2-3 years after final publication of the Preparatory Study and one taking effect 5-6 years after publication.</td>
</tr>
</tbody>
</table>
It is important that the methodology in a good way can deal with other criteria than energy efficiency. The use of hazardous substances in products is one such case. Hazardous substances should as far as possible be controlled/limited. In order to be able to increase the use of recycled materials, the products (and when they become end-of-life) need to contain as few hazardous substances possible.

The expansion to include energy-using products seems likely to accelerate the need to consider the impact of component performance on system performance - which itself is likely to be increasingly application-dependent. System-level performance is typically more difficult to regulate than product-level (and is perhaps outside the formal remit of the ErP, as system are more often “bespoke” rather than series produced single market products).

We would welcome new product examples where hazardous substances under the RoHS directive are still being used in any non-negligible quantity that would stand in the way of recycling.

Noted. But please consider that the perceived difference between ‘product-approach’ versus ‘system-approach’ is often used as a political argument to include or exclude certain favourable or unfavourable aspects/impacts in the imminent legislation. In design methodology and systems theory, every product is a system and vice versa; what matters is only the extend of the system boundaries and the perspective. So, from the scientific and technical viewpoint there is no such discrete distinction between ‘products’ and ‘systems’. Hence the MEeRP will not discuss it as such, but instead will try to provide guidance on the product scope (and practical boundaries) from the viewpoint of the experience of past prep. studies.

Extended Remarks

Expert / Consultant

Scope: implementing measures are only useful, if more or less standardised products are concerned that may e.g. be subject to CE marking. Large Taylor-made installations require measures for their operation, not for putting them on the marked and should not be subject to an Eco design preparatory study.

Section 8: A methodology is lacking for drafting measures concerning other aspects than energy consumption; with many measures concerning pollutant reduction no cost reductions occur. Possibilities are taking into account external costs or environmental quality targets.

Preparatory studies should more clearly indicate proposals for scope, requirements, etc. which can be directly used for drafting the implementing measures.

The consideration of refrigerants need to be strengthened based on the TEWI approach according to EN 378-1. Standardised processes should be established for regular and obligatory updating the databases of the EuP EcoReport.

The MEeRP study should include provisions on how to deal with:

- Uncertainty of input data, e.g. in cases, when very rough or inexistent EcoReport data is used with small but simple improvements
  OK

- Differing data for test stand (-> Eco design requirement) an real life (-> EcoReport) performance
  OK, is included

- Cases where improvements are not reflected at test stand measurement
  OK, is included but could be more explicit

Establishment of a reliable data basis:

Not a MEeRP issue.

The Commission should be enabled to review efficiency requirements regularly with little effort. Therefore industry and importers should be required to provide information regularly to an institution authorised by the commission. This information should cover data on product features of all products placed on the market to facilitate review and ensure a balanced set of

It is the task of the preparatory study to analyse, if it is appropriate to CE mark a product (for showing compliance with minimum requirements under the Ecodesign Directive).

For strict pollutant abatement, the necessity of mentioning external costs may arise.

This is required by the Commission. However, this is an iterative process, evolving over the whole study period.

In several prep. studies there have been several proposals how to shape the measures.
The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan already stated in 2008 that to implement the product policy of the EU “consistent and reliable data and methods are required to assess the overall environmental performance of products, their market penetration and to monitor progress. Data on products and related environmental impacts required and collected under different tools should be shared where useful. Such methods also need to be cost-effective and easy to apply, for policy makers and for industry.”

### Extended Remarks

<table>
<thead>
<tr>
<th>Industry / trade association</th>
<th>Consumer organisation</th>
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<tbody>
<tr>
<td>A standardised format for use in presenting study conclusions/recommendations would be a very useful addition to the methodology. This would enable a consistent view across all studies for all stakeholders. Presently no such format exists meaning that it can be difficult to determine what conclusions study consultants have come to. And while the Commission can always ask questions of the consultants they have contracted, that is not as easy for other stakeholders. The format should encompass:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The gathering of expertise to prepare Eco design measures is probably too much outsourced to external consultants, which then leads to serious lack of dynamism and updating. Not enough consistency is found between these studies and the ones under other product policy instruments (Eco label, RoHs…)</td>
</tr>
<tr>
<td>1. Identification of consultancy</td>
<td>The European Commission needs to rely more on in-house experts able to address this consistency issue and to provide a continuous and up-to-date technical assistance to the desk officers in charge. This role could for instance be devoted to the JRC who could be charged of some of the sections of the MEEUP (especially on LCAs and market monitoring)</td>
</tr>
<tr>
<td>2. Subject matter of consultation</td>
<td>Much more guidance should be provided on how to draft final task 8, especially the way to build more standardised and comparable policy scenarios, to draft minimum requirements (e.g. how many tiers to include, etc.) and the way to address issues that are cross-cutting (e.g. how to address chemicals, refrigerants, resource efficiency aspects…) Such an ‘Eco design implementation guidance’ could help save a lot of time and avoid repetitive debates under each lot.</td>
</tr>
<tr>
<td>3. Quantity of units placed on the EU market</td>
<td></td>
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<tr>
<td>4. Whether an Implementing Measure is recommended</td>
<td></td>
</tr>
<tr>
<td>5. Proposed measures to be covered by any Implementing Measure</td>
<td>See above</td>
</tr>
<tr>
<td>6. Possible limit values (specific Eco design requirements), for consideration by the Commission</td>
<td>See above</td>
</tr>
<tr>
<td>7. Identification of support in relation to standards consideration by CEN/CENELEC/ETSI</td>
<td></td>
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<tr>
<td>8. Identification of independent test laboratories capable of performing tests to determine compliance and whether these laboratories are accredited to perform such testing</td>
<td>See above</td>
</tr>
<tr>
<td>9. Projected economic impact of introducing an Implementing Measure for producers who place energy-related products on the market</td>
<td></td>
</tr>
<tr>
<td>10. Projected economic impact of introducing an Implementing Measure for consumers who purchase energy-related products</td>
<td></td>
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<tr>
<td>11. Any overlap with existing horizontal or specific Implementing Measures</td>
<td></td>
</tr>
<tr>
<td>The results and background data for all Eco-design Lots should be compiled in a common EU database. This would provide a solid basis for future revisions of the criterions, and would be easy to use for all experts. Now it seems that data are spread throughout large numbers of websites with very different formats and information levels, if available at all.</td>
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</table>

**Too generic to answer**

**Thanks for the suggestion. We will build on it**

**See above**

**See above**
<table>
<thead>
<tr>
<th>Extended Remarks</th>
<th>Industry / trade association</th>
<th>methodology?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry as studied by Entr Lot 4 cannot not be assessed as (domestic) products because of the extremely wide variety of applications, operating conditions, job changes etc... An approach as done within the IPPC directive on effluent control could be much more efficient than the methodology of EuP.</td>
<td>See above</td>
<td></td>
</tr>
<tr>
<td>Once Eco design is legislation the Commission should make sure that the national existing labels and standards harmonize, focusing on ErP Eco design.</td>
<td>Agree, but not an MEErP issue</td>
<td></td>
</tr>
<tr>
<td>Generally speaking there should be more flexibility to apply the methodology on different products. Especially as they often differ in a lot of ways. To apply the same methodology e.g. for small combustions for solid fuels and commercial catering equipment seams not to be reasonable.</td>
<td>This is contrary to the request by many others for more guidance.</td>
<td></td>
</tr>
<tr>
<td>From our point of view, the problem underlying all aspects of the MEEuP is that it is made for products in the mass market. As the MEEuP states itself on page 110, &quot;the eligible products or product groups should not be products of which only a few &quot;on-offs&quot; or a small client specific product series are made.&quot; However, this is often the case with regards to capital goods. Hence the MEEuP assumes that it is applied to products in the mass market (as for example white goods) and consequently the analysis (Base Case definition, best available technology, scenario analyses etc.) follows this approach. We are concerned that this approach will not lead to good results when applied to our sector with products for industrial applications, often custom made, in small series.</td>
<td>Although the production volume clearly needs to be taken into account when applying the methodology, it does not fundamentally alter the structure of the methodology. In fact, some principles in MEEuP/MEErP like TCO (Total Cost of Ownership), a concept very close to LCC, are much more current practice with capital goods than with the mass-produced products like whitegoods. Having said that, we will discuss the issue in the MEErP and try to provide more guidance.</td>
<td></td>
</tr>
<tr>
<td>In general we consider the procedure for the elaboration of implementing measures itself and its steps as useful. We appreciate that it ensures stakeholder participation, which is crucial for the quality and practicability of implementing measures.</td>
<td>Noted.</td>
<td></td>
</tr>
<tr>
<td>While we welcome the methodology as it is designed, we see enormous potential for improvement in the way it was implemented. Time management and planning of the various steps was very unpredictable.</td>
<td>Time management and planning (outside the structure) is not an issue for MEErP</td>
<td></td>
</tr>
<tr>
<td>This leads to significant consequences for competitiveness of European industry and its possibility to innovate.</td>
<td>Industry is invited to participate in any stakeholder discussions.</td>
<td></td>
</tr>
<tr>
<td>In particular the way the impact assessment is conducted is not transparent and very often its results are not comprehensible. Good reasoning of the result of the assessment and a link between study and impact assessment were missing.</td>
<td>We will try to improve and make more explicit what should be done</td>
<td></td>
</tr>
<tr>
<td>6. More guidance needed.</td>
<td>This comment is too generic.</td>
<td></td>
</tr>
<tr>
<td>7. Key role of the sensitivity analysis. Procedure on how to deal with it should be defined. More guidance on LCC, LLCC, BNAT needed.</td>
<td>See above</td>
<td></td>
</tr>
<tr>
<td>8. More guidance on this policy Impact Assessment for use with ERPs is needed.</td>
<td>The preparatory study only summarises a first impact analysis for the product group in task 8. If the Commission subsequently agrees to set minimum requirements for the studied product group, an impact assessment is carried out by the Commission.</td>
<td></td>
</tr>
<tr>
<td>currently, recycling aspects are not properly covered in the methodology and statement arguing that recycling credits are included for metals is wrong and misleading.</td>
<td>Any preparatory study should follow the MEEuP/MEErP methodology endorsed by the Ecodesign Consultation Forum.</td>
<td></td>
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</table>

24
For metals, the current methodology is only based on the recycled content approach (past-related) which does not consider the product recyclability.

Following sound accounting principles, the credit for recycling can only be applied once: either before (‘recycled content’) or after the use phase. A second principle is that there can be no more material recycled than is actually being disposed; for metals, used in long-living products and sales usually growing with GDP, this means that never more than 40% of secondary scrap can be recycled, because most of the metal is still in use (‘stock-effect’). In MEEuP 2005 it was decided for metals in ErP to give the credit before the use phase, i.e. the credit for recycling is incorporated in lower production impacts of the half-products that use more recycled material. The main reasons were that a) >90% of metal scrap is already recycled and not significantly influenced by possible EoL-directed design measures, b) partitioning to the production phase promote that designers, when possible, choose materials with a high share of recycled materials, c) partitioning to the production phase -- with the appropriate recycling percentages-- ensures that the principles of sound accounting are taken into account and need not burden the EoL analysis in individual studies. For plastics in EuP it was considered that their main use is in packaging and disposables, i.e. at a much shorter product life, and that increasing the (thermal and/or materials) recycling percentage could be an issue for the Ecodesigner. Hence MEEuP 2005 required the contractors for preparatory studies to investigate the exact EoL flows (no defaults). However, given that a) most prep. studies did not present new EoL flow data and did use the (optimistic) values found at the opening of the EcoReport file, b) that with the inclusion of ErP (e.g. building products) the stock-effect may well have a significant influence on the amount of plastics available for recycling and c) already the MEEuP 2005 study commented that the possibly too optimistic values for plastics recycling would be subject for further investigation, the EcoReport 2011 will explicitly take into account the stock-effect also for plastics and thereby ensure that also for the new product scope of ErP there will be a 'level playing field'.

Credits (referring to product recyclability, i.e. end of life recycling aspects) are only considered for plastics. Hence, the methodology is clearly discriminatory and inconsistent

Incorrect. Recycling is considered for all materials. See above and below
A result, the metal industry requests a revision of the methodology on recycling in accordance with the ILCD handbooks.

The ILCD/ELCD effort by JRC-IES is very valuable as it has attracted major business associations to provide LCA data, it has documented these inputs in an electronic database and it has reviewed compatibility with LCA ISO standards (e.g. ISO 14040). However, the ISO standards allow a large degree of flexibility in the calculation methods of many issues. And the ILCD handbooks have done little to apply restrictions on this degree of flexibility, which -in its present form- makes it incompatible with the overall aim of Ecodesign, i.e. to save resources and abate emissions in the real world. Recycling is such an issue. In detail: The ILCD handbook considers that the 'substitution method' (a.k.a. 'recyclability') is a valid yardstick for partitioning impacts of materials production. Under this method, given that around 90% of scrap is in theory 'recyclable', it is assumed that 90% of the impacts follows from recycled materials production (at impacts ca. 10% of primary production), even if this is not possible in the real world (see 'stock-effect' above) and is not even close to the 30-40% recycling rate reached today. Given that MEEuP and EcoReport deals with policy goals in the real world, the EcoReport does not follow this approach. Even for laymen there is a credibility issue if the Commission employs LCA methods that give a better environmental score to products made from high-purity, virgin materials than for products that use a high percentage of recycled materials (and thus have a higher 'contamination'). And this issue, although it is probably the most detrimental, is not the only one where the ILCD deviates from the principles proposed in the MEEuP.

Impact categories, additional impacts and up-to-date characterisation factors should be defined with Product Category Rules. The algorithm and process of deriving a final result from single indicators must be clear.

The impact categories, additional impacts, etc. are defined in the legislation. The principles of algorithms and processes are clearly documented in the methodology and sources for Unit Indicators are documented and thus traceable. Furthermore, the EcoReport provides a RAW-sheet that gives all the details of the intermediate calculations.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>The function of products and solutions must be clearly defined as well as the system boundaries. The life cycle approach is needed.</td>
<td>The MEEuP is based on a life cycle approach.</td>
</tr>
<tr>
<td>Develop methodology to account for use phase benefits of products dedicated to different sectors and opportunities for applications.</td>
<td>The use phase modelling is part of the MEEuP.</td>
</tr>
</tbody>
</table>

Method not applicable to non-energy using intermediary products. Their performance can only be assessed at the level of the end-product. Intermediary product A may have a better performance in end-product X, while intermediary product B performance better in end-product Y. See above

Impact categories, additional impacts and up-to-date characterisation factors should be fully aligned with CEN 350 work on construction products Environmental Product Declaration See above

<table>
<thead>
<tr>
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<th>Manufacturer / importer</th>
</tr>
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</table>
| Expand the variety of OEM manufacturing processes for polymers, since impacts from the BOM may be offset by the OEM manufacturing process | The feasibility to update the underlying data sets of EcoReport tool will be analysed in task 4.
Expand the variety of assembly stages to account for, and differentiate, the different activities, since impacts from the BOM may be offset at this stage. See above

Develop methodology to account for use phase benefits of energy related products that is consistent with energy labelling for energy relevant products. The update of the MEEuP will address (dynamic) labelling and benchmark categories, where appropriate.

I would further like to make some remarks on how recycling for metals was being modelled in the 2005 MEEuP methodology study. See above

Extended Remarks

Manufacturer / importer

In this study you refer that "recycling has both a demand and a supply side problem" and concluded for metal the demand side is to be decisive. As example, you pointed to a declining recycling rate for copper. In this logic, you have adopted a 'recycled content' based model.

For metals, on the supply side of recycling, there is little (if any) possibility for improvement. Collection rates are >90-95%. Yield rates >95%. That is why recycled content (at 90%) was assumed, at least to make sure that products with high recycled content stay in high demand. The case of Copper was an example and reflects the situation in 2003. It is not valid anymore, but there are plenty examples where due to local, regional, national circumstances market segments of recycled materials are/were subject to fluctuations in demand.

Apart from temporary instabilities, metal are still globally in short supply. Population grows and this population aspires enjoying the same 'functional units' as the most advanced regions. Efficiency gains (de-materialisation) to counter this effect will not stop the growing of materials in use. That is why recycling is so important.

"Dematerialisation" as well as "Recycling society" are both themes in the EU's resource efficiency policy. There is no reason to give up on "Dematerialisation", especially as EU is well on its way towards a decoupling of DMC growth and GDP growth. And equally recycling is important.

The fact that secondary materials go the application with least technical requirements is a logical & economical outcome. However diverting this flow to another application against current economic logic, would only result in the replacement of this flow by virgin material production. Therefore, metal products with higher recycled content are not environmental better that others as they all are linked to the same 'material pool'.

The 'recycled content' is indeed partitioned in accordance with the most economical (current) flows. Diverting these flows --e.g. through a different partitioning in tools that should help legislation-- would thus result in higher costs or lower gains, which is counterproductive to a healthy recycling society. Demand for recycled materials could drop and end-users --faced with a minimal price difference between recycled and virgin material solutions-- could increasingly choose the latter.

Your statement that "the "fairly pure" state that often is no longer good enough" for recycled steel is not in line with the 2011 adopted End-of-waste criteria for steel in Waste Frame directive which defines 'BAT' processing & quality criteria for ferrous scrap ensuring use.

It is no secret that for certain applications, e.g. automotive parts that need to be coated, a certain surface quality of cold-rolled steel is required. And it is also no secret that with current technology this limits the recycled content of secondary (EoL) scrap. For this reason, even if there was enough secondary scrap for today's production (which there isn't by far), virgin material will not easily be replaced in that application. Likewise in non-ferrous applications, the electric conductivity and reflectivity of the materials limits the demand. And in plastics applications the use of recycled plastics is limited for obvious reasons.

Having said all that, the argument of "purity" is only one argument why for metals in the MEEuP the credit was given at the production stage and not at end-of-life. Other argument is that at the EoL-stage there is virtually nothing one could do to improve the situation. And last but not least-as mentioned above-- giving the credit at the production...
### Extended Remarks

<table>
<thead>
<tr>
<th>Manufacturer / importer</th>
<th>Comments</th>
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<tbody>
<tr>
<td><strong>Stage at least makes sure that demand for secondary scrap stays high.</strong></td>
<td></td>
</tr>
<tr>
<td>Recycling aspects and recycling methodology should be properly addressed.</td>
<td>We think we are doing that</td>
</tr>
<tr>
<td>Credits (related to the future) refer to product recyclability and end of life recycling aspects which are not considered in the assessment and in the energy data used.</td>
<td>The argumentation is given above. But in your question there is an important point: When talking about &quot;recyclability&quot; we are talking about the future, perhaps even 50 years from now (e.g. construction products). And there is considerable uncertainty as to what this future may bring in e.g. 2060. What will be the material that a &quot;recyclable&quot; product will replace? Is it still virgin material of the same type, produced with the same processes that we have today? Or what? Perhaps we will see new --much more environmental friendly materials-- and processes that cost much less energy. So, even if we use 'recyclability' instead of --as we do now-- 'recycled content', what would be the credit? E.g. for aluminium, will we be replacing aluminium made with the Hall-Heroult process like today, or will there be a more energy-efficient chemical process?</td>
</tr>
<tr>
<td>A revision of the data and methodology on recycling is necessary.</td>
<td>See above. Any input on updated recycling rates is welcome</td>
</tr>
<tr>
<td>The use of a &quot;cradle to grave&quot; LCA (to avoid the transfer of burdens) and taking as reference to ILCD handbook could help in the application of EoL credits also to metals.</td>
<td>MEEuP/MEErP is using 'cradle to grave' LCA. For ILCD see above.</td>
</tr>
<tr>
<td>For metals the current methodology only refers to recycled content and it does not take into account the product recyclability.</td>
<td>See above</td>
</tr>
<tr>
<td>Always prepared to exchange views on the topic.</td>
<td>Noted.</td>
</tr>
</tbody>
</table>

---

### Extended Remarks

<table>
<thead>
<tr>
<th>Manufacturer / importer</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2: We have, even overlapping legislation, on EU level: HOWEVER sustainability/environmental performance for products s not well understood: it is not able to capture these performances in 1 figure and certainly not for intermediate products!</td>
<td>See above in section 1</td>
</tr>
<tr>
<td>Comment to 1.3 Test and methodology standards on CEN level and ISO-level are available especially made for CONSTRUCTION PRODUCTS and for WORKS (BUILDINGS). Communicating in the building chain requires harmonised methodologies and harmonised communication formats.</td>
<td>See above in section 1</td>
</tr>
<tr>
<td>2.3 Construction products are intermediate products, and there are many alternative products, systems and ways to achieve one or more building performance (a construction product may contribute to several aspects of several BWR's (Basic Work Requirements in the CPR). Trends are not set with products but in buildings.</td>
<td>See above in section 2</td>
</tr>
<tr>
<td>2.4 if, then for buildings. For construction products this might not present relevant data at all.</td>
<td>See above in section 2</td>
</tr>
</tbody>
</table>
ANNEX V

International review
US DoE Appliance and Equipment Efficiency Standards Program

Introduction

The US DOE’s Appliance and Equipment Efficiency Standards (hereafter ‘Appliance Standards’) is part of the Buildings Regulatory Program (BRP). The other two BRP-programs are ENERGY STAR (labelling) and the Building Energy Codes Program (comparable to the EU activities under the Energy Performance of Buildings directive).

The first appliance standards were enacted by law in 1987, and since that time a series of laws and DOE regulations have established, and periodically updated, energy efficiency or water use standards for over 50 categories of appliances and equipment used in the residential, commercial and industrial sectors.

This is shown in Table 1. Note that –compared to EU Ecodesign– DOE lighting products and heating products have been split in much smaller, technology-specific groups, but otherwise coverage is similar. Furthermore, DOE has included water-using products (plumbing products).

Since 2006 the priority of DoE is eliminating a backlog of 21 projects/product groups, i.e. product groups where the legislator failed to meet the deadline for updating. Currently 16 product groups have been updated and in the Multi-Year Program Plan Room and Central Air Conditioners (incl. heat pumps), Pool heaters (Gas Fired) and Direct heating equipment, Residential Furnaces and Boilers, Mobile Home Furnaces, Clothes dryers, Kitchen ranges and ovens, Fluorescent lamp ballasts are still marked as backlog.

5 The Department of Energy's Appliance and Equipment Efficiency Standards Program is conducted pursuant to Title III, Part B, of the Energy Policy and Conservation Act (EPCA or the Act). EPCA established test procedures, conservation targets (followed by standards if targets are not set), and labeling requirements for certain major household appliances. In 1987, EPCA was amended and updated by the National Appliance Energy Conservation Act (NAECA), which superseded existing State requirements. Fluorescent lamp ballasts were added by an amendment in 1988. The Energy Policy Act of 1992 (EPACT 1992) further amended EPCA to expand the coverage of the standards program to include certain industrial equipment, including commercial heating and air conditioning equipment, water heaters, certain incandescent and fluorescent lamps, distribution transformers, and electric motors. The Energy Policy Act of 2005 (EPACT 2005) significantly expanded and changed the Department’s regulatory requirements in appliance standards. The Energy Independence and Security Act of 2007 (EISA 2007) again expanded and changed the Department’s regulatory requirements. Amongst others, EISA 2007 requires all energy conservation standards promulgated after July 1, 2010 to include standards for standby-and off-mode energy consumption.
Table 1. Products Covered by DOE Standards

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Way Incandescent Lamp; Candelabra base incandescent lamp;</td>
<td>Direct heating equipment; Furnace Fans; Furnaces; Mobile Home Furnace; Pool heaters (Gas Fired); Residential Boilers; Residential Water heaters; Small Furnaces;</td>
<td>Central Air Conditioners and Central Air Conditioning Heat Pumps; Room Air Conditioners.</td>
</tr>
<tr>
<td>Ceiling Fan Light Kits; Ceiling Fans;</td>
<td>Residential:</td>
<td>Commercial:</td>
</tr>
<tr>
<td>Fluorescent lamp ballasts; General Service Fluorescent Lamps; General Service Incandescent Lamps; Incandescent Reflector Lamps; Intermediate Base Incandescent Lamps;</td>
<td>Commercial warm air furnaces; Packaged boilers; Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks; Unit Heaters.</td>
<td>Packaged terminal air conditioners and packaged terminal heat pumps; Single package vertical air conditioners and single package vertical heat pumps; Small commercial package air conditioning and heating equipment; Large commercial package air conditioning and heating equipment; Very large commercial package air conditioning and heating equipment; Small commercial split-system air conditioning and heating equipment; Large commercial split-system air conditioning and heating equipment; Very large commercial split-system air conditioning and heating equipment.</td>
</tr>
<tr>
<td>Light Emitting Diodes; Medium Base Compact Fluorescent Lamps; Organic Light Emitting Diodes; Rough Service Lamp; Shatter-Resistant Lamp; Torchieres; Vibration Service Lamp;</td>
<td>Appliances: Residential:</td>
<td>Commercial Refrigeration Products:</td>
</tr>
<tr>
<td>Commercial: Mercury Vapor Lamp Ballasts; Metal Halide Lamp Ballast; Metal halide Lamp Fixtures; High-intensity discharge lamps; Traffic Signal Modules and Pedestrian Modules; Illuminated Exit Signs.</td>
<td>Clothes dryers; Dehumidifiers; Dishwashers; Kitchen ranges and ovens; Microwave ovens; Refrigerators, Freezers and Refrigerator-Freezers; Residential Clothes washers.</td>
<td>Automatic commercial ice makers; Commercial refrigerators, freezers, and refrigerator-freezers; Refrigerated Beverage Vending Machines; Walk-in coolers and walk-in freezers.</td>
</tr>
</tbody>
</table>
2000 volcanoes(65,57),(962,948)

Computers and Electronics: Battery Chargers; External Power Supplies, Class A; External Power Supplies, non-Class A; Television sets; Transformers and Motors: Commercial: Distribution Transformers, MV Dry and Liquid-Immersed; Electric Motors; Small Electric Motors. | Plumbing Products: Residential: | Non-Energy 

<table>
<thead>
<tr>
<th>Non-Energy Products: Residential:</th>
<th>Residential:</th>
<th>Commercial:</th>
</tr>
</thead>
</table>


Methodology

This section of the report presents information on the process DOE follows in establishing of energy conservation standards. It is taken from the US DOE ‘US-EU High Level Regulatory Forum Scoping Study’ report on ‘An Inventory of US and EU Appliance Standards and Labeling Programs’ prepared by Navigant Consulting for DOE, July 2010.

DOE conducts an extensive analysis (described by the Process Improvement Rule) in order to comply with the seven statutory criteria in EPCA. These criteria and the underpinning analyses form the basis for the Secretary of Energy’s decision with respect to the appropriate national energy conservation standard.

Maximum Efficiency that is Technologically Feasible and Economically Justified

EPCA lists seven criteria that DOE must take into consideration when establishing a new or amended energy conservation standard. (42 U.S.C. 6295(o)(2)) The Secretary is required to choose the standard level that is designed to achieve the maximum improvement in energy-efficiency that is
technologically feasible and economically justified. In making this determination, the Secretary reviews stakeholder comments on the proposed standard level and determines whether the benefits of the standard exceed the burdens by the greatest extent possible concerning these seven criteria.\(^6\)

The seven statutory criteria represent the key questions that the Secretary takes into consideration when proposing and adopting the DOE regulatory standards:

(I) the economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;

(II) the savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of the standard;

(III) the total projected amount of energy, or as applicable, water, savings likely to result directly from the imposition of the standard;

(IV) any lessening of the utility or the performance of the covered products likely to result from the imposition of the standard;

(V) the impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard;

(VI) the need for national energy and water conservation; and

(VII) other factors the Secretary considers relevant.

**Standards Development Process**

In September 1995, DOE announced a formal effort to consider improvements to the process used to develop appliance efficiency standards, calling on energy efficiency groups, manufacturers, trade associations, state agencies, utilities and other interested parties to provide input to guide the Department. On July 15, 1996, the Department published Procedures for Consideration of New or Revised Energy Conservation Standards for Consumer Products (hereinafter referred to as the Process Rule). 61 FR 36974.

The Process Rule sets forth guidelines for developing efficiency standards. These guidelines are designed to provide for greater and more productive interaction between the Department and interested parties throughout the process. They are also designed so that key analyses are performed earlier in the process, with early opportunities for public input to, and comment on, the analyses. The guidelines are consistent with the procedural requirements of law, but add some important steps to enhance the process. The improvements can be summarized as follows.

- Provide for early input from stakeholders
- Increase the predictability of the rulemaking timetable
- Reduce the time and cost of developing standards
- Increase the use of outside technical expertise
- Eliminate problematic design options early in the process
- Conduct thorough analyses of impacts
- Use transparent and robust analytical methods
- Fully consider non-regulatory approaches
- Articulate policies to guide the selection of standards
- Support efforts to build consensus on standards
- Establish an annual priority-setting process to focus available resources on those efficiency standards likely to produce the greatest benefits

\(^6\) DOE rulemakings are conducted consistent with OMB circular A-4.
The process was designed with stakeholders in mind and with the intent to enhance the productivity of the program through improved communication. Collaboration and interaction with stakeholders has enhanced the quality of the resulting rules, typically by way of additional analysis conducted as issues are raised.

In addition to ensuring that its analyses address the seven EPCA criteria and follow the Process Rule guidelines for developing regulations, the Department must follow numerous procedural requirements—mandated by various statutes and Executive Orders—and perform all associated supporting analysis. These requirements are integrated into the rulemaking process, analysis, and documents. The following presents the list of analyses that DOE conducts when considering the appropriate efficiency level for an energy conservation standard:

The analyses that DOE performed for the advance notice of proposed rulemaking (ANOPR) include:

- **Market and Technology Assessment** to characterize the market (including manufacturers, shipments and trends) and to review technologies and approaches for making the covered product more efficient;
- **Screening Analysis** to evaluate technology options for improving efficiency that should not be considered further in the rulemaking because of issues with safety, utility, manufacturability or other defined criteria;
- **Engineering Analysis** to study the relationship between manufacturing a product to be more efficient and associated increases in the cost;
- **Energy Use and End-Use Load Characterization** to generate energy use estimates for the covered product in service and end-use load or consumption profiles;
- **Markup Analysis** to convert manufacturer prices to retail / installed customer prices;
- **Life-Cycle Cost (LCC) Analysis** to calculate, at the consumer level, the discounted operating cost savings over the average life of the product, compared to any increase in the retail / installed costs likely to result from the efficiency standard;
- **Shipments Analysis** to estimate shipments of the product over the time period examined in the analysis;
- **National Impact Analysis** to assess the aggregate impacts at the national level of consumer payback, net present value (NPV) of total consumer LCC, national energy savings (NES), and national employment.
- **Life-Cycle Cost Subgroup Analysis** to evaluate impacts on identifiable subgroups of customers who may be disproportionately affected by a national efficiency standard;
- **Manufacturer Impact Analysis** to estimate the financial impact of standards on manufacturers of the covered product and to calculate impacts on competition, employment at the manufacturing plant, and manufacturing capacity;
- **Utility Impact Analysis** to estimate the effects of proposed standards on the installed capacity and generating base of electric utilities (i.e., reduction in electricity sales);
- **Employment Impact Analysis** to estimate the impacts of standards on net jobs eliminated or created in the general economy as a consequence of increased spending on the more efficient products and reduced customer spending on energy;
- **Environmental Assessment** to evaluate the impacts of proposed standards on certain environmental indicators including CO2; and
- **Regulatory Impact Analysis** to present major alternatives to proposed standards that could achieve comparable energy savings at a reasonable cost.

These analyses are all conducted over the three-year rulemaking period.
Table: Flow Diagram of a DOE Energy Conservation Standards Rulemaking

<table>
<thead>
<tr>
<th>Approaches</th>
<th>Key Inputs</th>
<th>Analyses</th>
<th>Key Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Characteristic Industry</td>
<td>- Identify Firm/Products</td>
<td>- Market and Technology Assessment</td>
<td>- Product Classes, Technology Options</td>
</tr>
<tr>
<td>- Analysis of Market Data</td>
<td>- Historical Estimates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Analysis of Product Data</td>
<td>- Market Segmentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Analyzing Level Approach</td>
<td>- Product Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Design Option Approach</td>
<td>- Manufacturing Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Analysis of Energy Use Data</td>
<td>- Efficiency Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Outlet Distribution Channels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Economic Census Data Analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Retail Price Collection and Analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting Approach</td>
<td>- Energy Price Forecasts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Market Saturation</td>
<td>- Site-Related Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Manufacturer Prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Average Costs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Energy Use**

- Energy Prices
- Installation Costs
- Maintenance & Repair Costs
- Energy Efficiency Levels

**Marks for Product Price Determination**

- Annual Energy Use (UEC)
- Energy Efficiency Levels

**Life Cycle Cost and Payback Period Analysis**

- Installed Cost
- Life Cycle Costs
- Payback Period

**National Energy Conservation Standards Rulemaking**

- Advance Notice of Proposed Rulemaking (ANPR)
  - Total Standard Levels (TSL)
  - Life Cycle Costs
  - Payback Periods

- Final Rule
  - Department of Justice Review
  - Rulemaking Correction

*Figure 1 presents the interconnected analytical framework in a typical DOE energy conservation standards rulemaking, including some of the approaches to the analysis, key inputs, major analysis sections, and outputs.*
The table below shows how EPCA’s seven criteria are taken into consideration by the Secretary of Energy. The table identifies which rulemaking analyses address the EPCA factors, and whether DOE performs each analysis during the pre-NOPR or NOPR stage of the rulemaking. The sections below briefly describe each of these analyses.

**Table. Seven EPCA Criteria and Associated DOE Analyses**

<table>
<thead>
<tr>
<th>EPCA Criteria</th>
<th>Analyses DOE Performs</th>
<th>Rulemaking Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I) the economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;</td>
<td>Life-cycle cost and Payback Analysis (including markups)</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td></td>
<td>LCC Subgroup Analysis</td>
<td>NOPR</td>
</tr>
<tr>
<td></td>
<td>Manufacturer Impact Analysis</td>
<td>NOPR</td>
</tr>
<tr>
<td>(II) the savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of the standard;</td>
<td>Life-cycle cost and Payback Analysis (including markups)</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td>(III) the total projected amount of energy, or as applicable, water, savings likely to result directly from the imposition of the standard;</td>
<td>National Impact Analysis including shipments</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td>(IV) any lessening of the utility or the performance of the covered products likely to result from the imposition of the standard;</td>
<td>Screening Analysis</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td></td>
<td>Engineering Analysis</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td>(V) the impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard;</td>
<td>Manufacturer Impact Analysis</td>
<td>NOPR</td>
</tr>
<tr>
<td>(VI) the need for national energy and water conservation; and</td>
<td>National Impact Analysis including shipments</td>
<td>Pre-NOPR</td>
</tr>
<tr>
<td>(VII) other factors the Secretary considers relevant.</td>
<td>Environmental Assessment</td>
<td>NOPR</td>
</tr>
<tr>
<td></td>
<td>Utility Impact Analysis</td>
<td>NOPR</td>
</tr>
<tr>
<td></td>
<td>Employment Impact Analysis</td>
<td>NOPR</td>
</tr>
<tr>
<td></td>
<td>Regulatory Impact Analysis</td>
<td>NOPR</td>
</tr>
</tbody>
</table>

The Department’s analysis in support of the development of new or amended standards is designed to identify the efficiency level that represents the maximum improvement in energy efficiency that is technologically feasible and economically justified on the basis of the seven statutory criteria.

In the following sections, additional detail is provided on each of the rulemaking analyses. Note that these are general descriptions, and that for actual rulemakings, the methodology and/or inputs assumed may have to be adjusted to be in keeping with the product and its markets. As discussed earlier, these analyses are presented and described in the “Procedures, Interpretations and Policies for Consideration of New or Revised Energy Conservation Standards for Consumer Products” (also called the “Process Rule”), 10 CFR 430, Subpart C, Appendix A. In that policy statement, DOE outlined all of its procedural improvements, including a review of DOE’s: 1) economic models, 2) analytic tools, 3) methodologies, and 4) non regulatory approaches. The Process Rule recommended that DOE take into account uncertainty and variability by carrying out scenario or probability
analysis. The following sections provide a general description of the analytic components of the improved rulemaking framework.

Market and Technology Assessment

This Assessment characterizes the markets and existing technology options for making the covered product more energy-efficient. In the market assessment, DOE develops information on the present and past industry structure and market characteristics of the product(s) concerned. The market assessment consists of both quantitative and qualitative efforts to assess the industry and products based on publicly available information. Issues addressed in this market assessment included: 1) national shipments; 2) identification of the largest players in the industry; 3) existing non regulatory efficiency improvement initiatives; 4) developments around standards in States and neighboring countries; and 5) trends in product characteristics and retail markets. The information collected served as resource material that DOE used throughout the rulemaking.

In the technology assessment, DOE develops information about existing technology options and designs to improve energy-efficiency. In consultation with interested parties, DOE identified several technology options and designs for consideration. Another key part of the technology assessment is subdividing the covered products into classes that DOE can use in its rulemaking. Covered products are generally subdivided into product classes using the following criteria: a) the type of energy used, b) capacity, and c) performance related features that affect consumer utility or efficiency. DOE may set different efficiency standards to different product classes. DOE developed its product classes using information obtained from manufacturers, trade associations, and other interested parties. As an example, for water heaters, electric, oil and gas-fired water heaters would all be included in different product classes to ensure that the analysis and standard level developed takes into account the unique engineering and technical aspects of the covered product.

Screening Analysis

The screening analysis considers whether certain technologies should be used in the rulemaking analysis according to four screening criteria: 1) technologically feasible, 2) practicable to manufacture, install, and service, 3) do not have an adverse impact on product utility or product availability, and 4) do not adversely impact health and safety. DOE develops an initial list of efficiency enhancement design options from the technologies identified in the technology assessment. DOE then reviews that list to determine if the design options are technologically feasible, practicable to manufacture, install, and service, would not adversely affect product utility or product availability, or would not have adverse impacts on health and safety. The screening analysis is important because in the engineering analysis, DOE will only consider those efficiency enhancement design options that passed the four screening criteria. It should be noted that cost is not a screening criterion. In the distribution transformer rulemaking analysis, even though silver is a better conductor than copper, it was screened out of the rulemaking on the basis that it would not be practicable to manufacture due to the fact that there would not be sufficient supplies of silver to replace all the copper and aluminum wire being used by the transformer industry each year.

Engineering Analysis

The engineering analysis develops cost versus efficiency relationships for products that are the subject of a rulemaking, estimating manufacturer costs of achieving increased efficiency levels. DOE uses manufacturing costs to determine retail prices in the LCC analysis, and also uses them in the manufacturers impact analysis (MIA). The engineering analysis also determines the maximum technologically feasible energy efficiency level. In general, the engineering analysis estimates the
efficiency improvement potential of individual design options or combinations of design options that pass the four criteria in the screening analysis. The maximum technologically feasible level, another output from the engineering analysis, is the highest level of efficiency that can be achieved by adding efficiency improvements and/or design options, both commercially feasible and in prototypes. The design options comprising the maximum technologically feasible level must have been physically demonstrated in at least a prototype form to be considered technologically feasible.

In general, DOE can use three methodologies to generate the manufacturing costs needed for the engineering analysis. These methods are:

1. the design-option approach – reporting the incremental costs of adding design options to a baseline model;
2. the efficiency-level approach – reporting relative costs of achieving improvements in energy efficiency; and
3. the reverse engineering or cost assessment approach – involving a "bottom up" manufacturing cost assessment based on a detailed bill of materials derived from product teardowns.

In conducting an engineering analysis, DOE also recognizes that regulatory changes occurring outside of the standards-setting process can affect manufacturers of products. Some of these changes can also affect the efficiency of the product. DOE attempts to identify all “outside” issues that can impact the engineering analysis. This might include environmental regulations, import duties on certain components, or other regulatory requirements.

**Energy Use and End-Use Load Characterization**

The energy use and end-use load characterization produces energy use estimates and end-use load shapes for covered products. The energy use estimates enabled evaluation of energy savings from the operation of the appliance or equipment at various efficiency levels, while the end-use load characterization allows for the evaluation of the impact on monthly and peak demand for electricity.

**Markups for Equipment Price Determination**

DOE derives this installed price (or retail price) by applying markups to the manufacturer selling price it determined in the engineering analysis. This analysis considers the value chain, through which products are distributed and associated markups at each of those stages. Thus, markups, shipping costs, sales tax, and installation costs (if appropriate) are the costs associated with bringing a product to market are accounted for in this analysis.

**Life-Cycle Cost and Payback Period Analyses**

The LCC analysis, which calculates the discounted savings in operating costs throughout the estimated average life of the covered product compared to any increase in the installed cost for the product likely to result directly from the imposition of a standard. In determining economic justification, the Energy Policy and Conservation Act (EPCA) directs DOE to consider a number of different factors, including the economic impact of potential standards on consumers. (42 U.S.C. 6295 (o)(2)(B)(i))

To consider the economic impacts of standards, DOE calculates changes in LCC that are likely to result from the standard levels considered, as well as a simple payback period. DOE calculates both the LCC and the payback period (PBP) using a Monte Carlo statistical analysis so these results are presented as distributions of consumers with a variety of inputs rather than point values. The effect of standards on individual consumers includes a change in operating expense (usually decreased)
and a change in purchase price (usually increased). DOE analyzed the net effect by calculating the change in LCC as compared to the base case. Inputs to the LCC calculation include the installed consumer cost (purchase price plus shipping, sales tax, and installation cost), operating expenses (energy and maintenance costs), lifetime of the equipment, and a discount rate.

The PBP analysis, which calculates the amount of time needed to recover the additional cost that consumers pay for increased efficiency. Numerically, the simple payback period is the ratio of the increase in purchase price to the decrease in annual energy costs.

Within the economic analysis, The statute states that if the Secretary finds that the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy, as calculated under the applicable test procedure, then there shall be a rebuttable presumption that such standard level is economically justified. 42 U.S.C. 6295(o)(2)(B)(iii) If DOE finds this to be the case in a rulemaking, it continues to study other, higher, energy efficiency levels, and this level constitutes a minimum level that will be selected by the Secretary.

**Shipments Analysis**

DOE prepares shipment forecasts of covered products in the base case and each potential standards case as an input to the NES spreadsheet model. This study takes into account the elasticity of demand (if any), meaning the degree to which, as a product becomes more expensive, consumers purchase fewer of them. The shipments model starts with an estimate of the overall growth and then estimates increases in shipments using estimates of the relative market share for different covered products.

**National Impact Analysis**

The National Energy Savings and National Net Present Value impacts are the cumulative energy and economic effects of an energy conservation standard across the U.S. economy. DOE projects the impacts from the year the standard would take effect through a selected number of years in the future. DOE analyzes energy savings, energy cost savings, equipment costs, and NPV of savings (or costs) for each efficiency standard level. The national energy and cost savings (or increases) that would result from energy conservation standards depend on the projected energy savings per unit and the anticipated numbers of units sold. DOE creates base case shipments projections and candidate efficiency standard level projections.

To make the analysis accessible and transparent to all stakeholders, DOE uses a Microsoft Excel spreadsheet model to calculate the NES and the NPV (i.e., national economic costs and savings from new standards). Users can change input quantities within the spreadsheet to test the impact of alternative input assumptions. Unlike the LCC analysis, the NES spreadsheet does not use distributions for inputs or outputs. Users can demonstrate sensitivities by running different scenarios using the spreadsheet.

**Life-Cycle Cost Subgroup Analysis**

In this analysis, DOE examines the results from the LCC analysis to evaluate the cost impacts on particular consumer subgroups to determine if they would be differentially affected by potential energy conservation standards in a significant manner. The analysis of these subgroups depends on identifying subgroups with economic characteristics that sets them apart from the average user. Factors that could result in differential impacts to subgroups include differences in purchase price, energy price, usage profiles, and other factors. To the extent possible, DOE obtains estimates of the
variability in each input quantity and considered this variability in its calculation of consumer impacts. DOE discusses the variability in each input quantity and likely sources of information with the interested parties.

**Manufacturer Impact Analysis**

DOE conducts the manufacturer impact analysis to estimate the financial impact of efficiency standards on manufacturers of those covered products and to assess the impact of such standards on employment and manufacturing capacity. The MIA has both quantitative and qualitative components. The quantitative part of the MIA primarily relies on an industry-cash-flow model that takes into account industry cost structure, shipments, and pricing strategies. The model’s key output is the industry net present value (INPV), and it assesses the financial impact of higher efficiency standards by comparing changes in INPV between the base case and the various efficiency levels under consideration by DOE. The qualitative part of the analysis addresses factors such as the material supply chain, manufacturing techniques and equipment, and market and product trends, and includes a subgroup assessment of the impacts on small manufacturers.

DOE also conducts an assessment of impacts on appropriate subgroups of manufacturers. DOE is aware that smaller manufacturers, niche players, or manufacturers exhibiting a cost structure that differs from the industry average and who could be more negatively impacted by energy efficiency standards.

**Utility Impact Analysis**

DOE conducts the utility impact analysis to assess how utilities are affected through the reduction in electricity generation resulting from the increased energy efficiency standard. To perform the utility impact analysis, DOE uses a customized version of the Energy Information Administration's National Energy Modeling System (NEMS). NEMS is a large, general-equilibrium energy-economy model of the United States that EIA has developed over several years, primarily for the purpose of preparing the Annual Energy Outlook.

**Employment Impact Analysis**

DOE conducts the employment impact analysis to assess the impacts of standards on employment in both the manufacturing industry for the covered product and any relevant service industries, including energy suppliers, and the economy in general. DOE separates employment impacts into direct and indirect impacts. Direct employment impacts—discussed in the manufacturer impact analysis—would result if standards led to a change in the number of employees at manufacturing plants and related supply and service firms. Indirect employment impacts result from energy efficiency standards causing jobs to be eliminated or created in the general economy (other than in the manufacturing sector DOE is regulating). Indirect impacts may result both from expenditures shifting among goods (substitution effect), and from incomes changing, which will lead to a change in overall expenditure levels (income effect). An important indirect employment effect may arise from shifting investment from the energy sector into more (or less) labor-intensive industries.
Environmental Assessment

DOE conducts an environmental assessment as required under the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), regulations of the Council on Environmental Quality (49 CFR parts 1500-1508), DOE regulations for compliance with NEPA (10 CFR part 1021), and the Secretarial Policy on the National Environmental Policy Act (June 1994). The main environmental concern addressed is usually emissions from fossil-fuel-fired electricity generation. Power plant emissions include oxides of nitrogen (NOx) and sulfur dioxide (SO2), as well as carbon dioxide (CO2). The first two are major causes of acid precipitation, which can affect humans by reducing the productivity of farms, forests, and fisheries, decreasing recreational opportunities, and degrading susceptible buildings and monuments. NOx emissions are also precursor gases to urban smog and are particularly detrimental to air quality during hot, still weather. CO2 emissions are believed to contribute to raising the global temperature via the “greenhouse effect.”

Regulatory Impact Analysis

DOE conducts a regulatory impact analysis pursuant to Executive Order 12866, Regulatory Planning and Review, which is subject to review under the Executive Order by the Office of Information and Regulatory Affairs. 58 FR 51735 (October 4, 1993). DOE identifies and evaluates major non-regulatory alternatives as feasible policy options to achieve consumer product energy efficiency. These alternatives are evaluated in terms of their ability to achieve significant energy savings at a reasonable cost, and compared these results to the effectiveness of the rule. Under the Process Rule, DOE is committed to continually explore non-regulatory alternatives to standards, some of which include: consumer rebates; consumer tax credits; manufacturer tax credits; voluntary energy efficiency targets; early replacement and bulk government purchase contracts.

Budget and outlook

Methodology is very much linked to budget, because it is no use to implement a comprehensive methodology for rulemaking without the proper means to do the work. Furthermore, the ambitions in expanding and improving the methodology also are very much linked to the budgetary provisions. For that reason, this paragraph explores both the US DOE budget for the Appliance Standard programme and the US ambitions in improving the efficiency and effectiveness of the methodology for rulemaking.

The current (2010) budget for the Appliance Standards programme is $ 35 million. Total programme budget over the 2006-2010 period was $ 104 million, i.e. on average approximately $ 6 million per product group.7

Fig. 1 presents the projected budget for the Appliance and Equipment Efficiency Standards Program for 2011 onwards. The budget is divided into the major activity areas of the program and shows that from FY 2011 -2016, the Program can undertake additional Rulemaking activities beyond those already scheduled. These activities will be chosen based on the Priority Setting process or may be dictated by legislation or other priorities.

The 2011 budget of $ 23 million (ca. € 17 million) for “Standards Rulemaking”, i.e. 57% of the total budget, will predominantly go to the preparatory studies and stakeholder consultation by the National Laboratories and external consultancies. For comparison, the European Union has spent less than € 10 million in contracts for 31 preparatory studies over a period of 5 years (2006-2011).

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7 Indicative maximum figure estimated by VHK: total budget divided by 16 projects handled. Note that parts of the total budget may also have been partitioned to future projects or overhead.
On average, this is €2 million/year, or around 10-15% of the US annual budget. Over the last 5 years, the US has updated 16 product groups. Hence, per product group the average US budget of around 6 million is more than 10 times the EU budget. For comparison: the average contract sum for EU Ecodesign studies preparatory studies is less than €300,000; to this the administrative costs (policy officer and overhead) have to be added.

With its budget proposal DOE brings forward that “Energy conservation standards are one the most highly leveraged and beneficial policy tools for mitigating climate change. Standards not only decrease greenhouse gas emissions, but can also contribute to long term increases in standards of living and economic growth. It is common for US energy conservation standards to save several quadrillion BTU (quads) of energy over a 30-year period, reduce CO2 emissions by hundreds of millions of tons over the same timeframe, and produce several billion dollars of net consumer economic savings. Increased funding would enable acceleration of currently scheduled rulemakings, and would support the development of standards and test procedures for products that are not currently covered.”

Fig. 1. Projected Budget for Appliance and Equipment Efficiency Standards, ($ in millions)

DOE views the currently scheduled rulemakings as the base upon which it will build an even more effective/impactful program over the next five years. Within approximately one year, the Appliance and Equipment Efficiency Standards Program has been able to double its publication rate and start an entirely new compliance and enforcement program. While substantial productivity gains have already been made, DOE plans to take further actions to:
DOE will establish a process to set priorities for new activities based on the potential for energy savings and consumer cost savings. Possible new activities include:

- Accelerating rulemakings so that they are completed before the statutory deadline.
- Adding new covered products to the Appliance and Equipment Efficiency Standards Program.
- Increasing verification and enforcement activities.
- Other actions that would save significant amounts of energy.

The estimated cumulative net present value of consumer benefit from standards amounted to $64 billion at the end of 2005; standards are projected to save $241 billion by 2030, growing to $269 billion by 2045, while the cumulative cost of DOE’s program to establish and implement these standards over the past 20 years is in the range of $200-250 million. Annual carbon savings reach 38 million tons by 2020 and the cumulative savings by 2045 is estimated at 1.200 million tons.

DOE notes that there are number of products within the scope of current legislation for which standards have not been developed. These products will certainly be under consideration as the subject of new rulemakings. Examples include:

- Compressors
- Fans
- Blowers
- Refrigeration equipment
- Electric lights
- Electrolytic equipment
- Electric arc equipment
- Luminaires
- Ovens
- Kilns
- Evaporators
- Dryers
- Steam boilers

During FY2011, DOE plans to initiate a formal priority setting process to identify rulemakings with the largest potential energy savings and benefits to the nation. A variety of factors will be considered in the priority setting process, including:

- Estimated scope of energy savings
- Significant technological advances since previous standard
- Ability to bundle with an upcoming rulemaking
- Ability and benefits of harmonizing to non-DOE standards
- State of development of relevant test procedure
- Relative level of resources required

While it is not possible to fully predict what legislation affecting the Building Technologies Program will be passed or when, DOE continues to closely monitor potential energy legislation. This enables DOE to be better prepared for the potential impacts of new statutory requirements on the program and its rulemaking schedule.
Ambitions in improving the methodology and rulemaking process

In its Multi-Year Programme DOE sets out to further improve certain aspects of the rulemaking:

“Cost Reduction and Schedule Acceleration

DOE plans to implement a number of improvements to its internal operating processes over the next several years. The goals of the following program improvements are to allow DOE to issue rulemakings more rapidly and at lower cost.

Continuous Research and Data Gathering: In order to accelerate standard and test procedure rulemaking activities in FY2011 and beyond, DOE plans to launch a continuous research and data-gathering program. The program will be staffed by a core team of dedicated DOE contractor staff but will also enlist the support of independent sub-contractors and subject matter experts who are familiar with particular research areas and data. Potential tasks to be completed as part of this program include proactive scanning of emerging technologies, energy use verification under typical conditions, sponsorship of round robin testing, design option evaluation, development and validation of energy performance models, prototyping of max tech and highly efficient designs, and metered end-use studies. Elements of this program include developing and maintaining databases of information which are crosscutting in nature, and additional information which applies to specific products. Having this data on hand and continuously updated will allow DOE to skip over many preliminary data gathering activities that take significant time under the current process.

Standardization: In January 2010, the Appliance and Equipment Efficiency Standards program began a process improvement initiative that seeks to establish consistent, up-to-date and standardized guidance for conducting and documenting the analyses most common to its energy conservation standards rulemakings. The purpose of this effort is to reduce errors, contradictions, and duplicate efforts during the creation of federal register notices by standardizing and systematically updating a set of tools and templates to be used by DOE staff and contractors. Secondarily, the documents produced by this effort will help new staff, both internally and at contractors, ramp up on the analytical and administrative processes of the program. This effort will consist of two phases: (1) an initial tool development and process standardization effort, and (2) an ongoing maintenance effort. Moving forward, DOE’s standardization team will continue to generate and share guidance on rulemaking document content and supporting analyses.

Establishment of Appliance Technology Evaluation Center: Through a multi-phase process, the National Energy Technology Laboratory (NETL) is developing the Appliance Technology Evaluation Center (ATEC) at its Morgantown, WV, campus. The Appliance Test Evaluation Center at NETL is the Department’s central point for the evaluation of new technologies and the “reverse engineering” of appliances. ATEC also serves as the project management and contracting entity facilitating coordination with other DOE and private sector labs supporting the development of new test methods and verifying manufacturer compliance.

ATEC provides enhanced evaluation capabilities for test procedure program:

- Faster, more reliable, and higher quality customized evaluations of appliances and building equipment.
- Greater ability to meet increasing pace of test procedure development.
- Greater ability to design test procedures that are resistant to circumvention and anticipate future appliance advance
Support of Existing Test Procedure Development Organizations: Many DOE test procedures reference test procedures developed by other standards bodies (ex. AHRI, ASHRAE, ISO, IEC, IES, IEEE, NEMA etc). Often these test procedures form the basis in whole or in part, for DOE’s own test procedures. In an increasingly global market these test procedure development efforts involve numerous stakeholders representing a diverse, balanced and International perspective. A complete review of all relevant test procedures is an element of every DOE test procedure rulemaking. DOE recognizes that the pace of development and the completeness of these consensus test procedures are important to meeting the goal to review all test procedures at least every seven years.

DOE will seek opportunities to leverage resources and accelerate the pace of test procedure development by supporting existing test procedure development organizations. Such actions might include active participation in technical conferences, the exchange of information, and for high energy savings potential test procedures, and also might entail technical support such as the development of analytical models, laboratory testing, field tests etc, which accelerate development efforts.

Increased International Collaboration: Where possible, DOE will seek to partner with other nations to combat climate change, reduce the use of fossil fuels, and boost the global clean energy economy. DOE is currently participating in a global initiative, launched with the support of the Major Economies Forum (MEF), to collaborate across borders on test methods for measuring appliance efficiency, the expansion and acceleration of efficiency standards rulemakings, and on efficiency incentives for appliance manufacturers.

Improving Compliance

The goals of these initiatives are to improve the real-world effectiveness of efficiency standards and to improve compliance by conducting significantly more product testing.

- Increased Emphasis on Test Procedures;
- DOE Sponsorship of Round Robin Testing;
- Aggressive Enforcement;[8]
- Enforcement of Regional Standards;
- Mandatory Lab Accreditation;

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[8] A new Web-based tool, referred to as the Compliance and Certification Management System (CCMS), will be the preferred mechanism for submitting compliance and certification reports to DOE. CCMS allows compliance and certification reports to be submitted via e-mail and updates the address and contact information used to submit compliance statements and certification reports through certified mail to DOE. CCMS will also allow DOE to effectively and efficiently review and assess compliance and certification information. The system became available for use by manufacturers and third-party representatives June 1, 2010.

DOE is considering revising its enforcement procedures to ensure that all of its energy efficiency regulations are rigorously and consistently enforced.
Japanese Top Runner Programme

Japan’s Top Runner programme is a regulatory scheme designed to stimulate the continuous improvement of the use-phase energy efficiency of products within selected segments of markets for household and office appliances, vehicles, etc.

Through Parliamentary decision in 1998, the programme is incorporated as an element of the Japanese Law Concerning the Rational Use of Energy (the Energy Conservation Law). It is administered by the Agency for Natural Resources and Energy under METI, the Ministry of Economy, Trade and Industry.

A noteworthy and important feature of the Top Runner scheme is its focus on the supply-side, not the demand-side, of product markets. The obligation of compliance with Top Runner regulations rests entirely with manufacturers and importers. Neither retailers, nor product owners or users are targeted.

Through its design, the Top Runner programme undergoes recurring revisions, allowing its scope to be continuously modified. In iterative cycles, it introduces product-specific energy performance requirements, where the basis for the adoption of standards is pre-defined as the use-phase energy performance of the best technology available on the market at the time of revision. Exact standard levels, however, along with appropriate target years, are agreed on in extensive consultative processes involving several stakeholder groups. Thereafter, when promulgated by the regulator, the targets become mandatory for all manufacturers and importers in Japan (except for very small actors).

To date 23 product categories have been brought into the Top Runner scheme (see Table 1).
Table 2. Japan Top Runner program, subjects** (source: www.eccj.or.jp/top_runner)

Passenger Vehicles
- Dec. 1998 -Gasoline/Diesel Passenger Vehicles
- Feb. 2007 -Gasoline/Diesel Passenger Vehicles
- Apr. 2003 -LP Gas Passenger Vehicles
- Nov. 2005 -Heavy Vehicles (diesel, weighing over 3.5t)

Freight Vehicles
- Dec. 1998 -Freight Vehicles (gasoline/diesel, weight ≤ 2.5t)
- Feb. 2007 -Freight Vehicles (gasoline/diesel, weight ≤ 2.5t)
- Nov. 2005 -Heavy Vehicles (diesel, weight > 3.5t)

Air Conditioners
- Dec. 1998 -Air Conditioners
- Jul. 2006 -Air Conditioners
- Apr. 2008 -Air Conditioners

Electric Refrigerators
- May 1999 -Electric Refrigerators
- Jul. 2006 -Electric Refrigerators

Electric Freezers
- May 1999 -Electric Freezers
- Jul. 2006 -Electric Freezers

Electric Rice Cookers
- Jun. 2005 -Electric Rice Cookers

Microwave Ovens
- Nov. 2005 -Microwave Ovens

Fluorescent Lights
- Dec. 1998 -Fluorescent Lights
- Jul. 2009 -Fluorescent Lights
- Jul. 2009 -Fluorescent Light Bulb

Electric Toilet Seats
- Apr. 2002 -Electric Toilet Seats
- May 2007 -Electric Toilet Seats

TV Sets
- Dec. 1998 -CRT
- Jun. 2005 -CRT, LCD, Plasma
- Jul. 2009 -CRT, LCD, Plasma

Video Cassette Recorders
- Dec. 1998 -Video Cassette Recorders
- Jun. 2005 -Video Cassette Recorders

DVD Recorders
- Jun. 2005 -DVD Recorders
- May 2007 -DVD Recorders with Digital Tuner

Computers
- Dec. 1998 -Computers
- Dec. 2003 -Computers
- Dec. 2009 -Computers

Magnetic Disk Units
- Dec. 1998 -Magnetic Disk Units
- Dec. 2003 -Magnetic Disk Units
- Dec. 2009 -Magnetic Disk Units

Routers
- Apr. 2008 -Small Routers

Switches
- Apr. 2008 -L2 Switches

Copying Machines
- Dec. 1998 -Copying Machines

Space Heaters
- Apr. 2002 -Space Heaters(Gas,Oil)*

Gas Cooking Appliances
- Apr. 2002 -Burner Section*
- May 2004 -Grill Section & Oven Section

Gas Water Heaters
- Apr. 2002 -Instantaneous Gas Water Heaters & Bathtub Gas Water Heaters*
- May 2004 -Gas Water Heaters for Space Heating

Oil Water Heaters
- Apr. 2002 -Oil Water Heaters*

Vending Machines
- Apr. 2002 -Vending Machines*
- May 2007 -Vending Machines

Transformers
- Apr. 2002 -Transformers*

*=only summary report available in English
**=Preliminary translations of Final Reports available. The dates represent the time when Final Reports were developed by Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy.

The Top Runner programme has been evaluated by Nordqvist (2006) 3rd July 2006 within the framework of the AID-EE project under the ‘Energy Intelligence for Europe’ (EIE) programme. 9

Nordqvist describes the steps in a Top Runner cycle as follows:

After the establishment of a defining legal framework as the initial causal act, the cause-impact sequence of a loop through the Top Runner cycle runs through the following steps:

1) The regulator designates or discards product categories (whether they are nominated additions to the programme or revised and previously adopted designees).

2) Product committees negotiate and suggest appropriate conditions. As an important prerequisite for standard setting, the committees have to present methods for measuring and determining products’ energy performance.

3) Methods, target standards and target years proposed by product committees are officially published (in so-called interim reports) for public review.

4) Targets are set and promulgated by the regulator. This step signifies the commencement of commitment periods.

5) Increasingly, producers and importers take measures to comply with up-coming obligations, for example through technical research and development. The aggregated energy efficiency performance of marketed products shifts.

   //The improved products are sold by retailers and put to use in various sectors such as industry, commerce, administration and households.//

6) (S’) During commitment periods, the regulator may monitor and evaluate interim progress.

7) Commitment periods end, and target standards become legally obligatory minimum performance standards, as stipulated by the regulator.

8) Ex post revisions and evaluations of methods and targets are conducted by the regulator. (This step may coincide with step number 2.)

The suggested indicators of this cause-impact sequence, and their success and fail factors, are given in the figure below.

Nordqvist stresses the importance of step 3, i.e. an atmosphere of respect and trust between the product committees and the stakeholders in proposing methods and targets.

Nordqvist is critical of the ex post transparency and data availability. In his research he mainly finds ex ante projections of the savings but very little results of monitoring and actual savings achieved.
<table>
<thead>
<tr>
<th>Relationship with other instruments</th>
<th>Success Cause-impact relationship Indicators and fail factors</th>
<th>Indicators</th>
<th>Success and fail factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D for energy-conservation</td>
<td>The regulator selects (or discards) nominated product groups</td>
<td>Number and energy importance of designated product categories</td>
<td>Role of energy-use for products' perceived quality and performance; make-up of actor stage</td>
</tr>
<tr>
<td>Energy Saving Labelling Programme (E-Mark)</td>
<td>Product committees convene</td>
<td>Stakeholder representation and participation</td>
<td>Proper lists of invitation; awareness of, acceptance for, and interest in the programme; capability to participate</td>
</tr>
<tr>
<td>Complementary energy labels e.g. Energy Star, Tokyo's energy rating label, etc.</td>
<td>The regulator promulgates standards</td>
<td>Awareness of targets among (2ary as well as 1ary) stakeholders</td>
<td>Means of communication; related policy instruments</td>
</tr>
<tr>
<td>e-Shop commendation scheme</td>
<td>More energy-efficient products enter the market</td>
<td>Ratio of product models that comply with or exceed targets</td>
<td>Manufacturers’ and importers’ willingness and ability to comply</td>
</tr>
<tr>
<td>Energy efficiency award scheme</td>
<td>More energy-efficient products are put to use</td>
<td>Sales and penetration statistics</td>
<td>Impact of labelling and marketing efforts on end-user choices</td>
</tr>
<tr>
<td>Green Procurement Law</td>
<td>Continuous monitoring and evaluation of progress</td>
<td>Intermediary progress reporting</td>
<td>Transparency and data availability</td>
</tr>
<tr>
<td>Green vehicle tax relief scheme</td>
<td>By the target year, target standards become requirements</td>
<td>Number and types of sanctions</td>
<td>Stakeholders’ receptiveness to sanctions</td>
</tr>
<tr>
<td>Informed consumer affirmation scheme</td>
<td>The regulator revises and evaluates methods and targets</td>
<td>Revision reporting</td>
<td>Transparency and data availability</td>
</tr>
</tbody>
</table>

Fig. 1. Linear policy-theory sequence describing a Top Runner cycle (source: Nordqvist, 2006)
The following table illustrates the typical composition of subcommittees.

**Table 3. Examples of the composition of some Top Runner Standards Subcommittees**

<table>
<thead>
<tr>
<th>Energy Efficiency Standards Subcommittees, Advisory Committee for Natural Resources and Energy</th>
<th>Luminaire Evaluation Standards Subcommittee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Television Receiver Evaluation Standards Subcommittee</strong></td>
<td>Kenichi Akiya, Professor/President, Setagaya Learning Center, Open University of Japan (chairman)</td>
</tr>
<tr>
<td>Mitsutoshi Hatori, Professor Emeritus of The University of Tokyo (Chairman),</td>
<td>Mitsuo Akatsu, Director of Japan Luminaires Association</td>
</tr>
<tr>
<td>Hitoshi Aida, Professor of Integrated Information Science, Department of Electrical Engineering and Information Systems, Graduate School of Engineering, The University of Tokyo</td>
<td>Akira Ishihara, Managing Director of Energy Conservation Center (Participation from 3rd meeting)</td>
</tr>
<tr>
<td>Hiroaki Ikeda, Professor Emeritus of Chiba University</td>
<td>Shoichiro Ozeki, Energy/Environment Technology General Manager Energy Conservation Center (Participation in 1st and 2nd meetings)</td>
</tr>
<tr>
<td>Kenichi Ito, Senior Manager of Japan Consumers’ Association</td>
<td>Yoshihiko Ohtani, Professor, Dept. of Electric/Electronic Engineering, College of Industrial Technology, Nihon University</td>
</tr>
<tr>
<td>Hirotoshi Uehara, Chief of PDP Television Business Unit, Image Display/Device Business Group, AVC Networks Company, Panasonic Corporation</td>
<td>Tamaki Kamata, Researcher of Product Testing Dept., National Consumer Affairs Center of Japan</td>
</tr>
<tr>
<td>Hiroyuki Kudo, General Manager of Technology Division, Energy Conservation Center, Japan</td>
<td>Sadao Takahashi, Professor, Specializing in Architectural Engineering, Dept. of Construction Engineering, Fukui University of Technology</td>
</tr>
<tr>
<td>Kikuko Tatsumi, Executive Board Member and Chairman of Environment Committee, Nippon Association of Consumer Specialists</td>
<td>Yukio Nakano, Senior Researcher, System Engineering Research Laboratory, Central Research Institute of Electric Power Industry</td>
</tr>
<tr>
<td>Takahiro Tsurusaki, Executive Researcher, Jukankyo Research Institute</td>
<td>Hiroo Hasegawa, Deputy Dept. Manager, Energy Engineering Research Dept., National Institute of Advanced Industrial Science and Technology</td>
</tr>
<tr>
<td>Satoshi Hirano, Group Leader, Thermal and Fluid System Group, Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology</td>
<td>Tetsuji Takeuchi, Executive Vice President, Japan Electric Lamp Manufacturers Association</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer and Hard Disk Drive Judging Standards Subcommittee</th>
<th>Air Conditioner Evaluation Standards Subcommittee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAKAMOTO SAITO,</strong> Professor Emeritus, University of Tokyo (chairman)</td>
<td>TAKAMOTO SAITO, Professor Emeritus, University of Tokyo (chairman)</td>
</tr>
<tr>
<td><strong>SATORU AKAMA,</strong> Assistant Chairman, Business Air Conditioner Committee, Japan Refrigeration and Air Conditioning Industry Association</td>
<td>SATORU AKAMA, Assistant Chairman, Business Air Conditioner Committee, Japan Refrigeration and Air Conditioning Industry Association</td>
</tr>
<tr>
<td>Hideharu Amano, Professor at Faculty of Science and Technology, Keio University</td>
<td>HIROSHI ASANO Professor in Department of Mechanical Engineering, Graduate School of Engineering, University of Tokyo</td>
</tr>
<tr>
<td>Kenichi Ito, Director of the Education Planning Division, Japan Consumers’ Association</td>
<td>KAZUO UENO Deputy Director, Energy Technology Research Institute, National Institute of Advanced Industrial Science and Technology</td>
</tr>
<tr>
<td>Minako Oishi, Deputy chair of the Environment Committee, Nippon Association of Consumer Specialists</td>
<td>AKIRA OKAGAKI Executive Officer and Principal Consultant, NIKKEN SEKKEI Research Institute</td>
</tr>
<tr>
<td>Kazuhito Omaki, Professor at the Faculty of Information Science and Arts, Toyo University</td>
<td>HIROYUKI KUDO General Manager, Technology Dept., Energy Conservation Center, Japan</td>
</tr>
<tr>
<td>Seiichi Shin, Professor at the Department of Electronic Engineering, The University of Electro-Engineering</td>
<td>HARUKI SATO Professor, Department of System Design Engineering, Faculty of Science and Technology, Keio University</td>
</tr>
<tr>
<td>Tadayoshi Tanaka, Director of Energy Conservation Center, Japan, Technology Division</td>
<td>KIKUKO TATSUMI Managing Director &amp; Chairperson of Environment Committee, Nippon Association of Consumer Specialists</td>
</tr>
<tr>
<td>Yukio Nakano, Senior researcher at the System Engineering Research Laboratory, Central Research Institute of Electric Power Industry</td>
<td>KIYOSHI NAGASAWA Chairman of Home Air Conditioner Committee, Japan Refrigeration and Air Conditioning Industry Association</td>
</tr>
<tr>
<td>Takeshi Muranoi, Mitsubishi Electric Information Technology Corporation, Director, Business Group II</td>
<td>EIJJI HIHARA Professor Specialized in Environmental Studies, School of Frontier Science, University of TokyoGraduate</td>
</tr>
<tr>
<td></td>
<td>CHIHARU MURAKOSHI Director and Vice President, Jyukankyo Research Institute Inc.</td>
</tr>
</tbody>
</table>
Background: The set of reports for the new methodology (MEErP 2011) should be self-standing and fully replace the MEEuP 2005 reporting. This means that any useful information in the MEEuP 2005 report should be updated and incorporated.

Some of this information, like the explanation of the domain of eco-design from the designer’s point of view, does not quite fit the current MEErP 2011 format. It is incorporated separately in this annex of the project report because it is deemed too valuable to be lost.
SCOPE: DOMAIN OF ECO-DESIGNER

(from VHK, MEEuP methodology report, 2005, Chapter 2)

This section tries to define the scope and target group for this study and the ErP directive in more detail. The target audience for this study follows from the assignment given in Chapter 1: Policy makers who are looking for a methodology to help with the selection of products that are important enough to be included in the scope of the ErP directive. ‘Important’ is to be defined in terms of environmental impact, market relevance and improvement potential.

However, at the very latest when discussing the ‘improvement potential’ it should be clear that there is another important audience involved, namely the actors that have to realize this improvement potential.

The draft text of the directive refers broadly to manufacturers (and importers) and their products, but the rest of the directive indicates that a limited set of industry-decisions is addressed, namely those that are dealing with the design of ErP. In this section we will try to explore what are the scope, the reach and the limitations of these decisions, if not for any other reason, in order to be able to make an assessment of the improvement potential later on.

**Products**

First of all, the directive deals with product features: Not with production, not with sales, not with finance, but with products. This already sets it apart from policy measures like EMAS, IPPC, Green (public) procurement, etc. that target other activities within the companies. All these policy measures will at some point in some way influence Eco-design and vice-versa, but it is not their main focus.

**Figure 1.** Eco-design domain at company level
Product development

Secondly, the directive deals with new products, i.e. it aims to have an impact on product development: Not on the current products and their production, sales, etc. This sets it apart from policy measures dealing e.g. with the end-of-life of current products. This also sets the actors, the product developers, apart from company divisions that are dealing with new production technology and the development of new markets. Although ideally there is a strong interaction between product developers, production, R&D and marketers, the typical area of responsibility is different.

For instance, the product developer is not responsible for the energy efficiency or waste reduction of a piece of machinery within the company, but he is to a large extent responsible — through the choice of materials, functionality, geometry, etc. — whether this type or another type of production technology is required. Likewise, the product developer is not responsible for the distribution strategy, but — through volume, shape, weight, packaging, etc. — he or she can influence the environmental impact considerably.

As an illustration (there is more than one way to describe the process) the diagram by Eekels on the next page shows the various stages and domains of a company’s activity geared towards new products.

At the very top of the diagram we find the company’s definition of goals. This concerns questions like ‘The business we are in’ or whether or not a company wants to be a leader regarding environmental issues. On a more profane level it deals with objectives regarding turnover and profitability, which usually give the impetus for the research of new products, production facilities or markets. Eventually this process, also defined as ‘goal finding’ results in the selection of new ideas for e.g. new product/market combinations.

These ideas initially can have a very general scope, like ‘a modern bicycle for the elderly’ or ‘a dishwasher for small households’. During the development process that follows, this scope is very much narrowed by the product developers and the marketers, working on a long List of Specifications that take into account the wishes and demands of all stakeholders in the process. These are internal stakeholders within the company itself e.g. regarding the use of internal production facilities, tooling, investments, etc. and external stakeholders like the buyers/users/consumers, the legislators, the suppliers, the distributors, etc. Only after this initial stage, where the List of Specifications has been agreed upon, technical development will start. This process of strict product development will then result in the product design, i.e. a definition of the new product in terms of (electronic)-drawings and models defining the geometry of the product and its components, a Bill of Materials (BOM) defining the type and quantity of materials, a description of the production processes required and finally a ‘user manual’ indicating the intended use of the product. The development of a new product, i.e. a product for which the company is prepared to re-define its production-line (‘technology platform’), takes (at least) around 3 years in most industry sectors.

Finally, after the development process, the implementation stage comprises production, distribution, use and disposal of the products.

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10 In fact, this will be the stage where the EuP directive will have the most impact
goals

RESEARCH

selection

idea

PRODUCTION-DEVELOPMENT

PRODUCT-DESIGN

(product development in restricted sense)

MARKET RESEARCH & MARKETING

production-process etc

product design

plan for new activity

PRODUCTION

DISTRIBUTION

product

USE

WASTE/RECYCLING

Figure 2. Eco-design domain in the process of creating new products. [source: Eekels, J. and Roozenburg, R., Ontwerpmethodologie, DUT, Delft, 1976]
Energy-using Products

Thirdly, *energy-related* products (ErP) or parts are the subject of the directive: Not building materials, textiles, beverages, food-stuffs, furniture, services, etc. This sets them apart from the other subjects within the IPP-scope. It also makes them very special from a methodological point of view because they are by definition products actively consuming scarce (energy) resources during product life. Furthermore, many of them not only use energy resources during product life but also detergents (dishwashers), paper and toner (copiers), etc. And there may be an interaction whereby e.g. building materials and a building construction determine the load profile for heating boilers.

![Diagram: Domain of Eco-design of ErP and adjacent products relevant for the use phase of ErP](image)

**Figure 3.** Domain of Eco-design of ErP and adjacent products relevant for the use phase of ErP

Quite a few products can be improved significantly in terms of their energy- or resource efficiency during product life. This may lead to higher purchase prices, but the improvements are very often advantageous when looking at the overall economical Life Cycle Costs (= purchase price + lifetime running costs\(^{11}\)): consumers will actually be saving money. At the same time the manufacturers will also increase their turnover, thus creating a ‘win-win’ situation.

With most non-ErP products\(^{12}\), there is no such clear trade-off between a higher purchase price and lower running costs. At best, when confronted with a higher purchase price of e.g. shoes, clothes or furniture, the consumer can hope to gain economically because of a longer product life. But this is highly uncertain, because product life is not purely a technical matter\(^{13}\) and the moment that the consumer can actually see the proof of this advantage lies many years from the moment of purchase. Other distinguishing features of ErP with a direct impact during the use phase are:

- Large number of components and sub-assemblies (50 to a few 1000);

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\(^{11}\) also corrected for inflation and interest.

\(^{12}\) The only non-EuP products that have a similar, immediately gratifying reward for paying a higher purchase price, are some building materials. A more effective insulation of the walls, high-efficiency double glazing, etc. will immediately impact the heating costs of the house.

\(^{13}\) also depending on fashion, culture, etc.
- Large number of different material fractions used, covering the complete range from ferro- and non-ferro metals, rare metals like palladium, silver and gold (in electronics), bulk-plastics (PE, PP, PS), engineering plastics, glass (lights, displays) and ceramics;
- Functional complexity, because each ErP has at least one interface with the energy source, an energy conversion process and a control mechanism;
- Important influence in the environmental profile of emissions from combustion of fossil fuels: greenhouse gases (CO₂, CO, methane), acidification (SO₂) and eutrophication (NOₓ);
- Relatively less important influence of emissions of hazardous or toxic substances for most products. These are more typical —in larger quantities— of non-ErP’s like pesticides, fertilizers, paints, pharmaceuticals, etc.;
- Because of the relevance of the use phase, the design strategy for improvement of many products will presumably focus more on Design for Energy Efficiency, Fuel Switch, etc. whereas for non-ErP —apart from a relatively minor impact for maintenance (e.g. paints)— the environmental impact of the products during the use phase is relatively insignificant;
- Whereas with non-ErP the Design for Longevity is an important tool to decrease the overall environmental impact, with most large ErP a design strategy leading to a longer product life may also have a negative impact on the environment if it slows down the adoption of more resource-efficient new models by the market;
- Very important environmental impact of the consumer behaviour, not only regarding the purchase and disposal/recycling decision (as with non-ErP), but especially during the use of the product.

**ErP Industry**

The *manufacturers of ErP* are the prime focus of the directive. In a legal context (Art. 92, CE-mark, etc.) this is probably clearly defined. However, in terms of the influence on the ‘improvement potential’ this needs some clarification. For instance, looking upstream, the environmental impact of raw material production and the manufacture of half-products or even some components is only the responsibility of the ErP-industry *in as much as it can be influenced by design decisions*. Simply put, at a given time the environmental impact of producing 1 kg of aluminium extrusion profile or 1 kg cold-rolled steel-sheet is a given for the ErP-industry.

Naturally the ErP-designer can influence the environmental impact by lowering certain material requirements regarding corrosion resistance (influences the exact alloy) or the surface quality (e.g. influences the percentage of recycled material that can be used), but basically he or she is just a critical consumer in a huge materials shop with fixed prices (for the environment).

The same goes for small components; very few ErP-manufacturers make there own nuts, bolts and fasteners or will be inclined to put any design effort in.

For general components like electric motors, compressors, power supplies, computer hard disks, etc. the responsibility of the ErP industry becomes more fuzzy. Nowadays, with globally operating, specialised producers for these general components, most ErP-industry would not be competitive, nor would it have the technical know-how, to have these components produced completely client-specific. Having said that, as a client of these specialized OEMs the ErP-industry can influence the design on the medium and long term significantly: If it tells the OEMs that it is prepared to pay a certain price and purchase significant volumes of an OEM-product with certain environmentally advantageous, this will certainly trigger the R&D with the OEM.

Like it or not, this trend towards ‘co-makership’ has been so successful, that a large part of the ErP-industry has reduced their R&D capacity —not only for the general components but also for the core components— to

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14 Original Equipment Manufacturer (component supplier)
the bare minimum (and beyond), only drawing up the specs and leaving the actual R&D to the OEM. This, however, does not make the ErP-industry less responsible for the design decisions.

Looking downstream, the environmental impact of the actions of retailer, consumer, waste collectors, recyclers, etc. is only relevant in as much as they are influenced by product features.

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At company policy level:
The product developer assumes shared responsibility — with production and market developers — for the product policy and the definition of new product/market combinations

At tactical level:
The product developer is responsible for

Selection of materials
Design of the geometry
Selection of the type of production processes to realize the geometry
Prescription of the way that the product should be used.

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\[15\] In this context Art. 10 of the draft EuP directive is relevant, stating that ‘adequate basic information (e.g. on material composition, consumption of energy, etc.) will have to be provided to the equipment manufacturer if needed for the establishment of the ecological profile. It should be clear that unless implementing measures are adopted, no legal obligations flow from the framework Directive for manufacturers.’
Integrated Product Policy

The ErP directive aims at integrated product policy for companies, producing competitive products.\(^{16}\) Although this statement is self-evident, it has quite a few implications. It stresses the need to incorporate functional parameters defining the product performance into the equation. It stresses the need to integrate eco-design requirements in the list of specifications for the new product in a very practical way, close to the current engineering practice and design methodology. In other words, there should be no such thing as “eco-design” as a separate activity, but it should be one of the many disciplines—alongside materials science, mechanics, electronics, and aesthetics—to flow into the design process. Only in that way it can be ensured that it will lead to competitive and innovative products, not only satisfying policy goals regarding the environment and security of energy supply but also regarding the promotion of innovation (Lisbon agenda).

The diagram below shows the basic product design cycle, which is typical of most development processes. Although many outsiders mistake this cycle to be typical of the stages in the design process as a whole, it occurs—explicitly or implicitly—numerous times in the design process at various levels of aggregation.

Figure 5. Domain of Eco-design (in red) within the basis product design loop [after Archer, Technological Innovation, 1973]

The design process as a whole is described by Eekels as ‘a concentric, goal-finding action’, whereby the design loop first occurs at a strategic level of finding the appropriate new product idea, then it occurs at the level of concept development and engineering.

\(^{16}\) The proposed EuP directive ‘...aims to create the framework for improving the environmental performance of energy-using products while preserving and enhancing a sound economic environment for this significant sector of activity with regard to the free movement of goods within the EU and the competitiveness of industry.’
At the strategic level of generating ideas for new products, the notion of eco-analysis of the current products, the environmental goals one is trying to reach and the notion of how new products would be an improvement can be qualitative and abstract. At such a level a company may decide for instance that an all-in-one imaging centre is more environmentally friendly than a single copier, a single printer, a single fax machine and a single scanner. The eco-design dimension, as one of the many factors that are taken into consideration, can be an inspiration and guidance.

But once this product idea is fed into the product development department, the eco-design requirements have to be very precise and verifiable. This is elaborated in the next paragraph (indicators).

**Indicators for Designers**

The call for tender requires the development of *easy and understandable* indicators.

What this means, may be very different for the target group of policy makers, who have to make a selection of products to be tackled under the new framework directive, and the audience of product developers who have to realize an environmental improvement potential in practice. For the former it may be sufficient to work with highly aggregated parameters e.g. properly defined product groups represent X% of the total environmental emissions in certain categories, that they represent at least Y% of consumer- or business expenditure and that there is an improvement potential of roughly 2% for several environmental categories.

However, for the main stakeholders, the ErP-industry and their suppliers, this may not be ‘*easy and understandable*’ at all if they cannot translate this back to the indicators that they are used to in the product development process that they will have to go through in reaching this 2% *improvement*.

To give a general idea, for product developers, easy and understandable indicators should ideally:

- refer to a clearly defined functional product category;
- be numerical or Boolean (yes/no);
- be up-to-date (e.g. not relating to legacy parameters);
- when numerical they should:
  - preferably be absolute rather than relative;
  - preferably relating to physical/chemical parameters;
  - have clearly defined tolerances (with respect of a threshold value);
- relate to measurement standards that are:
  - accurate (using clear unequivocal definitions, permitting small tolerances on measurement of all relevant parameters);
  - reproducible (complete/ comprehensive — > comprising all relevant parameters);
  - realistic (e.g. duty cycle rather nominal);
  - economic (acceptable testing/procedural costs);
  - harmonized (e.g. EN/ISO standards, etc.).

In other words, these are indicators at the lowest possible aggregation level. As such they can be incorporated directly in the list of demands/specifications for the new product and thus become a part of the many restrictions and demands that apply in the product development process.
ANNEX VII

ECCP Tables (from MEEuP 2005)

**Background:** The set of reports for the new methodology (MEErP 2011) should be self-standing and fully replace the MEEuP 2005 reporting. This means that any useful information in the MEEuP 2005 report should be updated and incorporated.

Some of this information, like the ECCP tables, does not quite fit the current MEErP 2011 format. It is therefore incorporated separately in this annex of the project report because it is deemed too valuable to be lost.
ECCP TABLES
(from VHK, MEEuP methodology report, 2005, Appendix II)

Introduction
One of the most important references both for the ErP Directive and for the underlying methodology study is the European Climate Change Programme (ECCP) of the European Commission and more specifically the Second ECCP Progress Report “Can we meet our Kyoto targets?”, European Commission, April 2003. This report contains the results of estimated CO2-emissions and savings potentials at product group level. Results on fuel-related CO2-emissions for EU-15 were generated in particular by ECCP-WG3, ECCP-JSWG and ECCP-WG2 during the 2001-2003 period and summarized/compiled amongst others in Annex I of the report. Annex I showed the 1990-1995 baseline, the 2010 “Business-as-Usual” (baseline) scenario and the 2010 ECCP scenario. The latter incorporated the effect of the measures proposed by the working groups (labelling, MEPS, promotion, etc.).

However, the compilation in Annex I of the Second ECCP Progress Report was only complete for the residential sector. For the tertiary and industrial sector the Annex I showed only the 1990-1995 baseline. Also on request of the European Commission, VHK has completed the dataset for the tertiary and industrial sector in 2005 (MEEuP report).

The result is based on data and insights of over 8 years ago -- in 2001-2003 period-- and have thus far not been updated, at least not in a context of the ECCP. It should not be perceived as the current best VHK-estimate of the fuel-related CO2 emissions, but it is a compilation of the data —to the best of ability— of the output of the Working Groups as shown in the Second ECCP Progress Report and underlying working group reports on the basis of the information that was then available. Nor, as these specific tables have not been explicitly reviewed by e.g. the ECCP Steering Committee, should this perceived as the opinion of the European Commission at the time, and much less today.
Table 1. All Sectors 1990

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Source: Composed by VHK 2002 on basis of European Climate Change Programme (ECCP) working group reports & docs JSWG and WG3 (provisional analysis), European Commission, 2001.
Table 2. Residential sector Baselines 1990-2010 (all values in Mt CO2 eq.)

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<tr>
<th>RESIDENTIAL SECTOR</th>
<th>Fuel-Related CO2 emissions (in Mt CO2)</th>
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Source: Composed by VHK 2002 on basis of European Climate Change Programme (ECCP) working group reports & docs JSWG and WG3 ("provisional analysis"). European Commission, 2001.
Note: Conversion Electricity 1990: 1 TWh el. = 0.5 Mt CO2; 2010 1 TWh el. = 0.45 Mt CO2
Table 3. Residential Sector Baseline 2010 vs. ECCP 2010 (Values in Mt CO2 eq.)

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<th>Sector/function group</th>
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<th>ECCP 2010</th>
<th>Baseline 2010 minus ECCP 2010</th>
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</thead>
<tbody>
<tr>
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<td>797</td>
<td>618</td>
<td>179</td>
</tr>
<tr>
<td>of which</td>
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<tr>
<td>Space heating/cooling</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>of which</td>
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<tr>
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<td>376</td>
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<td>23</td>
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<td>of which</td>
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<td>On</td>
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<td>18</td>
<td>5</td>
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<tr>
<td>IT/ office equipment</td>
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<td>15</td>
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<tr>
<td>Other(electric)</td>
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</tr>
<tr>
<td>Autogeneration</td>
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<td>10</td>
</tr>
<tr>
<td>Total (check)</td>
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<td>618</td>
<td>179</td>
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<tr>
<td>of which (by energy source)</td>
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<td>Heat</td>
<td>28</td>
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Source: Composed by VHK 2002 on basis of European Climate Change Programme (ECCP) working group reports & docs JSWG and WG3 ('provisional analysis'), European Commission, 2001.

Note: Conversion Electricity 1990: 1 TWh el. = 0.5 Mt CO2; 2010 1 TWh el. = 0.45 Mt CO2.
### Table 4. Tertiary Sector Baselines 1990-2010

<table>
<thead>
<tr>
<th>Sector/function group</th>
<th>Reference 1990</th>
<th>Baseline 2010</th>
<th>Baseline 2010 minus Reference 1990</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>457</td>
<td>523</td>
<td>66</td>
<td>15%</td>
</tr>
<tr>
<td>of which</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Space heating/cooling, of which</strong></td>
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<td></td>
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<td></td>
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<td>-3%</td>
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<td>43</td>
<td>-3</td>
<td>-7%</td>
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<td>0%</td>
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<td>18</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-roofs</td>
<td>18</td>
<td>18</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ventilation losses</td>
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<td>5%</td>
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<td>Heating system losses</td>
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<td>-18%</td>
</tr>
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<td>21%</td>
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<tr>
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<td>-6%</td>
</tr>
<tr>
<td>Cooling (airconditioners)</td>
<td>32</td>
<td>48</td>
<td>16</td>
<td>50%</td>
</tr>
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<td>CH pump</td>
<td>13</td>
<td>15</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>District heating</td>
<td>?</td>
<td></td>
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<td></td>
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<tr>
<td><strong>Hot water, of which</strong></td>
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<td></td>
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<tr>
<td>Fossil</td>
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<td>30</td>
<td>6</td>
<td>25%</td>
</tr>
<tr>
<td>Electric</td>
<td>11</td>
<td>9</td>
<td>-2</td>
<td>-18%</td>
</tr>
<tr>
<td><strong>Whitegoods &amp; Cooking, of which</strong></td>
<td></td>
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<tr>
<td>Fossil (mainly hobs)</td>
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<td>42%</td>
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<td>6</td>
<td>46%</td>
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<td>Dishwashers</td>
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<td>24</td>
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<td><strong>Electronics, of which</strong></td>
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<td>20</td>
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<td><strong>Industrial Motors, of which</strong></td>
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<tr>
<td>Variable speed drives (VSDs)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fans</td>
<td></td>
<td></td>
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<tr>
<td>System opt.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Other(conveyors &amp; misc.)</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Ind. process heat</td>
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<tr>
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<td></td>
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<tr>
<td>Total (check)</td>
<td>457</td>
<td>523</td>
<td>66</td>
<td>15%</td>
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<td>of which (by energy source)</td>
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Note: Conveneion Electricity 1990: 1 TWh el. = 0.5 Mt CO₂; 2010 1 TWh el. = 0.45 Mt CO₂
Table 5. Tertiary Sector Baseline 2010 vs. ECCP 2010

<table>
<thead>
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<th>Sector/function group</th>
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<th>ECCP 2010</th>
<th>ECCP 2010 minus Baseline 2010</th>
<th>%</th>
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<td>Total</td>
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<td>398</td>
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<td>of which</td>
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<td>Space heating/cooling, of which</td>
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<td>29</td>
<td>-14</td>
<td>-33%</td>
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<td>-walls</td>
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<td>16</td>
<td>-2</td>
<td>-11%</td>
</tr>
<tr>
<td>Ventilation losses</td>
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</tr>
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<td>Whitegoods &amp; Cooking, of which</td>
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<td>Dishwashers</td>
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</tr>
<tr>
<td>Electric ovens</td>
<td>17</td>
<td>15</td>
<td>-2</td>
<td>-10%</td>
</tr>
<tr>
<td>Lighting (incl. Street lighting)</td>
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<td>-12</td>
<td>-14%</td>
</tr>
<tr>
<td>Electronics, of which</td>
<td>34</td>
<td>15</td>
<td>-19</td>
<td>-56%</td>
</tr>
<tr>
<td>Consumer el. (TV, audio, IRD, etc.)</td>
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</tr>
<tr>
<td>Stand-by</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT/ office equipment</td>
<td>34</td>
<td>15</td>
<td>-19</td>
<td>-56%</td>
</tr>
<tr>
<td>Industrial Motors, of which</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Variable speed drives (VSDs)</td>
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<td></td>
</tr>
<tr>
<td>Pumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compressors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System opt.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (conveyors &amp; misc.)</td>
<td>16</td>
<td>14</td>
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<td>-13%</td>
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<tr>
<td>Ind. process heat</td>
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<td>neg</td>
<td>neg</td>
<td></td>
</tr>
<tr>
<td>Total (check)</td>
<td>523</td>
<td>398</td>
<td>-126</td>
<td>-24%</td>
</tr>
<tr>
<td>of which (by energy source)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fossil</td>
<td>244</td>
<td>184</td>
<td>-60</td>
<td>-25%</td>
</tr>
<tr>
<td>Electricity</td>
<td>279</td>
<td>214</td>
<td>-66</td>
<td>-24%</td>
</tr>
<tr>
<td>Heat</td>
<td>?</td>
<td>?</td>
<td>?</td>
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</tr>
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</table>

Source: Composed by VHK 2002 on basis of European Climate Change Programme (ECCP) working group reports & docs JSWG and WG3 ('provisional analysis'); European Commission, 2001.
Note: Conversion Electricity 1990: 1 TWh el. = 0.5 Mt CO₂; 2010 1 TWh el. = 0.45 Mt CO₂.
Table 6. Tertiary Sector Baslines 1990-2010

<table>
<thead>
<tr>
<th>Sector/function group</th>
<th>Reference 1990</th>
<th>Baseline 2010</th>
<th>Baseline 2010 minus Reference 1990</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>1031</td>
<td>959</td>
<td>-72</td>
<td>-7%</td>
</tr>
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<td>of which</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Space heating/cooling, of which</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fossil, of which</td>
<td>76</td>
<td>72</td>
<td>-4</td>
<td>-5%</td>
</tr>
<tr>
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<td>29</td>
<td>28</td>
<td>-1</td>
<td>-3%</td>
</tr>
<tr>
<td>-windows</td>
<td>11</td>
<td>10</td>
<td>-1</td>
<td>-9%</td>
</tr>
<tr>
<td>-walls</td>
<td>8</td>
<td>6</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-floors</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0%</td>
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<td>-roofs</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ventilation losses</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Heating system losses</td>
<td>17</td>
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<td>-3</td>
<td>-18%</td>
</tr>
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<td>19</td>
<td>19</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Heating (incl. heatpump)</td>
<td>8</td>
<td>7</td>
<td>-1</td>
<td>-13%</td>
</tr>
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<td>8</td>
<td>12</td>
<td>4</td>
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</tr>
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<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Hot water, of which</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fossil</td>
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<tr>
<td>Electric</td>
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<tr>
<td><strong>Whitegoods &amp; Cooking, of which</strong></td>
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<td></td>
</tr>
<tr>
<td>Fossil (mainly hobs)</td>
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<tr>
<td>Electric, of which</td>
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<tr>
<td>Refrigeration/freezers</td>
<td></td>
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<td>Washing machines</td>
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<td>Dishwashers</td>
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<tr>
<td>Laundry driers</td>
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<tr>
<td>Electric ovens</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>16</td>
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<tr>
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<tr>
<td>On'</td>
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<td>IT/ office equipment</td>
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</tr>
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</tr>
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<td>Pumps</td>
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<td>6</td>
<td>15%</td>
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<tr>
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<td></td>
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<td></td>
</tr>
<tr>
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<td>82</td>
<td>67</td>
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<td>-18%</td>
</tr>
<tr>
<td>Ind. process heat *</td>
<td>560</td>
<td>435</td>
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<td>neg</td>
<td>neg</td>
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<tr>
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<td>1031</td>
<td>959</td>
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<td>-7%</td>
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<tr>
<td>of which (by energy source)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fossil</td>
<td>617</td>
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<td>-1%</td>
</tr>
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<td>414</td>
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<td>-5</td>
<td>-1%</td>
</tr>
<tr>
<td>Heat</td>
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</tr>
</tbody>
</table>

Source: Composed by VHK 2002 on basis of European Climate Change Programme (ECCP) working group reports & docs JSWG and WG3 ('provisional analysis'), European Commission, 2001.


Note: Conversion Electricity 1990: 1 TWh el. = 0.5 Mt CO₂; 2010 1 TWh el. = 0.45 Mt CO₂
<table>
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<tr>
<th>Industrial Sector</th>
<th>Fuel-Related CO2 emissions (in Mt CO2)</th>
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<tr>
<td><strong>TOTAL</strong></td>
<td>Baseline 2010</td>
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<tr>
<td></td>
<td>962</td>
</tr>
<tr>
<td><strong>Of which</strong></td>
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<tr>
<td><strong>Space heating/cooling, of which</strong></td>
<td></td>
</tr>
<tr>
<td>Fossil, of which</td>
<td>53</td>
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<td>Transmission losses</td>
<td>28</td>
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<tr>
<td>-windows</td>
<td>10</td>
</tr>
<tr>
<td>-walls</td>
<td>8</td>
</tr>
<tr>
<td>-floors</td>
<td>5</td>
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<tr>
<td>-roofs</td>
<td>5</td>
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<td><strong>Ventilation losses</strong></td>
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<td><strong>Heating system losses</strong></td>
<td>14</td>
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<td>Electric, of which</td>
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<td>Heating (incl. heatpump)</td>
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<td>Cooling (airconditioners)</td>
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<td>CH pump</td>
<td>3</td>
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<td><strong>District heating</strong></td>
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</tr>
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<td><strong>Hot water, of which</strong></td>
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</tr>
<tr>
<td>Fossil</td>
<td></td>
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<td>Electric</td>
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<td><strong>Whitgoods &amp; Cooking, of which</strong></td>
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<tr>
<td>Fossil (mainly hobs)</td>
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<td>Electric, of which</td>
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<td>Refrigeration/freezers</td>
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<td>Washing machines</td>
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<td>Dishwashers</td>
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<td>Laundry driers</td>
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<td>Electric ovens</td>
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<tr>
<td><strong>Lighting (incl. Street lighting)</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>Electronics, of which</strong></td>
<td>10</td>
</tr>
<tr>
<td>Consumer el. (TV, audio, IRD,etc.)</td>
<td>Stand-by</td>
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<tr>
<td>On' IT/ office equipment</td>
<td></td>
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<td><strong>Industrial Motors, of which</strong></td>
<td>355</td>
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<tr>
<td>Variable speed drives (VSDs)</td>
<td>187</td>
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<td>Pumps</td>
<td>66</td>
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<td>Compressors</td>
<td>54</td>
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<td>Fans</td>
<td>48</td>
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<td>System optimisation</td>
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</tr>
<tr>
<td><strong>Other electric (unspecified)</strong>*</td>
<td>67</td>
</tr>
<tr>
<td>Ind. process heat *</td>
<td>435</td>
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<td><strong>Autogeneration</strong></td>
<td>neg</td>
</tr>
<tr>
<td><strong>Total (check)</strong></td>
<td>962</td>
</tr>
<tr>
<td><strong>Of which (by energy source)</strong></td>
<td></td>
</tr>
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<td>Fossil</td>
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<td>474</td>
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<td>Heat</td>
<td>?</td>
</tr>
</tbody>
</table>

Note: Conversion Electricity 1990: 1 TWh el. = 0.5 Mt CO2; 2010 1 TWh el. = 0.45 Mt CO2
ANNEX VIII

Minutes
Stakeholder meeting 9.9.2011

Published as draft on www.meerp.eu project website 23.9.2009, with call for amendments until 7.10.2011. Published as final minutes on above website 10.10.2011.
Final Minutes of stakeholder meeting
Methodology for Ecodesign of Energy-related Products

Date: Friday, 9th September 2011
Place: Centre Borschette, Brussels (10.00-16.30 hr)

The list of attendants is attached as table 1 (end of document).

Meeting documents, published 3 weeks prior of the meeting on the project website [www.meerp.eu](http://www.meerp.eu) with notification of registered stakeholders:

1) Methodology report (part 1 and 2)
2) EcoReport tool (.xls file)
3) Project report
4) Draft Agenda

Presentation slides were published 3 days after the meeting (Monday 12.9.2011) for download on the project website: 3 presentations on the above reports (Project report, MEErP Part 1 and 2) plus addendum on recycling.

**DRAFT MINUTES**

Kerstin Lichtenvort of the European Commission opens the meeting and welcomes the attendants. She introduces the study and gives the floor to the chair of the meeting Mr. Rene Kemna (VHK, chair) to commence the presentations.

Mr. Kemna notes that the draft agenda is agreed and explains the meeting will entail three presentations, the first regarding the project report, the second regarding the methodology and a third regarding policies and data relevant for the project.

**On the presentation of the MEErP Project report**

Mr. Kemna presents the project report, followed by "Q&A" (the presentation can be downloaded from project website [www.meerp.eu](http://www.meerp.eu)).

Mr. Meuwissen (EUMEPS) has a general comment regarding the simultaneous aspect of the three studies for the Evaluation of the 2009 Ecodesign Directive, the update of the Ecodesign Methodology and the background study for the Ecodesign Working Plan. More specifically regarding the methodology he notes that the extension of the methodology regarding energy-related products is not well described. Mr. Kemna explains the expansion of the scope will be addressed during this meeting in Task 3 of the method.

Since no further questions regarding the project presentation were received, Mr. Kemna proceeds with the presentation regarding the reviewed methodology, followed by "Q&A" (the presentation can be downloaded from project website).

**On the presentation of the MEErP Methodology report**
Annette Gydesen (for Denmark) mentions that although the survey indicates Task 1-2 to be considered very useful, this is not the case for the Danish users, who feel it is too theoretical. The Danish researchers prefer more emphasis on technical aspects at the start of the study, to be detailed with legislation and standards later on. Mr. Kemna explains this is why Task 1-4 can be done in parallel and a Task 0 - a feasibility scan - has been added to the methodology.

Dirk Jepsen (Ökopol) appreciates the efforts made to make the tasks more explicit and has four more specific questions:

1. He asks the EC how binding the tasks descriptions will be for coming preparatory studies. Mr. Kemna replies that the methodology is intended to be complete and cover all relevant aspects. Whether the studies will cover all aspects is up to the Commission tender specifications and the available budget (larger studies require more budget). Martin Eifel (DG ENTR) replies that the studies will be as complete as possible and consultants are expected to be bound by the tender specifications, to provide a complete and uniform study.

2. Mr. Jepsen asks if there will be more guidance regarding how energy-related products for consumption/efficiency are to be taken into account and whether new LCIA unit indicators will be added to the LCA assessment. Mr. Kemna replies that unfortunately no 'example' preparatory study could be produced within the budget. The report now lists instructions and examples of a few products, e.g. on thermal insulation and windows. Where indispensable, e.g. for electricity, the indicators have been updated. Other indicators can be added in preparatory studies, also in the EcoReport using the New Materials facility.

3. Mr. Jepsen asks how other impacts than energy, i.e. other env. impact categories, are assessed during assessment of ecodesign option. Mr. Kemna replies that –as was the case in MEEuP— the other aspects are treated no different from ‘energy’. The misconception, voiced in several stakeholder comments to the questionnaire, that Ecodesign is only about energy must be the result of the transitional period according to Article 16(2) of the Ecodesign Directive 2009/125/EC where the most energy-consuming products were treated first and then it is no surprise that this aspect is dominant.

4. Mr. Jepsen asks whether there will be another stakeholder meeting to comment on the more complete study/reports. Mr. Kemna replies that this is not foreseen. Mr. Eifel adds that the situation will be assessed and what is necessary will be done.

Laura Spengler (Ökopol for ECOS) asks for another review period, to comment on the next version. Mr. Kemna replies that the deadline for the report is within a month (October). VHK will take on board as much as possible written comments from stakeholders on the content that is already in the reports, but warns that wishes for an extension to more tools, more guidance data will be problematic within the defined scope of the tender.

Anna Carlén (Swedish Member State) states that the task 0 as screening task is welcomed, and expects this will enhance efficiency of Task 1-7.

Herman Köhler (Verband der Chemische Industrie) asks if the ISO 14 series standards is followed. Mr. Kemna replies that the environmental analysis in the MEErP method follows the ISO 14 series as closely as possible, but within the freedom of choice within those standards the method does make specific choices --excluding others-- to suit the policy-support aim of the method.

Mr. Meuwissen (EUMEPS) states that the assessment of specifically energy-related products is not clear (the "how").
Sylvia Maurer (BEUC) appreciates the consideration of non-energy aspects, by including REACH in the assessment and asks to include the candidate list of SVHC\(^{17}\) in the assessment. There is also the question on how REACH and Ecodesign will co-exist. Mr. Kemna replies that the study considers both instruments, Ecodesign and REACH, as complementary. It will be a while before the SVHC –or Candidate substances-- are largely ‘banned’ (only allowed for specific applications with special permit) and Ecodesign measures could anticipate that. Inclusion of Candidate substances does not seem problematic and will be discussed with the Commission.

Stephane Arditi (EEB) appreciates the amount of work performend by the consultant and the Task 0 to 7.

1. Mr. Arditi questions whether there is enough emphasis placed on a good description of the user behaviour, since in some prep.studies this aspect is not very well documented/not reliable. Mr. Kemna replies that finding reliable data is difficult. Part 2 of the Methodology report tries to give more guidance summarizing user behaviour data from past and ongoing preparatory studies, but it is still work that needs to done in individual studies.

2. Mr. Arditi asks whether the study will give guidance in cross-category comparison of impacts in different environmental dimensions. Mr. Kemna: MEerP is not, nor does it strive to be, an automatic law-making method. With the extensive Part 2 report more policy background is given. With the societal LCC we give more information, but in the end policy makers and stakeholders will have to make the decision on how to deal with the multiple dimensions of a problem.

3. Mr. Arditi welcomes the introduction of societal costs. Mr. Kemna replies that this aspect is new and is looking forward to first experiences

4. Mr. Arditi asks for a better consideration of the equal life cycle cost point, which is in some cases achieved by Best Available Technology and should be the medium/long term goal/aim for legislation (equal costs and optimal protection of environment). Mr. Kemna confirms that this is a possible role of the BAT (which in some cases where the LLCC is equal to the BAT is already achieved). But in the methodology the difference between the BAT-point and a target is also very important to determine what would be the room for product differentiation after a target is implemented. If there is no room (all products being equivalent on environmental parameters) this could be harmful for competition and freedom of choice for the consumer.

Mr. Jepsen (Ökopoli) asks for more sophistication as regards the coverage by REACH. The candidate list has no regulatory impact, only the list of authorised/restricted substances. Mr. Jepsen proposes a ‘red flag’ assessment, where use of substances of the candidate list is indicated in the assessment. The risk of exposure is also relevant for the assessment. Mr. Kemna appreciates the concept as brought forward and will consider it.

Ms. Gydesen (representing Denmark and Norway) agrees with the position brought forward by Ms. Carlen, Sweden

Sascha Dietrich (Federal Ministry of Economics and Technology) states that the aim of the method should not be to do double work, for aspects already covered by other legislation. He concludes that the Ecodesign is not the right instrument for all environmental aspects. Mr. Kemna replies that this is indeed discussed in the methodology: Measures under the Ecodesign directive should indeed have an added value to what exists.

Sylvie Feindt (DIGITALEUROPE) welcomes the introduction of Task 0. As regards RoHS/REACH she states that these should not be integrated in the Ecodesign approach.

Rachel Buckle (UK Member State) states that the methodology should also consider extension of lifetime (durability) as ecodesign option and also mentions multifunctional products as another way for environmental

\(^{17}\) SVHC = Substances of Very High Concern, a term used in the context of REACH.
improvement. Mr. Kemna replies that in the methodology the lifetime was considered as an indicator, but – especially for products that by definition cause energy consumption and emissions during their life—lifetime extension is not often an improvement because it causes a larger inertia for improvements. The report mentions some examples and Mr. Kemna would appreciate if the UK could react to those. As regards multifunctional products the report (Task 1) gives some guidance on how to deal with them. Depending on the product, the multi-functionality could have good or bad impacts. Example of the latter is a combi-boiler, where often the water-heating function causes a huge oversizing compared to the capacity needed for space heating. In a smart-phone the multi-functionality could be a good thing if it actually displaces the purchase of e.g. camera’s and camcorders (QED).

Mr. Jepsen asks whether an excel-file on the scenarios (Task 7) will be prepared as part of deliverables since this could be useful for both consultants and other stakeholders. Mr. Kemna replies that development of an excel-model is not within the scope of the study. Nonetheless, the instructions that are in the report are enough for the EC to tender for such a tool.

**More specifically on task 1**
Mr. Arditi asks if a rebound effect is taken into account, or whether progressive minimum requirements are applicable. Mr. Kemna replies that continuous adjustment of standards is not always possible, and that shaping regarding size classes is better.

Mr. Meuwissen states that the requirement to have an "assessment of independent environmental parameters" makes the application to energy-related building products not possible. Mr. Kemna admits the assessment is more complex, but not impossible.

**More specifically on task 2**
Mr. Kemna explains that the value of 2050 for scenario calculations is taking into account longer lifetimes of building products and follows new policy deadlines, e.g. the carbon roadmap 2050 issued by DG Clima.

Mr. Arditi states that there has been little evidence that legislation has had an effect to raise the purchase price and thinks the methodology may be overestimating this effect. Mr. Kemna agrees that the modelled effects are not identical to a much more complex reality, where there are many factors influencing the market price. E.g. in whitegoods, without Ecodesign measures, a manufacturer makes a continuous effort—with R&D—to lower the production costs (smarter design, more production automation and lower labour costs). Depending on the competition, this will translate in lower market prices or higher margins. If he/she is confronted with Ecodesign measures, the R&D effort will go less into lowering costs and more into functional improvement of products to meet targets/favourable labelling classes. In the first year(s) after this effort, he will be able to get a price bonus for this effort, but soon competition will force him/her back to the previous prices as also these new products—which previously were niche-products with low production volume—experience the economies of scale that go with mass production. Now, one could try to put this industry behaviour (which is a real effort, even if it does not show up in the long-term price) in a complex model or one could simply accept that the method works with a simple model, where the effort is simply expressed through a price increase of the product. The MEErP chose the latter

Mike Scholand (CLASP) adds that the profit margin in an unregulated market is a third important factor influencing purchase price and adds that the method should ask for a sensitivity analysis as regards product prices. Mr. Kemna replies that indeed the sensitivity analysis looks at the price elasticity in that way.

**Lunch break from 13.00-14.00 hr.**
More specifically on task 3
Andoni Hidalgo (EURIMA) states that as regards thermal insulation products the methodology does not explain how the savings at building level are translated into recommendations at product level. Mr. Kemna replies that the task for calculating design options should be based on the results of Task 1 (legislation) and 2 (Market development) and that in the consideration of options any policy could be an outcome. Mr. Eifel (DG ENTR) adds that which policy option is preferred is decided by the Commission. Of course he wants the prep. studies to be effective and says that Task 0 (comparable to the analysis in the background study for the amended Working Plan) should ensure that a follow-up study for task 1-7 should be worthwhile.

Christian Leroy (European Aluminium Association) places remarks relating to the example of windows: for new buildings and significant renovations a holistic approach is preferred instead of a product approach. Secondly, he states that a proper consideration of climate zones is crucial and thirdly, that windows can also have a positive effect on the energy balance of a building which needs to be taken into account. Mr. Kemna replies that the goal is to have a synergy in legislation (e.g. EPBD and Ecodesign) and that the formulas of the example in the MEerP are a starting point of how this can be achieved, and not to exclude one or another. Secondly, as applied in the Regulation for air conditioners (and proposed for CH boilers, lot 1) the EU is able to set up legislation that takes into account a performance range across (three) climate zones (Mr. Leroy ask for further clarification, which is provided). Thirdly, it is agreed that windows can have a positive effect on the overall energy balance.

Mr. Jepsen asks for more clarification as regards taking into account effects of energy-related products and whether the required additional analysis is very large. Mr. Kemna refers to part 2, where example products are described shortly.

Mr. Meuwissen asks for a separate approach of construction products, since the CPR (Construction Products Regulation) has a similar aim as Ecodesign and points out the relevance of basic requirement for construction works #3, 6 and 7. He states that a new instrument would only introduce further risks and not help to achieve the shared objectives. Also the Member States have a responsibility in this. He also states that several mandates have already been issued to CEN to develop relevant standards. Mr. Kemna replies that consideration of existing policies is certainly important, but recalls that "thermal insulation" is recognised widely as an important energy-related product and is specifically mentioned in the recitals of the Directive, despite the fact that one can assume that Council and Parliament are aware of existing legislation.

More specifically on task 4
Mr. Jepsen asks how "best" in “Best Available Technology” is defined, i.e. how is the product scope delimited. Mr. Kemna anwers that the methodology for defining the product scope has an iterative aspect, which comes back in every Task of Task 1-4.

Mr. Arditi says that in the consideration of end-of-life the status of the technology applied is not known and appears to describe more often 'best case' than industry 'average' - this could lead to neglecting certain potentials.

More specifically on task 5
Mr. Jepsen asks:

1. As regards new materials whether these will be added or that procedures for describing new materials are included? Mr. Kemna replies that a) the LCA methodology including characterisation factors is defined, b) for LCIA unit indicators where it is indispensable (electricity) there was an update, c) in the EcoReport there is a New Materials facility where contractors for prep. studies can add data for new data, and d) the internal structure of the EcoReport has been improved allowing easy maintenance and use by 3rd parties that the Commission may or may not want to attract.

6
2. As regards characterisation factors for emissions water, there appears a lack of describing organic substances? Mr. Kemna replies that Eutrophication also includes TOC, DOC and related (BOD, COD) other environmental impacts; the method did not copy all substances from the water quality directive because many are pesticides, i.e. for agricultural use and not relevant for ErP.

3. As regards RoHS/REACH substances whether these are included under emissions?

4. As regards 'resources' that in other fora this refers to biotic depletion, biodiversity, land-use and not to materials consumption;

5. As regards the new parameter 'recymax' does it address the materials, rather than products? Mr. Kemna replies the parameter addresses materials;

6. As regards 'critical raw materials' he states that the assessment of equivalence factors is solely based on economic parameters, not on environmental. The metric "Antimony equivalent" is typically used for resource depletion, which could lead to confusion. Mr. Kemna replies that a different metric can be considered (e.g. tungsten equivalent);

7. As regards missing impact categories, Mr. Jepsen mentions that also 'biodiversity' is not used. Mr. Kemna replies that this is noted but can not be dealt with in the current update of the methodology;

Mr. Leroy states that the metal industry disagrees with the approach for incorporating recycling of materials (metals). The metal industry argues that the methodology neglects the fact that 90% of the original metal is currently recycled from metal building products at the end of their life. Mr Rigamonti (EUROFER) confirmed this position.

Mr. Kemna replies that this is not the case; the proposed methodology takes into account that 90% of the metal that is discarded will be recycled, i.e. contributes to diminishing the impact of the new metal that is brought on the market. But the methodology aims to describe the environmental impacts and resources use 'as is' in real-life. This means that—at any point in time—for growth markets and especially for products with a long product-life (slow replacement rate), the mass of products discarded—even if they are all recycled—will only be a fraction of the mass of new products sold. This 'stock-effect' puts a very real and very practical limit to the mass being recycled and thereby the savings on the production impact that can be achieved through recycling. The MEErP accounting simply assumes that you cannot recycle more material than is discarded. Thus, the 'closed loop', 'substitution', 'expansion', etc. methods cannot be accepted in a policy-oriented tool like MEErP because in all sorts of policy accounting (Kyoto, Gothenburg, Stockholm, NEC, etc.) the rapporteurs should always make an account of what 'is' and not what 'could be'. [See also Addendum Recycling slide presentation shown by Mr. Kemna]

Mr Leroy states that metal products suffer discrimination vs. plastic products since plastics are getting credits based on End of Life scenarios while it is not the case for metals.

Mr. Kemna mentions that in MEErP this principle (you cannot recycle more than is discarded) that is implicit in the metals recycling rates has now been made explicit in the new parameter 'recymax', which will also have its impact on the maximum recycling rate that can be applied to plastics in EcoReport, thus creating a level playing field between the materials. Finally, Mr. Kemna mentions that the MEErP study team is sensitive to the argument that some incentive to improve recyclability of metals, despite the already high recycling rates claimed by industry, in the design options (probably not in the base case) could be beneficial. But this needs to be further discussed internally.

Ms. Gydesen, on behalf of Norway, states that the fixed primary energy conversion factor should not be used, since it neglects national and time-related changes in the electricity production mix. The correct method will be to make use of the expected long-run marginal primary energy factor. This factor takes into account the investments in new electricity production capacity and will be dominated by renewable and efficient fossil fuelled plants (including CHP). Therefore the long run marginal primary energy factor will be much lower than the average factor. It will be difficult to estimate, as it highly depends on the political decisions in the MS. But
in contrast to using the average factor, the use of the long run marginal factor can lead to a more realistic picture.

In that context, always according to Norway, it is important that the primary energy factor is reduced in due time in order to avoid inappropriate infrastructural investments. And separate energy labels and ecodesign requirements for similar products using different energy sources (for instance electricity or gas) should be introduced. Norway calls for the impact analysis and the sensitivity analysis to take diverging primary energy factors into account.

Mr. Kemna recognizes Norway’s position and would be interested to receive more information on Norway’s projections of EU marginal primary energy factor. However, the use of the primary energy factor in MEErP is taken from the EU energy policy and legislation and cannot be modeled separately in MEErP. The same goes for the discussion on separate energy labels. As regards the sensitivity analysis, this is in large part depending on the individual preparatory study; the methodology would leave the freedom to make such an assessment if it is considered relevant.

Fabrice Matthieus (DG JRC) states that the 'substitution' method is not a form of double-counting. As regards critical raw materials he requires more explanation of the method behind the equivalence factors and proposes to use a different indicator material. As regards the stock effect ("recycmax") he thinks this is more material flow related and does not see how it should be used in the methodology.

Laura Spengler asks how the environmental impacts in other life cycle phases than the use phase will be taken into account when developing ecodesign alternatives for the base case. Mr. Kemna replies that the assessment should be based on the full life cycle of the product and not just the use-phase, which means that each option requires an ecobase.

Mr. Jepsen asks whether it is/will be possible to select eco-indicator materials/processes according a industry development state (good-average-best production technology). Mr. Kemna replies the eco-indicators are meant to represent a material/process choice representative of the average material used in current day and near future. ECOS states it would be an added benefit if this selection would be possible.

Mr. Kemna presents slides regarding the approach taken to incorporate efforts regarding recycling of materials. Mr Leroy stated that the MEErP approach uses a generic metal supply perspective while MEErP should use a product perspective by definition. Mr Leroy recommends then addressing both the input (recycled content) and output (end of life recycling rate) of metal flow related to the product under consideration, independently from the sector evolution. Mr. Leroy and Mr. Meuwissen remain in disagreement with the MEErP approach. Mr. Mathieux refers to the ILCD handbook. Mr. Kemna invites Member States to give their view on this issue in their written comments.

**More specifically on task 6 & 7**
Mr. Arditi welcomes the introduction of costs of societal damage.

**On the presentation of the MEErP Data & Policies report**
Mr. Kemna presents an overview of the content of the Methodology Part 2 report and recommends further reading.

**Deadline for written comments**
Mr. Kemna informs that the deadline for written comments on the MEErP report is until two weeks after the meeting, i.e. the 23rd of September 2011 is the last day for sending in comments to r.kemna@vhk.nl.

Meeting concluded (16.30h)
### Table 1: list of attendants (alphabetically)

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Andoni Hidalgo</td>
<td>Eurima, European Insulation Manufacturers Association</td>
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<tr>
<td>Andreas Halatsch</td>
<td>Federal environment agency Germany</td>
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<tr>
<td>Anna Carlén</td>
<td>Swedish Energy Agency</td>
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<tr>
<td>Annette Gydesen</td>
<td>Viegand &amp; Maagøe ApS (representing the Danish Energy Agency and Norway)</td>
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<tr>
<td>Bob Rivett</td>
<td>Emerson Electric, Vice President Technology, Head of the Advanced Design Centre</td>
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<tr>
<td>Caroline Thienpont</td>
<td>Federal public service – Environment (Belgium)</td>
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<tr>
<td>Cesar Santos Gil</td>
<td>European Commission, DG ENTR, Sustainable Industrial Policy unit (B1)</td>
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<tr>
<td>Christian Leroy</td>
<td>European Aluminium Association</td>
</tr>
<tr>
<td>Christiana Papazahariou</td>
<td>EPEE (European Partnership for Energy and the Environment)</td>
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<tr>
<td>Christine Spirlet</td>
<td>International Zinc Association</td>
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<tr>
<td>Corinna Grajetzky</td>
<td>Association of German Chambers of Industry and Commerce - Representation to the EU</td>
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<tr>
<td>Davide Minotti</td>
<td>European Commission, DG ENV, Sustainable Production and Consumption Unit (C1)</td>
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<tr>
<td>Dirk Jepsen</td>
<td>Ökopol GmbH</td>
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<tr>
<td>Fabrice Mathieux</td>
<td>European Commission, DG JRC-Ispa</td>
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<tr>
<td>Floris Akkerman</td>
<td>BAM</td>
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<tr>
<td>Frank Ennenbach</td>
<td>Sulzer Pumps, Cardo Flow Solutions AB, Lohmar, Germany</td>
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<tr>
<td>Frédéric Melchior</td>
<td>European Building Automation and Controls Association</td>
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<tr>
<td>Friedrich Klütsch</td>
<td>VDMA, Pumps + Systems Association, Frankfurt, Germany</td>
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<tr>
<td>Hannalena Ivarsson</td>
<td>Kreab Gavin Anderson, Deputy Managing Partner</td>
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<tr>
<td>Hans-Paul Siderius</td>
<td>AgentschapNL</td>
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<tr>
<td>Hermann Köhler</td>
<td>Verband der Chemischen Industrie</td>
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<tr>
<td>Jan Meuwissen</td>
<td>EUMEPS</td>
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<td>Johannes Auer</td>
<td>Siemens AG</td>
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<tr>
<td>Karoline Entacher</td>
<td>Permanent Representation of Austria to the European Union</td>
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<tr>
<td>Kathrin Völker</td>
<td>HKI – Industrial Association of House, Heating and Kitchen Technology</td>
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<tr>
<td>Kerstin Lichtenvort</td>
<td>European Commission, DG ENER, Energy Efficiency (C3)</td>
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<tr>
<td>Laura Spengler</td>
<td>Ökopol GmbH on behalf of ECOS</td>
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<td>Leendert-Jan de Olde</td>
<td>Philips</td>
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<tr>
<td>Marie Görkem</td>
<td>Kreab Gavin Anderson / Emerson Climate Technologies, Executive Associate</td>
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<tr>
<td>Martijn van Elburg</td>
<td>VHK (contractor, minutes)</td>
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<td>Martin Eifel</td>
<td>European Commission, DG ENTR, Sustainable Industrial Policy unit (B1)</td>
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<td>Matteo Rambaldi</td>
<td>CECED</td>
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<td>Matteo Rigamonti</td>
<td>Eurofer</td>
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<tr>
<td>Michael Scholand</td>
<td>representing CLASP Europe</td>
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<tr>
<td>Mr. Alexander Gabl</td>
<td>Austrian Federal Economic Chamber</td>
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<tr>
<td>Nelly Azais</td>
<td>COWI Belgium (contractor)</td>
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<tr>
<td>Patrick Jansen</td>
<td>Fest, The European Federation of the Sanitary and Heating Wholesale trade</td>
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<tr>
<td>Rachel Buckle</td>
<td>Department for Environment, Food and Rural Affairs (Government Department)</td>
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<tr>
<td>René Kemna</td>
<td>VHK (contractor, chair)</td>
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<tr>
<td>Rose Maria Laden Holdt</td>
<td>Viegand &amp; Maagøe ApS (representing the Danish Energy Agency and Norway)</td>
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<tr>
<td>Sascha Dietrich</td>
<td>BMWi</td>
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<tr>
<td>Stephane Arditi</td>
<td>EEB</td>
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<td>Sylvia Maurer</td>
<td>ANEC/BEUC</td>
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<td>Sylvie Feindt</td>
<td>Digitaleurope</td>
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Stakeholders were given the option to comment in writing until 2-3 weeks after the stakeholder meeting. Replies were sent directly and with clarification that they represent the view of the MEErP study team and should not be perceived as the opinion of the European Commission.

Comments of stakeholders and replies of the MEErP study team can be found hereafter.

Contents (no particular order):
- Germany
- Consumer associations
- CLASP
- Belgium, Flanders
- Netherlands
- Norway
- Norwegian confederation of enterprise
- DG JRC-IES
Umwelt Bundesamt (UBA), 26th September 2011:

Comments on the Study on Methodology for Ecodesign of Energy-related Products (MEErP), version of August 2011

MR1 = methodology report part 1, MR2 = methodology report part 2

*Answered by the MEErP study team, 28 Sept. 2011*

**UBA Comment 1 [overall]**

First of all we would like to thank for the comprehensive preparation of the documents and the good quality of the study. We understand that such a study faces resource constraints, which makes it impossible to tackle all issues. However, the changes and improvements of the methodology are of fundamental importance for future preparatory studies. Thus, since many important points in the methodology are still open or may be subject to changes, there should be an additional opportunity for stakeholders to comment before the final report and final version of the EcoReport is issued. Especially: For some proposed changes it is unclear how and where they will be applied in preparatory studies and the Ecoreport does not yet reflect some of the changes proposed in the methodology report (e.g. new impact indicators). This makes it complicated to understand the full picture of the proposed future methodology.

**Answer 1**

Thank you for the compliment. The draft final report is due in a few weeks and this will complete our contractual obligations with the Commission. We are not in a position to comment how the Commission will handle the evolution of the new ecodesign methodology and the EcoReport tool in particular, but we would imagine that there will be opportunities for fine tuning it. We will try to answer your questions below as good as possible and any additional comments you may have in the near future. As regards several new indicators (CRM, REACH, etc.) they will have to be performed manually for those products/components where it is relevant. The EcoReport is a convenience tool that automates some otherwise tedious tasks; it is not synonymous to the whole methodology.

**UBA Comment 2 [overall]**

The EcoReport Tool is still a “black box” regarding some of the background data included. E.g. calculation of the production phase for different components is not available to the experts using the tool. Due to this it is not possible for the consultants of the prep-studies to verify whether the results gained from EcoReport reflect lifecycle reality in the respective product group. As a result the environmental impact of the production phase might be over- or underestimated in a significant way and major possibilities to influence the environmental burden of the product lifecycle might not be addressed in the further assessments and political discussion.

**Example:**

A study on behalf of the Federal Environment Agency (UBA-study) performed a life cycle assessment of laptops and compared the results with the EuP-study lot 3 and Ecoinvent 2.2. Thereby the use phase has been modelled in the same way, while the data for production and distribution differed according to the applied methodology.
The different data and methodology caused considerable differences in the contribution of the life cycle stages to the global warming potential:

- EuP lot 3 study: 35.2 % production process (including distribution and material extraction); 60.2 % use phase
- Ecoinvent 2.2: 54 % production (including distribution and material extraction), 38.2 % use phase
- UBA-study: 56 % production (including distribution and material extraction), 36 % use phase.

In concrete terms the production of a notebook (including distribution and material extraction) causes 81 kg CO$_2$e according to the EuP lot 3 study, 195 kg CO$_2$e according to Ecoinvent 2.2 and 214 kg CO$_2$e according to the UBA-study.

These results show that in the MEEuP methodology the production of electronic components is underestimated. The following aspects seem to be mainly responsible for the differences and are not appropriately covered by the MEEuP respectively MEErP:

- Energy intensive production in dust-free-rooms
- Energy input to produce high-purity chemicals (e.g. energy input and carbon dioxide emissions for the production of hydrogen peroxide of high purity is 17 % higher than for the production of standard hydrogen peroxide.)

Further important aspects of an life cycle assessment, which should not be neglected:

- Considering emissions of fluorinated compounds: in case of display production increases the GWP by 22 %, in case of storage chips the differences can be in the range of factor 3.
- Consideration of Radiative Forcing Index (RFI-Factors) for flight transport increases the GWP of transport by 142 %.

**Answer 2:**

Please read the 2005 MEEuP report, Chapter 5, page 87, which introduces the Unit Indicators:

“The Unit Indicator table covers over 90% of the relevant inputs needed for the environmental impact assessment in the Product Cases (MEEUP Product Cases Report) and they represent the best available data that could be retrieved within the underlying study. Their purpose is to provide a set of ‘default values’ for the methodology, demonstrating its feasibility and applicability on the short term. By no means they are intended to deter from activities aimed at improving the quality and scope of the data. On the contrary, it is hoped that the compact and easily accessible Unit Indicator dataset and the EuP EcoReport will contribute in making Ecodesign a practical reality, stimulating the materials industry and OEMs to bring more and better environmental (process) data into the public domain and stimulating public support for efforts by un-biased experts to elaborate these data into useful and consistent indicators for Ecodesign. Such improved process data are expected to be provided by the European Platform on Life Cycle Assessment, which is a project initiated by the European Commission.”

In other words, the dataset was developed to demonstrate feasibility and short-term applicability. It provides default data to combat the argument that LCA in a policy context is not possible because of lack of data. Until 2005 this has been one of the main reasons for the non-acceptance of LCA tools. It was (and is) never intended, also not by the Commission who always demanded in the term-of-references for the tender that the contractors should have specific LCA know-how, to prohibit the performance of LCAs during the preparatory studies along the lines set out in the methodology report.
It was (and is) never intended as a sort of EU version of the excellent Swiss Ecoinvent database (www.ecoinvent.org), which is produced with a team of dedicated professionals over more than a decade and documented with 30-40,000 pages (!) of background reports, giving a detailed and fully transparent account of sources and calculation methods per material.

Having said that, we will shortly address your example of laptops and possible difference between studies on laptops. This is not an in-depth analysis, but we would like to address the issue more in general.

Basically, most of the differences stem from:

1) **Product life assumptions.** Until 2005-2006 (and still by some authors today) the product life of laptops was assumed to be 5-6 years. In 2006 we believe, a study on Japanese practice showed that —although 5-6 years may be the time between purchase and disposal—the actual service life was half, i.e. more like 2-3 years. This means that the production phase becomes twice as important.

2) **Energy efficiency and usage patterns of the laptops.** LCAs of laptops have been investigated over the last 10-12 years by many (>10) authors. Today’s laptops are much more energy efficient than models 12 years ago; probably—depending on the usage pattern assumed—using around half of the annual energy. Therefore, this can again double the importance of the production phase. Combined with point 1, the impact of the production phase (c.p.) vs. the use phase of a new efficient laptop with a 3 year product life can be 4 times more than the one we calculated in the Case study in 2005.

3) **The timing and scope of the production (LCI) data.** In the MEEuP study we used the global state-of-the-art data 2004-2005 for the electronics parts. So, not the average (which anyway is documented nowhere) but the best. This may be criticized, but in our view it was necessary in order to have a halfway robust data-set for such a fast-moving sector.

To give an idea: With each generation of LCD factories (every 12-18 months) the resources use and the emissions could be 20-25% less. Hence we took (or rather acquired through a long process) confidential detailed data from the Sharp Green Factory (a 6G fab) for LCD screens and checked them as much as possible against others. This particular factory, as is also documented in the MEEuP report, consumed and emitted only a fraction (<50%) of e.g. a 4G fab. And most certainly it is no comparison to the 1998-2001 US EPA data that are the basis for LCD screen LCAs in the Ecoinvent database.

There is a distinct pattern, which is apparent from the annual environmental accounting of most of the large Japanese manufacturers, showing how important the timing of the acquisition of electronics LCI data is. For instance, at the moment, the Sharp 2004 Green Factory would be only ‘average’ and the latest plant—extensively documented with generic data—is already much more ‘green’.

The diagram below is taken from the Sharp 2010 Environmental Report.
In that respect (Germany mentions fluorinated GHG) please note that Japan has a very aggressive strategy to ban fluorinated GHG and already the 2004 Green Factory achieved almost 100% recycling of cleaning agents.

The diagram below is taken from the 2010 annual environmental report of a large glass and panel supplier, i.e. the ACG group (Asahi), showing a 99% reduction of F-gas use between 1995 and 2009.

It wasn’t checked, but we suspect that—on the grounds above—our GWP data for the LCD-screen should be at least 4 times lower than 1998-2001 EcoInvent data on LCD screens.

As regards the other important factor, the mainboard, we think that the differences will not be that high: EcoInvent used the same main source as we did, i.e. the AMD Fab 36 in Dresden (data 2005). Unfortunately, for a part of their analysis EcoInvent still used Williams (2001) and AustriaMicroSystems (AMS 2004) data, which may still introduce some legacy figures. But overall we think they took the state-of-the-art 2005 data which would be ±50% similar to ours. For the PWB/PCB they used the STM Corporate Responsibility report as an input, which should not be dissimilar from the EcoReport.

When looking at the EcoInvent LCI data in more detail (from their 1000-page metareport No. 18 on electronics), the largest difference in chip manufacturing appears to be in the heat input: Electricity input is similar, but the use of natural gas is much higher. Their source is AMS 2004. Our sources do not show such high fossil fuel input, which in part could be explained by the larger use of efficient CHP, heat pumps and even large-area solar PV on the factory grounds with Japanese producers. But we would need to do a much more extensive research to get to the bottom of this.

4) There is at least one **structural difference** between EcoInvent and MEEuP/MEErP that can account for significant differences: Their GWP for electricity production is much higher than in MEEuP. EcoInvent
uses a carbon intensity of 0.562 kg CO2 eq./kWh (2004, UCTE, at “Klemme Kraftwerk”), whereas MEEuP uses 0.452 kg CO2 eq./kWh (2004, EU-25, including distribution losses).

Furthermore, for components made in Asia EcolInvent uses the local electricity mix emissions of Taiwan, Japan, Korea, etc.. This aggravates the differences even more (e.g. China and Korea in EcolInvent: 0.944 kg CO2 eq./kWh).

It would be outside the scope of the study to address this complex issue in full, but we believe that the key difference is that EcolInvent has followed a full bottom-up approach in its LCA, i.e. building their end-results from the data at the lowest aggregation level (i.e. a typical coal-fired plant, etc.) and then aggregating to country level and then to UCTE level. This is standard LCA practice, with all its pros (very comprehensive and transparent) and cons (very sensitive to the data quality especially at the lowest aggregation level).

In our case, given the scope of MEER, we could not avoid to built a substantial part of the figures for GWP, energy efficiency from plants, etc. from the official data supplied by Eurostat (which is an aggregation of data by Member States) and other official sources like (at the time) EPER. In the policy context for which MEER is to function it would not be appropriate to state that all the official EU emission and resources figures are wrong.

As regards airfreight, we used the NTM data (currently www.ntmcalc.se) in 2005. No RFI-index was documented, but it is not excluded that in the background it was taken into account. We checked the NTM data also against some air freight company data, like DFDS, US EPA data and GEMIS 4.2 at the time. In the end 0.143 kg CO2 eq./m³.km was used as a value for air freight in MEEuP.

In conclusion, and as mentioned before, MEEuP and MEER welcome contractors to insert new, well-documented LCAs. For that it is not necessary to first criticize the default values. In other words, from a methodology standpoint a new LCA could have been introduced with e.g. laptops as well.

**UBA Comment 3 [overall]**

The indirect ErP assessment approach needs further explanation. The use of a (reference) energy system to assess and compare the energy impacts of indirect ErP is in general an appropriate concept. Nevertheless, by using this approach, the “correct” modelling of these reference systems and their standardized use may have a huge impact on the results of the assessments. At the moment it is unclear how this will be applied in preparatory studies and in the EcoReport.

**Answer 3**
The examples in Task 3 (Part 1) will be revisited to show more clearly how it could work in practice.

**UBA Comment 4 [overall]**

The MEER report includes – based on the lessons learned from previous preparatory studies – several clarifications and proposes approaches how to tackle e.g. scoping problems. This seems very helpful in order to ensure a harmonised application of the assessment methodology and to gain comparable results.

Unfortunately it remains unclear to the reader how binding the proposed approaches within the different assessment tasks will be for the future use by the consultants of the prep studies. Further clarification on this would be helpful.

**Answer 4**
The term ‘binding’ seems less appropriate; the section tries to give more guidance to not only contractors and stakeholders but especially also to the person writing the tender specifications for the preparatory studies. Ultimately they will decide on what is ‘binding’ or not. During the stakeholder meeting, the Commission
representatives clearly said that, if properly justified, the assessments made in preparatory studies could deviate from the MEErP methodology.

**UBA Comments 5 and 6 [MR1 5, page 68]**
The chapter on Task 4 is completely missing at the moment. There should be an opportunity for stakeholders to comment on this important chapter. The identification and description of benchmarks has been very insufficient in some preparatory studies. The MEErP should therefore provide more guidance for the establishment of benchmarks. It is important to assess if this benchmark can be achieved for the whole scope or for single applications only. A general validity of benchmarks for a product group is a prerequisite in order to define benchmarks as real future target values. The best not yet available technology (BNAT) should not only be described technically but also by efficiency parameters (e.g. energy efficiency index) in order to get a picture of possible future levels of efficiency. This is of special importance for product groups where the energy label is revised or introduced in order to appropriately redefine future energy efficiency classes.

**Answer 5 and 6**
The chapter on Task 4 will be written with some guidance on benchmarks. However, it is a subject that is very difficult to handle in generic terms, i.e. without knowing the product group. If UBA has some examples of what could be specific guidance on benchmarks this will be most welcome.

**UBA Comment 7 [MR1 6.3, page 83]**

vhk propose a new “Critical raw materials” indicator. In general we welcome this attempt to address the issue of resource depletion. However it is not clear to us in which way (or even if) it is aimed to include the indicator in the methodology/Ecoreport tool.

As we understood from the discussion with the consultants during the stakeholder consultation on 9 September, unfortunately an inclusion of the well-established indicator Abiotic Depletion Potential (ADP) is not possible for the consultants due to missing quality targets. The consultants propose to restrict to the short list of the materials proposed by the Ad-hoc Working Group of the critical raw materials initiative as a first step. We understand this problem but:

- The limitations regarding the inclusion of a more meaningful and complete list of critical raw materials should be made explicit in the report.
- We think it should be pointed out in the report that the proposed indicator is more of economic nature rather than an environmental indicator due to the way it is defined.
- In order to avoid confusion with the established ADP a different material than Sb (antimony) should be chosen as reference for the derivation of characterisation factors.

**Answer 7**

CRM is one of the new policies, already foreshown of quantitative sub-indicators, developed by the Commission in the 2005-2011 period. As such, also in consultation with the Commission services, it is included in MEErP.

As mentioned before, it will be a mandatory assessment within the methodology on which contractors should report. However, it will not be a part of the EcoReport tool.

As you mention, the CRM is directed not only to global resources depletion in general but more towards security of material resources supply to the EU and uses sub-indicators like import-dependence, recycling rate and substitutability. We can add this in the report.
The ADP (Abiotic Depletion Potential), directed at preservation of global material resources, is not part of any official EU policy. Thus, as VHK is to follow (and not lead) EU legislation, the introduction in Ecodesign is not timely. As far as we can see, the Commission is moving in that direction, at least at strategic level, but we are still far off from an accepted indicator (ADP also still has some issues to solve before it is robust enough).

Agreed to use another reference; we will propose tungsten (W), which is the closest to Sb.

UBA Comment 8 [MR1 6.3, page 83f]

For addressing the issue of recycling during material selection the concept of recycmax, proposed by the consultants seems appropriate. It is much more realistic than the theoretical recyclability as proposed by some interested parties.

In order to avoid misunderstanding it should be stated clearly in the methodology that no method is included to assess the environmental effects of options to improve the component and/or product recycling.

Answer 8

Thank you for clarifying your position in the first part of your comment. As regards the second part ("In order to avoid...), this is not quite true:

- There is a modest credit (20% max) for pre-disassembly within a (product-specifically determined) time for PWBs/displays/batteries before the rest of the product goes into shredder-based recycling;
- For metal and glass, we are also considering a similar modest credit (ca. max 10% on impact of these fractions) to reward manufacturers to improve pre-disassembly time of large/valuable parts, e.g. glass shelves and plastic interior parts of fridges, stainless steel drums of washing machines, etc.;
- For plastic parts, contractors should indicate realistic percentages for recycling (maximised by recycmax), re-use, heat recovery and this percentages may change with the design options.

We will try to clarify better in the final version of Part 1.

UBA Comment 9 [MR1 6.3, page 93]

The report includes a new "indicator" REACH list of SVHC. Inclusion of toxicity effects is welcomed. However, the SVHC candidate list mechanism is obviously misunderstood and the reference in the current draft is partly outdated (there are much more candidate substances on the list) and a careful differentiation is needed between the direct obligations for market actors if a substance is included in the candidate list and further legal requirements if the candidate is chosen for restriction or authorisation regime under REACH. Moreover, it remains unclear from the current draft if the reference to the list made in the report means that the mentioned substances will be used as indicators in the Ecoreport, and if so, in which way (as single indicator each? As aggregated indicator – how?)

From a practical point of view it also needs to be considered that in many cases the use of SVHCs might not be technology dependent, i.e. it might be difficult to decide if a base case should be assessed with SVHC or not, as some products might contain SVHC (e.g. certain plasticizers) and others not as they use plasticizers not being a SVHC.
Answer 9

The 6 substances mentioned in MEErP are not part of the Candidate list any more. They have already moved on to the Annex IV list, i.e. a sunset date – after which they can no longer be placed on the market unless there is a special permission for a specific application — has been set. The reason why these substances, already regulated under REACH, are proposed as an indicator is that a) Ecodesign measures can accelerate and help prepare for REACH, i.e. by expanding the information requirement to direct clients (REACH) to the consumer buying products containing SVHC, and b) there will be exceptions (special permissions), where perhaps Ecodesign – with a focus on specific end-uses – can be a more precise instrument for banning the SVHC.

As mentioned, the assessment of SVHC in products under MEErP should be done ‘manually’: It is a simple account of SVHC-mass, where there is little to automate in a tool. On the contrary, we would foresee that – as the list of SVHC will be more and more populated by substances in the Candidate list — the inclusion in the EcoReport tool would be counterproductive (EcoReport tool should be updated monthly). As the legislator does not provide a characterization factor, we would propose a simple mass count (single indicator).

From a practical point of view there are several potential problems with REACH. The partitioning problem is one of them. Here it would be correct to apply the (estimated) sales-weighted average between SVHC-containing and non-SVHC containing products. Another problem, which should be solved by REACH (with Ecodesign to follow), is the application of the lower limit for the reporting under REACH. According to REACH, SVHC should be reported if the concentration exceeds 0.01 mass % per product, but it is as yet not clear what a ‘product’ is (a consumer product, a component, a homogenous mono-material part).

Another practical problem is that large parts of the manufacturing industry are not aware of REACH, which means that the reporting from this sector on SVHC will probably be suboptimal and requires contractors to make an extra effort. This problem is aggravated by the fact that most SVHC already are used in small concentrations because they are additives or auxiliary substances (PVC plasticizers, flame retardants, fragrances, chroming agents, foaming agents, etc.).

UBA Comment 10 [MR1 6.3, page 92]

Emissions to air during the use phase (e.g. exhaust gas as well as relevant indoor air emissions) are not yet appropriately reflected with the indicators. E.g. no indicator would lead to a proposal to limit NOx-emission, as it is planned at present for the implementing measure of boilers. While it is relevant to consider NMVOC and particulate matter for the entire life cycle, an assessment with regard only to the use phase with special focus on indoor air emissions needs other methods for evaluation. E.g. the consultants of ENER lot 4 imaging equipment considered different indoor air emissions in the study, while the methodology does not ask for it and other consultants would have not considered these aspects. Such possible emissions should be considered separately for the use phase at least under Miscellaneous.

Answer 10

NOx-emissions are incorporated in AP (emissions with adification potential) and expressed in SO2 mass eq. (1 g NOx = 0.7 g SO2 eq.). MEErP methodology would thus signal the relative significance of this group. This provides the argument for concrete measures. The design of these measures at a disaggregated level is the next step.

In principle, all emissions of NMVOC, PM, etc. in the use phase should be reported, also if they happen indoors. We would agree from a scientific point of view, that these emissions are potentially more harmful indoors than outdoors, but at the moment the EU has not developed a policy or specific characterization factors that would allow such a differentiated approach.
UBA Comment 11 [MR1 6.4, page 95]

Entering new materials into the calculation is possible with the new sheet for extra materials. It is good that this option is provided now, however, procedures are needed to ensure that such data input of prep study consultants is performed in a transparent and correct manner, and the data is cross-checked (e.g. through publication of complete data sets to prep study stakeholders) and used in a consistent way. Respective guidance should be given in the MEerP report.

Answer 11

We were under the impression that the principles of the accounting methodology were sufficiently explained in the report. If this is not the case in your opinion, we would need to know specifically what is missing.

In principle, as regards the procedures we would agree with you. However, we would allow –if stakeholders and Commission services agree– situations were not all data is revealed e.g. for reasons of confidentiality or copyright.

UBA Comment 12 [MR1 7.1.2, page 109]

The report proposes to include societal life cycle costs in the LCC discussion, but still in a quite vague manner. In general we very welcome to include these “damage costs”, which might give more weight to the environmental impacts during the cost discussions. From the respective scientific debate it is well known that not all impacts can be monetised easily at a same level of accuracy. More guidance should be given in the report how to handle the social LCC calculation. Furthermore it would be interesting to know, if the cost factors are already applied in other regulation and which variation of cost factors can be found in literature.

Answer 12

The purpose of adding the societal life cycle costs is indeed intended to give more weight to the environmental impacts during the costs discussion and could, in the political on measures, induce policy makers to move in a direction that deviates from the Least Life Cycle Costs for the consumer. But there is no EU legislation that would warrant automatic rules in this respect and thus intervention of the policy makers in interpreting the results will be required.

As regards the application in other regulation, the figures originate from the CAFÉ theme (Clearer Air For Europe) and we believe they have played a role in emission regulation of transportation.

UBA Comment 13 [MR1 7.1.3, page 110]

Energy performance standards under the Ecodesign Directive needs to be aligned more clearly with the best available technical solutions by which additional considerable saving potential could be tapped compared to the present level of the energy efficiency requirements. Article 15 (5) (c) of the Ecodesign Directive would allow higher efficiency gains than met by the least life cycle cost as long as the life cycle cost of the base case are not exceeded. Therefore the methodology should beside identifying LLCC and BAT also identify the efficiency case where the saving potential is higher than LLCC but the life cycle costs are the same as for the base case.

As this is in the first line a political request, Germany will address this issue also in the evaluation study of the Ecodesign directive and to the commission directly.
**Answer 13**

From an analytical point of view there is no problem in identifying such a point on the LCC curve, unless these options do not exist. In fact, this point is already described in the diagram in the MEErP report.

If such a point (suboptimal for the direct user) is taken into account, it will above all be relevant for the political decision making that follows after the preparatory study.

**UBA Comment 14 [MR1 8, page 114ff]**

For the performance of task 7 of the methodology the consultants propose to include all the relevant information gathered during the assessment and to be used during further discussions regarding the political choice among the different regulatory options (including impact assessment) in a standardised set of EXCEL sheets.

We welcome this proposal very much because the availability of those core resulting data would enhance transparency and facilitate commenting by stakeholders and Member States. This is even more relevant since in the past not all information from the prep studies was consistent among the different chapters/tasks.

We would like to see that the creation and use of those standardised EXCEL sheets is required for all prep study consultants in the future and the same is true regarding publication of the EXCEL files to the involved stakeholders.

**Answer 14**

Thank you for clarifying your position on this point. It is indeed foreseen that contractors should follow the procedures for creating the Excel sheets in Task 7 and— as with all their actions— be transparent.

**UBA Comment 15 [MR2 5.4 e.g. page 111f.]**

Differentiation of materials is still insufficient. For example the EcoReport Tool does not cover PCB/PWB materials as thermoplastics or polyurethane and the differentiation e.g. among different types of circuit boards is still too limited to cover different design options appropriately.

**Answer 15**

Noted. We interpret this as a request for a new study. To get an idea of what this study would entail, please see the EcolInvent report No. 18 on electronics. This report is not in the public domain but can be downloaded for free, after registering as a ‘guest’, from the EcoInvent website (www.ecoinvent.org).

**UBA Comment 16 [MR2 6.2, page 121]**

Tab. 21: The ambient heat source temperatures for heat pumps have been agreed as 10 °C for water, 0 °C for brine (see last lot 1 proposal).

**Answer 16**

The citation is from Lot 2 prep. study 2007, but we agree to update and/or also mention data from the latest 2011 working document drafts. (explained with a footnote)

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*MEErP study team, 3.10.2011*
ANEC/ BEUC Comments on the Study on the Methodology for Ecodesign of Energy-Related Products (MEErP)
With replies (RE:) by MEErP study team

Summary
This paper builds on comments we previously submitted to the team of consultants in March 2011 and comments on further draft reports issued in summer 2011. For more information, please visit the EuP Consumer Website: www.eupconsumer.eu

In this paper, ANEC and BEUC express their concerns about the way the evaluation of the MEEuP 2005 and the writing of the new methodology were handled by the European Commission. In particular, we regret that the Commission overlooked what constitutes a conflict of interest and that the consultants were granted very little time to accomplish their mission properly. We furthermore deplore that the boundaries of the study appear to overlap with other concomitant studies launched by the European Commission on the Ecodesign Directive.

We also regret the absence of innovative recommendations as to how to comprehend satisfactorily consumer behavior in the preparatory studies, for the (numerous) cases where relevant literature does not exist. We seek the consultants’ views on some of our own recommendations.

We review the proposed new structure of Ecodesign preparatory studies as well as guidelines drafted by the consultants on how preparatory studies should address the most frequent issues. Although we find some of the guidelines satisfactory (e.g. on multiple functionality of products), we regret the wording of other guidelines (e.g. non-quantifiable functionalities, rebound effect) and the lack of recommendation on key aspects (e.g. product durability).

Finally, the paper provides comments on the second part of the study dedicated to the link between Ecodesign and other environmental impacts and policies than energy in the use-phase. We call on the consultants to provide their views and recommendations on how to address such consumer-relevant issues as the use of nanomaterials or the accessibility of products in Ecodesign.

Background
The original “Methodology for the Ecodesign of Energy-using Products” (MEEuP)\textsuperscript{18} was developed in 2005 to “allow evaluating whether and to which extent various energy-using products fulfill certain criteria that make them eligible for implementing measures under the Ecodesign Directive 2005/32/EC”\textsuperscript{19}. In 2009, the Ecodesign Directive was amended to accommodate energy-related products, i.e. products which do not use energy directly but which have an impact on energy consumption (e.g. windows). With the extension of the Directive’s scope, it has become necessary to update the methodological guidance underpinning the preparatory studies for each product group. Consultants VHK, already in charge of writing the MEEuP 2005, were tasked by the European Commission with writing a study which should lead to the Methodology for the Ecodesign of Energy-Related Products (MEErP).

1. Consumer concerns regarding the framework of the study
ANEC and BEUC regret the conditions in which the present VHK study on the Ecodesign methodology was commissioned. We have three main concerns:


\textsuperscript{19} http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/methodology/index_en.htm
(comment 1) First, we believe that asking the same company (VHK) to evaluate the merits of an instrument that they have themselves produced does clearly constitute a case of conflict of interest. The European Commission displayed questionable judgment in the matter, irrelevant of the intrinsic competence of the VHK company.

**RE:** The comment is not directed explicitly at the study team, nonetheless we would like to make the following remarks: Having a contractor perform an update of earlier work is not construed as a conflict of interest under any EU terms of contract or exclusion criteria for the EU tender. The MEErP project is not an evaluation study; the request for stakeholder input is not the result of the project but a means to improve the methodology on points where stakeholders found it not or less useful. We believe the study to be executed with utmost transparency and without bias. If ANEC/BEUC can substantiate its statement by pointing out incidents of perceived conflict of interest, this would be useful because they do not show from any of the comments made below.

(comment 2) Secondly, we strongly regret the very short duration (6 months) given by the European Commission to the consultants to carry out the evaluation of the methodology and suggest an improved version. Moreover, the timing (draft reports available in July) did not put stakeholders in the best conditions to provide adequate input and feedback. Certainly, the limited duration and the questionable timing is not an indication of a strong commitment of the European Commission’s Directorate General for Enterprise (DG ENTR) to the Ecodesign process.

**RE:** Noted, but not directed at the MEErP study team. The comment will be published in the feedback-log

(comment 3) Finally, we regret the lack of a coordinated approach to the different studies currently targeting Ecodesign. Stakeholders were asked to spend time and resources contributing notably to the study on the methodology, launched by DG ENTR, and on the evaluation of the Ecodesign Directive\(^{20}\), commissioned by the same DG ENTR. The latter evaluation also looks at the methodology for Ecodesign and specifically polled stakeholders on that subject. We call on the European Commission to take into account the findings of the evaluation of the Directive before adopting a new methodology.

**RE:** Noted, but nor directed at the MEErP study team. The comment will be published in the feedback-log

(comment 4) The study acknowledges that the MEEuP 2005 methodology, compared to its US equivalent, focuses more on existing standards and legislation and less on the economics for the consumer\(^{21}\). ANEC and BEUC very much second this analysis. In fact, the analysis of consumer behaviour and economics in relation to a given product\(^{22}\) usually makes for one of the weakest sections of the Ecodesign Preparatory Studies.

Although the consultants agree that the consumer angle in the EU Preparatory Studies is not as strong as in equivalent schemes in other major economies, we regret that they do not more thoroughly investigate the need and potential to improve this chapter, in particular with regard to consumer behaviour\(^{23}\). See section 4

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\(^{20}\) Evaluation carried out by CSES; [http://www.cses.co.uk/ecodesign_evaluation/home/](http://www.cses.co.uk/ecodesign_evaluation/home/)

\(^{21}\) Project report page 14, under “Comparison to the MEEuP EU Ecodesign Methodology”

\(^{22}\) A section referred to as the “Task 3 report” found in each preparatory study on a given product group.

\(^{23}\) The Draft Report Part 1 section on Task 3 (pages 55 to 67) looks at the interaction between products and systems as well as ways to tackle “indirect Energy-related products” such as windows. It does not, however, include new recommendations on how to address the consumer behaviour angle. The Draf Report Part 2, page 165, merely hints at the issue and only provides information on residential dwellings’ heating needs.
(“Proposed new structure of preparatory studies”) below for our specific comments and suggestions on Task 3 (”Users”) in the MEErP.

RE: We will clarify this better in the report. The wording ‘economics for the consumer’ is used to differentiate with ‘economics for society’. The US DoE appliance studies do not spend more effort on consumer behaviour, nor do they use an LCC method for consumers that is different from ours. They do, however, spend more effort in trying to predict price changes through complex economic modelling. It would be helpful if ANEC/BEUC could indicate, as they support this approach, which parts of the US economical model they find most helpful.

(comment 5) Page 15 of the Draft Report Part 1 reads as follows:

“The Table 1 shows that the number of 200,000 units should indeed be seen as indicative. For consumer products (B2C) it represents roughly replacement sales a product with a product life of 10 years and a market penetration of 1% in a mature market. For consumer products, a minimum of 1 million products, equivalent to 5 % market penetration in the 200 million EU27-households is more appropriate.”

It is not clear whether the consultants are merely describing past practices in the selection of products or whether they prescriptively argue that a minimum of 1 million products sold per year would be a more appropriate threshold than the current indicative threshold of 200,000 units sold per year24. If this comment is to be read as prescriptive, it is problematic that the consultants do not further explain why a 1-million-units threshold would be preferable to the 200,000 threshold or to having no threshold at all.

ANEC and BEUC are of the opinion that if consumer-relevant products sold in fewer quantities than 1 million units pose significant environmental issues or present great improvement potential (which translates in significant potential savings for consumers), they should certainly be looked into as well, once products with more significant savings potential have been targeted.

When it comes to the “number of products” criterion, we believe that the threshold should remain indicative and low by default (possibly down to 50,000 units sold per year). More than a given threshold, it is the dynamics of the market which should be considered by consultants in the preparatory studies. The case of robot vacuum cleaners is a good example of a “niche” market bound by all accounts to have surpassed the 200,000 units mark long before a revision of an implementing measure on vacuum cleaners is in order. Tests and articles found in the publications of the European consumer organisations can greatly help assessing these trends.

RE: There is no disagreement there. The numbers are descriptive, i.e. intended to give policy makers more guidance but without an obligation.

(comment 6) The updated Task 3 (labelled “Users” in the proposed new methodology) builds on the previous MEEuP methodology. The “End-of-life behaviour” and “Local infra-structure” chapters of Task 3 in the MEEuP remain almost identical in the suggested MEErP, while the “real-life efficiency” chapter is significantly expended. In particular, ANEC and BEUC welcome the recommendation to extend the scope of the analysis to:

“controllability of products (flexibility and efficiency to react to different load situations), to the quality of possible controls (sensors, actuators, central processing unit) and/or to the quality of auxiliary devices that may or may not be part of the ErP as placed on the market”.

RE: Noted.

(comment 7) However, we regret that no alternative is put forward for cases of product groups where it is not possible to “identify, retrieve and analyse data”. Yet, experience has shown that lack of data on consumer behaviour has been a major obstacle to the completion of quality Task 3 reports.

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24 As detailed in the Ecodesign Directive, article 15(2)a.
We therefore believe that the following ANEC/BEUC suggestions for improvement should be investigated by the authors of the study:

- Where independent, detailed information and research on consumer behaviour with a given product is lacking (as is often the case for products tackled under the Ecodesign directive), consultants or in-house experts working on Preparatory Studies should have the means and the obligation to carry out their own research;

- This research could consist in e.g. consumers’ focus groups, follow-up of households by teams of specialists and/or surveys. The involvement of consumer organisations in the definition of the “terms of reference” of such research should in turn be sought by the consultants.”

**RE:** In the current proposal there are no restriction as regards budgetary means. This implies that all research should be performed at any cost, unless the Commission in its ToR decides differently. We do point out that this could mean that the budget for a preparatory study could amount to > 1 million EUR or –at current budgets—that no (competent) contractors will be found.

**(comment 8) ANEC and BEUC welcome the recommendation – already present in the MEEUP 2005 – that consultants working on Ecodesign preparatory studies should identify “trends in product design/features, illustrated by recent consumer association tests”**25. However, the study refers to consumer association tests as “anecdotic, not necessarily valid for the whole of the EU”. Although it is correct that consumer organisations’ tests do not claim to be fully representative of the diversity of products put on the market, our members routinely test in priority the most-sold products on the market. The test results published in each national consumer magazine after an ICRT26 test project correspond to the market trends observed in each specific country27. We therefore believe it inadequate to qualify these consumer tests as “anecdotic”.

**RE:** “Anecdotal” means, as you confirm, “not fully representative of the diversity of products put on the market”. We will use the latter wording.

The study looks back on past Ecodesign preparatory studies carried out under the MEEuP 2005, and offers guidelines on how to address several of the most frequent issues met in the course of the studies. The study does not, however, elaborate on other, crucial issues such as product durability. In the following paragraphs, ANEC and BEUC comment on the guidelines (or lack thereof) found in the study.

**Product durability**

**(comment 9) Reduced durability of products (and its corollary planned obsolescence) is a reality in product design nowadays**28. Yet, the word “durability” is not used in the 320 pages of the study. The study does not provide guidance for future preparatory studies on how/whether to make recommendations (in Task 8 “Policy recommendations”) on extending the lifetime of products through an Ecodesign implementing measure. The study does not advice preparatory studies on how to investigate the potential of some policy measures (e.g. extending the legal guarantee, banning the use of certain materials for key components, banning the use of “machine-killers”29).

In the past, we have asked for setting Ecodesign requirements which would contribute to prolonging the product’s lifetime. This will be even more important when the products will be brought to their technical

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26 International Consumer Research and Testing, the testing platform common to several of ANEC and BEUC member organisations.
27 Tests carried out by ICRT will typically look at more products than eventually make it in a given national consumer organisation’s publication. This is because each consumer organization involved in an ICRT test project publishes the ICRT test results for these appliances most present on its own national market.
29 i.e. these components, found in e.g. certain printers, which are designed to terminate the product after a certain number of uses
optimum regarding resource use. Such requests have always been rejected by the European Commission with the argument that they would not have the basis to develop such criteria. For this reason we call on you to include into the methodology a requirement which will look into the technical improvement options for product lifetime. This is already done in the EU Ecolabel scheme; this good approach could also be incorporated into Ecodesign. For instance the Ecolabel criteria for laptop computers foresee a minimum number of USB-ports to connect external devices to the laptop. This requirement ensures for instance that a laptop will be better equipped to keep up with technological changes and new innovations and may therefore being used longer. Another example could be to require manufacturers to offer spare parts even several years after a model disappeared from the market.

**RE:** Product life extension has been discussed. It has not been proposed as an indicator, because especially with products that are consuming resources and emitting pollutants during the product life (as most ErP) a long product-life can have a (significant) negative impact on realizing savings. This has been demonstrated by some examples.

However, and we will stress this more clearly in the report, the fact that a long product-life is not unconditionally a Good Thing doesn’t mean that it should not be investigated nor that product life requirements cannot be incorporated in measures. In ecodesign studies and working documents on light sources (e.g. performance criteria for CFLs and LEDs) and on vacuum cleaners the product life plays an important role.

**Multiple functionality of products**

(comment 10) ANEC and BEUC welcome the recommendation that “in case of multiple functionality, the Ecodesign measures should address and set minimum requirements for each functional parameter individually (not e.g. design a weighted average parameter)”\(^{30}\). This is a very sensible approach which guarantees transparency for consumers.

**RE:** Noted. Thank you for clarifying your position.

**Different capacities within a same product group**

(comment 11) ANEC and BEUC second the consultants’ statement that using the capacity or the size of an appliance as the functional unit in an Ecodesign measure can lead to a situation where large, more energy-consuming products receive a better rating [on the Energy Label] than smaller appliances consuming less energy in total. This is best exemplified by the Ecodesign measure for domestic fridges, where the functional unit is expressed in kWh electricity per unit of cabinet volume. However, the consultants’ suggestion to create “appropriate sub-categories of products” to avoid that situation is not satisfactory. Should two categories of products be consumer-relevant (and not based on a domestic/commercial divide, for instance), the risk remains that products accomplishing a same function are not labelled on the same basis, thereby confusing consumers. This risk should be stated more clearly in the study.

**RE:** Noted. We will mention the risk factor in the report

**Non-quantifiable functionality**

(comment 12) In cases where the functional unit is not easily quantifiable, the consultants argue that policymakers should set only limited hard requirements (“if any”) and provide consumers with ample information (e.g. through labelling) on the features offered by the wide range of different models within a same product

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\(^{30}\) Draft Report Part 1, page 36
group\textsuperscript{31}. To illustrate their concerns over “non-quantifiable” functionality, the consultants give the example of the efficiency of domestic luminaires, which - they admit themselves - “\textit{for sure is quantifiable (e.g. in lm/W)}”. Still, the consultants argue, efficiency of domestic luminaires is a domain “\textit{where the legislator cannot propose a minimum without objections from citizens}”.

We agree that the consultants’ reasoning may make sense for certain products. However, it is awkwardly - and at times contradictorily - expressed in the Draft Report. We argue that too often, hypothetical “citizens’ concerns” are raised by interested parties to prevent the adoption of strong requirements\textsuperscript{32}. We believe there is a confusion on the part of the consultants as to what triggered negative reaction in a certain press and among (part of) the public opinion regarding the phase-out of incandescent light bulbs. We argue that consumers may have been put off by the phase-out of incandescent light bulbs not so much because it directly “[\textit{limited} their consumer choice]”, but because of the sub-par quality of the alternative options: too many CFLs did not meet their claimed levels of performance in efficiency but also other critical parameters in the eyes of consumers (lifetime, number of switching cycles, etc). Adequate, consumer-friendly requirements on CFLs could have instilled greater consumer confidence in the replacements for incandescent light bulbs.

ANEC and BEUC therefore suggest that the paragraph be rewritten so as not to lead preparatory studies’ experts to believe that they should refrain from recommending setting hard requirements whenever a functionality borders the “unquantifiable”.

\textbf{RE:} We will stress that this applies to products where the cultural and historical values are dominant, in order to avoid the loophole that any product with an aesthetic component should be exempted.

Design option incremental costs

\textbf{(comment 13)} The consultants argue that “\textit{the price increase due to product design improvements is a very important dimension, because it sets Least Life-Cycle Cost target levels and largely determines the revenues for business stakeholders and affordability for consumers}”\textsuperscript{33}

We do not agree with the presupposition that an improvement in the energy efficiency of a product necessarily leads to an increase in price. The price of a product may perfectly decrease, especially once the market has embraced a new technology/approach to the product’s efficiency.

With that in mind, we welcome the cautious approach to the mechanisms of price-setting considered by the consultants: prices depend not only on what the new (environment-related) features would actually cost, but also on what the market is willing to pay.

\textbf{RE:} We will change “increase” in the quote into “change”.

\textbf{(comment 14)} The consultants further recommend that industry and trade experts be interviewed (e.g. through a questionnaire) to acquire their estimate of the price data. In this context, we recommend that information also be sought from consumer organisations that regularly purchase hundreds of products to carry out their tests and also regularly carry out price comparison exercises.

\textbf{RE:} Of course consumer organisations are a good source. We will mention that explicitly.

Moreover, when establishing the long-term price evolution stemming from a design option, we recommend that the consultants or in-house experts working on a preparatory study present separately two calculations: one following the strict “bottom-up” approach described in the study\textsuperscript{34} and consisting in breaking the price evolution into all relevant drivers, the other following the same approach but not including VAT nor retail

\textsuperscript{31} Draft Report Part 1, page 38
\textsuperscript{32} Industry has recently argued against setting requirements on coffee machines which could change the taste of coffee, for instance.
\textsuperscript{33} Draft Report Part 1, page 124
\textsuperscript{34} Draft Report Part 1, page 124
implemented—it is

We readily find, societal (interesting hindsight report evolution margins.

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Other environmental impacts

6. Other environmental impacts

Part 2 of the study focuses on a range of environmental impacts associated with products falling under the scope of the Ecodesign Directive. Part 2 “provides key numbers, trends, main sources of the impacts and how the [given environmental] parameter was included in Ecodesign studies so far”. ANEC and BEUC welcome the effort by the consultants to map the environmental impacts of products. However, several sections lack interesting data.

(comment 16) The noise issue is addressed37 almost exclusively from the perspective of traffic (figure 64) in urban zones (figure 65). Although the immediate relevance of this angle for domestic products is difficult to find, we believe we should read more about the impact of interior noise, e.g. in terms of data available and societal impact (e.g. impact on neighbours). We should also read the consultants’ perspective on the feasibility of covering the noise issue in Ecodesign with the sound pressure parameter (and not the less realistic sound power parameter used so far in Ecodesign measures).

RE: We are not aware of (uncontested) impacts of interior noise and would welcome the input from ANEC/BEUC on the issue. Noise standards refer either to buildings, with widely different values between Northern Europe and the rest of Europe, or products in those buildings, again with widely differing values and measurement methods per product of what would be acceptable. The noise related measures in Ecodesign

35 Finally defined in the Draft Report Part 1, page 121 as “the extra sales of an energy-related product and/or the extra use of that product because the consumers are no longer inhibited by feelings of „guilt” and/or by the running costs.”
36 http://rebound.eu-smr.eu/
37 Draft Report Part 2, page 99
have thus far been taken from the latter product-related values in a process of negotiation with stakeholders from different Member States and others like consumer associations, environmental NGOs, etc.. As regards the “consultant’s perspective” it should be noted that it is not our task to develop new EU policies, which would be the case for indoor noise.

(comment 17) In the section “Other health-related impacts”38, the consultants describe the basic features of the RoHS39 and REACH40 legislation. Although Part 1 of the study is supposed to look into details into how to tackle health-related impacts in the preparatory studies, it offers very little detail as to what these impacts might be and how to address them adequately in EU legislation. Among other topics, we should read the consultants’ perspective on the relevance for Ecodesign:

- Of the **effects of light** on the human body (indoor and outdoor “light pollution” caused by products emitting unnecessary light, for instance), very much like is done for noise pollution page 99;

- Of the ongoing debate at the SCENIHR41 level of the **health impacts of artificial light**.

- Of the use of **nanomaterials** in consumer products. We believe that it will be important to focus in the preparatory study on the use of nanomaterials. While nanomaterials are not dangerous simply because of their size, it is commonly understood that nanomaterials do have new properties related to their small size and that only little is understood yet with regard to potential negative health impacts and impacts on the environment. The Joint Research Centre of the EU is currently looking into the use of nanomaterials on the market. The study which will be published in October 2011 is part of the Commission exercise to reply to the European Parliament resolution on the safety of nanomaterials.

RE: We will make reference to the above examples in the report. Again, it would not be our perspective but the official EU perspective, e.g. like the latest SCENIHR report. Specifically as regards nanomaterials, an issue that is not in Annex I of the Ecodesign directive and where there is no official EU policy, we would have to be very cautious and present it as a future possibility but not more than that.

(comment 18) The consultants should give their perspective on how to approach the question of **accessibility of products** in the Ecodesign preparatory studies (notably in relation with the wide but inconsistent range of standards governing the accessibility of products). For instance, the question of how easy-to-use vacuum cleaners are was indirectly tackled by the European Commission in its proposal to consider “head-movement resistance” in the calculation of the annual energy consumption of vacuum cleaners. In future product groups (e.g. tapware, heating controls), there might be a **trade-off between efficiency and accessibility**. The consultants’ views on how to approach and possibly avoid this trade-off situation should be included in the MEERP.

RE: We assume that accessibility for disabled people is intended. It is a valid concern that an Ecodesign measure should not have a negative impact on the functionality not only for disabled people, but also elderly, children and (potential) users in general. This has been mentioned in the Part 1 report.

On the matter of guidance in the MEERP report, we seek more input from ANEC/BEUC because ‘ergonomics’ (‘Human Factors in Design and Engineering’) is a vast field of engineering science.

END

ANEC, the European Association for the Co-ordination of Consumer Representation in Standardisation 32 Av. de Tervueren, 1040 Brussels - +32 2 743 24 70 - www.anec.eu BEUC, the European Consumers’ Organisation Rue d’Arlon 80, 1000 Bruxelles - +32 2 743 15 90 - www.beuc.eu

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38 Draft Report Part 2, page 99
39 Restriction of Hazardous Substances (Directive 2002/95/EC)
40 Registration, Evaluation, Authorisation and Restriction of Chemicals (Regulation (EC) No 1907/2006)
41 Scientific Committee on Emerging and Newly Identified Health Risks, notably active on the health effects of artificial light.
COMMENTS CLASP, received 28.9.2011
+ANSWERS BY MEERP STUDY TEAM

To: René Kemna, VHK
From: Anita Eide
Cc: Kerstin Lichtenvort, DG Energy/European Commission
Cesar Santos, DG Enterprise and Industry/European Commission
Davide Minotti, DG Environment/European Commission
Marie Baton and Mike Scholand, CLASP

Comments on study for the Update of the Methodology for the Ecodesign of Energy-using Products (MEEuP)

RE: =Reply by the MEER study team

Thank you for the opportunity to submit final comments on the study for the Update of the Methodology for the Ecodesign of Energy-using Products (MEEuP). For your convenience we have tried to keep the points as brief as possible, but of course if you would like more information or further detail and data relating to any of our comments, then please let us know. Below follows a few CLASP suggestions for your consideration:
1. Funding allocated for each Ecodesign Preparatory Study should be increased, because:
   a. As the Commission revisits products and pushes for more ambitious regulatory levels, we would expect the degree of rigour and accuracy in the Preparatory Studies to increase necessitating increased levels of funding;
   b. Ecodesign is one of the most cost-effective policy instruments aimed at achieving energy savings and contributing to the EU targets of saving energy by 20% by 2020 and cutting greenhouse emissions by at least 20% by 2020 (as compared to 1990 levels);
   c. Compared to the United States, the European Commission spends approximately one-tenth of what the US Department of Energy spends per product study;
   d. More funding per product study would allow the Preparatory Study teams to address and carry out any additional analysis in response to key issues raised during the course of the stakeholder consultation process and also allow for appropriate editing of the final report providing for a quality final deliverable. Currently it seems that Preparatory Study budgets seldom allow contractors to address issues that are brought to their attention by stakeholders, resulting in too much reliance being placed on industry contributions and not enough resources being spent on incorporating input and suggestions from other stakeholders into the analysis; and
   e. Ecodesign regulations are cost-effective policy measures – the US DOE compared the cost of their programme to the estimated National Net Present Value for the US, and found the return to be about 578 for each dollar spent.1 *

RE: Thank you for clarifying your position. This comment is not directed at the study team. It will be published in the feedback-log.

2. Improve presentation of candidate regulatory levels in the final analysis to improve transparency:
   a. Candidate regulatory level table(s) that clearly presents the regulatory levels being considered, including multiple levels between LLCC and BAT;

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b. Summary table that brings together all policy-maker decision making criteria pertinent to each regulatory level such as LLCC, CO2 saving, first cost increase, sensitivity analyses, etc. (See example from the US DOE regulation for Distribution Transformers pasted below).

c. Establish a methodology for selecting the appropriate level as follows: start with the highest candidate regulatory level and discuss whether the analytical findings meet (or does not meet) the criteria for adoption; if it is rejected, proceed to the next highest level and discuss the analytical findings, and so on until a level is found that meets the Commission’s criteria.

d. Establish a common set of metrics and criteria for comparing the energy savings potential across different products. Using a common set of input data for energy prices and the projected price forecasts and a common set of criteria for the definition of one (or several) BAU scenario(s). Currently, to define the BAU, some studies take into account the current market trend of energy efficiency, whereas others define BAU as a “freeze” in efficiency, and in some studies it is not clearly indicated what is included in the BAU scenario.

### Table VI.22.—Summary of Liquid-Immersed Distribution Transformers Analytical Results

<table>
<thead>
<tr>
<th>Criteria</th>
<th>TSL1</th>
<th>TSL2</th>
<th>TSLD</th>
<th>TSCL</th>
<th>TSLB</th>
<th>TSL3</th>
<th>TSL4</th>
<th>TSLA</th>
<th>TSL5</th>
<th>TSL6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy saved (quads)</td>
<td>1.35</td>
<td>1.94</td>
<td>2.18</td>
<td>2.61</td>
<td>2.75</td>
<td>2.76</td>
<td>3.00</td>
<td>4.07</td>
<td>5.07</td>
<td>7.37</td>
</tr>
<tr>
<td>Generation capacity offset (GW)</td>
<td>1.4</td>
<td>1.9</td>
<td>2.1</td>
<td>2.5</td>
<td>2.7</td>
<td>2.7</td>
<td>2.9</td>
<td>3.9</td>
<td>5.0</td>
<td>7.2</td>
</tr>
<tr>
<td>NPV ($ billions)</td>
<td>1.63</td>
<td>1.95</td>
<td>1.91</td>
<td>1.11</td>
<td>1.11</td>
<td>2.37</td>
<td>2.13</td>
<td>(1.89)</td>
<td>(4.89)</td>
<td>(23.3)</td>
</tr>
<tr>
<td>@ 7% discount</td>
<td>5.67</td>
<td>7.56</td>
<td>7.56</td>
<td>6.66</td>
<td>7.26</td>
<td>9.17</td>
<td>9.33</td>
<td>4.47</td>
<td>1.40</td>
<td>(26.1)</td>
</tr>
<tr>
<td>Emission reductions, CO2 (Mt)</td>
<td>125</td>
<td>176</td>
<td>199</td>
<td>258</td>
<td>251</td>
<td>248</td>
<td>272</td>
<td>369</td>
<td>464</td>
<td>674</td>
</tr>
<tr>
<td>Life-cycle cost</td>
<td>2.3-7.3</td>
<td>2.4-10.4</td>
<td>3.6-10.4</td>
<td>4.3-15.7</td>
<td>5.0-15.7</td>
<td>2.4-11.4</td>
<td>7.8-11.4</td>
<td>10.6-24.7</td>
<td>19.3-23.4</td>
<td>21.6-52.1</td>
</tr>
<tr>
<td>Net increase in LCC (%)</td>
<td>14.9-68.7</td>
<td>20.6-68.1</td>
<td>20.6-59.0</td>
<td>16.5-56.5</td>
<td>16.5-47.1</td>
<td>13.0-66.1</td>
<td>2.1-60.0</td>
<td>0.1-13.0</td>
<td>0.0-10.0</td>
<td>0.0-9.0</td>
</tr>
<tr>
<td>Net savings in LCC (%)</td>
<td>28.9-40.9</td>
<td>31.9-50.7</td>
<td>33.2-50.7</td>
<td>36.5-50.7</td>
<td>36.5-50.7</td>
<td>31.9-60.2</td>
<td>35.2-60.2</td>
<td>20.3-64.9</td>
<td>16.2-32.3</td>
<td>0.5-15.2</td>
</tr>
<tr>
<td>Payback for average transformer (years)</td>
<td>2.3-7.3</td>
<td>2.4-10.4</td>
<td>3.6-10.4</td>
<td>4.3-15.7</td>
<td>5.0-15.7</td>
<td>2.4-11.4</td>
<td>7.8-11.4</td>
<td>10.6-24.7</td>
<td>19.3-23.4</td>
<td>21.6-52.1</td>
</tr>
<tr>
<td>2006 Material Price</td>
<td>1.4-21.1</td>
<td>1.4-20.7</td>
<td>1.4-20.7</td>
<td>2.5-23.2</td>
<td>5.1-25.7</td>
<td>2.0-19.9</td>
<td>12.4-24.3</td>
<td>22.4-79.6</td>
<td>57.7-84.8</td>
<td>84.9-99.5</td>
</tr>
<tr>
<td>No change in LCC (%)</td>
<td>17.2-54.9</td>
<td>12.3-48.8</td>
<td>6.9-32.4</td>
<td>26.1-62.4</td>
<td>25.1-92.8</td>
<td>26.2-74.2</td>
<td>25.0-74.2</td>
<td>11.4-73.9</td>
<td>8.6-41.0</td>
<td>9.9-86.1</td>
</tr>
<tr>
<td>Net savings in LCC (%)</td>
<td>20.0-39.5</td>
<td>20.0-59.0</td>
<td>20.0-59.0</td>
<td>26.1-62.4</td>
<td>25.1-92.8</td>
<td>26.2-74.2</td>
<td>25.0-74.2</td>
<td>11.4-73.9</td>
<td>8.6-41.0</td>
<td>9.9-86.1</td>
</tr>
<tr>
<td>Payback for average transformer, 2006 Material Price (years)</td>
<td>4.7-17.3</td>
<td>8.4-19.5</td>
<td>8.4-19.5</td>
<td>8.7-20.8</td>
<td>10.2-20.8</td>
<td>9.8-17.8</td>
<td>10.7-19.4</td>
<td>10.7-29.1</td>
<td>18.8-26.7</td>
<td>26.7-58.3</td>
</tr>
<tr>
<td>Average increase in consumer equipment cost before installation (%)</td>
<td>3.2-7.1</td>
<td>2.7-20.7</td>
<td>8.1-20.7</td>
<td>10.0-21.1</td>
<td>10.0-22.1</td>
<td>2.7-45.9</td>
<td>8.0-45.9</td>
<td>20.0-40.6</td>
<td>24.7-198.8</td>
<td>132.9-161.3</td>
</tr>
<tr>
<td>Manufacturer impact INPV ($ millions)</td>
<td>(19.1-13)</td>
<td>(22.8-29)</td>
<td>(32.7-37)</td>
<td>(47.7-47)</td>
<td>(61.7-52)</td>
<td>(100.0-11)</td>
<td>(122.0-12)</td>
<td>(169.48)</td>
<td>(250.94)</td>
<td>(676.200)</td>
</tr>
<tr>
<td>INPV change (%)</td>
<td>(5.6-2.1)</td>
<td>(7.7-6.0)</td>
<td>(6.5-4.0)</td>
<td>(7.7-7.1)</td>
<td>(6.9-3.0)</td>
<td>(17.1-5.0)</td>
<td>(15.0-5.0)</td>
<td>(26.7-7.9)</td>
<td>(42.1-10)</td>
<td>(56.2-33)</td>
</tr>
<tr>
<td>LCC selected designs with amorphous (%)</td>
<td>0.1-13</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
<td>0.1-14</td>
</tr>
<tr>
<td>LCC selected designs with core steel better than M2 (i.e., M2, Z&amp;D, ZGD, S4I) (%)</td>
<td>1.54</td>
<td>2.75</td>
<td>2.75</td>
<td>2.84</td>
<td>2.84</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
</tr>
<tr>
<td>Voltage sensitivity change (%) standard with silicon core steel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Single-phase, three-phase consistency (%)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

* Range represents the results for each of the five representative units derived from the individual design lines analyzed in the LCC.
** Percent increase in consumer equipment cost before installation, five-year average material pricing. DOE recognizes that these cost changes are the average changes for the Nation, and that some individual customers will experience larger changes, particularly if these customers are not evaluating the total costs when purchasing transformers.
*** Range represents the results of the ‘preservation-of-operating-profit’ and ‘preservation-of-gross-margin-percentage’ scenarios in the MIA.

RE: We agree to point d) and in fact have already incorporated this approach in the methodology. As regards ‘BAU’ we will state clearly that current market trends should be incorporated.

On the approach you suggest under points a), b) and c) we have to say that this fine-tuning of measures is usually the work done in the Commission’s Impact assessment study that runs in parallel with the Commission Working Documents and political consultations.

Furthermore, as Ecodesign will be dealing not only with energy but also with several environmental indicators it might not be that straightforward to copy the US approach.

Finally, when the Excel files with the scenarios are a part of the deliverables in the prep. study, and the consultants will have followed the guidelines we made, we think all stakeholders and policy makers will have
the tools to develop alternative scenarios by tweaking the parameters, which we think is the purpose of your request.

3. The study for the Update of the MEEuP may suggest that the Preparatory Study teams assess the potential for developing “Learning Curve” product pricing to apply to the product, meaning establishing some historical trend in price and efficiency over time, to try and develop a historical trend in technology and price evolution, and then conduct a sensitivity analysis at the expected learning curve (lower) price point. Present results/impacts along-side the reference case (see comment No. 2 above). There are three discrete factors at play that all impact price after a regulation has taken effect: (1) the price may increase because manufacturers are now incorporating better components, more material, more expensive parts; (2) the price may decrease because companies generally get better at manufacturing, they may redesign to reduce the number of components, they may have a programme focused on substituting parts designed to reduce costs; any OEM supplied parts such as high-efficiency compressors may get less expensive since a larger volume is being ordered (economies of scale); and (3) the price may decrease because energy efficient models tend to command a higher profit margin in the market, which will be eroded when that level becomes the minimum regulated standard that everyone makes. In our view, the MEErP should require that the Preparatory Study teams present their research and discussion on these three factors, and that they should be incorporated into the technology-price forecast in some transparent manner.243

RE: Thank you. We will incorporate this suggestion in the report.

4. CLASP supports the LCA approach described in the current MEEuP including a consideration of all environmental factors. From our point of view, we would consider it unrealistic to have an in-depth analysis for all environmental factors if the resource allocation remains the same. We therefore believe that Ecodesign should continue to focus on energy-related environmental impacts, where those are the most significant, and prioritise measures that mitigate these impacts. Furthermore, we agree with some of the industry comments that Ecodesign might not be the best place to address all things environmental. There should be a mechanism in place for referring issues to other Commission services responsible for relevant Directives (RoHS, WEEE, Reach, and so on.)

RE: The guiding principle, not only in the directive itself (Art. 15 (2)(c)(i), see MEErP report Part 1 p. 14) but also in the Commission’s internal procedures for approval (e.g. see Commission’s Impact Assessment guidelines) is that Ecodesign measures should only be introduced if there is a ‘market- or regulatory failure’. This means that the Ecodesign measures must constitute an added value over already existing legislation. In other words, the mechanism is in place.

5. When considering an appropriate regulatory level, Europe should set a level that is right for Europe, and in our view, Europe would be best served by adopting ambitious regulatory requirements for its products and equipment because (a) export models to economies with lower regulatory standards will benefit from the use of premium-efficiency component parts in compliant European models, making them more competitive in the export markets; and (b) European manufacturers will be in a more competitive position when new regulatory requirements in any export markets (which are sure to come) as they will already own the patents, have commercialised the technology, mastered the manufacturing process for the technologies / components / designs that comply with any new requirements in the export markets. For all of these reasons, we support ambitious regulatory levels because they are forward-thinking and environmentally sound.

RE: Agreed. On page 127 (and others) of the MEerP Part 1 report, discussing industry opportunities, you will find a similar wording.

6. CLASP believes that there is inherent value in having a two-tiered MEPS, and we therefore suggest that the MEerP strongly recommend that the Preparatory Study team always generate scenarios for two-tiered MEPS levels, one level taking effect 2-3 years after final publication of the Preparatory Study (which would ideally correspond to about a year after the adoption of the following Implementing measure) and one taking effect 5-6 years after publication (3 to 4 years after the adoption of the following Implementing measure).

RE: The issue is addressed on page 127 (8.3 Revenues) of the MEerP Part 1 report:
“The length of the ‘design cycle’ is the customary time period for redesign of the product platform in a specific sector. For average products (e.g. whitegoods) this period is 3-4 years, starting from the adoption of the legislation. For more conservative sectors, like installed products, this period may be longer (5 years); for more innovative sectors, like ICT products, this may be shorter (2-3 years). Note that this relates to the final target level, i.e. the second tier in a 2-tier measure. First tier requirements are usually intended to step-up best practice (application engineering), but for new R&D activities involving heavy retooling the second tier (or the ‘A’ class in an energy label) is the relevant requirement.”

In other words, the scenario analysis aims at the final target level, taking into account the design cycle. In our opinion, first tier levels (and second tier levels in a 3-tier measure) do not constitute a point that can be defined in terms of timing and target levels, but follows from mainly subjective (political? educational?) considerations and are often decided upon as a compromise between the demands of various stakeholders. If we were to make this 2-tier approach mandatory, the policy makers would miss out on the opportunity to just have a single tier or—as the case may be—the possibility to define a long-term third tier (e.g. like currently discussed for light sources, i.e. targeting LEDs in the 3rd tier). So we don’t see the use of making a 2-tier approach mandatory and thus restrict the freedom of choice for policy makers.

END
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With reply (RE) from MEErP study team
We have a few remarks to the draft MEErP study:

1. Task 5, base case LCC for consumer and society: We are happy to see that LCC is now expanded to consumer and society. We are disappointed though that only air pollution is included. Water and soil pollution are two other very important groups, which we believe should be included.  
RE: Unfortunately, the European Commission does not supply official numbers on the external monetary damages of water and soil pollution. The assessment of these figures would require –if it is at all possible given the current state-of-the-art -- an in-depth study that is outside the scope of our study.

2. Task 5, LCIA impact indicators: Product life is not included as an indicator: In the presentation of the stakeholdersconsultation September 9th is mentioned that it is usually counter-productive and therefor not to be used as indicator (slide 50). In our opinion this is not true for all products. We believe it should be mentioned that it can be used as an indicator in preparatory studies and if it is not used as an indicator it should be explained. The way it is formulated now, it appears to be that product life is never a good indicator and should not be taken into account.  
RE: We follow your suggestion and will mention more clearly that product life can be a parameter to be taken into account.

3. Task 6, (selection of) design options: The methodology as described is good, but in the past, for example in the preparatory study for vacuum cleaners, it is not clear how the selection of design options is done, why other options are not included, why other combinations of options are not taken into account, etc. We believe this could be avoided by mentioning very clear in the methodology report MEErP that all options and all combinations of options should be discussed, examined and calculated. If certain (combinations of) design options are not examined, we believe it should be explained why.  
RE: In Task 6 it will be up to the individual contractor of the preparatory study, with the Commission services and stakeholders, to cluster combinations of design options in such a way that the analysis is proportional and (still) results in valid results. Generally speaking it is usually not useful to study more than 8-10 options per product category. This does not mean that not all relevant combinations are studied, but this should be done in the technical analysis in Task 4; task 6 is above all the modelling stage which uses the insights from Task 4 as an input.

4. Task 6, ranking of design options by LCC-improvement to determine LLCC: Similar to remark 3, the methodology is good, but the application in preparatory studies is not always transparent and there seems to be very little explanation, which gives the impression that the methodology is not correctly applied.  
RE: As in MEEuP, it is proposed for MEErP to rank options according to payback period, but in the final version of the report we will expand on this issue especially for cases where there are significant differences in product life (e.g. as with lamps).

5. Task 7, summary. This is a very important part and it is good that it is now clearly included. In preparatory studies based on MEEuP, there was often no summary and no final conclusions. In our opinion an overview of all possible design options with an explanation why they are selected or why they are not taken into account are important as well as an overview of all policy measures (selected and not selected). The checklist of ecodesign parameters (2009/125/EC Annex I) can be used as a framework.
RE: Indeed MEErP 2011 is much more explicit in what is expected than MEEuP 2005 and requires more detail. Having said that, the selection of relevant clusters of design options should be done in Task 6, based on the outcomes of Task 4. Please note that ‘all possible design options’ could include several thousands of technical alternatives at component level and this is clearly not proportional, nor –we think—necessary.

Also as regards the policy measures, we think it is prudent to propose a realistic, limited set of options that are within the scope of the study, i.e. Ecodesign and Energy Labelling measures. This already requires the contractor to analyse 4 scenarios quantitatively, with possibly 2 or 3 sub-scenarios (e.g. for timing and target levels) per main scenario. Anything more would require a huge amount of extra analytical work (and budget) at hardly any gain, which would not be in line with the proportionality criterion mentioned in the Ecodesign directive.

Finally, we would like to point out that the methodology is intended for preparatory studies. After these studies there is a political trajectory where Commission, Member States and others will be developing draft measures with—in parallel—an impact assessment study that is published together with the new legislation. Please note that the above strictly represents the view of the MEErP Study team.

Samen maken we morgen mooier
... find in this e-mail some comments of the Netherlands regarding the discussion on recyclebility versus recycled content.
We support the proposed method, i.e. using the recycled content of the materials as used in the production of a product. However NL also thinks recyclebility is an important ecodesign aspect of a product that should be taken into account in the methodology: a better recyclebility results in less waste at the end of life of a product.

REPLY MEErP study team: Thank you for stating the Netherlands position on this issue. It will be incorporated in the project feedback-log
Norwegian comments to the MEErP Methodology Report

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http://www.energimerking.no/  http://www.nve.no/okodesign  
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Norway

Firstly, Norway wishes to make it clear that we are against the use of primary energy factor for electricity in the ecodesign and energy labeling regulations. From our point of view the regulations should apply to the product itself, not taking into account the whole energy supply system. Furthermore we consider it as very important to implement separate energy labels and ecodesign requirements for similar products using different energy carriers. Separate labels and requirements would lead to promotion of both energy efficient electric products and energy efficient products using other energy sources instead of potentially discriminating products using electricity compared to other products. Separate labels and separate requirements will also more easily lead to the realization of the energy efficiency potentials in energy related products.

We therefore suggest that preparatory studies should include implementation of separate energy labels and ecodesign requirements as one of the policy option in the impact analysis. Instructions about this should appear in the Methodology Report.

Even if we strongly dislike the use of primary energy factor in the regulations, we would like to make a comment on the use of it as it is proposed in the draft Methodology Report. In part 2 of this report the E27 average thermal electricity generation efficiencies according to various sources are presented. The fixed primary energy factor of 2.5 (efficiency value of 40 %) used in the preparatory studies so far represent a long term average factor over the product life of most products.

Electricity consumption is expected to increase in the years to come. In EUs report “A roadmap for moving to a competitive low carbon economy in 2050” it is stated on page 6:  
Electricity will play a central role in the low carbon economy. The analysis shows that it can almost totally eliminate CO2 emissions by 2050, and offers the prospect of partially replacing fossil fuels in transport and heating. Although electricity will increasingly be used in these two sectors, electricity consumption overall would only have to continue to increase at historic growth rates, thanks to continuous improvements in efficiency.

The electricity production system is according to this expected to expand. New electricity capacity will be dominated by renewables – among others hydropower and wind power - and efficient fossil fuelled plants. Modern gas turbine combined cycle plants will have an efficiency for electricity production only in the area of 60 %, and in the proposal for the new Directive on Energy Efficiency it is suggested that new thermal electricity generating installations with a total thermal input exceeding 20 MW are provided with equipment allowing for the recovery of waste heat by means of a high-efficiency cogeneration unit and are sited in a location where waste heat can be used by heat demand points. Electricity produced in CHP mode will have an efficiency in the area of 80 %. All together, the new production capacity will be much more efficient and hence have a much lower primary energy factor than the existing system as a whole. We may call this lower primary energy factor the long-run marginal primary energy factor.

When carrying out calculations of primary energy consumption related to changes (increasements) in the electricity production, the average primary energy factor is of limited interest. Instead one should calculate the primary energy use needed for the increased electricity production, and this is done by implementing the long-run marginal primary energy factor.
We realize that the long-run marginal primary energy factor may be difficult to estimate, as it also highly depends on political decisions in the Member States. But in contrast to employ the average primary energy factor, the use of the long-run marginal factor can lead to more realistic valuation of changes in the primary energy use.

*REPLY MEerP study team:* Thank you for your comment, which will be included in the 2nd feedback log of the project (annex to the Project Report). Your concerns have been clearly voiced by VMAS, acting on behalf of Norway, in the stakeholder meeting of 9 September 2011. These comments and the answers have been included in the upcoming minutes of the meeting, which can be downloaded from the [www.meerp.eu](http://www.meerp.eu) website.
On the use of primary energy factors in the Ecodesign and Energy Efficiency Directives

Although fully supporting the objectives of the directives, the confederation of Norwegian Enterprise (NHO) is concerned of the proposed use of primary energy factors (PEF) when implementing the directive. Using these factors in the proposed way discriminates electricity and favours other energy carriers. This is contrary to long term policy targets and inconsistent with other measures. Moreover it could lead to the discrimination and even abolition of a number of efficient electrical products. This is even more serious as several countries do not have a national energy-mix that supports other energy supplies. In Norway, electricity is generated from hydroelectric power with no CO₂-emissions. Introducing European measures that discourage the use of renewable energy would be very unfortunate.

Using PEF in the proposed way has a number of negative consequences as it;

- is inconsistent with the Commission’s Roadmap to a low carbon economy by 2050 where electricity plays a central role,
- fails its objective to improve energy efficiency of products, as it addresses the energy system behind the product of where consumers have no control,
- creates a lock-in of distributed natural gas,
- creates a competitive disadvantage for electricity, including renewable electricity. This could also affect system flexibility such as storage and balancing power,
- exclude several groups of products from CE-labelling and the common market. This would harm even the most energy efficient and regionally irreplaceable products.

The Commission proposes to introduce a fixed PEF of 2.5 attached to electricity, irrespective of it being generated from renewables, nuclear or fossil fuels. It is used as criteria to calculate energy efficiency and assess ecodesign properties for several products. This gives other energy carriers such as distributed gas a competitive advantage.

Moreover, this regulatory approach is not coherent with other EU policy measures, including the ETS, RES and CHP directives. EU ETS efficiently reduces emissions with cap-and-trade. Hence, if electricity is replaced by gas or fossil fuels not regulated by the ETS, emissions may increase. The Commission vision of a low carbon economy by 2050 can only be ensured if the choice of energy is technology neutral and reflects total emissions and energy market prices.

The initial purpose of PEF was to assess energy losses from the extraction, conversion and distribution of primary energy. This energy efficiency perspective by source was introduced with respect to security of supply rather than and, prior to, climate change considerations. Hence, introducing bottom-up measures such as PEF in ecodesign and other energy efficiency regulations, is not coherent with other top-down EU policy measures, including measures in the ETS directive, RES directive and CHP directive. The EU-ETS efficiently reduces emissions with cap-and-trade. Thus, marginal changes in the electricity consumption do not affect emissions.

However, if electricity consumption is replaced by gas or other fossil fuels that is not regulated by the ETS, this will work counterproductive. Furthermore, restricting electricity consumption can have a negative impact of investments in new renewable power generation. The vision of a low carbon economy by 2050 can only be ensured if the choice of energy is technology neutral and reflects total emissions and energy market prices.
By using PEF on electricity as proposed in the development of ecodesign criteria and energy efficiency calculations, electricity as a CO₂-free energy carrier will be substituted by natural gas which is not a CO₂-free energy carrier. Ideally, if EU is to reduce its GHG-emissions with 80 to 95 percent compared to 1990-level, end user energy consumption has to be based on CO₂-free energy carriers. This is in line with the European Commission communication *A roadmap for moving to a low carbon economy in 2050.*

Besides climate policy, our concern relates to the internal market. A number of Norwegian and Nordic made products could be banned from the European market, excluded from CE-labelling or not chosen by consumers, because of seemingly low energy efficiency-scores. Simultaneously, the Nordic infrastructure provides no alternative to electricity for consumers. It is therefore likely that the Norwegian and other Nordic governments would have to file for exemption. This is in turn contrary to the EEA Agreement and to the development of the internal market.

The above-mentioned consequences are certainly not the intentions of the directives. Our recommendation is therefore *not* to use primary energy factors for electricity in ecodesign and energy efficiency regulations. The relevant measurement in ecodesign regulations is end-user energy consumption by purchasable products not the performance of the energy system where the end-user is locked in.

- The Confederation of Norwegian Enterprise (NHO) strongly advises against the use of primary energy factor 2.5 for electricity in Energy Efficiency regulations.
- The use of this primary factor would in our opinion be technically and economically wrong, discriminatory and undermine the objectives of EU’s long term strategies.
- Our recommendation is therefore *not* to use primary energy factors for electricity in the Ecodesign and Energy Efficiency Directives.
- The Confederation of Norwegian Enterprises also strongly urges for the coordination with EU-ETS for hand in hand electricity savings and CO₂ emission reductions.
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Disclaimer: Views expressed are those of the individual and do not necessarily represent official views of the European Commission.

With reply (RE: ) from the MEErP Study Team

JRC/IES first thanks VHK for the work carried out: the MEErP methodology and tool will be very useful within the EcoDesign Directive framework.

JRC/IES is pleased to note that [...]disassembly of products (not only for circuit board, but also batteries, LCD and others) were considered by VHK in the methodology (PPT presentation) and that some aspects were about to be integrated into the tool. JRC/IES is looking forward to see these aspects integrated into the final version of the tool.

However:

- JRC/IES does not agree with one section of the MEErP report, (in particular Section 2.2 of part 2 of Methodology report, p24): JRC/IES argues that there is no double counting in the so-called “substitution methodology”, if properly applied. Moreover, the formulation “recyclability promoted by the metals industry and the ELCD” is inappropriate: the JRC/IES is not “promoting”, that implies interests/lobbying, but “recommending” and is doing this independently from other organizations. It is also incorrect (“JRC-IES” or “ILCD Handbook” should be put instead of “ELCD”). JRC/IES kindly asks the report to be modified accordingly.

RE: We will make the adjustments in the report.

- JRC/IES reiterates its recommendation to use the “substitution methodology” within a product-orientated approach such as the Ecodesign Directive: if environmentally significant and relevant, products containing recycled materials, on one hand, that are also well recyclable at end-of-life, on the other hand, should be promoted through ecodesign requirements. Therefore, JRC/IES argues that simplifying the recyclability of a product only by the ‘recycled content’ is not appropriate. After the discussion held during the meeting, JRC/IES hopes that the MEErP methodology / tool will fully allow (at least in the design options task) to measure environmental credits (in relevant impact categories) associated to higher recyclability of components thanks to ecodesign options (e.g. disassemblability of key components).

RE: As explained again during the stakeholder meeting (see minutes), VHK is of the opinion that the ‘substitution method’ is not appropriate for the purposes pursued by the MEErP. Having said that, within the boundaries of what is physically conceivable, we do plan to introduce a credit mechanism that will reward – along the main lines as proposed by the RRR study by JRC-IES—efforts by industry to improve recyclability.

- JRC/IES also questions on how the proposed stock model should be used by the MEErP methodology for end-of-life issues. With a product-centered approach, the delay between product commercialization and end-of-life does not influence the recyclability of products/materials as they all will eventually come to end-of-life.
**RE:** In Part 2 of the methodology the stock-effect is explained and illustrated with hard data. But there seems to be a misunderstanding that it deals with the delay between product commercialisation and end-of-life. This is inaccurate: It deals with the fact that in a growth market and at equal mass, the total mass of products discarded (i.e. sold X years ago) is—at any time—smaller than the total mass of the products that is being sold. Using the wording of JRC: It is true that all products ‘eventually’ will come to end-of-life, but—in a growth market—there is never a time (unless there is major disaster) that mass of products discarded equals the mass of new products placed on the market.

- JRC/IES in principle welcomes VHK’s proposal of a new CRM (Critical Raw Material) indicator to address the critical materials issue. As formulated earlier in July, JRC/IES still rises some doubts on the reliability and the robustness of the CRM indicator (e.g. why multiplying the three sub-indicators?). JRC/IES reiterates its recommendation to instead consider the well documented and widely published ADP (Abiotic Depletion Potential) LCIA indicator. JRC/IES would also welcome feedbacks from other stakeholders on the new CRM indicator.

**RE:** The calculation of the CRM-indicator, which uses sub-indicators that were also in the CRM policy paper (they were not random-picked by VHK), is of course open for criticism. So far there have been no reactions. Our problems with the ADP indicator have been addressed earlier.

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Feedback on ADDENDUM Recycling

As we did not have time to react on the Addendum recycling presentation ([http://www.meerp.eu/downloads/Addendum%20Recycling%2020110909.ppt](http://www.meerp.eu/downloads/Addendum%20Recycling%2020110909.ppt)), we formulate here a few remarks, organized in two questions:

- Question 1: does JRC/IES agree on how the so-called “recyclability approach” (i.e. the “substitution approach”, as described in the ILCD Handbook, Chapter 14) is described in the slides?
  - Unfortunately, we are not sure to have enough information on the slides to be able to answer this question; please find below further questions for clarification:
  - In most slides: why are installed stocks (linearly) declining over time?

**RE:** They are increasing over time: 2011 is on the left hand side; 1961 on the right hand side

- In slide 6:
  - Is it a “MATERIALS” approach?

**RE:** We are not sure what is intended by ‘materials approach’. Our intent is to represent materials flows related to products.

- What do you mean by: “New material from recyclable material (‘closed loop’), only replace waste”?

**RE:** Our understanding of the substitution method, which went uncorrected during the meeting but please correct if necessary, is that it considers in principle that all metals are fully recyclable and that it is considered that all new materials are accounted as coming from recycled materials. So, in theory, all the new material comes from recycled post-consumer material. However, the method does consider that there is a small fraction of the material lost (not collected) or actual material properties have changed. This small fraction (e.g. 12- 23%) needs to be replaced. As far as we can see from the ELCD, this replacement is not done by 100% virgin material, but again a mix of virgin material and recycled material (the ‘recycled content’).

- What do you mean by “waste”

**RE:** See above. It is the fraction that needs to be replaced to ‘close the loop’

- In slide 7:
  - What do you mean by “waste”?  

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RE: As before

- Are recycling “IMPACTS” graphically represented?

RE: Yes, i.e. approximated by the purple areas. The red areas relate to impacts from virgin material

- What do you mean by: “New material from recyclable material in ‘closed loop’: Only replace waste, partially by virgin and partially by recycled material”.

RE: As before

o JRC/IES indeed agrees that stocks are irrelevant in the “recyclability approach”.

o JRC/IES does not agree on the following:

  ▪ The “recyclability approach” does not only consider ‘Closed-loop’.

RE: Agreed. It also considers the “waste” fraction

  ▪ In the “recyclability approach”, “New materials” do not contain only “recyclable material” (slide 6 and 7).

RE: Agreed. It also considers that a part of the “waste” fraction is filled in by virgin material.

o JRC/IES therefore concludes that the slides presented are not in line with the “substitution approach” recommended by the ILCD Handbook.

- Question 2: does JRC/IES agree on the comparison of the “recyclability approach” with the so-called “recycled content approach”, and on the conclusion to choose the “recycled content approach”? To fully answer this question, we still lack some information. In particular: is the “recycled content” approach presented the “recycled content” approach commonly applied in LCA?

RE: There are several (allowed) approaches for recycling that in one way or another use “recycled content”. Which one is intended?
Values for energy contents of two LCA datasets (one from EcoReport tool, the other one from ELCD database) are compared in slide 8. JRC/IES argues that these two values are not representing the 2 methodologies described earlier.

RE: The recyclability value stems from summing the energy resources use in the ELCD database (for aluminium). If it is not this value, what would be the value?

  o In the framework of an (product-centered) Ecodesign policy, JRC/IES argues that:

    ▪ A stock approach should not be considered for end-of-life related issues;

RE: MEErP accounting is done for analytical purposes (descriptive) to guide policy makers who want to meet policy objectives. It is not prescriptive, i.e. it is not intended as a measure. If policy makers deem it beneficial – having seen the importance through an analytical tool-- they can always decide that the industry follows the ‘substitution method’ in a measure. The two things shouldn’t be mixed.

    ▪ Credits associated to the consumption of recycled materials and the credits associated to the recyclability (= production of secondary materials/energy from end-of-life products and waste) should be transparently and separately presented, as they refer to different potential ecodesign requirements. From our understanding, the “recyclability approach” stimulates better recyclable products.

RE: As above. Should the MEErP analysis indeed show that for a specific product there is a significant potential in recyclability then policy makers can always adopt as a measure any kind of mandatory accounting tool for this product that gives great importance to this aspect of the product.

END
ANNEX X

Feasibility conversion from ELCD to MEerP format
Feasibility conversion from ELCD to MEErP format

A brief feasibility study of the conversion from ELCD to MEErP format is one of the deliverables of Task 4 of the contract.

ELCD - European Reference Life Cycle data\textsuperscript{44}

The ELCD core database covers Life Cycle Inventory (LCI) data from EU-level business associations and other sources for materials, energy carriers, transport, and waste management. Focus is placed on data quality, consistency, and applicability. The respective data sets are provided and approved by the named industry association.

The target users of these data sets are experts/practitioners in Life Cycle Assessment (LCA). The data sets are accessible free of charge and without access or use restrictions for all LCA practitioners. The ELCD II includes data sets that have not been published beforehand and data sets that were only collected for this purpose.

ILCD - International Reference Life Cycle Data System\textsuperscript{45} provides a common basis for life cycle data and studies. Such data and studies reportedly support Ecolabelling, Eco design Carbon foot printing and Green Public Procurement.

The ELCD database contains information on Product flows, Waste flows, Processes for

- Energy carriers and technologies (173 items)
- Materials production (63)
- Systems (14)
- End of life treatment (45)
- Transport services (22)

For each of these 317 end-result the database provides around 70 types of inputs (Resources and Land Use) and 350 different types of outputs (Emissions to Air, Water and Soil plus other elementary flows). The categorisation of these 420 in- and outputs is given in the Table below.

Table 1 Flow categories in ELCD database

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Land use</td>
</tr>
<tr>
<td>Resources from ground</td>
<td>Land Transformation</td>
</tr>
<tr>
<td>Resources from water</td>
<td>Land occupation</td>
</tr>
<tr>
<td>Resources from air</td>
<td>to urban air close to ground</td>
</tr>
<tr>
<td>Resources form biosphere</td>
<td>To non-urban air or form high stacks</td>
</tr>
<tr>
<td></td>
<td>To lower stratosphere and upper troposphere</td>
</tr>
<tr>
<td>Emissions</td>
<td>Emissions to Air</td>
</tr>
<tr>
<td>Emissions to water</td>
<td>Emissions to Soil</td>
</tr>
<tr>
<td>Other elementary flows</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{44} \url{http://lca.jrc.ec.europa.eu}

\textsuperscript{45} \url{http://lct.jrc.ec.europa.eu/index_jrc}
With respect of the data already in the EcoReport that are relevant for ErP, the ELCD would mainly add building materials.

At full compatibility between ELCD and EcoReport, a conversion to the ErP EcoReport format would mean that appropriate LCIA multipliers have to be selected for 420 in- and outputs and then multiplied with the outcomes of the 317 end-products, resulting in 130,000 data fields.

**Compatibility**

However, at the moment ELCD and EcoReport are far from compatible.

The most important principle differences are:
The ELCD uses the 'substitution methodology' for the end-of-life phase, whereas the EcoReport end-of-life accounting is –although some modest credit for recyclability of future waste is also part of the methodology—primarily based on the recycled content, i.e. the material flows as they are. The difference has been extensively explained in the Methodology Reports, but basically the substitution methodology assumes that those materials (metals mainly) that can technically be recycled do not have an environmental or resources impact beyond a) the recycling effort and b) the effort of substituting (from a mix of virgin and recycled material) a small fraction of the disposed material that is truly unrecoverable. As such the ‘substitution methodology’ is not interested in the material and resources flows as they are in real-life, nor in the stock-effect in a growth market that places practical limits on the volume of waste material that is disposed and thus can be recycled.

In the context of Ecodesign, which is supposed to be an instrument helping policy makers to achieve real world targets based on actual material flows, resources use and emissions in certain target years, such an approach is not appropriate.

The deviation between the ELCD and the EcoReport/MEErP approach is not small. The table below shows some of the differences, i.e. up to a factor 3 or 4.

**Table 2 Primary energy used to produce materials compared ELCD vs. EcoReport**

<table>
<thead>
<tr>
<th>Material</th>
<th>ELCD</th>
<th>Eco report</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primaire energy in MJ/KG (ELCD)</td>
<td>Assumed recycling percentage</td>
</tr>
<tr>
<td>Aluminium Sheet</td>
<td>57</td>
<td>78%</td>
</tr>
<tr>
<td>Aluminium Extrusion</td>
<td>43.8</td>
<td>88%</td>
</tr>
<tr>
<td>Al Sheet/Extrusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al die-cast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless steel</td>
<td>27</td>
<td>80%</td>
</tr>
<tr>
<td>Copper Sheet</td>
<td>18</td>
<td>95%</td>
</tr>
<tr>
<td>Copper Tube</td>
<td>18</td>
<td>95%</td>
</tr>
<tr>
<td>Zinc</td>
<td>49.3</td>
<td>-</td>
</tr>
<tr>
<td>ZnAl4 cast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MgZn5 cast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low density granulate</td>
<td>76.4</td>
<td>0%</td>
</tr>
</tbody>
</table>

Second of all, although there is a dispute with the authors of the ELCD as to the extend, it should at least be checked whether the LCI data delivered by the business associations answer are consistent with not only the ISO 14044 standard and documentation standards but also whether they are consistent with EU policy principles such as the single EU energy market. For electricity that is not at least majority owned by a
manufacturer the principle should be, also in line with the rules for environmental business accounting (e.g. WRI), that electricity from the public grid is to be taken into account with one single value, independent of the location of the power plant and the location of the plant.

Thirdly, the ELCD database should be checked extensively for compatibility with official EU data and for technical feasibility. Below some remarkable examples are given:

1. For “Heat; residential heating systems from natural gas, condensing boiler, max. heat output 14.9 kW; consumption mix, at consumer; at a temperature level of 55°C” the ELCD uses an Annual Energy Use efficiency of 99%. On Net Calorific Value this is an efficiency of around 109-110%. At a temperature level that is around the dewpoint of natural gas flue gases, this is impossible.

2. For EU electric power generation and distribution, at consumer the ELCD uses an efficiency of 30.1% (primary energy factor PEF 3.3) for the reference year 2002. The efficiency is significantly lower than MEEuP and other sources. Compare findings in paragraph 4.3 on efficiency of power generation and distribution. Possible cause is the CHP partitioning method and/or the data input, given that also the other emissions are considerably higher.

3. ELCD finds that carbon dioxide emissions alone (without the impact of other GHG) of power generation and distribution are around 0.55 kg CO2/kWh in 2002. This is almost 20% higher than MEEuP estimates for all GHG emissions in the same reference year and it is 30-40% higher than carbon intensity estimates from other (Commission) sources.

4. As PEF for fossil fuel energy carriers, ELCD gives 1.14 for natural gas at the consumer. This means that energy for extraction, preparation and distribution is estimated at twice the value of MEEuP (i.e. 14% instead of 7%).

Apart from these principle differences, there are some pragmatic problems –mainly linked to the large effort required—that stand in the way of a quick conversion of ELCD data to the EcoReport format.

First of all, ELCD distinguishes between 420 types of in- and outputs, whereas the EcoReport supplies impact multipliers for only around 150 types, also including the underlying 50 GWP-multipliers for refrigerants and the multipliers for POPs.

Mainly this is due to the fact the EcoReport is tuned to implementing existing EU legislation and policy, whereas the ELCD appears to aim more at support of developing new legislation and policy.

More in detail, the following differences were identified within the limited scope of the feasibility study:

1. The EcoReport is limited to substances that are regulated in legislation, whereas ELCD also takes on board substances that are not regulated in the EU. Unless the EU wants the ELCD to assume the role of legislator, these non-regulated in- or outputs should have an impact multiplier 0 (zero).

2. The ELCD not only gives more in- and outputs than those that are being regulated, but on the other hand it also lacks a number of parameters that are important for EU-policy. For instance, the ELCD does not include ‘electricity’ as a resource in the 317 end-products of the database. Instead, in the ELCD the primary energy inputs of power generation and distribution by their origin (from oil, gas, biomass, etc.) are part of an overall primary energy figures from these origins. This may be scientifically plausible, but in the context of policy goals electricity needs to be distinguished.
3. The ELCD database contains compounds, e.g. substances where only a part (e.g. the metal ion) is regulated. To include these in the EcoReport, the regulated part of the compound should be assessed, possibly accompanied by some research and documentation as to how this would be a justified decomposition of the environmental effects. E.g. the compound may be more or less harmful than a weight-related multiplier suggests.

4. The ELCD database distinguishes outputs (emissions) not only by type, but also by destination. These destination categories are more extensive than those of the EcoReport (see Table 29). There is a distinction, between emissions to ‘urban air close to the ground’, ‘non-urban air or from high stacks and air emissions ‘to lower stratosphere and upper troposphere’. Similarly for there is a subdivision between fresh and sea water with emissions to water and for emissions to soil there is a distinction between agricultural and non-agricultural soil. EcoReport does not make these distinctions. First of all, because in many instances the legislator does not make those distinctions. Therefore, there would be no legal basis to split the impact multipliers for these sub-categories and thus this needs to be done on a pragmatic basis. This is a significant effort, considering that there is hardly any data and the few existing data are very hard to verify by an objective source.

5. The ELCD database distinguishes inputs (resources) not only by type, but also by origin. For instance, the primary energy inputs are split between renewable (gas, coal, oil, uranium, etc.) and non-renewable (geothermics, hydro, biomass, wood, wind, solar) and are given in mass and net calorific value (NCV). Behind these data there must be output data (emissions, etc.) that relate to the energy conversion processes needed to use the energy in the process. One would expect that within the database some form of harmonisation takes place. However, there is no report of this and it may well be that in fact each business association determines the emissions and resources use of underlying process specifically for its own sector only. E.g. it means that the same conversion process is different for each end-product. There may be good reasons for that, but it means that when the conversion from ELCD to EcoReport requires digging deeper into the underlying production, distribution and end-of-life processes a much larger data amount has to be converted than only the 420 in- and outputs. A full download of the data-base results in 19,400 xml files, which – if they all relate to underlying process-- indicates that on average around 65 processes contribute to 1 end-result.

Conclusions

1. In principle, VHK considers the ELCD the only public, EU-related data-source available with potentially sufficient level of detail to be implemented in the EcoReport. Possible alternative sources (Ecoinvent, databases in SIMAPRO, etc.) with potentially sufficient level of detail are not in the public domain. Adoption of LCA-values without background information is considered not appropriate.

2. However, based on the compatibility issues mentioned in this paragraph, VHK considers an update of the EcoReport with ELCD final output data ‘as is’ not appropriate. New data used in Ecodesign preparatory studies are scarce (e.g. only ENER Lot 15, see Ch. 1) , not documented and are for that reason not deemed appropriate to be included.

3. VHK estimates that the conversion of ELCD data to EcoReport would require a substantial effort, not taking into account activities in the field of stakeholder consultations that might be required when bringing the data of business associations in line with the (principles behind) the EcoReport format. This estimate is based on an acceptance of business association (detailed) values at face value. Should a documented comparison with other sources be required to verify validity of the data, a 2 or 3 person year effort is anticipated. Therefore this is not feasible within the budgetary means of the underlying study to undertake such action.
4. For future, new materials to be added to EcoReport, the “Extra Materials” sheet in EcoReport provides an interface, that can be used by the contractors (see par. 5.3) until such time that an effort is undertaken to at least extract data from the ELCD that are compatible with the MEErP/EcoReport format.

5. Finally, it must be considered that in terms of new materials, the current ELCD does not provide a final solution. It contains some building materials (bricks, insulation) that are not included in the current EcoReport database, but the ELCD does not contain any LCI data on electronics components, coatings, filler and fibre materials for plastics, auxiliary materials, etc.. In other words, once the principle compatibility problems are solved, the ELCD will still have to undertake a considerable effort to catch up with the EcoReport. And then again a considerable effort to expand the EcoReport database with new materials.
ANNEX XI

Comparison Table MEEuP 2005 - MEErP 2011

The following table gives a side-by-side comparison of the previous MEEuP 2005 versus the new MEErP 2011. Please note that this comparison only relates to the structure and the activities required from analysts.

It does not include Part 2 of the MEErP Methodology, nor the extension and guidance that is added in Part 1 for the various tools (including EcoReport 2011). For these items the reader should consult the reports directly.
1 Definition

Scope: This task should define the product category and define the system boundaries of the 'playing field' for eco-design. It is important for a realistic definition of design options and improvement potential and it is also relevant in the context of technically defining any implementing legislation or voluntary measures (if any).

1.1 Product category and performance assessment

- Prodcom category or categories (Eurostat);
- Categories according to EN- or ISO-standard(s);
- Labelling categories (EU Energy Label or Eco-label), if not defined by the above.

Categorisation will often be linked to the assessment of

- The primary product performance parameters (the “functional unit”).

If needed, on the basis of functional performance characteristics and not on the basis of technology, a further segmentation can be applied on the basis of

- Secondary product performance parameters.[1]

1.2 Test Standards

Identify and shortly describe

- the harmonised test standards;
- and additional sector-specific directions for product-testing.

regarding the test procedures for:

- the primary and secondary functional performance parameters mentioned above;
- resources use (energy, water, paper, toner, detergent, etc.) and emissions (NO_x, CO, particulate matter) during product-life;
- safety (gas, oil, electricity, EMC, stability of the product, etc.);
- noise and vibrations (if applicable);
- other product specific test procedures.

Executive Summary

The executive summary for stakeholders and the Commission, summarising all tasks completed, should be regularly updated for each stakeholder meeting and meeting with the Commission.

Task 0. First product screening (optional)

In case of large or inhomogeneous product groups, it is recommended to carry out a first product screening, considering the environmental impact and potential for improvement of the products as referred to in Article 15 of the Ecodesign Directive. The objective is to re-group or narrow the product scope, as appropriate from an ecodesign point of view, for the subsequent analysis in tasks 1-7.

Task 1. SCOPE

1.1. Product Scope

1.1.1 Identify relevant

a) Prodcom category or categories (Eurostat);
b) categories according to EN- or ISO-standard(s);
c) labelling categories (EU Energy Label or Eco-label), if not defined by the above.

1.1.2 Define preliminary product scope, including preliminary product definitions, taking into account that categorisation shall preferably be linked to primary performance parameter (the “functional unit”)

if needed sub-categorisation can take place on the basis of secondary performance parameters and for indirect ErPs the affected energy system(s).

1.2. Test standards (EU, Member State and third country level)

1.2.1 Identify and shortly describe

1.2.1.1 EN or ISO/IEC test standards

1.2.1.2 Mandates issued by the European Commission to the European Standardisation Organisations (ESOs)

1.2.1.3 if applicable, test standards in individual Member States

1.2.1.4 where relevant, third country test standards (e.g. ASHRAE, ANSI, JIS, etc.)

regarding the test procedures for

a) primary and secondary functional performance parameters under 1.1

b) resources use (energy and materials, incl. waste) and emissions

c) safety (inflammability, electric safety, EMC, stability, etc.)

d) noise and vibrations (if applicable)

e) other product-specific test procedures possibly posing barriers for Ecodesign measures
Apart from mentioning these standards, including a short description, it should also be reported which new standards are being developed, which problems (e.g. regarding tolerances, etc.) exist and what alternatives are being developed. Furthermore, the (ongoing) work on an ecodesign-standard, mandated by the European Commission to standardisation bodies, should be considered.[2]

1.3 Existing legislation

Task 1.3 should identify the relevant legislation for the product. This task can be subdivided in three parts:

1.3.1 Legislation and Agreements at European Community level

Apart from the obvious environmental directives (RoHS, WEEE, Packaging directive), this could building regulations (e.g. developed under the Performance of Buildings Directive), regulations on health and labour conditions (e.g. for air conditioners, copiers), minimum efficiency directives (boilers, refrigerators, ballasts, etc.), product liability, safety, EMC etc. Also EU Voluntary Agreements and already existing eco-design standards (e.g. ECMA, EIA) of the sector or related sectors need to be identified. And finally, especially in a Business-to-business context it needs to be described which quality requirements (e.g. “proven design”, maximum failure rate) are customary.

1.3.2 Legislation at Member State level

This section deals with the subjects as above, but now for legislation that has been indicated as being relevant by the Member States.

1.3.3 Third Country Legislation

This section again deals with the subjects as above, but now for legislation and measures in Third Countries (extra-EU) that have been indicated by stakeholders (NGOs, industry, consumers) as being relevant for the product group.

2 Economic and market analysis

Scope: To place the product group within the total of EU industry and trade policy (subtask 2.1). To provide market and cost inputs for the EU-wide environmental impact of the product group (subtask 2.2). To provide insight in the latest market trends so as to indicate the place of possible Eco-design measures in the context of the market-structures and ongoing trends in product design (subtask 2.3, also relevant for the impact analyses in Task 3). And finally, to provide a practical data set of prices and rates to be used in a Life Cycle Cost (LCC) calculation (Subtask 2.4).

2.1 Generic economic data

§ EU Production;
§ Extra-EU Trade;
§ Intra-EU Trade;
§ Apparent EU-consumption.[3]
Data should relate to the latest full year for which at least half of the Member States have reported. Preferably data should be in physical volume and in money units and split up per Member State. Information for this subtask should be derived from official EU statistics so as to be coherent with official data used in EU industry and trade policy.

### 2.2 Market and stock data

In physical units, for EU-25, for each of the categories as defined in 1.1 and for reference years
- § 1990 or 1995 (Kyoto ref.);
- § 2003-2005 (most recent real data);
- § 2010-2012 (forecast, end of KYoto phase 1, relevant also for Stockholm, etc.);
- § 2020-2025 (forecast, year in which all new eco-designs of today will be absorbed by the market).

The following parameters are to be identified:
- § Installed base (“stock”)[4] and penetration rate;
- § Annual sales growth rate (% or physical units);
- § Average Product Life (in years), differentiated in overall life time and time in service, and a rough indication of the spread (e.g. standard deviation);
- § Total sales/ real EU-consumption[5], (also in €, when available);
- § Replacement sales (derived);
- § New sales (derived).

### 2.3 Market trends

- § Latest consumer tests (anecdotal, not necessarily valid for the whole of the EU);

- § Description of the market and production structure and identification of the major players;

- § General trends in product-design and product-features.[6]

### 2.4 Consumer expenditure base data

For each of the categories defined in subtask 1.1:

- § Average consumer prices, incl. VAT, in Euro.

Determination of applicable rates for running costs and disposal, per EU Member State, specifically[7]:
- Electricity rates (€/kWh);
- Water (and sewage) rates (€/m³);
- If applicable: fossil fuel rates (€/GJ);
- Consumer prices of other consumables (detergent, toner, paper, etc.) (€/kg or €/piece);
- Repair and Maintenance costs (€/product life);
- Installation costs (for installed appliances only);
- Disposal tariffs/ taxes (€/product);
- Interest and inflation rates (%).

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Data should relate to the latest full year for which at least half of the Member States have reported to Eurostat. Preferably data should be in physical volume (e.g. units) and in money units and split up per Member State. Information for this subtask should be derived from official EU statistics so as to be coherent with official data used in EU industry and trade policy.

### 2.2 Market and stock data

In physical units, for EU-27, for each of the categories as defined in 1.1 and for reference years

- a. 1990 (Kyoto and "20-20-20" reference);
- b. 2010 (or most recent real data);
- c. 2013-2016 (forecast, presumable entry into force of measures);
- d. 2020-2030-2050 (forecast, years in which all new ecodesigns of today will be absorbed by the market).

The following parameters are to be identified:

- a. Installed base (“stock”) and penetration rate;
- b. Annual sales growth rate (% or physical units);
- c. Average Product Life (in years), in service, and a rough indication of the spread (e.g. standard deviation);
- d. Total sales/ real EU-consumption, (also in €, when available);
- e. Replacement sales (derived);
- f. New sales (derived).

### 2.3 Market trends

- 2.3.1. General market trends (growth/ decline, if applicable per segment), trends in product-design and product-features.

- Market channels and production structure; identification of the major players (associations, large companies, share SMEs, employment);

- Trends in product design/ features, illustrated by recent consumer association tests (valuable, but not necessarily fully representative of the diversity of products put on the market);

### 2.4 Consumer expenditure base data

For each of the categories defined in subtask 1.1, determine:

- a. Average EU consumer prices, incl. VAT (for consumer prices; streetprice) excl. VAT (for B2B products), in Euro.

- b. Consumer prices of consumables (detergent, toner, paper, etc.) (€/kg or €/piece);
- c. Repair and Maintenance costs (€/product life);
- d. Installation costs (for installed appliances only);
- e. Disposal tariffs/ taxes (€/product);

For electricity, fossil fuel, water, interest, inflation and discount rates use values for Jan. 2011 in MEeRP Chapter 3, including the average annual price increases mentioned there.

For regional differentiation of consumer prices (for sensitivity analysis) also see Chapter 3.
3 Consumer behaviour and local infrastructure

Scope: Consumer behaviour can —in part- be influenced by product-design but overall it is a very relevant input for the assessment of the environmental impact and the Life Cycle Costs of a product. One aim is to identify barriers and restrictions to possible eco-design measures, due to social, cultural or infrastructural factors. A second aim is to quantify relevant user-parameters that influence the environmental impact during product-life and that are different from the Standard test conditions as described in Subtask 1.2. [8]

3.1 Real Life Efficiency

This includes:

§ Load efficiency (real load vs. nominal capacity);
§ Temperature- and/or timer settings;
§ Dosage, quality and consumption of auxiliary inputs (detergents, paper- and toner use, etc.);
§ Frequency and characteristic of use;
§ Identification of use of second hand auxiliary inputs during product life (e.g. toner, recycled paper);
§ Power management enabling-rate and other user settings;
§ Best Practice in sustainable product use, amongst others regarding the items above.

3 USERS

3.1 System aspects use phase, for ErP with direct energy consumption

Identify, retrieve and analyse data, report on the environmental & resources impacts during the use phase for ErP with a direct energy consumption effect, with impact levels subdivided in

3.1.1 a strict product/ component scope (e.g. steady state efficiency and emissions at nominal load, as in traditional standards)

3.1.2 an extended product approach: considering that the ErP will be subject to various loads/user demands; the product scope could extend to controllability (flexibility and efficiency to react to different load situations, e.g. modulating burner, variable speed drive, ‘inverter’), the quality of possible controls (sensors, actuators, central processing unit) and/or the quality of auxiliary devices that may or may not be part of the ErP as placed on the market (e.g. separate heat recovery devices such as PFHRD[1])

Examples of possibly important factors to consider, depending on the nature of the ErP, are:

- Load efficiency (real load vs. nominal capacity);
- Temperature- and/or timer settings;
- Dosage, quality and consumption of auxiliary inputs (detergents, paper- and toner use, etc.);
- Frequency and characteristic of use (e.g. hours in on, standby or off mode);
- Identification of use of second hand auxiliary inputs during product life (e.g. toner, recycled paper);
- Power management enabling-rate and other user settings;
- Best Practice in sustainable product use, amongst others regarding the items above.
3.2.3 a technical systems approach: considering that the ErP is part of a larger product system and –through certain features of the ErP—can influence the functional performance and/or the resources use and emissions of that of that larger product system. E.g. central heating boiler regulation influencing indoor temperature fluctuation (discomfort), thus increasing heat demand.

Other example: combination and possible synergy from combining strict ErP with other ErP (consumer electronics TV/PC/phone/camera; combi-boiler with both space and hot water heating; hybrid boiler combining gas boiler with heat pump, etc.). Note that this still considers solutions of which the ErP is a physical part.

3.2.4 a functional systems approach: considering that often there are several ways to realize the basic function. E.g. water-based (hydronic) heating systems versus air-based heating systems, various modes of food preparation, etc.. This analysis will often not directly affect a single Ecodesign legislation, but it is of strategic interest to guarantee coherence and consistency between the various ErP being regulated.

3.2 System aspects use phase, for ErP with indirect energy consumption effect

Identify, retrieve and analyse data, report on the indirect environmental & resources impacts during the use phase for ErP with an indirect energy consumption effect (e.g. windows, insulation material, shower head, water taps), specifically

3.2.1 describe the affected energy system(s), i.e. the systems/products whose energy consumption in the use phase of the ErP is influenced by features of the ErP

3.2.2 repeat Tasks 1.2, 1.3 (relevant standards, legislation) and Task 2 (economic and market analysis) for the affected energy system, but only related to technical parameters that relevant for the aforementioned interaction with the ErP and only in as much as they are not already taken into account in Task 1 and 2 for the ErP.

3.2.3 information retrieval and analysis of the use phase energy consumption of the affected energy system (repeat 3.1 but only for the use phase of the affected energy system).

3.2.4 assess the interaction between the ErP and the affected energy system: describe the basic physical/chemical or other parameters and mechanisms behind the interaction, possible backed-up by statistical data or field trial or laboratory data.

3.2.5 quantify the energy use and the energy-related resources & environmental impacts during the use phase of the affected energy system(s) that is influenced by the ErP, following the outcomes of the relevant parts of Tasks 4 to 7 for the affected energy system.

3.2 End-of-Life behaviour

Identification of actual consumer behaviour (avg. EU) regarding end-of-life aspects. This includes:

§ Economical product life (=actual time to disposal);

§ Repair- and maintenance practice (frequency, spare parts, transportation and other impact parameters);

§ Present fractions to recycling, re-use and disposal;

3.3 End-of-Life behaviour

Identify, retrieve and analyse data, report on consumer behaviour (avg. EU) regarding end-of-life aspects. This includes:

3.3.1 Product use & stock life (=time between purchase and disposal);

3.3.2 Repair- and maintenance practice (frequency, spare parts, transportation and other impact parameters);

3.3.3 Collection rates, by fraction (consumer perspective);
4.3.4 Estimated second hand use, fraction of total and estimated second product life (in practice);
4.3.5 Best Practice in sustainable product use, amongst others regarding the items above.

3.3 Local-structure
Description, identification of barriers and opportunities relating to the local infra-structure regarding

4.1.3 Energy: reliability, availability and nature
4.1.2 Best Practice in sustainable product use, amongst others regarding the items above.

3.3.3 Local-structure
Identify, retrieve and analyse data, report on barriers and opportunities relating to the local infra-structure regarding

3.3.1 Energy: reliability, availability and nature
3.3.2 Water (e.g. use of rain water, possibilities for “hot fill” dishwashers);
3.3.3 Telecom (e.g. hot spots, WLAN, etc.);
3.3.4 Installation, e.g. availability and level of know-how/training of installers;
3.3.5 Physical environment, e.g. fraction of shared products, possibilities for shared laundry rooms, etc.

3.5 Recommendations
Make recommendations on
3.5.1 Refined product scope from the perspective of consumer behaviour and infrastructure
3.5.2 Barriers and opportunities for Ecodesign from the perspective of consumer behaviour and infrastructure

6.1 State-of-the-art in applied research for the product (prototype level)
6.2 State-of-the-art at component level (prototype, test and field trial level)
6.3 State-of-the-art of best existing product technology outside the EU

4.1 Production phase

\(\text{Product weight and Bill-of-Materials, distinguishing materials fractions/ electronics modules (weight) at the level of the EuP EcoReport Unit Indicators as proposed in the MEEUP report. This includes packaging materials and an assessment of the primary scrap production during sheet metal manufacturing.}\) [9]

4.2 Distribution phase

\(\text{Volume and weight of the packaged product.}\)

4.3 Use phase (product)

\(\text{Rated annual resources consumption (energy, water, detergent) and direct emissions}[^{10}]\text{ during product life according to the test standards defined in subtask 1.2;}\)

\(\text{Assessment of resources consumption (energy, water, detergent) and direct emissions during product life in off-standard conditions, i.e. at variable load.}\)

4.4 Use phase (system)

Almost every product has a clear interface with the surrounding system and often there are alternative routes to fulfil the same or a similar function. A CH boiler has an interface with the (heat load of the) house, the dishwasher has a manual alternative (handwash), PCs, TVs and mobile phones have overlapping functionality, refrigeration is only one way of food conservation and fridges interface with health/food waste/ packaging/shopping trips, etc. This paragraph should identify and describe the functional system to which the product in question belongs and identify and possibly quantify those product features that can reduce the environmental impact not only of the product but of the system as a whole. Please note that the scope of the system analysis is restricted only to issues that can be influenced by technical features of the product under investigation as defined in task 1. Furthermore, the system analysis serves as an addition to the more traditional product-specific analysis in paragraph 4.3, i.e. to design product-specific legislation (if any) in such a way that it would not make system-oriented innovations impossible.

4.5 End-of-life phase

Considerations regarding the end-of-life of materials flow[11] for

\(\text{Handling as pure waste (landfill, pyrolytic incineration);}\)

\(\text{Heat Recovery (non-hazardous incineration optimised for energy recovery);}\)

\(\text{Re-use or Closed-loop Recycling.}\)

4.3 Recommendations for

4.3.1 refined product scope from the technical perspective (e.g. exclude special applications for niche markets)

4.3.2 barriers and opportunities for Ecodesign from a technical perspective

4.3.3 the typical design cycle for this product and thus approximately appropriate timing of measures
5 Definition of Base-Case

Scope: For this assessment one or two average EU product (s) have to be defined or a representative product category as the “Base-case” for the whole of the EU-25 has to be chosen. On this Base-Case most of the environmental and Life Cycle Cost analyses will be built throughout the rest of the study. The Base-Case is a conscious abstraction of reality, necessary one for practical reasons (budget, time). Having said that, the question if this abstraction leads to inadmissible conclusions for certain market segments will be addressed in the impact- and sensitivity analysis. The description of the Base-Case is the synthesis of the results of Tasks 1 to 4 and the point-of-reference for tasks 6 (improvement potential) and 7 (impact analysis).

5.1 Product-specific inputs

§ Avg. EU product weight and Bill-of-Materials, distinguishing materials fractions (weight) at the level of the EuP EcoReport Unit Indicators as proposed in the MEEUP report. This includes packaging materials;
§ Primary scrap production during sheet metal manufacturing (avg. EU);[12]
§ Volume and weight of the packaged product avg. EU;
§ Annual resources consumption (energy, water, detergent and direct emissions)[13] during product life according to the test standards defined in subtask 1.2 (“EU Standard Base-Case”);
§ Annual resources consumption (energy, water, detergent and direct emissions during product life according to the real-life situation as defined in subtask 3.2 (“EU Real-life Base-Case”);
§ Selected EU scenario at end-of-life of materials flow [14] for:
  o Disposal (landfill, pyrolytic incineration);
  o Thermal Recycling (non-hazardous incineration optimised for energy recovery);
  o Re-use or Closed-loop Recycling.

5.1 Product-specific inputs

Choose from the previous tasks the most appropriate information

From all tasks 1 to 4:

Definition of the base case(s) (from all previous Tasks 1 to 4) with per Base Case

Task 1: The most appropriate test standard for performance and consumption data

Task 2: EU-27 annual unit sales 2010

EU-27 unit stock 2010
Purchase price. the installation costs (specify end-of-life disposal costs comprised in product price)
Repair and maintenance costs
Unitary rates for energy, water and/or other consumables
Discount, inflation, interest rates to be applied
Product service life

Task 3 Annual resources consumption (energy, water, consumables, from Task 3.1) and emissions caused during product life (from Task 3.2);
Product use&stock life, if appropriate (i.e. if deviates substantially from product service life)
As appropriate, multiplier(s) to transform standard test data to real-life consumption data
Average user demand/ load
Collection rate at end-of-life (per fraction if applicable)

Task 4 Product weight and Bill-of-Materials (BOM), preferably in EcoReport format (from Task 4)
Primary scrap production during sheet metal manufacturing (avg. EU);[12]
Volume and weight of the packaged product avg. EU;
Selected EU scenario at end-of-life of materials flow for:
5.2 Base-Case Environmental Impact Assessment.

Using the VHK EuP EcoReport indicate the environmental impact analysis, specifying:

5 Emission/resources categories as mentioned in the MEEUP Report;
5 Raw Materials Use and Manufacturing;
5 Use;

5 and End-of-Life Phase.

5.3 Base-Case Life Cycle Costs
Combining the results from tasks 2 and 3 define — for the
Standard and Real-Life Base-Case the Life Cycle Costs[16] LCC = PP + PWF * OE, where LCC is Life Cycle Costs, PP is the purchase price, OE is the operating expense and PWF (Present Worth Factor) is PWF= (1 – 1/(1+ r) N )/r , in which N is the product life and r is the discount (interest-inflation) rate.

5.4 EU Totals
Aggregate the Real-Life Base-Case environmental impact data (subtask 5.3) and the Life Cycle Cost data (subtask 5.4) to EU-25 level, using stock and market data from task 2, indicating
5 The life cycle environmental impact and total LCC of the new products designed in 2005 (this relates to a period of 2005 up to 2005+product life);
5 The annual (2005) impact of production, use and (estimated) disposal of the product group, assuming post-RoHS and post-WEEE conditions.[17]

5.5 EU-25 Total System Impact
Using the estimates of task 4 to estimate the total environmental impact of the product system and compare with outputs from input/output analysis (e.g. EIIPRO study).

5.2 Base-Case Environmental Impact Assessment.
Using the EcoReport and the above inputs calculate emission/resources categories in MEerP format for Raw Materials Use and Manufacturing; Distribution; Use phase (real life); End-of-Life Phase.

Furthermore, if more than one type of resource is used in the use phase, make a split-up between resources and their individual impacts.

5.3 Base-Case Life Cycle Costs for consumer
Combining the results from tasks 2 and 3 for the Real-Life Base-Case determine the Life Cycle Costs LCC = PP + PWF * OE + EoL, where LCC is Life Cycle Costs, PP is the purchase price, OE is the operating expense, PWF (Present Worth Factor) is PWF= (1 – 1/(1+ r) N )/r , in which N is the product life and r is the discount rate minus the growth rate of running cost components (e.g. energy, water rates) and EoL the End-of-Life costs.

5.4 EU Totals
Aggregate the Real-Life Base-Case environmental impact data and the Life Cycle Cost data (subtask 5.3 and 5.4) to EU-25 level, using stock and market data from task 2, indicating
5.4.1. The life cycle environmental impact and total LCC of the new products designed in 2010 or most recent year for which there are reliable date (this relates to a period of 2010 up to 2010+product life);
5.4.2. The annual (2010) impact of production, use and (estimated) disposal of the product group, both in terms of the annual environmental impacts and the annual monetary costs for consumers.

5.5 EU-25 Total System Impact
Using the estimates of task 4 to estimate the total environmental impact of the product system and compare with outputs from input/output analysis (e.g. EIIPRO study).

7 Improvement Potential

6 DESIGN OPTIONS
Scope: Identify design options, their monetary consequences in terms of Life Cycle Cost for the consumer, their environmental costs and benefits and pinpointing the solution with the Least Life Cycle Costs (LLCC) and the Best Available Technology (BAT).

The assessment of monetary Life Cycle Costs is relevant to indicate whether design solutions might negatively or positively impact the total EU consumer’s expenditure over the total product life (purchase, running costs, etc.). The distance between the LLCC and the BAT indicates—in a case a LLCC solution is set as a minimum target—the remaining space for product-differentiation (competition). The BAT indicates a medium-term target that would probably more subject to promotion measures than restrictive action. The BNAT (subtask 6.5) indicates long-term possibilities and helps to define the exact scope and definition of possible measures.

7.1 Options
§ Identification and description of individual design options for environmental improvement.

7.2 Impacts
§ Quantitative assessment of the environmental improvement per option (using EuP EcoReport).

7.3 Costs
§ Estimate of price increase due to implementation of these design options, either by looking at prices of products on the market and/or by applying a production cost model with sector-specific margins.

7.4 Analysis LLCC and BAT
§ Ranking of the individual design options by LCC (e.g. option 1, option 2, option 3);
§ Determination/ estimation of possible positive or negative ('rebound') side effects of the individual design measures;
§ Estimating the accumulative improvement and cost effect of implementing the ranked options simultaneously (e.g. option 1, option 1+2, option 1+2+3, etc.), also taking into account the above side-effects;
§ Ranking of the accumulative design options, drawing of a LCC-curve (Y-axis= LLCC, X-axis= options) and identifying the Least Life Cycle Cost (LLCC) point and the point with the Best Available Technology (BAT). [18]

7.5 Long-term targets (BNAT) and systems analysis
§ Discussion of long-term technical potential on the basis of outcomes of applied and fundamental research, but still in the context of the present product archetype;
§ Discussion of long-term potential on the basis of changes of the total system to which the present archetype product belongs: Societal transitions, product-services substitution, dematerialisation, etc.

8 Scenario-, policy-, impact- and sensitivity analysis

Options
6.1 Identify and describe (aggregated clusters of) design options to be taken into account (from Task 4, typically 4 to 8 design options are appropriate)

Impacts
6.2 Assess quantitatively the environmental improvement per option using the EcoReport tool. Compare the outcomes and report only on impacts that change significantly with the design options

Costs
6.3 Assess/ estimate price increase due to implementation of these design options, either on the basis of prices of products on the market and/or by applying a production cost model with sector-specific margins.

Analysis LLCC and BAT
6.4 Rank the individual design options by LCC (e.g. option 1, option 2, option 3)
6.4.1 Determine/ estimate possible positive or negative ('rebound') side effects of the individual design measures;
6.4.2 Estimate the accumulative improvement and cost effect of implementing the ranked options simultaneously (e.g. option 1, option 1+2, option 1+2+3, etc.), also taking into account the above side-effects.
6.4.3 Rank the accumulative design options, drawing of a LCC-curve (1st Y-axis= LLCC, 2nd Y-axis= impact (e.g. energy), X-axis= options) and identifying the Least Life Cycle Cost (LLCC) point and the point with the Best Available Technology (BAT);
6.4.4

Long-term targets (BNAT) and systems analysis
6.5 Discussion of long-term technical potential on the basis of outcomes of applied and fundamental research, but still in the context of the present product archetype;
Discussion of long-term potential on the basis of changes of the total system to which the present archetype product belongs: Societal transitions, product-services substitution, dematerialisation, etc.

SCENARIOS
Scope: This task summarizes and totals the outcomes of all previous tasks. It looks at suitable policy means to achieve the potential e.g. implementing LLCC as a minimum and BAT as a promotional target, using legislative or voluntary agreements, labelling and promotion. It draws up scenarios 1990 – 2020 quantifying the improvements that can be achieved vs. a Business-as-Usual scenario and compares the outcomes with EU environmental targets, the societal costs if the environmental impact reduction would have to be achieved in another way, etc. It makes an estimate of the impact on consumers (purchasing power, societal costs) and industry (employment, profitability, competitiveness, investment level, etc.) as described in Appendix 2 of the Directive, explicitly describing and taking into account the typical design cycle (platform change) in a product sector. Finally, in a sensitivity analysis of the main parameters it studies the robustness of the outcome.

8.1 Policy- and scenario analysis

7.1 Policy analysis

7.1.1 Describe stakeholder consultation during preparatory study

7.1.2 Describe barriers (and opportunities) for improvements environmental impact; opportunities for Ecodesign measures (from Tasks 1-4)

7.1.3 Describe pro's and cons of (combinations of) Ecodesign measures and other policy instruments (e.g. self regulation, energy label, EPBD); identify and describe overlaps with existing legislation

7.1.4 Select policy measures for further analysis, including timing and target levels, notably the options should

- Be based on the exact definition of the products, according to subtask 1.1 and modified/ confirmed by the other tasks;
  - Provide ecodesign requirements, such as minimum (or maximum) requirements[3];
- Be complemented, where appropriate, with (dynamic) labelling and benchmark categories linked to possible incentives, relating to public procurement or direct and indirect fiscal instruments. In case of energy labelling, labelling categories should be proposed;
- Where appropriate, apply existing standards or propose needs/ generic requirements for harmonised standards to be developed;
- Provide measurement requirements, including measurement standards and/or methods;
- Consider possible self-regulation, such as voluntary agreement or sectoral benchmarks initiatives;
- Provide requirements on installation of the product or on user information.}

8.2 Impact analysis industry and consumers

7.2 Scenario analysis

7.2.1 Set up a stock model for the baseline (Business-as-Usual BaU), calculate for the period 1990-2030, preceded by an appropriate built-up period (product life), for the following parameters per year X (X=1990-2030):

- annual sales in X (from Task 2, with actual and interpolated values), subdivided in new (incl. 1st time users) and replacement sales;
- annual stock of product (from Task 2)= accumulative sales in X and preceeding L-1 years (L=product life) minus products discarded in actual year (=sales in year X-L);
8.3 Sensitivity analysis of the main parameters.

7.3 Impact analysis industry and consumers

7.3.1 Introduce economic parameters in the stock model:

a. Introduce baseline product price (from previous tasks), in Net Present Value for a reference year (e.g. 2010), taking into account inflation rates as given in MEErP

b. Introduce unitary energy, water, consumable rates, annual repair and maintenance costs.

c. Introduce dynamic parameters: inflation rate, growth rate unitary prices (energy, water, etc.)

d. Simplify the relationship between a product’s unitary impacts and product purchase price: determine a linear price elasticity from known anchor points (BaseCase, LLCC, BAT) for price and unitary impact.

e. Determine the turnover rate per employment (from Task 2)

f. Determine the cost and margin built-up for the average product (%), with relative shares for OEMs, Manufacturer, Wholesale, Retail, VAT and other tax.

g. Introduce variables and mathematical relations in the stock model as appropriate (see also sensitivity analysis)
7.3.2 Calculate for the period 1990-2030 (with qualitative
discussion of 2030-2050) for each of the options identified
in 7.1.4 a scenario for total impact of the policy mix, at the
given timing and target level(s) (graphs and labels per
impact type)

a. EU-27 running costs including and excluding
taxes (indicator of utility income and
government income from energy/water/etc. VAT
and other tax) in Euro2010, 1990-2030
b. EU-27 consumer expenditure, 1990-2030
c. EU-27 annual revenue industry, wholesale, retail,
product VAT and other taxes (mln. Euro) in
Euro2010, for reference years 2020 ad 2030 (or
2050 instead of 2030 for construction products)
d. indicative share of SMEs, share in industry
revenue; qualitative discussion of possible effect
e. employment (no. of jobs) industry, wholesale,
retail/installers for reference years 2020 and
2030;

7.4 Sensitivity analysis of the main parameters.
Recalculate selected scenarios for variation in
a. higher and lower (50%) energy prices;
b. higher and lower (50%) elasticity between
product price and unitary impact parameter;
c. new target levels or differences in timing as
indicated by the Commission services;
d. life cycle costs including external societal
damages (societal LCC):
Extend the calculation of the base-case Life Cycle Costs for
the end-user with the societal costs for emissions
indicated in Chapter 5, using the outcome of Task 5.2
(emissions in mass per product over product life) and the
monetary values per emission (in €/unit of mass) in
Chapter 8
and report on the in-/decrements (in tables)

7.5 Summary
7.5.1 Summarise the main policy recommendations per
product
7.5.2 Summarize the main outcomes of the scenarios for
Baseline, 2020 and 2030 (2050 for construction products)
7.5.3 Summarize the risk of possible negative impacts on health,
safety, etc. in one +/- table

FOOTNOTES
1[1] For instance, for washing machines and dishwashers the
primary product performance parameter is given in x kg of laundry
washed or x standard settings of dishes over de lifetime (following
ISO 14040 series). The cleaning performance, rinsing performance,
etc. can be secondary parameters. The number of (sub) categories
should be kept to the minimum necessary, based on functional
aspects and not on the basis of the technology or price.

FOOTNOTES
residual heat from central heating boiler flue gas and uses them for
sanitary hot water heating with a high energy saving potential)

1[3] Calculated from production, imports and exports. If available, changes in product stock should be taken into account, but usually this will not be the case.

1[4] Forecasts 2010 and 2020 are to take into account population growth rates and/or building growth rates.

1[5] The objective is to define the actual consumption as reliably as possible for the categories defined in task 1.1, for the latest full year for which consistent data could be retrieved. Significant differences between the actual consumption and the apparent consumption in subtask 2.2 may occur.

1[6] From the marketing point of view, not from the perspective of a detailed technical analysis.

1[7] Note that a part of these data could be harmonised for all product groups.

1[8] Examples are the actual temperature-settings for laundry and dishwashing equipment, the loading efficiency (real load vs. nominal capacity) for a whole range of appliances, power management enabling rate for ICT equipment, etc.


1[10] This relates to product-specific emissions during product-life, e.g. ozone for certain imaging equipment, radiation for certain televisions, etc.

1[11] At least for plastics and electronics, as defined in the EuP EcoReport. For metals and glass this may also be indicated if the recycling percentage is less than 95%.


1[13] This only relates to emissions that are not already taken into account in the VHK EcoReport Unit Indicators.

1[14] At least for plastics and electronics, as defined in the EuP EcoReport. For metals and glass this may also be indicated if the recycling percentage is less than 95%.

1[15] Making two analyses

1[16] LCC = PP + PWF * OE, where LCC is Life Cycle Costs, PP is the purchase price, OE is the operating expense and PWF (Present Worth Factor) is PWF = (1 – 1/(1+r)^N)/r, in which N is the product life and r is the discount (interest-inflation) rate.

1[17] “Business-as-Usual” scenario to be based on this assumption.

1[18] This is usually the last point of the curve showing the product design with the lowest environmental impact, irrespective of the price.

1[2] note that the EcoReport 2011 software tool uses average mix of transport modes by type of product. If the ErP deviates substantially from the average transport mix, this can be corrected ex-post. This would give the industry sectors with an environmentally-friendly transport policy (local suppliers, ship instead of airplane) an option to take their effort into account.

1[3] Ecodesign requirements should always address improvements in terms of environmental performance, not in terms of technologies.
ANNEX XII

Slides hand-out
Stakeholder meeting 9.9.2011

Slides were presented to stakeholders at the above meeting and published on the www.meerp.eu project website 12.9.2011.
Methodology for Ecodesign of Energy-related Products

MEErP 2011

stakeholder meeting BXL 9.9.2011

COWI Belgium sprl - in association with - Van Holsteijn en Kemna B.V. (VHK)

Aims

1. To review the effectiveness and update, whenever necessary, the Ecodesign Methodology after having been applied for 5 years in ecodesign studies and contributed to the evaluation of implementing measures on energy-using products.

2. To extend the Ecodesign Methodology to Energy-related Products to evaluate whether and to which extent new energy-related products fulfill certain criteria for implementing measures under the Ecodesign Directive 2009/125/EC.

Tasks

1. Information Sourcing and Publicity

2. Extension of the Methodology to Energy-related Products

3. Update of the Methodology Report

4. Update of the EcoReport Tool

MEErP Reports & Tool

1. Project Report (Task 1)
2. Methods Report (Main, tasks 2-4)
3. Environmental Policies & Data Report (tasks 2-4)
4. EcoReport tool (xls)

Planning (real)

Jan 2011
- Project start.
- Launch website www.meerp.eu.
- General notification/ invitation to register.

Feb 2011
- Registration of stakeholders.
- Questionnaire at registration (closes 28 Feb. + 4 weeks extra)

Mar 2011
- Draft report Task 1 (incl. results quest.)

Apr 2011 (pre-draft Mac, draft May)
- Draft report Task 2.
- Draft report Task 3-3.

May 2011 (pre-draft Apr, draft May)
- Draft report Task 1-3.

Jun 2011 (June)
- Invitation to stakeholders meeting (incl. documents) (Aug)

Jul 2011 (Sept)
- Stakeholder meeting.
- Minutes of stakeholder meeting published on website.

Sep 2011 (Sept/Oct)
- Final report Task 1-4.

Project ends October 2011
Methodology for Ecodesign of Energy-related Products

MEErP 2011
Project Report

COWI Belgium sprl - in association with Van Holsteijn en Kemna B.V. (VHK)

Project Report structure

Task 1
• Stakeholder list
• Information sourcing & publicity
• Questionnaire
• Desk research
  — Methodology: comments in Ecodesign prep. studies
  — International review/ comparison similar (LCA-type) methods
Other
• Procedural parts of other tasks
• Relevant MEEuP parts

Stakeholder list

Preliminary mailing list stakeholders (invited to register)
• 138 European industry associations, including SMEs;
• 2 EU consumer organisations and 3 groups environmental NGOs;
• 39 Member States’ representatives;
• 31 organisations/individual experts conducting ecodesign preparatory studies or related ecodesign studies/projects;
• 35 surveillance authorities

Result: >110 stakeholders registered

Project Website (www.meerp.eu)

Questionnaire [intro]

Evaluation of the existing Methodology (MEEuP) / suggestions for change

Registered Stakeholder:

Name: __________________________

Organisation: __________________________

E-mail address: __________________________

The Methodology for Ecodesign of Energy-using Products (MEEuP) consists of 8 sections and – per section – 3 to 5 subsections.

Please give your score on the usefulness of each subsection (1-5 useful); 5 very useful) by filling in an 'X' in the appropriate box. Filling in the whole questionnaire (without remarks) takes under 10 minutes.

After filling in the questionnaires, please send the Excel file as an attachment to an e-mail with subject 'MEEuPQ' to m.van.der.voort@vhk.nl

Detailed comments and suggestions may be placed in the Remarks/ remarks per main section (maximum 255 characters) and/or in the Extended remarks/ remarks at the end of the questionnaire.

Prepared for the European Commission, DG Enterprise and Industry
Unit B3 Sustainable Industrial Policy

under specific contract SI2.581259, Technical Assistance for the update of the Methodology for the Ecodesign of Energy-using products (MEEuP), within the framework service contract TREN/R1/350-2008 Lot 3

Rend Kemna (p.l.)
Brussels/Delft, 30 July 2011

DISCLAIMER:
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The authors have produced this report to their best ability and knowledge, nevertheless they assume no liability for any damages, material or immaterial, that may arise from the use of the report or its content.
Questionnaire [Input form]

Scores and comments on the old 8 MEEuP sections (example)

<table>
<thead>
<tr>
<th>Section 1. Definitions, standards and legislation</th>
<th>not useful</th>
<th>useful</th>
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<tbody>
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<td>1.1. Product definition(s)</td>
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<tr>
<td>1.2. Legislation (EU) Extra-EU and Member State level</td>
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<td></td>
</tr>
<tr>
<td>1.3. Test standards (EU), Extra-EU and Member State level</td>
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Questionnaire [Input form]

Questionnaire [Scoring]

'Usefulness' scores per section (n= ca. 50).

Overall score 75%

<table>
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<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
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<td>20%</td>
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<td>5%</td>
<td>0%</td>
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<tr>
<td>Economic and market analysis (Task 2)</td>
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<td>40%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
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<tr>
<td>Consumer behaviour and infrastructure (Task 7)</td>
<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>Technical analysis existing products (Task 4)</td>
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<td>20%</td>
<td>0%</td>
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<td>0%</td>
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<tr>
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<td>30%</td>
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<td>30%</td>
<td>30%</td>
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<tr>
<td>Analysis Best Available Technology (Task 4)</td>
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<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td>Improvement Potential (Task 7)</td>
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<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>Scenario, policy, impact and sensit. Analysis (Task 8)</td>
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<td>80%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
<td>90%</td>
</tr>
</tbody>
</table>

Questionnaire [Comments 1]

Feedback log:
- 200 comments asked & answered (29 pages report);

Highlights (by definition incomplete)
- Key message: Proven and effective methodology. New MEErP should focus more on ‘how’ instead of ‘why’ aspects are to be treated
- Many suggestions not only on method but on management/procedural issues (speed up, streamline, etc.)

Questionnaire [Comments 2]

In detail:
- Give more guidance in general
- Improve data consistency between sections of the methodology
- Improve comparability between (results of) various prep. studies
- Metals industry disagrees with MEEuP metals recycling approach (to discuss later)
- Insulation industry wants more guidance on how long-life construction products are to be taken into account & how environmental characteristics can be identified for products embedded in a building system (to discuss later)
- Perception of several stakeholders that non-energy aspects are not (enough) taken into account
- Poor quality Prodcom data; reliable market data from other sources needed

Desk research 1 [Methodology comments prep. studies]

Few comments, mainly on (LCI) data availability
- TV study stated that method was wrong/incomplete, because emission/energy data for LED screens in EcoReport were to low
  
Reaction: For electronics MEEuP data were based on best technology 2004 (Sharp Green Factory). These can be very much lower than average plants. MEEuP did not omit upstream processes as suggested.
- Solid fuel boiler study did not find EcoReport unit indicator data for all fuels. Thus consultant had to perform its own LCA.
  
Reaction: Nothing wrong with prep. studies performing LCA for specific subjects. In fact, it should happen more often but should then also be well documented.

Desk research 2 [International review 1]

- Ecodesign methodology, using holistic ‘cradle-to-grave’ LCA-like tools for preparation of mandatory legislation, is unique.
- Not unique is the assessment of economic Least Life Cycle Costs (LCC) to determine target level. Compare: US DOE Appliance Standards
- Not unique is the use of Best Available Technology (BAT) as a benchmark (EU Energy Lab). Compare: Japanese Top Runner
- Apart from LCA, MEErP very similar to US Appliance (Energy) Standards methodology and very dissimilar from Japan
- US lead times 3-4 years from start study to Appliance Standard legislation (as in EU). US is fighting against backlog.
- Latest proposal for US Appliance Standards also include plumbing products (showerheads, toilets, etc.)
Desk research 2 [International review 2]

- US budgets for Appliance Standards (2006-2010) were 10 times higher than EU budgets for similar Ecodesign studies.
- US ca. $3 – 5 mln. versus EU ca. €0.3 mln. per study.

Projected Annual Baseline Budget by Activity

Final Notes

- Updated legacy items from MEEuP 2005, like ‘Domain Ecodesigner’ and ‘Energy Analysis methodology’ (applies also to LCA) are to be added, because MEErP 2011 report must be self-standing document.
- There are a few ‘to do’ items and final editing is needed (language)
- Project report may be subject to change, following stakeholder comments in meeting
- Next (after Q&A project report): How stakeholder suggestions were incorporated in the new methodology

Questions/ comments?
Methodology for Ecodesign of Energy-related Products

MEErP 2011

Methods Report (Methodology Part 1)

Methodology aim

MEErP 2011 is a comprehensive and detailed methodology for performing Ecodesign preparatory studies ("technical, environmental and economic analysis") required under the 2009/125/EC directive. It is described in generic terms - in Annexes I and II of the directive.

The methodology describes tasks, tools, data and deliverables for the preparation and assessment of product options, in order to help the Commission to decide which of these options are to be set down as legislative requirements. It allows the Commission to decide which of the available options should be selected and which should not be selected.

1. Introduction: Legal background Directive, New methodology

Follows guidance for Capita Selecta in tasks of new methodology:

- Task 1: Scope - incl. guide product definition/ grouping
- Task 2: Markets - incl. default energy/water/etc. rates
- Task 3: Users - incl. extension EuP to ErP; system approach
- Task 4: Technologies - incl. guide assessment design options
- Task 5/6: Environment - incl. intro EcoReport tool
- Task 5/6: Economics - incl. LCC methods, consumer & societal
- Task 7: Scenarios - incl. guide on basic stock model set-up

References, list of figures, list of tables (acronyms at front of report)

Methodology Reports

Part 1: Methods (comparable to old MEEuP 2005 set-up, this ppt)

Part 2: Environmental policies and data (guidance doc, separate ppt)

- Policy description, targets, sources → background & streamline future studies no need to repeat in studies, just update
- Offical resources use & emission data & trends: 'Top-down' per resource or emission, allowing comparison with the 'bottom-up' LCA results from EcoReport → shows that Ecodesign is not 'just about energy' and increases accuracy of contractor assessments
- Useful default data (harmonised) on buildings, occupancy, etc. from past/ongoing Ecodesign studies → streamline future studies & better comparability, more robust
1.4 NEW Method outlines

1.4.1 NEW Method outlines, continued

Checklist Ecodesign Parameters 2009/121/EC Annex I

In stages Life Cycle of the product:
- raw material selection and use
- manufacturing
- packaging, transport, distribution
- installation and maintenance
- use
- end-of-life

for each phase:
- predicted consumption resources
- anticipated emissions to air, water, soil
- potential pollution through physical effects (noise, radiation, vibration, EMT)
- expected generation of waste
- possibilities for reuse, recycling, energy recovery

The following parameters must be used:
- Weight & volume of the product
- Use of materials issued from recycling
- Consumption of energy, water and other resources
- Use of hazardous substances
- Quantity of consumables during use phase
- Waste for reuse and recycling
- Incorporation of used components
- Avoidance technical barriers for reuse/recycling
- Extension of lifetime
- Quantification of substances and emissions to air (HC, AP, VOC, ODR, POP, NM, FIN)
- Assessments to water (HRA, EP & substances negatively affect oxygen balance)
- Assessments to soil ( spit, leaching of hazardous substances in use/EOC phase)

Checklist ANNEX I

Table 22: Normalisation factors: EU-27 Totals 2007

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value 2007</th>
<th>ECOReport unreasonable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>0.026</td>
<td>0.026</td>
</tr>
<tr>
<td>Paper/cardboard</td>
<td>0.007</td>
<td>0.007</td>
</tr>
<tr>
<td>Plastics</td>
<td>0.006</td>
<td>0.006</td>
</tr>
<tr>
<td>Metals</td>
<td>0.002</td>
<td>0.002</td>
</tr>
<tr>
<td>Ceramics</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Non-metallic light sources</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Non-Metallic heavy sources</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

1.4.1' NEW STRUCTURE (Fig. 1)

1.4.1'NEW [Highlights/ incomplete]
**Introduction [1.4 New method outlines, continued 2]**

1.4

- Task 5 (ECA part): Stock effect (recycling cap) now also for plastics in long-lasting products
- Task 5 (LCA part): Environmental indicator checklist (from Annex I), further extended with health-related issues (indoor noise, vibration, radiation, EMF)
- Task 5 (LCC part): LCC analysis also for societal costs (from CAFE), New: escalation rate
- Task 6 (design options): more guidance on e.g. design option clustering (to do?)
- Task 7 (Scenarios) more tuned to next step (Impact Assessment).

1.5 Detailed guidance, tools, data, etc. only for new and critical areas (Chapters 2 to 8 → MEErP Tasks 1 to 7)

---

**Task 1: Scope [summary overview]**

1.1.1 Identify relevant Prodcom/ EN/ISO/ Labelling categories
1.1.2 Define preliminary product scope, definition, primary (“functional unit”) and secondary performance parameters, for indirect EPs the affected energy systems.

1.2. Test standards (EU, Member State and 3rd country level)

1.2.1 Identify & describe relevant test standards: EN/ISO/ Member States / 3rd country test standards (e.g. ASHRAE, ANSI, JIS) & mandates to ESOS, regarding the test procedures for performance (as in 1.1.2), resources use & emissions, safety, noise & vibrations if applicable, other posing a barrier.

1.2.2 Do a comparative analysis for overlapping test standards

1.2.3 Report on new test standards being developed (describe major changes), problems on accuracy, reproducibility, affordability, representativeness; draft mandates into the ESI; differences between standards covering the same subjects (comparative analysis)

---

**Task 1 [guidance product scope & definition]**

Lessons learned from past/ ongoing prep. studies for products

a/b with multiple – alternative or simultaneous – functionality (heat, OR cool, heat OR hot water, ventilate AND cool, oven grill AND/OR microwave, etc.)
c with different capacities (wide disparity in size/capacity/etc.)
d with integrated lay-out (one package) and/or modular lay-out (multi-package)
e that are parts/components (not end-products)
f where performance is a mix of operating modes
g where real-life operating conditions (e.g. climate) show large differences
h with identical function (e.g. space heat), but very different technologies (e.g. gas boiler, heat pump, etc.)
i where important parts of performance are non-quantifiable (e.g. aesthetics, cultural value, etc.)
j where the functionality test standards are under review

---

**Questions/ comments?**
**Task 2: Markets [summary overview]**

2.1. Generic economic data

Official EU statistics: EU production, extra-EU trade, intra-EU trade → Apparent consumption (physical units & value; split up per EU Member State).

2.2. Market and stock data


Parameters:
- installed base (‘stock’, units) & penetration rate [%];
- annual sales growth rate [%];
- average product/service life (years) & rough indication of spread
- replacement sales (units, derived);
- new sales (derived).

**Task 2: Markets [summary overview 2]**

2.3. Market trends

2.3.1 General trends

2.3.2 Market Channels & production structure; major players

2.3.3 Trends in product design, from consumer ass. tests (anecdotal)

2.4. Consumer expenditure base data

- Avg. EU end-user prices (consumer incl. VAT); B2B excl. VAT
- Prices of consumables (detergent, toner, paper, etc.), in
- Repair & maintenance costs, in €/life
- Installation costs (installed products only)
- Disposal tariffs/taxes (possible)

For energy, water, interest, discount rates and their annual real increase (escalation rate) use MEErP default values.

**Task 2: Markets [Default rates, sample]**

**Task 2: Markets [Default rates, summary EU]**

Summary energy, water & financial rates EU-27, 1.1.2011

<table>
<thead>
<tr>
<th></th>
<th>incl VAT</th>
<th>excl VAT</th>
<th>Year on year growth</th>
<th>Long term annual growth</th>
<th>Domestic price change</th>
<th>Domestic price change excl VAT</th>
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</thead>
<tbody>
<tr>
<td>Electricity – € / kWh</td>
<td>0.19</td>
<td>0.11</td>
<td>5%</td>
<td>0.31</td>
<td>2.1%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Gas – € / gas (m³)</td>
<td>1.59</td>
<td>1.08</td>
<td>4%</td>
<td>2.6%</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Water – € / m³</td>
<td>3.70</td>
<td>3.70</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.5%</td>
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<td>Interest rate – %</td>
<td>7.7%</td>
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<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
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</tr>
</tbody>
</table>

Questions/comments?

* = unless deviation from actual values exceeds 1% point

Source: Eurostat 2011 et al.
Task 3: Users [basic definitions]

- **ErP with direct impact**
  - Production
  - Distribution
  - Use phase
  - End-Use

- **ErP with indirect impact**
  - Production
  - Distribution
  - Use phase
  - End-Use

- **ErP with direct + indirect impact**
  - Production
  - Distribution
  - Use phase
  - End-Use

---

Task 3.1: Example System Aspects

3.1. EXAMPLE: Ventilation from product=strict to product=sysm
- **Motor**
- **Drive + Motor**
- **Fan + Drive + Motor**
- **Central Ventilation Unit: Casing, Filters, Unit Controls, Heat exchanger (recovery), Fan(s) + Drive(s)**
- **Mechanical Ventilation System: Central Ventilation Unit(s) + Ductwork + Terminals + Distribution controls + possibly additional functionality (pre-heat, humidification, etc.)**
- **Natural Ventilation (or hybrid) Systems**

---

Task 3: Users [summary overview]

3.2. System aspects: use phase, for ErP with indirect impact

- **Identify and describe affected energy system(s), including -generically- interaction**
- **Repeat Tasks 1.2, 1.3 (test standards, legislation and 2 (market) for affected energy system, but only for technical parameters relevant for interaction with ErP**
- **Data retrieval of use phase energy consumption (and related emissions) of affected energy system (=Task 3.1 repeat for affected system)**
- **Technical detailed description of interaction between ErP and affected system (backed up by statistics, field data)**
- **Quantify energy use and related environmental impacts of the affected energy system during the use phase, in as much as it depends on the interaction with the ErP**

---

Figure 3.1: Example System Aspects

EU-27 ELECTRICITY END-USE, 2007, in TWh

---

Figure 3.2: Example 1

EXAMPLE: Building Insulation Materials (BIM)
Task 3.2: Example 1
EXAMPLE: Building Insulation Materials (BIM)

$$\text{Affected Energy} \ AE = \text{Transmission losses buildings QT}$$

$$AE = UT \ \text{season}$$

with
- $AE$ is affected energy consumption in Wh
- $U$ is the average insulation value in W/m².K
- $T$ is non-transparent building shell surface in m²
- $\text{season}$ is time period of heating/cooling season in h

$$\eta$$ is efficiency central heating system

$$T$$ is average temperature difference indoor-outdoor over the season in degree Kelvin ($K$)

$$A$$ is non-transparent building shell surface in m²

$$\Delta q$$ is efficiency central heating system

$$\eta_{CH}$$ is dimensionless

$$\text{Interaction:} \ \text{Energy:} \ \eta_{\text{CH}} \ \Delta q \ \text{season}$$

$$\text{Example:} \ \eta \approx 0.7 \ W/m².K$$

**Example:** Energy exchange from inside to outside during the heating season or vice versa.

**Task 3.2: Example 2
EXAMPLE: Windows (continued, interactions*)

$$\text{Affected Energy} \ AE = \text{Transmission losses building QT}$$

$$AE = U T$$

with
- $AE$ is affected energy consumption in Wh
- $U$ is the average insulation value in W/m².K
- $T$ is non-transparent building shell surface in m²
- $$\text{QT}$$ is BIM but for transparent shell components
- $g$ in W per period and $\eta_{\text{dimensionless}}$

**Example:** Energy exchange from inside to outside during the heating season or vice versa.

**Task 3.2: More examples
EXAMPLE: Water-saving showerheads & taps

Save linearly* on variable part of water heater energy (total water heater energy minus standing loss):

$$AE = (\text{QWH stood})$$

**EXAMPLE: Cold wash detergents

Save linearly* on electric heating element energy (not the motor energy) of the washing machine, proportional to temperature difference between cold water temperature, multiplied with the specific energy consumption $q$ (in Wh/K).

$$AE = (\text{Twash – Tcoldwater}) x q \text{WMheat}$$

**MOST ABOVE EXAMPLES:** Problem is in the data, not in the method

* = simplified, e.g. not addressing transparent solutions, possible interference/ventilation issues

**Task 3: Users [summary overview 3]

3.3. End-of-Life behaviour
3.3.1 Product use & stock life (+time between purchase and disposal)
3.3.2 Repair & maintenance practice (frequency, spare parts, trip km, other impacts)
3.3.3 Collection rate (by fraction, consumer perspective)
3.3.4 Second hand use, fraction of total and second hand life
3.3.5 Best Practice in product use (from above)

3.4. Local infrastructure (barriers & opportunities)
3.4.1 Energy: reliability, availability and nature
3.4.2 Water (when appropriate, e.g. use of rain water, hot fill with washing machines)
3.4.3 Telecom (when appropriate, hot spots, WLAN, etc.)
3.4.4 Installers, e.g. availability, level of know-how/training
3.4.5 Physical environment, e.g. possibilities for product sharing

3.5. Recommendations

3.5.1 Refined product scope usage & consumer perspective
3.5.2 Barriers and opportunities, from consumer behaviour and infrastructure

**After Task 3:**
- Inputs (use phase) available for following tasks
- Barriers and opportunities identified consumer behaviour
Task 4: Technologies [summary overview]

4.1 Technical product description, illustrated with data on performance, price, resources/emissions impact of technologies.

4.1.1 Existing products (working towards definition of Base Cases).

4.1.2 Products with standard improvement (design) options.

4.1.3 Best Available Technology (BfT) (best of products on the market).

4.1.4 Best Not yet Available Technology (BNAT) (best of products in field tests, labs, etc.; previously separate task).

4.2 Production, distribution and end-of-life, specifically regarding BOMs (Bill-of-Materials), preferably in EcoReport format (see Task 5).

4.2.1 Primary scrap production during sheet metal manufacturing.

4.2.2 Packaging materials.

4.2.3 Volume and weight of the packaged product.

Questions/ comments?

Task 5: Environment & Economics [summary overview]

5.1 Product specific inputs, choose all relevant quantifiable Base Case information from previous tasks and prepare for modelling.

5.2 Base Case Environmental Impact Assessment, use EcoReport with outputs per environmental indicator and ‘cradle-to-grave’ stages of product life (New: REACH).

5.3 Base Case Life Cycle Costs for consumer, use new LCC equations, including escalation rate.

5.4 Base Case Life Cycle Costs for society, use extended LCC equations with CO2 and stock price, societal damage certain emissions, etc.

5.5 EU Totals, aggregate results 5.3 and 5.4 (per product) to EU totals.

- 5.5.1 over period 2010 to 2010+ product service life.
- 5.5.2 per year (most recent, e.g. 2010).

Task 5.2: LCI* accounting principle

- Process
  - Raw Material(s)
  - New Material(Output)

- Emissions to air → water → soil (waste)
- Energy / water/ aux. resources
- Capital equipment manufacturing (usually negligible <1%)

- Total account of resources use and emissions for new material

Questions/ comments?
LCI indicators emissions

<table>
<thead>
<tr>
<th>Impact Unit</th>
<th>Material(s)</th>
<th>kg CO2 eq</th>
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</thead>
<tbody>
<tr>
<td>CO2</td>
<td>kg</td>
<td>1.37</td>
</tr>
<tr>
<td>NOx</td>
<td>g</td>
<td>0.07</td>
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<td>SO2</td>
<td>g</td>
<td>0.08</td>
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<tr>
<td>PM</td>
<td>g</td>
<td>0.5</td>
</tr>
<tr>
<td>PAH</td>
<td>g</td>
<td>0.2</td>
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<tr>
<td>PM10</td>
<td>g</td>
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<td>PM2.5</td>
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<td>SO3</td>
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<td>Hg</td>
<td>g</td>
<td>0.5</td>
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MEErP Methodology Part 1

LCI indicators resources use 1

<table>
<thead>
<tr>
<th>Impact Unit</th>
<th>Resource(s)</th>
<th>kg</th>
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<tbody>
<tr>
<td>Metals</td>
<td>Ni, Cu, Pd, Ru, Os, Ir, Pt</td>
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</tr>
<tr>
<td>Glass</td>
<td>SiO2, CaO, MgO, Al2O3</td>
<td></td>
</tr>
<tr>
<td>Plastics</td>
<td>PE, PP, PS</td>
<td></td>
</tr>
</tbody>
</table>

LCI indicators resources use 2

Recycling %

New indicator: 'recycmax', sets cap on secondary recycling fraction to take into account stock effect (relevant for long-living E/P, level playing field between plastics and metals)

Stock effect (construction):
Dispose: Sales 40-50 years ago. As continuous growth (e.g. 3%) even if all waste is recycled it is never enough to cover more than ca. 35% of New Sales input.

Critical Raw Materials (CRM) g/kg


The characterisation factors are based on multiplication of 4 factors with values as given in the COM annexes:

- EU consumption (t/ha, for normalisation purposes)
- Import dependency rate (% import of EU-use)
- Substitutability rate (fraction determined by expert panel, 1=substitution very well possible, 0=impossible)
- (1 - post consumer Recycling rate)

The reference is Antimony (Sb) and the indicator is expressed in g Sb equivalent.
LCIA indicators resources use 4

<table>
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<tr>
<th>Impact</th>
<th>Unit</th>
<th>Calculating</th>
<th>Requirement</th>
<th>Primary energy</th>
<th>Net Calorific Value</th>
<th>Conversion in Part II</th>
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</thead>
<tbody>
<tr>
<td>Energy</td>
<td>MU</td>
<td>Direct &amp; Indirect</td>
<td>Requirement</td>
<td>3 MJ primary = 1 kWh e</td>
<td>Net Calorific Value</td>
<td>Conversion in Part II</td>
</tr>
<tr>
<td>Water</td>
<td>m³</td>
<td>Process water</td>
<td>Cooling Water</td>
<td>m³</td>
<td>m³</td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>kg</td>
<td>Hazardous</td>
<td>Non-hazardous</td>
<td>kg</td>
<td>kg</td>
<td></td>
</tr>
</tbody>
</table>

LCIA non-indicators

Product life l, number of users N, land-use
- The current values of l and N are important modelling inputs, but not to be used as indicators because
- For EIP with improvement potential beyond the minimum target level, prolonging product life l can (usually) be counter-productive
- For promotion of number of users N per product is a Good Thing, but in practice is hardly influenced by product design. Therefore not considered.
- Background: Correlation formula
  \[ E_{\text{function}} = \frac{(E_{\text{production}} + E_{\text{use}} + E_{\text{disposal}} - E_{\text{recycling}})}{(l \times N)} \]
  with \( E_{\text{function}} \) is impact per person year.
- Land-use is a (scientific) parameter, but currently not developed sufficiently yet in EU policies for EIP (possibly at next review)

EcoReport 2011

- EcoReport 2011 tool (.xls) automates most of LCA calculations, but manual calculation still necessary for some indicators (as indicated in report)
- Basic set of "LCIA Unit Indicators" in impacts/kg material or input is given, but must be extended/corrected in prep. study as necessary with Extra Materials worksheet facility
- With respect of 2005 the updated LCIA characterisation factors were used. LCIA Unit indicator for electricity was updated.
- To facilitate assessment of eligibility a table of Normalisation factors is added and fraction of EU-shares of products in an emission or resources quantity is calculated (see also Task 1)
- EcoReport 2011 is primarily intended for environmental analysis, but basic economics calculation (LCC) is also foreseen. The latter has been extended with escalation rate of energy prices (see also hereafter)
- For internal Commission use and easier maintenance by 3rd parties the xls tool has been restructured.
- A new manual was added, both in the report and the xls tool.

EcoReport 2011: New Materials sheet

Task 5.3: Life Cycle Costs (consumer)

\[ LCC = PP + PWF \times OE + EoL, \]
where:
- \( LCC \) is Life Cycle Costs to end-users in €,
- \( PP \) is the purchase price (including installation costs) in €,
- \( OE \) is the annual operating expense in €
- \( EoL \) End-of-life costs (disposal cost, recycling charge) or benefit (resale) in €
- \( PWF \) (Present Worth Factor) is:

\[ PWF = \frac{1}{(1+d)^{l}} \]

- \( l \) is the product life in years and
- \( d \) is the discount rate in %
- \( g \) is the inflation-corrected annual growth rate of OE (a.k.a. 'escalation rate') in %
Task 5.3: Life Cycle Costs (consumer)

When Operating Expense consists of several elements (energy, water, etc.), then calculate escalation rate from the weighted average.

If d = e, as is currently the case, then simplified formula:

\[ LCC = PP + N \ast OE + EoL, \]

where

- \( N \) is the product life in years

RULE: Currently both d and e are around 4% for energy products. If difference between the two is >1% then the complex formula shall be used.

Task 5.3: Life Cycle Costs (societal)

Societal LCC = LCC consumer + LCC ext.damages (to society) [NEW]

\[ LCC ext.damages = PP\text{damages} + N \ast OE\text{damages} + EoL\text{damages} \]

\[ PP\text{damages} = \text{Impacts} \left[ \text{GWP in kg CO}_2 \text{eq.}, \text{AP in kg SO}_2 \text{eq., etc.} \right. \text{ in Production and Distribution phase} \times \text{Damage unit value} \text{ (in €/kg)} \]

\[ OE\text{damages} = \text{Impacts} \text{ in Use Phase} \times \text{Damage unit value} \]

\[ EoL\text{damages} = \text{Impacts} \text{ in End of Life Phase} \times \text{Damage unit value} \]

**Table 5.3.1: Impacts**

<table>
<thead>
<tr>
<th>Impacts</th>
<th>GWP, kg CO2 eq</th>
<th>AP, kg SO2 eq</th>
<th>VOC, kg</th>
<th>PM, kg PM10 eq</th>
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<tr>
<td>Damage 1</td>
<td>0.014 €/kg</td>
<td>0.006 €/kg</td>
<td>0.001 €/kg</td>
<td>0.0001 €/kg</td>
</tr>
<tr>
<td>Damage 2</td>
<td>0.008 €/kg</td>
<td>0.0008 €/kg</td>
<td>0.0001 €/kg</td>
<td>0.00001 €/kg</td>
</tr>
</tbody>
</table>

Source values: CAFE. Escalation rate of damages is same as of energy (4%)
**Task 6: Design Options [summary overview 3]**

6.5 Long term potential (BNAT) & systems analysis

6.5.1 Discuss long-term technical potential within existing product system. Showing that after LLCC targets there is sufficient scope for product differentiation (relevant for industry competitiveness and consumer choice; also for ‘A’+ label classes)

6.5.2 Discuss long-term technical potential of new (alternative) systems. Showing that after LLCC targets there is sufficient scope for product differentiation (relevant for industry competitiveness and consumer choice)

**Tasks 6:**

- LLCC target levels (→ specific EcoDesign limits)
- BAT and BNAT benchmark levels (→ ‘A’, ‘A’+ etc. label class limits, if applicable)
- Scope for product differentiation, after LLCC levels

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**Questions/ comments ?**

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**Task 7: Scenarios [summary overview 2]**

7.2 Scenario analysis unit stock/sale & environmental

7.2.1 Set up stock-model, 1990-2050 (2020) with MEERp guidance and calculate baseline scenario (‘BAT’, ‘Base Case’) for resources use/ emissions [in physical units]

7.2.2 Calculate scenario for options identified in 7.1.4 (e.g. ‘Min’, ‘Max’, ‘Min+Max’, etc.)

7.3 Impact analysis (socio) economic

7.3.1 Introduce economic parameters (prices, rates, turnover/employee, margins & overhead, etc.). Determine simple (linear) price elasticity for indicator target levels, from known anchor points (BC, LLCC, BAT)

7.3.2 Run extended stock model scenarios 1990-2050 (2020) for EU-27 on running costs & consumer expenditure, industry/wholesale/retail revenues & jobs (2020 and 2030), SME share in jobs and revenues

---

**Task 7: Scenarios [summary overview 3]**

7.4 Sensitivity Analysis

Run scenarios at 50% higher/lower energy price and price elasticity

Run scenarios at different target & timing levels (indicated by Commission)

7.5 Summary

7.5.1 Summary policies chosen/investigated

7.5.2 Summary annual and accumulative scenario outcomes for Baseline, 2020 and 2030 (2050 for construction products)

7.5.3 Summary of possible negative impact on competitiveness, health, safety [y/-table]
Task 7: Scenarios [summary overview 4]

After Task 7 & final report:

There should be

• Sufficient information for the Commission to draw up first Working Documents (draft legislation)
• Sufficient information for the Commission’s Impact Analysis, accompanying the legislation

BUT

• MEErP 2011 is not an automatic law making procedure; the preparatory study is an analytical document at the responsibility of the contractor. Political and legislative choices, at the responsibility of the Commission, are indispensable in the follow-up.

Task 7: Guidance on stock model set-up

Questions/ comments?
MEErP presentation 9.9.2011

ADDENDUM RECYCLING

COWI/VHK 2011

New 2011

‘recycled content’ approach

Disposal 2011

MATERIALS

Installed stock kg
2011

age

New 2011

‘recycled content’ approach

MATERIALS

Installed stock kg
2011

age

New 2011

‘recycled content’ approach

MATERIALS

Installed stock kg
2011

age

New 2011

‘recycled content’ approach

MATERIALS

Installed stock kg
2011

age

New 2011

‘recycled content’ approach

MATERIALS

Installed stock kg
2011

age

Basic descriptive accounting: The sum fits the total impact of the material in a particular (future) year

New material from recyclable material ('closed loop'), only replace waste

‘recyclability’ approach

potentially recyclable material

Stock irrelevant

waste
New material from recyclable material in ‘closed loop’: Only replace waste, partially by virgin and partially by recycled material + for every ‘loop’ count the recycling impact.

IMPACTS

potentially recyclable material

Stock irrelevant

RESULT

MEErP ‘Recyclability’

193 MJ/kg recyc. 11% (overall aluminium 35%)

43 MJ/kg recyc. 88%

e.g. aluminium extrusion
Methodology for Ecodesign of Energy-related Products

MEErP 2011
Env. Policies & Data Report
(Methodology Part 2)

COWI Belgium sprl -in association with- Van Holsteijn en Kemna B.V. (VHK)

Prepared for the European Commission, DG Enterprise and Industry
Unit BI Sustainable Industrial Policy

under specific contract SI2.581529, Technical Assistance for the update of
the Methodology for the Ecodesign of Energy-using products (MEEuP),
within the framework service contract TREU/R1/350-2008 Lot 3

Reni Kemna (p.l.)
Brussels/Delft, 30 July 2011

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MEErP 2011
Methodology Reports

Content
Materials Recycling Energy Water Waste Emissions Other impacts

EcoReport Unit Indicators
Climate, Energy & Buildings People

MEErP 2011
Policies & Data Report

The EU strategy in materials resources efficiency is probably best characterised by the ‘5R’ priorities
in the 2008 Waste Framework Directive:

- Reduce (Design for Dematerialisation)
- Re-use (Design for Re-use)
- Recycle (Design for Recycling)
- Recover (Design for energy recovery)
- Remove (Design for best disposal)

Figure 1: Share of imports in EU-27 consumption of selected materials (2000–2007)
Figure 2. Crude steel production and scrap consumption EU27 (source: Eurofer).
Note: The scrap also includes over one-third primary scrap, i.e. recovered from processing and manufacturing. The secondary scrap at end-of-life is comparable to that of aluminium, i.e. around 35-40% ‘recycled content’ overall.


Figure 4. EU27 plastics use and end-of-life 2009 (source: PlasticsEurope, Plastics-The Facts, 2010)

Figure 5. Europe Plastics Demand by Resin Types 2009
(Source: PlasticsEurope Market Research Group (PEMRG))

Figure 6. EU27+EFTA aluminium demand 1980-2009 and main applications
(source European Aluminium Association EAA, 2010)

Figure 7. Materials balance aluminium production ‘Europe’
(at least EU27+Norway, Iceland, Switzerland, Liechtenstein), 2008 (source EAA 2010)
Figure 8. European Aluminium Flow, 2004 (source EAA & OEA, Aluminium Recycling Europe, 2006).

Figure 9. Production concentration of the 'critical' raw materials by source country (source: EC, DG ENTR).

Figure 10. Generation of post-consumer plastics waste by application, EU-27, 2008

Figure 14. EARTH’S ENERGY RESOURCES: Energy flux, accumulation, destruction, and use (Source: W. Hermann. Quantifying Global Exergy Resources. Energy 2006;31(12):1349-1366.)
Figure 18. IEA long-term global energy scenario ‘Golden Age of Gas’ (source: IEA 2011)

Figure 19. Annual global flow of consumed energy resources (Cullen & Allwood 2010)

Figure 20. Energy Trade Balance, EU-27, 2007 [© VHK 2011]


Figure 22. Renewable energy flows, EU-27, 2007, in Mtce (© VHK 2011)

Figure 23. Energy Balance, EU-27, 2007, Total gross inland consumption (Mtoe) [© VHK 2011 on the basis of Eurostat Energy Balance Sheet 2007 (2010 ed.), with adjustments]
Figure 25. Gross electricity (left) and primary energy (right) consumption by main fuel in EU 27, 1990–2008 Source: EEA, 2010a, Eurostat 2010

Figure 27. Projections of renewable energy in electricity and heating/cooling (source: EC, 2011, Analysis on the basis of National Renewable Energy Action Plans)

Figure 28. EU-27, 2007 Energy consumption by product origin © VHK 2011

Figure 29. EU27 Thermal electricity generation efficiency according to misc. sources (compilation VHK 2011)


<table>
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<tr>
<th>From</th>
<th>TJ</th>
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<th>Mtoe</th>
<th>GWh</th>
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<td>1x10^-3</td>
<td>1.163x10^-3</td>
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<tr>
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<td>1x10^7</td>
<td>1</td>
<td>11630</td>
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<td>GWh</td>
<td>3.6</td>
<td>860</td>
<td>8.6x10^-4</td>
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Figure 30: Water abstraction for irrigation, manufacturing industry, energy cooling and public water supply (million m³/year) in the early 1990s and 1998–2007 in Eastern, Western and Southern parts of Europe and Turkey (source: EEA CSI).

Figure 31: Waste streams by type (EU27 and Norway), Source: Eurostat data centre on waste, 2010.

Figure 32: Waste streams by origin 2006 for EU, EFTA, Turkey and Croatia. Source: Eurostat data centre on waste, 2010.

Figure 33: Hazardous waste generation in the EU-15, EU-12 and in EU-27 plus Norway, Switzerland, and Croatia, 1997 to 2006. [1997 data not including Croatia] Source: Compiled by ETC/SCP based on countries’ reporting to the European Commission and to the Secretariat of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (2010a,b).

Figure 34: WEEE put on the market, collected and recycled/recovered/reused in 23 European countries (kg/person), all figures relate to 2006. Source: Compiled by ETC/SCP based data from Eurostat data centre on waste, 2010a,b.
**Figure 35:** Trends and outlook for management of municipal waste in the EU-27 (excluding Cyprus) plus Norway and Switzerland, baseline scenario. Source: ETC/SCP, 2010a.

**Figure 37:** Absolute GHG emissions in the EU 27, 1970–2009 Source: EEA, 2010a, 2010b; EC-JRC/PBL, 2009.

**Figure 39.** GHG emissions by sector (source: European Environmental Agency EEA)

**Figure 40:** Change in GHG emissions by main gas in EU 27, 1990–2008 (left) and breakdown by gas in 2008 (right) (source EEA, 2010a)

**Figure 41:** Overview of top decreasing/increasing GHG sources in the EU 27, 1990–2008 Source: EEA, 2010a

Note: The ranking is based on the so-called key source categories analysis, at EU level, 2008 EU GHG inventory to the UNFCCC. The numbers in brackets refer to multi-year data for reporting greenhouse gas emissions sources according to the UNFCCC Reporting Provisions (UNFCCC, 2008).
Figure 44: Production and consumption of ozone depleting substances in EEA member countries, 1986–2009. Source: EEA, 2010a.

Figure 45: Past and projected emissions of the acidifying pollutants. EEA–32 + Western Balkan countries. Source: IASIA, 2010a.

Figure 46: NOx, SOx, NH3 emission sources EU, 2007. Source: EEA, 2010 air pollution.

Figure 47: NMVOC emission sources EU, 2007. Source: EEA, 2010 air pollution.

Figure 48: Past and projected emissions of NMVOC emissions. EEA–32 + Western Balkan countries. Source: IASIA, 2010a.

Figure 49: Emission trends of selected persistent organic pollutants (POPs) (EEA member countries - indexed 1990 = 100). Source: EEA gap-filled URTAP Convention.
Figure 52: Emissions by sector of selected persistent organic pollutants - 2008 (EEA member countries) Source: EEA gap-filled LRTAP Convention

Figure 54: Emission trends of selected heavy metals (EEA member countries - indexed 1990 = 100) Source: EEA gap-filled LRTAP Convention

Note: Emission trends 1990-2008 for cadmium (Cd), mercury (Hg) and lead (Pb).

Figure 55: Emissions by sector of selected heavy metals - 2008 (EEA member countries) Source: EEA gap-filled LRTAP Convention

Figure 56: Past and projected emissions of the main air pollutants and primary particulate matter: EEA-32 + Western Balkan countries Source: IIASA, 2010a

Figure 57: Emissions of primary PM2.5 and PM10 particulate matter (EEA member countries) Source: EEA gap-filled LRTAP Convention dataviewer

Figure 58: Sector contributions of emissions of primary particulate matter (EEA member countries, 2008). Source: EEA gap-filled LRTAP Convention dataviewer

Note: This chart shows past emission trends of primary PM2.5 and PM10 particulate matter, 1990-2008.
OTHER IMPACTS

Figure 59: Regional variation in wastewater treatment between 1990 and 2007. Source: EEA-ETC/WTR (CSI-024)

Figure 60: Emissions of mercury to water based on E-PRTR reporting of 2007 data. Source: Version 2 published on 8 June 2010; www.eea.europa.eu/data-and-maps/data/esa_eprtr/esa_eprtr?tab=tab1

Figure 61: Trends in annually averaged river orthophosphate concentration (mg/l) aggregated to the sea region to which each river drains. Source: EEA-ETC/Water (CSI 020)

Figure 62: Trends in total phosphorus concentrations (mg/l) in lakes of three European regions. Source: EEA-ETC/Water (CSI 020)

Figure 63: Overview of the aquatic nitrogen cycle and sources of pollution with nitrogen. Source: Ærtebjerg et al. (2003) in EEA 2010

Figure 64: Reported noise exposure of more than 55 dB L_{Aeq} in European agglomerations with more than 250,000 inhabitants based on the results of strategic noise mapping. Source: Noise 2010

The figure shows the reported long-term (yearly) average exposure to day-evening-night noise of more than 55 dB L_{Aeq} in 117 agglomerations with more than 250,000 inhabitants.
# ECOREPORT

## UNIT INDICATORS

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<th>TDI WATER</th>
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<td>1.25</td>
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Table 1: ECOREPORT unit indicators, Part 1 (MM)

---

Table 2: ECOREPORT unit indicators, Part 2 (MM)

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Table 3: ECOREPORT unit indicators, Part 3 (MM)

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<td>1.26</td>
<td>1.25</td>
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<td>1.25</td>
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</table>
Figure 71. Tertiary sector hot water tapping points.
Note: Indicative of hot water use distribution. Tertiary sector hot water consumption is ca. 33% of residential. Source: BRGC 2004.

Figure 72. Simplified approach: One- or two dwelling units, 110 m²/dwelling; Multi-family 65 m²/dwelling; tertiary 2,500 m²/building, Industrial 2,500 m²/building, Agricultural greenhouses 5,800 m²/building.

Figure 73. Split-up of 110 bln. m³ heated volume equivalent at 18°C indoor temperature in the EU (VHK, summary of ENER Lot 1, 2007, Task 3 report).

Figure 74. EU-27 number of single family or duplex dwellings and buildings 2010

Figure 75. EU-27 number of dwellings in multi-family buildings

Figure 76. Share of low- and high-rise buildings EU-27
Figure 77: Tertiary sector building units, EU-25, 2005.

Figure 81: EU Hotels, Bars and Restaurants 2005, no. of companies and accumulated ventilation rate (in mln. m³) by type. Eurostat (2006) reports for the EU-27 a capacity of in total 25 mln. beds/places, subdivided between 11 mln. hotel beds, 9 mln. places on tourist campsites, 2,5 mln. holiday dwellings and 2,2 other collective accommodations.

Figure 84: EU Transport key figures (CA Factsbook)

Figure 85 Public sector summary, ventilation by department (11,100 m³/min)
Figure 95 EU Secondary sector 2005, no. of companies by type and accumulated ventilation rate (in m³/h)

Figure 96 Justice dept., heated building volume by application (ca. 75-80 m³)

Figure 98 Defence dept., EU military personnel by country

Figure 99 No. of industrial sector buildings (VHK, summary of DG TREN, Lot 1, 2007, Task 3 report)

Figure 90 EU Primary sector 2005, no. of companies by type and accumulated ventilation rate (in m³/h)

Figure 91 EU 2005 Industrial etc. building units 2010 (in mln., total 3.88 mln.)

People
Figure 92. Comfort and setback temperatures and time-periods in residential dwelling (VHK, ENEA Lot 1, 2007)

Note: For modeling purposes it is assumed that residential dwellings are constantly occupied, but not equally in all zones. The day-zone (living, kitchen, hall) is 50% of the heated floor area and occupied 16h/day from 7 to 23h. The night-zone (bedrooms) is 40% of the heated floor area and actively used 5h/day (excl. sleep). The bathroom is used 4 h/day at two different periods (7-9h and 21-22h).

Figure 93. Offices of all sizes. Occupancy rate

Questions/ comments?