Material Efficiency & Resource Conservation

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Ecodesign Directive

Executive Summary

Summary report on Task 14 within the framework of the „Material Efficiency and Resource Conservation“ (MaRess) Project

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1 Background

In 2005, the European Union released the Energy using Products (EuP) Directive, focusing on environmental standards for energy using products (Directive 2005/32/EC of the European Parliament and Council of 06 July 2005, revised by Directive 2009/125/EC of the European Parliament and the Council of 21 October 2009). This directive, also called Ecodesign Directive, establishes a framework for defining concrete requirements for individual products through so-called implementing measures. As a framework directive, it requires definition of regulations on the European and implementation on the national level. It includes both options to determine measures and regulations as well as self-regulating alternatives for the industry. In order to prepare **implementing measures,** the European Commission

- contracts **preparatory studies** on selected product groups and on cross-product group topics,
- prepares a **working programme**, which has to be revised after three years, determining the product groups to be covered (firstly for the years 2009-2011). In its interim working programme, the Commission had already determined 18 product groups and one cross-cutting issue and commissioned the respective preparatory studies for the implementing measures, serving as a basis for the discussion on proposals regarding the implementing measures during the project progression,
- involves already designated representatives of the Member States and interested parties (industry and business, trade, trade unions, wholesalers and retailers, importers, environmental protection and consumer organisations) via a **consultation forum** and
- is assisted by representatives of the Member States in a **regulatory committee**.

The example which gave rise to the highest publicity regarding an implementing measure within the Ecodesign Directive is the regulation on household lamps, leading to the phasing-out of incandescent lamps and which has evoked numerous discussions in 2009. Besides, this regulation was the subject of one out of nine short expertises within this Task 14 of the MaRess project. In addition, the European Commission has already implemented minimum requirements for other products like refrigerators and freezers, television sets and electric motors, which manufacturers and importers have to comply with when placing products on the European common market. Suggestions regarding implementing measures for further products are currently being discussed and preliminary studies are being prepared.

2 Objectives and Tasks

Against this background, the main tasks of the “MaRess” Task 14 regarding the Ecodesign Directive have been:

- a **critical examination of the working programmes 2009-2011 presented by the European Commission** for the further work process regarding the implementation of the EU Ecodesign Directive **as well as of the drafts for the implementing measures** regarding selected product groups,
- the scientific **support for a German positioning** within the consultation process for the Ecodesign Directive on the EU level, and,
- the **support for the practical application of future-oriented Ecodesign approaches**.

These tasks have been accomplished in close co-operation with the donors and in dialogue with the relevant groups of actors in Germany.

The overall objective has been to reach comprehensive and, at the same time, practice-oriented consideration of ecodesign aspects by making proposals for the design of measures for the implementation of the EU Ecodesign Directive on the EU level.

Additionally, more attention for the importance and practical implementation approaches of future-oriented Ecodesign approaches should be generated.

3 Approach

The demonstrated tasks have each been adjusted in close co-operation with the donors on behalf of the German Federal Environment Ministry (Bundesumweltministerium) and the German Federal Environment Agency (Umweltbundesamt) within the consultation process for the Ecodesign Directive and the communication and information processes with national stakeholders. In doing so, the objectives of the Task could be fully achieved. Especially the following results have been presented:

- **Nine short expertises** regarding different Ecodesign topics: In each case the basis have been specifications by the Federal Environment Agency including the research questions to be answered. For the acquirement of answers, analyses, evaluations, comments and information (e.g. preliminary studies, working documents, Excel tools), all relevant materials from the European Ecodesign Directive process have been used, but also other studies of third parties, data from producers and from the Federal Environment Agency as well as expertises, data and models available from the contractors. Some of these short expertises served exclusively as internal working papers for the preparation of a German positioning within the European consultation process, others are also publicly available at the following internet address (partly in English, partly in German only):

  http://ressourcen.wupperinst.org/downloads/index.html.

- **Further compilations** for the Federal Environment Agency: These included the preparation of data sheets for selected product groups and the supplement of a potential analysis of the Federal Environment Agency regarding Ecodesign Directive implementation measures.

- **Four expert dialogues** were planned, prepared, moderated and evaluated. Besides, the concept for a further expert dialogue was developed. The preparation of the expert discussions partly included the drafting of background and positioning papers. A total of 140 persons participated in the four expert dialogues from 2008 to 2010. Programmes, contributions and protocols of the dialogues are available on the following websites:

  http://www.umweltbundesamt.de/produkte/oekodesign/EbP-Fachgespraeche.htm and http://ressourcen.wupperinst.org/downloads/index.html.

- An **information pool** on the Ecodesign Directive, which was initiated in a previous project (project no. 206 93 300 / 02), was continued on demand of the donors until the beginning of August 2008, including the website www.eup-netzwerk.de, a monthly newsletter, a helpdesk, as well as presentations and discussions concerning the Ecodesign Directive on the occasion of conferences. Since mid of August 2008, the Federal Institute for Materials Research and Testing (BAM), now in charge of this matter, publishes its own newsletter in cooperation with the Federal Environment Agency. However, Ökopol continues with the information activities independently from the MaRess project in a different context.

The milestones and products of the Task 14 regarding the Ecodesign Directive are summarised in the following table.

4 Milestones and Products

Tab. 1: Overview of Task 14 results

Task 14 Ecodesign Directive	
AS14.1 Short expertises within the European consultation process	Short expertises on the following subjects: • Analysis of and comments on the **working programme** of the European Commission regarding the Ecodesign Directive for the years 2009-2011 • Statistical analysis of manufacturer data for **lamps*** • Ecodesign requirements for **heating systems and hot water supply boilers**: analysis of devices labelled with the “Blue Angel”* • Analysis of and comments on the Ecodesign preparatory studies on **home ventilating and air conditioners*** • Information on several questions regarding an EU regulation proposal for Ecodesign requirements for **ventilators** • Analysis of and comments on a proposal of the European Commission for Ecodesign requirements on **commercial refrigerators and freezers** • Analysis of and comments on a suggestion by the European manufacturer association CECIMO for a self-regulation initiative by the manufacturers of **machine tools** within the Ecodesign Directive framework • Analysis of the environmental impacts of **light-emitting diodes (LEDs)*** • Preparation of conclusions from the expert discussion **„Waste prevention and design for recycling“** Further compilations for the Federal Environment Agency: • **Data sheets** for selected product groups • Contribution to the Federal Environment Agency’s analysis of **energy savings potentials** of the Ecodesign Directive implementation measures
AS14.2 Expert discussion on national level	Expert discussions (concept, preparation, implementation, minutes, partly background and position papers) regarding the following topics:** • **Ecodesign Directive & Blue Angel**, 25.06.2008, Berlin (with the jury for the environmental label) • Ecodesign for **building technology**, 29.10.2008, Berlin • Ecodesign for **solid fuel small combustion plants**, 01.04.2009, Berlin • **Waste prevention and design for recycling** – operationability for the Ecodesign Directive, 02.03.2010, Berlin Concept for another expert discussion: • Ecodesign and the interests of **consumers**
AS14.3 Information on Ecodesign	Information provided until the beginning of August 2008, in particular: • **Website** www.eup-netzwerk.de • Monthly published **newsletter** • **Helpdesk** • **Presentations and discussions** about the Ecodesign directive on events Since mid-August 2008, the now responsible Federal Institute for Materials Research and Testing (BAM) publishes a newsletter in co-operation with the Federal Environment Agency (see also http://www.ebpg.bam.de).

* see http://ressourcen.wupperinst.org/downloads/index.html

** see http://www.umweltbundesamt.de/produkte/oekodesign/EbP-Fachgespraeche.htm

5 Essential Results

5.1 Essential Results of the Short Expertises

The following summary presents the essential results of the short expertises:

- The European Commission had issued a **working programme for the Ecodesign Directive process for 2009-2011**. The analysis of this programme **demonstrated**, that substantial energy savings are attainable through ecodesign requirements for energy-using products specified in the working programme. Ambitious, dynamic and technology-independent standards are necessary. The experiences of the interim working programme have demonstrated the need for stronger quality assurance of preparatory studies.
- Ideally, energy efficiency requirements for **non-directional household lamps** should put the service provided by a lamp (and its ballast) to the end-user in the centre of attention. Hence, regulatory measures are proposed as a function of light quantity and additional lamp features provided by the lamp (i.e. colour temperature, colour rendering or shatter protection), yielding a certain maximum rated power consumption as a function of these variables. A statistical analysis based on catalogue data from manufacturers could not deliver robust and funded parameters and coefficients for such a function in practice.
- The recent proposals of the European Commission for Ecodesign requirements for **heating systems and hot water supply** were analysed. The requirements and methodology for measuring energy efficiency of these appliances developed within the EU ecodesign process were exemplarily applied to selected heating systems and hot water boilers with the voluntary eco-label “Blue Angel”. The results of the calculations and further analyses showed that the implementation measures proposed by the European Commission would lead to significant changes in the market of heating technology: Market share of low-temperature heaters, which will be banned from the EU-market in 2013 due to efficiency requirements, is currently about 25%. Additionally, some combustion boilers of inferior quality will be banned. And finally, promoting programmes of both product ranges in Germany had to be adjusted.
- The analyses of the Ecodesign preparatory studies for **room air conditioning** found them seemingly consistent to a large extent. However, they revealed some improvement potential. For example, the influence of control technology on efficiency is not considered. Additionally, power limits and measurement standards applied in residential air conditioning are not clear.
- Some comments collected by producers and experts on the proposal by the European Commission for the regulation of **fans** seemed to stress the strong impact on Small and Medium Enterprises (SME) in comparison to the impact on larger com-

panies. For some smaller producers, the change in production and marketing structures will be costly whilst some European (and especially German) producers will benefit from regulation, as they will find it easier to place their more efficient products on the market. Exact estimation of the effects and conclusions were not possible due to lacking data. Experts, however, considered the proposed requirements to be feasible for the reduction of product life-cycle costs.

- The analysis of the Commission proposal on requirements for **commercial refrigerators and freezers** showed the necessity of alignment of the three EU Ecodesign Directive lots ENER 12, 13 and ENTR 1 for different product groups in the field of refrigeration and freezing. In addition to energy efficiency requirements, regulation should stimulate a more efficient lighting and the use of more climate-friendly refrigerants. A mandatory labelling of the appliances is generally regarded as positive.
- The producers association of **machine tools**, CECIMO, has proposed a self-regulatory initiative for ecodesign of their products. It seems to be a plausible proposal to first initiate a streamlined and coherent process of data generation before using this improved data to analyse the possibility of minimum energy efficiency standards. In parallel, possible energy efficiency potentials through minimum requirements for certain components should be analysed.
- The study on **light emitting diodes** (LED) analysed potential toxic or environmentally relevant materials in the production and use phase of LED, which of the materials might be scarce and recycling potentials. Special emphasis was put towards the semiconductor metals indium and gallium as they are produced as by-products in the production process of other metals in relatively small quantities. No significant negative environmental impacts have been encountered, but there are optimisation potentials in the production process and there is no data yet on recycling potentials and quota, as well as on long-term effects of LED-based lightening. A complete shift to LED technology in many countries might lead to resource scarcity problems and price increases.
- Some recommendations have been elaborated following the experts dialogue on **waste prevention and design for recycling**, especially with regard to the broadening of the applicability of the Ecodesign Directive and the consequent demand for a review of the EuP methodology.

5.2 Conclusions on experts dialogues

With the expansion of instruments for environmental protection using the means of product regulation by the European Commission and the German Federal Government, the coordination of these instruments and its material requirements has become crucial. It is essential for realising synergies and for combining instruments effectively.

The first experts dialogue on 25 June 2008 in Berlin and the subsequent strategy paper „**Ecodesign & Blue Angel**“[1] discussed the strategic positioning of the voluntary ecolabel within the array of instruments of product-related environmental protection measures. Its focus lay especially on the energy-using products regulated by the Ecodesign Directive 2009/125/EG, i.e. the then effective Directive 2005/32/EG. The essential contribution by the “Blue Angel” label is to represent a certain additional value in terms of environmental and health-related issues in comparison to existing minimum requirements and energy-efficiency labels, such that customers accept the ecolabel. Therefore, the criteria of the “Blue Angel” might have to be adjusted following EU-wide Ecodesign requirements in different product groups.

The second experts dialogue on 29 October 2008 discussed ecodesign requirements for **technical building equipment**, respectively for the ten relevant product groups regulated within the framework of the Ecodesign Directive. Special emphasis was laid on the relation between the EU Ecodesign Directive and the European Buildings Directive and its national implementation in Germany, on uniformly applied norms across product groups, on a standardised proceeding within the Ecodesign regulations demanded by participants, especially concerning different product groups relevant for heating, and finally on the consequences of technical building equipments for customers and the responsibilities of the overall optimisation.

As well in the field of heating, technical state of the art and future developments of **solid fuel small combustion installations**, emissions of particulate matters from these appliances, and standardisation processes within Europe, energy efficiency and testing procedures have been analysed in a meeting on 1 April 2009 in Berlin. Additionally, interactions between the EU Ecodesign Directive and the German emissions ordinance 1.BlmSchV and the (already above) observed systematical deviations in the development of Ecodesign requirements for heating equipment were discussed in this meeting. As it took place at a relatively early point in time concerning the regulation process, the numerous experts’ proposals could be used in the further elaboration of preparatory studies before the European Commission will issue the first draft regulation. This opened possibilities for detecting and indicating undesired developments in the regulation process.

Within the framework of the preparatory studies for the EU Ecodesign implementing measures, the analysis of the amounts of waste of the considered product groups is part of a simplified life-cycle assessment. However, requirements for the mitigation of waste-related environmental impacts or supporting the utilisation of recycled materials have not been integrated yet into the regulatory measures in the context of the Ecodesign Directive. Exceptions are information requirements for recycling and demounting for certain product groups (see e.g. lamps, pumps and motors). The reasons for this exclusion and the question if an inclusion of this topic into the ecodesign process might open up new potentials for environmental relief have been discussed at an

[1] Original German title: Ökodesign & Blauer Engel.

experts' meeting on **waste prevention and design for recycling** on 3 February 2010 in Berlin. First of all, technical, economic and political obstacles for the realisation of a waste-reducing and recycling-appropriate construction within the existing legal framework were analysed. On this basis, requirements for recovering and recycling were elaborated in two directions: towards the product design by producers and towards coordination and regulation of policy instruments and measures. Finally, possibilities and limits for further operationalisations of requirements for sustainable product design and recycling economy within the Ecodesign Directive have been discussed.

5.3 Main results of the information offered

Central elements of information materials provided have been the website www.eup-netzwerk.de which has been visited by about 3,000 users per month and the 6 email newsletters disseminated to about 300 recipients (relevant stakeholders, especially producers, government institutions and associations). These offers were completed by presentations and discussions on the Ecodesign Directive at events and conferences as well as by a helpdesk.

Actors regarded these information as useful, as feedback indicated: At this time, it was the only informational source in Germany comprising the entire Ecodesign Directive process in a clear-presented way and providing all relevant documents as fast as possible, usually within few days after issuing. This was especially important as many actors (especially small and medium enterprises) were not well-informed about the process.

6 Ecodesign Directive: Preliminary Conclusions

First rough estimations by Wuppertal Institute which have not been published yet estimated possible reductions of about 320 to 600 TWh/year of heat/fuels and about 500 to 600 TWh/year electricity, if the European Union (EU-27) realised **ambitious, but practice-oriented ecodesign requirements** for the about 40 product groups currently focused on. This induces a possible reduction of 210 to 270 million t CO_2 equivalents per year in relation to business-as-usual development. The expected increase in electricity consumption in the EU-27 may thus be mitigated and the already expected reductions of heating and fuel consumption may be enhanced.

There is no end in sight towards ongoing selection of product groups, the elaboration of preparatory studies and executive measures for ecodesign requirements for products in the European internal market. The Commission amplified the scope of the Ecodesign Directive with its 2009 revision: Now, not only energy-using products but all energy-related products shall be included. Consequently, in addition to energy efficiency issues, other ecodesign aspects (such as **material efficiency**) will gain higher importance. The question rises, which chances and challenges may be derived from the experiences with the current regulations and which aspects will have to be included with this broadening of the field of application.

As well, the **shortcomings** of the enacted ecodesign regulations have become clear:

- The **quality and methodology of preparatory studies** is not always sufficient for the deduction and justification of effective and practice-oriented implementing measures. Consequently, the European Commission should improve the requirements for the contractors of preparatory studies, for the methodological framework and tools to be applied by them, and for a common design for the presentation of results from preparatory studies.
- **Consumers** and their possible reactions to changing products and their information necessities are often not sufficiently acknowledged.
- **Aspects other than energy use** are insufficiently addressed. Apart from several information requirements, there are no measures e.g. for promoting recyclability. Other environmental or health-related aspects such as noise, toxic emissions, emissions of refrigerants in cooling appliances or use of scarce materials are not satisfactorily taken into account. Material efficiency is of no matter for the elaboration of ecodesign requirements.
- The analysis of products for technical building equipment such as heating boilers or air conditioning yields: the Ecodesign Directive only allows for a **product-specific perspective**. Interaction effects between different components (“products”) are analysed only partly by this framework. Synergy effects for additional energy savings can be realised by optimising component usage, adequate dimensioning and regulated operation within a **systemic context**. On the other hand, certain energy-efficient appliances exist, which, in certain systemic contexts, will lead to an increase in energy consumption. Many product groups thus require not only implementing measures for the market access of the special product group but an optimisation of the entire **policy package** they are embedded in, and to coordinate the single measures within the package. For instance, requirements to technical building equipment within the Ecodesign-Directive should be aligned with the EU-Energy Performance of Buildings Directive and its national implementation, with requirements regarding EU energy labelling and with any national support measures.
- Finally, the **largest part of energy savings potentials** of technology with high energy consumption and a sales minimum of 200,000 per year (criteria formulated by the Ecodesign Directive) **will be exhausted soon** by the implementing measures realised or proposed so far. Implementing measures for the remaining more complex and less standardised products with sufficient sales quantities will be increasingly difficult to realise.

Despite these limits, the Ecodesign Directive induces a **change towards more environmentally compatible products** and, in some product groups, leads to ecological innovations. Additionally, consumers are released from some information problems: they can place confidence in the market banning of the most inefficient and, in terms of **life-cycle costs,** most expensive products and in the setting up of market conditions to guide them towards more sustainable consumption.

The widened applicability of the Ecodesign Directive with its recast in 2009 to **energy-related products** creates a demand for the revaluation of numerous aspects if not only energy consumption shall be focused on. The restructuring of the ecodesign methodology required to be applied by preparatory study contractors will be especially challenging: to analyse the entire product life-cycle with all relevant environmental effects, material efficiencies and resource consumptions, to estimate consequences to certain possible policy measures and to balance the trade-offs of conflicting goals.

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