Preparatory study for the Ecodesign and Energy Labelling Working Plan 2020-2024

Assistance to the European Commission

TASK 1 BACKGROUND, METHODOLOGY AND STAKEHOLDER CONSULTATION
FINAL

Prepared by:
Viegand Maagøe A/S
Oeko-Institut e.V.
Van Holsteijn en Kemna BV
for the European Commission, DG GROW

April 2021

Prepared by:
Study team: Viegand Maagøe A/S (lead), Oeko-Institut e.V. and
Van Holsteijn en Kemna BV
Study team contact: Project Manager Jan Viegand,
e-mail: jv@viegandmaagoe.dk
Study website: www.ecodesignworkingplan20-24.eu

Main responsible team member for each product group and horizontal
initiative:
- Viegand Maagøe A/S: Uninterruptible power supplies, interconnected
  home audio and video, small network equipment for home and office use,
  aircurtains, small-scale cooking products, universal external power
  supplies, universal batteries, industrial sensors, base stations, professional
  cooking appliances, swimming pool heaters, electric vehicle chargers,
  enterprise network equipment
- Oeko-Institut e.V.: Unmanned aircrafts (drones), ecological profile,
  durability, greenhouse covers, market surveillance, non-tertiary coffee
  machines, tertiary coffee machines, hair dryers, firmware and software,
  scarce and critical raw materials
- Van Holsteijn en Kemna BV: Professional laundry appliances, professional
  dishwashers, window products, low temperature emitters, water
  decalcifiers / softeners, lightweight design, post consumer recycled
  content, street lighting systems via PV

Study team members:
- Viegand Maagøe A/S: Peter Martin Skov Hansen, Flemming Andersen,
  Kristian Madsen, Mette Rames, Bjarke Spliid Hansen, Jan Viegand
- Oeko-Institut e.V.: Corinna Fischer, Kathrin Graulich
- Van Holsteijn en Kemna BV: René Kemna, Elizabeth Maier, Hans Couvée,
  Roy van den Boorn, Rob van Holsteijn, Daniela Kemna, Martijn van
  Elburg, Pepijn Wesselman

Contract
Service contract SI2.825361
Preparatory study for the Ecodesign Working Plan 2020-2014

Cover: Viegand Maagøe A/S

EUROPEAN COMMISSION

LEGAL NOTICE

ACRONYMS

ABS	Acrylonitrile butadiene styrene	EPD	Environmental Product Declaration
AC	Alternate current/Direct current	EPR	Extended Producer Responsibility
AI	Artificial Intelligence	EPS	External Power Supply
ASTM	American Society for Testing and Materials	EPS	Expanded Polystyrene (foam)
BAT	Best Available Technology	EPTA	(Greek consultant)
BFR	Brominated Flame Retardants	ErP	Energy related product
BLDC	Brushless Direct Current	ETFE	Ethylene Tetrafluoroethylene
bn	Billion	EU	European Union
BNAT	Best Not yet Available Technology	EVA	Ethylene Vinyl Acetate
BOM	Bill of Materials	EVA	European Vending Association
BST	Base stations	EVA-EMP	European Vending Association - Energy Measurement Protocol
CAD	Computer Aided Design	FCM	Food Contact Materials
CBI	Coffee Business Intelligence	FDM	Fused Deposition Modelling
CECED	Conseil Européen de la Construction d'appareils Domestiques (predecessor of APPLIA)	FEM	Finite Element Modelling and Simulation
CEN	Comité Européen de Normalisation	FP7	Seventh Framework Programme (European Union research and development funding programme)
CENELEC	Comité Européen de Normalisation Électrotechnique	GER	Gross Energy Requirement
CFD	Computational fluid dynamics	GHG	Greenhouse Gas
CLASP	Collaborative Labelling and Standards Program (NGO)	GJ	Gigajoules
CLC/TC	Comité Européen de Normalisation Électrotechnique/Technical Committee	GPS	Gel Permeation Chromatography
CLP	Classification, Labelling and Packaging Regulation	GPS	Global Positioning System
CO2e	Carbondioxide equivalent	GPSD	General Product Safety Directive
CoC	Code of Conduct	GRP	Glass-fiber reinforced polyester
CPR	Construction Products Regulation	GS	Geprüfte Sicherheit (Tested Safety)
CRT	Cathode Ray Tube	GWh	Gigawatthours
DC	Direct Current	ha.	Hectares
DIN	Deutsches Institut für Normung (German Standardisation Organisation)	HALE	High altitude, long endurance
DOE	Department of Energy (USA)	HDPE	High-density polyethylene
DR	Drying Rate	HEPS	High Efficiency Performance Standards
DSC	Differential Scanning Calorimetry	HFRs	Halogenated Flame Retardants
EAP	Environment Action Plan	HIPS	High Impact Polystyrene
EASA	European Aviation Safety Agency	HKI	Industrieverband Haus-, Heiz- und Küchentechnik e.V.
EC	Electricity Consumption	HORECA	Hotel, Restaurant, and Catering / Café business
EC	European Commission	ibid.	ibidem (at the same place)
EC	European Community	IC	Integrated circuit
ECHA	European Chemicals Agency	ICAO	International Civil Aviation Organisation
ECOS	European Environmental Citizens Organsation	ICP	Inductively Coupled Plasma mass spectrometry
EEC	European Economic Community	IEC	International Electrotechnical Commission
EEE	Electrical and electronic equipment	IGU	Integrated Glazing Unit
EFCEM	European Federation of Catering Equipment Manufacturers	ISO	International Standardisation Organisation
EIA	Ecodesign Impact Accounting	kton	Kilo tonnes (metric, 1000 tonnes)
EMC	Electromagnetic Compatibility Directive	kW	Kilowatts
EN	European Norm	kWh	Kilowatthours
ENAK	(Swiss association for energy efficiency in the hospitality industry)	LASE	Low altitude, short endurance
EPA	Environmental Protection Agency (USA)	LCA	Life Cycle Assessment
EPBD	Energy Performance of Buildings Directive	LCC	Life Cycle Cost
LCD	Liquid crystal display	PRODCOM	Production Communautaire (database)

LDPE	Low density polyethelene	PS	Polystyrene
LED	Light emitting diode	PUR	Polyurethane
LIDAR	Light detection and ranging	PVC	Polyvinylchloride
LLCC	Least Life Cycle Costs	RAN	Radio Access Network
LVD	Low Voltage Directive	REACH	Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals
M	Million	RED	Radio Equipment Directive
MAV	Micro-air vehicle	RoHS	Restriction of Certain Hazardous Substances Directive
MEErP	Methodology for the Ecodesign of Energy-related Products	SCIP	Substances of Concern In articles as such or in complex objects (Products)
MEMS	Micro-electromechanical systems	SD	Smart Dust
MEPS	Minimum Efficiency Performance Standards	SEM	Scanning electron microscopy
MJ	Megajoules	SFOE	Swiss Federal Office of Energy
ML	Machine learning	SMEs	Small & medium size entreprises
MoU	Memorandum of Understanding	SVHC	Substances of Very High Concern
MSA	Market surveillance authority	SVHC	Substances of Very High Concern
MSP	Manufacturer selling price	SW	Solid Works (software)
MSW	Municipal Solid Waste	TEC plastics	Technical plastics
Mt	Million tonnes (metric)	TGA	Thermal Gravimetric Analysis
Mt CO2 eq./yr	Megatonnes of CO2 equivalent per year	TGL	Thai Green Label
MWh	Megawatthours	TOTEM	Tool to Optimise the Total Environmental impact of Materials
NAV	Nano-air vehicle	TWh	TeraWatthour
NEMS	Nano electromechanical systems	UA	Unmanned aircraft
NIR	Near Infrared Radiation	UAS	Unmanned aircraft system / Unmanned aerial system
NMR	Nuclear Magnetic Resonance	UAV	Unmanned aerial vehicle
OCS	Office Coffee Service	UK	United Kingdom
PA6	Polyamide (nylon)	USB	Universal Serial Bus
PAH	Polycyclic Aromatic Hydrocarbons	UV	Ultraviolet Radiation
PAR	Photosynthetic Active Radiation	Uw	U-value (insulation value) of window
PAV	Pico-air vehicle	VFF	Verband Fenster + Fassade
PBB	Polybromated Biphenyle	VHK	Van Hosteijn en Kemna
PBDE	Polybromated Diphenyle Ether	VOC	Volatile Organic Compounds
PC	Polycarbonate	W	Watts
PC-ABS	Polycarbonate/acrylonitrile butadiene styrene	WEEE	Waste electrical and electronic equipment
PCR	Polycarbonate recycled	WG	Working Group
PE	Poly-ethylene	Wh	Watthours
PEF	Primary Energy Factor	WP	Working Plan
PEF	Product Environmental Footprint	XRF	X-Ray Fluorescence
PEFCR	Product Environmental Footprint Category Rule	XRM	X-ray microscopy
PET	Polyethylene Terephthalate	µUAV	Micro-unmanned aerial vehicle
PJ	PetaJoules		
PMMA	Polymethyl methacrylate		
PoE	Power over Ethernet		
POP	Persistent Organic Pollutants		
PP	Polypropylene		
PPS	Polyphenylene Sulfide		

Contents

List of tables

List of figures

1 INTRODUCTION

This report presents the results of Task 1 'Background, methodology and stakeholder consultation' of the Preparatory study for the Ecodesign and Energy Labelling Working Plan 2020-2024. Task 1 provides the relevant policy background and methodology and outlines the stakeholder involvement.

Stakeholder comments have been received and taken into account when preparing this final version.

1.1 The Working Plan study

The European Commission has launched a preparatory study that will inform and assist the Commission in preparing the Ecodesign and Energy Labelling Working Plan 2020-2024 as part of the implementation of the Ecodesign Directive 2009/125/EC[1] and Energy Labelling Regulation (EU) 2017/1369[2]. The study is carried out by Viegand Maagøe, VHK and Oeko-Institut for the European Commission, DG GROW. The study started in March 2020 and is anticipated to be completed by the end of April 2021.

Formally, this is the first combined Ecodesign and Energy Labelling Working Plan to be undertaken following the changes contained in the Energy Labelling Regulation (EU) 2017/1369 (Article 15). However, it should be noted that previous Ecodesign Working Plans informally always kept in mind the possibility of combining Ecodesign and Energy Labelling, where judged appropriate on a product-by-product basis.

The Working Plan study is the first step in a process aiming at publishing implementing measures and acts in the Official Journal. Figure 1 shows a brief overview of the process.

---

[1] https://eur-lex.europa.eu/eli/dir/2009/125/2012-12-04 (consolidated text)

[2] https://eur-lex.europa.eu/eli/reg/2017/1369/oj
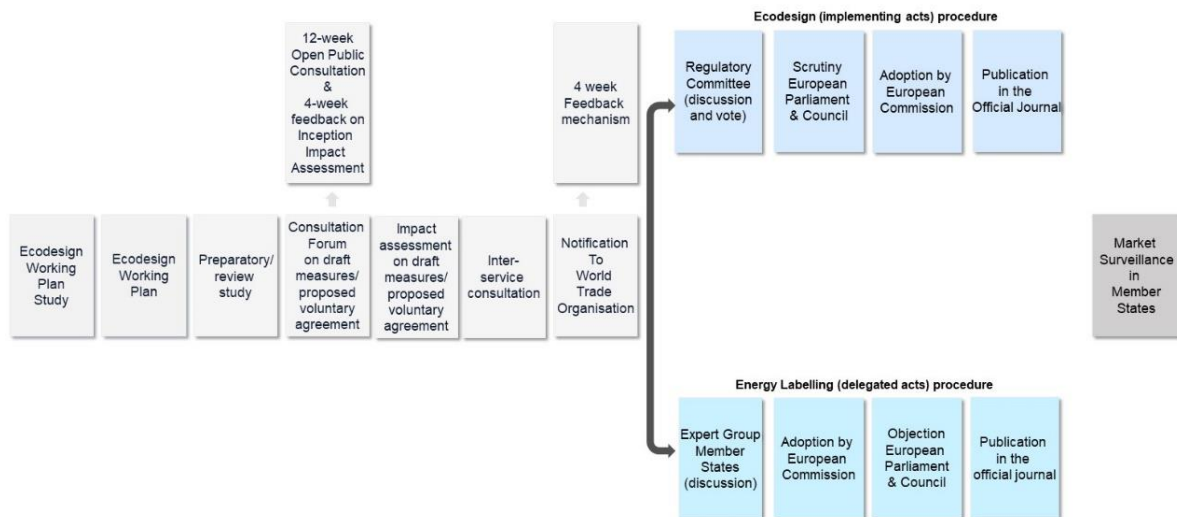
Figure 1: Process for establishing Ecodesign and Energy Labelling implementing measures and delegated acts.

1.2 Objectives

The following objectives of the Ecodesign and Energy Labelling Working Plan 2020-2024 preparatory study have been established:

1. Develop the approach for identification and prioritisation of product groups and horizontal initiatives for the working plan with a view to better take into account environmental impacts in all life-cycle stages and circular economy aspects such as products durability, reparability, upgradability, recyclability and/or recycled content.

2. Analyse the product groups and horizontal initiatives regarding sales, stock, resource consumption, improvement potential, environmental impacts, regulatory coverage and feasibility, market surveillance impact and industrial competitiveness.

3. Inform and assist the European Commission in its decision-making process to compile the Ecodesign and Energy Labelling Working Plan 2020-2024 with a strong and transparent evidence base derived from scrutinising regulations and available studies, together with a thorough consultation process of relevant stakeholders.

1.3 The study team

The Preparatory study for the Ecodesign and Energy Labelling Working Plan 2020-2024 is carried out by a consortium consisting of:
- Viegand Maagøe A/S (lead)
- Oeko-Institut e.V.
- Van Holsteijn en Kemna BV

The collective experience of the consortium used for this study stems from involvement in European product policy & policy instruments during more than 20 years including:

- Ecodesign directive and energy labelling regulation since the preparatory phases
- Development of the MEEuP / MEErP (Methodology of Energy-using / Energy-related Products)
- Carried out more than 50 preparatory and review studies and impact assessments
- Two previous working plan studies
- EU Energy Star, Green Public Procurement, standardisation
- National Market Surveillance activities
- Ecodesign Impact Accounting
- ICT Impact Study for ENER (included in current Working Plan and a basis for the current study)
- Product design, technical knowledge, circular economy, LCA, scenario modelling, stakeholder consultations, policy instruments, etc.

1.4 Acknowledgements

The study team would like to express our appreciation to the European Commission (DG GROW and the Inter-Service Group (GROW, ENER, ENV, CNECT, JUST)) and to all stakeholders and other persons and organisations we have been in contact with during the study for all input, information and dialogue, which have been very useful for the quality of the work.

1.5 Disclaimer

The information and views set out in this study and in the study reports are those of the authors and do not necessarily reflect the official opinion of the European Commission.

All assumption, estimations, assessments and analyses have been made on the basis of data and information available and the study team's knowledge and experience, and reflecting the aim of the study i.e. to inform and assist the European Commission in its decision-making process to compile the Ecodesign and Energy Labelling Working Plan 2020-2024. Due to the amount of analyses made and the relatively limited resources available for each product group and horizontal initiative, obviously the study team had to focus on the main topics for each product and initiative and to recognise a certain level of uncertainties.

For product groups and horizontal initiatives selected for the Working Plan, detailed analyses will be carried out before any implementing measure will be established and a further policy process will be carried out.

2 POLICY BACKGROUND

2.1 Ecodesign and Energy Labelling

The Ecodesign Directive and the Energy Labelling Regulation are elements of a broader product policy aiming at increasing the energy efficiency of products and in parallel reducing their overall environmental impacts; promoting the free-movement of energy-related products within EU; and providing consumers with information allowing them to select more energy efficient products among the marketed products.

At a strategic level, the Ecodesign Directive and the Energy Labelling Regulation should contribute to achieving the objectives of the Clean Energy for All Europeans package from November 2016[3], facilitating the transition away from fossil fuels towards cleaner energy and delivering on the EU's Paris Agreement commitments for reducing greenhouse gas emissions.

The Ecodesign Directive pushes manufacturers and importers to produce more energy efficient products by setting minimum requirements on products to be placed on the EU market, while the Energy Labelling Regulation provides consumers with information about the energy efficiency of products via an EU-wide energy label grading products from A (most efficient) to G (least efficient), thus encouraging EU citizens to select more energy- and resource-efficient products. Additionally, both the Ecodesign Directive and the Energy Labelling Regulation provide information on product topics related to parameters such as energy use, environmental properties, etc.

The Commission estimates that the Ecodesign Directive and the Energy Labelling Regulation contribute to about half of the EU energy saving targets for 2020, where the Directive provides 85% and the Regulation 15%[4]. Additionally, the two legal instruments reduce fossil fuel imports by circa 23% for natural gas and circa 37% for coal; ensure a level playing field for the manufacturers; and provide economic savings for EU citizens for a modelled "basket" of products corresponding to about 500 EUR/year per household.

Over the years there has been a development from mainly focusing on energy in-use consumption and related environmental impacts to broader resource aspects, taking into account the full life-cycle including material use, durability, end-of-life aspects and circularity. This took place partly due to the two aforementioned Circular Economy Action Plans, which consider the Ecodesign implementing regulations and Energy Labelling delegated acts as important instruments to reach the targets (see details in Section 2.2.1); partly due to the implemented measures capturing a large part of the in-use saving potential and thereby increasing the importance of the other life-cycle impacts.

Surveys of European consumers' opinion on environment reveal that the majority are positive towards environmental protection. E.g. a Eurobarometer survey in 2017 reported

---

[3] https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en
[4] The Ecodesign Directive (2009/125/EC). European Implementation Assessment. European Parliament Research Service. Anna Zygierewicz. November 2017.

that 94% of the respondents said that protecting the environment was important to them personally[5].

A similar trend can be seen among enterprises. Another Eurobarometer survey from 2016 showed that 73% of European SMEs are undertaking 'some kind of circular economy activities'[6], while the same figures or larger companies and companies with highest turnover is 89% and 80%, respectively. However, a study from 2015 concluded that when it comes to a practical and effective implementation and use of approaches and tools for complying with Ecodesign requirements, companies still have difficulties modifying traditional design processes. The study team of the current working plan study can add that when doing preparatory studies for product groups involving manufacturers, who have not previously been involved in Ecodesign and/or Energy Labelling activities, it requires more introduction to and more dialogue with them in order for them to fully comprehend the legislative process, the related stakeholder consultations and the subsequent necessary design changes for their products.

The Commission expects that both the Ecodesign Directive and the Energy Labelling Regulation will continue to play an important role in delivering energy and resource savings for consumers and creating business opportunities for European industry, via ensuring that more energy-efficient products come to the market through Ecodesign, while simultaneously encouraging and empowering consumers to buy the most resource-efficient products based on useful information through EU Energy Labelling[7].

2.1.1 Ecodesign Directive[8]

The Ecodesign Directive 2009/125/EC of 21 October 2009 is a framework directive, which establishes EU-wide implementing measures for improving the environmental performance of products, such as household appliances, ICT products (Information and Communication Technologies) and electric motors, when they are placed or put into service on the EU market. Being a framework directive, it provides for the setting of requirements, which the energy-related products covered by implementing measures – adopted separately – must fulfil in order to be placed on the market or put into service. An alternative is a self-regulation measure / industry voluntary agreement e.g. for imaging equipment (copy, print and scanner equipment).

The 2009 directive is a recast of the previous directive, Directive 2005/32/EC, where one important amendment incorporated into the recast 2009 version was the change of overall scope from 'energy using' to 'energy-related' products.

Product-specific implementing regulations and self-regulation are drafted on the basis of a preparatory study and revised on the basis of a review study following the Methodology for the Ecodesign of Energy-related Products (MEErP). Self-regulation typically takes place as a voluntary agreement proposed by the relevant industry stakeholders and according to Annex VIII of the 2009 Directive.

---

[5] Attitudes of European citizens towards the environment, Report, Special Eurobarometer 468, November 2017.
[6] European SMEs and the circular economy, Flash Eurobarometer 441, June 2016.
[7] Communication from the Commission, Ecodesign Working Plan 2016-2019, COM(2016) 773.
[8] https://ec.europa.eu/growth/industry/sustainability/ecodesign_en

Article 16 of the Ecodesign Directive lays down the requirement that the Commission establish a working plan that should be amended periodically by the Commission after consultation with the Consultation Forum. Three working plans (after a transitional period plan launched soon after the adoption of the 2005 Directive) have been communicated to date (2009-2011, 2012-2014, 2016-2019). The current working plan preparatory study is launched to provide the basis for the fourth working plan.

Implementing measures may lay down specific Ecodesign requirements following the method described in Annex II of the Directive. Until now, implementing measures have only been established via these (Annex II) specific requirements. However, the Directive also provides an opportunity of setting generic Ecodesign requirements following Annex I in cases where it is not possible to set specific Ecodesign requirements. These requirements may relate to supply of information, and may be requirements for the manufacturer through establishing the product's ecological profile and evaluating alternative design solutions against benchmarks established by the Commission.

2.1.2 Energy Labelling regulation

The Energy Labelling Regulation of 4 July 2017[9] is a framework regulation in line with the Ecodesign Directive establishing the general framework for implementing EU energy labelling in EU. It replaces the former Energy Labelling Directive 2010/30/EU. The latest 2017 Energy Labelling regulation has maintained the same scope as the previous directive, but some of the provisions are modified and enhanced in order to improve the effectiveness of the framework legislative scheme. The specific requirements and the label classes are established through delegated acts.

One of the new elements in the framework Energy Labelling regulation is that it lays down an obligation on the Commission to establish and make periodic updates of a long-term working plan (Article 15). The working plan must, in line with the Ecodesign Working Plan, set out an indicative list of product groups which are considered priorities for the adaption of delegated acts. The working plan shall also set out plans for the revision and rescaling of labels for product groups with the exception of the rescaling of labels which were in force at 1 August 2017, for which the rescaling is provided for in Article 11 of the Regulation.

The working plan should be reviewed every three years, and the Commission may choose to combine the working plan with the working plan that should be established in accordance with Article 16 of the Ecodesign Directive. This is the reason why the Commission has launched this combined study for Ecodesign and Energy Labelling.

There is to large extent synergy between the Ecodesign and Energy Labelling frameworks. Whilst Ecodesign addresses the supply side and pushes the market towards higher energy and resource efficiency, Energy Labelling addresses the demand side and pulls the market to even higher levels of efficiencies. The combined effects ensure dynamic improvements of the market. In this respect it also makes sense to elaborate a common working plan for both Ecodesign and Energy Labelling.

---

[9] Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU.

Other important improvements in the most recent Energy Labelling framework regulation are:

- the provisions for rescaling of the label to the A-G scale, at the same time taking into account the speed of technological progress for each product group, and ensuring that the top class(es) is empty in newly rescaled labels
- establishment of the product registration database (so-called "EPREL" database), which is a useful tool for consumers, dealers, market surveillance authorities, and for the regulatory process on revision of labels.

2.1.3 Ecodesign working plans and working plan studies

So far, four subsequent phases of implementation of working plans have taken place; a transitional period and three working plans. Each working plan has been preceded by a preparatory study.

Transitional period (2005-2009)

For this period, 8 indicative product groups had been defined in Art. 16 of the previous version of the Ecodesign Directive (Directive 2005/32/EC)[10]. These groups had later been split up into many more subgroups. 20 preparatory studies were launched in 2006; one more study (on commercial wet appliances) was added in 2009, and four more studies on motor-related products followed in 2012, together with one update study on commercial refrigeration, making for 26 studies in total. The products covered were energy-using products (EuP), because the 2005 framework directive covered solely energy-using products, with the exception of means of transport, since they are by definition excluded from the scope of the Directive (owing to the plethora of transport-related EU legislation).

First Ecodesign Working Plan 2009-2011

This Working Plan also covered EuP according to Directive 2005/32/EC, by that time already in force and being actively applied. It was preceded by a Working Plan Study that ran from 2006 to 2007; its final report was published in December 2007. The study, conducted by EPTA, PE International and NTUA[11], classified all products within the scope of the Ecodesign Directive into 57 distinct product groups. Of those, 25 were chosen as priority "A" products, and 9 were ranked priority "B". The Working Plan itself was published in October 2008.[12] It contained 10 product groups, 9 of which were chosen from the study based on the criteria of sales and trade volume, energy consumption and improvement potential. The tenth group (water-using products) had been added by the Commission after consultation with stakeholders on the grounds that water scarcity and droughts were recognised as a growing problem in Europe, even if it is debatable whether all water-using products can be categorised as energy-using or even energy-related. 12 preparatory studies were launched in 2009 and one more in 2012.

---

[10] https://eur-lex.europa.eu/legal-content/AUTO/?uri=CELEX:32005L0032&qid=1594284293298&rid=1

[11] EPTA Ltd.; EP international; NTUA (2007): Study for preparing the first Working Plan of the Ecodesign Directive. Report for tender No. ENTR/06/026. https://www.eup-network.de/fileadmin/user_upload/Hintergrund/EuP-Dokumente/Studie_Arbeitsprogramm_08_01.pdf

[12] COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT: Establishment of the working plan for 2009-2011 under the Ecodesign Directive. Brussels, 21.10.2008. COM(2008) 660 final. https://eur-lex.europa.eu/legal-content/AUTO/?uri=CELEX:52008DC0660&qid=1594285824843&rid=1

Second Ecodesign Working Plan 2012-2014

The Second Working Plan (2012-2014), published in December 2012, for the first time covered energy-related products (ErP), according to the new, current Ecodesign Directive 2009/125/EC, which from that time covered not only energy-using products but also energy-related products, such as windows. The respective Working Plan study was conducted by Van Holsteijn en Kemna (VHK) from November 2010 to December 2011 and presented a list of 36 product groups, ranked by energy savings potential, some of which had already been proposed by the first Working Plan Study.[13] According to the Terms of Reference, the first twenty were considered as priority products. The actual Working Plan[14] included seven broad groups and five conditional product groups; the latter groups depending on the outcome of on that time ongoing regulatory processes and/or reviews.

Basically, the above set of products comprise the first priority groups of the study. Smart appliances / meters and wine storage appliances were subsequently added; the latter, because there is a legal obligation under Ecodesign regulation 643/2009 to assess the need to adopt Ecodesign requirements for this product group. Also, thermal insulation products were chosen (as a conditional product) from the list of non-priority products. Preparatory studies and short or scoping studies have been launched for all seven priority product groups and two of the conditional product groups (the others being considered in the context of reviews). In addition to these twelve groups, a scoping study was conducted for power generation equipment below 50 MW, which was not included in the Working Plan, but had been suggested by stakeholders later on.

Third Ecodesign Working Plan 2016-2019

The third Working Plan was based on a preparatory study conducted by Oeko-Institut, Bio Intelligence Service and ERA Technologies.[15] The study recommended 16 product groups, ranked by energy savings potential to be included in the Ecodesign Working Plan. In addition, it included a reminder list of product groups, which could be considered in forthcoming reviews of existing regulations, and a supplementary report on materials. Whereas the focus of Ecodesign and Energy Labelling had been primarily on energy savings up to that point, the supplementary report explored possibilities of how Ecodesign could be used to improve material efficiency.

The actual resulting 2016-2019 Working Plan[16] included seven new product groups and 22 reviews of existing product groups. Preparatory studies have been launched for all seven new product groups. In the light of the fast technological changes that take place in ICT products, a separate track was proposed for a number of these products that were not included in the Working Plan: a separate assessment ("the ICT Study") was mandated to

---

[13] Martijn van Elburg (coordinator), Maaike van der Voort, Roy van den Boorn, Rene Kemna and William Li (2011): Study on Amended Working Plan under the Ecodesign Directive (remaining energy-using products and new energy-related products). Prepared for the European Commission under DG ENTR Service Contract SI2.574204.
https://www.vhk.nl/downloads/Reports/2012/VHK%20468%20Study%20on%20Amended%20Working%20Plan%20under%20the%20Ecodesign%20Directive.ZIP

[14] COMMISSION STAFF WORKING DOCUMENT: Establishment of the Working Plan 2012-2014 under the Ecodesign Directive. Brussels, 7.12.2012. SWD(2012) 434 final.
https://ec.europa.eu/docsroom/documents/9952/attachments/1/translations/en/renditions/pdf

[15] Oeko-Institut e.V; Bio by Deloitte; ERA Technologies (2015): Preparatory Study to establish the Ecodesign Working Plan 2015-2017 implementing Directive 2009/125/EC.
https://ec.europa.eu/docsroom/documents/20374

[16] COMMUNICATION FROM THE COMMISSION: Ecodesign Working Plan 2016-2019. Brussels, 30.11.2016. COM(2016) 773 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1483960559694&uri=CELEX%3A52016DC0773

be launched, with a view to their possible inclusion in the Ecodesign Working Plan. The first part of this very recent ongoing study, conducted by VHK with input from Viegand Maagøe, has been completed in August 2020[17].

Table 1 gives an overview of products regulated to date (April 2021), and of ongoing processes.[18] Under "status", the most recent regulation is given (even if not yet in force).

Table 1: Overview of Ecodesign and Energy Labelling regulations and ongoing processes.

Category	Product group	DG & "Lot"	Status
Lighting	Light sources and separate control gears	ENER 8 / 9 / 19 / 37	In effect until 01/09/2021: EL: 847/2012 ED: 1194/2012, 244/2009, 245/2009, 347/2010, 859/2009 Energy Labelling (EL): Reg. 2019/2015. Ecodesign (ED): Reg. 2019/2020.
Heaters	Local space heaters	ENER 15 / 20	EL: Reg. 2015/1186 ED: Reg. 2015/1185; 2015/1188 Revision ongoing
	Space and water heaters	ENER 1, ENER 2	EL: Reg. 811/2013, 812/2013 ED: Reg. 813/2013, 814/2013 Revision ongoing
	Solid fuel boilers	ENER 15	EL: Reg. 2015/1187 ED: Reg. 2015/1189 Special study on third party certification completed
	Air heating and cooling products	ENER 21	ED: Reg. 2016/2281
Fridges and freezers	Refrigerating appliances	ENER 13 / 34	EL: Reg. 2019/2016 ED: Reg. 2019/2019
	Professional refrigerated storage	ENTR (GROW) 1	EL: 2015/1094 ED: 2015/1095 2019/2019

---

[17] https://circabc.europa.eu/ui/group/1582d77c-d930-4c0d-b163-4f67e1d42f5b/library/b6884364-4e14-44a1-9e23-03a7fed002af

[18] See for details on regulations in force: https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/energy-efficient-products_en

Category	Product group	DG & "Lot"	Status
	cabinets (and other equipment)		2019/2016 Revision ongoing
	Refrigerators with a direct sales function	ENER 12	EL: 2019/2018 ED: 2019/2024
Vacuum cleaners		ENER 17	ED: Reg. 666/2013 Revision ongoing
Washing machines and driers	Washing machines and washer-driers	ENER 14	EL: Reg. 2019/2014 ED: Reg. 2019/2023
	Tumble driers	ENER 16	EL: 392/2012 ED: 932/2012 Revision ongoing
Air conditioners and fans	Air conditioners and comfort fans	ENER 10	EL: Reg. 626/2011 ED: Reg. 206/2010 Revision ongoing
	Industrial fans	ENER 11	ED: Reg. 327/2011 Revision ongoing
	Ventilation units	ENTR (GROW) 6	EL: Reg. 1254/2014 ED: Reg. 1253/2014 Revision ongoing
	Air heating and cooling products	ENER 21	ED: Reg. 2016/2281 Revision in 2022
Displays and TV boxes	Displays	ENER 5	EL: Reg. 2019/2013 ED: Reg. 2019/2021
	Set-top-boxes	No lot ENER 18	Simple: ED: Reg. 107/2009 Complex: Voluntary Agreement To be terminated
Kitchen appliances	Cooking appliances	ENER 22 / 23	EL: Reg. 65/2014 ED: Reg. 66/2014 Revision ongoing
	Dishwashers	ENER 14	EL: 2019/2017 ED: 2019/2022
Pumps	Water pumps	ENER 11 / 28 / 29	ED: Reg. 547/2012 Revision ongoing
	Circulators	ENER 11	ED: Reg. 641/2009; amendment 622/2009 Revision ongoing
Transformers and converters	Power transformers	ENTR (GROW) 2	ED: Reg. 548/2014, amendment: Reg. 2019/1783
	External power supplies	ENER 7	ED: Reg. 2019/1782
Computers and servers	Computers	ENER 3	ED: Reg. 617/2013
	Servers and data storage products	ENTR (GROW) 9	ED: Reg. 2019/424
Imaging equipment		ENER 4	Voluntary agreement

Category	Product group	DG & "Lot"	Status
			Revision ongoing
Game consoles		ENTR (GROW) 3	Voluntary agreement Revision ongoing
Electric motors		ENER 11 / 30	ED: Reg. 2019/1781
Off-mode, standby and networked standby		ENER 6 / 26	ED: Reg. 1275/2008; amendment: 801/2013 Revision ongoing
Welding equipment		ENTR (GROW) 5	Reg. 2019/1784
Tyres		ENER	EL: Reg. 2020/740
Building Automation and Control Systems		ENER 38	Preparatory study ongoing
Lifts		GROW 11	Preparatory study available
Hand dryers		GROW 12	Draft preparatory study available
Solar panels and inverters		ENV (JRC)	Preparatory study available
High-pressure cleaners		ENV (JRC)	Preparatory study available
Electric kettles		ENER	Preparatory study ongoing
Refrigerated containers		ENER	Preparatory study completed
Batteries		GROW	Preparatory study completed
Mobile phones, smart phones and tablets		GROW	Preparatory study available
ICT-study		ENV (JRC)	Preparatory study ongoing

For the product groups in Table 2, preparatory studies or scoping studies have been conducted, but no regulation has followed to date (but may follow).

Table 2: Product groups studied but not regulated.

Product group	DG & Lot number
Professional washing machines, dryers and dishwashers	ENER 24
Non-tertiary coffee machines	ENER 25
Uninterruptible power supplies	ENER 27
Compressors	ENER 31
Windows	ENER 32
Smart Appliances	ENER 33
Power generation equipment under 50 MW (scoping study)	ENER 35
Thermal insulation (short study)	ENER 36
Industrial and laboratory furnaces and ovens	ENTR (GROW) 4
Steam boilers	ENTR (GROW) 7
Power cables	ENTR (GROW) 8
Taps and showers	JRC 1

2.1.4 Method for Ecodesign of Energy-related Products (MEErP)

The Ecodesign Directive 2009/125/EC prescribes that in preparing a draft implementing measure, the Commission shall make a series of analyses and assessments. The underlying "Methodology for the Ecodesign of Energy-related Products (MEErP)" is applied in so-called preparatory studies intended to provide operational guidance to the Commission to prepare draft implementing measures. The MEErP contains a structured procedure for analysing a product group from scope and definitions to impact scenarios for a number of policy options.

The MEErP is a supporting tool to assist in the structured assessment of the potential and feasibility of possible Ecodesign improvement measures, and it provides a basis for policy making for Ecodesign and Energy Labelling measures for new products, i.e. via preparatory studies, and for review studies of existing regulations.

The MEErP prescribes a clear structure to have an equal analytical basis for all product groups, to be able to compare sub-groups and design options via:
- Tasks 1 to 4 (product definitions, standards and legislation; economic and market analysis; consumer behaviour and local infrastructure; technical analysis) that have a clear focus on data retrieval and initial analysis and
- Tasks 5 (assessment of base case), 6 (improvement potential) and 7 (policy, scenarios, impact and sensitivity analysis) with a clear focus on modelling.

Through the execution of the tasks, it is clarified if the product is in scope of the Ecodesign directive in terms of significant volume, significant environmental impact and significant potential for improvement without excessive costs. MEErP provides a potential basis for regulation via identifying technological opportunities and development (improvements, BAT and BNAT) and calculated impacts on energy, environment, economy and employment. MEErP contains a streamlined LCA (Life Cycle Assessment) and LCC (Life Cycle Cost) tool, called the EcoReport Tool. Furthermore as part of the process, the users of the MEErP tools should develop a sales-stock model over time, historically/contemporaneously and modelling predictions c.30 years into the future, and a scenario modelling tool.

MEErP and the EcoReport Tool can be found on the Commission website.[19] The same methodology is in the main part also used for adopting delegated acts by establishing detailed requirements relating to EU Energy Labels for specific product groups.

MEErP has been based on the MEEuP (Methodology for Ecodesign of Energy-using Products), developed in 2005, and the methodology and the tool have been revised and complemented twice: in 2011 to extend the Ecodesign Methodology from Energy using Products (EuP) to Energy-related Products (ErP) and in 2013 to include material efficiency aspects in the MEErP and the EcoReport tool.

With the update in 2013, the following material efficiency aspects were further included in the EcoReport tool and the MEErP guidance:
- Recyclability benefit rate;
- Recycled content;
- Lifetime (as results per year of use); and
- Critical Raw Materials (CRM).

MEErP is currently under review. However, the outcome of the MEErP review has not been integrated into the current study since its results and conclusions will only be available after the completion of the study.

2.2 Circular Economy

2.2.1   Circular Economy Action Plans

First Circular Economy Action Plan
In December 2015, the European Commission adopted the so-called 'Circular Economy Package'[20] with the aim to help accelerate Europe's transition towards a circular economy. The main part of the package is the 'EU Action Plan for the Circular Economy'[21] proposing actions and funding that should contribute to "closing the loop" of product lifecycles through greater recycling and re-use, via extracting the maximum value and use from all raw materials, products and waste, together with fostering energy savings and reducing Greenhouse Gas emissions. Its aim was to ensure that the right regulatory framework was in place for the development of the circular economy in EU, and to give clear signals to EU industry, end-users and other stakeholders on the way forward with long-term waste targets and concrete, broad and ambitious actions to be carried out before 2020.

The 2015 Circular Economy Action Plan (CEAP) includes specific actions e.g. within product design and waste management, and specific priority areas such as plastics and critical raw materials (CRM). The concept of Ecodesign and the framework of the Ecodesign directive are mentioned several times in the CEAP as important instruments for targeting e.g. reparability, durability, upgradability, recyclability, or certain materials or substances.

---

[19] https://ec.europa.eu/growth/industry/sustainability/ecodesign_en

[20] https://ec.europa.eu/environment/circular-economy/first_circular_economy_action_plan.html

[21] https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF

In total, 54 dedicated measures were set out by the action plan representing a balanced mix of voluntary initiatives and regulatory actions along production, consumption, waste management and secondary raw materials. This, inter alia, includes measures in the Ecodesign Working Plan for 2016-2019 to promote reparability, durability and recyclability of products, in addition to energy efficiency, measures for the development of quality standards for secondary raw materials or a strategy on plastics in the circular economy, by addressing issues of recyclability, biodegradability, and the presence of hazardous substances in plastics.

Four years after its adoption, in March 2019, the European Commission adopted a comprehensive report on the implementation, main achievements and future challenges of the Circular Economy Action Plan[22]. Actions that were noted, with relevance also for the next Ecodesign and Energy Labelling Working Plan 2020-2024 were the following:

- Emphasis on circular economy aspects in future product requirements under the Ecodesign directive.
- Request to European standardisation organisations to develop standards on material efficiency for setting future Ecodesign requirements on durability, reparability and recyclability of products
- Proposal for an implementing regulation on televisions and displays.
- Better enforcement of existing guarantees on tangible products, accompanied by a reflection on improvements intended to deter unfair commercial practices such as misleading and unfounded environmental claims ('greenwashing'), undisclosed planned obsolescence practices.
- Action on false green claims, including updated guidance on unfair commercial practices: The revised guidance incorporates key principles on the content, presentation and documentation of environmental claims. It also clarifies the application of the Directive on unfair obsolescence practices – which will allow a better enforcement by market surveillance authorities in this area.
- Analysis of the possibility to propose horizontal requirements on repair information provision in the context of Ecodesign: A reparability scoring system was developed by the Joint Research Centre (JRC)[23]; see further details on this study in Section 2.2.3. The JRC study was followed up by a consumer behavioural study to better understand how consumers assess and appreciate information on reparability of devices, building upon the behavioural study on consumer's engagement in the circular economy, finalised in 2018. On the basis of these studies and building on the positive experience acquired under the Energy Labelling regulation, the Commission is developing a scoring system on product reparability.
- Inter alia, the Commission has requested the European Committee for Standardisation (CEN) to perform a comprehensive mapping exercise of existing or ongoing standardisation work related to the quality of secondary raw materials, in particular for plastics. Specific studies are currently focusing on the development of standards for sustainable chemicals and for secondary raw materials. If these standards are agreed upon in the future, minimum requirements under Ecodesign implementing measures, or information requirements under Energy Labelling might be developed. For example, one of the targets of the future Working Plan 2020-

---

[22] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0190&from=EN

[23] https://susproc.jrc.ec.europa.eu/ScoringSystemOnReparability/index.html

2024 is to take into account environmental impacts other than energy use and GHG emissions, which includes for example recycled content.

- Strategy on plastics in the circular economy: One of the four main pillars of the EU Strategy for Plastics is improving the economics and quality of plastics recycling, with actions related to improving product design, boosting recycled content and improving separate collection of plastic waste. Also, for the point above, the requirements under the next Ecodesign Working Plan might provide the possibility to boost the uptake of recycled plastics in products placed on the EU market.
- Assessment of the contribution of the 2012 Bio-economy Strategy to the circular economy with the aim of deploying rapidly bio-economies across the whole of Europe: According to the strategy, the promotion of bio-based materials and products, whenever possible and relevant, should be ensured during the development of EU Ecolabel and GPP criteria for new or existing product groups, according to Environmental Footprint results, and in line with available EU standards and technical reports. It might be analysed if - beyond these voluntary instruments - whether mandatory Ecodesign legislation might be feasible to promote product design using bio-based materials.
- Improve exchange of information between manufacturers and recyclers on electronic products: In order to facilitate the preparation for re-use and the correct and environmentally sound treatment of electronic waste, the Ecodesign legislation might also set mandatory information requirements related to the design of products (as e.g. QR codes on the products containing the required information).

Further, under the Circular Economy Package, a Communication was published in 2018 on options to address the interface between chemical, product and waste legislation that assesses how the rules on waste, products and chemicals relate to each other. To achieve the aim that materials are safe, fit-for-purpose and designed for durability, recyclability and have a low environmental impact - which is also main target of Ecodesign product-specific legislation - goods should be designed, manufactured, traded and recycled with minimal use of substances of concern to facilitate reuse in a way that maximises the materials' economic benefits and utility to society, while maintaining a high level of human health and environmental protection. These inter-linkages to waste and chemicals legislation will also play a relevant role when setting up the next Ecodesign and Energy Labelling Working Plan 2020-2024 by paying greater attention to Circular Economy factors.

It should also be noted that in 2019 a Commission Staff Working Document was released, entitled "Sustainable Products in a Circular Economy - Towards an EU Product Policy Framework contributing to the Circular Economy"[24]. The assessment of this 2019 evaluation was that there was an overall remaining potential with regard to the following product policy aspects:

- policies systematically targeting circularity for specific sectors, such as those set out for plastics in the Plastics Strategy, are not in place in other relevant sectors such as textiles, furniture and food;
  Ecodesign polices have successfully been used to stimulate circularity for energy-related products. Such policies are not yet applied in other relevant sectors;
- there is not yet a systematic assessment of synergies between policies and legislation that interact with product policies, in particular consumer protection policies; this includes issues related to premature obsolescence of products, rights

---

[24] https://ec.europa.eu/environment/circular-economy/pdf/sustainable_products_circular_economy.pdf

of consumers or effective and affordable repair services; this also applies to synergies with policies on climate change and air pollution;

- measurement and assessment tools such as Product Environmental Footprint methods for the verification and substantiation of green claims on the environmental performance of products have been developed, but are not yet applied to their full potential.

New Circular Economy Action Plan

In March 2020, the European Commission adopted a new Circular Economy Action Plan (CEAP 2)25 - one of the main blocks of the previously adopted (December 2019) European Green Deal (COM(2019) 640 final), Europe's new agenda for sustainable growth that shall provide the political guidelines for the next European Commission 2019-202426. The second CEAP builds on the work done since 2015 following the First Circular Economy Action Plan.

CEAP 2 presents a set of interrelated initiatives to establish a strong and coherent 'sustainability product policy framework' that will make sustainable products, services and business models the norm and transform consumption patterns so that no waste is produced in the first place. The Ecodesign Directive is mentioned as successfully regulating energy efficiency and some circularity features of energy-related products, whereas at the same time, instruments such as the EU Ecolabel or EU Green Public Procurement (GPP) criteria are broader in scope but have reduced impact due to the limitations of voluntary approaches.

According to the CEAP 2, there is no comprehensive set of requirements to ensure that all products placed on the EU market become increasingly sustainable and incorporate circularity aspects fully. In order to make products fit for a climate-neutral, resource-efficient and circular economy, and in parallel to reduce waste whilst ensuring that the performance of front-runners in sustainability progressively becomes the norm, the Commission has undertaken in CEAP 2 to propose a sustainable product policy legislative initiative.

The core of this legislative initiative in CEAP 2 is widening the Ecodesign Directive beyond energy-related products so as to make the Ecodesign framework applicable to the broadest possible range of products and make it further deliver on circularity.

As part of this legislative initiative, and, where appropriate, through complementary legislative proposals, the Commission aims consider establishing the following aspects:

- improving product durability, reusability, upgradability and reparability, addressing the presence of hazardous chemicals in products, and further increasing their energy and resource efficiency;
- increasing recycled content in products, while ensuring their performance and safety;
- enabling remanufacturing and high-quality recycling;
- reducing carbon and environmental footprints;
- restricting single-use and countering premature obsolescence;

---

[25] https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF

[26] https://ec.europa.eu/environment/circular-economy/index_en.htm

- introducing a ban on the destruction of unsold durable goods;
- incentivising product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle;
- mobilising the potential of digitalisation of product information, including solutions such as digital passports, tagging and watermarks;
- rewarding products based on their different sustainability performance, including the linking of high performance levels to incentives.

According to the CEAP 2, priority shall be given to product groups such as electronics, ICT and textiles but also furniture and high impact intermediary products such as steel, cement and chemicals. Further product groups should be identified based on their environmental impact and circularity potential.

Related to these topics, the CEAP 2 also aims to enhance the participation of consumers in the circular economy, inter alia by proposing a revision of EU consumer law to ensure that consumers receive trustworthy and relevant information on products at the point of sale, including on their lifespan and on the availability of repair services, spare parts and repair manuals. The Commission plans also to consider further strengthening consumer protection against greenwashing and premature obsolescence by setting minimum requirements for sustainability labels/logos and for information tools. Furthermore, the Commission intends to work towards establishing a new 'right to repair' and the consideration of new horizontal material rights for consumers, e.g., regarding availability of spare parts or access to repair and, in the case of ICT and electronics, to upgrading services.

As 'key product value chains' with direct or indirect links to the Ecodesign regulatory framework, the following product groups are in the focus of the CEAP 2:

- Electronics and ICT: The Commission intends to present a 'Circular Electronics Initiative' mobilising existing and new instruments. In line with the new sustainable products policy framework, the intention of this initiative is to promote longer product lifetimes and include, among others, the following actions:
  - regulatory measures for electronics and ICT including mobile phones, tablets and laptops under the Ecodesign Directive so that devices are designed for energy efficiency and durability, reparability, upgradability, maintenance, reuse and recycling. The upcoming Ecodesign Working Plan is to set out further details on this. Printers and consumables such as cartridges will also be covered unless the sector reaches an ambitious voluntary agreement within the coming six months;
  - focus on electronics and ICT as a priority sector for implementing the 'right to repair', including a right to update obsolete software;
  - regulatory measures on chargers for mobile phones and similar devices, including the introduction of a common charger, improving the durability of charging cables, and incentives to decouple the purchase of chargers from the purchase of new devices;

- Batteries: The Commission plans to consider the following elements (which may comprise a mix of legislative devices, rather than or in addition to Ecodesign measures per se)[27]:
  - rules on recycled content and measures to improve the collection and recycling rates of all batteries, ensure the recovery of valuable materials and provide guidance to consumers;
  - addressing non-rechargeable batteries with a view to progressively phasing out their use where alternatives exists;
  - sustainability and transparency requirements for batteries taking account of, for instance, the carbon footprint of battery manufacturing, ethical sourcing of raw materials and security of supply, and facilitating reuse, repurposing and recycling.

- Plastics: To increase uptake of recycled plastics and contribute to the more sustainable use of plastics, the Commission intends to propose mandatory requirements for recycled content and waste reduction measures for key products; the CEAP 2 cites packaging, construction materials and vehicles as examples of key products, but linkages to further energy-related products within the Ecodesign regulatory framework might be analysed within this study for the awaited following Ecodesign and Energy Labelling Working Plan.

Finally, the CEAP 2 includes the following targets with indirect interlinkages also to product policy, i.e. applicable also to the Ecodesign policy framework:

- Enhancing circularity in a toxic-free environment: The forthcoming Chemicals Strategy for Sustainability shall further address the interface between chemicals, products and waste legislation and strengthen synergies with the circular economy.

- The creation of a well-functioning EU market for secondary raw materials: A number of actions are included in the Circular Economy Action Plan, notably introducing requirements for recycled content in products; therefore, amongst others, the role of standardisation should be enhanced, based on the ongoing assessment of existing standardisation work at national, European and international levels.

2.2.2 Horizontal standardisation of material efficiency aspects in energy-related products in support of the Ecodesign Directive

After the publication of the first Circular Economy Action Plan in 2015, the European Commission requested the three European Standardization Organizations – CEN, CENELEC and ETSI - to develop standards to support Ecodesign requirements on material efficiency aspects for energy-related products, covering the following aspects: extending product lifetime, the ability to reuse components or recycle materials from products at end-of-life, and the use of reused components and/or recycled materials in products.[28]

---

[27] In December 2019, a proposal for a regulation concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020 was published: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0798

[28] https://www.cencenelec.eu/News/Brief_News/Pages/EN-2019-050.aspx

According to the strategy set up by CEN-CENELEC[29], the activities on standardization in the fields of Ecodesign and Energy Labelling are coordinated by the CEN-CENELEC Ecodesign Coordination Group (ECO-CG). The group serves as a focal point concerning standardization issues relating to the Ecodesign Standardization Requests delivered under Directive 2009/125/EC on Ecodesign of energy-related products and Directive 2010/30/EU on Energy labelling of energy-related products and their future versions. CEN-CENELEC's Joint Technical Committee 10 (CEN-CLC JTC 10) 'Energy-related products - Material Efficiency Aspects for Ecodesign' works in response to fulfil the Standardization Request M/543 on material efficiency aspects of energy-related products.

As of June 2020, CEN-CLC JTC 10 had published the standards presented in Table 3[30].

Table 3: Published standards for 'Energy-related products - Material Efficiency Aspects for Ecodesign'.

Title	Scope
EN 45552:2020 General method for the assessment of the durability of energy-related products	The standard will cover a set of parameters for assessing durability of energy-related products (ErP) and a general method to describe and assess the durability of ErP, i.e. both electrotechnical and non-electro technical products. It will be applicable to all energy-related products, that is, all products covered by the Ecodesign Directive 2009/125/EC.
EN 45553:2020 General method for the assessment of the ability to remanufacture energy-related products	This European Standard (EN) will provide a general methodology for the assessment of the ability to re-manufacture energy-related products. This EN will elaborate the assessment and process of re-manufacturability in a horizontal, cross-product way. However, a fully appropriate assessment can only be done in a product-specific way, taking into account specific parameters of a specific energy related product.
EN 45554:2020 General methods for the assessment of the ability to repair, reuse and upgrade energy-related products	This standard will fulfil requirements in Standardisation request M/543 by defining parameters and methods relevant for assessing the ability to repair and reuse products; the ability to upgrade products, excluding remanufacturing; the ability to access or remove certain components, consumables or assemblies from products to facilitate repair, reuse or upgrade and lastly by defining reusability indexes or criteria.
EN 45555:2019 General methods for assessing the recyclability and recoverability of energy-related products	This European standard (EN) provides a general methodology for: • Assessing the recyclability of energy-related products • Assessing the recoverability of energy-related products • Assessing the ability to access or remove certain components or assemblies from energy-related products to facilitate their potential for recycling or other recovery operations.

---

[29] https://www.cen.eu/news/brochures/brochures/CEN-CENELEC_WP_2019.pdf

[30] https://standards.cen.eu/dyn/www/f?p=204:32:0:::::FSP_ORG_ID,FSP_LANG_ID:2240017,25&cs=1D4156C3D679EE526A476E8463ACFAA98

	• Assessing the recyclability of critical raw materials from energy-related products. This EN will address recyclability and recoverability in a horizontal, cross-product way. However, a fully appropriate assessment can only be performed in a product-specific way, taking into account specific parameters of a specific product group. This standard will define a series of parameters which may be considered to calculate product-specific recycling and recoverability rates.
EN 45556:2019 General method for assessing the proportion of reused components in energy-related products	This document deals with the assessment of the proportion of reused components in energy-related products on a generic level. All energy-related products are in the scope of this standard.
EN 45557:2020 General method for assessing the proportion of recycled material content in energy-related products	This European Standard (EN) provides a general methodology for assessing the proportion of recycled material in energy-related products.
EN 45558:2019 General method to declare the use of critical raw materials in energy-related products	In accordance with standardisation request M/543 it is necessary to consider the "Use and recyclability of Critical Raw Materials to the EU, listed by the European Commission". This standard facilitates this requirement by describing appropriate information on critical materials.
EN 45559:2019 Methods for providing information relating to material efficiency aspects of energy-related products	In accordance with standardisation request M/543 it is necessary to consider the "Documentation and/or marking regarding information relating to material efficiency of the product taking into account the intended audience (consumers, professionals or market surveillance authorities)". This standard facilitates by describing requirement for providing appropriate information.

According to the CEN-CLC JTC 10, the Technical Report shown separately below in Table 4 is still being drafted (status June 2020)[31].

---

[31]

https://standards.cen.eu/dyn/www/f?p=204:22:0::::FSP_ORG_ID,FSP_LANG_ID:2240017,25&cs=1D4156C3D679EE526A476E8463ACFAA98

Table 4: Technical Report under drafting for 'Energy-related products - Material Efficiency Aspects for Ecodesign'

Title	Scope
CLC/prTR 45550 Definitions related to material efficiency	Standardisation Request M/543 requires the following: "Definition of parameters and methods relevant for assessing durability, upgradability and ability to repair, re-use and re-manufacture of products". Hence, this Technical Report, "Definitions related to material efficiency", will constitute a collection of common terms used in deliverables prepared in accordance with M/543. The purpose of such a collection is to provide a single definition of key terms used in different deliverables produced by CEN-CENELEC TC10. The source of the terms and definitions may be documents developed in the various working groups of the CEN-CENELEC TC10 or any text referenced by such documents. Where any potential discrepancies may occur between multiple definitions for the same term, this Technical report will recommend a preferred definition.

In summary, these 8 horizontal standards and one Technical Report provide the generic principles and methods, including underlying definitions, for the assessment of product material efficiency under Ecodesign and Energy Labelling, which includes the following:

- assessment of the durability;
- assessment of the ability to remanufacture;
- assessment of the ability to repair, reuse and upgrade;
- assessment of the recyclability and recoverability
- assessment of the proportion of reused components
- assessment of the proportion of recycled material content;
- method to declare the use of critical raw materials;
- methods for providing information relating to material efficiency aspects

The above directly address energy-related products overall, and shall facilitate the application of future Ecodesign requirements on material efficiency aspects for energy-related products and specific product groups, in support of the implementation of Directive 2009/125/EC of the European Parliament and of the Council.

2.2.3   Reparability Scoring System

As part of the implementation of the First Circular Economy Action Plan, the European Commission carried out a study for the analysis and development of a possible scoring system to inform about the ability to repair and upgrade products. The final report was published in March 2019[32]. The overall aims of the study were:

- To develop a general approach for the assessment of the ability to repair or upgrade energy-related products (ErP);
- To test the feasibility and types of results derived using the general approach on three specific product groups (laptops, vacuum cleaners and washing machines).

---

[32] https://ec.europa.eu/jrc/en/publication/analysis-and-development-scoring-system-repair-and-upgrade-products

To reduce the complexity of an assessment, the system is based on key components ('priority parts') that are important both functionally and for repair and/or upgrade operations and have to be chosen per product category (i.e., on a product-specific basis).

Further, the study selected 12 'key parameters for repair and upgrade' which have to be prioritized and chosen upon their relevance per product category:

- Disassembly depth / sequence
- Fasteners
- Tools
- Disassembly time
- Diagnosis support and interfaces
- Type and availability of information
- Spare parts
- Software and firmware
- Safety, skills and working environment
- Data transfer and deletion
- Password reset and restoration of factory settings
- Commercial guarantee

Based on the selected priority parts and key parameters for repair and upgrade per product category, the assessment framework is composed of:

- 'Pass/fail criteria' that products have to fulfil in order to be considered as reparable/upgradable, and thus eligible for being assessed through the scoring criteria;
- 'Scoring criteria', to rate the extent to which products are reparable or upgradable. Scores can be aggregated and reported in different types of indices, which could be more or less suitable based on the final application of the scoring system.

According to the Commission, this scoring system could serve as a technical reference for potential use in product-related policy-making (e.g. Ecodesign, Energy Label, GPP, Ecolabel), for the design of a new label, or as one or more public guidance documents (for designers and consumer testing organisations). The study itself does not propose or pre-empt any future policy decision.

The study on the reparability scoring system is being followed up by a consumer behavioural study to better understand how consumers assess and appreciate information on reparability of devices. As of mid-May 2020, the results of the consumer behavioural study were still not available to the public.

2.3 Other Community legislation and schemes

Several other Community types of legislation and schemes can be relevant in relation to the Working Plan and the current study. This is because there may be product groups that could usefully be studied simultaneously for possible Ecodesign, Energy Labelling, EU Ecolabel and EU Green Public Procurement applications e.g. as presently being performed for the first time with the combined Ecodesign, Energy Label, EU Ecolabel and EU Green Public Procurement Preparatory Study regarding solar photovoltaic panels and associated products.

Additionally, products may be or have been subject to a scheme such as the previous EU Energy Star Programme, with lessons learned regarding e.g. requirements and measurement methods.

2.3.1   EU Ecolabel

The EU Ecolabel was established in 1992 as a label of environmental excellence that is awarded to products and services meeting high environmental standards throughout their life-cycle[33]: from raw material extraction, to production, distribution and disposal. The EU Ecolabel promotes the circular economy by encouraging producers to generate less waste and CO2 during the manufacturing process. The framework of the EU Ecolabel criteria also encourages companies to develop products that are durable, easy to repair and recycle.

The EU Ecolabel criteria provide demanding cutting-edge guidelines for companies looking to lower their environmental impact and guarantee the efficiency of their environmental actions through third party controls. Furthermore, many companies turn to the EU Ecolabel criteria for guidance on eco-friendly best practices when developing their product lines.

Currently, there are 24 different product categories for consumers and businesses.

2.3.2   Green Public Procurement

Green Public Procurement (GPP)[34] is a voluntary instrument for public procurement for a better environment, for use when public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured. The instruments; policy background, definition, objectives, target etc. are described in a Communication from the Commission[35] (7/2008).

Being a voluntary instrument, Member States and public authorities can determine the extent to which they implement it.

Public authorities are major consumers in Europe: they spend approximately 2 trillion EUR annually, representing around 14 % of the EU's gross domestic product[36]. By using their purchasing power to choose goods and services with lower impacts on the environment, they can make an important contribution to sustainable consumption and production. Furthermore, GPP is also about influencing the market because by promoting and using GPP, public authorities can provide industry actors with real incentives for developing green technologies and products. In some sectors, public purchasers command a significant share of the market (e.g. public transport and construction, health services and education) and so their decisions have considerable impact.

Currently, GPP criteria exist for 20 product categories[37].

---

[33] https://ec.europa.eu/environment/ecolabel/

[34] https://ec.europa.eu/environment/gpp/

[35] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Public procurement for a better environment

[36] https://ec.europa.eu/growth/single-market/public-procurement_en

[37] https://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

2.3.3   Product Environmental Footprint criteria

The Product Environmental Footprint (PEF) is a multi-criteria Life Cycle Assessment-based measure of the environmental performance of a good or service throughout its life cycle. PEF information is produced for the overarching purpose of seeking to reduce the environmental impacts of goods and services taking into account supply chain activities (from extraction of raw materials, through production and use, to final waste management). In addition to PEF is the OEF, Organisation Environmental Footprint. PEFs are complimentary to other instruments focused on specific sites and thresholds.

A pilot phase was carried out from 2013 to 2016 by the European Commission together with stakeholders with the objectives of testing the process for developing product- and sector-specific rules; testing different approaches to verification; and testing communication vehicles for communicating life cycle environmental performance to business partners, consumers and other company stakeholders.

PEFCR (Product Environmental Footprint Category Rules) i.e. the set of rules on how to measure the life cycle environmental performance of the product within scope presently exist for 19 product groups[38].

This PEF Guide[39] provides guidance on how to calculate a PEF, as well as how to develop product category specific methodological requirements for use in Product Environmental Footprint Category Rules (PEFCRs). It gives a method for modelling the environmental impacts of the flows of material/energy and the emissions and waste streams associated with a product throughout its life cycle.

2.3.4   Resource Efficiency Assessment of Product - REAPro

REAPro (Resource Efficiency Assessment of Product methodology)[40,41] is a method to assess energy-related products against a set of resource efficiency criteria, and to identify hot-spots and improvement potentials. The method has been applied and tested on various case-studies as: dishwashers, electronic displays, computers (notebook and tablets) and enterprise servers.

Among other elements, the method allows to compare lifetime extensions of existing products with increased energy efficiency of new products on the market. It further considers reuse of certain components for the remanufacturing of products and recyclability of plastics.

2.3.5   Code of Conduct for ICT

In 2000 the European Commission launched the EU Code of Conduct for ICT as a voluntary policy instrument. It initially targeted External Power Supplies, and Digital TV Services. Later, additional Codes of Conduct were introduced for Uninterruptible Power Supplies (UPS), Broadband Equipment, and Data Centres.

---

[38] https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm
[39] Product Environmental Footprint (PEF) Guide. European Commission. Joint Research Centre. July 2012.
[40] https://ec.europa.eu/jrc/en/news/new-method-assess-resource-efficiency-products
[41] Revision of methods to assess material efficiency of energy related products and potential requirements. Environmental Footprint and Material Efficiency Support for Product Policy. December 2016.

The above-mentioned EU Code of Conduct is a flexible mechanism to initiate and develop policies to improve energy efficiency; the resulting Codes also create a forum for industry, experts and Member States where an open and continuous dialogue may take place on market, product and system performance. Via the Code of Conduct, ambitious voluntary standards and commitments have been set.

The scheme is managed by the Joint Research Centre, Ispra[42] of the European Commission.

2.3.6　EU Energy Star

The EU ENERGY STAR programme followed an Agreement[43] between the European Community (now the EU) and the Government of the USA to coordinate energy labelling of office equipment. It was managed by the European Commission.

The US partner was the Environmental Protection Agency (EPA), which started the scheme in the US in 1992. The EU-US ENERGY STAR Agreement was signed in 2001 and started to be operational from 2003, for 5 years. It was subsequently renewed twice, each time for 5 years, but finally expired on 20 February 2018.

The amount of product groups included in the agreement was increased over time. At the time of expiry of the agreement in 2018, the following product groups were contained within its scope:
- Computers
- Displays
- Imaging equipment
- Enterprise servers
- Uninterruptable power supplies

Furthermore, the EU was involved in developing new specifications for the following product groups, which however were not adopted in the EU before the expiry of the agreement:
- Data centre storage
- Small network equipment
- Large network equipment

The development process of these product groups is available at the US EPA website for Energy Star product specifications[44].

---

[42] https://ec.europa.eu/jrc/en/energy-efficiency/products/coc
[43] Agreement between the Government of the United States of America and the European Community on the coordination of energy-efficient labelling programs for office equipment
[44] https://www.energystar.gov/products/spec

3 METHODOLOGY

3.1 Task 2

Task 2 aims at identifying product groups and horizontal initiatives for the following assessments outlined below in Task 3. The outcome of the task is series of lists of potential product groups and horizontal initiatives, which have been compiled via through semi-qualitative / semi-quantitative screening and assessment techniques.

The methodology is presented in details in the Task 2 report and will therefore not be further presented here.

3.2 Task 3

3.2.1 Introduction

Task 3 aims at performing preliminary analyses of the product groups and horizontal initiatives identified in Task 2 in terms of sales, stock, resource consumption and technical-economic improvement potential. The Task 3 assessments also verify if the product or initiative under scrutiny is within the scope of the Ecodesign Directive and the Energy Labelling Regulation.

The methodology applied is based on the MEErP (see previous description in Section 2.1.4). However, it is important to note that the MEErP is usually a tool for preparatory and review studies, which typically have a duration of 1.5 to 2 years with a resource input of 100-200 person-days for one product group or initiative. However, the current study comprises a very rapid review, consisting of around 3 person-days per product group or initiative. Furthermore, the overall aim of the EELWP study should also be kept in mind, namely to select product groups and initiatives on the basis of the scope requirements in the Ecodesign directive and Energy Labelling regulation, including verifying sufficient size of product market (stock and potential future sales), potential impact and the feasibility of measures in terms of possible regulation, industrial competitiveness etc. The aim of MEErP for preparatory studies is to reach a very detailed picture of the technical, market, usage etc. background, and to develop scenarios for policy options for implementing measures.

Against this background, the *sensu lato* use of the MEErP in this study is mainly applied by utilising the overall analytical structure for providing initial data and information, to then give an approximate initial assessment of the potential relevance of product categories for the next Ecodesign and Energy Labelling Working Plan. Further, for horizontal measures analysed in this study, such as the potential application of an "ecological profile" or the "horizontal solutions for improved market surveillance", a more qualitative analysis and assessment approach has been used.

In addition to MEErP, the EcoReport Tool and the Ecodesign Impact Accounting (EIA)[45] have been used, where relevant. EIA is a comprehensive accounting of the impacts of

---

[45] https://ec.europa.eu/energy/en/studies/ecodesign-impact-accounting-0

Ecodesign and Energy Labelling measures on energy consumption, socio-economic impacts (jobs), industrial competitiveness (revenues) and technology development, over the period 1990-2050.

The EIA studies started in 2013 and are ongoing. VHK, part of the study team, has developed the EIA methodology and has been carrying out the studies since the first study. The advantage of EIA is that it is designed to handle a large number of products reporting results for individual product groups and for all product groups in a variety of groupings.

The EIA exercise, conducted annually, collects data from the impact assessments, preparatory and review studies that are carried out for all products with a proposal for a new or revised Ecodesign and/or Energy Labelling regulation (including also the tyre labelling regulation, voluntary agreements and Energy Star[46]) and combines them inside a common calculation methodology, which is based on the MEErP[47]. The overall EIA collated reports are then updated annually.

3.2.2 Methodology

The Task 3 analyses consist of the following basic steps, which may be deviated from, corresponding to data and information available:

1. Scope, policy measures and test standards: Assessment of proposed scope, existing policy measures (if any) and availability of test standards

2. Market: Assessment of sales and stock data for EU27 for product types in scope and estimated development to 2030 and in some cases up to 2050. This is supplemented with a description of the present market, and anticipated development trends.

3. Usage: Description of typical usages and types of users. Data is collated for usage in terms of times, hours etc. per year.

4. Technologies: Description of typical technologies for BAU (Business As Usual), BAT (Best Available Technology) and BNAT (Best Not yet Available Technology). Data is presented for average intensity / efficiency, as far as data are available, and improvement opportunities.

5. Energy, Materials, Emissions and Costs: Where relevant and possible, calculation or estimation of impact on resources for design, use and end-of-life in BAU and life cycle cost (LCC). The LLC figures are for acquisition, use during the life of the product and end-of-life data for the users, the economy and including externalities.

6. Savings potential: Estimations of saving potential (energy, resources, utilities costs, etc) and of economic feasibility. For lifetime extensions, this may be assessed per lifetime year taking into account a potential higher in-use consumption for lifetime extended products compared to the newer products on the market.

---

[46] The EU-US agreement to coordinate energy labelling of office equipment (Energy Star) expired on 20 February 2018.

[47] Methodology for the Ecodesign of Energy-related Products, as amended in 2011 and 2013, see http://ec.europa.eu/growth/industry/sustainability/ecodesign_en

Data sources include:
- EIA (described above)
- The ICT Impact Study (see Section 2.1.3)
- Previous preparatory studies, review studies and impact assessments within Ecodesign and Energy Labelling
- Material related to Ecolabel, Green Public Procurement, Product Environmental Footprint, Code of Conducts and EU Energy Star
- Other studies: e.g., market data, peer-reviewed Life Cycle Assessment journal articles, articles published by think-tanks, NGOs or governmental bodies, etc
- Input from stakeholders

Maintaining the overall aim of this task, the study team aims to include the following aspects during Task 3 analyses, where relevant and where sufficient resources are available:
- Additional Life Cycle Assessments (LCA), in order to cross-check findings from the application of the EcoReport and other LCA data
- Material resources to address wider issues beyond Critical Raw Materials
- Recyclability and easy upgrades and repairs of products
- Software obsolescence for ICT and other products
- Triangulation or crosschecking of data and information by use of other sources
- Possible use of other parts of the Ecodesign Directive, mainly Annex I, generic Ecodesign requirements
- Environmental externalities in the economic assessments.

3.3 Task 4

3.3.1 Introduction

The Task 4 assessments consist of complementary analysis of a number of most relevant product groups and horizontal initiatives to provide a more holistic picture of them when including other environmental impacts; an analysis and view with regard to existing regulations for the same or similar products; regulatory feasibility; and industrial competitiveness. The results of Task 4 will include fiches with data and information covering the selected products and initiatives and recommendations on possible inclusion on the Ecodesign and Energy Labelling Working Plan 2020-2024.

3.3.2 Methodology

The Task 4 analyses consist of the following basic steps, from which there may be some deviation, according to available data and information:

1. Further environmental impacts: The analyses will build iteratively on the analyses in Task 3 and extend the environmental impact areas to include, where relevant:
   a. consumption of materials and other resources such as fresh water
   b. emissions to air, water and soil, including hazardous substances
   c. possibility for reuse, recycling and recovery of material and/or of energy
   d. consideration of the Critical Raw Materials (CRM) and other "scarce" materials used in the product and components, and an evaluation of the

environmental and resource impacts, together with replacement / reuse / recycling / redesign improvement considerations

   e. durability / reparability of the product

   f. generation of waste

For a number of the product groups, the analyses may need to be carried out qualitatively or, if quantitatively, to the accuracy solely of within an order of magnitude, because the information available, or retrievable from stakeholders within the study timeframe might not permit a more detailed study.

2. Route to market: Assessment of possible involvement of craftsmen, architects, advisers etc. in the decision-making of selection of product or service to purchase.

3. Existing regulatory coverage and regulatory feasibility: The following areas will be assessed:

   a. Suitability for complementary policy measures, i.e. Ecodesign, Energy Labelling, EU Ecolabel and/or Green Public Procurement (GPP): The EU Ecolabel and Green Public Procurement may be complementary instruments taking into account that they are voluntary instruments as such.

   b. Existing third country legislation (minimum energy or environmental performance standards, ecolabels, Green Public Procurement, other Circular Economy-type legislation, etc.): Existing legislation and standards may facilitate the implementation of Ecodesign and Energy Labelling if the related industry partners are already well aware of these schemes and measures according to the standards in them, and may even have some products complying with GPP criteria, etc.

   c. Legal feasibility with regard to the 2009 Ecodesign Directive and 2017 Energy Labelling Regulation: the main point is if there are any legal hindrances to setting Ecodesign and/ or Energy Labelling requirements, e.g. if the product is out of scope because of being "means of transport for persons or goods." which are exempted from both regulations.

   d. The absence of Community legislation in the environmental field: If no environmental legislation exists for a product group and if other considerations are in favour of setting requirements, this would be an indicator of the potential need of a legislation, or at least that considerations could begin from a "blank slate".

   e. Other relevant Community policies with an impact on Ecodesign for avoiding overlaps: Overlap in policies needs to be avoided and therefore other policies and regulations should be properly assessed. There may be cases where a component in a product is regulated, where it is relevant also to regulate the product itself. Here it is important to avoid double-counting, i.e. counting the saving impact for both the component and the product.

   f. The feasibility to establish Ecodesign requirements based on product characteristics or product market structure: The feasibility will be looked at by assessing the design changes needed on the product to comply with the considered Ecodesign requirements (which are based on what will be needed to achieve the improvement potential), which again may have an impact on the market structure. E.g. for improving a product, a component supplier for the product manufacturer may also need to improve the component, or a horizontal data protocol such as Bluetooth and Docsis may need to be further

developed for supporting low-energy consuming wireless or wired interfaces.

4. The cost-effectiveness of regulating specific products groups and initiatives as opposed to other product groups, initiatives, etc. This will be part of the overall ranking and comparison of the product matrices

5. Improved industrial competitiveness (mainly qualitatively):

    a. Impact on innovation and skills at industry level

    b. International trade on the area including product share manufactured in the EU and outside (both products and components) and impact due to the resulting implemented regulation

    c. Current industry structure and impact, including SMEs, micro-enterprises, social enterprises, new types of industry constellations, etc.

    d. Impact from mega-trends, disruptive trends, etc.

6. Final fiches of the assessed product groups and horizontal measures and recommendations for inclusions in the Ecodesign and Energy Labelling Working Plan 2020-2024

The primary data sources will largely be those utilised in Task 3, to be supplemented as required and feasible within the overview scope of the Task 3 and Task 4 exercise.

4 STAKEHOLDER INVOLVEMENT

4.1 Objectives of the involvement of stakeholders

Stakeholder involvement is crucial for the success of the working plan study – as it is for other studies related to ecodesign and energy labelling. The stakeholders concerned are an important source of information and data and most of them are in varying degrees involved in implementation of potential measures.

The objective of involving stakeholders is to increase the quality of the assessments and analyses through the stakeholders' willingness to provide information, data and positions, and to comment on draft reports. It is also important to keep the relevant stakeholders informed about possible coming regulation(s) within areas of interest for them, and to attempt to seek their validation of compiled data, possible design solutions, and employment and financial feedback.

Stakeholder consultation has been quite extensive throughout the course of the study due to nature of this study being relevant for many industry sectors, industry associations, indudstry groupings, Member States, consumer organisations, environmental organisations, etc. Currently, there were close to 600 persons registered on the study website for updates.

4.2 Stakeholder identification

The relevant stakeholder group has been set as very broad, in order to cover all the relevant product groups and types of stakeholders. The European Commission sent out information about the study to all members of the Ecodesign and Energy Labelling Consultation Forum with an invitation to register at the study website. Furthermore, broader information dissemination through LinkedIn and Twitter and via individual contacts was carried out.

4.3 Study website

The communication hub for the stakeholder involvement is a study website established by the study team. In agreement with the European Commission, the domain name "ecodesignworkingplan20-24.eu" was selected for the website. A screenshot of the website is presented in Figure 2.

Figure 2: Screenshot of the study website, ecodesignworkingplan20-24.eu (captured March 2021).
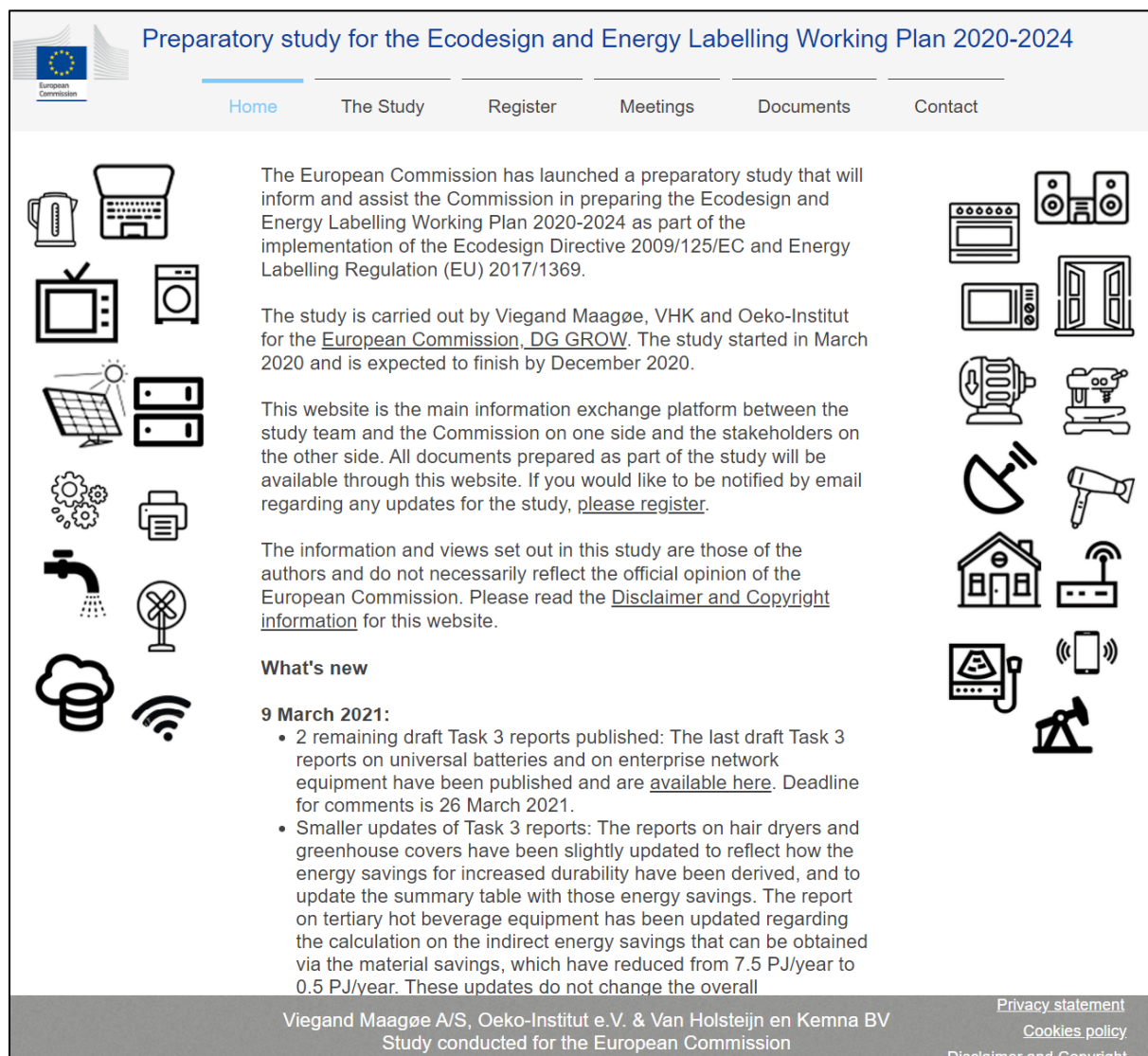
The main elements are:
- Home page: Brief introduction to the study and a news section
- The Study: Presents the background, objectives, methodology, timeline and policy background.
- Register: Persons registering will receive notifications by email regarding any updates for the study such as published reports and invitation to stakeholder meetings.
- Meetings: Stakeholder meetings will be announced and when registration for meetings commences, a meeting registration form is made available.
- Documents: All published documents, including a stakeholder specific commenting form, meeting minutes, etc. are made available here, together with any relevant background documents not necessarily prepared by the study team.
- Contacts: Names of the study team organisations are available together with contact details of the Project Manager.

The website will be continuously updated throughout the contract period. Subsequently, the dedicated website and its content will remain available for a number of years.

4.4 Stakeholder meetings and reports for commenting

From the study outset, formal stakeholder consultations have been incorporated into considerations via two envisaged stakeholder meetings and sets of iterative written comments on the task reports circulated via the study website. Additionally, other inputs have been provided via direct contact via telephone and email communications.

Originally, two one day face to face meetings in Brussels were planned, however, due to the Covid-19 pandemic and like other stakeholder meetings, they had to be converted to online meetings. This gave an opportunity to invite more participants to the meeting - compared to traditional stakeholder face to face meetings - up to about 200, which was the limit of the online meeting platform. However, at the same time the form of the meetings had to be changed into being rather a shorted information meeting (3-4 hours duration) with a limited level of questions and answers, instead of a full day meeting with sufficient time for dialogues.

The first stakeholder meeting was held on 10 July 2020 attended by 164 stakeholders, experts etc. In advance of the meeting, drafts of Task 2 and 3 reports were available on the study website. The draft Task 3 report contained assessment of the product groups and horizontal initiatives selected at that time, totally 15. The slides presented and the minutes of the meeting can be downloaded from the study website (www.ecodesignworkingplan20-24.eu/documents).

In September 2020, draft Task 1 report and 1 additional Task 3 horizontal initative report were published.

The remaining Task 3 assessments of product groups and horizontal intiatives were published in advance of the second stakeholder meeting together with the draft Task 4 report and final drafts of the reports published in draft versions previously.

Stakeholders have been provided with between three and six weeks for commenting on the reports. Around 60 organisations, mainly industry associations, indudstry groupings, consumer organisations, environmental organisations and Member States have provided comments and position papers.

The second stakeholder meeting was held on 26 March 2021 attended by close to 200 persons.

5 EUROPEAN COMMISSION INTER-SERVICE GROUP

DG GROW of the European Commission is responsible for the preparation of the Ecodesign and Energy Labelling Working Plan and for the Working Plan study service contract. Because several DGs are involved in the area of Ecodesign and Energy Labelling, an Inter-Service Group (ISG) has been established chaired by GROW, as a means of thorough consultation of the other DGs and receiving inputs from them.

Participants in the ISG are:
- DG for Internal Market, Industry, Entrepreneurship and SMEs (GROW), chair
- DG Energy (ENER)
- DG Environment (ENV)
- DG Communications Networks, Content and Technology (CONNECT)
- DG Justice and Consumers (JUST)
- Secretariat-General (SG)

Frequent meetings are held between the ISG and the study team, and the ISG is invited to attend the stakeholder meetings.