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Explanatory Memorandum to

COMMISSION REGULATION (EU) No .../..

of **XXX**

**implementing Directive 2009/125/EC of the European Parliament and of the Council
with regard to ecodesign requirements for household washing machines and washer-
dryers,**

**repealing,
Regulation (EU) No 1015/2010 with regard to ecodesign requirements for household
washing machines**

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1. CONTEXT OF THE PROPOSAL

Grounds for and objectives of the proposal

The Ecodesign Directive 2009/125/EC¹ establishes a framework for the setting of ecodesign requirements for energy-related products at EU level. It is a key instrument of the union policy for improving the energy and other environmental aspects of products placed on the market or put into service in the European Economic Area (EEA). It is an important instrument for achieving the EU energy savings objectives for 2020 and 2030, and its implementation is one of the priorities in the commission's Communication on Energy 2020 and Energy Efficiency Plan 2011, being reinforced by the current Ecodesign Working Plan 2016-2019². It is also expected to contribute significantly to the transition towards a more circular economy, as expressed in the Circular Economy action plan 2015³. Furthermore, implementation of Directive 2009/125/EC will contribute to the EU's target of reducing greenhouse gases by at least 20% by 2020 and by 40% by 2030.

The revision clause (Article 7) of Regulation 1015/2010/EU states that the Commission should review the regulation in the light of the technological development no later than 4 years after its entry into force and in particular assess the verification tolerances set out in Annex III, the opportunity of setting requirements on rinsing and spin-drying efficiency and the potential for hot water inlet. Regulation 1015/2010/EU also recommended in Recital (5) that combined washer-dryers should be addressed in an implementing measure of Directive 2009/125/EC.

Household washing machines were included as one of the priority products for revision in the Ecodesign Working Plan 2012-2014. Furthermore, according to Article 11(5) of the new framework Regulation (EU) 2017/1369, a new delegated act for energy labelling of household washing machines must be adopted at the latest by 2 November 2018 to introduce A to G rescaled labels.

In order to revise both the Ecodesign and Energy Label regulations, a review study⁴ was launched in 2014, resulting in a final report published in September 2017. The study included a stakeholder survey, two stakeholder meetings in 2015 and a web-seminar in 2016. It involved approximately 140 stakeholders.

General context

Household washing machines and household washer driers are widely used in the European Union. It is estimated that on average 92% of the European households are equipped with a household washing machine and approximately 4% of those own a washer drier.

Unless measures specifically relating to these products are introduced, the total electricity consumption of washing machines and washer driers in the EU is expected to reach 28.65 TWh/year and 2.59 TWh/year, respectively, by 2030. Both electricity consumptions together are equivalent to 11.33 million ton CO_{2eq}. Additionally, the water consumption related to these products is expected to reach 2200 million m³ of water in 2030.

¹ Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (OJ L 285, 31.10.2009, p. 10).

² Communication from the Commission on the Ecodesign Working Plan 2016-2019, COM(2016) 773 final, 30.11.2016

³ Closing the loop - An EU action plan for the Circular Economy". COM(2015) 614 final, Brussels, 2.12.2015

⁴ Ecodesign and energy label preparatory study on Washing machines and washer driers, available at: http://susproc.jrc.ec.europa.eu/Washing_machines_and_washer_dryers/documents.html

The impact assessment shows that the energy consumption and emissions related to the usage of washing machines and washer driers can be further reduced below the level they would reach in a business-as-usual scenario in a cost-effective way.

The main reasons for not realizing these saving potentials are the failure of the market to:

- (i) provide a better fit between the washing programme portfolio used for testing (optimized by the manufacturers) and the real demand of washing programmes used by consumers;
- (ii) provide a better fit between the usual loading by the users and the rated capacity or loading adaptation of the washing machines and washer driers;
- (iii) guide consumers to make purchase decisions based on the life cycle cost rather than the purchase cost and
- (iv) provide incentives for repairing the appliances and managing properly the products at the end of their use phase.

The objective of the revision of Regulation 1015/2010/EU is to trigger a change in market conditions and appliances optimization. The proposed revision and integration of washer-driers in its scope is expected to reduce the total energy consumption of these products each year across the EU compared to a business-as-usual scenario by around 1.5 TWh/year, 0.5 Mt CO₂ eq/year and up to 45 million m³ water per year by 2030. It is also expected to facilitate repair activities and end-of-life treatment by ensuring that the necessary information and spare parts are available.

Existing regulation and standards in EU and third countries

The Ecodesign Framework Directive 2009/125/EC is an important instrument for achieving the European targets on energy efficiency and the implementation of this revised regulation is a concrete contribution to this process.

Additionally, other eco-design regulations are of relevance for washing machines and washer driers are the standby and off mode regulation 1275/2008, the eco-design regulation 801/2013 on networked standby or the low voltage directive 201/35/EC and the electromagnetic compatibility directive 2014/30/EC.

Regarding the legislation set in third countries, many economies around the world (e.g. US, Japan, Australia, China, Brazil or Mexico) have introduced in recent years some sort of legislation on these products. The US Department of Energy introduced in 2011 modified energy factors and modified water factors that were revised in 2012. This regulation proposed several steps for improvement and the last one will come into force in 2018. Additionally, approximately the 25% best performing machines in terms of energy consumption may be awarded the Energy Star.

The performance of washing machines is tested in accordance with the standard EN 60456:2011 that was developed under the mandate M/458 to facilitate the implementation of these directives, for which harmonized standards should be developed to cover essential requirements. This standard thoroughly describes the methodology for measuring the washing performance, energy consumption of the main cycle and low power modes, water consumption and time of the standard washing programmes.

The same mandate M/458 also required the development of procedures and methods for measuring the rinsing efficiency of household washing machines. In principle EN 60456:2011 describes a procedure for measuring rinsing efficiency by measuring the remaining alkalinity in the load after the spinning. However, it suffers from a poor reproducibility and does not

allow for comparison of different machines tested in different locations. No agreement has been reached so far on a reliable methodology to measure the rinsing efficiency of these appliances.

Directive 96/60/EC regulates the energy labelling of washer-driers. The performance of washer-driers is tested in accordance with EN 50229 that was published in 1997 and modified subsequently to include the changes in EN 60456 and EN 61121. This standard deals with performance criteria including energy and water consumption for the 60C cotton wash programme as specified in EN 60456 and energy and water consumption of the drying cycle based on EN 61121.

New standards would be needed for the implementation of the proposed working document for washing machines and washer driers.

2. CONSULTATION OF INTERESTED PARTIES AND IMPACT ASSESSMENT

Consultation of interested parties

Methods used, main sectors targeted and general profile of respondents

The Commission consulted interested parties from within and outside the EU, and Member States' experts from the very beginning of the review study for this Regulation. The proposed eco-design requirements are to be discussed in the Ecodesign and Energy Label Consultation Forum set up under Directive 2009/125/EC and Regulation 2017/1369. The Consultation Forum comprises Member States' experts and a balanced representation of interested parties, namely manufacturers, retailers, environmental NGOs and consumer organisations. The Commission will present two working documents proposing changes to the ecodesign requirements and the energy label for household washing machines and washer-dryers at the Consultation Forum meeting of 23 November 2017.

All relevant working documents were circulated to the Member States, the European Parliament and interested parties. The working documents for the Consultation Forum will be published in the Commission's CIRCA system, together with comments received in writing from interested parties during the preparatory review. Commission staff also discussed the initiative bilaterally with various interested parties and Member States. The World Trade Organisation was notified of the draft Regulation on [insert date], to ensure that no barriers to trade (prohibited under the Technical Barriers to Trade Agreement) would be introduced.

Collection and use of expertise

Relevant scientific fields

Internal and external expertise was mainly gathered through the review study, which was designed to provide technical, environmental and economic analysis.

Methodology used

The technical, environmental and economic analysis of the study followed the structure recommended in the *Methodology for Ecodesign of Energy-related Products*⁵.

Main organisations and experts consulted

The review study was conducted as an open process, with input from interested parties including individual manufacturers, associations of manufacturers, repairers and waste managers, representatives of the national bodies, environmental NGOs and consumer organisations and experts.

⁵ http://ec.europa.eu/growth/industry/sustainability/ecodesign_en

Publication of the expert advice

Interim results of the review study and further relevant material were published regularly on the website⁶ created for the study in order that interested parties could consult this information and provide their input promptly. Additionally, all registered stakeholders were invited to provide comments on the published study throughout an information exchange information platform (BATIS).

Interested parties were invited to consultation meetings held in June 2015, in November 2015 and in October 2016 to discuss the preliminary results. The written contributions received during the consultation process [and the minutes of the Consultation Forum] meeting are available on the Commission's CIRCA portal.

The review study made a number of recommendations as to the ecodesign and energy label requirements that could be introduced or modified for washing machines and washer-dryers. These were based on the technical, market and economic analysis carried out. The Commission used these recommendations, together with the most recent data available from industry, as the basis for the proposed revised eco-design and energy label requirements. [The views expressed by the members of the Consultation Forum were addressed during the impact assessment.]

The main results of the review study are the following:

- Energy label classes: Most of the washing machines already exceed the highest current energy efficiency class A+++, especially appliances with large rated capacity and heat pump washing machines. A rescaling of the energy labelling classes should therefore simplify comparisons for consumers and provide an incentive to manufacture to continue improving their appliances.
- Range of programmes: Washing machines are characterised by offering a broad range of programmes, besides the standard cotton 40°C/60°C programmes which are the basis for the energy label. Usually, non-standard programmes are not optimised for energy efficiency to the same extent as the standard programmes. A user survey undertaken in 2015 indicated that 90% of respondents expect or understand the label to represent the performance of the washing machine in all programmes, not only in some of them.
- Use of standard programmes: Especially for washing machines, the standard cotton 40°C/60°C programmes are actually used only to a minor extent (17% altogether, or 5% if considering only the programmes lasting more than 3 hours). There are other programmes for the same purpose (i.e. the 'normal' cotton 40°C/60°C programmes) which are used more often (26% altogether) which consume more energy and water than the standard programmes. In some appliances, consumers can also alter the standard cotton 40°C/60°C programmes by adding options such as 'short' or different temperatures. Such alterations tend to increase the energy and/or water consumption of the standard programmes.
- Programme duration: The standard cotton 40°C/60°C programme, whose combined consumption is displayed on the energy label and thus influences the purchase decisions of consumers, is designed to improve the energy efficiency, often with the consequence of reducing the washing temperature and prolonging

⁶ http://susproc.jrc.ec.europa.eu/Washing_machines_and_washer_dryers/index.html

the programme duration. This consequence is in contradiction with the usual preference of consumers. The 2015 user survey indicated that most consumers accept a maximum of 2 to 3h whereas there is clear reluctance to use longer programmes (beyond 3 hours).

- Loading of machines: In general, consumer research shows that the average amount of load in actual conditions of use is around 3.4 kg per cycle for the cotton programmes. This load is much lower than full load and lower than the average 5 kg load used for measurement under standard conditions for a 7 kg capacity machine. In parallel, the market seems to evolve towards an increase of the rated load capacity of machines. The current calculation of the Energy Efficiency Index makes it relatively easier for large machines to reach good labels. However, the lower consumption values per kilogram of laundry are only obtained if the machines are fully loaded, which is generally not the case in actual households conditions. Corrective actions should aim at improving the loading of the machines, as it is one key aspect to increase their energy efficiency. According to the review study, even relatively small increases of load (e.g. 4-8%) would be beneficial for the overall performance of the machines.
- Technical innovation: the results from the review show that further energy savings for the washing machines could be achieved by technical improvement in permanent magnet motor, improved drenching, improved load detection and partial load adaptation, automatic detergent dosage or consumer feedback on loading. These options barely influence the life cycle cost. The use of a heat pump leads to energy savings but these savings do not make up for the initial investment cost over the lifetime of the appliance. For washer-dryers further improvement in the technical design includes options such as permanent magnet motor, improved load detection and adaptation, improve drenching, automatic detergent dosage, consumer feedback on loading and improvement of the drying phase through air condensing or design of combined wash&dry programme. These options barely influence the life cycle cost. The use of a heat pump for improving the drying process represents a significant investment cost but it also leads to significant energy saving and it can therefore be considered as a suitable technology option for this appliance.
- Durability: Statistics point to an increased proportion of household washing machines which have to be replaced earlier than the expected average lifetime, especially within the first 5 years due to a defect. Early device defects may be due in part to inadequate consumer behaviour.

The main results of the review study regarding the other particular aspects mentioned in Article 7 of Regulation 1015/2010 are the following:

- Rinsing performance: standard EN60456:2011 describes a procedure for measuring rinsing efficiency by measuring alkalinity. This method was not considered sufficiently reproducible, resulting in difficulties to compare rinsing efficiencies or to set minimum requirements. An alternative measurement method for rinsing performance is under development but not yet finalised. Additionally, the rinsing performance is indirectly regulated by the washing efficiency requirement and the maximum water consumption requirement. It is proposed to re-assess the rinsing performance in the next revision based on the new measuring standards under development.

- Spin-drying efficiency: The spin-drying efficiency influences the residual moisture content of the laundry which ultimately decreases the energy demand of the subsequent drying process but also the energy demand of the subsequent ironing process. Given the different programmes and user needs in terms of drying and of spinning, the complexity of assessing possible trade-offs with line-drying and ironing and the market transformation observed (most of the appliances on the market achieve a dry-spinning efficiency class between C and A), it is proposed to keep the current information on spin-drying efficiency classes in the product information sheet, accessible through a QR code on the energy label, and not to set ecodesign requirements on spin-drying. In addition, it was observed that most of the appliances on the market achieve a dry-spinning efficiency class between C and A with a potential to change this level of performance.
- Hot water inlet: the use of hot water inlet could lead to additional energy savings if the optimal conditions are met (e.g. short and well-insulated pipelines, high efficient water boilers, provision of renewable energy sources to heat-up the water, etc.). However, given the variety of installations and boilers used in houses and the complexity of assessing possible trade-offs, it does not seem advisable to set stronger requirements at this stage. Additionally, the market share of appliances that are compatible with hot water inlet is currently very low although some increase is expected in the near future in relation with the installations of renewable energy technologies in the residential sector as supported by Art 13(4) of Directive 2009/28/EC.
- Verification tolerances: the current tolerances (10% for single tests and 6% for three appliances tests) seem appropriate in view of stakeholders' feedback. However, the review proposes changes in the testing portfolio which may need to revalidate the verification tolerances by means of round robin tests (also called ring test) performed among different laboratories.

[In order to assess different policy options that could address the points above, several scenarios were created. In addition to 'business-as-usual' case (i.e. not introducing any change other than the rescaling of the energy classes), options include introducing changes in the testing conditions of products, keeping the energy label only, implementing ecodesign measures and rescaling the energy labelling with more demanding conditions and integrating resource efficiency aspects.

Based on an assessment of the costs and benefits of the options, the scenario that combines ecodesign requirements with rescaling of the energy label for washing machines and washer-dryers were chosen as the preferred option. Additionally, the option that pointed to the cotton 40°C programme as the unique testing programme for the washing process was considered as one of the most feasible and beneficial options.]

This option would result in lower overall energy consumption, lower water consumption and related emissions at no excessive lifecycle cost, as well as material efficiency improvements, which were analysed in parallel in consultation with experts and interested parties.

The proposed revision and integration of washer-dryers in its scope is expected to reduce the total energy consumption of these products each year across the EU compared to a business-as-usual scenario by around 1.5 TWh/year, 0.5 Mt CO₂ eq/year and up to 45 million m³ water per year by 2030. The new requirements are also expected to facilitate repair activities and end-of-life treatment by ensuring that the necessary information and spare parts are available.

The aim of the measures is to address the market failure that has led to the sub-optimal design and low use of washing machines and washer-dryers programmes with improved environmental performance. The chosen option best fulfils the requirements of the ecodesign Directive.

The proposed ecodesign requirements will have the following results:

- realising the potential for cost-effective improvements to the energy efficiency of washing machines and washer-dryers;
- reducing the use-phase energy consumption of and emissions from washing machines and washer-dryers, thus reducing the overall effect that these products have on the environment;
- reducing the combined cost of purchase and use for the consumer: consumers may have to pay more for the washing machines and washer-dryers but they will save in energy costs, resulting in a pay-back time shorter than the lifetime of the product;
- keeping a clear legal framework that ensures fair competition;
- improving the competitiveness of industry;
- benefiting employment in the EU;
- harmonising EU requirements for the placing on the market of washing machines and washer-dryers relating to energy efficiency and emissions, thus ensuring the lowest possible administrative burden and cost for businesses;
- avoiding, as far as possible, creating a disproportionate burden or additional costs for manufacturers, by providing for transitional periods that take into account redesign cycles, the pace of innovation and the return on investment.

3. LEGAL ELEMENTS OF THE PROPOSAL

3.1. Summary of the proposed options for the Ecodesign Regulation

The working document on potential ecodesign requirements for washing machines and washer-dryers proposes the following changes in comparison to Regulation 1015/2010:

1. Definition of the scope of the proposed Regulations

This Regulation establishes ecodesign requirements for the placing on the market of electric mains-operated household washing machines and household washer-dryers, and electric mains-operated washing machines and household washer-dryers that can also be powered by batteries, including built-in household washing machines and washer-dryers.

2. Requirements on washing programmes

- (1) clear definition of the 'cotton 40°C' programme and prohibition to use another name such as "normal", "daily" or "standard" for programmes providing the same washing cycle except for better performing programmes
- (2) requirement to have a programme at 20°C
- (3) requirement of minimum temperature in the laundry core of 45°C for the 'cotton 60°C' cycle and 30°C (for at least 5 minutes) for the 'cotton 40°C' cycle
- (4) use of the 'cotton 40°C' programme for the measurement of the energy efficiency index, water consumption, programme time and acoustic airborne noise emissions

- (5) energy efficiency index based on the weighted energy efficiency at full load, half load and quarter load
 - (6) requirement for the EEI to be lower than 135 on 1 December 2020, 105 on 1 December 2024
 - (7) requirements for the washing performance and water consumption unchanged; new requirements on low-power modes
3. Information requirements on washing machines and the washing process of washer-dryers
- (8) information on the performance of the main washing programmes at different loads; information on the power consumption of the low-power modes
 - (9) information that the 'cotton 40 °C' programme is able to clean normally soiled cotton, and that the most efficient programmes in terms of energy and water consumption are those that perform at lower temperatures and longer duration;
 - (10) information that loading the machine up to the capacity indicated by the manufacturer for the respective programmes will contribute to energy and water savings, and recommendation on the type of detergents suitable for the various washing temperatures and washing programmes
 - (11) information on maintenance operations for the purpose of ensuring durability and repair, including access to professional repair and information on the availability horizon of spare parts
4. Requirements on washer-dryers
- (12) definition of a complete washing and drying cycle including the 'cotton 40°C' programme for washing and the drying cycle achieving 'cupboard dry' status, to be used for the measurement of the energy efficiency index and other parameters
 - (13) information requirements on the performance of the main complete cycles at different loads
 - (14) information on the appropriateness of the standard complete cycle, on loading and on low-power modes, similar to the information requirements on washing cycles
5. Additional requirements on repair and end-of-life aspects (resource efficiency)

The working document on potential Ecodesign requirements for household washing machines and household washer-dryers is part of the first wave of Ecodesign product groups to be proposed after the adoption of the Circular Economy package. As such, it envisages a number of requirements related to circular economy and resource efficiency, over and above those related to energy efficiency.

The benefits of resource efficiency requirements are typically realised during repair or at the end-of-life stage of the product life cycle, as opposed to energy savings during the use phase. The proposed resource efficiency requirements could represent the most suitable and balanced approach based on the currently available data. The input of the Ecodesign Consultation Forum on these matters would be valuable.

Resource efficiency requirements proposed in the working document include:

- (15) Information requirements for refrigeration gases
- (16) Design for dismantling for the purposes of depollution, material recovery and recycling.

- (17) Declaration of spare part availability horizon time, with a minimum of 7 years, and maximum delivery time of 3 weeks
- (18) Access to repair and maintenance information (RMI) for independent repairers with reasonable and proportionate fees

3.2. Measurements and calculations

Measurements of the relevant product parameters should be performed using reliable, accurate and reproducible measurement methods, which take into account the recognised state-of-the-art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation⁷.

CENELEC should adapt the existing measurement standards that would provide proper measurement methods for all household washing machines and washer-dryers covered by the scope of the proposed measure.

3.3. Conformity assessment procedures

As required by Article 8(2) of the Ecodesign Directive, the proposed Regulation specifies the conformity assessment procedures to be used and allows manufacturers the choice between internal design control set out in Annex IV to that Directive and the management system set out in Annex V.

3.4. Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the verification procedure for the requirements set out for the Ecodesign and the labelling measure respectively in Annex III of the working document for the revised EU Ecodesign regulation for household washing machines and household washer-dryers and in Annex VIII of the working document for the revised EU Energy label regulation for household washing machines and household washer-dryers.

The verification tolerances set out in the Annexes relate only to the verification of the measured parameters by Member States authorities and shall not be used by the manufacturer or importer as an allowed tolerance to establish the values in the technical documentation.

3.5. Benchmarks

Benchmarks for energy efficiency and emissions are provided to allow the best performing products to be identified. The benchmarks define in quantitative terms 'energy consumption', 'water consumption', 'programme time' and 'low noise emissions', on the basis of the currently available technologies.

3.6. Date for evaluation and possible revision

⁷ OJ L 316, 14.11.2012, p. 12

The Regulation is to be reviewed no later than 1 December 2023.

The main issues for a possible revision are:

- energy and water consumption,
- changes in the user behaviour increasing the use of most-efficient programmes,
- assessment if further requirements on increasing material efficiency and durability of the products can be applied.

Legal basis

The proposed Regulation is an implementing measure adopted pursuant to Directive 2009/125/EC (the Ecodesign Directive), in particular Article 15(1) thereof. This Directive is based on Article 114 of the Treaty.

Subsidiarity principle

The adoption of ecodesign measures for washing machines and washer-dryers by individual Member States, through their national legislation, would create obstacles to the free movement of goods within the EU. It is necessary for such measures in force throughout the EU to have the same content. In line with the principle of subsidiarity, it is thus appropriate for the measures in question to be adopted at EU level.

Proportionality principle

In accordance with the principle of proportionality, this measure does not go beyond what is necessary in order to achieve the objective, which is to set harmonised ecodesign requirements for household washing machines and household washer-dryers. It repeals and replaces an existing Regulation. It sets requirements that act as an incentive for technology leaders to invest in high-efficiency household washing machines and washer-dryers. It also leads to higher savings than any other conceivable option whilst imposing minimum administrative costs.

Choice of instrument

Proposed instrument: Regulation.

Other means would not be appropriate for the following reason(s):

The proposed form of action is a Commission Regulation implementing Directive 2009/125/EC. This form has been chosen because the objectives of the action can be achieved most efficiently by introducing fully harmonised requirements throughout the EU, thus ensuring the free movement of household washing machines and washer-dryers that comply with the requirements. Furthermore, as it repeals and replaces an existing Commission Regulation and the legal base is Directive 2009/125/EC, and other legal instrument would be inappropriate.

4. BUDGETARY IMPLICATION

The proposal has no implications for the EU budget.

5. ADDITIONAL INFORMATION

Review/revision/sunset clause

The proposal includes a review clause.

European Economic Area

The proposed Regulation concerns an EEA matter and should therefore extend to the European Economic Area.

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