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COMMISSION DELEGATED REGULATION (EU) No …/..

of 18.2.2013

supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device

(Text with EEA relevance)

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE DELEGATED ACT

Grounds for and objectives of the proposal

Water heaters and hot water storage tanks are widely used in the European Union to supply hot water for sanitary purposes and store hot water for sanitary and space heating purposes. Most heaters on sale today are conventional water heaters using electricity or gas, but new technologies such as heat pumps, integrated solar water heaters and packages combining water heaters and large solar devices are rapidly entering the market. The environmental impact of water heaters and hot water storage tanks in the EU is significant. In 2005, for example, the energy consumption in the use phase was estimated at 2156 PJ (51 Mtoe) representing 124 Mt CO_2 in emissions.

The aim of this Regulation is to introduce a harmonised scheme for labelling products according to their energy efficiency and energy consumption and providing standard product information for consumers. The labelling requirements also provide a dynamic incentive for manufacturers to improve energy efficiency and to accelerate the market take-up of energy-efficient stand-alone water heaters and hot water storage tanks and also packages of water heaters and solar devices.

It would complement the proposed Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks.

General context

One of the main reasons for persistent sales of low-efficiency water heaters and hot water storage tanks is that end-users base their purchase decisions on the purchase costs of products rather than their life cycle costs, a situation not helped by the current practice of not fully including environmental costs in energy costs. Also, the information available to purchasers on the energy efficiency of water heaters and hot water storage tanks is limited, which gives rise to asymmetric information. This situation is particularly acute when end-users want to combine water heaters with solar devices, such as solar collectors, solar hot water storage tanks, solar pumps and further parts. The result is that end-users often miss opportunities for cost-effective improvements in energy efficiency. Another problem is split incentives: for example, a building owner who purchases and installs a water heater, hot water storage tank or solar device may aim for lower purchase costs but the tenant may end up paying higher energy bills as a result.

Furthermore, dealers who sell water heaters to end-users and usually install them lack standardised information needed to offer end-users packages of water heating products that have come onto the EU market following the introduction of renewable technologies.

This proposal aims to address these market barriers by introducing EU energy labels for stand-alone water heaters and hot water storage tanks and a label for packages of water heaters and solar devices. It introduces the widely known A-G scale to cover the various types of conventional water heaters and hot water storage tanks. Additionally, the dynamic top classes A^{+}, A^{++} and A^{+++} are intended to promote the use of renewable energy sources and

superinsulated tanks. Standardised product information will be made available to end-users in the form of 'fiches' (i.e. information notices), on the internet and in advertisements.

According to the impact assessment, water heaters and hot water storage tanks are responsible for about 3 % of the total gross energy consumption of the EU-27, which is roughly the annual gross energy consumption of Sweden. The aim of this proposal is to reduce the energy consumption of these appliances. It is estimated that the combined effect of the proposed new ecodesign requirements and the new labelling scheme set out in this proposal would lead to an annual reduction of about 450 PJ (11 Mtoe) by 2020, corresponding to about 26 Mt CO_2 emissions or the annual gross energy consumption of Lithuania and Cyprus together, compared to 'business as usual'.

Existing provisions in the area of the proposal

In addition to a proposed ecodesign implementing measure introducing energy efficiency, sound power level and nitrogen oxide emissions requirements for water heaters and hot water storage tanks, the following measures also address the environmental performance of these products, although not in the field of energy labelling:

– Commission Decision 2007/742/EC[1] of 9 November 2007 establishing the ecological criteria for the award of the Community eco-label to electrically driven, gas driven or gas absorption heat pumps;

– Directive 2010/31/EU[2] of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings;

– Directive 2009/28/EC[3] of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources;

– Regulation (EC) No 842/2006[4] of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases;

– Commission Delegated Regulation (EU) No 626/2011[5] of 4 May 2011 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of air conditioners (only air-to-air heat pumps).

Consistency with the other EU policies and objectives

Increased market take-up of energy-efficient water heaters and hot water storage tanks through the introduction of new energy efficiency classes and proposed ecodesign requirements will contribute to the 20 % energy savings which should be achieved until 2020 according to the Energy Efficiency Action Plan (COM(2006) 545), and are confirmed in the Commission's Communication on Energy 2020 (COM(2010) 639) and Energy Efficiency Plan 2011 (COM(2011) 109).

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1 OJ L 301, 20.11.2007, p. 14.
2 OJ L 153, 18.6.2010, p. 13.
3 OJ L 140, 5.6.2009, p. 16.
4 OJ L 161, 14.6.2006, p. 1.
5 OJ L 178, 6.7.2011, p. 1.

The present proposal will complement promotion of the market take-up of efficient products, which is at the heart of the EU's Europe 2020 strategy for smart, sustainable and inclusive growth (COM(2010) 2020), as it will greatly improve energy efficiency, support the transition to a resource-efficient economy, encourage investment in R&D and ensure a level playing field for heating products.

The proposed energy labelling of water heaters and hot water storage tanks is also in line with the Commission's industrial policy, in particular the Sustainable Consumption, Production and Industrial Policy Action Plan (COM(2008) 397) and the European Economic Recovery Plan (COM(2008) 800), which mentions energy efficiency as one of the key priorities, referring for example to the promotion of the rapid take-up of products offering a 'high potential for energy savings'.

Furthermore, implementation of Directive 2010/30/EU[6] contributes to the EU's objective of attaining at least a 20% reduction in greenhouse gas emissions by 2020.

2. CONSULTATIONS PRIOR TO THE ADOPTION OF THE ACT

Consultation of interested parties

EU and international stakeholders and Member State experts were consulted from the very beginning of the preparatory study, and energy labelling was discussed together with ecodesign requirements in the Ecodesign Consultation Forum set up under the Ecodesign Framework Directive 2009/125/EC[7]. The Consultation Forum comprises Member State experts and a balanced representation of stakeholders, namely manufacturers, retailers, environmental NGOs and consumer organisations. At the meetings of the Consultation Forum on 29 February 2008, 8 July 2008 and 24/25 June 2009, the Commission presented working documents suggesting ecodesign requirements and an energy labelling scheme for heaters[8], water heaters and hot water storage tanks. The working documents were also discussed at a meeting of the Ecodesign Regulatory Committee on 11 April 2011 and a Member State expert meeting on 29 June 2012.

All relevant working documents were circulated to the Member States, European Parliament and stakeholders, and the working documents for the Consultation Forum were published in the Commission's CIRCA system alongside the stakeholder comments received in writing. In addition, the initiative was discussed on many occasions at meetings of Commission staff with stakeholders and Member States and also with international partners, such as Japan and the US. The WTO/TBT was notified of the draft Regulation on 4 June 2012, to ensure that no barriers to trade are introduced.

Additional written consultations at expert level were launched in June 2010 and March 2011 on updated working documents for ecodesign and energy labelling measures for water heaters and hot water storage tanks, which build on the input and feedback provided during the earlier consultations in the Consultation Forum.

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6 OJ L 153, 18.6.2010, p. 1.

7 OJ L 285, 31.10.2009, p. 10.

8 Heaters are covered by a separate proposal.

Summary of responses and how they have been taken into account

In general, an energy labelling scheme for heaters is supported by stakeholders and Member States. The positions of the main stakeholders on crucial features of the Commission proposal can be summarised as follows:

Product scope

The products to be covered are conventional water heaters, heat pump water heaters and solar water heaters with a rated heat output of ≤ 70 kW, hot water storage tanks with a storage volume of ≤ 500 litres and packages combining water heaters and solar devices. The water heaters are able to use electricity and fuel, including from biomass (unless predominantly) in order not to exclude water heaters capable of combusting biomass. A solar water heater is placed on the market as one unit, with integrated solar collectors, solar hot water storage tanks, heat generators and other parts. Solar water heaters typically have about two collectors and are widely used in southern Europe. On the other hand, solar devices are typically larger devices consisting of a number of solar collectors, solar hot water storage tanks and other products, either placed on the market individually or as one unit (solar-only systems).

Product label

The product label for water heaters and hot water storage tanks is in general accepted by Member States and stakeholders. Consumer organisations asked for the labels to be kept simple for end-users and insisted that the energy labels show the sound power levels of water heaters.

Several Member States and stakeholders called for the efficiency in % to be removed from the label, as test conditions differ between heaters, but asked for the efficiency in % to be kept on the fiche. Furthermore, it was requested that electricity consumption be indicated in final energy (kWh/year) and fuel consumption in GJ/year, corresponding to what most end-users see on their energy bills. Several Member States remarked that water heaters are nowadays able to work only at off-peak hours rather than only during night hours so end-users benefit from lower tariffs. The layout of the label was modified accordingly.

Package label

While the product label helps to provide standardised information to end-users on stand-alone water heaters, the information on packages of water heaters combined with solar devices remains limited. To address this market barrier, a package label is proposed.

Several Member States and manufacturers called for the proposed package fiche to be supplemented by a vertical label in the usual product label design to allow better communication between dealer and end-user.

The package label and fiches were supported by most Member States and stakeholders, although some Member States took the view that the package fiche could have been included in the Energy Performance of Buildings Directive 2010/31/EU. A disclaimer is therefore proposed to clarify that the package fiche concerns the efficiency of product packages and not the energy performance of buildings. The energy efficiency of the hot water system is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics, for example insulation.

Suppliers requested to place on the market bundled packages of water heaters and solar devices, in particular as the market structure does not allow them to act as dealer (retailer or installer). On the other hand, some suppliers of solar devices, mainly SMEs, feared unfair competition. Several Member States suggested therefore that the supplier and also the dealer should be allowed to issue the package label and fiche. The dealer should base his package fiche on product fiches provided by the suppliers of the water heaters and solar devices. A dealer may re-assemble a package provided by the supplier, e.g. issue a new package label and fiche with a more efficient solar device. Some Member States also requested that suppliers and dealers should advertise the efficiency of the package (if there are advertisements on packages).

Dealer responsibility is limited to a straightforward calculation based on product fiches received from suppliers of water heaters and solar devices. To support dealers, mainly SMEs, the Commission will provide templates and guidelines for dealers on the Commission's energy labelling website[9].

The package label is introduced in line with the package label in the proposed Delegated Regulation for energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device, and packages of combination heater, temperature control and solar device. The same fiche will be used for the water heating function of combination heaters.

Energy labelling scales

Regarding water heaters, the principle of a single energy efficiency grading based on primary energy consumption was in general accepted. This includes a single scale for all water heating technologies on the product and package label to create a level playing field for water heaters and promote the single energy market. However, some Member States and stakeholders preferred technology- and fuel-specific scales. Stakeholders requested that energy classes should be defined in such a way that the best conventional technology should be able to reach at most class A. They provided evidence that the A and B class boundaries of water heaters providing medium to large tapping profiles should be increased due to new market developments.

Member States and stakeholders accepted that the A^{+} to A^{+++} classes could only be reached by water heaters using renewable energy sources. However, stakeholders suggested increasing the bandwidth of energy efficiency ranking bands implying the energy input of renewable energy sources to improve differentiation, in particular for water heaters using solar heat which can contribute up to approximately 70% of annual heat demand. It is therefore suggested that energy efficiency classes 'better than A' be defined such that the energy efficiency classes $A^{+}/A^{++}/A^{+++}$ correspond to a contribution of 35%/50%/60% of renewable energy sources to energy consumption with respect to energy efficiency class A (that is: the threshold between efficiency classes A and B is divided by 0,65, 0,5 and 0,4, respectively). A RES contribution of 50% and more can only be achieved by solar devices, consequently A^{++} and A^{+++} classes are only used for the package label.

Regarding hot water storage tanks, several Member States and stakeholders remarked that the A class boundary only allowed half as much standing loss as hot water storage tanks in the C class and that superinsulated tanks would enter the market prior to the five-year review. The

[9] http://ec.europa.eu/energy/efficiency/labelling/labelling_en.htm

A and B class boundaries were therefore revised, and a class A^+ will be introduced four years after the entry into force of the Regulation.

Timetable

The timing of the introduction of energy labelling in two stages, two and four years after the entry into force of the Regulation, is accepted, in particular as the energy labelling timetable is aligned with the ecodesign timetable for water heaters, hot water storage tanks.

One stakeholder asked for voluntary use of the label to be allowed directly after entry into force of the Regulation. Such voluntary use of a label has been allowed for other revised energy labels. However, the water heater label will be newly introduced in the European Union, and all suppliers and dealers should be given a level playing field and the necessary lead time to introduce the energy label in the market at the same time.

Testing and calculation methods

Some stakeholders remarked that the symbol for frequency-weighted sound power level L_{WA} is dB.

The Regulation takes the comments from stakeholders and Member States into account.

Collection and use of expertise

Input from scientific expertise

External expertise was mainly gathered through the preparatory study providing technical, environmental and economic analysis, which was carried out by a consortium of external consultants on behalf of the Commission's Directorate-General for Energy.

Main organisations/experts consulted

The preparatory study was conducted in an open process, taking into account input from relevant stakeholders, including manufacturers, installers, retailers and their associations, environmental NGOs, consumer organisations, EU/EEA Member State experts and experts from outside the EU.

Summary of advice received and used

No potentially serious risks with irreversible consequences were mentioned.

Impact assessment

An impact assessment of the possible policy measures was carried out pursuant to Article 15(4)(b) of Directive 2009/125/EC. Several policy options for bringing about market transformation to achieve the appropriate level of ambition were considered, including the 'business-as-usual' case, self-regulation, energy labelling only, ecodesign regulation only, a combination of the latter two, and requirements for hot water systems under the Energy Performance of Buildings Directive only.

However, given the clear legislative mandate to introduce ecodesign requirements and energy labelling for water heaters and heaters, the depth of analysis for options other than an

implementing legal act was proportionate, and the focus was on the assessment of the proposed implementing regulations.

The impacts of policy scenarios for introducing energy labels were assessed against the 'business as usual' scenario. Based on an assessment of costs and benefits, a combination of ecodesign requirements, labelling and system requirements for the energy performance of buildings was identified as the preferred option to solve the problem of market failure in the take-up of water heaters and hot water storage tanks with improved environmental performance, as that combination best meets the requirements of the Ecodesign and Energy Labelling Directives.

Consequently, the option comprising the adoption of ecodesign requirements together with the introduction of a product and package labelling scheme was chosen, as it delivers most savings and is also preferred by stakeholders.

It will ensure that:

– ongoing energy improvements are maintained and fostered by providing standardised information to end-users and removing market barriers due to asymmetric information and split incentives;

– there is a dynamic market transformation towards highly efficient water heaters, hot water storage tanks and packages of water heaters combined with renewable energy technologies;

– fair competition and product differentiation continue to result in energy improvements;

– a cost-effective level of energy consumption is reached;

– the competitiveness of the industry is enhanced by the expansion of the EU single market for sustainable products;

– the burdens on suppliers, including SMEs, are not excessive, as the transition periods take redesign cycles into account;

– there is no negative impact on employment in the EU.

3. LEGAL ELEMENTS OF THE DELEGATED ACT

Summary of the proposed action

The proposed measure sets out new mandatory labelling and standard product information requirements for suppliers placing on the market and/or putting into service water heaters, hot water storage tanks, solar devices (solar-only system, solar collector, solar tank and other solar products placed on the market separately) or packages of water heaters and solar devices, and for dealers offering stand-alone water heaters and packages of water heaters and solar devices. The scope of the measure is aligned with the scope of a proposed ecodesign implementing measure setting requirements for the energy efficiency, sound power levels and nitrogen oxide emissions of water heaters and hot water storage tanks.

The energy efficiency ranking of water heaters is based on the scheme laid down in Directive 2010/30/EU in having an efficiency scale for water heating, covering conventional water heaters, integrated solar water heaters and heat pump water heaters and packages of water heaters with larger solar devices. Two years after the entry into force of the Regulation, a scale from G to A for conventional water heaters will be introduced (for small load profiles, G-A for electric water heaters; for medium to large load profiles, G-C for electric water heaters, C-A for gas water heaters), while actual solar water heaters and heat pump water heaters are not sufficiently efficient yet to reach classes beyond A. Four years after the entry into force of the Regulation, a further class A^{+} will be added on top of the labelling scale to encourage the development of more efficient solar water heaters and heat pump water heaters. Classes A^{++} and A^{+++} can only be reached by packages with large solar devices. This will ensure dynamic market transformation toward highly efficient heaters using new and renewable energy technologies.

For hot water storage tanks an efficiency scale G-A will be introduced from two years after the entry into force of the Regulation. Four years after its entry into force, a further class A^{+} will be added on top of the labelling scale to encourage the development of superinsulated storage tanks.

Furthermore, the product label will show the sound power level to end-users, standardised product information will be introduced for water heaters and hot water storage tanks, such as a product fiche and technical documentation, and requirements will be specified for information to be provided in any form of distance selling of water heaters and hot water storage tanks, and in any advertisements and technical promotional material for them.

As water heaters might be sold in packages with large solar devices, a package label and a comprehensible calculation on the fiche are introduced to provide information on the overall efficiency of the package of products to the end-user. The supplier and also the dealer may issue the package label and fiche. The package label is based on the single efficiency scale for water heating with classes from G to A^{+++}, reflecting the potentially higher energy efficiency of such packages.

The proposed product and package labels and standardised product information will help overcome the lack of information for people buying water heaters and hot water storage tanks and the split incentives for building owners and tenants.

The measurement methods and the verification procedure for market surveillance in this Regulation are aligned with those in the proposed ecodesign implementing measure.

Legal basis

The Delegated Regulation implements Directive 2010/30/EU, in particular its Article 10.

Subsidiarity principle

The Regulation implements Directive 2010/30/EU in line with its Article 10.

Proportionality principle

In accordance with the principle of proportionality, this measure does not go beyond what is necessary to achieve its objective.

The form of the implementing measure is a Regulation, which is directly applicable in all Member States. This ensures that national and EU administrations will not incur any costs for transposing the implementing legislation into national legislation.

Choice of instrument

Proposed instrument: Delegated Regulation.

Budgetary implication

The proposal has no implications for the EU budget.

ADDITIONAL INFORMATION

Review/revision/sunset clause

The draft includes a revision clause.

European Economic Area

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

COMMISSION DELEGATED REGULATION (EU) No …/..

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supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products[10], and in particular Article 10 thereof,

Whereas:

(1) Directive 2010/30/EU requires the Commission to adopt delegated acts as regards the labelling of energy-related products that have a significant potential for energy savings but exhibit a wide disparity in performance levels with equivalent functionality.

(2) The energy consumed by water heaters and hot water storage tanks accounts for a significant share of the total energy demand in the Union, and water heaters and hot water storage tanks with equivalent functionality exhibit a wide disparity in terms of water heating energy efficiency and standing loss. The scope for reducing their energy consumption is significant and includes combining water heaters with appropriate solar devices. Water heaters, hot water storage tanks and packages of water heaters and solar devices should therefore be covered by energy labelling requirements.

(3) Water heaters that are designed for using gaseous or liquid fuels predominantly (more than 50%) produced from biomass have specific technical characteristics which require further technical, economic and environmental analyses. Depending on the outcome of the analyses, energy labelling requirements for those water heaters should be set at a later stage, if appropriate.

(4) Harmonised provisions should be laid down on labelling and standard product information regarding the energy efficiency of water heaters and hot water storage

[10] OJ L 153, 18.6.2010, p. 1.

tanks in order to provide incentives for manufacturers to improve the energy efficiency of these products, to encourage end-users to purchase energy-efficient products and to contribute to the functioning of the internal market.

(5) As regards significant energy and cost savings for each type of water heater and for hot water storage tanks, this Regulation should introduce a new single labelling scale from A to G for conventional water heaters, solar water heaters and heat pump water heaters and for hot water storage tanks. A dynamic class A^+ should be added to the classification after two years to accelerate the market penetration of the most efficient water heaters and hot water storage tanks.

(6) This Regulation should ensure that consumers get more accurate comparative information about the performance of solar water heaters and heat pump water heaters in three European climate zones.

(7) The sound power level of a water heater could be an important consideration for end-users. Information on sound power levels should be included on the labels of water heaters.

(8) The combined effect of this Regulation and Commission Regulation (EU) No …/… of … implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks [Number of the Regulation and OJ reference in footnote to be inserted before publication in the OJ] is expected to result in estimated annual energy savings of around 450 PJ (11 Mtoe) by 2020, corresponding to about 26 Mt CO_2 emissions, compared to what would happen if no measures were taken.

(9) The information provided on the labels should be obtained through reliable, accurate and reproducible measurement and calculation procedures that take into account recognised state-of-the-art measurement and calculation methods including, where available, harmonised standards adopted by the European standardisation bodies under a request from the Commission, in accordance with the procedures laid down in the Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services[11], for the purpose of establishing ecodesign requirements.

(10) This Regulation should specify a uniform design and content of product labels for water heaters and hot water storage tanks.

(11) In addition, this Regulation should specify requirements for the product fiche and technical documentation for water heaters and hot water storage tanks.

(12) Moreover, this Regulation should specify requirements for the information to be provided for any form of distance selling of water heaters and hot water storage tanks and in any advertisements and technical promotional material for such products.

(13) In addition to the product labels and fiches for water heaters and hot water storage tanks laid down in this Regulation, a package label and fiche based on product fiches

[11] OJ L 204, 21.7.1998, p. 37.

from suppliers should ensure that the end-user has easy access to information on the energy performance of water heaters in combination with solar devices. The most efficient class A^{+++} may be reached by such a package.

(14) It is appropriate to provide for a review of the provisions of this Regulation taking into account technological progress,

HAS ADOPTED THIS REGULATION:

Article 1
Subject matter and scope

1. This Regulation establishes requirements for the energy labelling of, and the provision of supplementary product information on, water heaters with a rated heat output ≤ 70 kW, hot water storage tanks with a storage volume ≤ 500 litres and packages of water heater ≤ 70 kW and solar device.

2. This Regulation shall not apply to:

   (a) water heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

   (b) water heaters using solid fuels;

   (c) water heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council[12];

   (d) combination heaters as defined in Article 2 of Commission Delegated Regulation (EU) No …/…. [Number of the heater energy labelling Regulation and OJ reference in footnote to be inserted before publication in the OJ];

   (e) water heaters which do not meet at least the load profile with the smallest reference energy, as specified in Annex VII, Table 3;

   (f) water heaters designed for making hot drinks and/or food only.

Article 2
Definitions

In addition to the definitions set out in Article 2 of Directive 2010/30/EC, the following definitions shall apply for the purposes of this Regulation:

(1) 'water heater' means a device that

   (a) is connected to an external supply of drinking or sanitary water;

   (b) generates and transfers heat to deliver drinking or sanitary hot water at given temperature levels, quantities and flow rates during given intervals; and

[12] OJ L 334, 17.12.2010, p. 17.

(c) is equipped with one or more heat generators;

(2) ‘heat generator’ means the part of a water heater that generates the heat using one or more of the following processes:

(a) combustion of fossil fuels and/or biomass fuels;

(b) use of the Joule effect in electric resistance heating elements;

(c) capture of ambient heat from an air source, water source or ground source, and/or waste heat;

(3) ‘rated heat output’ means the declared heat output of the water heater when providing water heating at standard rating conditions, expressed in kW;

(4) ‘storage volume’ (*V)* means the rated volume of a hot water storage tank, expressed in litres;

(5) ‘standard rating conditions’ means the operating conditions of water heaters for establishing the rated heat output, water heating energy efficiency and sound power level, and of hot water storage tanks for establishing the standing loss;

(6) ‘biomass’ means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

(7) ‘biomass fuel’ means a gaseous or liquid fuel produced from biomass;

(8) ‘fossil fuel’ means a gaseous or liquid fuel of fossil origin;

(9) ‘hot water storage tank’ means a vessel for storing hot water for water and/or space heating purposes, including any additives, which is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(10) ‘back-up immersion heater’ means a Joule effect electric resistance heater that is part of a hot water storage tank and generates heat only when the external heat source is disrupted (including during maintenance periods) or out of order, or that is part of a solar hot water storage tank and provides heat when the solar heat source is not sufficient to satisfy required comfort levels;

(11) ‘solar device’ means a solar-only system, a solar collector, a solar hot water storage tank or a pump in the collector loop, which are placed on the market separately;

(12) ‘solar-only system’ means a device that is equipped with one or more solar collectors and solar hot water storage tanks and possibly pumps in the collector loop and other parts, which is placed on the market as one unit and is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(13) ‘package of water heater and solar device’ means a package offered to the end-user containing one or more water heaters and one or more solar devices;

(14) 'water heating energy efficiency' (η_{wh}) means the ratio between the useful energy provided by a water heater or a package of water heater and solar device and the energy required for its generation, expressed in %;

(15) 'sound power level' (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB;

(16) 'standing loss' (S) means the heating power dissipated from a hot water storage tank at given water and ambient temperatures, expressed in W;

(17) 'heat pump water heater' means a water heater that uses ambient heat from an air source, water source or ground source, and/or waste heat for heat generation.

For the purposes of Annexes II to IX, additional definitions are set out in Annex I.

Article 3
Responsibilities of suppliers and timetable

1. From [date to be inserted: two years after this Regulation has entered into force] suppliers placing water heaters on the market and/or putting them into service, including those integrated in packages of water heater and solar device, shall ensure that:

(a) a printed label complying with the format and content of information set out in point 1.1 of Annex III is provided for each water heater conforming to the water heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump water heaters, the printed label is provided at least in the packaging of the heat generator; for water heaters intended for use in packages of water heater and solar device, a second label complying with the format and content of information set out in point 3 of Annex III is provided for each water heater;

(b) a product fiche, as set out in point 1 of Annex IV, is provided for each water heater, whereby: for heat pump water heaters, the product fiche is provided at least for the heat generator; for water heaters intended for use in packages of water heater and solar device, a second fiche, as set out in point 4 of Annex IV, is provided;

(c) the technical documentation, as set out in point 1 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific water heater model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific water heater model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model;

From [date to be inserted: four years after this Regulation has entered into force] a printed label complying with the format and content of information set out in point 1.2 of Annex III shall be provided for each water heater conforming to the water heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump water heaters, the printed label shall be provided at least in the packaging of the heat generator.

2. From [date to be inserted: two years after this Regulation has entered into force] suppliers placing hot water storage tanks on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 2.1 of Annex III is provided for each hot water storage tank conforming to the energy efficiency classes set out in point 2 of Annex II;

(b) a product fiche, as set out in point 2 of Annex IV, is provided;

(c) the technical documentation, as set out in point 2 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific hot water storage tank model and containing energy-related or price information includes a reference to the energy efficiency class for that model;

(e) any technical promotional material concerning a specific hot water storage tank model and describing its specific technical parameters includes a reference to the energy efficiency class for that model;

From [date to be inserted: four years after this Regulation has entered into force] a printed label complying with the format and content of information as set out in point 2.2 of Annex III shall be provided for each hot water storage tank conforming to the energy efficiency classes set out in point 2 of Annex II.

3. From [date to be inserted: two years after this Regulation has entered into force] suppliers placing solar devices on the market and/or putting them into service shall ensure that:

(a) a product fiche, as set out in point 3 of Annex IV, is provided;

(b) the technical documentation, as set out in point 3 of Annex V, is provided on request to the authorities of the Member States and to the Commission.

4. From [date to be inserted: two years after this Regulation has entered into force] suppliers placing packages of water heater and solar device on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 3 of Annex III is provided for each package of water heater and solar device conforming to the water heating energy efficiency classes set out in point 1 of Annex II;

(b) a product fiche, as set out in point 4 of Annex IV, is provided for each package of water heater and solar device;

(c) the technical documentation, as set out in point 4 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific package of water heater and solar device model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific package of water heater and solar device model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

Article 4
Responsibilities of dealers

1. Dealers of water heaters shall ensure that:

(a) each water heater, at the point of sale, bears the label provided by suppliers in accordance with Article 3(1), as set out in point 1 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) water heaters offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the water heater displayed, are marketed with the information provided by the suppliers in accordance with point 1 of Annex VI;

(c) any advertisement relating to a specific water heater model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific water heater model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

2. Dealers of hot water storage tanks shall ensure that:

(a) each hot water storage tank, at the point of sale, bears the label provided by suppliers in accordance with Article 3(2), as set out in point 2 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) hot water storage tanks offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the hot water storage tank displayed, are marketed with the information provided by the suppliers in accordance with point 2 of Annex VI;

(c) any advertisement relating to a specific hot water storage tank model and containing energy-related or price information includes a reference to the energy efficiency class for that model;

(d) any technical promotional material concerning a specific hot water storage tank model and describing its specific technical parameters includes a reference to the energy efficiency class for that model.

3. Dealers of packages of water heater and solar device shall ensure, based on the label and fiches provided by suppliers in accordance with Article 3(1), 3(3) and 3(4), that:

(a) any offer for a specific package includes the water heating energy efficiency and the water heating energy efficiency class for that package under average, colder or warmer climate conditions, as applicable, by displaying with the package the label set out in point 3 of Annex III and providing the fiche set out in point 4 of Annex IV, duly filled in according to the characteristics of that package;

(b) packages of water heater and solar device offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the package of water heater and solar device displayed, are marketed with the information provided in accordance with point 3 of Annex VI;

(c) any advertisement relating to a specific package of water heater and solar device model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific package of water heater and solar device model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

Article 5

Measurement and calculation methods

The information to be provided pursuant to Articles 3 and 4 shall be obtained by reliable, accurate and reproducible measurement and calculation methods which take into account the recognised state-of-the-art measurement and calculation methods, as set out in Annex VII and Annex VIII.

Article 6

Verification procedure for market surveillance purposes

Member States shall apply the procedure set out in Annex IX when assessing the conformity of the declared water heating energy efficiency class, water heating energy efficiency, annual energy consumption and sound power level of water heaters and the declared energy efficiency class and standing loss of hot water storage tanks.

Article 7
Review

The Commission shall review this Regulation in the light of technological progress no later than five years after its entry into force. The review shall in particular assess any significant changes in the market shares of various types of appliances and the appropriateness of the package fiche and label set out in point 3 of Annex III and point 4 of Annex IV.

Article 8
Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 18.2.2013

For the Commission
The President
José Manuel BARROSO

ANNEX I
Definitions applicable for Annexes II to IX

For the purposes of Annexes II to IX, the following definitions shall apply:

(1) 'conventional water heater' means a water heater that generates heat using the combustion of fossil and/or biomass fuels and/or the Joule effect in electric resistance heating elements;

(2) 'solar water heater' means a water heater equipped with one or more solar collectors, solar hot water storage tanks, heat generators and possibly pumps in the collector loop and other parts, a solar water heater is placed on the market as one unit;

(3) 'load profile' means a given sequence of water draw-offs, as specified in Annex VII, Table 3; each water heater meets at least one load profile;

(4) 'water draw-off' means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex VII, Table 3;

(5) 'useful water flow rate' (f) means the minimum flow rate, expressed in litres per minute, for which hot water is contributing to the reference energy, as specified in Annex VII, Table 3;

(6) 'useful water temperature' (T_m) means the water temperature, expressed in degrees Celsius, at which hot water starts contributing to the reference energy, as specified in Annex VII, Table 3;

(7) 'useful energy content' (Q_{tap}) means the energy content of hot water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex VII, Table 3;

(8) 'energy content of hot water' means the product of the specific heat capacity of water, the average temperature difference between the hot water output and cold water input, and the total mass of the hot water delivered;

(9) 'peak temperature' (T_p) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex VII, Table 3;

(10) 'reference energy' (Q_{ref}) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex VII, Table 3;

(11) 'maximum load profile' means the load profile with the greatest reference energy that a water heater is able to provide while fulfilling the temperature and flow rate conditions of that load profile;

(12) 'declared load profile' means the load profile applied when determining water heating energy efficiency;

(13) ‘conversion coefficient’ (*CC*) means a coefficient reflecting the estimated 40% average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council[13]; the value of the conversion coefficient is *CC* = 2,5;

(14) ‘daily electricity consumption’ (Q_{elec}) means the consumption of electricity over 24 consecutive hours under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

(15) ‘daily fuel consumption’ *(*Q_{fuel}*)* means the consumption of fuels over 24 consecutive hours under the declared load profile and under given climate conditions, expressed in kWh in terms of *GCV*, and for the purposes of point 4 in Annex VIII expressed in GJ in terms of *GCV*;

(16) ‘gross calorific value’ (*GCV*) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

(17) ‘smart control’ means a device that automatically adapts the water heating process to individual usage conditions with the aim of reducing energy consumption;

(18) ‘smart control compliance’ (*smart*) means the measure of whether a water heater equipped with smart controls fulfils the criterion set out in point 5 of Annex VIII;

(19) ‘smart control factor’ (*SCF*) means the water heating energy efficiency gain due to smart control under the conditions set out in point 3 of Annex VII;

(20) ‘weekly electricity consumption with smart controls’ ($Q_{elec,week,smart}$) means the weekly electricity consumption of a water heater with the smart control function enabled, expressed in kWh in terms of final energy;

(21) ‘weekly fuel consumption with smart controls’ ($Q_{fuel,week,smart}$) means the weekly fuel consumption of a water heater with the smart control function enabled, expressed in kWh in terms of *GCV*;

(22) ‘weekly electricity consumption without smart controls’ ($Q_{elec,week}$) means the weekly electricity consumption of a water heater with the smart control function disabled, expressed in kWh in terms of final energy;

(23) ‘weekly fuel consumption without smart controls’ ($Q_{fuel,week}$) means the weekly fuel consumption of a water heater with the smart control function disabled, expressed in kWh in terms of *GCV*;

(24) ‘annual electricity consumption’ (*AEC*) means the annual electricity consumption of a water heater under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

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[13] OJ L 315, 14.11.2012, p. 1.

(25) ‘annual fuel consumption’ (*AFC*) means the annual fossil and/or biomass fuel consumption of a water heater under the declared load profile and under given climate conditions, expressed in GJ in terms of *GCV*;

(26) ‘ambient correction term’ (Q_{cor}) means a term which takes into account the fact that the place where the water heater is installed is not an isothermal place, expressed in kWh;

(27) ‘standby heat loss’ (P_{stby}) means the heat loss of a heat pump water heater in operating modes without heat demand, expressed in kW;

(28) ‘average climate conditions’, ‘colder climate conditions’ and ‘warmer climate conditions’ mean the temperatures and global solar irradiance conditions characteristic for the cities of Strasbourg, Helsinki and Athens, respectively;

(29) ‘annual energy consumption’ (Q_{tota}) means the annual energy consumption of a solar water heater, expressed in kWh in terms of primary energy and/or kWh in terms of *GCV*;

(30) ‘annual non-solar heat contribution’ *(*Q_{nonsol}*)*, means the annual contribution of electricity (expressed in kWh in terms of primary energy) and/or fuels (expressed in kWh in terms of *GCV*) to the useful heat output of a solar water heater or a package of water heater and solar device, taking into account the annual amount of heat captured by the solar collector and the heat losses of the solar hot water storage tank;

(31) ‘solar collector’ means a device designed to absorb global solar irradiance and to transfer the heat energy so produced to a fluid passing through it; it is characterised by the collector aperture area, the zero-loss efficiency, the first order coefficient, the second-order coefficient and the incidence angle modifier;

(32) ‘global solar irradiance’ means the rate of total incoming solar energy, both direct and diffuse, on a collector plane with an inclination of 45 degrees and southward orientation at the Earth’s surface, expressed in W/m²;

(33) ‘collector aperture area’ (A_{sol}) means the maximum projected area through which unconcentrated solar radiation enters the collector, expressed in m²;

(34) ‘zero-loss efficiency’ (η_0) means the efficiency of the solar collector, when the solar collector mean fluid temperature is equal to the ambient temperature;

(35) ‘first-order coefficient’ (a_1) means the heat loss coefficient of a solar collector, expressed in W/(m² K);

(36) ‘second-order coefficient’ (a_2) means the coefficient measuring the temperature dependence of the first order coefficient, expressed in W/(m² K²);

(37) ‘incidence angle modifier’ (*IAM*) means the ratio of the useful heat output of the solar collector at a given incidence angle and its useful heat output at an incidence angle of 0 degrees;

(38) ‘incidence angle’ means the angle between the direction to the sun and the direction perpendicular to the solar collector aperture;

(39) ‘solar hot water storage tank’ means a hot water storage tank storing heat energy produced by one or more solar collectors;

(40) ‘heat generator water heating energy efficiency’ ($\eta_{wh,nonsol}$) means the water heating energy efficiency of a heat generator which is part of a solar water heater, expressed in %, established under average climate conditions and without using solar heat input;

(41) ‘auxiliary electricity consumption’ (Q_{aux}), for the purpose of Figure 1 in Annex IV referred to as ‘auxiliary electricity’, means the annual electricity consumption of a solar water heater or a solar-only system that is due to the pump power consumption and the standby power consumption, expressed in kWh in terms of final energy;

(42) ‘pump power consumption’ (*solpump*) means the rated electrical power consumption of the pump in the collector loop of a solar water heater or solar-only system, expressed in W;

(43) ‘standby power consumption’ (*solstandby)* means the rated electrical power consumption of a solar water heater or solar-only system when the pump and the heat generator are inactive, expressed in W;

(44) ‘model identifier’ means the code, usually alphanumeric, which distinguishes a specific water heater, hot water storage tank, solar device or package of water heater and solar device model from other models with the same trade mark, supplier’s name or dealer’s name.

ANNEX II
Energy efficiency classes

1. Water heating energy efficiency classes of water heaters

The water heating energy efficiency class of a water heater shall be determined on the basis of its water heating energy efficiency as set out in Table 1.

The water heating energy efficiency of a water heater shall be calculated in accordance with point 3 of Annex VIII, for solar water heaters and heat pump water heaters under average climate conditions.

2. Energy efficiency classes of hot water storage tanks

The energy efficiency class of a hot water storage tank shall be determined on the basis of its standing loss as set out in Table 2.

Table 2: Energy efficiency classes of hot water storage tanks

Energy efficiency class	**Standing loss *S* in Watts, with storage volume *V* in litres**
A+	$S < 5{,}5 + 3{,}16 \cdot V^{0,4}$
A	$5{,}5 + 3{,}16 \cdot V^{0,4} \leq S < 8{,}5 + 4{,}25 \cdot V^{0,4}$
B	$8{,}5 + 4{,}25 \cdot V^{0,4} \leq S < 12 + 5{,}93 \cdot V^{0,4}$
C	$12 + 5{,}93 \cdot V^{0,4} \leq S < 16{,}66 + 8{,}33 \cdot V^{0,4}$
D	$16{,}66 + 8{,}33 \cdot V^{0,4} \leq S < 21 + 10{,}33 \cdot V^{0,4}$
E	$21 + 10{,}33 \cdot V^{0,4} \leq S < 26 + 13{,}66 \cdot V^{0,4}$
F	$26 + 13{,}66 \cdot V^{0,4} \leq S < 31 + 16{,}66 \cdot V^{0,4}$
G	$S > 31 + 16{,}66 \cdot V^{0,4}$

Table 1: Water heating energy efficiency classes of water heaters, categorised by declared load profiles, η_{wh} *in %*

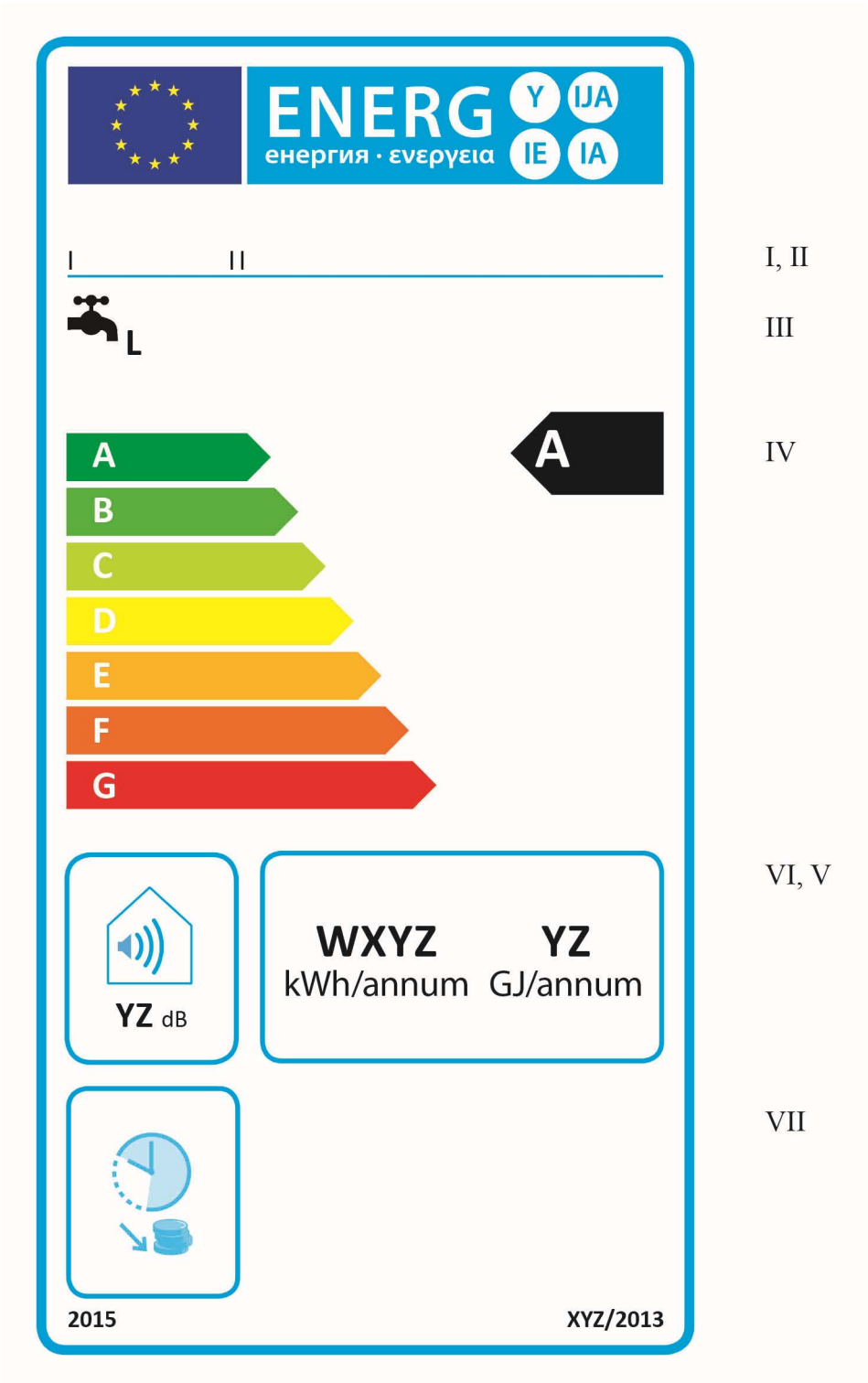
	3XS	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**
A^{+++}	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 69$	$\eta_{wh} \geq 90$	$\eta_{wh} \geq 163$	$\eta_{wh} \geq 188$	$\eta_{wh} \geq 200$	$\eta_{wh} \geq 213$
A^{++}	$53 \leq \eta_{wh} < 62$	$53 \leq \eta_{wh} < 62$	$61 \leq \eta_{wh} < 69$	$72 \leq \eta_{wh} < 90$	$130 \leq \eta_{wh} < 163$	$150 \leq \eta_{wh} < 188$	$160 \leq \eta_{wh} < 200$	$170 \leq \eta_{wh} < 213$
A^{+}	$44 \leq \eta_{wh} < 53$	$44 \leq \eta_{wh} < 53$	$53 \leq \eta_{wh} < 61$	$55 \leq \eta_{wh} < 72$	$100 \leq \eta_{wh} <130$	$115 \leq \eta_{wh} < 150$	$123 \leq \eta_{wh} < 160$	$131 \leq \eta_{wh} < 170$
A	$35 \leq \eta_{wh} < 44$	$35 \leq \eta_{wh} < 44$	$38 \leq \eta_{wh} < 53$	$38 \leq \eta_{wh} < 55$	$65 \leq \eta_{wh} < 100$	$75 \leq \eta_{wh} < 115$	$80 \leq \eta_{wh} < 123$	$85 \leq \eta_{wh} < 131$
B	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$35 \leq \eta_{wh} < 38$	$35 \leq \eta_{wh} < 38$	$39 \leq \eta_{wh} < 65$	$50 \leq \eta_{wh} < 75$	$55 \leq \eta_{wh} < 80$	$60 \leq \eta_{wh} < 85$
C	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$36 \leq \eta_{wh} < 39$	$37 \leq \eta_{wh} < 50$	$38 \leq \eta_{wh} < 55$	$40 \leq \eta_{wh} < 60$
D	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$33 \leq \eta_{wh} < 36$	$34 \leq \eta_{wh} < 37$	$35 \leq \eta_{wh} < 38$	$36 \leq \eta_{wh} < 40$
E	$22 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$30 \leq \eta_{wh} < 33$	$30 \leq \eta_{wh} < 34$	$30 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 36$
F	$19 \leq \eta_{wh} < 22$	$20 \leq \eta_{wh} < 23$	$23 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$28 \leq \eta_{wh} < 32$
G	$\eta_{wh} < 19$	$\eta_{wh} < 20$	$\eta_{wh} < 23$	$\eta_{wh} < 23$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 28$

ANNEX III
The labels

1. Water heaters

1.1. Label 1

1.1.1. Conventional water heaters in water heating energy efficiency classes A to G



(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

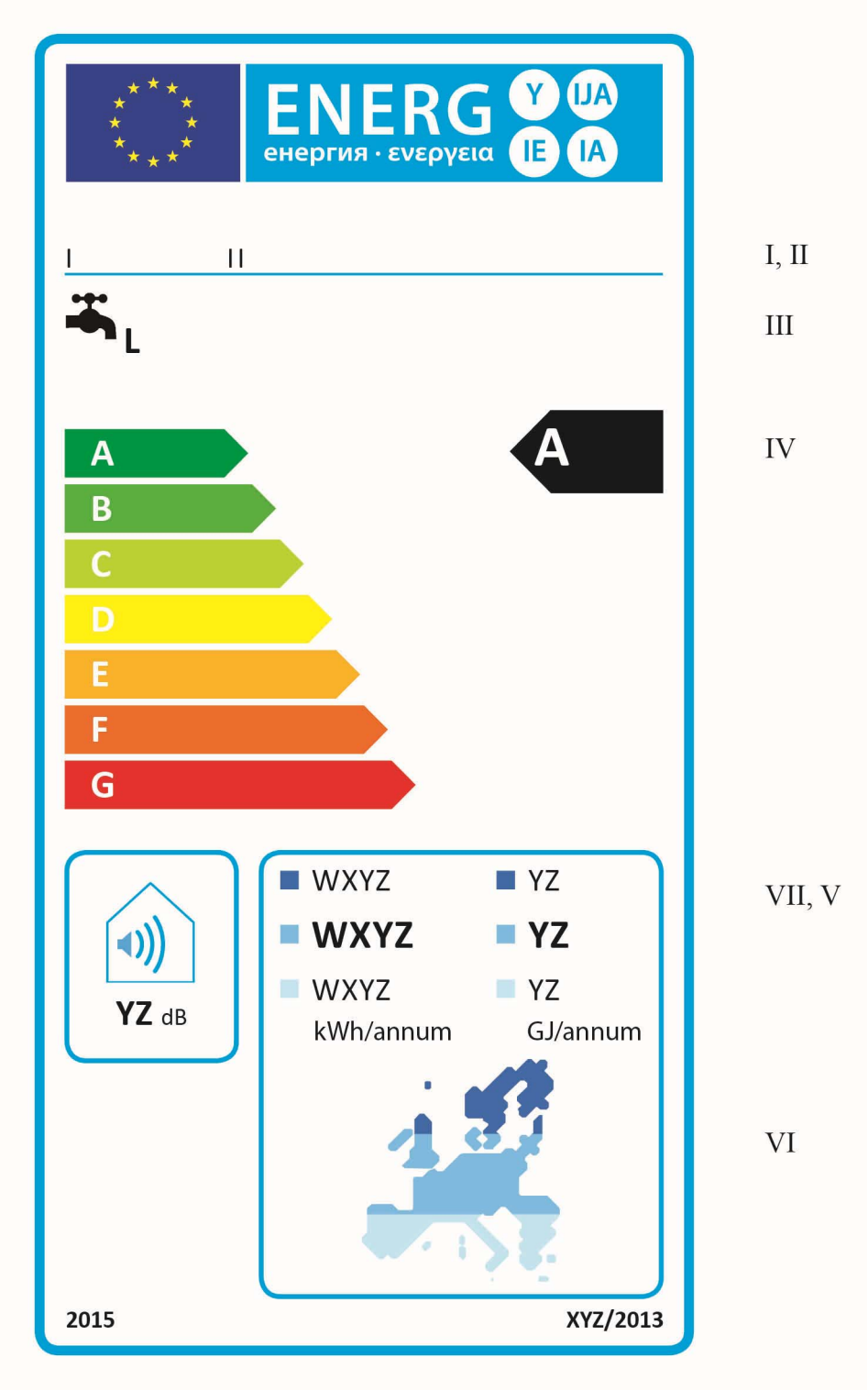
V. the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer;

VII. for conventional water heaters able to work only during off-peak hours, the pictogram referred to in point 4(d)(10) of this Annex may be added.

(b) The design aspects of the label for conventional water heaters shall be in accordance with point 4 of this Annex.

1.1.2. Solar water heaters in water heating energy efficiency classes A to G



(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class under average climate conditions, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

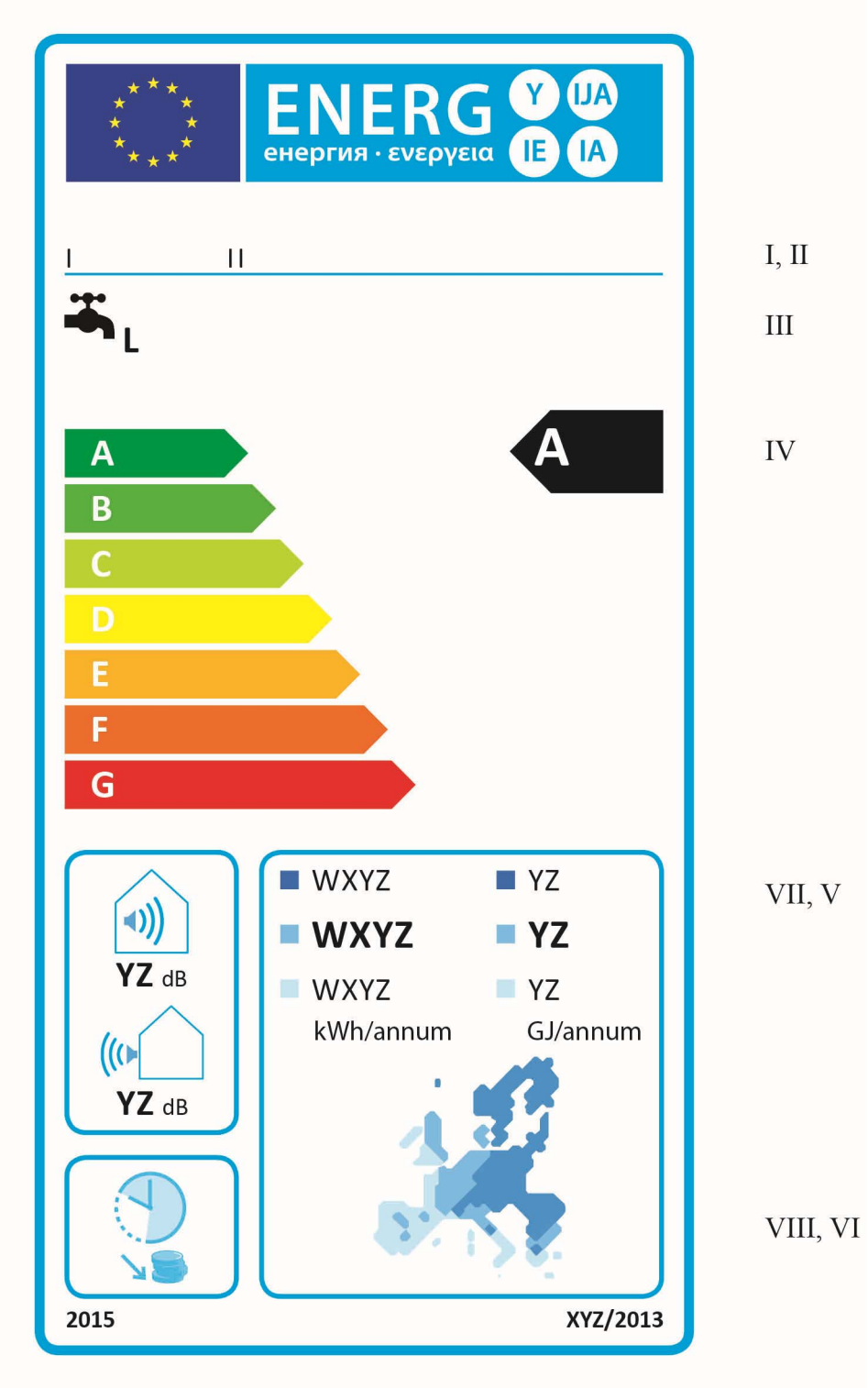
V. the annual electricity consumption in kWh in terms of final energy or the annual fuel consumption in GJ in terms of *GCV*, under average, colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. European solar map displaying three indicative global solar irradiance zones;

VII. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer.

(b) The design aspects of the label for solar water heaters shall be in accordance with point 5 of this Annex.

1.1.3. Heat pump water heaters in water heating energy efficiency classes A to G



(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class under average climate conditions, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

V. the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under average, colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. European temperature map displaying three indicative temperature zones;

VII. the sound power level L_{WA}, indoors (if applicable) and outdoors, in dB, rounded to the nearest integer;

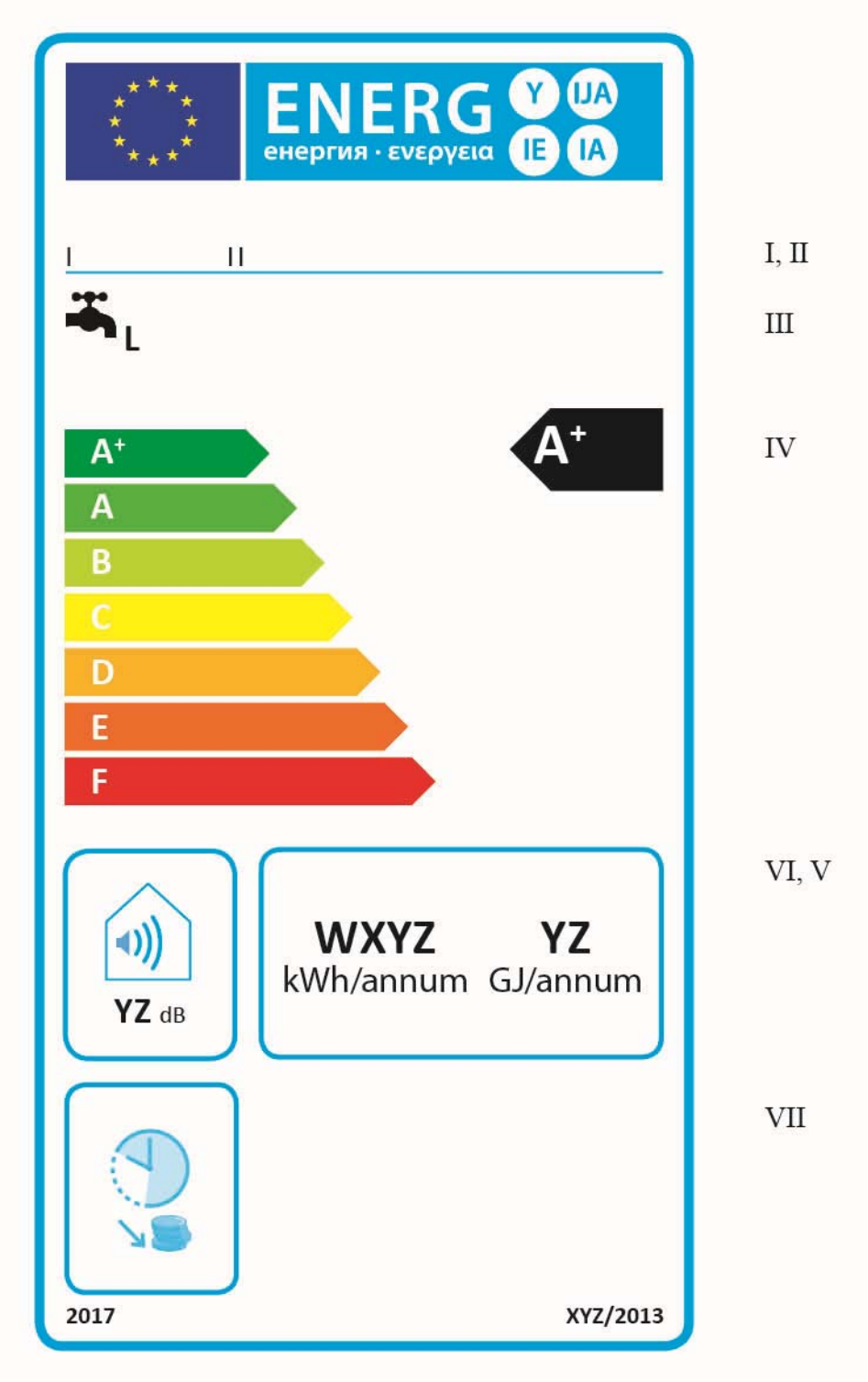
VIII. for heat pump water heaters able to work only during off-peak hours, the pictogram referred to in point 6(d)(11) of this Annex may be added.

(b) The design aspects of the label for heat pump water heaters shall be in accordance with point 6 of this Annex. By way of exception, where a model has been granted an 'EU Ecolabel' under Regulation (EC) No 66/2010 of the European Parliament and of the Council[14], a copy of the EU Ecolabel may be added.

[14] OJ L 27, 30.1.2010, p. 1.

1.2. Label 2

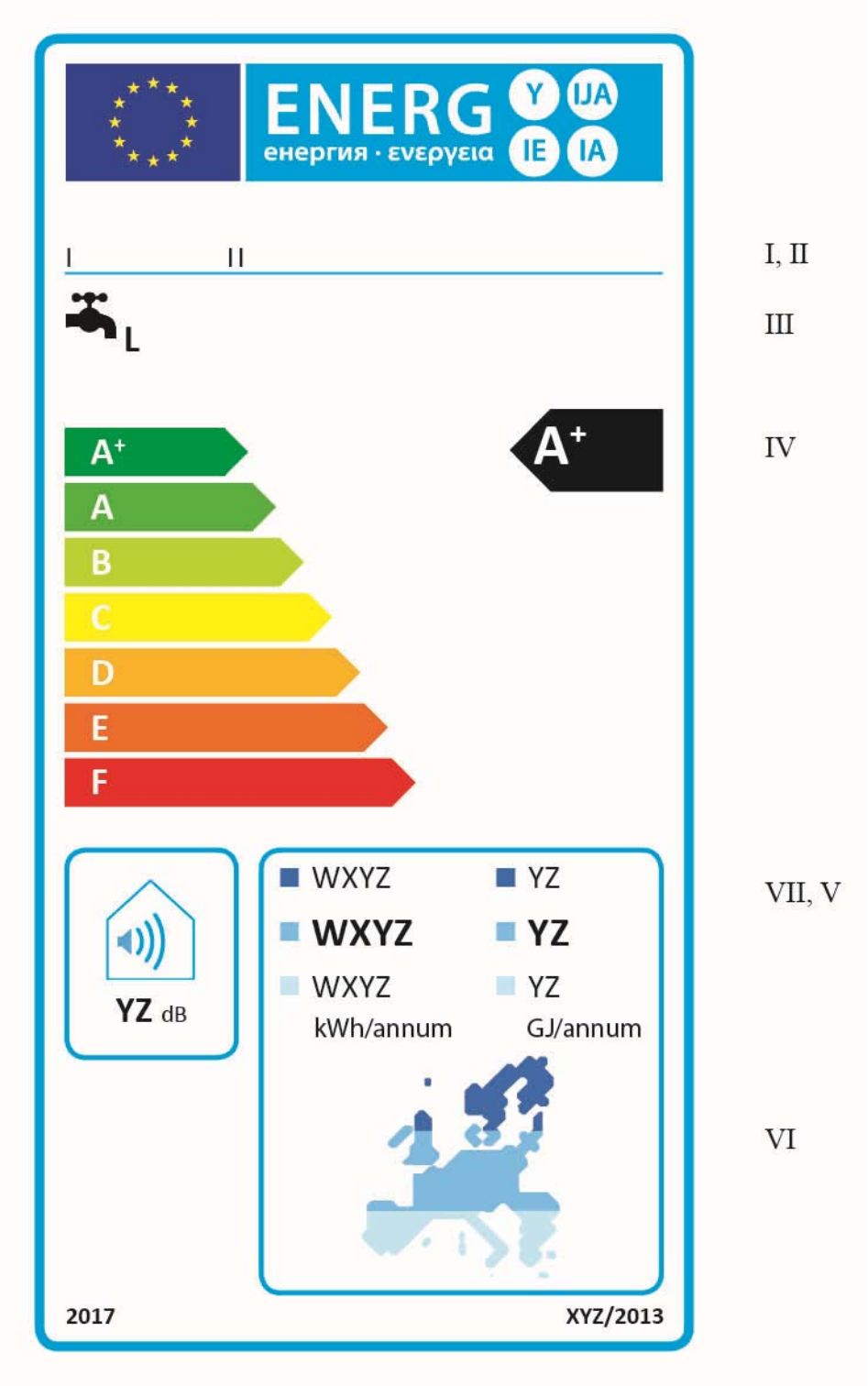
1.2.1. Conventional water heaters in water heating energy efficiency classes A^+ to F



(a) The information listed in point 1.1.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for conventional water heaters shall be in accordance with point 4 of this Annex.

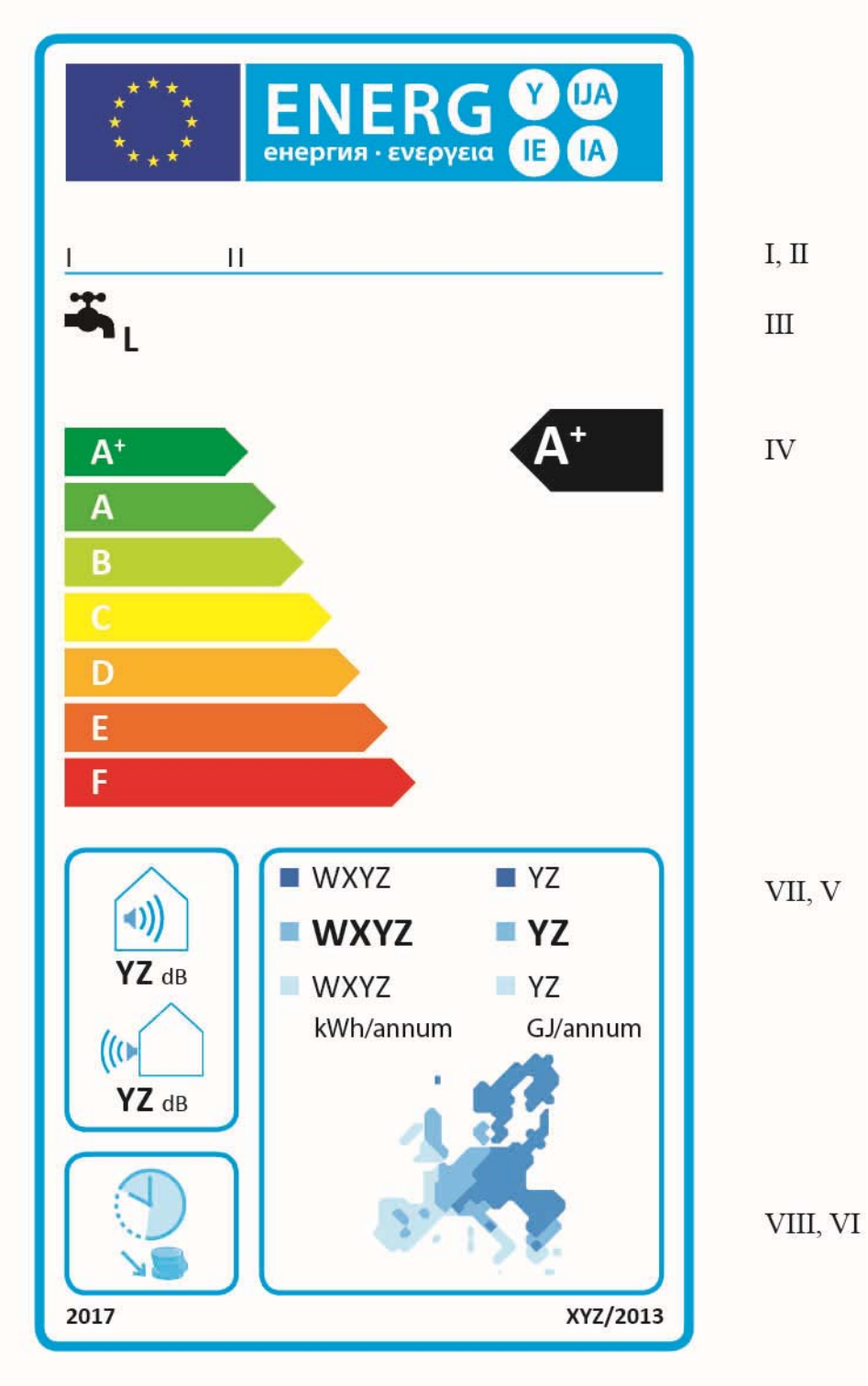
1.2.2. Solar water heaters in water heating energy efficiency classes A^+ to F



(a) The information listed in point 1.1.2(a) of this Annex shall be included in the label.

(b) The design aspects of the label for solar water heaters shall be in accordance with point 5 of this Annex.

1.2.3. Heat pump water heaters in water heating energy efficiency classes A^+ to F

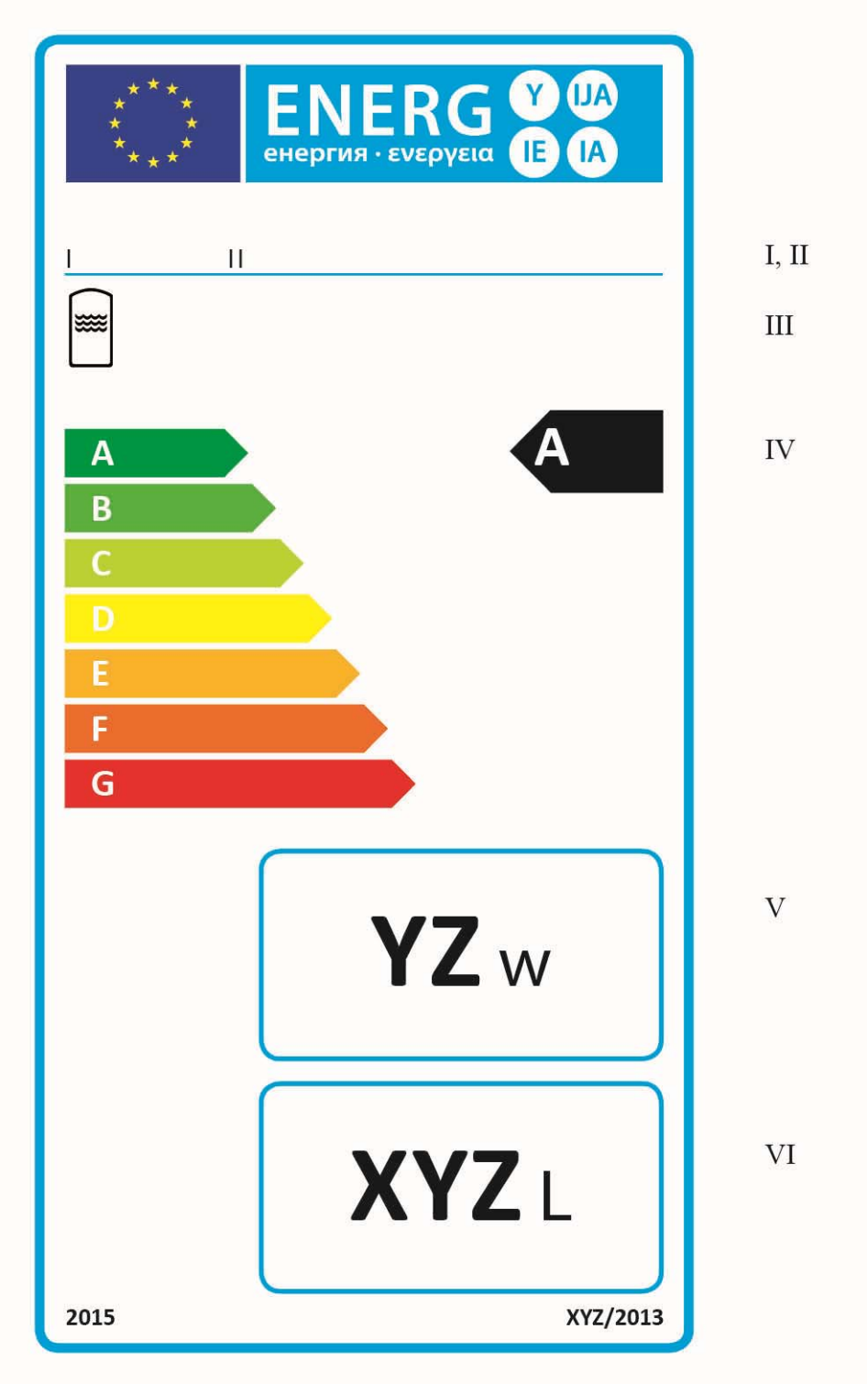


(a) The information listed in point 1.1.3(a) of this Annex shall be included in the label.

(b) The design aspects of the label for heat pump water heaters shall be in accordance with point 6 of this Annex.

2. Hot water storage tanks

2.1. Label 1 for hot water storage tanks in energy efficiency classes A to G



(a) The following information shall be included in the label:

I. supplier’s name or trade mark;

II. supplier’s model identifier;

III. the water storage function;

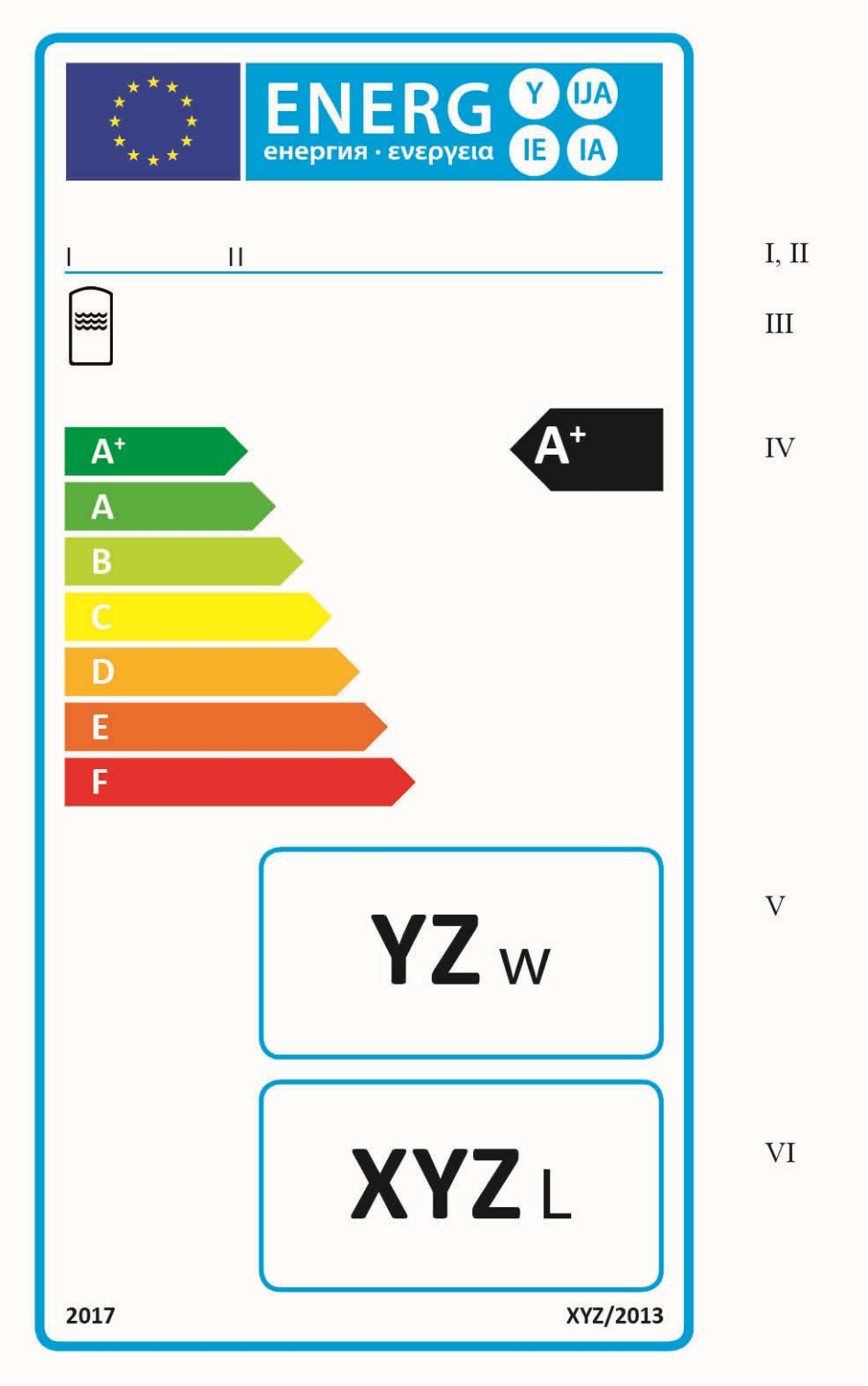
IV. the energy efficiency class, determined in accordance with point 2 of Annex II; the head of the arrow containing the energy efficiency class of the hot water storage tank shall be placed at the same height as the head of the relevant energy efficiency class;

V. the standing loss in W, rounded to the nearest integer;

VI. the hot water storage tank volume in litres, rounded to the nearest integer.

(b) The design aspects of the label for hot water storage tanks shall be in accordance with point 7 of this Annex.

2.2. Label 2 for hot water storage tanks in energy efficiency classes A^+ to F

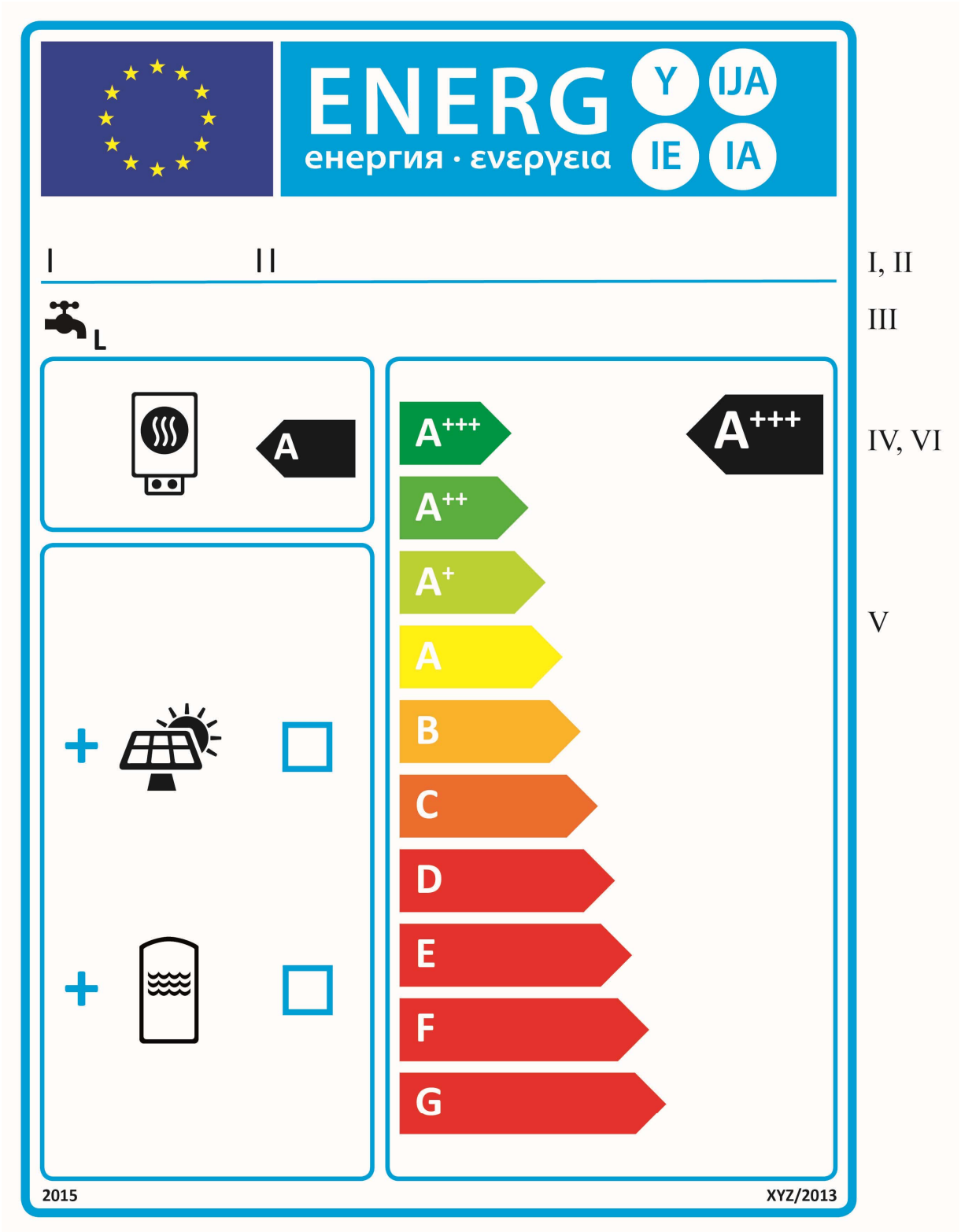


(a) The information listed in point 2.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for hot water storage tanks shall be in accordance with point 7 of this Annex.

3. Packages of water heater and solar device

Label for packages of water heater and solar device in water heating energy efficiency classes A^{+++} to G



(a) The following information shall be included in the label:

I. dealer’s and/or supplier's name or trade mark;

II. dealer’s and/or supplier's model(s) identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

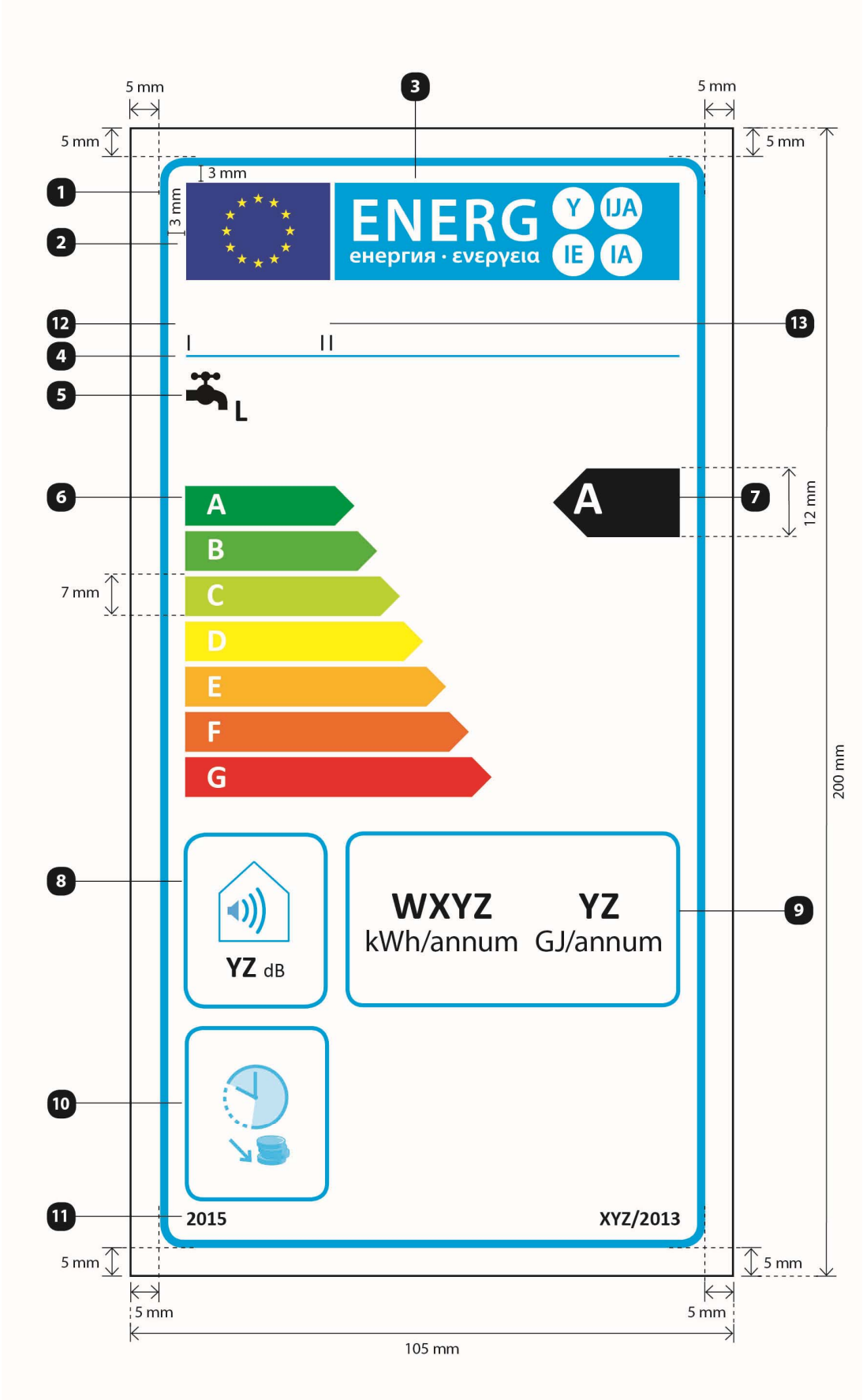
IV. the water heating energy efficiency class of the water heater, determined in accordance with point 1 of Annex II;

V. indication of whether a solar collector and hot water storage tank may be included in the package of water heater and solar device;

VI. the water heating energy efficiency class of the package of water heater and solar device, determined in accordance with point 4 of Annex IV; the head of the arrow containing the water heating energy efficiency class of the package of water heater and solar device shall be placed at the same height as the head of the relevant energy efficiency class.

(b) The design aspects of the label for packages of water heater and solar device shall be in accordance with point 8 of this Annex. For packages of water heater and solar device in water heating energy efficiency classes A^{+++} to D, the last classes E to G in the A^{+++} to G scale may be omitted.

4. The design of the label for conventional water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

– **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

– **Arrow:** height: 7 mm, gap: 1 mm, colours:
Highest class: X-00-X-00,
Second class: 70-00-X-00,
Third class: 30-00-X-00,
Fourth class: 00-00-X-00,
Fifth class: 00-30-X-00,
Sixth class: 00-70-X-00,
Last class: 00-X-X-00,

– **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

– **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

– **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors:**

– **Pictogram** as depicted,

– **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm,

– **Value 'YZ':** Calibri bold 15 pt, 100 % black,

– **Text 'dB':** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

– **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm,

– **Value 'WXYZ' or 'YZ':** Calibri bold at least 20 pt, 100 % black,

– **Text 'kWh/annum' or 'GJ/annum':** Calibri regular at least 15 pt, 100 % black.

❿ **If applicable, off-peak fitness:**

– **Pictogram** as depicted,

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓫ **Year of label introduction and number of Regulation:**

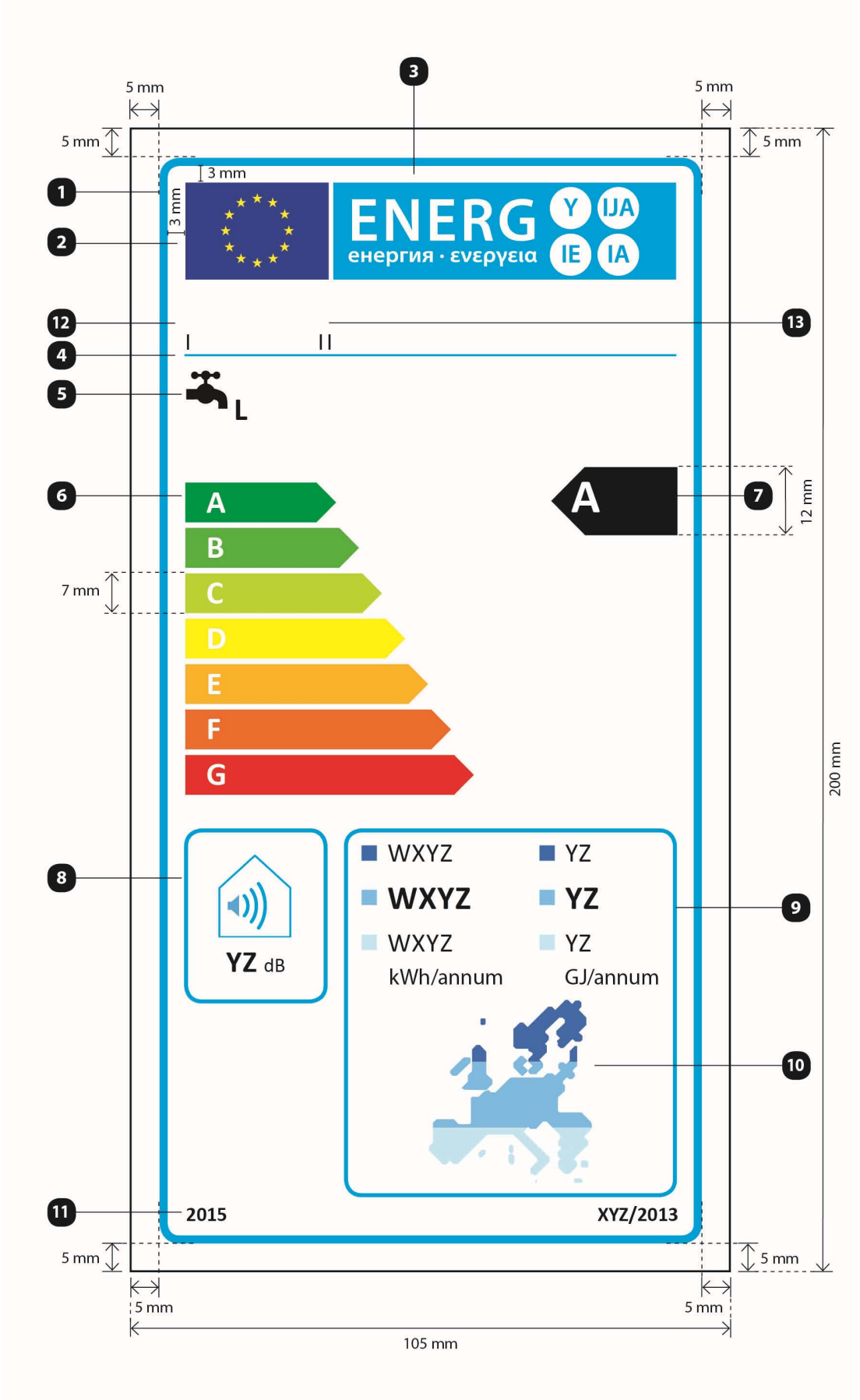
– **Text:** Calibri bold 10 pt.

⓬ **Supplier's name or trademark.**

⓭ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 x 12 mm.

5. The design of the label for solar water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

– **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

– **Arrow:** height: 7 mm, gap: 1 mm, colours:
Highest class: X-00-X-00,
Second class: 70-00-X-00,
Third class: 30-00-X-00,
Fourth class: 00-00-X-00,
Fifth class: 00-30-X-00,
Sixth class: 00-70-X-00,
Last class: 00-X-X-00,

– **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

– **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

– **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors:**

– **Pictogram** as depicted,

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Value ‘YZ’:** Calibri bold 15 pt, 100 % black,

– **Text ‘dB’:** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Values ‘WXYZ’ or ‘YZ’:** Calibri at least 13 pt, 100 % black

– **Text ‘kWh/annum’ or ‘GJ/annum’:** Calibri regular at least 11 pt, 100 % black

❿ **European solar map and colour squares:**

– **Pictogram** as depicted,

– **Colours**: Dark blue: 86-51-00-00,
Middle blue: 53-08-00-00,
Light blue: 25-00-02-00.

⓫ **Year of label introduction and number of Regulation:**

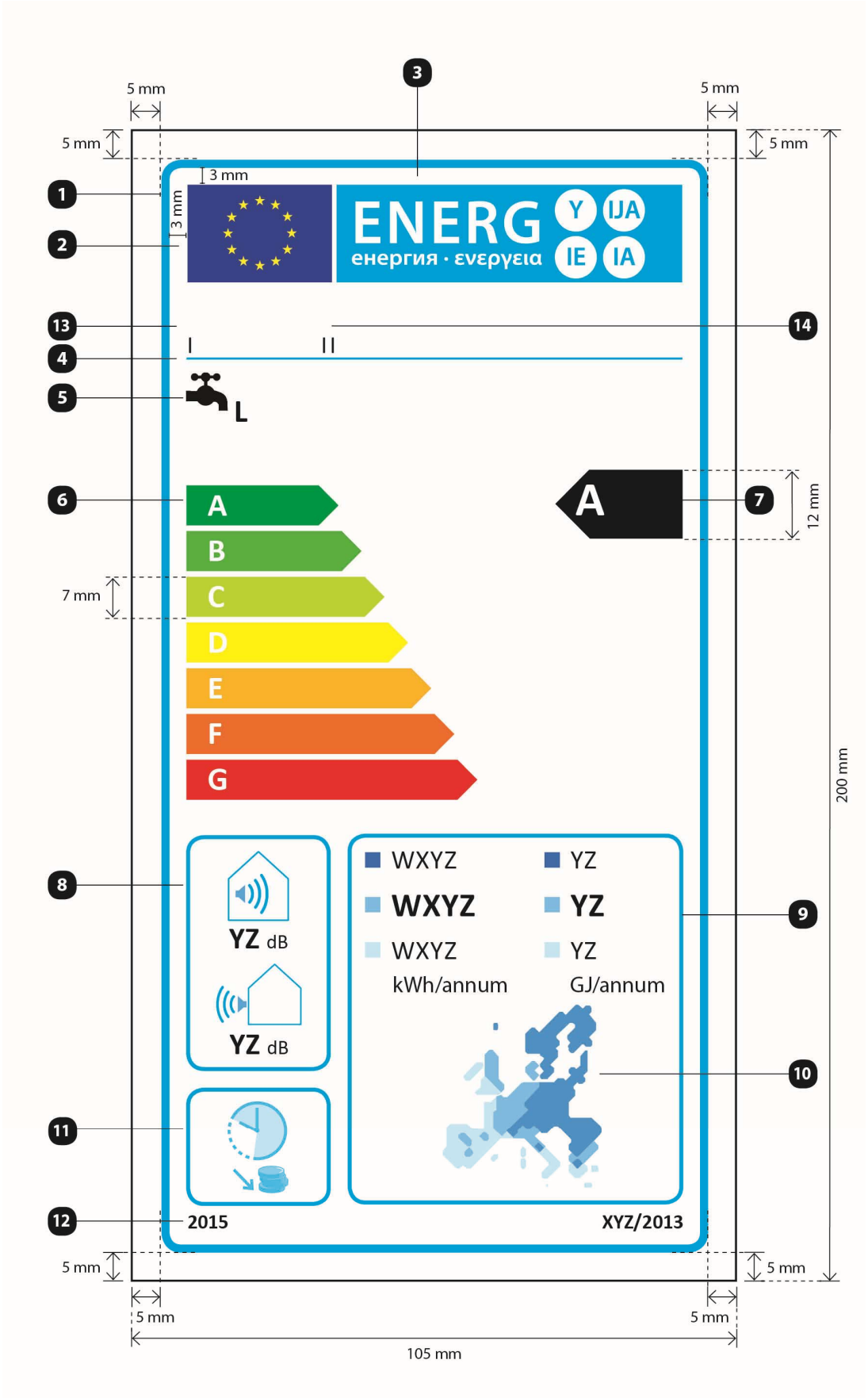
– **Text:** Calibri bold 10 pt.

⓬ **Supplier’s name or trademark.**

⓭ **Supplier’s model identifier:**

The supplier’s name or trade mark and model identifier shall fit in a space of 86 x 12 mm.

6. The design of the label for heat pump water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

– **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

– **Arrow:** height: 7 mm, gap: 1 mm, colours:
Highest class: X-00-X-00,
Second class: 70-00-X-00,
Third class: 30-00-X-00,
Fourth class: 00-00-X-00,
Fifth class: 00-30-X-00,
Sixth class: 00-70-X-00,
Last class: 00-X-X-00,

– **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

– **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

– **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors (if applicable) and outdoors:**

– **Pictogram** as depicted,

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Value ‘YZ’:** Calibri bold 15 pt, 100 % black,

– **Text ‘dB’:** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Values ‘WXYZ’ or ‘YZ’:** Calibri at least 13 pt, 100 % black,

– **Text ‘kWh/annum’ or ‘GJ/annum’:** Calibri regular at least 11 pt, 100 % black.

❿ **European temperature map and colour squares:**

– **Pictogram** as depicted,

– **Colours**: Dark blue: 86-51-00-00,
Middle blue: 53-08-00-00,
Light blue: 25-00-02-00.

⓫ **If applicable, off-peak fitness:**

– **Pictogram** as depicted,

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓬ **Year of label introduction and number of Regulation:**

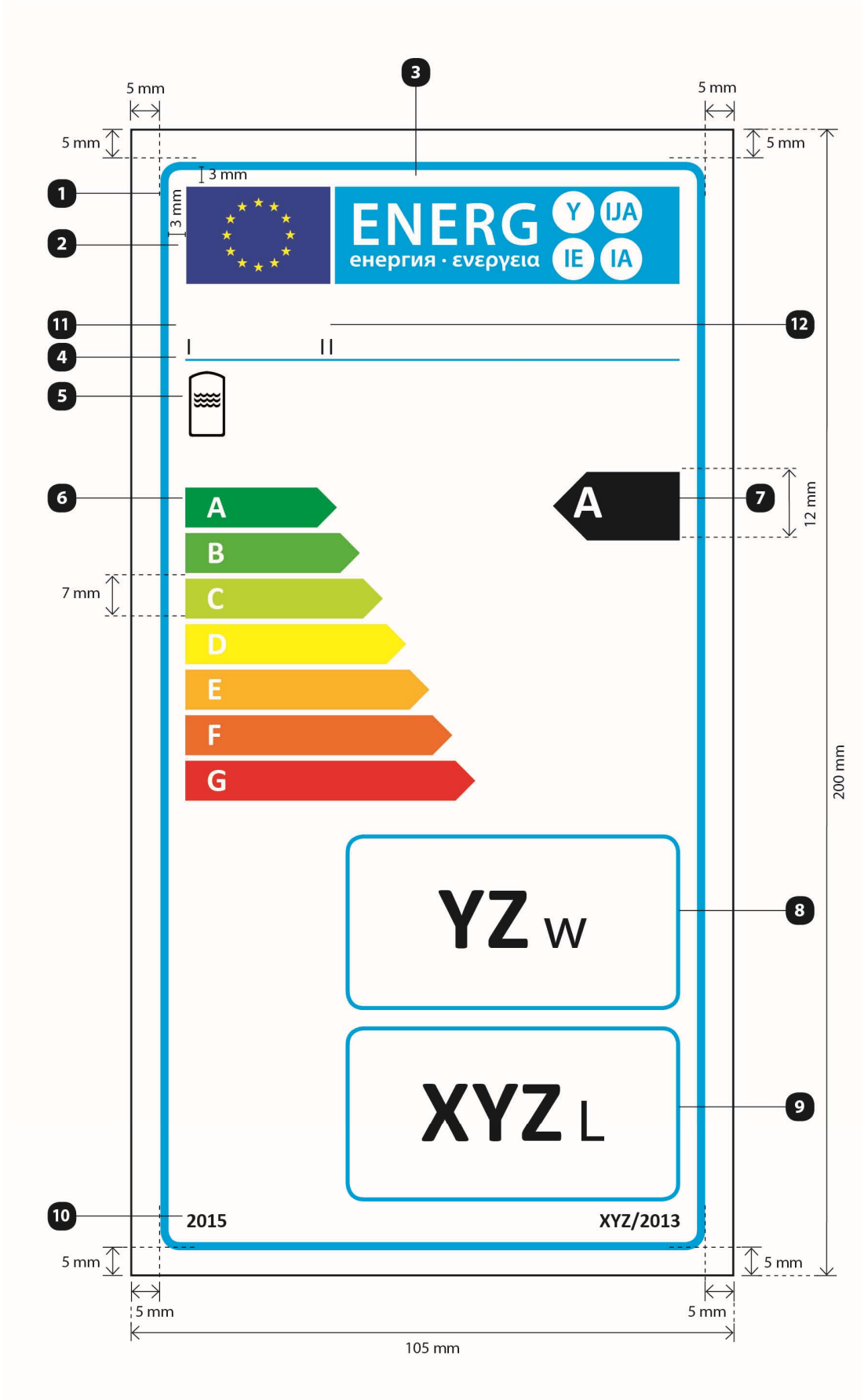
– **Text:** Calibri bold 10 pt.

⓭ **Supplier’s name or trademark.**

⓮ **Supplier’s model identifier:**

The supplier’s name or trade mark and model identifier shall fit in a space of 86 x 12 mm.

7. The design of the label for hot water storage tanks shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Storage function:**

– **Pictogram** as depicted.

❻ **A-G or A^{+}-F scale:**

– **Arrow:** height: 7 mm, gap: 1 mm, colours:
Highest class: X-00-X-00,
Second class: 70-00-X-00,
Third class: 30-00-X-00,
Fourth class: 00-00-X-00,
Fifth class: 00-30-X-00,
Sixth class: 00-70-X-00,
Last class: 00-X-X-00,

– **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Energy efficiency class:**

– **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

– **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Standing loss:**

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Value 'YZ':** Calibri bold 45 pt, 100 % black,

– **Text ‘W’:** Calibri regular 30 pt, 100 % black.

❾ **Storage volume:**

– **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

– **Value ‘XYZ’:** Calibri bold 45 pt, 100 % black,

– **Text ‘L’:** Calibri regular 30 pt, 100 % black.

❿ **Year of label introduction and number of Regulation:**

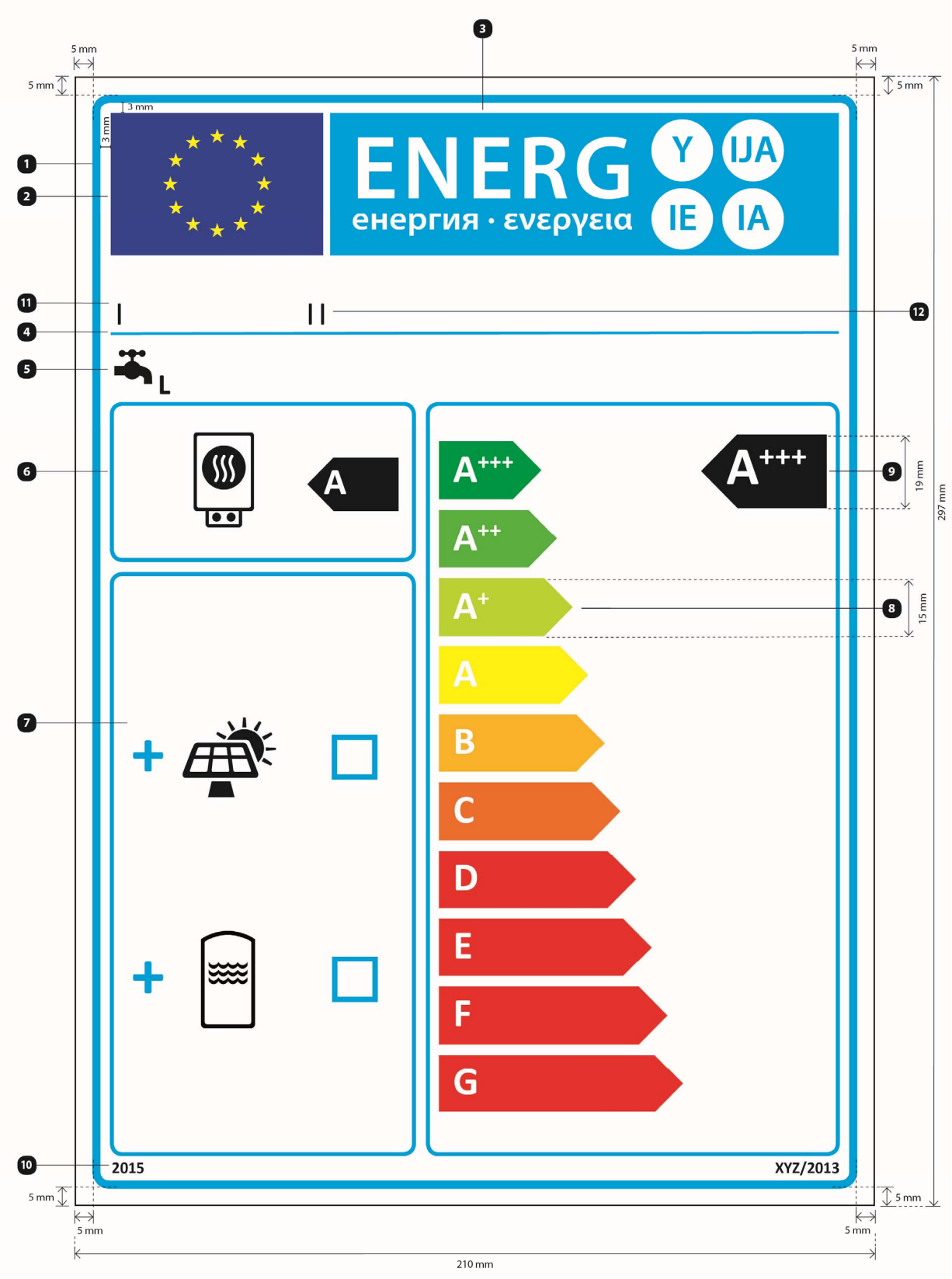
– **Text:** Calibri bold 10 pt.

⓫ **Supplier’s name or trademark.**

⓬ **Supplier’s model identifier:**

The supplier’s name or trade mark and model identifier shall fit in a space of 86 x 12 mm.

8. The design of the label for packages of water heater and solar device shall be the following:



Whereby:

(a) The label shall be at least 210 mm wide and 297 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 6 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 191 mm, height: 37 mm.

❹ **Sub-logos border:** 2 pt, colour: cyan 100 %, length: 191 mm.

❺ **Water heating function:**

– **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 22 pt, 100 % black.

❻ **Water Heater:**

– **Pictogram** as depicted.

– **Water heating energy efficiency class of water heater:**
Arrow: width: 24 mm, height: 14 mm, 100 % black,
Text: Calibri bold 28 pt, capitals, white,

– **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❼ **Package with solar collector and/or hot water storage tank:**

– **Pictograms** as depicted,

– **‘+’ symbol:** Calibri bold 50 pt, cyan 100 %,

– **Boxes:** width: 12 mm, height: 12 mm, border: 4 pt, cyan 100 %,

– **Border:** 3 pt – colour: cyan 100 % – round corners: 3,5 mm.

❽ **A^{+++}-G scale with border:**

– **Arrow:** height: 15 mm, gap: 3 mm, colours:
Highest class: X-00-X-00,
Second class: 70-00-X-00,
Third class: 30-00-X-00,
Fourth class: 00-00-X-00,
Fifth class: 00-30-X-00,
Sixth class: 00-70-X-00,
Seventh class: 00-X-X-00,
If applicable, last classes: 00-X-X-00,

– **Text:** Calibri bold 30 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

– **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❾ **Water heating energy efficiency class for package of water heater and solar device:**

– **Arrow:** width: 33 mm, height: 19 mm, 100 % black,

– **Text:** Calibri bold 40 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❿ **Year of label introduction and number of Regulation:**

– **Text:** Calibri bold 12 pt.

⓫ **Dealer's and/or supplier's name or trademark.**

⓬ **Dealer's and/or supplier's model identifier:**

The dealer's and/or supplier's name or trade mark and model identifier shall fit in a space of 191 x 19 mm.

ANNEX IV
Product Fiche

1. Water heaters

1.1. The information in the product fiche of the water heater shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the declared load profile, expressed by the appropriate letter and typical usage in accordance with Table 3 of Annex VII;

(d) the water heating energy efficiency class of the model, determined in accordance with point 1 of Annex II, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(e) the water heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(f) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(g) if applicable, other load profiles for which the water heater is suitable to use and the corresponding water heating energy efficiency and annual electricity consumption as set out in points (e) and (f);

(h) the thermostat temperature settings of the water heater, as placed on the market by the supplier;

(i) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump water heaters if applicable);

(j) if applicable, an indication that the water heater is able to work only during off-peak hours;

(k) any specific precautions that shall be taken when the water heater is assembled, installed or maintained;

(l) where the value of *smart* is declared as being '1', an indication that the information on water heating energy efficiency, annual electricity and fuel consumption, as applicable, relate to enabled smart control settings only;

in addition, for solar water heaters and heat pump water heaters:

(m) the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(n) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

in addition, for solar water heaters:

(o) the collector aperture area in m², to two decimal places;

(p) the zero-loss efficiency, to three decimal places;

(q) the first-order coefficient in W/(m² K), to two decimal places;

(r) the second-order coefficient in W/(m² K²), to three decimal places;

(s) the incidence angle modifier, to two decimal places;

(t) the storage volume in litres, rounded to the nearest integer;

(u) the pump power consumption in W, rounded to the nearest integer;

(v) the standby power consumption in W, to two decimal places;

in addition, for heat pump water heaters:

(w) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer.

1.2. One fiche may cover a number of water heater models supplied by the same supplier.

1.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 1.1 not already displayed on the label shall also be provided.

2. Hot water storage tanks

2.1. The information in the product fiche of the hot water storage tank shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the energy efficiency class of the model, determined in accordance with point 2 of Annex II;

(d) the standing loss in W, rounded to the nearest integer;

(e) the storage volume in litres, rounded to the nearest integer.

2.2. One fiche may cover a number of hot water storage tank models supplied by the same supplier.

2.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 2.1 not already displayed on the label shall also be provided.

3. Solar devices

3.1. The information in the product fiche of the solar device shall be provided in the following order and shall be included in the product brochure or other literature provided with the product (for pumps in the collector loop if applicable):

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the collector aperture area in m², to two decimal places;

(d) the zero-loss efficiency, to three decimal places;

(e) the first-order coefficient in W/(m² K), to two decimal places;

(f) the second-order coefficient in W/(m² K²), to three decimal places;

(g) the incidence angle modifier, to two decimal places;

(h) the storage volume in litres, rounded to the nearest integer;

(i) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, for the load profiles M, L, XL and XXL under average climate conditions, rounded to the nearest integer;

(j) the pump power consumption in W, rounded to the nearest integer;

(k) the standby power consumption in W, to two decimal places;

(l) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to the nearest integer.

3.2. One fiche may cover a number of solar device models supplied by the same supplier.

4. Packages of water heater and solar device

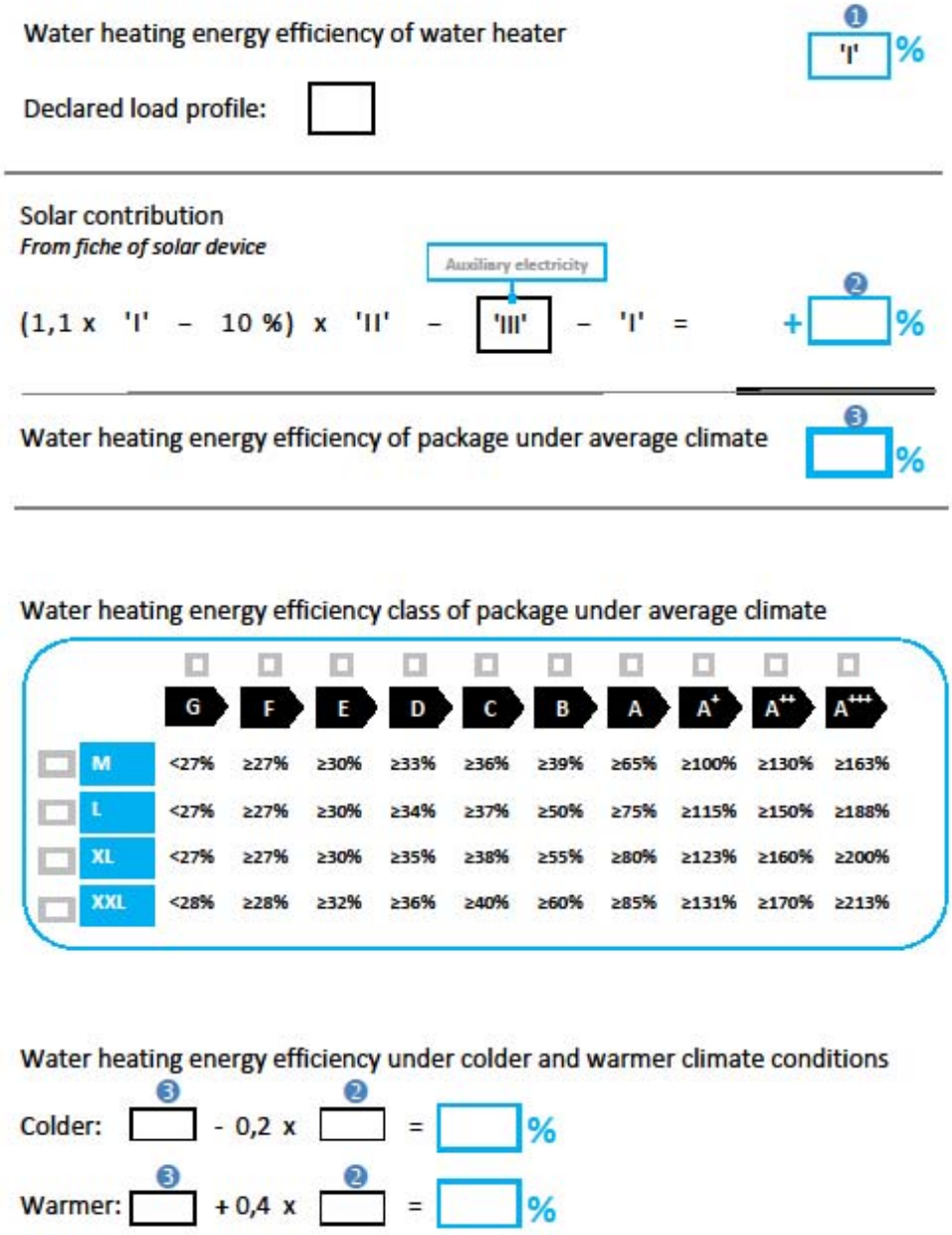
The fiche for packages of water heater and solar device shall contain the elements set out in Figure 1 for evaluating the water heating energy efficiency of a package of water heater and solar device, where the following information shall be included:

– I: the value of the water heating energy efficiency of the water heater, expressed in %;

– II: the value of the mathematical expression $(220 \cdot Q_{ref})/Q_{nonsol}$, where Q_{ref} is taken from Table 3 in Annex VII and Q_{nonsol} from the product fiche of the solar device for the declared load profile M, L, XL or XXL of the water heater;

– III: the value of the mathematical expression $(Q_{aux} \cdot 2{,}5)/(220 \cdot Q_{ref})$, expressed in %, where Q_{aux} is taken from the product fiche of the solar device and Q_{ref} from Table 3 in Annex VII for the declared load profile M, L, XL or XXL.

Figure 1: Fiche for a package of water heater and solar device indicating the water heating energy efficiency of the package offered



ANNEX V
Technical documentation

1. Water heaters

For water heaters, the technical documentation referred to in Article 3(1)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the water heater model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters specified in point 7 of Annex VII;

(g) the results of the calculations for the technical parameters specified in point 2 of Annex VIII;

(h) any specific precautions that shall be taken when the water heater is assembled, installed or maintained.

2. Hot water storage tanks

For hot water storage tanks, the technical documentation referred to in Article 3(2)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the hot water storage tank model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters specified in point 8 of Annex VII;

(g) any specific precautions that shall be taken when the hot water storage tank is assembled, installed or maintained.

3. Solar devices

The technical documentation of solar devices referred to in Article 3(3)(b) shall include:

(a) the name and address of the supplier;

(b) a description of the solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters as specified in point 9 of Annex VII;

(g) any specific precautions that shall be taken when the solar device is assembled, installed or maintained.

4. Packages of water heater and solar device

For packages of water heater and solar device, the technical documentation referred to in Article 3(4)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the package of water heater and solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

– the water heating energy efficiency in %, rounded to the nearest integer;

– the technical parameters set out in points 1, 2 and 3 of this Annex;

(g) any specific precautions that shall be taken when the package of water heater and solar device is assembled, installed or maintained.

ANNEX VI
Information to be provided in cases where end-users cannot be expected to see the product displayed

1. Water heaters

1.1. The information referred to in Article 4(1)(b) shall be provided in the following order:

(a) the declared load profile, expressed by the appropriate letter and typical usage in accordance with Table 3 of Annex VII;

(b) the water heating energy efficiency class of the model, under average climate conditions, in accordance with point 1 of Annex II;

(c) the water heating energy efficiency in %, under average climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(d) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under average climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

(e) the sound power level, indoors, in dB, rounded to the nearest integer (for heat pump water heaters, if applicable);

in addition, for solar water heaters and heat pump water heaters:

(f) the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(g) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

in addition, for solar water heaters:

(h) the collector aperture area in m^2, to two decimal places;

(i) the storage volume in litres, rounded to the nearest integer;

in addition, for heat pump water heaters:

(j) the sound power level, outdoors, in dB, rounded to the nearest integer.

1.2. Where other information contained in the product fiche is also provided, it shall be in the form and order specified in point 1 of Annex IV.

1.3. The size and font in which the information referred in points 1.1 and 1.2 is printed or shown shall be legible.

2. Hot water storage tanks

2.1. The information referred to in Article 4(2)(b) shall be provided in the following order:

(a) the energy efficiency class of the model, determined in accordance with point 2 of Annex II;

(b) the standing loss in W, rounded to the nearest integer;

(c) the storage volume in litres, rounded to the nearest integer;

2.2. The size and font in which the information referred in point 2.1 is printed or shown shall be legible.

3. Packages of water heater and solar device

3.1. The information referred to in Article 4(3)(b) shall be provided in the following order:

(a) the water heating energy efficiency class of the model, determined in accordance with point 1 of Annex II;

(b) the water heating energy efficiency in %, rounded to the nearest integer;

(c) the elements set out in Figure 1 of Annex IV.

3.2. The size and font in which the information referred in point 3.1 is printed or shown shall be legible.

ANNEX VII
Measurements

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible measurement methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 9.

2. General conditions for testing water heaters:

   (a) measurements shall be carried out using the load profiles set out in Table 3;

   (b) measurements shall be carried out using a 24-hour measurement cycle as follows:

   – 00:00 to 06:59: no water draw-off;

   – from 07:00: water draw-offs according to the declared load profile;

   – from end of last water draw-off until 24:00: no water draw-off;

   (c) the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile.

Table 3: Load profiles of water heaters

	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	ºC	**kWh**	l/min	ºC	**kWh**	l/min	ºC	**kWh**	l/min	ºC	ºC
07:00	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
07:05	**0,015**	2	25										
07:15	**0,015**	2	25										
07:26	**0,015**	2	25										
07:30	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,105**	3	25	
07:45													
08:01													
08:05													
08:15													
08:25													
08:30				**0,105**	2	25				**0,105**	3	25	
08:45													
09:00	**0,015**	2	25										
09:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
10:00													
10:30													
11:00													
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
12:00	**0,015**	2	25	**0,105**	2	25							
12:30	**0,015**	2	25	**0,105**	2	25							
12:45	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,315**	4	10	55
14:30	**0,015**	2	25										
15:00	**0,015**	2	25										
15:30	**0,015**	2	25										
16:00	**0,015**	2	25										
16:30													
17:00													
18:00				**0,105**	2	25				**0,105**	3	25	
18:15				**0,105**	2	25				**0,105**	3	40	
18:30	**0,015**	2	25	**0,105**	2	25							
19:00	**0,015**	2	25	**0,105**	2	25							
19:30	**0,015**	2	25	**0,105**	2	25							
20:00				**0,105**	2	25							
20:30							**1,05**	3	35	**0,42**	4	10	55
20:45				**0,105**	2	25							
20:46													
21:00				**0,105**	2	25							
21:15	**0,015**	2	25	**0,105**	2	25							
21:30	**0,015**	2	25							**0,525**	5	45	
21:35	**0,015**	2	25	**0,105**	2	25							
21:45	**0,015**	2	25	**0,105**	2	25							
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**			

Continued Table 3: Load profiles of water heaters

	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/mn	ºC	ºC	**kWh**	l/min	ºC	ºC	**kWh**	l/min	ºC	ºC
07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
07:05	**1,4**	6	40		**1,4**	6	40					
07:15									**1,82**	6	40	
07:26									**0,105**	3	25	
07:30	**0,105**	3	25		**0,105**	3	25					
07:45					**0,105**	3	25		**4,42**	10	10	40
08:01	**0,105**	3	25						**0,105**	3	25	
08:05					**3,605**	10	10	40				
08:15	**0,105**	3	25						**0,105**	3	25	
08:25					**0,105**	3	25					
08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
10:00									**0,105**	3	25	
10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40
11:00									**0,105**	3	25	
11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
12:00												
12:30												
12:45	**0,315**	4	10	55	**0,315**	4	10	55	**0,735**	4	10	55
14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
15:00									**0,105**	3	25	
15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
16:00									**0,105**	3	25	
16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
17:00									**0,105**	3	25	
18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
19:30												
20:00												
20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55
20:45												
20:46									**4,42**	10	10	40
21:00					**3,605**	10	10	40				
21:15	**0,105**	3	25						**0,105**	3	25	
21:30	**1,4**	6	40		**0,105**	3	25		**4,42**	10	10	40
21:35												
21:45												
Q_{ref}	**5,845**				**11,655**				**19,07**			

Continued Table 3: Load profiles of water heaters

	XXL			
	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	ºC	ºC
07:00	**0,105**	3	25	
07:05				
07:15	**1,82**	6	40	
07:26	**0,105**	3	25	
07:30				
07:45	**6,24**	16	10	40
08:01	**0,105**	3	25	
08:05				
08:15	**0,105**	3	25	
08:25				
08:30	**0,105**	3	25	
08:45	**0,105**	3	25	
09:00	**0,105**	3	25	
09:30	**0,105**	3	25	
10:00	**0,105**	3	25	
10:30	**0,105**	3	10	40
11:00	**0,105**	3	25	
11:30	**0,105**	3	25	
11:45	**0,105**	3	25	
12:00				
12:30				
12:45	**0,735**	4	10	55
14:30	**0,105**	3	25	
15:00	**0,105**	3	25	
15:30	**0,105**	3	25	
16:00	**0,105**	3	25	
16:30	**0,105**	3	25	
17:00	**0,105**	3	25	
18:00	**0,105**	3	25	
18:15	**0,105**	3	40	
18:30	**0,105**	3	40	
19:00	**0,105**	3	25	
19:30				
20:00				
20:30	**0,735**	4	10	55
20:45				
20:46	**6,24**	16	10	40
21:00				
21:15	**0,105**	3	25	
21:30	**6,24**	16	10	40
21:35				
21:45				
Q_{ref}	**24,53**			

3. Conditions for testing the smart control compliance (*smart*) of water heaters

Where the supplier deems it appropriate to declare the value of *smart* as being '1', measurements of the weekly electricity and/or fuel consumption with smart controls and the weekly electricity and/or fuel consumption without smart controls shall be carried out using a two-week measurement cycle as follows:

– days 1 to 5: random sequence of load profiles chosen from the declared load profile and the load profile one below the declared load profile, and smart control disabled;

– days 6 and 7: no water draw-offs, and smart control disabled;

– days 8 to 12: repetition of the same sequence applied for days 1 to 5, and smart control enabled;

– days 13 and 14: no water draw-offs, and smart control enabled;

– the difference between the useful energy content measured during days 1 to 7 and the useful energy content measured during days 8 to 14 shall not exceed 2% of Q_{ref} of the declared load profile.

4. Conditions for testing solar water heaters

The solar collector, solar hot water storage tank, pump in the collector loop (if applicable) and heat generator shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination. The heat generator shall be tested under the conditions set out in point 2 of this Annex.

The results shall be used for the calculations set out in point 3(b) of Annex VIII under the conditions set out in Tables 4 and 5. For the purpose of establishing Q_{tota} the efficiency of the heat generator using the Joule effect in electric resistance heating elements is assumed to be 100/*CC*, expressed in %.

5. Conditions for testing heat pump water heaters

– Heat pump water heaters shall be tested under the conditions set out in Table 6;

– Heat pump water heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 7.

6. Conditions for testing solar devices

The solar collector, solar hot water storage tank and pump in the collector loop (if applicable) shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination.

The results shall be used for the calculations of Q_{nonsol} for the load profiles M, L, XL and XXL under the average climate conditions set out in Tables 4 and 5 and Q_{aux}.

Table 4: Average daytime temperature [°C]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	+ 2,8	+ 2,6	+ 7,4	+ 12,2	+ 16,3	+ 19,8	+ 21,0	+ 22,0	+ 17,0	+ 11,9	+ 5,6	+ 3,2
Colder climate conditions	- 3,8	- 4,1	- 0,6	+ 5,2	+ 11,0	+ 16,5	+ 19,3	+ 18,4	+ 12,8	+ 6,7	+ 1,2	- 3,5
Warmer climate conditions	+ 9,5	+ 10,1	+ 11,6	+ 15,3	+ 21,4	+ 26,5	+ 28,8	+ 27,9	+ 23,6	+ 19,0	+ 14,5	+ 10,4

Table 5: Average global solar irradiance [W/m^2]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	70	104	149	192	221	222	232	217	176	129	80	56
Colder climate conditions	22	75	124	192	234	237	238	181	120	64	23	13
Warmer climate conditions	128	137	182	227	248	268	268	263	243	175	126	109

Table 6: Standard rating conditions for heat pump water heaters, temperatures in dry bulb air temperature (wet bulb air temperature in brackets)

Heat source	**Outdoor air**			**Indoor air**	**Exhaust air**	**Brine**	**Water**
Climate conditions	**Average climate conditions**	**Colder climate conditions**	**Warmer climate conditions**	**Not applicable**	**All climate conditions**		
Temperature	+ 7 °C (+ 6 °C)	+ 2 °C (+ 1 °C)	+ 14 °C (+ 13 °C)	+ 20 °C (maximum + 15 °C)	+ 20 °C (+ 12 °C)	0 °C (inlet) / - 3 °C (outlet)	+ 10 °C (inlet) / + 7 °C (outlet)

Table 7: Maximum ventilation exhaust air available [m^3/h], at a temperature of 20 °C and with humidity of 5,5 g/m^3

Declared load profile	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**
Maximum ventilation exhaust air available	109	128	128	159	190	870	1 021

7. Technical parameters of water heaters

The following parameters shall be established for water heaters:

(a) the daily electricity consumption Q_{elec} in kWh, rounded to three decimal places;

(b) the declared load profile, expressed by the appropriate letter in accordance with Table 3 of this Annex;

(c) the sound power level in dB, indoors, rounded to the nearest integer (for heat pump water heaters, if applicable);

in addition, for water heaters using fossil and/or biomass fuels:

(d) the daily fuel consumption Q_{fuel} in kWh in terms of *GCV*, rounded to three decimal places;

in addition, for water heaters for which the value of smart is declared as being '1':

(e) the weekly fuel consumption with smart controls $Q_{fuel,week,smart}$ in kWh in terms of *GCV*, rounded to three decimal places;

(f) the weekly electricity consumption with smart controls $Q_{elec,week,smart}$ in kWh, rounded to three decimal places;

(g) the weekly fuel consumption without smart controls $Q_{fuel,week}$ in kWh in terms of *GCV*, rounded to three decimal places;

(h) the weekly electricity consumption without smart controls $Q_{elec,week}$ in kWh, rounded to three decimal places;

in addition, for solar water heaters:

(i) the collector aperture area A_{sol} in m², rounded to two decimal places;

(j) the zero-loss efficiency η_0, rounded to three decimal places;

(k) the first-order coefficient a_1 in W/(m² K), rounded to two decimal places;

(l) the second-order coefficient a_2 in W/(m² K²), rounded to three decimal places;

(m) the incidence angle modifier *IAM*, rounded to two decimal places;

(n) the pump power consumption *solpump* in W, rounded to two decimal places;

(o) the standby power consumption *solstandby* in W, rounded to two decimal places;

in addition, for heat pump water heaters:

(p) the sound power level L_{WA} in dB, outdoors, rounded to the nearest integer.

8. Technical parameters of hot water storage tanks

The following parameters shall be established for hot water storage tanks:

(a) the storage volume V in litres, rounded to one decimal place;

(b) the standing loss S in W, rounded to one decimal place.

9. Technical parameters of solar devices

The following parameters shall be established for solar devices:

(a) the collector aperture area A_{sol} in m², rounded to two decimal places;

(b) the zero-loss efficiency η_0, rounded to three decimal places;

(c) the first-order coefficient a_1 in W/(m² K), rounded to two decimal places;

(d) the second-order coefficient a_2 in W/(m² K²), rounded to three decimal places;

(e) the incidence angle modifier *IAM*, rounded to two decimal place;

(f) the pump power consumption *solpump* in W, rounded to two decimal places;

(g) the standby power consumption, *solstandby* in W, rounded to two decimal places.

ANNEX VIII
Method for calculating the water heating energy efficiency of water heaters

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other appropriate calculation methods that take into account the generally recognised state-of-the-art methods. They shall meet the technical parameters and calculations set out in points 2 to 6.

   Technical parameters used for the calculations shall be measured in accordance with Annex VII.

2. Technical parameters of water heaters

   The following parameters shall be calculated for water heaters under average climate conditions:

   (a) the water heating energy efficiency η_{wh} in %, rounded to one decimal place;

   (b) the annual electricity consumption *AEC* in kWh in terms of final energy, rounded to the nearest integer;

   in addition, for water heaters using fuels under average climate conditions:

   (c) the annual fuel consumption *AFC* in kWh in terms of *GCV*, rounded to the nearest integer;

   in addition, for solar water heaters under average climate conditions:

   (d) the heat generator water heating energy efficiency $\eta_{wh,nonsol}$ in %, rounded to one decimal place;

   (e) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to one decimal place.

   in addition, for solar water heaters and heat pump water heaters under colder and warmer climate conditions:

   (f) the parameters set out in points (a) to (c);

   in addition for solar water heaters under average, colder and warmer climate conditions:

   (g) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, rounded to one decimal place;

3. Calculation of the water heating energy efficiency η_{wh}

   (a) Conventional water heaters and heat pump water heaters:

   The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$$

For water-/brine-to-water heat pump water heaters, the electricity consumption of one or more ground water pumps shall be taken into account.

(b) Solar water heaters:

The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{0{,}6 \cdot 366 \cdot Q_{ref}}{Q_{tota}}$$

Where:

$$Q_{tota} = \frac{Q_{nonsol}}{1{,}1 \cdot \eta_{wh,nonsol} - 0{,}1} + Q_{aux} \cdot CC$$

4. Calculation of the annual electricity consumption AEC and the annual fuel consumption AFC

(a) Conventional water heaters and heat pump water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = 0{,}6 \cdot 366 \cdot \left(Q_{elec} \cdot (1 - SCF \cdot smart) + \frac{Q_{cor}}{CC} \right)$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = 0{,}6 \cdot 366 \cdot \left(Q_{fuel} \cdot (1 - SCF \cdot smart) + Q_{cor} \right)$$

(b) Solar water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = \frac{CC \cdot Q_{elec}}{Q_{fuel} + CC \cdot Q_{elec}} \cdot \frac{Q_{tota}}{CC}$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = \frac{Q_{fuel}}{Q_{fuel} + CC \cdot Q_{elec}} \cdot Q_{tota}$$

5. Determination of the smart control factor *SCF* and of smart control compliance *smart*

(a) The smart control factor is calculated as follows:

$$SCF = 1 - \frac{Q_{fuel,week,smart} + CC \cdot Q_{elec,week,smart}}{Q_{fuel,week} + CC \cdot Q_{elec,week}}$$

(b) If $SCF \geq 0{,}07$, the value of *smart* shall be 1. In all other cases, the value of *smart* shall be 0.

6. Determination of the ambient correction term Q_{cor}

The ambient correction term is calculated as follows:

(a) for conventional water heaters using electricity:

$$Q_{cor} = -k \cdot \left(CC \cdot \left(Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref}\right)\right)$$

(b) for conventional water heaters using fuels:

$$Q_{cor} = -k \cdot \left(Q_{fuel} \cdot (1 - SCF \cdot smart) - Q_{ref}\right)$$

(c) for heat pump water heaters:

$$Q_{cor} = -k \cdot 24h \cdot P_{stby}$$

Where:

the k-values are given in Table 8 for each load profile.

Table 8: k-values

	3XS	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**
k	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,0

ANNEX IX
Verification procedure for market surveillance purposes

For the purposes of assessing the conformity with the requirements laid down in Articles 3 and 4, Member State authorities shall test a single water heater, hot water storage tank, solar device or package of water heater and solar device and provide the information on the test results to the authorities of the other Member States. If the measured parameters do not meet the values declared by the supplier within the ranges set out in Table 9, the measurement shall be carried out on three additional water heaters, hot water storage tanks, solar devices or packages of water heater and solar device and the information on the test results shall be provided to the authorities of the other Member States and to the Commission within one month of testing. The arithmetic mean of the measured values of these three water heaters, hot water storage tanks, solar devices or packages of water heater and solar device shall meet the values declared by the supplier within the range set out in Table 9.

Otherwise, the model and all other equivalent water heater models, hot water storage tanks models, solar device models or package of water heater and solar device models shall be considered not to comply.

Member State authorities shall use the procedures set out in Annexes VII and VIII.

Table 9: Verification tolerances

Measured parameter	**Verification tolerance**
Daily electricity consumption Q_{elec}	The measured value shall not be more than 5 % higher than the rated value (*).
Sound power level L_{WA}, indoors and/or outdoors	The measured value shall not be more than 2 dB higher than the rated value.
Daily fuel consumption Q_{fuel}	The measured value shall not be more than 5 % higher than the rated value.
Weekly fuel consumption with smart controls $Q_{fuel,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly fuel consumption without smart controls $Q_{fuel,week}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption with smart controls $Q_{elec,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption without smart controls $Q_{elec,week}$	The measured value shall not be more than 5 % higher than the rated value.
Collector aperture area A_{sol}	The measured value shall not be more than 2 % lower than the rated value.
Pump power consumption *solpump*	The measured value shall not be more than 3 % higher than the rated value.

Standby power consumption *solstandby*	The measured value shall not be more than 5 % higher than the rated value.
Storage volume *V*	The measured value shall not be more than 2 % lower than the rated value.
Standing loss *S*	The measured value shall not be more than 5 % higher than the rated value.

(*) 'Rated value' means the value declared by the supplier.