Voluntary Industry Agreement to improve the energy consumption of Complex Set Top Boxes within the European Community

Proposal from the industry group, Version 2
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1. INTRODUCTION

This industry Code seeks to contribute to the achievement of the EU Action Plan on Energy Efficiency and in particular of the Ecodesign Directive[1] by reducing the potential environmental impact of CSTBs, which will ultimately be beneficial to consumers and other end users.

Service Providers, Equipment Manufacturers, Software Providers, Conditional Access Providers and Component Manufacturers representing a large majority of the CSTB industry have been invited to sign this Code.

While continual improvements have reduced the environmental impact of CSTBs, the CSTB industry recognises that further improvements must be pursued. It is recognised that the energy consumption of CSTBs is influenced by the services offered, the number of features provided and by the components used.

Having considered the applicability of the Ecodesign Directive and Regulation 1275/2008/CE [2](the "Regulation") to CSTBs, and concluded that, in the event that CSTBs were to fall within the scope of the Regulation, then the requirements therein would in fact be "*inappropriate for the intended use*"[3] for the vast majority of CSTB products. Moreover, it is concluded that a voluntary code of conduct is best placed to achieve the overall objective of going beyond a "business as usual" scenario, as set out in Section 3 of this Code, and ensuring the free movement of CSTBs in the Internal Market.

This Code provides a complete and adequate alternative to an implementing measure in the context of the Ecodesign Directive, which provides that priority should be given to alternative courses of action such as self-regulation by the industry.

The Signatories shall ensure that this Code is implemented in full compliance with all the provisions of the Treaty of the European Union (in particular internal market and competition rules) as well as with the international engagements of the European Community, including multilateral trade rules, and accept that it shall be assessed against the indicative criteria set out in Annex VIII of the Ecodesign Directive and in the light of the European Commission Guide to the Implementation of Directives based on the New Approach and the Global Approach ("Blue Guide")[4].

In line with the European Commission "Communication on Environmental Agreements at Community level within the Framework of the Action Plan on the Simplification and Improvement of the Regulatory Environment"[5], this Code may be acknowledged by the European Commission through an exchange of letters with the Signatories.

2. EQUIPMENT COVERED BY THE CODE

This Code is effective from the Effective Date and covers CSTBs, as described and defined in Annex B and Annex F. This Code does not have retroactive effect: only individual CSTBs that are placed on the Internal Market for the first time on or after the Effective Date or which are put into service in the Internal Market for the first time on or after the Effective Date, in accordance with the Blue Guide, are subject to this Code. The scope of the Code as described in this Section 2 also applies to CSTBs that

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[1] Directive 2005/32/EC.

[2] Commission Regulation (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment

[3] Annex II, paragraphs (1)(c), (2)(c) and (2)(d) of Regulation 1275/2008/CE

[4] http://ec.europa.eu/enterprise/newapproach/legislation/guide/document/1999_1282_en.pdf

[5] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52002DC0412:EN:NOT

are manufactured outside the European Community on or after the Effective Date and which are supplied, distributed or used within the European Community.

3. OVERALL OBJECTIVE

The overall objective of the Code is to reduce the energy consumption of CSTBs in accordance with the Tier 1 and Tier 2 energy consumption targets and time frame established in Annex D (*Maximum Energy Consumption Targets and Time Schedule*), with a view to maximising the environmental benefits from improved design. Ecodesign requirements and energy consumption targets should be set bearing in mind the intended use of CSTBs, and should not have a negative impact on their functionality. In particular a detrimental impact on CSTBs (which would include slower start-up times, the ability to schedule recordings, the ability to record remotely, hinder the availability of push VOD content to customers, etc.) would seriously impede the intended use of the vast majority of CSTBs, and in so doing, would fundamentally undermine the EU Action Plan on Energy Efficiency for this product group.

In direct contrast to this, the Code delivers an industry-wide commitment to reducing the potential environmental impact of CSTBs. It goes beyond a "business as usual" scenario and provides for quick progress by means of rapid and cost-effective implementation, while allowing for flexible and appropriate adaptation to technological options and market sensitivities. This Code sets out the means by which the Signatories, which are drawn from across the spectrum of the CSTB industry, will commit to achieving such rapid and effective implementation while continuing to invest in and develop sustainable and appropriate "best of class" CSTB products.

4. COMMITMENTS

From the Effective Date, Signatories individually and collectively agree to be responsible to the European Commission and will each make their reasonable efforts to:

4.1 abide by the general principles of CSTB hardware and software design set out in Annex A (*General Principles of CSTB Design)*;

4.2 reduce the energy consumption of CSTBs to the minimum necessary to meet their operational specification while not limiting Service Providers' ongoing ability to improve functionality and offer service enhancements;

4.3 not exceed the maximum energy consumption targets set out in Annex D (*Maximum Energy Consumption Targets and Time Schedule*)

In particular,:

4.3.1 each Signatory shall ensure that 90% of its CSTBs comply with the Tier 1 energy consumption targets of the Code as set out in Annex D (*Maximum Energy Consumption Targets and Time Schedule*). For the avoidance of doubt, only CSTBs placed on the Internal Market for the first time on or after the Effective Date or put into service in the Internal Market for the first time on or after the Effective Date (in accordance with the Blue Guide) shall count towards this target of 90%. This principle also applies to CSTBs that are manufactured outside of the European Community, but which are supplied, distributed or used within the European Community.

4.3.2 should a Signatory achieve compliance with Section 4.3.1 above from the Effective Date, then that Signatory is entitled to make that achievement public;

4.3.3 should 25% or more of a Signatory's CSTBs comply with the Tier 2 energy consumption targets of the Code as set out in Annex D (*Maximum Energy Consumption Targets and Time Schedule*) before 1 January 2013 then that Signatory is entitled to make that achievement public;

4.4 develop an appropriate commitment to ensure the active involvement of potential signatories;

4.5 work with the European Commission, Member States' representatives and other interested parties involved in CSTBs to agree common working agendas to improve the environmental performance of CSTBs;

4.6 co-operate with the European Commission and Member States to monitor the effectiveness of this Code through the procedure described below in Section 5 (*Reporting, Monitoring and Compliance*);

4.7 co-operate with other Signatories, with the European Commission and with Member States to review the Code and the Tier 1 and Tier 2 energy consumption targets through the procedure described below in Section 7 (*Review, Revision and Termination of the Code*);

4.8 inform consumers about the environmental characteristics and performance of CSTBs, and facilitate and encourage consumers to adopt energy efficient practices in connection with the use of CSTBs. In particular, Signatories shall provide consumers with detailed information about energy consumption levels. Such information shall be made available online and where relevant and possible, at the point of sale; and

4.9 ensure that procurement specifications for CSTBs are compliant with this Code.

4.10 Signatories commit only to the areas which are under their individual control and responsibility.

4.10.1 Specifically Signatories who are:

a) Component Manufacturers, in order to support Equipment Manufacturers in meeting and where possible improving upon the energy consumption targets contained within this Code, commit to designing CSTB components which improve functionality and enable component sub-systems to be controlled and operated in the most energy efficient manner;

b) Conditional Access Providers commit, in order to support Service Providers in meeting and where possible improving upon the energy consumption targets contained within this Code, to designing and developing conditional access systems which enable improved CSTB energy efficiency without negatively impacting functional and operational requirements of Service Providers;

c) Equipment Manufacturers commit to designing and manufacturing CSTBs to Service Providers functional and operational specifications that meet the energy limits contained within this Code and where possible improve upon them;

d) Service Providers commit to working with all other Signatories in order that the Service Provider's supply of CSTBs to end-users is compliant with this Code; and

e) Software Providers, in order to support Service Providers in meeting and where possible improving upon the energy consumption targets contained within this Code, commit to developing and supplying software power management applications which enable Service Providers to fully utilise and integrate hardware power management features provided by Equipment Manufacturers and to do so without negatively impacting other CSTB features and functionality.

5. REPORTING, MONITORING, REVISION & COMPLIANCE

The European Commission in partnership with the Steering Committee shall be invited to monitor the achievements of the objectives set out in the Code. The plan for monitoring and reporting shall be detailed, transparent and objective. It shall remain for the European Commission assisted by the Steering Committee to consider whether the objectives of the Code have been met.

5.1 Reporting

Each Signatory shall provide information to the Independent Inspector detailing the energy consumption of each type of CSTB it manufactures, supplies, distributes or uses within the European Community in compliance with this Code, as applicable, and taking into account the relevant provisions of Annex C (*Measurement Method and Conditions*). For the avoidance of doubt, such reporting also applies to CSTBs manufactured outside of the European Community, but supplied, distributed or used within the European Community, in compliance with this Code.

Each Signatory shall provide the required information for the relevant Reporting Period in the format specified in Annex G. Information supplied by a Signatory will be determined by its Main Activity (as categorised in Annex G). For the avoidance of doubt, each Signatory may not perform more than one Main Activity under this Code.

The Signatories note that some elements of reporting compliance under this Code are likely to require the provision of commercially sensitive information. Requirements relating to the supply of information by the Signatory shall be proportionate and shall take into account the legitimate confidentiality of commercially sensitive information. These requirements shall provide for the secure supply and provision of all information (including commercially sensitive information). The receipt of information supplied by a Signatory shall always be subject to obligations of confidentiality. For the avoidance of doubt this will include maintaining confidentiality of information from other Signatories, while ensuring confidence in the compliance of individual Signatories with this Code.

5.2 Monitoring

The Commission, in partnership with the Signatories shall be invited to monitor the achievement of the objectives of the Code, in accordance with Annex VIII of the Ecodesign Directive. Independent inspectors (who, for the avoidance of doubt, shall be bound by the same obligations of confidence as set out in Section 5.1, above) may be instructed to conduct an audit of the information supplied by any individual Signatory. The Commission, assisted by the Steering Committee,shall consider whether the objectives of the Code have been met, taking into account the results of audits produced by the Independent Inspector. To preserve business secrets and commercial confidences, any official report produced by the Commission in connection with the information supplied by any individual Signatory shall not refer to the performance of individual companies.

The Chair of the Steering Committee will ensure that at least once during each Reporting Period the Signatories and the Commission shall meet to discuss the Code in order to:

5.2.1 evaluate the effectiveness of this Code in achieving its objectives as set out at Section 3;

5.2.2 evaluate current and future developments that may influence energy consumption (for example, integrated circuit development, conditional access systems) with a view to agreeing a course of action and/or revising the Code;

5.2.3 set future targets to increase energy savings.

Such discussions shall take place on a confidential basis.

5.3 Revision

5.3.1 Decisions to amend the Code:

Once the monitoring process set out in Section 5.2 of the Code has been completed, the Steering Committee may agree to implement any necessary amendments to the Code. All reasonable efforts shall be taken to ensure that the decisions of the Steering Committee to amend the Code are taken on the basis of a consensus.

However, where consensus on an amendment to the Code cannot be achieved in the course of a meeting of the Steering Committee, a call for an indicative vote may be made by the Steering Committee Chair or by a Quorum.

If the indicative vote indicates a favourable outcome (which shall be determined by achieving a minimum of a two-thirds majority) but a consensus is nonetheless not achieved, a call for a deciding vote may be made by a Quorum to be held at the following meeting of the Steering Committee. At such second meeting, the adoption of a decision shall require:

a. a Quorum (as defined in Annex F);

b. compliance with the Voting Procedures;

c. the agreement of a two thirds majority (66%) of the Quorum; and

d. appropriate agreement from the European Commission. The Signatories will work together with the European Commission to agree how it will be involved in this process and shall amend the Code accordingly by 1 January 2011.

Representatives from Member States and interested parties involved with CSTBs shall be invited to participate in discussions concerning amendments to the Code, but shall not be entitled to vote on any proposed revision.

5.3.2 Any other decisions:

All reasonable efforts shall be taken to ensure that the decisions of the Steering Committee are taken on the basis of a consensus.

However, where consensus on an issue cannot be achieved in the course of a meeting of the Steering Committee, a call for an indicative vote may be made by the Steering Committee Chair or by a Quorum.

If the indicative vote indicates a favourable outcome (in accordance with a requirement for a two-thirds majority) but a consensus is nonetheless not achieved, a call for a deciding vote may be made by a Quorum to be held at the following meeting of the Steering Committee. At such second meeting, the adoption of a decision shall be made in accordance with the Voting Procedures. At such second meeting, the adoption of a decision shall require:

a. a Quorum (as defined in Annex F);

b. compliance with the Voting Procedures;

c. the agreement of a two thirds majority (66%) of the Quorum.

5.4 Compliance

Compliance with the Code by individual Signatories, including with the commitments set out in Section 4, shall be assessed by the Independent Inspector at the end of each Reporting Period on the basis of the information provided by each Signatory in accordance with Section 5.1, above.

A Defaulting Signatory shall forfeit its Signatory status. A mechanism shall be developed to remove the Signatory status of a Defaulting Signatory. The Signatories will work together to agree this mechanism

and amend the Code by January 1 2011 A Defaulting Signatory may however, engage in discussions with the European Commission, Member States and other Signatories with the intention of meeting its commitments under this Code.

In addition, it may be appropriate for a mechanism to be developed to allow a Defaulting Signatory, who is striving to meet the Code and expects to do so within a short period, to continue as a Signatory. The Signatories will work together with other stakeholders to agree if this is appropriate and, if so, to develop a mechanism for assessing and reporting such cases and amend the Code by January 1 2011, taking into account the requirement of equal treatment described in Section 6.1 below.

6. NATURE AND ORGANISATION OF CODE

6.1 Nature of Code

The Signatory signs and enters into this Code for and on behalf of itself and makes its commitment under the Code to the European Commission.

This Code shall not amount to a commercial agreement and shall not give rise to any commercial expectations or liabilities as between the Signatories in respect of the fulfilment of their individual commitments under the Code.

All Signatories will be treated equally and there shall be no special arrangements for individual Signatories.

6.2 Organisation of Code

Each Signatory to the Code as well as the European Commission shall have the right to nominate one person to represent it at the Steering Committee.

The Steering Committee shall elect, from amongst its members, a Chair. The Chair shall be responsible for convening the Steering Committee at regular intervals (and at least twice every Reporting Period) and for running such meetings of the Steering Committee. The Chair shall, however, have no executive or representative function unless this is delegated to them by the Steering Committee.

Meetings of the Steering Committee shall be open to named members and any person representing a Signatory or potential signatory to the Code, as well as to any representatives of the European Commission or Member States, as well as member states of the EEA or EFTA, and any other person who wishes to attend and who the Steering Committee believes represents a legitimate stakeholder. The Steering Committee will seek to achieve agreement by consensus at all times. If consensus cannot be achieved, the Steering Committee may reach a decision in accordance with the Voting Procedures.

The Steering Committee may decide to develop and adopt further rules of procedure where it deems it necessary and may decide to delegate powers where it deems it to be necessary to specific individuals or to sub-committees.

7. TERMINATION OF THE CODE

Signatories remain bound by the Code until they elect to terminate their Signatory status. A Signatory shall be entitled to terminate its Signatory status by giving twenty eight days' written notice to the Chair of the Steering Committee. The Chair shall inform all members of the Steering Committee, the European Commission and such other persons as the Chair may deem appropriate.

ANNEX A – GENERAL PRINCIPLES OF CSTB DESIGN

A Signatory of this Code shall use its reasonable efforts to ensure:

A.1 CSTB's are designed so as to reduce energy consumption within the constraints of their operational specification.

A.2 Operational and control systems are specified on the presumption that hardware has energy management built in, i.e. depending on the functionality required from the unit, the hardware could switch to a mode with a lower energy consumption;

A.3 For Tier 1, an Auto Power Down (APD) feature is encouraged under this Code and credit for anticipated energy savings for CSTBs that have APD capability is provided in Annex C Section C.7.2 (Equation 1: Base Assessment). For Tier 2, an APD feature shall be provided. Where APD is available its defaulted mode shall be "on" or "enabled". In claiming the APD credit, the software versions running on the box should be noted to enable verification.

A.4 If the APD feature is present it is required that the CSTB automatically switches itself into the lowest standby mode, after a period of time in the On mode following the last user interaction, which the Service Provider deems to be appropriate. This period of time shall be set at a default of no more than 4 hours by the Equipment Manufacturer or Service Provider and may be user adjustable but shall not be able to be set to a period of more than 8 hours. The CSTB should allow the viewer to continue watching beyond the set period by prompting the viewer to confirm that the CSTB is still in use. The Auto Power Down feature may however be able to be overridden by a user through a special menu option.

A.5 The CSTB may exit an automatically-initiated standby mode in order to download content and scan for program and system information, scheduling information, or any other maintenance activity. After activity is complete, the CSTB must return to the previous standby mode within no more than 15 minutes.

A.6 Whilst adhering to the general principle of designing products to reduce energy consumption, Service Providers, Equipment Manufacturers, Software Providers, Conditional Access Providers and Component Manufacturers are constantly innovating their products as new service concepts and technologies develop. To avoid stifling such innovation, any unanticipated additional functionality which consumes significant energy but which is not listed in Table 4 in Annex D (Additional Functionalities Annual Energy Allowance) shall be deactivated during the measurement process. However, in the event that such deactivation is either inappropriate or unnecessary, then this requirement shall not be compulsory. The test results shall explicitly list any functions that were deactivated during the measurement process. Signatories shall ensure that when the Code is revised in accordance with Section 5.3 above, the list of additional functionalities in Table 4 in Annex D is updated to take into account the incremental energy consumption of any additional functionality not known or implemented at the time the Code first entered into force or was last revised;

A.7 Software Downloads to CSTB's shall not increase the power consumption requirements above the initial TEC allowance unless they provide additional functionality. Such additional functionality shall not increase the TEC allowance if listed in Table 4 Annex D, otherwise it should be deactivated for measurement purposes as described in Section A.6 above.

A.8 Direct to retail devices, that is, CSTBs not supplied to an end user via a Service Provider (as defined in Annex F of this Code), that provide for speculative recording (typically push video-on--demand content) must have a user-accessible menu option allowing the user to disable this feature at will. Manufacturers must also include instructions for disabling speculative recording in product materials. CSTBs supplied by a Service Provider that provide for speculative recording must have a user-accessible menu option allowing the user to disable this feature at will, , or alternatively a disable function that can be applied upon user request,

for example via the Service Provider call centre. The Service Provider must also include instructions for disabling speculative recording in product materials.

ANNEX B – CSTB FUNCTIONALITY AND OPERATIONAL MODES

B.1 CSTB

A CSTB is a standalone device equipped to allow conditional access that is capable of receiving, decoding and processing data from digital broadcasting streams and related services, and providing output audio and video signals. It may have either an internal or else a dedicated external power supply.

For the purposes of the Code a device shall not be considered to be a CSTB unless it can fulfil the functions of a CSTB when activated by the operator of the network.

A Simple STB, as defined in Annex F, is outside the scope of this Code. Also excluded from the scope of this Code are devices whose primary function is something other than the reception of television signals, such as but not limited to:

- Computers fitted with digital TV tuners or TV add-in cards;
- Games consoles with digital TV tuners
- Digital receivers with recording function based on removable media in a standard library format (VHS tape, DVD, Blu-ray disk and similar)
- Digital TVs with integrated receiver decoder
- External plug in digital receivers for computers (e.g. USB)

B.2 TEC Base Functionality Allowances of CSTBs

The TEC base functionality allowances of all CSTBs includes Conditional Access to allow the decoding of standard definition digital video and audio signals. The base functionality of all CSTBs includes the reception of digital TV signals from Cable, Satellite, IP, Terrestrial, distribution systems or else Thin-Client functionality, as further specified below.

The classification of each CSTB (as set out below) is distinct and each classification is mutually exclusive.

A. Cable CSTB is a CSTB which is capable of receiving digital television signals from a coaxial or hybrid fibre/coaxial distribution system and deliver them to a consumer display and/or external recording device. If the CSTB meets the definition of a Cable CSTB and the CSTB is capable of receiving a cable service protected by conditional access, the base functionality is defined to be cable, regardless of whether the cable reception is considered the “principal functionality” by the Manufacturer or Service Provider.

B. Satellite CSTB is a CSTB which is capable of receiving digital television signals from satellites and deliver them to a consumer display and/or external recording device. If the CSTB base functionality is not cable and the CSTB meets the definition of a Satellite CSTB and the CSTB is capable of receiving a satellite service protected by conditional access, the base functionality is defined to be satellite, regardless of whether the satellite reception is considered the “principal functionality” by the Manufacturer or Service Provider.

C. Internet Protocol (IP) CSTB is a CSTB which is capable of receiving digital television/video signals encapsulated in IP packets and deliver them to a consumer display and/or external recording device. If the CSTB base functionality is not cable or satellite and the CSTB meets the definition of an IP CSTB and the CSTB is capable of receiving an IP service protected by conditional access, the base functionality is defined to be IP, regardless of whether the IP reception is considered the “principal functionality” by the Manufacturer or Service Provider.

D. Terrestrial CSTB is a CSTB which is capable of receiving digital television signals over the air (OTA) and deliver them to a consumer display and/or external recording device. If the CSTB base functionality is not cable, satellite or IP and the CSTB meets the definition of a Terrestrial CSTB and the CSTB is capable of receiving a terrestrial service protected by conditional access, the base functionality is defined to be terrestrial, regardless of whether the terrestrial

reception is considered the “principal functionality” by the Manufacturer or Service Provider.

E. Thin-Client/Remote CSTB: A CSTB that is designed to interface between a CTSB and a TV (or other output device) that has no ability to interface with the Service Provider directly and relies solely on a CSTB for content. Any CSTB that meets the definition of Cable, Satellite, IP or Terrestrial CSTB is not a Thin-Client/Remote CSTB. If the CSTB base functionality is not cable, satellite, terrestrial or IP, and the CSTB otherwise meets the definition of Thin-Client/Remote, the base function is thin-client/remote.

B.3 Additional TEC Functionality Allowances of CSTBs

F. Additional Tuners: An additional Tuner which provides access to an additional source of digital media content either from the primary network or a physically separate network; i.e. it need not be for the same source media type. For example, a device with additional Tuners has the ability to tune into two or more separate streams of video, audio, interactive media, service information or EPG data simultaneously and process these stream separately being either physical outputs, picture-in-picture, interactive media, EPG or recording mechanisms. The allowance for additional Tuners only applies to conventional Tuners, and not additional network based IP inputs such as an additional Ethernet interface.

G. Advanced Video Processing/Codecs: Advanced methods for video encoding, transcoding and decoding beyond MPEG-2. Examples include, but are not limited to, H.264/MPEG 4 and SMPTE 421M.

H. Digital Video Recorder (DVR): A device that stores video in a digital format to a rewritable disk drive or other non-volatile storage media local to the unit. The term covers DVR functions integrated in a CSTB; it does not include server based DVR capabilities. DVR capability may also provide ‘live pause’ functionality. For the DVR energy allowance to be claimed the recording capability must be greater than 15 minutes.

I. High Definition (“HD”) Resolution: Video output with resolutions greater or equal to 720p (1280 pixels x 720 lines at 50 frames/s progressive) or 1080i (1920 pixels x 1080 lines at 25 frames/s interlaced).

J. Multi-Decode and Display: A CSTB with a functionality allowance that meets the definition for Cable, Satellite, IP or Terrestrial CSTB above and is capable of additional decoding for providing independent content to multiple display devices, e.g. TVs, within a single family dwelling.

K. Return Path: This is an indicator of an enhanced functionality CSTB. Return Path functionality may be provided by any common means of connecting to a telecommunications network and used for the purpose of two way data communications between the CSTB and the service provider.

B.4 Operational modes

L. On: Operational mode in which the CSTB is at least actively performing its base functionality. Note that the energy consumption targets related to “On” mode might be variable over the time and dependent on the real functionality requested from the CSTB.

M. Standby: Operational mode in which the CSTB has less energy consumption, capability, and responsiveness than in the “On” mode .The energy consumption targets related to “Standby” mode might be variable and dependent on the real functionality requested from the CSTB.

N. The CSTB may enter a Standby mode from the On mode after:

a. The CSTB receives a notification from the user to enter a standby mode via a power button press on a remote control or front panel of the unit, or through an electronic signal or data packet received via a digital interface on the CSTB; or

b. Where APD is supported, the CSTB auto-powers down to a standby mode. The energy consumption after auto-power down to standby and after a user initiated power down to standby may, or may not be equivalent.

ANNEX C – CALCULATION OF TOTAL ENERGY CONSUMPTION

The energy consumption shall be calculated and declared taking into account the relevant provisions of this Annex. In this measurement process, the energy consumed in the On and standby modes will be multiplied by the number of hours a defined typical device spends in On and Standby. The result will be a single energy value representing the energy usage of the device over the course of an entire year: its Total Energy Consumption.

Standby mode measurement should be taken at least 30 minutes after the device enters such a mode.

The *Total Energy Consumption* of a CSTB is compared to its *Total Energy Allowance* to determine its compliance with this Code. The following parts describe the way for determining CSTB yearly energy allowances as well as calculating their Total Energy Consumption.

C.1 General

The CSTB should be tested as shipped and as normally installed for the end-user. Where the CSTB is capable of supporting a wired or wireless local area network this should be disabled. If it can not be disabled, the CSTB should be operated in the most basic mode required to produce picture and sound from the specified broadcast stream, for one local monitoring point working to the standard of that broadcast stream

One appropriate digital (test) HD broadcast stream shall be fed into the equipment. If the equipment does not accept HD inputs a standard (SD) stream shall be used.

No peripherals shall be attached except when necessary for feeding the broadcast stream into the equipment and delivering the function(s) as described in this Annex. Where such a peripheral requires power from the CSTB (e.g. a powered antenna for a Terrestrial CSTB or a Low Noise Block (LNB) for a Satellite CSTB) but is not of a unique design specific to the CSTB and essential to make the CSTB function, then the energy required for the peripheral shall not be included in the test measurement.

The duration of measurement should be evaluated according to IEC62301.

C.2 Calculated Total Energy Consumption criteria

The criterion used in order to assess compliance of CSTBs with this Code is its calculated total energy consumption (TEC - in annual kWh). The criterion is an allowance for base functionality, plus allowances for specific, additional functionalities present across a duty cycle. This duty cycle is further explained in Sub-Section C.7.1.

C.3 Base Functionality Allowance

The appropriate base functionalities are defined in Annex B.2. The corresponding allowances values are given in the Table 3 of Annex D (*Maximum Energy Consumption Targets and Time Schedule*).

C.4 Additional Functionality Allowance

The appropriate additional functionalities are defined in Annex B.3. If applicable, these shall be determined using values from Table 4 (Annex D).

C.5 Calculating Annual Energy Allowance

To calculate the Code allowance for a given CSTB, take the sum of the base functionality allowance and all applicable additional functionalities allowances (Note that there may not be any additional functions in devices such as standard cable or satellite CSTBs). This sum is the calculated annual kWh limit, or TEC value. This sum equals the maximum amount of energy the box can use in a given year as calculated following the measurement procedure described in this Annex C.

Annual Energy Allowance (kWh/year) = Base Functionality Allowance + Additional Functionalities Allowance

C.6 Multi-Decode and Display Functionality Allowance

When using the Multi-**Decode and Display** additional functionality energy allowance to establish the criteria for a CSTB, the following procedure must be followed. This allowance may only be used for CSTBs that can provide independent content to more than one display device, e.g., TV, portable media player, etc. When utilizing the allowance for a second display, the content provided to the second display must be different to the content provided to the primary display. For the purposes of this specification, TV can be any device capable of streaming and displaying real-time video from the EUT. Specific requirements for testing CSTBs with Multi-**Decode and Display** are included below.

- First, test the CSTB with Multi-**Decode and Display** and compare the results to the specification criteria assuming the CSTB will deliver content to only one display device, i.e., do not include the Multi-**Decode and Display** allowance. If the CSTB meets the targets, no further measurement is required.

- If the CSTB does not pass the single display device CSTB test, then determine if it qualifies when using the **Multi-Decode and Display allowance:**

    - Retest with a second display device running the same test simultaneously with the first.

Add the Multi-**Decode and Display** additional annual energy allowance listed in Table 3 of Annex D to the criteria established for the CSTB. Compare the test results to the Multi-**Decode and Display** criteria to see if the CSTB is compliant with Code. For units that can support a second display device without the need for a thin client, the manufacturer can add in half of the relevant Thin Client allowance (see Section B2, above).

C.7 Device Total Energy Consumption (TEC) Assessment

In this specification, the energy consumed in the On and Standby modes will be multiplied by the number of hours a defined typical device spends in On and Standby. The result will be single energy value representing the energy usage of the device over the course of an entire year.

C.7.1 Duty cycle for basic functionalities

The Base Duty Cycle defines the number of hours during which a CSTB is considered to be working in "On"(=> $T_{On)}$ and "Standby modes" (=> $T_{Standby}$ or $T_{APD).}$

The duty cycle is dependent on the (optional) availability of the Auto Power Down feature.

Table 1: Base Functionality Duty Cycle

CSTB with **NO** APD	**On**	**Standby**	
Daily time duration in this mode	T_{On}= 9h	$T_{Standby}$=15h	
CSTB **with** APD	**On**	**Standby**	**Standby from APD**
Daily time duration in this mode	T_{On}= 4.5h	$T_{Standby}$=15h	T_{APD} =4.5h

C.7.2 Equation 1: Base Assessment

Applies To All Products

Calculate the base energy consumption by multiplying the measured energy consumption as specified in this test procedure by the hours per day values in the equations below. If the EUT does not include the capability for Auto Power Down, then use the first equation (a). If the product does include Auto Power Down capability, and it meets the requirements in Annex A (A.3; A.4), then use the second equation (b).

$P_{TV,}$ $P_{Standby}$ and P_{APD} are power levels in watts as measured according to the measurement procedure set out in this Annex C.

a) Annual energy (kWh/yr) for a product with no Auto Power Down

$$kWh\ base = 0.365 \times (T_{On} \times P_{TV} + T_{Standby} \times P_{Standby})$$

b) Annual energy (kWh/yr) for a product with Auto Power Down capability

$$kWh\ base = 0.365 \times (T_{On} \times P_{TV} + T_{Standby.} \times P_{Standby\ .} + T_{APD} \times P_{APD)}$$

Examples:

(A) The EUT does not have Auto Power Down capability, and the measurements during the measurement procedure are as follows: P_{TV} = 24.0 watts and $P_{Standby}$ = 15.0 watts. The annual energy consumption is then:

$$kWh_{Base} = 0.365 * (9 * 24.0 + 15 * 15.0) = \mathbf{161\ kWh/yr}$$

(B) The EUT does have Auto Power Down capability, and the measurements during the measurement procedure are similar to example A: P_{TV} = 24.0 watts, $P_{Standby}$ = 15.0 watts and P_{APD} = 3 watts. The annual energy consumption is then:

$$kWh_{Base} = 0.365 * (4.5 * 24.0 + 15 * 15.0 + 4.5 * 3.0) = \mathbf{126.5\ kWh/yr}$$

If the TEC assessed for the product is less than the Annual Energy Allowance calculated from Annex D below, the product is compliant with the energy consumption targets of the Code.

ANNEX D – MAXIMUM ENERGY CONSUMPTION TARGETS AND TIME SCHEDULE

D.1 **Effective Date**: This Code is effective from July 1, 2010.

Tier 1 energy consumption targets shall be effective from the Effective Date.

Tier 2 energy consumption targets will become effective on July 1, 2013.

D.2 Base Functionality Allowance

The base functionality allowance, if applicable, shall be determined using values from Table 3. See also Annex B.2, above.

Table 3: Base Functionality Annual Energy Allowance

Base Functionality	**Tier1 Annual Energy Allowance** *(kWh/year)*	**Tier2[6] Annual Energy Allowance** *(kWh/year)*
Cable	45	40
Satellite	45	40
IP	40	35
Terrestrial	40	35
Thin-Client/Remote	40	35

[6] Tier 2 limits have been provided throughout this specification as preliminary targets that will be re-evaluated and finalized at least nine months prior to the Tier 2 effective date.

D.3. Additional Functionalities Allowance

The Additional Functionalities Allowance, if applicable, shall be determined using values from Table 4.

Table 4: Additional Functionalities Annual Energy Allowance

Additional Functionalities	**Tier 1 Annual Energy Allowance** *(kWh/year)*	**Tier 2 Annual Energy Allowance** *(kWh/year)*
Adv. Video Processing[7][8]	20	14
High Definition	20	14
Additional Tuners [9]	20	14
DVR	20	18
Return Path	60	35
Multi-Decode and Display	38	12

7 The Adv. Video Processing adder only applies once per box and cannot be applied multiple times.

8 In BioIS, the allowance for Advanced Video Processing has been combined with High Definition and equals 40kWh. In the Voluntary agreement, the codec and resolution were kept separate. This is to allow for cases when Standard definition TV content are encoded/decoded using Advanced Video formats such as H.264/AVC and, conversely, for situations when High definition TV content is encoded/decoded using MPEG-2

9 For each additional tuner, and associated components.

ANNEX E - TEST PROCEDURE

1. OVERVIEW

1.1 The intention of this Section is to define an independent test process to determine the energy consumption of a CSTB under various standardised operating conditions, these are designed to emulate 'real world' viewing habits.

1.2 All testing shall be carried out in controlled repeatable conditions, as specified below.

1.3 Unless otherwise specified, all commands to the EUT shall be via the supplied remote control.

1.4 Except for a smart card or Conditional Access module there shall be no external loads connected to the EUT, unless these are required for the EUT to function, if other external loads are required these shall not measurably increase the load on the EUT e.g. for satellite the LNB supply shall be via a DC block (i.e. powered independently).

1.5 All compliance testing shall be carried out on products representative of production units. To provide results that will give an accurate representation of actual deployed usage the software used in the EUT shall be the same as the software used by the product when deployed by the Service Provider.

1.6 The compliance testing shall be carried out on one (1) random sample product. If the results show that the product has passed by a margin of greater than 10% then the product is deemed to be compliant. If the product fails then that model does not comply with the Code. If the product passes with a margin of less than 10% then two (2) further random samples shall be taken. If both of these pass then the product shall be deemed to have complied. If any one (1) of the two samples exceeds the limits then the product does not comply.

1.7 When testing standard definition operations the audio/video content shall be encoded using a qualifying technology (MPEG2 with scrambling) and typically a sports or film channel.

1.8 When an allowance for high definition is taken the audio/video content shall be encoded using a qualifying technology (MPEG2 with scrambling) and typically an HD sports or film channel.

1.9 Where an allowance for the Return Path is claimed then the EUT must be operated to the highest version of the Return Path technology that it is compatible with.

1.10 Where the allowance for advanced video processing is taken, then at least 1 test stream shall be encoded using a qualifying technology (e.g. MPEG4, H.264 etc. with scrambling).

1.11 Where the energy savings can be influenced by the end user then all measurements shall be made using the factory default settings.

1.12 Where the allowance for Multi-**Decode and Display** is claimed then at least one additional display device shall be connected to the EUT when performing the test methods set out at Sections 5, 6, 7, 8 or 9 of this Annex E and the secondary display device shall render different content than the primary display device being used for the test. The EUT shall provide content to the additional display device for the duration of the test.

2. GENERAL TEST CONDITIONS

2.1 The general conditions of test are described in IEC 62301 (Household electrical appliances – Measurement of standby power). The main requirements are summarised briefly below.

Test Conditions	Value
Ambient temperature	23 ± 5 ^{0}C
Air speed close to the unit	≤ 0.5 m/s
Supply voltage	230V ± 1% 50 Hz ± 1%
Supply voltage waveform	Total harmonic content ≤ 2% Crest factor between 1.34 and 1.49
Power level ≥ 0.5W Power level ≤ 0.5W Power ≤10 W Power 10 ≤ 100 W	Uncertainty ≤ 2% at the 95% confidence level Uncertainty ≤ 0.01 W at the 95% confidence level Resolution ≥ 0.01 W Resolution ≥ 0.1 W

2.2 Test instruments shall be calibrated annually to traceable national standards to maintain the levels of accuracy above.

3. TEST METHOD FOR STANDBY (USER INITIATED)

3.1 The EUT shall be put into its on mode.

3.2 If the EUT is capable of scheduling a recording then a recording shall be scheduled two (2) hours in the future.

3.3 After five (5) minutes in this mode, the standby or off button on the remote control shall be pressed.

3.4 The EUT shall then be left for a maximum of thirty (30) minutes for any housekeeping activities to complete.

3.5 At the end of the thirty (30) minutes or housekeeping activities the average energy in watt/hours shall be measured for a period of ten (10) minutes. Based on this ten (10) minute measurement the standby part of the TEC shall be calculated.

3.6 If the EUT has a variable power usage in standby the test cycle duration, over which the average power is to be measured, shall be amended to one (1) complete power usage cycle which shall be taken to be the cycle from minimum to maximum usage so that the standby part of the TEC shall be calculated based on one (1) complete cycle.

3.7 If the EUT is fitted with a front panel switch which initiates a different level of energy saving, then the test shall be repeated using the front panel switch to initiate the standby mode, with the test cycle being repeated in accordance with Sections 3.1 – 3.5 inclusive of Annex E. If the results are different then the higher value shall be used

4. TEST METHOD FOR AUTO- POWER DOWN

4.1 If the EUT is capable of scheduling a recording then a recording shall be scheduled 6 hours in the future.

4.2 The EUT shall be connected either to a live stream or a pre-recorded stream and left until the auto-standby is initiated.

4.3 The EUT shall then be left for a maximum of 30 minutes for any housekeeping activities to complete. At the end of the 30 minutes or housekeeping activities the average energy in watt hours shall be measured in accordance with Section 3 above. Based on this measurement the auto-standby part of the TEC shall be calculated.

5. TEST METHOD FOR ON MODE OF STANDARD DEFINITION NON-PVR

5.1 The EUT shall be connected either to a live stream or a pre-recorded stream.

5.2 The EUT shall then be left for a maximum of thirty (30) minutes or until the EUT has stabilised.

5.3 The average energy in watt hours shall then be measured for a period of ten (10) minutes.

5.4 Based on this ten (10) minute measurement the on-mode part of the TEC shall be calculated.

6. TEST METHOD FOR ON MODE OF HIGH DEFINITION NON-PVR

6.1 The EUT shall be connected to, and displaying a stream of high definition content.

6.2 The EUT shall then be left for a maximum of thirty (30) minutes or until the EUT has stabilised.

6.3 The average energy in watt hours shall then be measured for a period of five (5) minutes (P_HD-NPVR)

6.4 Using the standard remote control the EUT shall then be re-tuned to a standard definition channel and the average consumption measured for a further fifteen (15) minutes (P_SD-NPVR).

6.5 The average HD non PVR watt/hours = ¼ P_HD-NPVR + ¾ P_SD-NPVR

6.6 Based on this twenty (20) minute measurement the on-mode part of the TEC shall be calculated

Note: it is expected that as the quantity of High Definition content increases later versions of this document will require a higher ratio of HD content.

7. TEST METHOD FOR ON MODE OF STANDARD DEFINITION PVR

7.1 The EUT shall be connected either to a live stream or a pre-recorded stream.

7.2 The EUT shall then be left for a maximum of thirty (30) minutes or until the EUT has stabilised.

7.3 The EUT shall then be operated in accordance with Table 1. For typical 2 tuner EUT this means 1 channel will be viewed whilst a second is recorded, for a 6 tuner EUT 1 channel will be viewed and 5 recorded.

7.4 For the purposes of this test where there is more than 1 tuner the viewed channel shall be different to the recorded channels

Viewing	Recording	Duration
1	0	10

1	1	10

Table 1a – normal operation duty cycle – single tuner

Active Tuners	Viewing	Recor	Duration
1	1	0	10
2	1	1	10

Table 1b – normal operation duty cycle – dual tuners

Active Tuners	Viewing	Recor	Duration
1	1	0	5
2	1	1	10
3+	1	All -1	5

Table 1c – normal operation duty cycle – multi-tuners

7.5 The average energy in watt/hours shall then be measured for each period. Based on this 20 minute measurement the on-mode part of the TEC shall be calculated.

8. TEST METHOD FOR ON MODE OF HIGH DEFINITION PVR

8.1 The EUT shall be connected either to a live stream or a pre-recorded stream.

8.2 The EUT shall then be left for a maximum of 30 minutes or until the EUT has stabilised.

8.3 The EUT shall then be operated in accordance with Table 2. For typical 2 Tuner EUT this means 1 channel will be viewed whilst a second is recorded, for a 6 tuner EUT 1 channel will be viewed and 5 recorded.

8.4 For the purposes of this test where there is more than 1 tuner the viewed channel shall be different to the recorded channels

Viewing HD	Viewing SD	Recording HD	Recording SD	Duration

1	0	0	0	5
0	1	0	0	5
1	0	1	0	5
0	1	0	1	5

Table 2a – normal operation duty cycle – single tuner

Active Tuners	Viewing HD	Viewing SD	Recording HD	Recording SD	Duration
1	1	0	0	0	5
2	0	1	0	1	5
2	1	0	0	1	5
2	0	1	1	0	5

Table 2b – normal operation duty cycle – dual tuner

Active tuners	Viewing HD	Viewing SD	Recording HD	Recording SD	Duration
1	1	0	0	0	5
2	0	1	1	0	5
3	1	0	2	0	5
n > 3	0	1	2	All remaining	5

Table 2c – normal operation duty cycle – multi tuner

For example if 5 tuners are fitted then the final test shall be view 1 SD channel, record 2 HD channels and record 2 SD channels

8.5 The average energy in watt/hours shall then be measured for each period. Based on this 20 minute measurement the on-mode part of the TEC shall be calculated.

ANNEX F – GENERAL DEFINITIONS

1. "Auto-Power-Down" or "APD" means the capability to automatically switch from the On mode to a standby mode after a period of time without user input, generally based on the amount of time the unit has remained "idle" from last active use, i.e., user input such as channel change, volume change, menu access, etc.;

2. "Code" means this Voluntary Industry Agreement to improve the energy consumption of Complex Set Top Boxes within the European Community;

3. "Component Manufacturer" means a company or other legal entity that is responsible for designing and manufacturing components that will be used by a second company to build a product;

4. "Conditional Access" means the encryption, decryption, and authorization techniques employed to make access to content conditional upon prior authorisation.

5. Conditional Access Provider" means a company that supplies the encryption, decryption, and authorization techniques employed to protect content from unauthorized viewing;

6. "CSTB" means a complex set top box, the functionality, components and operational modes and power modes of which is more particularly defined within Annex B and which is placed on the Internal Market for the first time on or after the Effective Date or put into service in the Internal Market for the first time on or after the Effective Date. For the avoidance of doubt, any CSTB that is placed on the Internal Market for the first time before the Effective Date or put into service in the Internal Market for the first time before the Effective Date (a "pre-2010 box"). Is expressly excluded from the scope of this Code. This includes any pre-2010 box that is repaired, upgraded or refurbished and returned into the Internal Market, or that is used in a "swap-for-failure" scenario after the Effective Date;

7. "Defaulting Signatory" means a Signatory that has failed to comply with its commitments under the Code;

8. "Equipment Manufacturer" means the company who uses a component or components made by the Component Manufacturer, and is responsible for designing, developing and/or manufacturing a CSTB with a view to placing it on the Internal Market on its own behalf;

9. "Equipment Under Test" or "EUT" means the equipment being tested;

10. "HD" means High Definition;

11. "IEC" means the International Electro technical Commission;

12. "IEC 62301" means the document entitled "Household electrical appliances - Measurement of standby power";

13. "Independent Inspector" means the independent third party designated by the Steering Committee (on behalf of all Signatories) and who is tasked with, and responsible for, the collection and processing of information supplied by Signatories pursuant to Section 5.1 and Annex G, and determining a Signatory's compliance with the Code in accordance with Section 5.4. The Steering Committee shall engage the services of the Independent Inspector upon terms and conditions that shall require undertakings of confidentiality from the Independent Inspector, and which shall also set out any requirements or applicable mechanisms for a process of appeal, should this ever be necessary;

14. "Internal Market" means the internal market as defined in the Treaty establishing the European Community;

15. “Main Activity” means the principal commercial activity of a Signatory. For the avoidance of doubt, a Signatory is not precluded from undertaking more than one Activity (as set out in Section 5.1 of the Code), but it may only declare itself to have one Main Activity for the purposes of this Code;

16. “Member States” means the member states of the European Community;

17. “Quorum” means two thirds of the Signatories being present at a meeting of the Steering Committee;

18. “Reporting Period” means a year ending on June 30 and for which period the required information is to be submitted by a Signatory by no later than August 31 in the following year;

19. “SD” means Standard Definition;

20. “Service Provider” means an entity that, whether by cable, satellite, terrestrial or telecommunications, provides video (and possibly other) content to subscribers with whom it has an ongoing contractual relationship. A Service Provider in the context of the Code is one that supplies CSTBs to end users;

21. “Signatories” means those companies or industry participants who sign this Code, which shall include (but not be limited to) Equipment Manufacturers, Software Providers, Conditional Access Providers, Component Manufacturers and Service Providers;

22. “Simple STB” means a standalone device which, irrespective of the interfaces used, has the primary function of converting standard-definition (SD) or high-definition (HD), free-to-air digital broadcast signals to analogue broadcast signals suitable for analogue television or radio, and has no ‘conditional access’ (CA) function. For example, a STB that has an unpopulated Common Interface socket is a Simple STB. A STB that has a Common Interface socket which is populated with an active Common Interface Module is a Complex STB.

23. “Software Provider” means a company who is responsible for producing the middleware and/or the operational software for the CSTB;

24. “Steering Committee” means the co-ordinating and governing body of this Code, appointed in accordance with the principles set out in Section 6;

25. “Total Energy Consumption” or “TEC” means an assessment tool used in this specification that provides flexibility to approach the issue of energy efficiency while retaining a comparable metric to assess performance. In this specification, efficiency criteria are noted in terms of calculated energy use over a year for a typical user (kWh/yr) rather than energy (watts) for On and standby modes;

26. “Tuner” means a tuner in the conventional sense. i.e. a tuner is a device or component that has the capability to demodulate physical transmissions from the DTV network at the electrical and mechanical level, corresponding to the OSI Physical Layer 1. Examples include DVB-S, DVB-T, DVB-C, DVB-H, ITU G.992.x (G.DMT etc), IEEE 802.16 (WiMAX). A tuner may also incorporate functionality from higher OSI layers (for example Ethernet), but to be classified as a “tuner” for the purposes of this code it must provide OSI Layer 1 functionality and be used for the purpose of reception of digital media (DTV) content. A “Return Path” and an “Out-of-Band Tuner” is not considered a tuner for the purposes of this code – see separate definitions. For the avoidance of doubt an Ethernet connector is not a tuner as it does not provide OSI layer 1 functionality;

27. “TWh” means terawatt hours; and

28. “Voting Procedures” means the process for casting votes at the Steering Committee. A Signatory which reports under the Code shall be entitled to cast a single vote for the Main

Activity that it performs (in accordance with Section 5.1). The Voting Procedures will be carried out in a manner which ensures that a balanced representation of views between the various Signatories to this Code is achieved at all times.

ANNEX G – REPORTING PRO-FORMA

Information to be provided by Equipment Manufacturers:

Name of the Signatory	
Company registration No. of Signatory	
Main Activity of Signatory	
Reporting Period to which the information relates	
Model type(s) and number of each model of CSTB manufactured, supplied and/or distributed by Equipment Manufacturer at wholesale and/or retail level (whether by sale, rental or free of charge), as applicable	
Energy consumption in the Reporting Period per CSTB model manufactured, supplied and/or distributed by Equipment Manufacturer at wholesale and/or retail level (whether by sale, rental or free of charge), as applicable, measured in TEC (according to the test procedure set out in Annex E)	

Information to be provided by Service Providers:

Name of the Signatory	
Company registration No. of Signatory	
Main Activity of Signatory	
Reporting Period to which the information relates	
Model type(s) and number of each model of CSTB supplied and/or distributed by the Service Provider at wholesale and/or retail level (whether by sale, rental or free of charge), as applicable	
Energy consumption in the Reporting Period per CSTB model supplied and/or distributed by the Service Provider at wholesale and/or retail level (whether by sale, rental or free of charge), as applicable, measured in TEC (according to the test procedure set out in	

Annex E)	

Information to be provided by Signatories which are neither Equipment Manufacturers nor Service Providers:

Name of the Signatory	
Company registration No. of Signatory	
Main Activity of Signatory	
Reporting Period to which the information relates	
Provide specific model and/or version numbers for products shipped during the Reporting Period together with their relevant energy saving features	
Provide roadmap features/products planned for release in the following Reporting Period listing specific and/or planned improvements	

ANNEX H – SIGNING FORM

Voluntary Industry Agreement to improve the energy consumption of Complex Set Top Boxes within the European Community

Name of Signatory: ……..

Main Activity of Signatory ……..

Signs this Voluntary Industry Agreement and commits to the overall objective of reducing the energy consumption of CSTBs within the European Community as set out herein.

For each Reporting Period, the Signatory will provide information to the Independent Inspector detailing the energy consumption of each type of CSTB it manufactures, supplies, distributes or uses within the European Community, as applicable, in accordance with Section 5.1 and Annex G of this Voluntary Industry Agreement.

Signatory agrees to this Signing Form being shared with Member States' representatives involved with regulation under the Ecodesign Directive 2005/32/EC.

For the Signatory:

Date: ……..

Name of Authorised Representative: ……

Function of Authorised Representative: ……

Address of Signatory: ……
……
……

Company Registration No of Signatory: ……

Email: ……

Signature: ……

Please send a duly signed and completed Signing Form to:

Jacek TRUSZCZYNSKI
European Commission
Directorate-General for Energy and Transport
Directorate D - New and renewable sources of energy, Energy efficiency & Innovation
Unit D3 - Energy efficiency of products & Intelligent Energy - Europe
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