

DG ENER Lot 20: Local room heating products
Eco-design Preparatory Study
Minutes of the first stakeholder meeting – April 18th 2011

Study performed for: European Commission (DG ENER)
 Contact: Guido De Wilt

Contact BIO Intelligence Service (BIO): Adrian Tan / Sandeep Pahal
 Tel.: +33 (0)1 53 90 11 80
 Email: contact@ecoheater.org / adrian.tan@biois.com / sandeep.pahal@biois.com

Date: Monday 18th April 2011
 10:00 – 17:00

Location: European Commission, Charlemagne Building
 Room: Lord Jenkins
 170, rue de la Loi
 1040 Brussels, Belgium

Agenda

WELCOME & “TOUR DE TABLE”	3
INTRODUCTION TO THE ECODESIGN DIRECTIVE	3
INTERACTION WITH OTHER ECODESIGN LOTS.....	3
TASK 1.1 – PRODUCT DEFINITION AND DISCUSSION ON SCOPE.....	3
TASK 1.2 – TEST STANDARDS & TASK 1.3 – EXISTING LEGISLATION	6
TASK 2 – ECONOMIC AND MARKET ANALYSIS	7
TASK 3 – CONSUMER BEHAVIOUR AND LOCAL INFRASTRUCTURE.....	8
NEXT STEPS: TASK 4, 5 AND 6 AND BASE CASES	9
CONCLUSION AND WRAP-UP	10
ANNEX A	12

List of participants.....	12
ANNEX B	15
Example of base cases, BAT and improvement options.....	15

WELCOME & “TOUR DE TABLE”

After a short welcome, all participants introduced themselves in a “tour de table”. See ANNEX A for a list of participants. The Policy Officer for the study, **Guido de Wilt (GdW)** welcomed everybody and introduced this stakeholder meeting as the first in a long process.

Alain Maillard, COTHERM, asked when the process would come to an end. **GdW** estimated implementing measures could be agreed upon by the end of 2012, but this is subject to change.

INTRODUCTION TO THE ECODESIGN DIRECTIVE

Benoît Tinetti (BT), BIO, introduced the Ecodesign Directive. **Konrad Weber (KW)**, Schwank, asked to what extent criteria had to be fulfilled for a certain product to be within the scope of the study. **GdW** answered that 200 000 is an indicative number for sales that is applicable to the entire set of products in the lot (and not just individual product categories within the lot). He further clarified that the scope of the study and implementing measures covers all manufacturers (big and small) regardless of the number of product units they sell each year, i.e. the Directive is still applicable even if individual manufacturers only sell one unit of the product each year.

INTERACTION WITH OTHER ECODESIGN LOTS

Sandeep Pahal (SP), BIO, presented an overview of other Ecodesign studies related to HVAC. **KW** asked for what was meant by the ‘systems approach’. **GdW** clarified that the Ecodesign Directive and related preparatory studies consider the ‘extended product’. For example in the case of a boiler the heat generator, heat exchanger, pump, storage tank, controls, etc. are all considered. The Energy Performance of Buildings Directive (EPBD) is concerned with the building envelope and HVAC systems as parts of the same entity. The Ecodesign Directive does not address buildings, but it does take EPBD into consideration to ensure both Directives are complementary.

TASK 1.1 – PRODUCT DEFINITION AND DISCUSSION ON SCOPE

SP presented the products that are expected to be in the scope and then initiated a discussion on the scope. **Reginald Brown (RB)**, BSRIA/Defra, asked whether emissions and indoor air quality were considered in the study. **Adrian Tan (AT)**, BIO, replied that the study will not suggest any changes to indoor air quality, but will be concerned with emissions to the external environment. Any implementing measures under the Ecodesign Directive should not alter the functionality of the product, nor should it result in any degradation of any health or safety aspect of the product.

Peter Bethlehem (PB), Biddle, asked for a clear distinction between ‘air curtains’ and ‘over door heaters’ as there seems to be confusion between the two. **KW** pointed out that ‘energy efficiency’ was defined differently in all the lots and asked how alignment across products and Ecodesign lots could be ensured. **AT** called upon all stakeholders to provide suggestions for parameters to measure energy efficiency for the products they were most familiar with based on test standards. The approach to calculating energy efficiency should respect former preparatory studies and be consistent with current studies.

Gunnar Olsen (GO), INFORSE, asked what was known about sauna heaters and their use in Europe. **Anja Behnke (AB)**, Federal Environment Agency Germany, asked whether the proposal for excluding sauna heaters was aligned with DG ENER Lot 15 (solid fuel small combustion installations) and whether there were any other technical justification besides room temperature for this. **AT** replied that little was known about saunas, but these aspects would be investigated. **AB** further asked whether agricultural uses of space heaters were considered in DG ENTR Lot 4 (industrial furnaces and ovens). **SP** responded that they were considered but not included in the scope of that study.

Jens Schubert (JS), Federal Environment Agency Germany, thought it would be a good idea to exclude outdoor applications to make the scope more sound. Likewise it was reasonable to assign rooftops to ENER Lot 21 (central heating products using hot air to distribute heat). He also pointed out that the German market surveillance has prohibited the sales of ‘heat balls’ (incandescent light bulbs sold as space heating devices).

GO asked that if decorative fires were to be excluded, what was the size of the market segment? If they are marginal products, then it would be acceptable to exclude them. If they were included in the scope, he would suggest a requirement on how much energy could be used to provide the decorative flame effect (e.g. light provided per energy consumed). **GO** supported the idea that rooftops would be assigned to ENER Lot 21. Regarding space heaters that use hot water (hydronic systems), **GO** saw this as a separate product group that is an energy-related product and not an energy-using product more like radiators, which should be dealt with in future Ecodesign lots. **GO** also suggested that since there was no news on ENER Lot 15 that the direct heating solid fuel appliances be considered again in ENER Lot 20 as they are not so different from gas heaters. **AT** pointed out that the study on products which were already considered in ENER Lot 15 was not going to be repeated.

GdW informed that he was responsible for ENER Lot 1, 15, 20 and 21. Work was ongoing in ENER Lot 15, but policy priority is on ENER Lot 1 (boilers). The Commission strives for consistency across lots and therefore once implementing measures for ENER Lot 1 have been approved, then Lot 15 will follow in a consistent manner. **GdW** wanted to ask the stakeholders what they thought of the size of the ‘local room’? Are large halls, e.g. airports, considered a local room? Is there any way to define the heating lots based on room size without overlooking products or having overlaps between lots?

Emilien Gasc (EG), ANEC/BEUC, agreed with the point that consumers see decorative fires as room heaters and therefore these should be included in the scope. He also proposed that the concept of ‘local room’ could be extended to the outdoor space. He asked GdW for clarification, if outdoor heaters were not included in the lot, whether the Commission was planning on including these in any other lots.

Jan Peters (JP), Interfocos, made the point that if ‘decorative’ is used as a criterion for excluding products then more products should be taken out of the scope. Regarding decorative fires hundreds of thousands are sold each year and they are also used for heating. If energy savings is a criterion then all decorative heating appliances should stay within the scope.

KW remarked that he was not happy that industrial heaters were classified as local room heaters as these can be as high as 500 kW, but he did not have a proposal for what the definition of local room heaters should be. He wanted to point out that heating systems for non-residential buildings can be very different. What is important is the relation between the product and the building, e.g. use, size, structure, capacity, etc. Another important issue is that heating systems are decided by professionals and engineers that are qualified to specify such systems.

Bart Looman (BL), Euro-Air, followed the remarks pointing out that the heating system used in buildings is not just dependent on size, but the use of the building. He mentioned a Dutch study that investigated the products using least energy to heat up a building depending on the system needs. He asked for a clear distinction between Ecodesign and EPBD and suggested a label for the consultants specifying the heating system.

GdW commented that implementing measures under Ecodesign not only address residential applications, but also industrial applications, e.g. the fan regulation covers products up to 500 kW. Ecodesign regulations are also applicable to business-to-business applications, where professional installers are involved. Minimum requirements, labelling and required information for professionals are all on the table for implementing measures. Different approaches can be used for different products and different applications. Ecodesign measures can contribute to objectives of the EPBD, e.g. windows, but they have to be consistent. Efficient products will lead to efficient buildings. You will never get an efficient building from inefficient products.

Gerard Auvergne (GA), ELVHIS, commented that application is more important than room size. As this is the case, the study will have to consider the many different applications for each product type. He asked whether comparisons will be made across applications and across products in different lots.

AB remarked that Ecodesign should be related to the size of the product. After a certain size, installations are custom-made built on-site. The study should look in to where this point is. **Walter Eiler (WE)**, ZVEI/Stiebel Eltron, concurred that application is more relevant than room size. Residential uses are very different from commercial and industrial. **Felix van Eyken (FvE)**, EHI, suggested to look at ENER Lot 1 and Lot 15 studies for inspiration. ENER Lot 1 has 0 – 70 kW power capacity for boilers for

residential applications, while in Lot 15 most solid fuel heaters have a power capacity of 15 – 25 kW. An upper limit of 70 kW for residential applications should be appropriate.

RB confirmed that the same approach for decorative fires is used as for other types of heaters. He also asked whether portable outdoor heaters that are used for temporary heating on construction sites are included in the scope. **GO** mentioned that his understanding of the portable temporary heaters on constructions sites was that they were used in closed areas until a permanent heating system is installed. Certain construction tasks can only take place at a certain temperature. If these are not tackled in this lot they risk being overlooked. From a consumer’s point of view, outdoor heaters should be considered.

Regarding size and/or capacity **GO** pointed out that even though heating systems over a certain size are specified and installed by professionals, often they are pressed to deliver the cheapest solution at installation rather than taking the life cycle costs into consideration. Implementing measures such as a regulation could also address public procurement no matter what the size of the installation to ensure the best choice for society.

PB supported excluding air curtains from the scope of this lot as they have a different functionality, but was open to have it considered for Ecodesign - particularly with regards to distinguishing the efficiency of over door heaters and air curtains.

TASK 1.2 – TEST STANDARDS & TASK 1.3 – EXISTING LEGISLATION

JS asked about how energy efficiency is defined for electric heating (almost all electrical energy is converted to heat) and what improvement options are envisaged. A second question related to what energy losses at a system level are taken into account. **SP** answered that from a system perspective controls could be taken into consideration for electric heating. **AT** confirmed that losses will be taken into account, but did not specify them in detail.

FvE asked whether fuel types will be compared regarding efficiency, and if so, what factor will be used. **BT** answered that the aim of the Ecodesign studies is not to propose a new conversion factor between fuel types. At this stage of the project the idea is not to compare products using different fuel types with each other, but rather to provide scientific knowledge of the environmental impacts of space heaters regardless of the fuel they use. For space heaters with the same functionality comparisons can be made, but it will be up to the Commission after the study is over to decide whether they would like to favour one fuel type over another. The study will not propose any preference for fuel types. **GdW** added that the ENER Lot 1 study will set the precedence for dealing with different fuel types. Regarding standards, GdW mentioned that ENER Lot 20 and 21 is part of the horizontal mandate that was given by the Commission to CEN/CENELEC.

GO pointed out that the standards mentioned in the report are based on ‘net calorific values’, but in ENER Lot 1 ‘gross calorific values’ are used.

KW confirmed that in the non-residential market the two standards concerned with efficiency or energy performance of heating systems are EN 416-2 and EN 419-2. What is missing is the link between any heating product and the heat transfer inside buildings.

AB pointed out that some legislation which was sent to BIO has not been included in the study. It is important that a proper analysis of national laws is done in the study as any EU regulation can supersede national legislation even if it is weaker.

Stefano Vit (SV), CECED, corrected the French label for electric heaters: it is NF Performance, not NF Environnement.

KW pointed out that the German legislative requirements for combustion and thermal efficiency for heating generators are concentrated on water based systems and air based systems excluded from the scope of the legislation. **AB** reacted and insisted that they might be excluded from requirements, but not from the scope of the legislation.

RB wanted to clarify aspects of the ECA Scheme. These are reviewed every year and are supposed to only support the top 25% of best performing products. It is therefore not strictly a standard.

Antonio Alvarez, AFYCET, added a standard EA 20036:2009 for oil-filled radiators.

Andreas Helm, HKI informed the consultants that the German test standard for fireplaces for liquid fuels has been changed to DIN 4734-1.

TASK 2 – ECONOMIC AND MARKET ANALYSIS

SP presented the findings of task 2.

Jonathan Jones, Tyco Thermal Controls, found the lower end of the heating capacity range for electric floor heating 85 W/m² too high, 25 -30 W/m² would be more correct. 300 W/m² is extremely high, but could cater for storage type systems. An appropriate average could be 100 W/m². **Jacob Madsen**, Danfoss, agreed with this.

KW remarked the figures for oil fired warm air heaters are much too high. He will provide data together with sales volumes for 2009. **AB** asked whether the figures for fuel oil were included in the kerosene numbers. **AT** answered that fuel oil was not included in the numbers and mentioned that the estimates for these are missing. **AB** took the opportunity to point out that kerosene heaters are forbidden in Germany.

GO asked whether there was good evidence of the short life times of heaters without maintenance. He suspected that these products would just be thrown out before repair. **SP** answered that the evidence is based on stakeholder responses to the questionnaires.

RB remarked that the repair costs seemed to be low as it would cost up to €100 just to get someone to come check a heater. **SP** answered that this might be true for an individual product in need of repair, but the figures are supposed to represent an average of all products installed.

PB thought repair costs seemed a bit high for air curtains, €100 would be more correct. Likewise installation costs for air curtains €500 would be more representative.

SV commented that repair costs for radiators and fan heaters should be similar to other electric heaters between € 0 and €30.

GO asked to correct the share of heating provided by electricity in Denmark to 3.5% instead of 7%. He added that it should be mentioned that installation of electric heating as primary heating is forbidden in Denmark. **GO** also commented that it is worthwhile mentioning that the low temperature heating has the additional health advantage that it does not burn the dust. Finally **GO** commented on the low oil price provided in the table: this was during a dip in prices. A more representative value should be used.

Jean Terrier (JT), GrDF, pointed out that energy prices for residential and industrial uses are different and should be distinguished.

TASK 3 – CONSUMER BEHAVIOUR AND LOCAL INFRASTRUCTURE

SP presented the findings of Task 3. **KW** asked whether the hours per heating season represented the amount of time the heater was working. This differs depending on the heating system. The use of the heating system is not the same as the amount of time the burner is on. **GO** thought it looked like this might be true for the first two climate groups (FI, SE & EE, LV, LT), but not for the last group (CY, MT).

KW restated that heating durations depend on the uses of the building and applications, but as a global average for duration of 1 or 1½ shifts a day would be representative.

JT commented on factors for choosing heating systems and restated that building types and applications are important factors and space area is not appropriate to determine heating systems. Therefore it would be very difficult to fix a limit based on area for the different heating appliances. Thermal engineers are typically involved in the specification of heating installations and only in very few cases do consumers specify what heating system to install. **KW** concurred that for small spaces, e.g. service stations, the end-user decides, but for larger and more complicated uses professional

consultants are used. **GA** called for a separation between residential and non-residential in Task 3.

GO thought that the temporary uses in e.g. holiday homes, huts, etc. were not well analysed. Clarity would also be appreciated on the reuse of oil in heaters (oil for combustion or oil in oil-filled heaters). **GO** also asked whether there was any evidence of fear of complexity of modern heating appliances compared to the more traditional heaters. He also noted that the 'rebound effect' mentioned should not be confused with the difference between increased energy consumption and the aspect that people can now afford to heat their houses properly. Before, they might not have been able to afford to heat their houses efficiently.

SV called for a clear definition of primary and secondary heating. This should be provided in Task 1.

NEXT STEPS: TASK 4, 5 AND 6 AND BASE CASES

SP presented the next tasks to be performed. **KW** asked for examples of base cases, BAT and BNAT from another lot. **BIO** will provide examples of this with the minutes (see ANNEX B).

BIO asked all stakeholders to provide their final comments and inputs to Task 1, 2 and 3 by May 20th 2011.

SV asked what the difference was between flued gas heaters and flued gas fires. **SP** answered that gas fires have live flame effect.

AB noticed that no base cases were proposed for liquid fuel. **SP** responded that the impression was that the EU wide energy saving potential was limited, but the data gathered is not convincing.

RB pointed out that many industrial unit heaters are steam heating systems. Likewise **GO** remarked that no radiant domestic heaters are proposed as a base case. **SP** responded that this could be seen as an improvement option for convector heaters.

Alain Maillard, Cotherm, asked how office spaces were considered – as residential or non-residential? **FvE** held the point that residential buildings are quite specific and that office buildings should be considered differently. **AT** said that this will be taken into consideration. The position is that residential and office buildings are definitely different when it comes to central heating products (ENER Lot 21).

JT asked whether the same criteria will be applied for the choice of base cases for residential uses in both lots 20 and 21 - particularly whether energy sources will be compared. **AT** answered that in general the same approach will be used, but the definition of base cases is also a pragmatic choice.

GdW would like to see size/heating capacity as a distinguishing factor for residential and non-residential. He would also favour a clear split which products are in ENER Lot 20 or Lot 21 so it is clear for everyone where the product is covered.

BL highlighted that norms define residential and non-residential differently, so the term in itself cannot be used.

Vincent Cornillon, GrDF, remarked that when a house is designed there is a choice between direct heating and central heating and therefore a link between ENER Lot 1 and ENER Lot 20. **GdW** responded that the EPBD and building regulations in Member States deal with that aspect.

RB asked whether it was deliberate to have heat pumps in ENER Lot 21. **SP** responded that as heat pumps below 12 kW was dealt with in ENER Lot 10, it would be more appropriate that heat pumps over 12 kW would heat more than a local room. **RB** claimed that there is a significant market for heat pump products with a heating only function that are only used for single room heating. **AT** restated that although some products could be seen in the scope of both lots 20 and 21, the project team would strive to analyse product types (from both a direct heating and central heating perspective) in only one lot.

KW had a question concerning the scope of base cases. The heat generator is of course included, but are temperature control system, flue gas system, recirculation fans, etc also included? **AT** answered that the base cases will start with the heat generator, but the extended product will be considered as all such components affect the efficiency.

GA asked whether the potential of design improvement options is crucial for the choice of base cases. **AT** clarified that base cases are defined and combinations of BAT and BNATs will be considered as design options.

BL asked whether implementing measures will be put forward for the installed stock as this is where the greatest potential for energy saving is. **AT** recognised the point and said that this would be considered, but currently under the Ecodesign Directive these cannot be addressed. The Commission will however consider other options to address the installed stock.

CONCLUSION AND WRAP-UP

AT finally mentioned that the final decision on the scope is up to the Commission to make after hearing the various arguments and points of view from all stakeholders.

AT summed up the day and thanked all stakeholders for the numerous turnover and good comments provided. **Final inputs for Task 1, 2 and 3 are due 20th May 2011.** The project team will be contacting stakeholders for their inputs on Task 4, 5 and 6 in the coming weeks.

GdW mentioned that he was happy with the input and participation of the stakeholders during the day. He thanked all for coming and wished for a continued good progress in the study.

ANNEX A

LIST OF PARTICIPANTS

DG Energy,

European Commission:

- Guido de Wilt (**GdW**), ENER Lot 20 & 21

Project team:

- Adrian Tan (**AT**), BIO Intelligence Service
- Sandeep Pahal (**SP**), BIO Intelligence Service
- Benoît Tinetti (**BT**), BIO Intelligence Service
- Jens Helpenstell, TÜV Rheinland Energie und Umwelt GmbH

Registered stakeholders:

- Lasse Alsterberg, Tyco Thermal Controls
- Antonio Alvarez, AFYCET
- GERARD AUVERGNE (**GA**), ELVHIS
- Rodney Ayre, Mitsubishi Electric
- Herbert Bee, beefire
- Marie-Josephine BEGUIN, Carver Climate Systems
- Anja Behnke (**AB**), Federal Environment Agency - Germany
- Peter Bethlehem (**PB**), Biddle
- Denis Bonvillain, EPEE
- Reginald Brown (**RB**), BSRIA/Defra
- Kelly Butler, BEAMA
- Mats Careborg, Frico AB
- Laurent Caro, Groupe SEB
- Maxime Charles de la Brousse, Grayling
- Vincent Cornillon, GDF SUEZ
- JEROME DE LIGNEROLLES, COTHERM
- Jo Depoortere, VIVOX NV
- Walter Eiler (**WE**), ZVEI / Stiebel Eltron
- Cayre Emmanuelle, EDF R&D
- Muiris Flynn, Glen Dimplex Heating

- Mara Missouri GAJIC, Groupe Muller
- Emilien Gasc **(EG)**, ANEC/BEUC
- Jack Gault, Glen Dimplex
- Marinus Gelten, DRU Verwarming BV
- Asen Georgiev, TESH
- Heinrich Göddeke, ECA / EFA
- Andreas Helm, HKI Industrieverband
- Christian Herten **(CH)**, GEA Air Treatment GmbH
- Johannes Hoogkamer **(JH)**, Eurovent
- Kazuyuki Imura, Mitsubishi Electric Europe B.V.
- William Jenrick, Charlton & Jenrick Ltd
- Jonathan Jones, Tyco Thermal Controls
- Julie Kjestrup, Danfoss
- Halleur Lionel, EDF R&D
- Martina Loibl, Toshiba Carrier
- Bart Looman **(BL)**, Winterwarm / Euro-Air
- Ana Patricia Lopez Blanco, CECED
- Richard Lowrie, Mitsubishi Electric
- Jacob Madsen, Danfoss A/S
- ALAIN MAILLARD, COTHERM
- Michael Muerköster, Danfoss
- PATRICK MURE, GDF SUEZ
- Jan Nideggen, Teddington Luftschleieranlagen GmbH
- Gunnar Boye Olesen **(GO)**, International Network for Sustainable Energy - Europe
- Asle Ornhaug, Glen Dimplex Nordic AS
- Christianna Papazahariou, shecco
- Jan Peters **(JP)**, Interfocos B.V.
- Kristian Pettersson, Rettigicc
- An Pittoors, Bouwunie
- Matteo Rambaldi, CECED
- Pia Rasmussen, Danish Energy Agency / Danish Technological Institute
- Mats Sandor, Systemair AB

- THIERRY SAUBLET, GIFAM
- Jens Schuberth **(JS)**, Federal Environment Agency - Germany
- Bram Soenen, Federal Public Service Health, Food chain Safety and Environment - Directorate-General for Environment (DG5) - Product policy
- A.M. Stavenga, Mark b.v.
- Jean TERRIER **(JT)**, GrDF
- Pascal Teurquetil, Groupe Muller
- Jun Toutain, Norwegian Water Resources and Energy Directorate
- Felix Van Eyken **(FvE)**, EHI
- Stefano Vit **(SV)**, Ceced
- Konrad Weber **(KW)**, Schwank
- Dirk Wellkamp, EHI
- Frederic Wuhrlin, SANYO
- Chris Yates, Heating & Hotwater Industry Council

ANNEX B

EXAMPLE OF BASE CASES, BAT AND IMPROVEMENT OPTIONS

The following provides examples of how base cases were developed in the ENER Lot 15 Ecodesign preparatory study on solid fuel small combustion installations¹. This information is merely illustrative to give stakeholders of ENER Lot 20 an idea of how base cases are selected in the MEEuP approach.

Table 1: The evolution of product scope from Task 1 to Task 5 base case definition for ENER Lot 15 (solid fuel small combustion installations)

Task 1	Task 2 Task 3	Task 4	Task 5 Base Case
Fireplace	Open fireplace	Open fireplace	BC1
	Insert / closed fireplace	Insert	BC2
		Insert + II ^{ary} *air	BC2
		Closed fireplace Closed fireplace + II ^{ary} air	BC2 BC2
Stoves	Roomheater Stove	Traditional stove Modern stove Continuous burning stove Advanced stove	BC3/4 BC3/4
		Slow heat release	Kachelofen Slow heat release stove
	Pellet	Pellet stove	BC7
Cooker	Cooker	Traditional cooker	BC5
		Advanced cooker	
Boilers <50kW	Hand fuelled	Conventional, overfeed	BC8
		Conventional, I ^{ary} air control, natural, overfire	BC8
		Conventional, II ^{ary} air control, forced, overfire	
		Conventional, II ^{ary} air control, forced, upperfire	
		Advanced, gravity fed, natural, underfire	
		Advanced, gravity fed, forced, underfire	
	Downdraught (gasifying), underfire, forced	BC9	
	Automatically fuelled	Stoker, upperfire, forced	BC10
		Push-down, upperfire, forced	BC10
		Pellet, upperfire, forced	
Boilers 50-500kW	Hand fuelled	Advanced, gravity fed, underfire, natural	
		Advanced, gravity feed, upperfire, forced	
		Conventional, II ^{ary} , upperfire, forced	
		Downdraught (gasifying), underfire, forced	
	Automatically fuelled	Stoker, underfeed, forced	

¹ Project website: www.ecosolidfuel.org

Task 1	Task 2 Task 3	Task 4	Task 5 Base Case
		Pellet boiler, upperfire, forced	BC11
		Moving grate, overfeed stoker, forced	BC12
		Underfeed rotating grate, forced	

Compared to other Ecodesign preparatory studies, ENER Lot 15 had exceptionally many base cases due to the broad range of solid fuel combustion installations. These were split into two groups: 'direct heating' and 'indirect heating' base cases (Table 2 and Table 3).

Table 2: Overview and description of direct heating base cases for ENER Lot 15 (solid fuel small combustion installations)

NAME	Base Case	Description of products represented	Fuel	Power [kW]	Test Standard Efficiency [NCV %]	Estimated Real Life Efficiency [NCV %]	Applicable Standard
OPEN FIREPLACE	BC 1	Inset direct heating appliances, <15kW power output, unenclosed firebed, mostly masonry material, manual fuel feeding, no boiler function	Wood	9	30	25	EN 13229
CLOSED FIREPLACE, INSERT	BC 2	Inset direct heating appliances with fully enclosed combustion zones, <15kW power output, efficiency between 50-85%, mostly ferrous material, manual fuel feeding, no boiler function	Wood	8	70	65	EN13229
WOOD STOVE	BC 3	Freestanding direct heating appliances <15kW power output, efficiency between 50-85%, enclosed firebed, mostly ferrous material, manual fuel feeding, no boiler function	Wood	7	70	65	EN13240
COAL STOVE	BC 4	Freestanding direct heating appliances <15kW power output, efficiency between 50-85%, enclosed firebed, mostly ferrous material, manual fuel feeding, no boiler function	Hard Coal	7	70	65	EN 13240
COOKER	BC 5	Freestanding direct heating appliances <15kW power output with cooking function, efficiency between 45-85%, enclosed firebed, mostly ferrous material, manual fuel feeding, no boiler function	Wood	9	65	60	EN 12815
SHR STOVE	BC 6	Direct heating appliances , <30kW flame power output (<6kW output from thermal mass - long duration), efficiency between 70-85%, enclosed firebed, mostly ceramics and masonry	Wood	15 (3 kW- long duration)	80	75	EN 15250

NAME	Base Case	Description of products represented	Fuel	Power [kW]	Test Standard Efficiency [NCV %]	Estimated Real Life Efficiency [NCV %]	Applicable Standard
		material, manual fuel feeding					
PELLET STOVE	BC 7	Freestanding direct heating appliances, <15kW power output, efficiency between 75-95%, enclosed firebed, mostly ferrous material, automatic fuel feeding, no boiler function	Pellets	9	88	83	EN 14785

Table 3: Overview and description of indirect heating base cases for ENER Lot 15 (solid fuel small combustion installations)

NAME	Base Case	Description of products represented	Fuel	Power [kW]	Test Standard Efficiency [NCV %]	Estimated Real Life Efficiency [NCV %]	Applicable Standard
DOM. CONV. BOILER	BC 8	Indirect heating appliances, efficiency between 47-75%, natural draught, upperfire technology, mostly ferrous materials, natural draft, manual fuel batch feeding, no modulation	Wood	18	66	50	EN 303-5
DOM. DD. GAS. BOILER	BC 9	Indirect heating appliances, gasifying downburning technology efficiency between 75-90%, mostly ferrous materials, forced draft, fuel 'semi automatic' gravity feed, modulation: 100-50%	Wood	20	88	66	EN 303-5
RETORT COAL BOILER	BC 10	Indirect heating appliances, efficiency between 75-90%, mostly ferrous materials, forced draft, retort auto fuel feeding, modulation: 100-30%	Hard Coal	25	82	64	EN 303-5
PELLET BOILER	BC 11	Indirect heating appliances, efficiency between 75-90%, mostly ferrous materials, forced or natural draft, auto fuel feeding, modulation: 100-30%	Pellets	25	88	69	EN 303-5
NON DOMESTIC CHIP BOILER	BC 12	Indirect heating appliances, <500kW power output, efficiency between 75-90%, mostly ferrous materials, forced or natural draft, auto fuel feeding, modulation: 100-20%	Chips	160	88	70	EN 303-5

Improvement options for design were investigated at both a component and product level (see Table 4 and Table 5).

Table 4: Overview of component improvement options for base cases in ENER Lot 15 (solid fuel small combustion installations)

BASE CASE		Component			
		Boiler/heat storage	Lambda probe control	Electrostatic precipitator (ESP) *	Condensation heat recovery
BC 1	OPEN FIREPLACE				
BC 2	CLOSED FIREPLACE / INSERT	✓		✓	
BC 3	WOOD STOVE	✓		✓	
BC 4	COAL STOVE	✓		✓	
BC 5	COOKER	✓		✓	
BC 6	SHR STOVE	-		✓	
BC 7	PELLET STOVE	✓		✓	
BC 8	DOM. BOILER - UPPERFIRE	-	✓	✓	
BC 9	DOM. BOILER - DOWNDRAUGHT	-	✓	✓	✓
BC 10	COAL BOILER	-	✓	✓	
BC 11	PELLET BOILER	-	✓	✓	✓
BC 12	CHIP BOILER	-	✓	✓	✓
<p>'-' signifies the base case is assumed to already include this design option</p> <p>* ESP is available as a retrofit option for stock also</p>					

Table 5: Overview of Best Available Technologies (BAT) as design improvement options for base cases in ENER Lot 15 (solid fuel small combustion installations)

	Best Available Technologies	BAT 1	BAT 2	BAT 3	BAT 4	BAT 5	BAT 6	BAT 7	BAT 8	BAT 9
		Closed fireplace, fireplace insert	Advanced stove	Advanced cooker	Slow heat release stove	Pellet stove	Pellet boiler	Downdraught gasifying boiler	Stoker boiler, coal	Chips boiler
BC 1	OPEN FP	✓								
BC 2	CL FP/ INSERT	✓								
BC 3	WOOD STOVE		✓							
BC 4	COAL STOVE									
BC 5	COOKER			✓						
BC 6	SHR STOVE				✓					
BC 7	PELLET STOVE					✓				
BC 8	DOM. BOILER CONV							✓		
BC 9	DOM. BOILER DD GSFY.							✓		
BC 10	COAL BOILER								✓	
BC 11	PELLET BOILER						✓			
BC 12	CHIP BOILER									✓