

Minutes of the meeting

Project	Ecodesign: Preparatory Study on Steam Boilers (DG ENTR Lot 7)
Event	Stakeholder meeting
Date & time	6 th March 2014; 09:45 - 15:45
Location	Centre A. Borschette Salle AB-4D rue Froissart 36 1040 Brussels

Agenda

9:45 – 10:00	Arrival of participants
10:00 – 10:15	Welcome and round of introductions Davide Polverini, European Commission
10:15 – 10:30	Background and objective of the study Davide Polverini, European Commission
10:30 – 10:50	Methodology of the study and objectives of the meeting Clemens Rohde, Fraunhofer ISI
10:50 – 11:15	Presentation of preliminary results of Task 1: Scope Clemens Rohde, Fraunhofer ISI
11:15 – 11:45	Presentation of preliminary results of Task 2: Markets Paolo Gentili, PwC
11:45 – 12:45	Discussions on Task 1 and 2
12:45 – 13:45	Lunch break
13:45 – 14:05	Presentation of preliminary results of Task 3: Users Ali Aydemir, Fraunhofer ISI
14:05 – 14:30	Presentation of preliminary results of Task 4: Technologies Sotirios Karellas, NTUA-ICCS
14:30 – 15:30	Discussions on Task 3 and 4
15:30 – 16:00	Further proceeding and schedule, other issues Clemens Rohde, Fraunhofer ISI
16:00	Closing Davide Polverini, European Commission

List of participants

- Mr. Ali Aydemir, Fraunhofer ISI
- Mr. Hannes Christoph Baechle, Robert Bosch GmbH (from 11:40)
- Mr. Yeen Chan, ICF International (from 10:45)
- Mrs. Silvia Dovidio, pwc
- Mrs. Chloé Fayole, ECOS
- Mr. Paolo Gentili, pwc
- Mr. Simon Hirzel, Fraunhofer ISI
- Mr. Christian Jensen, Viegang Maggøe (from 10:20)
- Prof. Sotirios Karellas, NTUA

- Mr. Joachim Lenz, Bosch Industriekessel GmbH
- Mrs. Berit Ostrander, Fraunhofer ISI
- Mrs. Krystyna Panek-Gondek, European Commission DG ENV
- Mr. Markus Pieper, Viessmann Werke Berlin GmbH
- Mr. Davide Polverini, European Commission DG ENTR
- Mrs. Fanny Rateau, EHI
- Mr. Clemens Rohde, Fraunhofer ISI
- Mr. Thomas Schreiber, DIN e.V.
- Mr. Christian Tebert, Oekopol Institute
- Mr. Glenn Widerström, Swedish Energy Agency

#1: Welcome and round of introductions – 10:00

Mr. Polverini welcomes all participants. All participants introduce themselves.

Comments to the agenda:

Mr. Tebert suggests to have a discussion after each task instead of having a common discussion for Tasks 1 and 2 and Tasks 3 and 4. The agenda is modified accordingly.

#2: Background and objective of the study – 10:15

Mr. Polverini presents the background and objective of the study. He asks all participants for feedback and invites everyone to send written comments until 4 weeks after the meeting. He notes the small number of participants in this meeting, which might show the specificity of boilers or the need to increase the number of stakeholders.

Mr. Polverini points out that steam boilers are in the priority product group of the working program 2012-2014 and that the current preparatory phase aims to analyze if it is worth to regulate this product group.

Following the presentation Mr. Schreiber asks if all presentations are made public. This is confirmed by Mr. Polverini.

Mr. Schreiber inquires about the start of standardization work related to the study. Mr. Polverini assures that the study will give manufactures enough time to adapt to new regulations. If there is no standardized version in time, the EC will provide a guidance for manufactures as a draft of upcoming standards, if required. If a new standard is required, the EC will trigger the standardization process as early as possible.

#3: Methodology of the study and objectives of the meeting – 10:35

Mr. Rohde presents the methodology of the study and the objectives of the meeting. He informs everyone that there will be an additional stakeholder meeting to present and discuss the results on Tasks 5 to 7 with the stakeholders. He points out that the consortium relies on the help and input of the stakeholders as steam boilers are not a handbook product.

Mr. Rohde asks for further comments by the stakeholders.

- Mrs. Rateau welcomes the fact of a 2nd stakeholder meeting and asks for the exact date. She points out that due to summer holidays the date should be fixed quite in advance. She further asks if it is possible to receive a draft report 2 weeks in advance. This would give stakeholders more time to prepare for the meeting.
- Mr. Tebert adds that the version can be a draft and incomplete. This would still improve the discussion during the meeting.
- Mr. Polverini announces that the 2nd meeting will be around end of June/beginning of July. [Addendum after the meeting: The second meeting will be held on July, 3rd in Brussels.]

Mr. Rohde underlines that draft reports are published as soon as possible, but he also points out that the consortium depends on timely external input. He encourages stakeholders to send in feedback on the reports on time.

- Mrs. Fayole requires to know when the study is planned to be finalized and asks why there is no 3rd meeting.

Mr. Rohde points out that only one stakeholder meeting has been foreseen for the steam boiler preparatory study by the EC. The planned 2nd meeting is a voluntary effort by the project consortium.

Mr. Polverini adds that the finalization of the report is planned for the end of August plus some additional time to finalize the report. The length of each preparatory study depends on the sensibility, complexity and the number of products. Due to only one product, the time frame was reduced and only one stakeholder meeting planned. The goal is to avoid lengthy processes and there is no fixed number of meetings for the preparatory study.

Mr. Tebert highlights that there should always be a meeting after all reports are available to permit transparency and a final discussion.

- Mr. Schreiber inquires about the involvement of stakeholders in the study so far. Mr. Rohde informs that there are about 40-50 registered stakeholders. The consortium tries to keep bilateral talks to a minimum to limit interaction to official meetings. This is to make sure that everyone is involved. However, there may be bilateral contacts due to contact requests by industry or if specific information has to be collected to fulfill the tasks.

#4: Presentation of the preliminary results of Task 1: Scope – 11:00

Mr. Rohde presents the results of Task 1 and opens the discussion after the presentation.

Mr. Tebert proposes that the consortium should be as precise as possible in defining the product scope. This could be done with the help of official standards as they define the products and the system boundary. Mr. Tebert observes that the use of waste heat for boilers is mentioned in the conclusions of the report, but it is not detailed in Task 1. He therefore suggests to revise the report accordingly (Slide 20/21). Furthermore he asks for a definition of the thermal input in the report. It should be clarified if the nominal thermal input is gross or net. Mr. Rohde points out that the consortium will consider these amendments to the report.

Mrs. Rateau proposes to have an overview table of all existing CEN and ISO standards (as a sum up of sections 1.3.1 and 1.3.2) and those under revision (e.g. EN 12953 will be renewed) to work with the most current versions. They should be used throughout the whole process.

Mrs. Rateau suggests to mention the SULES (“super ultra-low emissions”) concept laid down in section 1.4.1.6 “Proposal for a directive on the limitation of emissions of certain pollutants into the air from medium combustion plant of Article 5 linked with the benchmark values laid down in Annex III.

Mr. Pieper underlines the importance of a system boundary for the efficiency. Mr. Rohde postpones the discussion about the system boundary to Task 3 where this issue is treated in detail.

Mrs. Fayole mentions the relevance of small boilers as they still represent 10-40% of the product group. As they are not covered by the preparatory study she would favor to include a quick analysis of their energy saving potential in the study. Mr. Rohde points out that the feasibility of doing so will be discussed with the EC.

Mr. Chan would like to know if boilers above 50 MW are excluded because of the IED (Industrial Emissions Directive) although it does not cover the energy component. Mr. Rohde explains that the reason for the exclusion is due to the assignment by the EC as well as to the IED which covers the CO₂ aspect. Mr. Polverini adds that the EC tries to avoid a double

regulation and therefore chose an upper limit of 50 MW. He underlines that the current version of the MCP directive is not finalized and that if emissions of steam boilers are regulated by the Ecodesign directive they will not be subject to the MCP.

Mr. Schreiber asks when the information and standards discussed in Task 1 will be relevant. Mr. Rohde points out that they will be relevant for the definition of the improvement potentials in Task 6. He further underlines that Ecodesign is an iterative process and thus, it is difficult to specifically pinpoint at which point of time certain information will be used. Mr. Polverini adds that contacts with the standardization organization will help to find out what else has to be standardized.

Mr. Rohde asks to send any comments on the reports and slides via e-mail [[Addendum: contact@eco-steamboilers.eu](mailto:contact@eco-steamboilers.eu)] and closes the discussion.

#5: Presentation of the preliminary results of Task 2: Market – 11:40

Mr. Gentili presents Task 2 results. He points out that it was difficult to compile information on the market situation due to limits in data availability. Mr. Rohde invites all participants to share their comments on Task 2.

The major discussion point for Task 2 is the estimated stock data based on PRODCOM which is, according to Mr. Pieper and Mr. Lenz, a factor 10 too high. The main arguments are listed below.

Arguments by the manufacturers why PRODCOM data cannot be used (Mr. Lenz and Mr. Pieper)

- PRODCOM data does not exclude boilers smaller 1MW and bigger 50 MW.
- The boilers included in the PRODCOM codes are not all steam boilers. A better definition of the three codes is needed.
- PRODCOM data is not necessarily reliable as the numbers vary from one year to the other. (e.g. the numbers presented on slide 12 for Denmark are due to a special order of specific steam boilers that are used with special type of coal.) (Mr. Lenz)
- Data for water-tube boilers is not reliable for the capacity span of 1-50 MW because the major segment of water-tube boilers are power houses with much higher output (Mr. Lenz).
- The numbers for fire-tube boilers produced are factor 10 too high whereas the revenue per unit is much too low (Mr. Lenz). He cannot make statements for every country but the numbers for Germany, Italy and Spain are too high.
- The BDH estimate of 70.000 steam boilers in the European field seems to be rather correct. However if the life span for those boilers is estimated with 20 years (which is conservative because some of them last 50 to 60 years) the annual production volume in the study is unrealistic as the producers would not have the capacity to replace old (not state-of-the-art) boilers within a short period of time. (Mr. Lenz)
- Working with the PRODCOM data would mean to work with invalid data (Mr. Lenz)
- Mr. Lenz admits that the manufacturers have production data. The reason for not sharing it, is due to the small amount of manufacturers in Germany as well as in Europe. He points out that it would not be legal to share information for reasons of confidentiality as each company would then know the numbers of its competitors. However he cannot offer a solution. The market is too narrow to share information without a distortion of competition.
- Mrs. Rateau supports Mr. Lenz and Mr. Pieper by saying that not even the associations have access to numbers due to legal reasons.
- Mrs. Fayole asks everyone to cooperate.

- To the question of Mr. Chan how many people filled out the questionnaire Mr. Gentili answers 3 out of 35.

Arguments by the Consortium and the EC why the PRODCOM data has to be used

- Although the numbers are not reliable, they are the only official numbers available. With the information given, the consortium has to use the PRODCOM data and merge them with sound assumptions. The other solution would be a better contribution by the industry (Mr. Rohde).
- The only other option is to gather information by contacting those authorities that supervise the installation of steam boilers. This takes too much time because all 28 member states have to be contacted and some countries do not even gather data. It might take a year to map this data and thus clearly exceed the time frame/budget of the project. PRODCOM data could be improved with the help of the stakeholders as long as the numbers provided are based on official sources. Otherwise they are not statistical or analytical and cannot be used as a sound base (Mr. Gentili).
- It is not possible to use the BDH estimations as they are as uncertain as the PRODCOM data. The information used for the preparatory study has to be well documented information and if any stakeholders disagree with the PRODCOM data they should cooperate and offer the data they have. In any case it is important that the data is sound and well documented. (Mr. Polverini)

Agreement:

- Mr. Polverini will check the legal background. He points out that if the manufacturers can or will not share well documented data, data from PRODCOM and Eurostat will be used instead. He kindly asks the stakeholders to recheck if they can provide any reliable data.
- The consortium will re-contact industry. It is important to work together to gain reliable data as a personal opinion is not enough. However this will result in a delay in the time schedule. (Mr. Rohde)
- Mr. Rohde suggests to compile information on a European basis. Mr. Pieper and Mr. Lenz agree as stakeholders will be less reluctant to talk about European figures as they are not as detailed.
- Mr. Pieper suggests to ask for a total European production capacity. Mr. Lenz adds that this could be achieved with a simple questionnaire on European numbers only.

The data collected with such a questionnaire could be compiled by the consortium. The information published afterwards should only list the manufacturers that answered to the questionnaire and a final result of all numbers. Missing values could then be estimated by the industry as long as at least 10 manufacturers replied to the questionnaire. This would prevent a distortion of competition.

- Everyone agrees in a new shorter questionnaire. The consortium will re-contact industry and EHI and revise the final result in an iterative process with manufacturers, EHI and national associations. Therefore EHI is responsible to derive stock data and average sales data for the last years from national associations and submit them to the consortium together with the information which manufacturer participated at the survey. Afterwards Mr. Lenz and Mr. Pieper will evaluate the stock estimation for Europe based on the total figures together with the information which manufacturer participated in the national survey conducted by the EHI (respectively national associations).
- Furthermore Lenz and Pieper suggest doing the same calculation as the BDH did based on Germany for other countries to be able to compare the results.

- The conclusion of the discussion is that the consortium will uptake talks with associations until four weeks after their meeting [Addendum: April, 4th 2014].
- Mr. Tebert suggests that apart from only European numbers in general the base cases should be considered when collecting numbers. However Mr. Polverini rejects this idea due to the time schedule and the fact that the base cases will not be defined until the next stakeholder meeting.

Lunch – 12:20

#6: Presentation of the preliminary results of Tasks 3: Users – 14:00

Mr. Aydemir ends his presentation on Task 3 with a set of 5 questions that are discussed after the presentation:

1. Operation hours per year?

According to Mr. Lenz some applications run continuously and others run infrequently, e.g. they serve only as backup steam boilers or to help start and stop steam turbines. Therefore the operation hours depend on a shift model, which is a complex topic. He offers to help define categories, which boilers exist and how they run. However Mr. Aydemir states that it is not possible to evaluate different shift modes within the study as there is no comprehensive data available to outline different shift modes for industrial steam boilers in Europe. Thus the consortium will define operation hours per year for each base case based on figures from U.S. stock data for the industrial steam boiler population where operation hours for different industries has been assessed. The calculation scheme for that will be presented to Mr. Lenz in the next stakeholder meeting.

2. Frequency of load changes relevant?

Mr. Pieper does not think that load changes are relevant as long as a steam boiler is not switched off completely. Only a complete "cold" restart decreases efficiency significantly, which occurs comparatively seldom. This is the case because industrial steam boilers (respectively the material the whole construction consists of) have to achieve a certain temperature before working properly. Thus the efficiency during start ups of industrial steam boilers is lower than in steady state operation. Furthermore very low operation modes decrease the efficiency of industrial steam boilers. This is the case for load points lower than 40% down to 10%-15% of nominal load. As this is very seldom the case and industrial steam boilers are usually pre-heated in order to avoid "cold" restarts there is typically no major impact on the efficiency of a boiler caused by load changes.

3. Assumptions for the starting time?

Mr. Lenz argues that starting the boiler is important. Some boilers have to be able to start immediately as backup systems for power turbines. These boilers are always under pressure and thus have to be preheated for years only to be a backup for another source of steam, e.g. a steam turbine. Such a backup may for example only come into operation every 4 years. Mr. Pieper says that this is not as relevant as boilers are always under pressure to avoid corrosion (exception: revision).

4. Load point for the cases?

Mr. Lenz and Mr. Pieper agree that it is not relevant to look at the load point.

5. Scheme to define cases?

Discussion postponed to Task 4.

General discussion:

- Mr. Pieper remarks that a pressure of 0.5 to 0.7 bar with an efficiency of 92% is impossible. 85% to 87% is the average efficiency (for industrial steam boilers without

economizer). Furthermore costs savings are not linear with an efficiency increase. 91% without an economizer is impossible. Nearly 100% of new installed German steam boilers are equipped with an economizer and at least 90% of all European steam boilers also. Mr. Lenz adds that the advantage of an economizer is the payback time, which is in some cases less than one year.

- Mr. Jensen contradicts to a number of condensate returned of 90 % mentioned on page 89 of the report. The amount of condensate returned has a huge impact on the efficiency. Mr. Pieper agrees that the more condensate is returned the better. However this is not possible in some processes. He estimates that on average 50% of the condensate is returned therefore regulating the amount of condensate returned is not plausible. Mr. Polverini suggest to leave it out of the study as long as it not really relevant for some products.
- Mr. Tebert points out that the standard on measuring efficiency mentioned on page 91 of the draft report should also be mentioned in Task 1.
- Mr. Tebert mentions that so far the end of life behavior of the product has not been considered in the study, especially with regard to special steel and electronic waste. Mr. Rohde agrees in principle but points out that the end of life behavior will not be as relevant as it is for other products. Therefore, the end of life behavior will only be briefly treated in the report.
- Mr. Polverini agrees that is important to focus on the users as the energy efficiency has the most important impact. Mr. Jensen mentions that is complicated to talk about efficiency due to a lot of parameters. A legislation has to be very complex to cover all cases of different boilers and efficiencies. Mr. Polverini explains that the legislation approach is typically to have one (or more) common concept that might only fit with (e.g.) 90% of all cases. The remaining 10% could be excluded from the legislation because they are too complicated to regulate.

#7: Presentation of the preliminary results of Tasks 4: Technologies – 14:50

Mr. Karellas presents the current state of Tasks 4 and opens the discussion. A major challenge is to obtain the required data to define the base cases.

Remarks on the presentation and the report:

1. Mr. Jensen mentions that there is a mistake on page 121 of the report as wood chips are not waste fuel.
2. Mr. Lenz comments on slide 7: the statement that most industrial boilers are fire-tube boilers is true for Europe but is vice versa in Asia due to the fuel used. In Asia 90% of all boilers are water-tube boilers.

General discussion:

- Mr. Tebert mentions that the definition of BAT and BNAT is still missing. Mr. Karellas elaborates that this will be integrated into the report.
- Mr. Karellas would like to know if an efficiency range of 75% - 95% can be used for all base cases. He further asks which pressure ranges fit to which base case. He mentions that technically everything can be done but would like to know which pressure levels are most common. Mr. Lenz answers that there are no general answers as the manufacturers produce each boiler on customer need.
- Mr. Rohde concludes that apart from the capacity another dimension with the pressure has to be added to the base cases. This will result in 6 combinations of pressure and capacity. Mr. Pieper accepts the statement that with increasing pressure the efficiency increases as well. Mr. Pieper states that there is a linear relation between efficiency and pressure. In the range of 1 to 50 MW steam boilers can have the same efficiency but smaller boilers are more expensive per MW.

- Mr. Karellas asks if there is a connection between power output and pressure for commonly bought boilers. Mr. Lenz offers to draw a diagram/ create a matrix of the connection. However Mr. Pieper intervenes that he has tried this and that it changes every year.
- Mr. Rohde asks for a qualitative answer and Mr. Pieper suggests to enter a 3rd dimension because the type of fuel has a great impact as well as natural gas e.g. is completely different to biogas. Mr. Rohde therefore asks for a correlation between boiler size and fuel used whereas Mr. Lenz contradicts and says that mostly natural gas is used for fire-tube boilers. Mr. Pieper adds that pellets are used as well.
- Mr. Lenz mentions that with the numbers needed for the base cases (slide 21), the manufacturers face the same problem as before. It is not legal to publish any data. To solve this problem Mr. Polverini sums up that if the stakeholders do not provide any data, the consortium will have to work with assumptions and present them at the next meeting. The stakeholders are then invited to correct this data based on factual input. However he asks the manufacturers to again check which data is sensible and which is not. Mr. Tebert supports this idea, he underlines that it is an iterative process. The consortium has to present numbers. He does not understand why the data is sensible since all cases are approximations to reality and not specific real cases.
- Mr. Jensen mentions that Task 4 for should focus more on the fuel type used because so far Task 4 tries to generalize too much. Mr. Karellas knows this but also says that the generalization is needed. He will still try to find a solution. He states that a 10 ton boiler with 30 bar is more expensive than a 30 ton boiler with 10 bar.
- Mr. Jensen mentions that a steam boiler is not the primary product for the industry. What is relevant is the product they want to produce. Mr. Rohde agrees but mentions that this fact is not relevant for the study.

Everyone agrees that the manufacturers will again check if they are allowed to give some data.

#8: Further proceedings and schedule, other issues

The consortium announces to upload a comment sheet. A sheet contributed by Mr. Schreiber will be used as a template. [Addendum: A sheet based on input by My. Schreiber and Mr. Tebert is available on the project website now.]

Comments on the report should be send to contact@eco-steamboilers.eu by April, 4th.

The date of the 2nd meeting will be announced as soon as possible. It will be checked that it is not at the same time as the sustainable energy week. [Addendum: The second meeting will be held on July, 3rd in Brussels.]

#9: Closing

Mr. Polverini closes the meeting at 15:45. The next meeting will deal with Tasks 5 to 7. He thanks everyone for the participation and future collaboration.