Topic	Minutes of the 1st Technical Working Group Meeting: Ecodesign/ Energy Labelling Review Study: Cooking appliances
Day & Location	19 March 2020 by means of interactive webinar
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Participants	• APPLiA (Home Appliance Europe) • APPLUS Laboratories • BAM (Bundesanstalt für Materialforschung und -prüfung) • BMWi • Bonn University • CENELEC (European Committee for Electrotechnical Standardization) • Danish Energy Agency • DTI (Danish Technological Institute) • ECOS (European Environmental Citizens Organisation for Standardisation) • EFCEM (European Federation of Catering Equipment Manufacturers) • Electrolux Professional • FEAD (European Federation of Waste Management and Environmental Services) • FERRE-FEMAS • HKI • MARCOGAZ • MIDEA • MIELE • Swedish Energy Agency • TGCP • UBA (Umweltbundesamt) • Unox

Introduction and general aims of the 1st TWG meeting

The first Technical Working Group (TWG) meeting for the review study for Cooking appliances aimed to present and discussthe first draft of the Preparatory study. The meeting was carried out by means of a webinar that was structured as follows:

- Objectives, methodology and timeline
- Task 1 – Scope definition, standard methods and legislation
- Task 2 – Market analysis

- Task 3 – Analysis of user behaviour and system aspects – preliminary task report to be completed for the next meeting
- Task 4 – Analysis of technologies
- Conclusions, next steps and outlook – Wrap-up of the meeting

Objectives, methodology and timeline

All participants introduced themselves and their company or association. JRC explained the objective of the review study, which would be developed following the MEErP. The timeline has been structured according the different tasks described in the MEErP, and includes a second meeting to be tentatively held in October 2020. The finalization of the project is foreseen in the first quarter of 2021.

Task 1 - Product Scope, legislation and standardisation

Domestic, Commercial & Professional cooking appliances

JRC presented the different points of view about the inclusion or exclusion of professional and commercial cooking appliances in the project. The JRC proposal highlighted the different user needs and the much broader product variability associated with professional products and acknowledged that these aspects significantly hinder the potential development of common requirements. The lack of EU harmonised standards for professional products was also an important issue.

JRC proposed that the development of any Ecodesign/Energy labelling requirements for commercial/professional cooking appliances should be separated from the domestic cooking appliances regulations. This would ensure that requirements and energy labelling categories would be suitable and meaningful by considering sector-specific user needs.

Besides, JRC presented definitions to clarify the terms used in this discussion:

- Commercial. Appliances to be used in an area accessible to the public (not a household) with an intended non-professional use.
- Professional. Appliances to be used in an area not accessible to the public with an intended professional use, with low scale production of food.
- Industrial. Appliances to be used in an area not accessible to the public, with an intended professional use, for large scale production of food.

EFCEM agreed with these definitions stressing that they should be based on who normally used the equipment rather than the equipment itself. They also expressed their preference to separate professional and cooking appliances in the scope of the project for domestic cooking appliances. Besides, EFCEM was concerned about which policy option would be developed:

ecodesign or energy labeling. While EFCEM deemed both extremely challenging for the professional sector, energy labelling would be the most complicated one. This was due to the lack of harmonized standards and the variety of products, which made classification and fair comparison of products a very complex exercise.

Regarding the test methods for professional, ECOS asked if the JRC had been in contact with WG18 about the status of test standards with professional and commercial cooking appliances. EFCEM replied that some test methods had been finalised for convection ovens but work was still ongoing regarding the reproducibility of tests for steam ovens and considering how real food tests could be considered.

ECOS stated that they were in favour of the inclusion of professional and commercial cooking appliances within the scope of this project for domestic cooking appliances – but first would like to know more about the scale of impacts involved. Another stakeholder also asked about the impact of professional and commercial cooking appliances and what would the improvement potential be. JRC responded that it was potentially large but making a reasonable estimate was proving difficult due to the incomplete market data and a lack of knowledge about user behaviour. EFCEM added that these difficulties were significant enough to justify a separate study and stated that the current market data available under custom codes was far from a complete picture of the actual market. In their view, a preliminary study would need to be carried out first just to understand the impacts involved before deciding on any steps to take.

Ovens

JRC presented various topics regarding scope, legislation and standardisation for ovens:

- Including "solo" steam ovens within the scope of ecodesign and energy labelling regulations.
- Including microwave ovens within the scope of ecodesign and energy labelling regulations.
- Including microwave-assisted ovens within the scope of ecodesign and energy labelling regulations.
- The definition of a "standard heating function" for ovens.
- Temperature in oven cavity during brick method test.
- Measurement of oven cavity volume.
- Using food for testing energy consumption of ovens.

On **the possibility of including solo steam ovens within the scope** of ecodesign or energy labelling regulations, JRC explained that in current version of the regulation, those ovens are

out of scope. However, if the use of these appliances today was sufficiently high, the regulation might be missing a significant portion of EU energy consumption. JRC asked stakeholders for information on how often these appliances were used and based on that, whether they should be included within the scope of new regulations.

On this topic, a representative from Neff-BSH asked for clarification about whether the discussion was talking about solo steam functions or solo steam appliances. JRC stated that the discussion should be about appliances at this point.

On **the possibility of including solo microwave ovens within the scope** of ecodesign or energy labelling regulations, JRC explained that in the current version of the regulation, appliances which offer microwave heating function were out of the scope. However, if the use of these appliances today was sufficiently high, the regulation might be missing a significant portion of EU energy consumption. JRC asked stakeholders for information on how often these appliances were used and based on that, whether they should be included within the scope of new regulations.

On this topic, ECOS mentioned the ADEME study onsite monitoring campaign, which should be published soon. The results from this study showed that microwave ownership rates were very high in France (and probably in rest of EU) and that energy consumption was not negligible in the context of consumption by domestic ovens, hobs and range hoods. ECOS were in favour of considering the inclusion of microwave ovens in the scope.

On **the possibility of including microwave-assisted ovens within the scope** of ecodesign or energy labelling regulations, JRC explained that, similar to the cases of solo steam ovens and solo microwave ovens, if the use of microwave-assisted ovens today was sufficienly high, the regulation might be missing a significant portion of EU energy consumption. Moreover, JRC pointed out that if there were energy benefits in microwave-assisted ovens, they were currently not apparent to consumers. JRC asked stakeholders for information on how often these appliances were used and based on that, whether they should be included within the scope of new regulations.

On this topic, a representative of APPLIA indicated that the inclusion of combi-microwave function in the scope was difficult to justify due to the impossibility of measuring the energy consumption by the standard method. The Technical Committees would not be able to develop any future method capable of measuring the energy performance of combi-microwave function before the end of this project.

Another representative of APPLIA added that the function of combi-microwaves and combi-steam modes were not applicable to all types of cooking.

JRC concluded that there are two angles to consider here: (i) comparing different combi-modes in different appliances and (ii) compare combi-ovens only by its solo functions. There are many different variations possible and a fair and objective comparison would be very difficult.

On **the definition of a "standard-heating function" for ovens**, JRC explained that in the current ecodesign and energy labelling regulations, energy consumption of the best performing

mode is used for Energy Efficiency Index (EEI) calculations. Therefore, manufacturers are free to choose which mode to use for the EEI calculation. Those best performing modes are ″eco-modes", usually not able to cook a wide range of recipes, and therefore not necessarily representative of the common use of oven. To overcome this, a request from various stakeholders for the revision of current regulation and standards is a clearer definition of the ″standard heating function" for ovens. On this topic, JRC asked to stakeholders what the benefits of defining a standard-heating function were, whether eco-modes should be used in the calculations of energy efficiency and if new test standards such as the brick method 2.0 would address this issue.

On this topic, ECOS highlighted that the brick method 2.0 was a step forward, however, the standard heating mode was not sufficiently defined for a proper comparison. There should be a precise definition of the mode used in the test, based on the common practice of EU households (which should be considered in the context of the user behaviour study results). However, fixing the mode to test should not kill innovation either. An optional second mode, a best efficiency mode, could also be tested and included in the labelling, clearly indicating the limitations to cook with this mode. The optional second mode could also be justified based on results of food-based tests.

A representative of APPLIA answered that ovens can have 10-15 different modes, each mode for a different application. There is no mode that is suitable for all cooking and we cannot require any test to link to all modes, so the results cannot be a perfect reflection of actual consumption.

A representative from the Danish Energy Agency asked for more details of the brick method 2.0 and the main differences from method 1.0. A representative from CENELEC provided feedback on the brick method 2.0: the biggest improvement is that the test is now split into 2 phases and that the 2nd phase (after the brick is removed) does not start until the oven has cooled down. Consequently, the variability of results caused by the door opening operation to remove the brick is no longer given. Another major improvement is the in-situ monitoring of the real temperature in the oven using a so called observer thermocouple and that the temperature is calculated over a period of 20 min after the set temperature is reached.. Another change is that the same the same temperature settings are used for the conventional and hot-air modes, whereas previously there were some differences. Deviations of the highest temperature should not influence the result, because it is extrapolated to a fixed temperature via a regression line.

On the topic of **temperature in oven cavity during energy consumption testing**, JRC explained that the current brick method test consists in measuring energy consumption for heating up a brick by 55K, with 3 heating functions and 3 temperature settings, indicated by a table. JRC added that two issues have been highlighted by stakeholders.

The first issue is that if the temperature in the third row of the table cannot be reached, the standard requires using the maximum temperature of the appliance. Therefore, some ovens

might offer a lower maximum temperature than the one required in the standard, achieving lower energy consumption values for that specific temperature.

The second issue is that the brick method test and regulation specify only the temperature but not how long this temperature has to be maintained for measuring energy consumption. In some occasions, it has been observed by market surveillance authorities that the temperature which is set during the test and that is displayed in the appliance was only reached at the beginning of the test cycle. This may indicate that some products were able to identify that a test procedure was being performed.

JRC asked how common these issues were in current ovens, how significant in terms of results, and whether the new test standards would address these issues.

No additional comments or questions were given from stakeholders on this topic, although some of those issues were already addressed earlier when detail was provided on the brick method 2.0 test.

Regarding **the measurement of oven cavity volume during energy consumption testing**, JRC explained that the current brick method test indicates that non-essential removable items may be removed for volume measurement. Also, with the current definition of Energy Efficiency Index, larger cavity volumes lead to better EEI values. Therefore, manufacturers have an incentive to remove all possible items in the cavity during the test. JRC asked if there is evidence that essential items are being removed for cavity volume measurement, if this is affecting results significantly, and whether the new test standards will address these issues.

No additional comments or questions were given from stakeholders on this topic.

On **the possibility of using real food for testing energy consumption of ovens**, JRC explained that the current brick method test is based on the heating of a standard load (a brick). Some stakeholders argue that heating up a brick is not sufficiently representative of cooking different types of food and therefore, test methods based on cooking a standard meal (also known as the energy cake test) are currently under investigation. JRC also asked if there is evidence that a brick does not represent accurately the cooking process of different types of food and if food can be standardised in a way to overcome repeatability & reproducibility issues.

On this topic ECOS asked if it would be possible to develop a food-based test to assess the performance and impact of solo microwave ovens. CENELEC answered that a method for measuring the energy consumption of solo microwave function was already available (based on water loads). A standardized method for measuring the energy consumption of solo steam ovens was not defined.

<u>Hobs</u>

JRC presented the proposed modifications of the scope of domestic hobs, mainly to evaluate the current exclusion of small burners:

- Gas hob means an appliance or part of an appliance which incorporates one or more cooking zones including a control unit and which is heated by gas burner.
- Small (auxiliary) burners with a nominal heat input below 1.16 kW are not covered by the current standard, since the test procedure is not optimal for them (they are not normally used for boiling big amounts of water). If small burners are to be included in the scope of Ecodesign, a test should be developed.

Besides, JRC explained that some issues had been reported about the simmering test method. Some stakeholders found it difficult for inexperienced testers (market surveillance, external laboratories, etc.) to find the right setting (power) to get simmering. So it was proposed to give some indications in an informative annex. In addition, in their view choosing the position of the cookware can orientate the result in a favourable way for the manufacturer so this should be further assessed

CENELEC explained that the standards were very clear about how the cookware must be placed, so no need for concern. The issue with simmering for electric hobs has now been solved and and CENELEC is working on an informative annex which provides guidance on that.

Range hoods

Recirculation hoods and odour reduction

JRC presented the proposed changes on the scope to include recirculation in the definition of range hoods. Besides, the main topics for discussion were the following:

- The proposal from the Swedish Energy Agency to improve the methodology to calculate the energy efficiency of range hoods. This proposal takes into account the capture efficiency of cooking odour and the energy consumption of heating or cooling of replaced air, distinguishing ducted, recirculation and central ventilation installation.
- How to measure the odour removal efficiency of the filter installed in recirculation hoods.
- Real life representativeness: a proposal to improve it has been presented from different stakeholders, which covers:
    - Pressure – airflow curve and the corresponding electric power curve.
    - Measure minimum and maximum continuous modes and for the boost mode.
    - 3 points at different drawback pressures for each mode (so called 9 points method).

- Effectiveness of lights and verification tolerances.

The Swedish Energy Agency explained that the main objective of their methodology was improving the current methodology to focus more on the primary function of the range hood, which is to capture and remove the cooking odour. Their concern is that the current method

seems to favour range hoods simply for having high maximum airflow rates and this is an issue to be solved. The reason to include the heating/cooling energy due to the air replacement is that this would counterbalance the benefits due to high airflow rate. The Danish Energy Agency also supported the need to find a direct or indirect solution to the problem of high air flow range hoods being favoured in the energy labelling

APPLiA replied that these concerns were justified because the current method only looks at the best efficiency point using boost speed. In their view, the 9 point method being developed by the Technical Committee would provide a much better evaluation of real range hood use and will reduce the benefits that high maximum airflow rate range hoods may have. The 9 point calculation method will be an average of results from minimum, maximum and boost modes, each at three different pressure drops. Besides they warned that the Swedish proposal would end up with two energy labels for the same model, depending on installation configuration and filter used. They informed that there is no precedent for this in energy labelling (i.e. the energy class being influenced by third party components and external factors).

Regarding the odour removal efficiency, several stakeholders asked whether JRC proposed odour reduction "factors" or "efficiencies" (efficiency would be unit of odour removed per unit of energy consumed while factor would simply be the % of odour removed under standard test conditions). JRC clarified that they meant a factor, something similar to the grease absorption factor. In this regard, APPLiA explained that if recirculation hoods are also tested, they will be at a great disadvantage, since the most efficient installation type is the ducted one. Besides, when attempting to define an odour removal factor, an important variable that would need to be considered is the filter installed in a range hoods. Normally filters are not included when the range hood is purchased from the manufacturer, but at the moment of the installation. JRC proposed that an option may be an odour removal claim being stated on the filter kits themselves

Task 2 – Markets

JRC presented the following topics about Market analysis:

- Main objectives:
    - Context of product groups within EU industry.
    - Insights into market trends.
    - Estimate costs for consumers.
- Data sources:
    - Euromonitor.
    - GfK.
    - Previous Preparatory Study (Lots 22 & 23).

- Relevant parameters (EU28):
    - Sales trends.
    - Technology trend.
    - Stock estimation (up to 2040).
    - Energy Efficiency classes.
    - Purchase price.
- Questions to stakeholders:
    - Are our estimations correct?
    - Are we missing any significant trend in terms of sales or technology?

Stakeholders will provide comments in written form

Task 3 – Users

JRC presented the main points from the Task 3 draft report shared a few weeks ago, including the key messages from other user behaviour studies, and an overview of questions designed for ongoing Commission study for user behaviour.

ECOS asked whether the figures mentioned in the slides referred to primary energy or to energy consumed at household level. JRC replied that the reference sources would need to be checked but it is most likely to be household energy consumption. Going to primary energy would simply add another assumption on top of the numbers reported and should be avoided at this stage. When the time comes to work on the modeling tasks and the impact assessment, household consumption figures would then be translated into primary energy.

The Danish Energy Agency asked if the questionnaire included questions about the maintenance of range hood filters, since the lack of maintenance can have an impact on the performance of the range hoods. JRC replied that the questionnaire originally had a question on this in a draft version, but when shortening the questionnaire it was removed. There is a question that asks what type of filter is used in the range hood and for anyone answering "don't know", it can be assumed that the range hood is not well maintained.

APPLiA explained that with a closed/non-maintained filter, speed would increase, but energy consumption would decrease as less air is to be moved.. The energy efficiency is however penalised

CENELEC pointed out that it is also important to ask about the frequency of use and if users choose the correct cookware size. JRC replied that the questionnaire included questions of frequency of use for ovens, hobs and range hoods. The questions cover usage over a typical week rather than a typical day, since it is likely that there is a big difference between week day behaviour and weekend behaviour.

APPLiA referred to data in a study carried out in 2011, which was included in the literature review of Task 3 report. APPLiA indicated that there were no ecodesign-energy labeling measures in 2011, so the data is quite outdated. Regarding the figure of 679 uses per year of

hobs, APPLiA requested a clarification as whether it referred to the use of hob only or together with range hood.

JRC replied that the numbers in the slides were quoted from the previous study, and that the results from the new user behaviour study would give a better view of the current situation. The questionnaire includes the frequency of use of hobs per week and the duration of use per week. Likewise for range hoods, asking how often range hoods are used (i) in combination with the hob and (ii) when the hob is switched off.

Task 4 – Technologies

Regarding oven technologies, JRC presented the following topics:

- Cavity volume.
- Microwave heating functions.
- Steam-assisted heating functions.
- Cavity materials.
- Base cases and Best Available Technologies (BAT).
- Best Not Available Technologies (BNAT).

On the topic of **cavity volume,** JRC explained that the mass of the materials in the cavity was proportional to the energy consumed to bring the oven to its operating temperature. Therefore, a larger cavity would have a higher energy consumption. Current ecodesign and energy labelling regulation does not penalize larger cavity volumes. Moreover, JRC observed a market trend in the last years towards larger cavity volumes. On this topic, JRC asked stakeholder if current domestic ovens were over-dimensioned and if there was potential of overall energy consumption reduction by promoting the purchase of ″the right-size" of ovens.

On this topic, ECOS indicated that they saw a trend towards larger cavity ovens and also saw that they are favoured in the calculation of EEI. However, the larger the cavity, the higher energy consumption, because there is more air that needs to be heated and material that can absorb heat. They added that it was needed to fully or partially decouple cavity volume from the calculation of EEI and make it less linear, as for example had been done for tumble driers. They recommended studying the absolute energy consumption of ovens, independently of their cavity volume. The Danish Energy Agency agreed on this point, indicating that there must be a less linear correlation between energy efficiency and cavity volume.

A representative from APPLiA pointed out that they had doubts about the proportionality of volume and material quantity. The size of the oven is physically limited by the space available in the kitchen, so it is not necessarily proportional.

On the topic of **microwave heating functions,** JRC explained first that one of the reasons to leave ″solo" microwave ovens out of the scope of current regulation was their small improvement potential in terms of energy consumption. Research indicates that, compared to several cooking processes, e.g. on the hob, there can be - depending on food and amount - substantial energy savings with ″solo" microwave ovens. However, consumers tend to use them for defrosting or heating only.

Secondly, in terms of assisted-microwave ovens, JRC pointed out that their benefits are lower energy consumption, improved food quality and reduced time.. Moreover, energy and time savings have been observed in tests with real food. However, since microwave-assisted ovens are out of scope, these potential benefits are not transmitted to consumer.

JRC asked stakeholders if there is potential for improvement in ″solo" microwave ovens and what could be done to make the potential energy consumption benefits of microwave-assisted ovens more apparent to consumers.

On the topic of **steam-assisted heating functions,** JRC explained that the main benefits of this type of oven were related to health (due to the reduced need of oil and fat), cooking time and better results for specific recipes that require steam. Moreover, market research suggested that it was easier to reach higher energy categories (A++ or A+) for ovens equipped with steam-assisted heating functions (though the market data do not show which function of those ovens was used for the energy class). JRC asked stakeholders if the benefits of steam-assisted ovens were mainly related to health, cooking time and cooking results, and if there is a direct relationship between energy class and steam-assisted function.

On this topic, CENELEC asked JRC to clarify and be consistent with the different functions and appliances: solo steam, steam assisted and combination of steam and heating.

On the topic of **cavity materials,** JRC explained that the most common materials in cavities were dark enamel coated steels. However, certain projects had been developed to study the feasibility of high-emissivity materials in the cavity, mainly through the use of stainless steel. One of these projects was the one called Highly Efficient Oven (HEO). The hypothesis of this project was that using a highly reflecting cavity wall can help to increase the radiative heat transfer mechanism, allowing energy consumption during use to be reduced. The preliminary results published as part of this project suggested that the stainless steel wall had been manufactured with 50% less energy than the traditional dark enamel cavity, and that it contributed to reduce energy consumption by 30% when conducting the brick method test. The JRC asked stakeholders if the energy consumption of ovens could be reduced by using high-emissivity materials such as stainless-steel and if these materials are compatible with pyrolytic cleaning.

Regarding stainless steel oven in the HEO example, a representative from APPLIA pointed out that there are several issues that consumers would not like: (i) that the heating element at the bottom is inside the cavity (difficult to clean) and (ii) that stainless steel scratches easily and is prone to staining and decolouration over time.

Regarding **Best Available Technologies,** JRC presented an analysis conducted on a sample of 46 models from the TopTen database. From the analysis of that data, JRC observed that:

- 100% products were below the Ecodesign limit for 2019.
- There were 4 products with significantly better EEI: all of them were steam-assisted ovens.
- There was only 1 product in A++ class (steam-assisted oven).
- Ovens and cookers (stoves) had similar values right below A+ limit.

From this analysis, JRC concluded that the Best Available Technology for domestic ovens is currently an electric oven with steam-assisted heating function.

In terms of **Base Cases** for the subsequent environmental evaluation of technology options, JRC presented two representative base cases for domestic ovens: one for electric and one for gas:

	Base Case 1: Electric oven	**Base Case 2: Gas oven**	**BAT: electric oven with steam-assisted function**
Cavity volume (l)	70	70	70
Number of cavities	1	1	1
Mounting	Built-in	Free-standing	Built-in
Steam heating function	None	None	Yes
Microwave assisted function	None	None	None
Self-cleaning systems	Pyrolytic	None	Pyrolytic

Energy consumption conventional mode	0.9 kWh/cycle	5.4 MJ/cycle	0.89 kWh/cycle
Energy consumption fan forced mode	0.7 kWh/cycle	n/a	0.52 kWh/cycle

In terms of Base Cases and Best Available Technologies, JRC asked stakeholders if the assumptions presented in the table above were reasonable for the subsequent environmental evaluation of technology options.

On the proposal of considering as BAT a steam-assisted oven, a representative from APPLIA indicated that there were different steam functions modes among the different models. Steam can be produced by means of injectors (hi-tech way), or just by filling a tray at the bottom of the oven with water (so called direct steam, a low-tech approach). Steam is usually combined with convection. The steam function does not necessarily entail a better energy class, because the sealing is not so good in those low end models with direct steam. A representative from APPLIA added that steam ovens were probably better because they were better sealed, to avoid losing steam.

Based on that feedback, JRC asked if a better sealing of the oven could be considered BAT. CENELEC answered that the better the sealing, the higher the humidity inside the oven if venting is insufficient - that is not good for the performance of some cooking functions. APPLIA agreed with this point, adding that the high humidity would create condensation and this would affect negatively the performance of some modes, for example baking modes would need to deliver higher venting rates with well-sealed doors.

JRC asked which current technologies could be considered as BAT for the preparatory project under development, but no specific feedback was provided by stakeholders on this topic.

In terms of **Best Not Available Technology,** JRC explained that after a comprehensive literature review an obvious technology which is able to improve drastically energy consumption of ovens in the near future was not identified. This was confirmed with the feedback received from the industry. Two technology aspects were proposed as potential BNAT:

- Increased reflectivity materials for cavity.
- The use of solid-state semiconductors for MW-assisted ovens.

JRC asked stakeholders if the proposed technologies are BNAT and if there are there others not identified by the JRC but no specific feedback was provided by stakeholders on this topic.

On topics not specifically raised by the JRC, ENER asked if it was intended to look at portable ovens for the scope. JRC explained that there were challenges trying to find good market data for portable ovens. A representative from APPLIA added that there was a practical limit below which there would not be sufficient space or heating capacity to complete the brick test.

Hobs

Regarding hob technologies, JRC presented the following topics:

- Relevant technologies:
    - Gas hobs.
    - Solid plates.
    - Radiant hobs.
    - Induction hobs.
    - Air venting hobs.
- Best Available Technologies (BAT).
- Best Not Available Technologies (BNAT).

Regarding electric appliances, APPLiA indicated that there was currently very little margin for improvement in solid plate hobs, as they were already equipped with energy regulators. They also pointed out that for induction hobs, heat losses on surface were not directly a consequence of the hob, but of secondary heat radiated from the cookware.

Concerning gas hobs, APPLiA clarified that pressurised pre-mix burners were not used for indoors appliances, as these were only needed in outdoor (i.e. windy) conditions.

Regarding hydrogen fueled hobs as BNAT, APPLiA stressed that dual fuel hydrogen or natural gas firing during the life cycle of the hob was not feasible. The same hob cannot work with two different fuels, it must be fueled by only one type of fuel.

ENER explained that hydrogen may not be the solution at this moment, but it could be in the future. Given that these appliances have long lifetimes, it would be worth to consider how to achieve a gradual penetration of hydrogen technology, for example, capable to run on a mixture of natural gas and hydrogen, and including this information in the labelling. ENER informed that this labeling was currently being done for boilers.

APPLiA replied that up to 20% hydrogen can be used in mixed fuels, and there were projects to develop products in that direction, however no commercial products were expected for the next 5 years. They also clarified that boilers used internal combustion while hobs used external combustion. This means that the hydrogen combustion in a hob would require a whole new burner design and the safety requirements would be very different.

ECOS was not in favour of promoting the use of a mix of natural gas and hydrogen because this would perpetuate the use of natural gas and compromise efforts to achieve climate neutrality. However, they acknowledged that there were technical and safety challenges and that the technology was still too immature to start a discussion.

Range hoods

Regarding range hoods technologies, JRC presented the following topics:

- Base cases.
- Relevant technology aspects:
  - Fans.
  - Electric motors.
  - Odour filters.
- Best Available Technologies (BAT).

DTI stressed that odour reduction must be included in the Regulation somehow, since this was the primary function of range hoods. In their view, the current method of assessing the energy efficiency of range hoods is counter-intuitive, where higher maximum airflow rates generally mean better energy classes. The Swedish Energy Agency supported DTI opinion, highlighting that the odour removal was key to the functionality of range hoods.

APPLiA recognised that there was is a correlation between maximum airflow rate and efficiency captured by the label, since the method did not represent the real use of the range hood. In real life the user will almost always select lower speeds that the boost mode used in the test.

In this regard, CENELEC explained that the Technical Committee had been working on the 9 point method that would use average data from minimum, maximum and boost speeds, each at 3 different back pressures and this would address concerns about high airflow rate products being favoured. CENELEC stressed that a decision must be made on whether to focus purely on fluid-dynamic efficiency (FDE) or to incorporate elements of odour removal as well in the method. In CENELEC view, the starting point should be FDE data based on the 9 points method and only later potentially consider factoring in odour removal. CENELEC explained that both approaches cannot be developed at the same time.

APPLiA explained that brushless motors can significantly improve the efficiency of range hoods. They are able to provide high airflows with little power, more efficiently. However, brushless motors are not fully established in range hood products on the market, most models today are equipped with asynchronus motors.

APPLiA asked JRC: how many models can be considered in the base case analysis. They explained that the maximum air flow rate for range hoods can vary from 200 to 900 m3 per hour. JRC replied that several bases cases can be used (i.e. 2 or 3, not 10), in order to achieve a cluster of base cases that are representative of the market.

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Conclusion - Actions

Stakeholders' feedback to be provided to the project team regarding the presented 1st part of the preparatory study (Task 1-4) either through BATIS or by email to JRC-B5-COOKING@ec.europa.eu by 30/04/2020.

After receiving all stakeholders' comments, the project team will revise the documents accordingly.

Webinars will be organised to discuss the main issues, to present the results of the user behaviour study, to discuss the 9 point method further and to gain further insights and feedback about business as usual for stocks.

The Commission asked the industry to share as much data as possible with JRC as they do not have currently access to the EPREL database.

APPLiA asked whether any delays to the project foreseen, given the circumstances (COVID-19 pandemic). ENER replied that this issue is under discussion though there are legal obligations for reviewing the criteria.

JRC thanked the stakeholders for their participation and closed the webinar.