

Ecodesign Air conditioning and ventilation systems (ENTR-Lot 6)

Minutes of First Stakeholder Meeting

5th July 2010, Brussels

Centre Conference Albert Borschette

Attendants :

Mr.	Albig	Jürgen	Ziehl-Abegg AG
Ms.	Baert	Els	EPEE
Mr.	Baumeister	Robert	FGK and German Association of AHU Manufacturer (RLT)
Mr.	Bonvillain	Denis	EPEE
Mr.	Choi	Jake	Samsung Electronics
Mr..	Damm	Thomas	VDMA Air-handling Technology Association
Mr.	De Faucal	Yannick	Daikin Europe N.V.
Ms.	De Smedt	Veerle	Daikin Europe N.V.
Mr.	Dupré	Guy-Noël	UNICLIMA
Mr.	Ennenbach	Frank	Europump
Mr.	Fivash	Carl	Greenwood Air Management
Mr.	Galsgaard	Christen	Dansk Ventilation
Mr.	Händel	Claus	FGK and European Ventilation Industry Association (EVIA)
Mr.	Herten	Christian	GEA Air Treatment
Mr.	Hoogkamer	Johannes	Eurovent
Mr.	Hopkins	Daniel	Ebm-Papst UK Ltd
Mr.	Kataoka	Osami	JRAIA
Mr.	Klütsch	Friedrich	Europump
Mr.	Legay	Laurent	Carrier HVAC
Ms.	Lichtenvort	Kerstin	EC-DG ENTR
Mrs.	Loibl	Martina	EPEE
Mr.	Madorell	Roger	Soler & Palau Research S.L.U.
Mr.	Mattson	Lars	Lindab Ventilation AB
Mr.	Marx	Uwe	Vaillant GmbH
Mr.	Nicolle	Darcy	United Technologies Corporation
Mr.	Noriaki	Hayashida	EPEE
Mrs.	Papazahariou	Christianna	Shecco
Mr.	Pennati	Walter Giuseppe	CoAer / ANIMA
Mrs.	Permats	Britta	Svensk Ventilation (Swedvent)
Mr.	Railio	Jorma	Finnish Association of Mechanical Building Services (FAMBSI)
Mr.	Roithmayer	Wolfgang	Wolf GmbH
Mr.	Sándor	Mats	Systemair AB
Mr.	Schuberth	Jens	Federal Environment Agency (UBA)
Mr.	Segneri	Laurent	Danfoss
Mr.	Söderholm	Andreas	Ultramare AB
Mr.	Sweeney	Paul	Greenwood Air Management

Mr.	Thie	Stefan	Fujitsu General (Euro) GmbH
Mr.	Törpe	Martin	AL-KO Therm GmbH Germany
Mr.	Toulouse	Edouard	ECOS
Ms.	Voigt	Andrea	EPEE
Mr.	Westerdorf	Thomas	GEA Air Treatment Services GmbH

Consultants:

Mr.	Adnot	Jérôme	Armines
Mr.	Hitchin	Roger	BRE
Mr.	Kemna	René	VHK
Ms	Pout	Christine	BRE
Mr.	Rivière	Philippe	Armines

Philippe Rivière (Armines) introduces the meeting at 10.00 and asks participants to contribute and comment on the material presented at the meeting.

Kerstin Lichtenvort (EC) outlines the Ecodesign Directive process. The main new aspect of 2009/125/EC is the extension from Energy-using Products to Energy-related Products. The Directive is enacted through product-specific Implementing Measures or through self-regulation by industry. So far there have been nine implementing measures which are expected to save 315 TWh per year in 2020. Ten families of products are targeted for the period 2009-2011. AC (Air Conditioning) and Ventilation have a high priority due to long operating times, high potential for savings, third countries specifications, etc (more detailed background is available on EC ecodesign web site)¹.

For this preparatory study there will be three meetings and all Stakeholders are welcome to register on the web site. Today only the first three tasks of the contents of a preparatory study are requested to the contractors. The end of the contract is the End of May 2012. The EC have not yet commented on the draft reports prepared for this study to date and the meeting provides an important opportunity for Stakeholders to react preliminary results, and in particular on task 1 which includes the proposed definition of products to be considered in the products list which could potentially be CE marked or for which a requirement to pass certain performance information to the installers could be imposed.

Philippe Rivière reminded the main purpose of the project and the proposed time table. He noted that the second part of the task 3 report should be made available ahead of the second Stakeholder meeting. The first information request was issued on May 7 2010 and first version of Task 1, 2 and part of the Task 3 report were made available on June 11 2010. He requested comments on these from stakeholders and where appropriate, dedicated technical meetings should be organised.

René Kemna (VHK) described the findings of Task 1 about Ventilation systems. Definitions of Ventilation are provided, acknowledging that there will always be an amount of overlap between ventilation and AC. Ventilation (both supply and extraction) results in a change of concentration in pollutants. Sources of leakage are described, leading to a consideration of possible improvements. Effective ventilation, reaching the final user, as opposed to leaky

¹ See http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/index_en.htm

ventilation, is also a source of progress. There are leakage measurements. SPI (residential) and SFP (non residential, for AHU) are defined but show discrepancies. Similarly for Heat Recovery there are various standards which are not in perfect agreement. It is clear that there is scope for improving/reconciling standards in this area. Ventilation types A, B, C, D, E are described. The trade off between Heat recovery, heat loss control and electrical consumption is described. Exhaust ventilation products (rooftop fans, boxed fans), local and central heat recovery products and larger air handling units were all shown. Relevant legislation obviously includes the EPBD recast (which now explicitly includes ventilation). Standards are in continuous extension with the growth of the industry. The new labelling directive 2010/30/EC will lead us to discuss if trade associations labelling is still useful as it is or can be transformed (RLT and Eurovent). National legislation is reviewed. A unified presentation in terms of SFP is made. A number of MS made HR (Heat Recovery) compulsory. Scope: 125W per fan, AHCU, LHRV, CHR.V.

Johannes Hoogkamer (Eurovent) said he was pleased that some Eurovent recommendations have already been taken into account but would like to see some aspects taken further: ducts and filters are ErP (Energy-related Products) and the Eurovent Certification Company already has a labelling system for AHU and rooftop air conditioners, as well as heat exchangers. He also commented that the report mixes products and systems. More Eurovent labels are being created for fans and filters, as a voluntary measure. Kemna indicated that ductwork (performance) is mostly down to how it has been installed. Also what will be the extent of a voluntary agreement of the industry? What percentage of industry will be covered? Lichtenvort reminds annex VIII of the Ecodesign Directive which requires conditions of representativeness: 75-80% of the industry at least participating is considered appropriate by the EC.

Claus Händel (FGK) supports the cut at 125 W. Els Baert (EPEE) stresses that ENER lot 10 does not encompass HR. So it's difficult to consider only non residential HR in ENTR lot 6. Kemna indicates that ENER lot 10 measure on domestic ventilation units is in stakeholder consultation.

Daniel Hopkins (Ebm-Papst) wonders if there will be only a standardisation of characteristics or real MEPS². Kemna indicates that the EC will decide after the finalisation of this preparatory study about a potential MEPS and another outcome can be a labelling scheme.

Christen Galsgaard (Densk Ventilation) is happy to find that ductworks leakage is considered. The power consumption due to diameter and installation has also to be considered. René Kemna indicates that we are speaking of a product directive. What can be done at manufacturer level? At least clarify and weight the central ventilation impact in terms of ducts. Most of installation problems have to be taken in the frame of the EPBD (Energy Performance of Buildings Directive).

Kerstin Lichtenvort asks what the manufacturers propose for ductwork. They will have to clarify their proposal after the meeting to see if it's Ecodesign or EPBD. Thomas Damm (VDMA) reminds of two studies done for DG ENTR about ducts and will provide the reports. The recent fans regulation, reminds Kerstin Lichtenvort, leads to the proposal of other

² MEPS : Minimum Energy Performance Standard – minimum energy efficiency requirements for CE marking.

parameters around the fan itself and that will be considered in ENTR lot 6. If there are problems with the efficiency as defined in that regulation they should be formulated in the frame of ENTR lot 6.

Osami Kataoka (JRAIA) asks if 125W is the maximum power demand or the power at the minimum speed. The best efficiency of the fan does not always lead to the best product, namely in the case of HR. Higher flows can achieve higher HR, and noise requirements should not oppose to energy efficiency. René Kemna welcomes in advance all suggestion.

Johannes Hoogkamer discusses the application of the products for non occupied industrial spaces. René Kemna answers that this limit has little impact because there is about always human occupation.

Philippe Rivière introduces Air conditioning systems - Task 1. Functions are defined. Then we move from systems to products. Standard 15240 restricts AC to cases where there is cooling. Humidity treatment is included in that definition. All types of sources of cooling are described. All air systems, either CAV or VAV, water based systems are listed based on Ashrae handbook. Water to air systems are considered here, not in ENER lot 10, because they are part of large AC systems. DX systems display many configurations. The products are grouped into: cooling generators, air circulation and air treatment products, water circulation products, terminal units, heat rejection products, and controls as they define the conditions in which the other products operate. Cool generators are well defined in the standards, but with distinct testing conditions. To know their efficiency they have to be included in a system. Rooftops are also a product common to AC and V. Other standards are listed and performance parameters are defined. Legislation and standards deriving from EPBD are described. Almost all products are covered by regional standards, either in Europe or in the USA. Translation of MEPS into the proper units should be made. Inspection requirements have been modified in EPBD recast. Reinforced performance requirements are requested. The focus moves to full system consumption, through a set of standards that will ease task 3. Rules for sizing are not accurate in those standards, and left to national legislation. Control functions are defined now in a standard. Revision of F-gas directive is an important issue for our study. Interactions with ENER lot 21 (heating through air) and ENTR lot 1 (chillers) are important and will be monitored (for instance chilled water limit with ENTR lot 1). There is no "voluntary agreement"³ in Europe but there does exist voluntary certification and labelling programmes: the Eurovent Certification Company programme is a voluntary third party certification scheme at EU level and provides data source about Energy Efficiency. The example of chiller data is taken: an emerging technology shows a very high ESEER despite a regular EER. The national legislations provide very different measures from one country to another. In some cases some systems are banned, some features are compulsory, some control laws preferred, etc. US legislation is very comprehensive compared to some EU MS legislation. Japan, Australia and New Zealand legislation are quickly reviewed. Help from manufacturers can be the transmission to Armines of technical data for the same machine in different standardisation frames. All cool generators and all energy using products are to be in the scope; some controls of AC will be included.

Discussion takes place on scope and findings of task 1 about AC.

³ With the meaning of the Ecodesign Directive.

Chillers are split between ENTR lot 1 and ENTR lot 6. Jens Schuberth from the German Federal Environment Agency supports the view of leaving all chillers in ENTR lot 1. Philippe Rivière answers that not only temperatures regimes are different but also that they are likely to be used at very constant regimes and at full load in ENTR lot 1 and not in ENTR Lot 6. In the US we have at the same time full load and part load legislation. The EC can also merge both studies in a single measure. The richness of EU market and efforts of improvement is underestimated according to Christen Galscaard, a limited view of countries is covered: Eurovent is calling for a full coverage of cooling and heating. Walter Pennati CoAer/ANIMA asks for a better discussion of systems, not only products. Philippe Rivière indicates that products are the target but systems are considered to give the view of how the products are used.

Cooling function includes dehumidification? The energy aspect of this will be taken into account. Dehumidification/humidification is to be included at least for desiccant cooling according to the German Federal Environment Agency.

How to deal with reversible products without including the heating function? Or even why not taking into account all heating functions? Chillers heating function is included in ENER lot 1, so we will consider the products for their cooling function and build on the secondary heating function from ENER lot 1. Christen Galscaard wonders why heating and cooling were both studied in ENER lot 10 and will be split now in ENTR lot 6 and ENER lot 21. Kerstin Lichtenvort explains that the proposals the EC received from the technical consultants Armines and BIO are based on the EC ecodesign working plan, and that the two studies (heating and cooling) may converge. ENER Lot 21 is really studying heat pumps. Els Baert says that the primary function of a product is only decided by the installer, in front of the building and would prefer to have both functions in the same lot, and to take into account the variety of climates. Kerstin Lichtenvort reminds the definition of AC in EN standards, which differs from the definition of Heat Pumps. Claus Händel explains that the use of air as a carrier limits the scope of ENTR lot 6 : all three aspects are interconnected. This gives the real target. René Kemna indicates that for evaluation in MEEuP, the function has to be defined and followed. The fact that the product has 8 or 10 functions leads to a partitioning of cost issues but the functions cannot be all aggregated. Coordination will be done with ENER lot 1 and ENER Lot 21. René Kemna indicates that in the US a product good for one function cannot avoid the MEPS for another function. Only in the economic calculation the various functions are aggregated. Roger Hitchin (BRE) indicates that MEPS can be based on each function but the target of market transformation can mix various functions. Christen Galscaard admits this view point but requests that all functions are taken into account in estimating the environmental impact. Air generates a strong link and constraint on products. If ENTR lot 6 forgets heating the industry cannot use its results. Philippe Rivière indicates that ENER lot 1 takes care of water based heating. Christen Galscaard stresses that air generates a strong connection between many heating modes. ENER Lot 21 is precisely “air heating” says Philippe Rivière. ⁴

Heat recovery capability? For the contractors it's very dependant on the specific buildings. It's a feature of VRF but the complete study of the building demand is not the scope of Ecodesign but of EPBD. Els Baert stresses the importance of multi-functionality. Claus Händel asks clarification: all water to water or DX heat recovery options are excluded? Philippe Rivière indicates what is at stake is heat recovery between zones being cooled and heated at

⁴ It was decided after the first stakeholder meeting that the air-conditioning part of ENTR lot 6 will cover the cooling and heating function of the air-conditioning products covered and will coordinate its work closely with ENER lot 1, 10 and 21.

the same time. Christen Galscaard indicates it's a huge stake. Laurent Legay UTC/Carrier indicates that there is at well a high potential for condenser heat recovery, namely for DHW in hotels. Philippe Rivière says it will not be forgotten, but it is not central.

Roger Hitchin (BRE) gives the overall view of markets of Air conditioning and Ventilation systems based on Task 2 report. They allow to estimate the impacts and to define the base cases. Centralised AC systems: the energy consumption depends on the type of distribution and on the climate to a large extent. Costs are different by system type but in a scattered way. Most of the system costs are not in the Energy-using Products. Sales are shown by country and product type, in terms of share of kW, not numbers. Compressors types are different in sales compared with the stock. In 2030, the chillers installed before 2020 will still represent 55% of stock. Non chillers systems are split between "single splits & rooftops" and "multisplit & VRF". Sizes of AHU may differ from one source to another. They are usually rated A or C and half include HR. Other products are not so well known.

Discussions on task 2 provisional results: Walter Pennati thinks the AHU production of Italy is underestimated because there are many small companies. Christen Galscaard stresses with others that AHU should not include ventilation only units. For instance in Denmark, making a 100% mistake due to this confusion is easy. In Germany 60000 AHU were produced last year with an average 14000 m³/h. René Kemna indicates that the figure depends on where you put the lower limit - 5000 m³/h? - as it results in a change of the average flow. Germany produces large AHU for export. Market information is really missing (if possible to be supplied broken down by category as specified in the Information Request) and will be provided by some stakeholders for AHU and other products below:

- Cooling towers
- Filters
- Other system component products
- Large single-splits
- Terminal units

The status of Ventilation systems analysis in Task 3 is given by René Kemna. Very important information is still lacking. Average flows can be estimated from ventilation standards. A rough estimates leads to a range between 41 and 76 Tm³/h. Starting from total space heating we find 500 Tm³/h. This last figure is more realistic because it corresponds to living space not personal (immediate vicinity) space. The partition of the residential section between low rise and high rise leads to a refinement of the figures into local fans, box fans and heat recovery units. Public sector, sports, retail, etc. are detailed. Industry is not strictly in the scope but the same products will be used. Barriers and policy tools (regulation & tax subsidies) are analysed from a survey. Controls: smaller systems operate continuously, larger have a timer then demand side ventilation rises. Filters and ductwork has to be integrated, in a way to be defined.

Next steps of the project are indicated by Philippe Rivière: second stakeholder meeting is planned in September 2011. Kerstin Lichtenwort asks for indication about other environmental impacts, namely refrigerants (which may lead to a bonus as discussed in ENER lot 10 measures). Christianna Papazahariou (Shecco): GWP is certainly to be taken into account. Martina Loibl (EPEE): the type of refrigerant can be taken into account but cannot alter energy efficiency requirements. Darcy Nicole (UTC): products are leak tight in factory,

the rest is not the responsibility of the manufacturer. Energy is the major impact. Osami Kataoka: evaluate the different levels of internal air quality.

Basics of Base cases are introduced by Philippe Rivière. René Kemna shows the tentative buildings for the study of ventilation and AC. Walter Pennati argues against the size distinction and pinpoints the importance of climate above building type. René Kemna accepts the point for Italy due to the variety in climates. The three climates that will be used in the study allow understanding this problem in Italy – climates of ENER Lot 1 and ENER lot 10 measures. Laurent Legay wonders what the benefits of this level of building definition are. Philippe Rivière answers all systems cannot be used in all buildings.

Philippe Rivière thanks the participants and closes the meeting at 16.00.