MINUTES

8th Expert Meeting
SYRACUSE 26-27 SEP.2018

Campus: Center of Excellence, University of Syracuse, USA.

ATTENDANCE 27 Sep.-2018, participants present in person:

1. Rojas-Kopeinig Gabriel, Universität Innsbruck, Austria
2. Laverge Jelle, Ghent University, Belgium
3. Tariku Fitsum, British Columbia Institute of Technology, Canada
4. Rode Carsten- Operating Agent (OA) Technical University of Denmark, Denmark.
5. Kolarik Jakub, Technical University of Denmark, Denmark.
6. Smith Kevin, Technical University of Denmark, Denmark.
7. Qin Menghao, Technical University of Denmark, Denmark.
8. Elarga Hagar, Technical University of Denmark, Denmark.
9. Grunewald John, TU Dresden, Germany.
10. Burmandir Esfandiar, University College of London, United Kingdom.
11. Zhang Jensen, Syracuse University, United States of America.
12. Deen Tompkins, Deen Tompkins group, USA.
13. De Jonge Klaas, Ghent University, Belgium.
14. Xinging Fan, Dalian university of technology, China.
15. Witterseh Thomas, Danish Technolgical Institute, Denamrk
16. Kundsen Henrik, Aalborg university, Denmark.
17. Abadie Marc, University of La Rochelle, France.
18. Shen Jilia, Syracuse University, United States of America.
19. Prasced Ramesh, Syracuse University, United States of America.
20. Zhang Xvenyan, Dalian university of technology, China.
21. Liu Zhenlei, Syracuse University, United States of America.
22. Arensano Marco, Universita Politecnica Delle Marche, Italy.
23. Zhang Rui, Syracuse University, United States of America.
24. Zhi Gao, Nanjing University, China.

Participants present on skype call

1. Sun Chanjuan, University of Shanghai for Science and Technology, China.
2. Weiss Dirk, TU Dresden, Germany.
3. Manfred Plagmann, BRANZ, New Zealand.

LIST OF ACRONYMS

AI	Action Item
ASAP	As Soon As Possible (in connection to AI)
BEPS	Building Energy Performance Simulation
ExCo	EBC Executive Committee
IAQ	Indoor Air Quality
OA	Operating Agent
RID	Research Item Description
ST	Subtask
STL	Subtask Leader

Thursday, 27 Sept-2018

Start of the meeting and review of agenda**Carsten Rode -Technical University of Denmark,**
Carsten briefly introduced the agenda (ATTACHMENT A) also he has mentioned that the main challenge is to balance between better IAQ and energy efficient residential buildings. Furthermore, design guidelines have to be prepared. He emphasized that some present knowledge gaps concerning the indoor chemistry analysis, IAQ modelling, combined influence of heat, moisture on materials will be filled through this Annex. Carsten highlighted the critical time line of Annex 68 where all work has to be completed by spring 2019 and all results have to be reported by spring 2020. All presentations given at the meeting can be found at the Share Point.

Thursday 27th Sep 2018	
8:00-8:30	**Registration**
8:30-10:30	**Session-1 subtask 2**
10:30-12:20	**Session-2 subtask.3**
1:10- 3:00	**Session-3 subtask.4**
3:00-4:20	**Session-4 subtask.5**

Friday 28th Sep 2018	
8:30-9:10	**Session-1 ST3 leftover**
9:10-9:40	**Managerial issue**
9:40-12:00	**Session-a Annex final report discussion**
1:00- 3:00	**Session-b Annex final report discussion**

1. ST 2 session

For the ST2 time slot, six presentations were scheduled:

1.1 The Progress of ST2 has been presented by Menghao Qin –DTU which included

-Two setups to measure VOC emissions from different building materials under diverse boundary conditions (temperature and relative humidity) are ongoing.
-Two common exercises have been published, the third one will be completed soon.
-The literature review on the exist database and models has been carried out.

1.2 Menghao Qin, DTU instead of Weihui Liang -Nanjing University

The effect of temperature and humidity on the VOC emissions from a wood lacquer

Menghao presented briefly the experiments conducted in Nanjing university to investigate the VOC emission from a wet material. It was concluded that Formaldehyde and VOC emissions from the wood lacquer are positive correlated with temperature. In addition, VOC emissions are highest when RH=50% and lowest when RH=80%.

1.3 Prof. Chen Huang and Dr. Sun Chanjuan- University of Shanghai,

Associations between the emission of indoor formaldehyde and benzene with air infiltration rate in bedrooms

She talked about the problems associated with the modernization to the indoor building materials and furniture and how it affected the concentration of indoor HCHO and VOCs, which have increased. She explained the formation of a research group called CCHH (China, Children, Homes, Health), which has been established among 9 universities in China to investigate the prevalence of asthma among children in Shanghai in the past 20 years highlighting that the percentage has increased from 1.5% to 7.6%. Research has investigated the relation between influence factors such as family background, diet, and indoor air quality on children´s health. 454 families have been investigated through conducting surveys and an experimental campaign to measure pollutants VOC and BTEX. Measurements showed that CO_2 levels have decreased during night due to the increasing in the infiltration rates increment. In children's bedrooms, the difference of the concentration of benzene in different administrative districts and the concentration of HCHO in different construction year were statistically significant ($p<0.05$). It was also concluded that Emission factor (EF) of indoor HCHO and benzene increased with the increase of air infiltration rate, except in houses built after 2006. Meanwhile, the increasing trend in suburban area is higher than in urban areas.

1.4 Shen Jilia, Prasad Ramesh and Liu Zhenlei-Syracuse University,

Green Building Technology Database (GBD):Methodology and Case study

The presentation discussed the building energy consumption in the US, which constitutes 40% of the total national consumption. In the US, green building technologies are implemented and integrated in buildings to reduce building energy consumption. Jilia highlighted some challenges facing the green building application such as building technologies may differ from one building to another depending on local conditions. Developing a reference building is the aim of this research

by assuming that it should have the same geometry and configuration as the target building but without the identified green features. Reference building has the same climate, cite and geometry as the target building (except for Site or Form & Massing analysis). For schedules (occupancy, activity, internal heat gain, etc.), density parameters (people density, lighting density, etc.) and other heat sources, the reference building has the exact same properties as the target building. A building was considered as a case study in Strasbourg, France. A comparison between targeted and reference buildings showed that the energy consumption of the target building was lower than the reference building by about 55%.

1.5 Liu Zhenlei -Syracuse University,

An approach and procedure to develop the database of emission model parameters (Common Exercise 3 of Subtask 2)

Liu discussed the procedures to develop a database from emission tests to make up for an apparent lack of some required coefficients (D_m , K_{ma} , C_{m0}). The procedure starts from an initial guess of the partition coefficient and the initial concentration $\mathbf{K_{ma}}$, $\mathbf{C_{m0}}$. A semi-empirical model for evaporative sources was used to approximate $C_a(t)$ for the initial emission period (first 24 h). It was followed by determination of $C_s(0)$, K_m and K_s by curve fitting. The values of D_m and C_{m0} were limited to make sure the results are reasonable. Finally, the C_{m0} is re-calculated by using the total amount of VOC emitted from the material during the test period. Some modifications are still needed to be included such as (power law interpolation) and to include the similarity method for the case without emission/sorption test.

1.6 Zhi Gao- Nanjing University,

Indoor/outdoor ozone transport and preliminary study of ozone emission from electrical appliances

Gao discussed 18 homes and a couple of office and hospital buildings. The tests included measuring the ozone concentrations while windows are open or closed in addition to the outdoor concentrations. The study highlighted the factors affecting the ozone emissions such as

- Device design: electrode structure, electrode materials, electrode polarity, working current and voltage
- User behavior: Air flow set level, cleaning and maintenance
- Environmental conditions: Temperature, RH

Future studies will include

- Thermal environment study of street space in 6 cities: real location & local climate, vegetation effect:
- The effect of green roof and vertical greenery on microclimate
- Reactive gas transport (ozone) in urban microclimate
- The microclimate in street intersections

2. ST3 session

For the ST3 time slot, seven presentations were scheduled (of which two presentations were moved to the following day):

2.1 John Grunewald- Dresden University,
ST3 CE introduction + organization

John welcomed everyone and gave a brief introduction to ST3 activities. He highlighted that the main ST3 objectives are to analyze available building energy and emission models. A common exercise is dedicated to compare the behaviour of different simulation tools (IDA ICE, EnergyPlus, TRNSYS, NANRAD) by implementing models for the PASSYS cell (PASSYS cell is a European experimental project used to test building construction, it consists of a single test room attached to a service room). The idea was to change the wall constructions of the PASYSS cell and compare the consequences on indoor performance of different numerical models. Modelling has been initiated with thermal, hygrothermal, and air flow analyses, respectively, and since not all the models can make VOC modelling, a decision has to be made to select which tool to use.

2.2 Dirk Weiss, Dresden University
ST3 results from NANRAD- Energy Plus and DELPHIN6 simulations

Dirk illustrated in details the common exercise with fifteen test cases with different boundary conditions of (outdoor conditions, construction, indoor conditions, internal loads, infiltration, cooling/heating conditions and infiltration). For the base case, Essen/Germany outdoor conditions were considered in the simulations. NANRAD, EnergyPlus and IDA-ICE simulation results were compared and RMSE, CV(RMSD), MBE and total error were calculated to evaluate the accuracy of the simulations. An Excel sheet was prepared by Dresden University to easily include any numerical model results and compare it to the existing data using the error analysis parameters. A comparison between different softwares was shown. Dirk asked the Annex participants to decide on a reference case to be generalized to all simulated cases.

Discussion:

Jakub highlighted the importance of deciding a reference data set. In addition, we have to analyze the data and apparent shifts that could be due to mistakes in input data, and we have to agree on the description of the cases and if there are updated versions of the cases. We need also to order the cloud share so it becomes clear for everyone where to upload the latest results. John replied that he has organized the cloud recently and he will send the latest link to Jakub.

2.3 Jakub Kolarik, Technical University of Denmark,
ST3 results from TRNSYS- IDA-ICE simulations

Jakub presented a comparison of IDA ICE & NANDRAD with TRNSYS results that has been executed by Hagar. He highlighted some differences between the set conditions of the two models such as the value of the outside convection heat transfer coefficient and how it in IDA ICE depends on the wind velocity, while in TRNSYS there is the possibility to consider it as a constant value. He showed some comparative profiles of the indoor temperature, included also the NANDRAD and EnergyPlus. RMSE and normalized RMSE were estimated with respect to the NANdRAD results.

Discussion:
John mentioned that the emissivity for longwave radiation are for all inner walls.
Gabriel commented that a normalized RMSE does not make sense and he preferred to use only the RMSE. Jakub mentioned that 5% in coefficient of variations could be considered as a good agreement, but this we need to decide.

2.4 Gabriel Rojas, Universitat Innsbruck,
ST3 results from Dynbil simulations
Gabriel presented numerical models results from Dynbil in comparison with TRNSYS, IDA ICE and IDA-ICE. Dynbil Results showed good agreement with other software's. He highlighted that clear and unambiguous specifications have to be identified to ensure comparability, especially for 3D simulations. The steps, which include adding humidity, airflows, infiltration, and contaminant source models, are expected to be done soon.

2.5 Romesh Prasced, Syracuse University
PASYSS cell simulations
Romesh presented his simulation work executed in CHAMPS, Delfin5 and Delfin6 software for a PASYSS cell. The work is subdivided into two sections, the hygrothermal and VOC analysis for serval comparison cases such as (brick vs. steel and insulation, and for different geometries). It was concluded that CHAMPS-BES was hard to use to simulate the HM cases. Need 1 min to run one time step. Steel + insulation system gives more insulation than brick system with higher internal temperature at winter. While the brick system has more thermal capacity that will delay the peak temperature at summer. On the other hand, analyses of VOC transport through particle board were considered through two cases, with and without solar radiation. It was concluded that CHAMPS software is slow compared to Delfin and the diffusion of the VOC diffusion is faster after taking into account the solar radiation influence.

Discussion:
John mentioned that it would be interesting to compare the influence of window (with shortwave solar radiation and at variable altitudes) using different software.

ST3-Concluding remarks:
John : Common exercises are diverted through different tools, moisture and air flow need to be added to Delfin, where adding VOC emission is currently under progress. We are working on the similarity approach to try to overcome some omissions of the current DB.

3. ST4 session

For the ST4 time slot, five presentations were scheduled

3.1 Jakub Kolarik-Technical University of Denmark,
Strategies for design and control of buildings
Jakub presented the agenda of ST4, including a summary of current activities, common exercises and report. The first activity included a state of the art on how to design ventilation system, collect data from available standards and conducting a survey with stakeholders (designers, engineers,

municipalities, etc.). Some publications are already published covering this activity. The second and third activities are related to design and operation, for example numerical simulation for operation optimization, lab level tests, etc. The last activity is to document the cases studies with challenges and problems, highlighting new ideas.

3.1 Kevin M. Smith- Technical University of Denmark,
Room based demand control of residential ventilation in IDA-ICE.
Kevin explained about a room based ventilation system with demand control installed in a residential building. The ventilation system was integrated with a heat recovery unit and controlled by wireless sensors installed in 4 out of 8 apartments in building in Copenhagen, Denmark. Each unit has an air supply plenum where it is connected to separate fans and air ducts i.e. the air duct system will remain balanced in the supply and exhaust directions, which leads to a more efficient use of electrical energy. Implementing the IC meters where temperature, CO_2, and RH values are used for demand control on room level. The system has given energy savings of 40% per year. Future work will include: Use of the collected data from IC-meters to estimate infiltration, user behavior: occupancy, moisture, in addition to using the optimization tool in IDA ICE for set-points of supply temperature, humidity, and max temperature.

Discussion:
Jelle proposed to use as an unbalanced non-controlled system as reference baseline.
Gabriel asked if there are any sound attenuators in the system.

Welcome by Director of Center of Excellence:
Edward Bogucz welcomed the attendees and talked about the history of the Center of Excellence and wished for a fruitful meeting.

3.2 Gabriel Rojas, Universitat Innsbruck,
Particle generation during cooking and the effectiveness of residential cooker hoods
Gabriel presented measurement results of generation of particles and pollutants coming from residential cooking and how effective the hoods are to capture cooking contaminants. Capture efficiency can vary from 50% to 100% and air flow, geometry, and volume are parameters that affect the efficiency. A comparison between extracting and recirculating residential kitchen range hoods for the use in high energy efficient housing has been carried out. An experimental set up was executed to investigate the air quality after using the recirculating hood and for 6 different commercially available filter types (filters included 3 new and 3 used), cooking onions, burger and heating oil (some test also with fish, toast and eggs). Results showed that the tested carbon filters reduced the particle mass by 60-70% (particles ~2µm) and caused a reduction of count of Ultra Fine Particles by 0-50%, which mainly depended on cooking types and substances. In addition, it reduced the UFP formation by taking out the grease from the fumes. Finally, the performance of carbon filters was better than expected, but further improvement is still needed for better indoor air quality.
Discussion:
Jelle had two comments, the first: the test was executed using 100% capture efficiency, what would the comparison will look like if the efficiency was varied? The second was related to energy calculation and if the temperature drop during cooking time was taken into account.

Jensen asked how do you calculate the capture efficiency was calculated, and Gabriel replied that he only checked the filtration efficiency, and a comparison of how much the filter removes was executed with and without the filter.
Fitsum asked if the recirculation fan started only when cooking started, and when it was shut down. Gabriel replied that it was running before cooking and continued after the cooking was finished.

3.3 Jakub Kolarik, - Technical University of Denmark,
Summary of activity 4.1 – Requirements, guidelines, barriers and challenges with respect to ventilation in low energy residences (prepared by Daria Zukowska)
Jakub talked a little about activity 4.1, participated countries, the guidelines for practitioners and stakeholder surveys. The survey was a structured interview for designers and building owners, and different countries participated in the surveys with more active interaction. China was excluded from the journal article due to lack of data concerning the surveys.

Discussion:
Gabriel: the idea of over flow ventilation is a novel idea and it could overcome the duct space problem. It was originated in Switzerland, and is now under investigation in Austria. Carsten and Jakub proposed to have a title of Mechanical ventilation in residences – current challenges, innovative solutions and outlook for the ST4.

3.4 Jakub Kolarik-- Technical University of Denmark,
Activities 4.2 and 4.3 – Focus on design and operation
Whilst activities 4.2 and 4.3 focus on design and operation, Jakub presented several case studies, which will be included in the ST4 chapter such as the study on recirculating kitchen hoods and overflow ventilation systems by Gabriel. Jakub highlighted that the idea behind this case study summary is to inspire stakeholders with new ideas. Each example will be presented in two pages with accessible references included. In cases when references are not accessible, the case study presentations will be extended to 6 pages. By 15 Oct all participants' cases will be collected and by 15 Nov the editorial board will select the most related cases to be demonstrated. At the next meeting in Copenhagen more consistent results will be presented.

4. ST5 session

Jelle clarified ST5 presentations and mentioned that for the ST5 time slot, six presentations were scheduled.

4.1 Fitsum Traiku, British Columbia Institute of Technology

Ventilation Rates & Effectiveness

Fitsum presented an experimental investigation concerning the effectiveness of a ventilation system with low CFM rates according to the ASHRAE 62 standard and the distributed ventilation design. Test buildings with an area of 200 ft^2 were used. Parameters such as air temperature, CO_2, and RH were measured in five different vertical positions. An occupant simulator with a defined schedule

was used. In addition, a mixed ventilation and under floor ventilation systems were investigated. Results have shown that:
-A radiant floor heating system creates more uniform surface temperature distribution compared to Heat Hump HP, Electric Board Heater EBH and Panel Radiant Heater PRH.
-The RH and CO_2 distribution shows that higher ventilation flow rates results in slightly lower RH and CO_2 concentrations compared to lower ventilation flow rates.
-15 cfm provides relatively high Contaminant removal effectiveness CRE than 7.5 cfm, and it is also true comparing 7.5 cfm to 5 cfm.
-Overall, the higher the ventilation flow rate, the better is the indoor air quality.
Discussion:

Gabriel asked how the outer conditions were considered especially since the experiments include four different heating systems. Fitsum replied that the experiments were run in January and that they selected a comparable outside temperature for each two cases that had to be examined in parallel.

4.2 Jelle Laverge- Ghent University

The dormitory Experiment, (prepared by Sara Paralovo)

Jelle presented an experimental campaign held at the student dormitory studio in Belgium with two pollutants sources (particle OSB and Paint). The experiments lasted for three weeks in February 2018, initiated by measuring normal conditions, followed by high RH, high Temperature, high RH again, and then all sources were removed and another round of measurements was carried out. VOC, Temp and RH were measured and the ACH was 1.1 h^{-1}.

The next steps will include: To re-do the dormitory experiment to explain some results. Some issues will be considered such as to use shorter sampling tubes, to take extra care to avoid leakage; and finally to observe the effect of occupancy.

Discussion: Jelle mentioned that results are summarized in a report on the Share point.

4.3 Manfred Plagmann, BRANZ

IAQ of four 'high-spec' New Zealand houses – a pilot study (prepared by Roman Jaques)

Manfred presented a BRANZ project and how to refine a practical method to measure IAQ in new dwellings. And to gain better understanding of 'typical' pollutants and remediation opportunities in high performance, mechanically vented New Zealand dwellings through a pilot case study. 4 houses located in Christchurch were investigated with higher-than-Code insulation levels, balanced ventilation, measured infiltration rate (i.e. blower door tested). Measurements lasted for 1 week each season. HCHO, CO_2, CO, PM 2.5, Temp and RH were measured.

Discussion:
Marco asked how the PM 2.5 was defined, and Manfred replied that it is the USA EPA IAQ categories (24-hr moving average).

4.4 Fitsum Traiku, British Columbia Institute of Technology

Annex 68 Design and Operational Strategies for High IAQ in Low Energy Buildings

Fitsum presented the information sheet and how to fill it in. He clarified the required information such as location, type of building, floor area, and heating system. Fitsum has used a case study in Canada as an example, and he asked for suggestions how to improve the information sheet.

Discussion:
Jelle mentioned that this sheet is prepared to all participants who have case studies in order to summarize the project description and lesson learnt, which also will be an output of ST5. Gabriel asked if this sheet is only a summary and Jelle approved and added that for each case a link will be provided if more detail needed.

4.5 Esfand Bruman, University college of London.

Reflections and comments on the spread sheet

Esfand thinks that the spreadsheet is user friendly and he mentioned that it would be good to standardize the units rather than leaving it for the users. In addition, it would be good to add more information about the type of heating system. For the IAQ section, limiting the values to the maximum and average, it would be helpful to include the minimum, median and quartile values. Jelle replied that ST1 has confided to average and maximum values and ST5 has followed this matrix. Esfand added that type of used sensors, accuracy and uncertainties, measurement period and frequency of readings could be also added to improve the sheet.

4.6 Klaas De jonge- Ghent University

Impact of heating system on emissions and VOC simulations

Klaas explained about three main objectives of his study, which are: impact of having a demand control compared to standard ventilation system; influence of different heating system; and the influence of the number of occupants. An emission model has been implemented in CONTAM. Three types of families, four ventilation systems: mechanical exhaust, mechanical supply and exhaust, mechanical ventilation with CO_2 monitoring and control for supply; and humidity control for the mechanical exhaust. Results have shown that temperature and RH have a great impact on VOC emissions. In addition the occupants have a noticeable influence on the DCV.

Discussion:
Gabriel, asked if the temperature and relative humidity dependency was for formaldehyde and if the emission source comes from the floor only and Klaas replied "yes" to both questions. In addition, Gabriel asked if the air temperature was kept constant. Klass replied that air temperature was kept constant at 16°C in hallways and 24°C in other rooms according to the Belgian STDS but at night, the temperature declined to 16°C only at the case without floor heating to mimic thermal inertia.

Friday 28 Sep-2018

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21. Gao Zhi, Nanjing University, China.

5. Left over presentations

The day started 8:30 am. Carsten Rode thanked Jensen and everyone for a successful work and social meeting yesterday. Then John started his presentations that were left over from the day before.

5.1 ST3- John Grunewald- Dresden University,

DELPHIN6 VOC model implementations and Analysis of VOC diffusion and partition similarity relations (back to back presentations)
John presented briefly the history of the Heat, Air, Moisture in Building Envelope Systems (HAM-BES) modelling with VOC implementation starting from CHAMPS-BES to Delfin 6 by including the VOC balance equations (gaseous and adsorbed phases). A brief introduction to DELFIN6 was clarified highlighting the VOC DB included in the software. John mentioned that only one single VOC material could be included in the simulation per time. Material mapping could be a solution of the VOC DB shortage by matching with a reference material, which is already available in the current DB. John explained the governing equations, including balance and phase transition terms between gaseous and adsorbed VOCs, resulting in four unknowns for the elements. John also clarified the similarity approach using the water vapor.

Discussion
John asked the participants if more information is required for future purposes of VOC simulations. Carsten said that it would be informative to include the influence of humidity. John clarified the content and login information to the Dresden university cloud, which includes the tool and modelling document.

6. Managerial Issues

Carsten rode-DTU has presented some administrative issues: He started by putting the overall objectives of Annex68, confirming that if any changes in plans have occurred, participants should declare it to the ExCO. In addition, he clarified that even with the update for the extended time plan, he urge participants to know that we are now in the documentation phase.
In addition Carsten said that now we should 'Wrap up all common exercise and current activities to make sure that Annex 68 finishes on time´. Carsten showed the list of agreed deliverables that should come from Annex 68. He stressed that if any changes are needed, they have to be declared now.

Carsten talked a little about the participating countries, mentioning that Estonia is not an EBC member but that it has been exceptionally permitted by the ExCo to participate as an observer country in the Annex 68 work. Jakub asked if Estonia's contribution couldn't be included and Carsten replied that it is permissible.

Carsten asked ST leaders for 2 page status reports to prepare the Annex68 status report which shall be sent to Ex-CO/EBC program by the end of October.

Carsten also encouraged participants to write reports and identifying authors.

CHAMPS workshop will continue and topics and places are open for discussion. Jensen proposed to attach the workshop to different PhD summer schools for the continuation. John proposed the Central European building physics conference that will be held in Prague in Sept. 2019, which might be a good opportunity to host the CHAMPS workshop. Another option Carsten Proposed is IAQVEC 2019 (5-7 Sept. in Bari). Jensen proposed that it could be hosted by Nanjing University, and he will make further investigations into this possibility.

Carsten also mentioned that he participated as a visitor in the Board of Directors meeting of the AIVC and he encouraged participants to send him relevant reports to be published to AIVC webpage.

Carsten urged Jakub and Jelle to summarize in an article their Webinar presentations regarding cheap indoor climate sensors.
Furthermore, Carsten urged participants to cooperate with other annexes related to ventilation themes.

Carsten urged participants to check the Website and Share point for revision and feedback and to possibly publish the Annex 68 results at the coming AIVC conference in Ghent (15-16 October 2019).

7. Final report plans

Carsten asked each ST leader to present the documenting plans for the remaining time period to identify clearly final tasks as: finalize list of contribution, final decisions regarding layout, final version of chapters.

ST2

Menghao Qin clarified the contents of the report (indoor pollution due to indoor materials and assemblies), In total there are five chapters, including CH-1-introduction, CH-2 definition of reference buildings, CH-3 the model based and testing of VOC emissions CH-4, the effect of T and RH on the VOC emissions, CH-5 the DB of VOC emission for the IAQ simulation.

Discussion

Carsten asked about the timeline and Menghao replied that only some writing is needed and some coordination with Jensen and John will be executed and it is expected by the end of this year all pending issues will be solved.

ST3

John Grunewald, has presented the expected participants list and he gave an overall idea about the scientific contents including the balance equations, VOC data, Delphine 6 and similarity approach, reference cases and common exercises. John highlighted also that quality assurance procedures are needed for developed models, he proposed a procedure that could be followed, which is producing each night automatically a list of reference cases then evaluation steps happens to compare reference cases with solutions and if the solution is not the same so next morning developers receive a notification email that there might be an error.

Carsten asked John to clarify contributors list and timeline for each chapter, John replied that this is not the first priority but, to finish the VOC data and the similarity approach.

ST4

Jakub Kolarik, talked briefly about ST4 deliverables and he clarified a template for the contributions to help participants documenting their common exercises. He will ask DTU's graphical experts to organize the contents of each case to be nicely fitted in 2 pages. Jakub also clarified that a discussion is still needed to determine if 2 pages are enough for each common exercise or it should be increased.

Discussion

Carsten highlighted the importance of assigning the time line and editors list to avoid that any obstructions might happen during the documenting process.

ST5

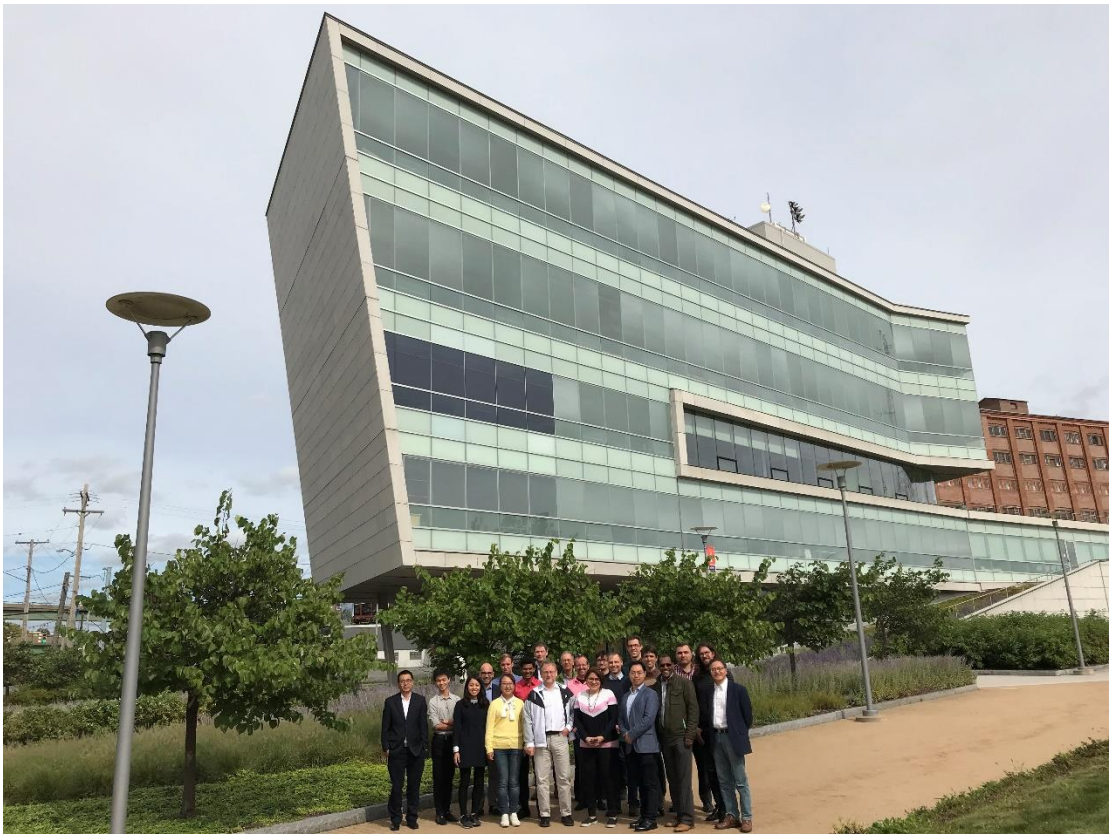
Jelle Laverge clarified ST5's three main parts of the report. The first part is regarding the Excel spreadsheet, which will summarize the collection of all case studies. Jelle urged everyone to fill in this sheet and send it back to Fitsum and him. The second part shall report on controlled experiments. And the last part will be a literature review regarding measuring techniques, which is available on the Share point for review.

The title of the first section name will be "Indoor air quality assessment" and it shall include different measuring techniques such as for radioactive compounds and biological pollutants that have to be clarified. The second section will be regarding "Ventilation flow rate measurements", using tracer gas test, air leakage testing, component air tightness, and air flow turbulence. Jelle also determined the list of participants related to each task.

Final Words

Carsten urged participants to consider and discuss ideas for a possible follow up Annex that could be proposed to the ExCo. Jelle suggested that this is something that we can maybe agree on by the Copenhagen meeting so we will have a more clear idea by then.

Carsten invited and welcomed everyone to join the coming Annex 68 expert meeting in Copenhagen on March 11-12, 2019.



Picture: Participants in the meeting