Learnings from SERG hosting a virtual 4-day conference

The Energy and Climate Change Division (ECCD) and the Sustainable Energy Research Group (SERG) within the School of Engineering at the University of Southampton, UK, hosted the International Energy Agency's (IEA) Energy in Buildings and Communities (EBC) Programme Symposium and Task Group meetings addressing Occupant-Centric Building Design and Operation ('Annex 79') from 20-23 April 2020. In light of the COVID-19 pandemic, the 4-day event took place virtually using a video and web conferencing platform. This was the first time the event was held online. The ease of attending virtually, facilitated by the Management Team, resulted in a record attendance of over 230 delegates from 25 countries and 82 institutions (Fig 1).

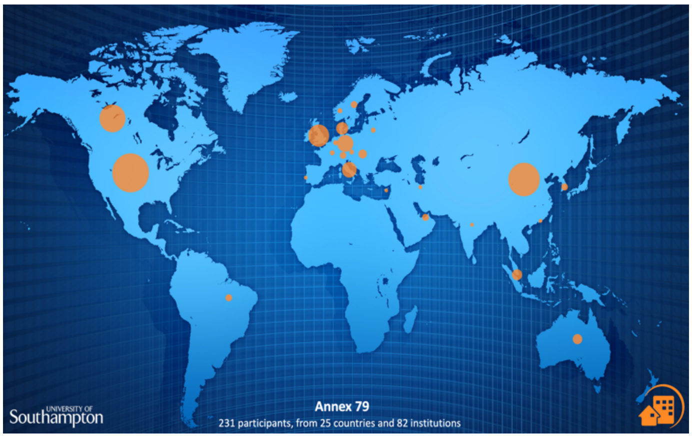

Fig 1: Map of IEA Annex 79 attendees

Topic	Attendees	Concurrent views
Symposium Session 1	155	125
Symposium Session 2	150	131
Symposium Session 3	144	121
Symposium Session 4	131	111
Symposium Session 5	136	118
Symposium Session 6	123	115
Expert Meeting Day 1	136	126
Expert Meeting Day 2	122	115

Table 1: IEA Annex 79 attendance figures

Leading academics, practitioners, policy-makers, manufacturers and students from the fields of engineering, architecture, psychology, sociology and marketing came together to exchange ideas and good practice. Creating and strengthening partnerships to integrate and implement occupancy and occupant behaviour into the design process of buildings and their operation, enhancing both energy performance and occupant comfort.

The first two days of virtual meetings (20-21 April) comprised the 5th International Symposium, and a full programme of six sessions, chaired jointly by Stephanie Gauthier and AbuBakr Bahaj of ECCD (Fig 2). With the various presentations and question and answer sessions covering cutting-edge research from around the world, including topics as diverse as building simulation, teleworking, 'big data' modelling, nudges and behaviour change, introducing a range of case studies and academic approaches to the attendees.

The final two days (22-23 April) was dedicated to the 4th IEA EBC Annex 79 Expert Meeting (Fig 3). These expert meetings discussed, planning and pursuing research activities and initiatives for the five year Annex 79 across the four sub-tasks:

- Subtask 1: Multi-aspect environmental exposure, building interfaces, and human behaviour.
- Subtask 2: Data-driven occupant modelling strategies and digital tools.
- Subtask 3: Applying occupant behaviour models in performance-based design process.
- Subtask 4: Development and demonstrations of occupant-centric building controls.

These Subtask Meetings included an overview of activities within each subtask (plenary) and then three breakout sessions held as Breakout Rooms within the digital platform. The Rooms provided flexibility to allow participants to join appropriate sessions and move between the subtasks. The discussion that ensued in the various sessions covered how to implement innovations and the transfer of knowledge between researchers and practitioners in the best practice for occupant-centric building design and operation. With participants sharing, a post-meeting drink together in various time zones honouring Annex tradition.

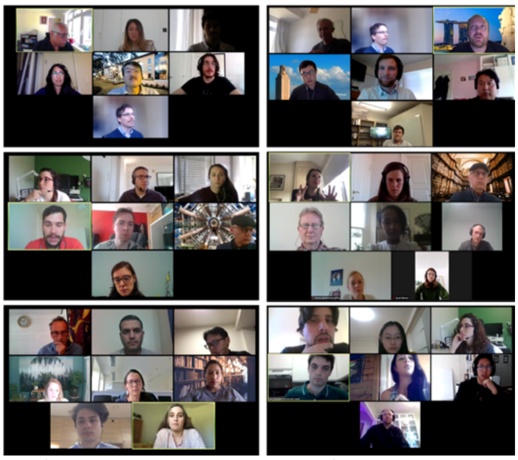

Fig 2: IEA Annex 79 Symposium presenters.

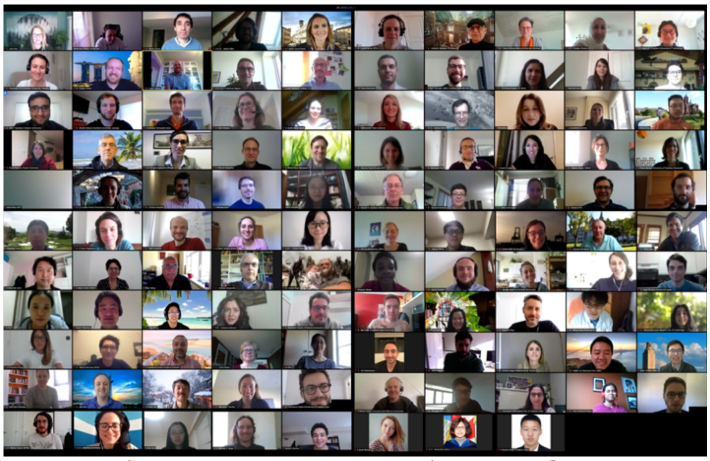

Fig 3: IEA Annex Expert Meeting group photo.

The follow-up event will be held at the University of Southern Demark lead by Professor Mikkel Baun Kjærgaard see annex79.iea-ebc.org for further details. With a number of lessons learned in the planning and deployment of the event, this report will aim to document the approach and recommended best practice for the benefit of those planning to host similar events.

Types of virtual conference format

There are a number of formats of virtual conferences, while we conducted a fully remote conference with 100% remote participation there are three other forms.

If you are able to host a traditional face-to-face conference, you can expand your audience by live-streaming the proceedings on video platforms such as YouTube, still allowing for participation through messaging or comments on the live-stream. Secondly, if you wish to support a traditional conference with virtual presentations, you can utilise two-way enable conferencing platforms such as Zoom or Skype as opposed to video platforms allowing interaction for all participants. This can be a viable option to involve speakers who are unable to travel for environmental, monetary or time purposes. A third and growing option is a semi-virtual conference with interconnected regional/local hubs allowing attendees to assemble in multiple locations reducing the time, cost and emissions related to travel. This multi-location semi-virtual approach is a best-of-both approach that can be of particular use for international conferences.

The 100% remote participation – as implemented for the Annex 79 event- can be in two modes, either involving pre-recorded presentations where communication can be over comments or live and interactive with Q&A sessions. An online conference can easily be recorded in alternate viewpoints (gallery, presenter, shared screen) benefitting those who may have been unable to join due to time zone differences. Innovative, simple formats such as the Zoom web conferencing platform, which was deployed for the Annex 79 event, are helping lower the technological barriers to entry which have previously dissuaded organisations from hosting virtual conferences. Furthermore, a solely virtual conference forgoes the need to arrange rooms, food, accommodation and visas, allowing reducing the burdens on organisers. This being said, it will still require time and funds to organise, heavily dependent upon the host institution's previous experience in organising and attending virtual events and the cost of the digital platform and associated training (if required).

Selection of online platform

When selecting an online platform, you should consider its familiarity and simplicity, whether users will be required to download software and the likelihood of attendees being familiar with the software. One must also consider technical support and training, whether someone in the division has experience/skills in the software, and whether the selected platform provides technical support and training. Both are likely to incur an additional cost but are recommended if you are working in a small team or have nobody with the relevant experience/skills.

It is recommended that you draw out a draft timetable of your event in advance of researching into the various conferencing platforms to ensure that you select the platform best suited to your event. Additionally you should always try to have a backup teleconferencing platform with similar features as a contingency plan.

Registrations and pre-event messaging to participants and presenters

A website form should be implemented for registration to capture participants details (contact information, institutions and location) using a webstore or equivalent when charging a registration fee. Location data is required to ensure that the timing of the conference is suitable for the majority of attendees. While you want to ensure that those hosting the event will be doing so during normal work hours if the majority of attendees are in a different time zone it may be pertinent to alter the timing. Be conscious of attendees and in particular presenters who will be required to attend during irregular hours offering thanks for their understanding. For the Annex 79 event the format was altered from a 3 to 4 day event allowing for shorter sessions, minimising the burden on those having to join during non-work hours. Running a virtual event allows one the opportunity to prolong the event over multiple days or host alternate time slots suited for alternate time zones. For our event we opted for a single time slot as we wished to maintain momentum and focus, if you provide multiple slots for different time zones you are likely have reduced attendance for each session whereas having a set shorter time period we managed to maintain a regular attendance over the four days.

Manual export of contact details can be used to email event updates, joining instructions and meeting IDs to attendees. If it is possible to set up the online meeting/webinar prior to opening registration this will allow meeting details to be sent automatically, reducing administration time, particularly useful with late registrations. Invitations should include whether the joining instructions can be forwarded on. For a free to attend event this can be a useful method to boost attendance, making sure the meeting platform has sufficient capacity. Registration numbers should be continually reviewed to ensure that the maximum capacity is not breached.

Traditionally programmes have to be prepared and printed in advance of the event, being virtual however allows one to continually amend the programme as presenters withdraw or change. The document should be referenced in all communication with either a link or QR code, sending out an attached PDF version as part of the final reminder email to attendees. The programme should include a short guide on the digital platform including how to join the virtual meeting and information on the format of the event, in particular detailing the forms of engagement attendees will have.

Methods of engagement and communication

There are various methods available for attendees to put forward questions; either verbally, through the meeting chat window or via a Q&A feature. Verbal questions can either be conducted through all participants having permission to speak or through the host providing permission to those selected by the Chair having 'raised a hand' mirroring a traditional conference. The chat feature can be used however, as it is just a continuous text field this can be difficult to manage, particularly for events with large audiences. Q&A features are often included in conference software, however secondary dedicated platforms, such as Slido are available to manage questions. Having a dedicated Q&A feature will allow all attendees to easily view and upvote questions (reducing the likelihood of duplicate questions) and provide the Chair with the ability to dismiss a question once they have asked it to the speaker/panel. Advice should be given to attendees on how best to pose their question, asking that they state who the question is aimed toward, of particular importance for open Q&A sessions.

The method of Q&A should ensure that all participants have equal access to ask a question (how many will join with a microphone) and that the posited questions can easily be viewed and upvoted. It was for this reason that we decided to host separate Zoom webinars for each presentation session, ensuring that only questions pertinent to the session were viewable by attendees. While it can be argued that allowing for verbal questions can increase attendees interaction, using a Q&A feature provides (a) a greater level of control with the chair deciding on follow up questions, (b) the ability for presenters to provide additional written answers to questions and (c) an ability to store the questions on a depository for further discussion and communication post-event, ensuring all attendees questions are answered. While it is preferable to maintain all facilities within a single platform it may be optimum to provide a separate channel for Q&As, when trialling systems one needs to determine the ease of use for attendees and the Chair.

Added to this you need to outline a method of communication for reporting issues or technical problems ensuring that issues are easy to identify and respond to. If, for example you have two hundred attendees communicating over a group chat if someone posts a technical problem within the chat it could easily be missed, thus you need to allow for individuals to either directly communicate with the host through a private chat or provide a separate channel such as Skype/email. Certain software packages may provide technical support staff as part of your contract/package and it is worth investigating whether this available. For the Annex 79 meeting we advised participants in the meeting to privately message the host if they encountered a technical issue who would then respond with initial support and if the problem persisted would instruct them to raise the issue via a Division email. A separate team member was monitoring said account and was able to immediately respond and, if required, set up a separate online meeting to provide further support and test features without having to upset the flow of the event.

As mentioned, simplicity is key, however when planning a digital event one needs to consider the duration. If it is a one-day event, then all processes have to be quick and easy to learn and so it is likely to be preferable for all actions to be within a single platform. If, however, the event is over multiple days then participants are likely to become more confident in the platform over time, and you would likely be able to include additional platforms or processes latter in the meeting. The first session of an online event is likely to have reduced involvement from attendees as they familiarise themselves with the platform, thus this should be kept as simple as possible. For example, the Annex 79 symposium took place in advance of the expert meeting, this provided two days of presentations where attendees only had access to the chat and Q&A features. Following this they participated in the expert meeting where everyone had access to microphones, screen sharing and were required to use breakout rooms. Where possible, sessions that require the highest level of engagement and involvement from attendees should be left to the latter stages of the event.

Preparation of chairs and hosts

Even though the event will be held digitally it still needs to be rehearsed, for those with limited experience this is imperative and should be conducted multiple times with various attendees and group sizes. Hosts, chairs and presenters should all be given advanced access to the platform to undertake specific rehearsal sessions.

Hosts need to become familiar with all the web conferencing features (Q&As, breakout rooms, etc.) and experience multiple roles (host, co-host, panellist and attendee) from multiple platforms (PC, Mac, tablet, mobile) to better understand what each participant can and cannot do, and test what each participant's experience will be, in order to provide instruction and troubleshooting advice. With features such as renaming (display name), audio settings and chat often appearing on different areas of the screen or within alternate menus dependent upon an attendee's status and device.

Chairs should undergo multiple training sessions, familiarising themselves with the features and various roles with explicit instructions on their roles and responsibilities. It is best practice to prepare a guidance document for Chairs providing a script, outlining: introduction, speaker and Q&A sessions and closing the session. The introduction should include a general welcome to the session, a reminder that it is being recorded (if applicable), the basic 'ground rules' (the methods with which attendees can raise questions, communicate to the host and report technical issues) and the format of the session reminding all presenters to have their presentations open and ready to share. The speaker and Q&A sessions include basic introductions to each speaker and a reminder for Chairs to continually ask attendees to compose or upvote questions through the Q&A feature. It was advised that if questions were addressed to multiple panellists the Chair would suggest an order of response. The closing of the sessions included all the necessary thank you messages, instructions on joining the next session and a reminder about the recommended hashtag for ongoing discussions over social media.

Ahead of the event, presenters were provided multiple short slots to practice hosting their presentation and check their microphone settings. This involved presenters one-by one sharing their screen, testing their microphone and familiarizing themselves with the platform features allowing them to ask the hosts any questions about the event. It is advised that you offer session specific slots to reduce the likelihood of too many presenters joining at once and having to wait long periods of time to practice. If you have many international presenters, you may wish to provide continent rather than session specific time slots. Presenters should be instructed to keep their video feed on while presenting and during the open question and answer session, of most importance as no presentation will be being shared. It is wise to remind presenters once more that the session will be recorded ensuring permission to host and share the session post-event (further to this an email should be sent to all presenters post-event setting a deadline for presenters to withdraw permission for their presentation to be made public). While practicing should reduce the likelihood of complications, the hosts should have back-up copies of all presentations that they can share in case of any last-minute difficulties.

If you are unable to run a practice session for attendees, alongside providing joining information within the programme there should be a detailed help and instructions page on the event website and a concise guidance document to be sent out with the invitation and reminder email. This document should outline how an attendee joins the event and what they should expect when they join (i.e whether they have access to their microphone, methods of communication etc.) with additional links to the event website and the chosen platforms help pages. See the Annex 79 web conferencing information page (https://iea-annex.org/web-conferencing/) for example, which includes links to the relevant Zoom webpages.

Management and execution of the event
If possible, try to keep a consistent main host throughout the entirety of the virtual event, allowing all attendees to know who the main contact is with any issues/concerns. The hosts roles during the event will include locating and upgrading select attendees to panellists or hosts when they are participating in a session, conducting last minute practice sessions with the panellists and conversing with all attendees explaining what is going to happen, and reminding participants on the method of reporting technical issues. We recommend using a second host (co-host) to share responsibility for some of these tasks, allowing the lead host to continue to converse with panellists or attendees either verbally or through the chat. A second host is of most importance at the start of the event (when there is likely to be the most technical issues) and during any registration/joining period. While collaboration should be flexible it is important to clearly define the key responsibilities and priority actions between hosts. You should have contingency plans (third back-up host) for sickness or internet outages, both of which are particularly pertinent during a global pandemic. Added to this, hosts and moderators should have a separate communication channel (e.g. Microsoft Teams, Skype etc.) during the event to ensure all individuals are aware of any situations providing greater adaptability and responsiveness.

During registration/joining periods it is wise to share a welcome screen presentation that clearly states the name of the event and provides clear instructions on who to contact if you require support. Additionally, it helps to either have low level music playing or communicate semi-regularly so that attendees know the sound is working.

Presenters should be advised to join their session at least 15 minutes before the start time in order to allow each person to quickly test their microphone and screen sharing capacity. Despite having conducted a training session in advance of the meeting some presenters may use a different set-up or have missed the training so it is imperative to test the audio quality of each presenter as early as possible on the day.

The online platform should allow for private messaging between attendees, allowing them the opportunity to arrange one-to-one appointments and with efforts made to ensure all attendees have access to the contact details of all the presenters. This said, it may be beneficial to include dedicated networking time to encourage conversation and crossovers. Utilising registration information, organisers could link attendees with similar interests/backgrounds and create a number of breakout sessions or allow attendees to personally decide upon and join small breakout rooms themed about relevant topics/issues, with each room facilitated by a room host. In order to allow effective networking, breakout rooms should be capped to no more than 25 participants thus allowing all participants opportunity to speak. Regardless of whether you provide networking slots during the event, a post-event breakout opportunity should be provided either through an open meeting room (as implemented for the Annex 79 meeting), message/chat board or other more novel methods such as virtual environments for attendees to populate and communicate.

Fig 4: IEA Annex post-meeting breakout opportunity where attendees shared a drink together.

Lastly, while the Annex 79 meeting did not incorporate poster sessions, this is a standard feature of most conferences and whilst not easily replicated can still be incorporated. We would advise preparing a virtual showcase (on the events website) allowing attendees to share their posters, with a comment sections and contact details encouraging attendees to contact the authors during the event. Further to this, posters (with clearly legible contact information) could be included in a revolving presentation exhibited during scheduled breaks.

One should acknowledge that when running a digital event, you are likely to encounter at least one or two technical issues (particularly when inviting a large audience). If there is a particular feature that is prone to difficulties it is often best making attendees aware of potential problems and explain how these can be mitigated. For example, during our practice sessions using the Zoom Breakout Rooms function we found that on occasions it would eject attendees that were attempting to leave a breakout room, resulting in them having to re-join the session. Most attendees would not be changing breakout rooms and so the issue was considered too minor to pursue an alternate strategy, and during the event this was not an issue with only a couple of cases being accidently ejected. As attendees had previously been warned about this issue, they re-joined the meeting and were able to join a new breakout session with minimal disruption.

More information about ECCD and SERG can be found [here]() and please contact serg@soton.ac.uk if you have any questions or queries.