

**Building EQ Committee
Virtual Annual Meeting
June 18, 2020**

Participants: Doug Cochrane (Chair), John Constantinide (Vice Chair), Rob Risley (Business Development SubC Chair), Chris Balbach (Methodology SubC Chair), Esteban Baccini, Charles Eley, David Underwood Hugh Crowther, Dennis Knight (Coordinating Officer)

Not available: Daniel Redmond

Incoming Members: Mahroo Eftekhari, Anoop Peediyakkan, Michael Deru

Staff: Lilas Pratt (staff liaison), Jeff Littleton, Alice Yates, Emily Porcari

Guests: Darryl Boyce, Mick Schwedler, Bruce Hunn, Ross Montgomery, Stephen Roth, Charles Dorgan

Principal Motions¹

Motion #1: John Constantinide moved, and Chris Balbach seconded that the meeting minutes from the Building EQ Committee February 3, 2020 Orlando Winter Conference be approved.

Vote: Motion passed by unanimous voice vote. 6-0-0, CNV

Motion #2: John Constantinide moved, and David Underwood seconded that the Building EQ committee recommend that the BOD include \$14K in the SY 20-21 Budget for the operation of the Building EQ Portal.

Vote: Motion passed 7-0-0, CV

New and Open Action Items

June 5, 2020 Methodology Subcommittee Virtual Annual Conference

- **AI 1:** Lilas Pratt to post the documentation for PRM methodology on Basecamp.
- **AI 2:** Chris Balbach to ask 1771-RP PI to present at an upcoming Methodology SubC meeting on the application of Task 5.
- **AI 3:** Methodology Subcommittee to provide suggestions on virtual assessments to Standard 211 committee and TC 7.6.
- **AI 4:** Chris Balbach to ask Tianzhen Hong to speak about system level KPIs at a future Methodology Subcommittee meeting.

June 4, 2020 Business Development Subcommittee Virtual Annual Conference

- ✓ **AI 1:** Lilas Pratt to query the portal to determine how many projects are using French or Spanish.
- **AI 2:** Lilas Pratt to generate an initial spreadsheet list with columns for use in targeting organizations.
- **AI 3:** Rob Risley and Lilas Pratt to generate a proposed prioritization of target organizations.

¹ All votes are recorded as yes-no-abstain.

- **AI 4: Rob Risley** to work with **Bill Dean** to determine how to take advantage of ASHRAE MOUs to reach out to other organizations.
- **AI 5: Dan Redmond** to follow up with CTTC on best way to follow with additional information after Building EQ presentations to chapters/regions.
- **AI 6: Lilas Pratt** to provide a list of resources available for follow up to Dan Redmond (including videos, handouts, case studies, testimonials).
- **AI 7: Bruce Hunn** to ask what kind of follow up might be helpful at his June 9 presentation.
- **AI 8: Lilas Pratt** to send an email to Mark Owen about the feasibility selling advertising space on the Portal.
- **AI 9: Lilas Pratt** to ask ASHRAE Marketing how traffic on the Portal is tracked as that information will be essential for advertising decisions.
- **AI 10: Lilas Pratt** to create a straw poll of potential survey questions to send to users.

May 14, 2020 Methodology Subcommittee Web Meeting

- **AI 4: Chris Balbach** to reach out to Liam Buckley at IES Virtual Environment to see what arrangements might be possible for use of their software. **On-hold**

February 3, 2020 Orlando Winter Meeting

- **AI 1: Lilas Pratt** to have IEQ wording changed from screening to observations.
- **AI 4: Lilas Pratt** to meet with Ross Montgomery to look through Portal to see what projects might make good case studies options. **On-going**
- **AI 5: Dan Redmond** to coordinate with SSPC 62.1 on instruments used for air quality measurements.

February 2, 2020 Business Development Subcommittee Orlando Winter Meeting

- **AI 2: Lilas Pratt** to mine some data from the list of universities downloading course material and provide to the committee for follow-up by the committee.

January 13, 2019 Atlanta Winter Meeting

- **AI 1: Lilas Pratt** to contact Montana University regarding ASHRAE use of their one hour course. **On-going**

January 12, 2019 Business Development Subcommittee Meeting

- **AI 3: Lilas Pratt** to develop French Portal examples (screens/reports/etc.) for use on sales calls to Hydro Quebec. **On-going**

Meeting Minutes

1. Call to Order – Meeting convened at 11:06am EDT, Quorum was established
2. Report from the Chair
 - Committee Chair, Doug Cochrane, thanked the committee for their wonderful work.
 - He noted that there 59 countries represented in the Portal. There are 8 users registered in French with 3 active projects and 16 users registered in Spanish with 6 active projects.
 - There have been 95 downloads of the university course with 52 of those for universities located outside North America. The university course has been translated into

Spanish for use in Argentina and Walter Lenzi is moving forward with translating the course into Portugal so that it can be used in Brazil.

- Hugh Crowther completed 4 podcasts which are now posted on Building EQ landing page. The podcasts provide a great overview of the Portal.
- John Constantinide has 4 case studies in progress.
- The Portal has been migrated to a secure server which will allow DOD facilities to use the Building EQ Portal.
- Tim Wentz has shared that the University of Nebraska, Lincoln has a master plan of sustainability where all 153 campus buildings will have a Building EQ assessment.

3. Report from Society President

- Society President, Darryl Boyce, shared that while he believes Building EQ program is important, it is on the list of Society budget cuts for FY 20-21. He noted that cutting the program would tarnish ASHRAE's reputation. The Portal:
 - has been promoted heavily with APPA and building organizations
 - directly supports the Society vision of healthy/sustainability
 - has a huge global reach
 - directly supports building owners and their ability to evaluate operations with specific actions
 - has developed onto a solid platform that could be expanded to IEQ evaluations which is becoming an important consideration for the Society as IEQ needs to be expanded without expending more energy.

4. Report from the Coordinating Officer (Dennis Knight)

- Coordinating Officer, Dennis Knight, thanked everyone on the committee for supporting Building EQ and assured the committee that he will continue to support the committee and program
- He noted that this committee has some of the most committed and passionate members he has worked with and that he can't remember any committee that has been under as much scrutiny as this committee has been during its entire existence.
- Building Operators need tools like the Building EQ Portal and other tools that allow them to do risk assessment and audit their buildings for many things, not just energy.

5. Approval of minutes (Cochrane)

a. February 3, 2020 web meeting

(File: [bEQCommittee_3Feb2019_WM_MtgMinutes_Draft_R1.pdf](#))

Motion #1: John Constantinide moved, and Chris Balbach seconded that the meeting minutes from the Building EQ Committee February 3, 2020 Orlando Winter Conference be approved.

Vote: Motion passed by unanimous voice vote. 6-0-0, CNV

6. Review of [Action Items](#)

7. Web Portal Statistics

- Doug Cochrane reported on the latest web Portal statistics as of May 31, 2020.
- All categories have increased by at least 25% since the beginning of the Society year.
 - Users: 1121 (893 at beginning of SY – 26% increase)

- Projects: 716 (510 at beginning of SY – 40% increase)
 - Submitted/Approved projects: 51 (28 at beginning of SY – 82% increase)
 - Reports purchased: 7 (\$1150) (1 at beginning of SY)
 - Paid credentials: 46 (\$870) (36 at beginning of SY – 28% increase)
- The committee asked if there are statistics on the internet clicks to the Portal. Some information exists and Lilas Pratt is working with ASHRAE’s website staff to get more clarity on the information.
- The initial information shared includes:
 - From 1/1/2020 through 5/31/2020, there were 330 clicks from the Building EQ Landing page on the ASHRAE website to the Building EQ Portal log-in screen.
 - A spot check for the first week in June showed that 16.8% of users went directly to the Building EQ Portal log-in screen, 59% of users arrived at the site via organic search, and 10% went from the ASHRAE website to the Portal.

8. Committee Liaison Reports

a. Government Affairs Committee (GAC)

- Ross Montgomery reported that the GAC appreciates being a part of the Building EQ program and they have continued to promote the program in their visits to various government jurisdictions.
- The committee had an MBO this year to develop programs to promote use of Portal in collaboration with committee and the actions against that MBO include:
 - Sending a survey to chapter GAC representatives
 - Promoting the Portal language translations
 - Promoting the university course to student branches and government jurisdictions
 - Working with Building EQ Committee to update the Government fact sheet, developed a fact sheet and a short PowerPoint presentation specifically for GAC.

b. Student Activities

- No report at this time.

c. CTTC (Dan Redmond)

- No report at this time.

9. Methodology Subcommittee Report (Chris Balbach)

- Chris Balbach recapped the discussions from the June 5, 2020 Methodology Subcommittee meeting as shown in [Attachment A](#).
- The committee discussed the status of the As Designed Rating on the new ASHRAE HQ Building. A former committee member has volunteered to donate time to the work. The committee is just waiting on the modeling input files to initiate the process. At this point, it is unlikely that the AD assessment and rating will be completed prior to July 1.
- A brief update on current proposed Portal changes is as follows. Additional details are shown in [Attachment A](#).
 - The committee continues to look using the Standard 90.1 Performance Rating Method (PRM) to calculate the As Designed rating. A proposed methodology has been defined and stress tested using DOE data. The committee would like to stress test it with a real building using the new ASHRAE HQ building project and rating it with both the existing and proposed methodologies.
 - The current methodology is not really scalable in the marketplace as it takes a fair amount of time and skill by the modeler to create the model. The proposed

change represents a dramatic decrease in the required effort and skill level from modeler, which would significantly lower cost.

- The committee is planning to update the site-source multiplier for electricity in the Portal using the number that has been proposed for Standard 189.1 through a recent addendum. That addendum should be approved for publication at this virtual conference. The multiplier will change from 3.14 to 2.64 and will be communicated to users as it will affect scores somewhat.
- John Constantinide and Chris Balbach are working with TC 9.9 to see if metrics in Standard 90.4 can be used in the Portal to add Data Centers as a building type in the Portal. The goal is to develop methodologies that align with that standard and the marketplace. Two possible approaches are being explored.
- An updated was provided on ASHRAE research projects that are being sponsored or co-sponsored by the Building EQ Committee. Additional details are shown in [Attachment A](#).
 - RP-1771 Energy Modeling of Typical Commercial Buildings is now in the latter stages of the project which includes development of adjustment factors to more accurately align a CBECs baseline with a Standard 90.4-2004 baseline. Key findings have implications on the As Designed rating.
 - RP-1836 Developing a Standardized Categorization System for EEMs is the early stages of the project. The goal is to standardize how EEMs are categorized which will be helpful to the Building EQ database collection of information on EEMs.
- The subcommittee explored how the Building EQ Tool could be used to support the idea of remote energy audits utilizing smart phones, tablets, and real-time chat and video tools. The need for this type of audit protocol has become apparent in view of the effects from Covid-19 pandemic.
- Chris Balbach has reached out to Jim Kelsey in order to coordinate and align with Standard 211. Building EQ would prefer to point to existing standards for the rules for any action on remote audits. TC 7.6 which is updating the PCBEA is also interested in pursuing this.
- Carmel Software has been awarded a DOE Small Business Innovation Research (SBIR) grant for \$200k (see [SBIR attachment](#)). The grant is to create a simple methodology to transfer information from the DOE Asset Score Audit Tool using Building Sync. Phase 1 will focus solely on creating a template to transfer information to the Building EQ Portal. Cancelling Building EQ would affect the ability of this project to go forward as planned and Carmel Software would have to move to a different tool.
- The subcommittee initiated a discussion on how system level KPIs (key performance indicators) might be integrated into the Portal. The Portal currently focuses primarily on whole building metrics and the rating process applies to a whole building or campus.
- Looking at where the Portal might need to move in the future, the next step may be to go down to the system level metrics such as LPDs.
- DOE is investing money in characterizing and documenting additional system level KPIs, which would help standardize these metrics so that they can be compared. The measurement of these KPIs has now moved to a point to make this idea feasible.

10. Business Development Subcommittee Report (Rob Risley)

- Rob Risley recapped the discussions from the June 4, 2020 Business Development Subcommittee meeting as shown in [Attachment B](#)

- Recent Marketing efforts include four podcasts that were developed by committee member, Hugh Crowther. Three podcasts are general overviews of the Portal and the fourth is an overview of how Building EQ benefits Universities.
- An ASHRAE-APPA joint flyer was developed through collaboration between the Building EQ committee and the ASHRAE-APPA joint working team. The flyer will be distributed with a cover letter and a fact sheet to APPA member universities and ASHRAE student branches. The subcommittee will look at how it is received and feedback.
- A case study is being developed which will be used as a template for future case studies – this activity has been on-hold due to current resource constraints.
- The subcommittee reviewed a list of organizations for potential outreach. Leads are currently managed via a spreadsheet to track inquiries that come to the committee. Association, organization and individual lead coordinators are assigned as needed.
- Outreach is not limited to the members of this committee. A list of [awards, presentations, and testimonials](#) (see attachment) show that users of the tool are also important outreach contributors. The presentations also show the rapidly growing interest in Building EQ in the global market.
- The subcommittee looked at how to increase revenue streams for the Portal. Ideas for [potential revenue sources](#) (see attachment) include charging for a plaque and adding advertising to the Portal. The feasibility of advertising will be investigated with Mark Owens.
- The committee also discussed on what services users might pay for and how to get more feedback on this from current users. It was agreed that a short survey should be developed to get more information.

11. New Business

a. Motion for maintaining the Program

- Finance committee has approved a budget that would cut all funding for the operation of the Building EQ Portal and committee. When Building EQ gives their report to the BOD on June 23, Dennis Knight would like to make a motion on behalf of the committee to put money back into the budget to just cover the minimum outlay needed to keep the Portal operation.

Motion #2: John Constantinide moved, and David Underwood seconded that the Building EQ committee recommend that the BOD include \$14K in the SY 20-21 Budget for the operation of the Building EQ Portal.

Discussion:

- Cutting the Portal seems a big draconian and short sighted.
- Being aware of financial needs of the Society, the committee would plan to take the measures needed to still operate the Portal in a cost effective manner including conducting all virtual meetings in SY 20-21.
- Many people outside of the committee who support the continuation of the program are participating in this discussion and are looking to tell the story of the success of the program.
- The program is on the verge of blossoming, so that this would not seem like the right time to discontinue it.
- Building EQ has had a relatively short lifespan compared to many programs and has more users than some other programs. The program has created unique relationships including

with students and developed new avenues of growth for ASHRAE. All of this is more than could have been imagined at its inception.

- ASHRAE is a non-profit organization built to provide service to members and the industry. Like many non-profits, ASHRAE is funded by memberships, trade shows, and donations like most non-profits and doesn't really make profits from products. .
- It is most unfortunate for this program to be singled out when it is gaining momentum. moving ASHRAE into a digital world, and has the support of so many outside ASHRAE.
- Building EQ is the first product of ASHRAE that is truly digital.
- The strongest points in favor of maintaining the Portal are a hit to ASHRAE's reputation, the time that Building Owner's have invested into putting data into the Portal that would no longer be available to them, the work with universities including the university course and student engagement, and the alignment of the program with items in ASHRAE's strategic plan.

Vote: Motion passed 7-0-0, CV

12. [Budget Update](#) (see attachment below)

- The committee has proposed a budget that cuts all costs except for those necessary to maintain the operation of the Portal (hosting and maintenance). They would like to request the ability to reinvest any revenue from the Portal in development or promotion.
- If the 14K is not approved, that would effectively close the Portal which would end Building EQ project. If the Portal is discontinued and categorized the software as obsolete and having no value, ASHRAE would need to write off the asset which would be an expense equal to the remaining depreciation (\$115k).
- Marketing time that continues to be invested in the Building EQ. Committee would be looking primarily looking to Marketing for

13. Recognition of Outgoing Members (Doug Cochrane)

- Doug Cochrane recognized the outgoing members: Esteban Baccini, Presidential member David Underwood, and past Chair of Building EQ, Hugh Crowther.
- He noted that Certificates of Appreciation will be sent to these members.

14. Remarks from Outgoing Chair

- Doug Cochrane reflected on his time on the committee and how much he has enjoyed the ride. He thinks it is an important tool and provides great value to the Society.
- He wishes the committee all the best and is confident the committee will be able to keep the portal alive and move forward.

15. Remarks from Incoming Chair

- John Constantinide thanked Doug Cochrane for his leadership and insights.
- He is look forward to chairing the committee and plans the following assignments for the upcoming year:
 - Rob Risley will be Vice-chair and continue to lead the Business Development Subcommittee.
 - Business Development Subcommittee members will be Mahroo Eftekhari, Anoop Peediyakkan, Dan Redmond, and Hugh Crowther.
 - Chris Balbach will remain as Methodology Subcommittee chair.
 - Methodology subcommittee members will be Charles Eley, Michael Deru, and Bruce Hunn.

- Hugh Crowther and Bruce Hunn will not be Building EQ committee members for SY 20-21 but will continue to be part of the subcommittees as noted above.
- Doug Cochrane has also agreed to help out with the committee in the future.

16. Upcoming Meetings: TBD

17. Adjourn – Meeting adjourned at 1:25pm EDT

Budget Update

 BUILDING EQ PROPOSED BUDGET

Updated May 1, 2020

	Current Year 19-20		Upcoming Year 20-21			Comments	Future Budgets	
	Actual Jul-Mar	Budget	Current Budget	Proposed Budget	Savings		21-22 Budget	22-23 Budget
REVENUE	\$1,100	\$2,000	\$5,000	\$5,000	\$0		\$10,000	\$10,000
EXPENSES (Operating Expenses)	Actual Jul-Mar	Budget	Current Budget	Proposed Budget	Savings		21-22 Budget	22-23 Budget
Promotion	\$300	\$10,000	\$10,200	\$0	\$10,200	Committee will continue to utilize committee and staff resources for promotional opportunities.	\$10,700	\$10,700
Development	\$25,800	\$30,000	\$30,600	\$5,000	\$25,600	Budget matches forecasted revenue . Committee proposes to reinvest into Portal development only what matches actual revenue.	\$30,000	\$30,000
Transportation for Members	\$6,500	\$15,000	\$15,000	\$0	\$15,000	Committee will move to virtual meetings for the SY20-21 and reduce in-person meetings in future years.	\$10,000	\$10,000
Outside Services	\$10,700	\$12,800	\$14,000	\$14,000	\$0	Portal Maintenance & Hosting <i>Required expense to keep Portal running</i>	\$15,000	\$16,000
Subtotal	\$43,300	\$67,800	\$69,800	\$19,000	\$50,800		\$65,700	\$66,700
EXPENSES (Sunk Cost Expenses)	Actual Jul-Mar	Budget	Current Budget	Proposed Budget	Savings		22-23 Budget	22-23 Budget
Salaries	\$43,700	\$46,100	\$47,700	\$47,700	\$0	Required staff time will likely be reduced due to fewer meetings and development projects.	\$47,700	\$47,700
Payroll Taxes & Benefits	\$11,800	\$14,000	\$14,500	\$14,500	\$0	Required staff time will likely be reduced due to fewer meetings and development projects.	\$14,500	\$14,500
Travel Staff	\$200	\$500	\$500	\$0	\$500		\$500	\$500
Depreciation Expense	\$30,000	\$40,000	\$40,000	\$40,000	\$0	Portal capital expenditure for development	\$40,000	\$40,000
Subtotal	\$85,700	\$100,600	\$102,700	\$102,200	\$500		\$102,700	\$102,700
Totals	\$129,000	\$168,400	\$172,500	\$121,200	\$51,300		\$168,400	\$169,400

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Attachment A – Methodology Subcommittee Meeting

June 5, 2020, 11:00am-1:00pm

Available: Chris Balbach, Bruce Hunn, Charles Eley

Other Committee: Doug Cochrane, John Constantinide, Rob Risley, David Underwood

Incoming members: Mahroo Eftekhari, Anoop Peediyakkan, Michael Deru

Guests: Ross Montgomery, Osama Khayata, Stephen Roth

Meeting Notes:

1. Call to Order – Meeting convened at 11:02am EDT, Quorum was established.
2. As Designed Rating on ASHRAE HQ Building
 - The committee has agreed to do an As Designed rating on the new ASHRAE HQ building. The Ad hoc committee is to provide the energy model inputs for that work.
 - After determining which software was being used by the design team, the committee reached out to a former committee member and determined that she has access to that software and may be willing to run the As Designed modeling.
 - The committee is still waiting for the energy model and Doug Cochrane has continued to follow up with the Building Ad hoc committee.
 - This initial effort will be to provide a preliminary Building EQ Performance Score. The final building score is subject to final verification of the as-built conditions. ASHRAE Staff will be available to do the walk through to verify as-built conditions after construction is complete.
3. Updates on Proposed Portal Changes:
 - a. Integration of the Building EQ As Designed rating with Standard 90.1 PRM (Eley)
 - The concept is to modify the As Designed rating so that the modeling results from the 90.1 PRM can be used for determining the baseline. This methodology would resolve a lot of problems with the current approach which is fairly complicated and has not gained much traction.
 - The current methodology uses an empirical median baseline based on 2003 CBECS data by building data, corrected or location. The rated building uses standardized model using of building operating parameters from COMNET.
 - The new methodology would use modeled information for both the baseline and the rated building. The baseline model would have the same form and configuration as the rated building but would be upgraded or downgraded to meet roughly Standard 90.1-2004. Both models would use the same energy simulation software, temperature setpoints, hours of operation, plug loads, occupants.
 - There is significant documentation on this proposed methodology that will be shared with the incoming committee members.
 - A cost estimate to implement the methodology has been received, but the committee is waiting for the final phase of 1771-RP (see recap below) as information from that project is expected to help refine the final process.
 - Some comparisons of the two methodologies were done using PNNL energy simulations and the numbers were fairly close. However, the committee would like to stress test the methodology on a real building prior to any implementation. The plan is to do this with the new ASHRAE HQ building.

- b. Site-Source Energy conversion factors (Eley)
 - SSPC 189.1 approved an addendum with a site-source conversion factor change for electricity still in Orlando. That addendum is expected to be approved by all required bodies at this virtual conference.
 - The current site-source factor for electricity used in the Portal is 3.14. The proposed site-source factor for electricity is 2.64.
 - The change was initiated due to increased grid efficiency as well as a methodology change in the fossil fuel equivalency approach.
 - Once the new factor is implemented, it will be applied to all projects in the Portal. The effect is expected to be minimal since the same factor will be used in the calculation for both the median baseline and for the rated building.

- 4. Research Project Updates:
 - a. 1771-RP Energy Modeling of Typical Commercial Buildings
 - Interim report on task 5 has been completed – calibrating the model for operational input.
 - PMS approved the methodology from Task 5 and they are now applying that methodology to all the building types. They will then move onto Task 6.
 - The extended completion date is now March 2021.
 - PI presented at the Orlando meeting – those slides are attached to Orlando meeting notes.

 - b. RP 1836 Developing a Standardized Categorization System for EEMs
 - Chris Balbach is the PMS chair for this project. The project also has a Project advisory board that meets regularly. The next PMS meeting is June 10, 2-3pm EDT.
 - The intent of the project is not create energy efficiency measures (EEMs), but rather to develop a categorization system so that information can be mapped more easily.

- 5. [Adding Data Centers](#) to Building EQ Portal
 - The committee has reached out to TC 9.9 about how data centers might fit into the Portal. Several committee members will attend the TC 9.9 meeting during the virtual Annual Conference to discuss.
 - There would seem to be two options for getting data centers into the Portal, one is more of a short term solution and the other is more of a long term solution.
 - Option 1: Using Architecture 2030 Zero Tool
 - Option 2: Developing new methodology
 - The long term option would use different metrics than EUI for looking at energy performance of Data Centers as defined by Standard 90.4 and/or TC 9.9.
 - The real value of adding data centers is probably for multiple purpose buildings who have data centers as one of the space types in the building.

- 6. New Business
 - a. Remote Energy Audits aligned with Standard 211 and Building EQ
 - NYSERDA has been putting together policies and procedures for remote energy audits through an ad hoc effort, but there is not yet any materials to reference for how this might be done. The concept is to provide a different way of collecting data using tools like smart phones, tablets, and ZOOM type software.

- Building EQ might be an appropriate reference source if the Portal had a definition of what remote access would look like. The Portal aspect of Building EQ lends itself to this approach.
 - The committee needs to define what a virtual visit would look like as well as the requirements for the on-site person who is working with the remote assessors. Once defined, the committee may wish to request that Standard 211 add this option to the standard as an acceptable practice for compliance.
 - Since communicating remotely is the new normal, this needs to be explored as a viable option.
 - TC 7.6 has an energy audit subcommittee that is updating the old Green Guide PCBEA (Procedures for Commercial Buildings Energy Audits) to act as a best practice guide for Standard 211. That subcommittee can help facilitate this effort.
 - One concern raised was that while a site visit allows for an independent observer to look at what they deem important, a virtual visit might not provide a full picture of the building. In a virtual visit, the on-site building representative may not know what is important to show to the virtual assessor or could potentially hide something they don't want seen by the virtual assessor.
- b. [Std 62.1 Ventilation Tables](#) for ventilation quantities and measurements (see attachment)
- This is intended mainly as an introduction to this topic to the committee for future discussion.
 - The tables have been recommended by Hoy Bohanon and SSPC 62.1 for updating of the values currently in COMNET for use in the AS Designed Rating. Implementing these tables may improve the current As Designed rating procedures.
- c. [Carmel Software SBIR Phase I Project](#) (see attachment below)
- Carmel Software (Portal developer) applied for and received a small business innovation research grant (SBIR) from DOE EERE BTO (Department of Energy, Energy Efficiency & Renewable Energy, Building Technology Office).
 - The work is to find more use cases for BuildingSync. The goal of the project is to develop a web-based software that will streamline the flow of information from Asset Score Audit Template into third-party software tools
 - Phase 1 is a \$200,000 grant and will focus solely on the workflow from Asset Score to one existing energy benchmarking software tool (ASHRAE Building EQ) to develop a template for transferring this information.
 - If the template is accepted, Part 2 would award up to \$1,000,000 to develop a commercial product that applies broadly to multiple third-party software tools.
 - There is already a use case for data transfer from DOE Asset Tool to Building EQ, but it is a very clunky process. This project will streamline that process so that it can be accomplished by pushing just one button and ultimately apply that to many tools.
 - DOE Asset Tool is the required data collector for several municipalities including New York City. This tool would facilitate the flow of information to Building EQ which would provide a Building EQ Performance Score and a standardized audit report. Making it easier to get information into Building EQ is a win for ASHRAE.
 - Project is scheduled to start in mid-July. Carmelsoft will be working with Rensselaer Polytechnic Institute (RPI) on the project.
 - The Building EQ Committee would like to assist as needed to make this successful.

d. System Level KPIs (Key Performance Indicators)

- Key Performance Indicators (KPIs) are performance metrics. Building EQ currently works with whole building KPIs (e.g., EUI) which is very common with benchmarking. On the other end of the spectrum are component level KPIs. System KPIs are between these two extremes. Examples of system level performance metrics include LPD (lighting power density) or TSPR (total system performance ratio).
- How does this apply to Building EQ?
 - If the Building EQ assessment could collect system level data, it could be used as a metric to provide additional and more specific information to improve a building's energy performance.
 - If building has a bad score, the building owner may want to dig deeper by looking at system level performance metrics.
 - This kind of information is currently collected as part of the IAQ survey, but there is no context or application to the Building Performance Score.
- The committee would need to define the KPIs and then agree to what is and is not good performance under that KPI. This kind of work is going on now in various quarters and that work could be referenced by the committee.
 - LBNL has recently released a research project on this, available at: https://escholarship.org/content/qt417235ks/qt417235ks_noSplash_7224e6724eab5ab4aebcd48cb2fccd33.pdf. LBNL has also released information in publicly available code as a mechanism for determining target KPIs.
 - Now that this has been developed, the lab is under pressure to get these used. Standard 189.1 has been approached by LBNL about including some of these system level KPIs as part of the standard.
 - Michael Deru had a project a few years ago looking at system level KPIs in different climate zones for different building types. He put together a draft spreadsheet using data from reference models. Data is entered into the spreadsheet to produce a graph showing a range of performance which could be compared to measured performance. The draft can be shared with the committee
 - New management systems are being developed that would allow for the collection of the data that would be required to calculate many system KPIs (e.g., zone occupant count). The Covid pandemic is driving some of this development.
- The first question is whether the committee wants to advance Building EQ beyond whole building performance and into systems performance.
 - This does make sense and it could be integrated into the Portal in a couple of ways.
 - If the information collected is robust enough to calculate the KPIs, the Portal could display that information and provide focused guidance on how to improve building performance.
 - This would really set Building EQ apart from other available benchmarking and assessment programs and it would enrich the database that is being developed in the Building EQ Portal.
- What are next steps?
 - Perhaps invite someone from LBNL to present on the topic and generate a more open discussion on what data would need to be collected and the stability of the KPI lists.

- The Performance Metrics Protocols (PMP) documents dealt with system metrics in the Level 2 measurements but didn't really include KPIs. So, this really fits in well with that effort and TC 7.6 may well be interested in working on this effort.

7. Next Meeting

- 2nd Thursday of the month, July 9, 2020 at 11am-12pm EDT
- The Subcommittee will continue the monthly meetings through SY 20-21.

8. Adjourn – Meeting adjourned at 1:01pm EDT

Adding Data Centers to Building EQ Portal

From: John Constantinide

Sent: Monday, May 18, 2020 8:57 AM

Subject: FW: Adding Data Centers as a Building Type to Building EQ

Doug, Chris, and Lilas,

It seems they welcome a short presentation about Building EQ and discussion about incorporating data centers as a building type at their virtual meeting, the time and date of which will be publicized.

Depending on our availability, Doug, Chris, or I should present something that is more technically-oriented and discussion-based, both pitching Building EQ briefly but also listening to their feedback on the inclusion of data centers.

Thoughts?

John Constantinide, P.E., M.S.

From: ASHRAE TC 9.9 Chair

Sent: Monday, May 18, 2020 8:50 AM

To: John Constantinide

Subject: Re: Adding Data Centers as a Building Type to Building EQ

John,

Thank you for reaching out regarding the interest in TC 9.9 feedback on the inclusion of data centers in the Building EQ methodology. Obviously energy audits are a big aspect of identifying inefficiencies in a data center environment, particularly in the raised floor area where poor airflow management drives much of the inefficiency. TC 9.9 has written a number of publications on metrics and best practices for improving energy efficiency, which I'm sure can be leveraged. Additionally, if you're not aware, ASHRAE Standard 90.4 is an energy standard for data centers. It introduced two metrics, Mechanical Load Component (MLC) and Electrical Loss Component (ELC) as the design metrics for showing compliance to the standard. PUE remains the industry accepted metric for the operational performance of the data center and ASHRAE TC 9.9 has co-authored a [datacom series book](#) with The Green Grid on this metric. TC 9.9 also has the [Green Tips](#) datacom series book which when it was written was done in a way to facilitate an energy audit.

I would like to propose that if you're willing, to have a short presentation on the topic at our virtual summer meeting (date is still TBD). During the normal on-site meeting we typically have 100+ people at the meetings and we've found this the best way to drive engagement. We've done similar with other committees, such as commissioning. In the meantime, I can share your questions with members of the committee to see about getting any feedback in the near term.

Best regards,

Dustin

On Thu, May 14, 2020 at 3:02 PM John Constantinide <jmc@knights.ucf.edu> wrote:
Good afternoon Mr. Demetriou:

I am e-mailing to seek expertise, insight, and advice from your TC membership about adding data centers as a building type for Building EQ. Of interest to the Building EQ Methodology Subcommittee are the following items:

1. What is the market demand for energy audits of data center spaces, both in buildings dedicated as a data center building type or as part of a multi-function building?
2. Considering that Building EQ uses EUI as its metric for rating a building's energy performance, what would be the best approach to incorporate data centers into the Building EQ platform (e.g. continue using EUI or incorporating another metric, such as PUE)?
3. Is there input from the TC membership that would help enhance the Building EQ platform's ability to assess building energy performance and assist with conducting an ASHRAE Level 1 Energy Audit of data center spaces?

I copied the Building EQ Committee Chair, Doug Cochrane, the Building EQ Methodology Subcommittee Chair, Chris Balbach, and the ASHRAE Staff Liaison for the Building EQ Committee, Lilas Pratt. I welcome you to ask any questions you may have to help address the above items.

I appreciate your time with this e-mail and look forward to receiving TC 9.9 input.

Respectfully,
John Constantinide, P.E., M.S.

Standard 62.1-2019 Ventilation Tables

From: Hoy Bohanon
Sent: Friday, January 31, 2020 9:07 AM
Subject: Building EQ Methodology

This is to make you aware that the new 62.1-2019 has two tables that should be helpful in setting methodology for ventilation quantities and measurements.
They are simple ventilation per unit area tables.
They should be used in place of assumptions that are made in absence of better information.

Best Regards,
Hoy



62_1_2016_b_2018100
9.pdf



62_1_2016_z_2018062
8.pdf

Carmelsoft SBIR Phase I Project

Excerpt from Summary Abstract of the Proposal to the SBIR:

Problem: The (Building Technology Office of EERE) BTO wishes to expand the number of third-party software tools that can import data from DOE's Asset Score Audit Template (<https://buildingenergyscore.energy.gov/>) and the accompanying data format that it supports: BuildingSync XML (<https://buildingsync.net/>). Currently, the number of software tools that import Asset Score data and BuildingSync is limited. The whole purpose of Asset Score Audit Template is to store energy efficiency data about a commercial building. However, this data is useless if it cannot easily be consumed by other related software tools that can perform building energy benchmark tests, building energy modeling, and other types of building analysis. The term used to describe how one software tool communicates with another is: **interoperability**. Unfortunately, developing interoperability integration tools in existing building analysis software is a tedious and time-consuming process. Therefore, it discourages software developers from creating functionality such as those that import BuildingSync.

Solution: For Phase I of this project in response to DE-FOA-0002146, we propose developing a web-based software tool that will completely streamline the flow of information from Asset Score Audit Template into third-party software tools, so that all the user has to do is press one button on the producing or consuming software tool, and the software will perform quick data checks and validation and then seamlessly transfer data to the consuming tool, thereby eliminating the user having to manual enter the data. **Phase I will focus solely on the workflow from Asset Score to one existing energy benchmarking software tool (ASHRAE Building EQ).** Once it is proven that this workflow can be streamlined, future phases will focus on other software tools and schemas such as gbXML

Attachment B – Business Development Subcommittee Meeting

June 4, 2020, 11:00am-1:00pm

Available: Rob Risley, Hugh Crowther, David Underwood, Esteban Baccini, Daniel Redmond

Other Committee: John Constantine, Doug Cochrane, Charles Eley, Chris Balbach, Bruce Hunn,

Incoming members: Anoop Peediayakkan, Mahroo Eftekhari, Michael Deru

Guests: Stephen Ross, Ross Montgomery, Osama Khayata, Meghan McNulty

Meeting Notes:

1. Call to Order – Meeting convened at 11:03am EDT, Quorum was established.
2. Marketing Updates
 - a. Portal Stats -Add stats
 - Lilas Pratt reviewed the latest Portal stats with the committee. The percentage growth in the number of users (26% increase) and projects (40% increase) since the beginning of the Society year was noted.
 - The committee asked how many projects in the system were using French or Spanish.
 - There have been no submittals in French or Spanish, but we will need to query the database to determine the number of projects in the system that are using these languages.
 - b. Podcasts
 - Four podcasts have been completed and posted on the main Building EQ webpage and on the ASHRAE YouTube channel.
 - Three of the podcasts are a general overview of the Portal. The fourth is geared specifically to Universities.
 - The podcasts are very well done – a great job by Hugh Crowther to create them.
 - The committee encourages everyone to view them.
 - c. ASHRAE-APPA Joint Flyer
 - The flyer has been completed and approved by the ASHRAE-APPA working group.
 - A cover letter is being developed to send the flyer accompanied by the University fact sheet out to ASHRAE student branches and APPA members.
 - This approach is a great model that can be replicated with other organizations that this committee is reaching out to.
 - d. Case Study Development
 - The development of the first case study is on hold due to demands on ASHRAE Marketing staff time. Work will re-initiate after the completion of the virtual annual meeting.
 - This first case study will provide a template to follow for all future case studies, both in format and general content. Once the design is determined, the committee will create a checklist of information to solicit additional buildings for case studies.
 - The case studies need to tell a compelling story that includes why did the building use Building EQ and what benefit did they derive as a result.
3. Review of Potential Organizational Leads
 - a. [Organizational Leads from ASHRAE MOUs](#) (see attachment below)
 - Rob Risley noted that the committee has created some liaison assignments as part of outreach efforts to various organizations. Additional organizations for potential

outreach have been identified through a review of current ASHRAE MOUs. In order to make use of these MOUs, the committee needs to work through ExCom and the liaison assigned to that organization.

- First the committee will need to specify what they are looking to accomplish in the outreach for each organization.
- Building EQ ExCom will work through the BOD Coordinating Officer (CO), Bill Dean to connect with Society ExCom and the MOU Organization liaisons.

b. Other Organization Leads

- APPA – Higher Education Facility Engineers: This continues to be the model for organization outreach (see notes above).
- ASHE – American Society of Hospital Engineers: The committee had a conference call with Kara Brooks and Sheila Hayter on April 28 to introduce ASHE to Building EQ. Tim Wentz had facilitated the initiation of the call.
- SAME – Society of American Military engineers: Previous interaction has suggested that there is only a superficial level of understanding building level energy management within this group. Targeting installation managers under DOD would be a better outreach effort.
- IMT – Institute of Market Transformation: This group has not been supportive of Building EQ in Florida as an alternative compliance path to E* under Florida regulations. The committee needs to reach out to them to demonstrate the benefits of Building EQ.
- Other organizations identified for possible outreach include: Association of Sanitary Engineers, National Institute of Building Sciences (NIBS), and National Association of State Energy Officials (NASEO).
- For consortium/municipal organizations (such as NASEO), enlisting the help of GAC and ASHRAE's Government Affairs staff would be prudent, so as to allow the GAC representatives to reach out to government oriented organizations

c. Next Steps for Outreach

- It was suggested that the committee create a list with columns to develop analytics and strategy for outreach. The committee should focus on technical organizations identify the top 5 organizational targets and rank the organizations based on prioritization criteria such as:
- Would they be interested in benchmarking/energy auditing
 - Do they have access to a tool for that work
 - How does BEQ fit in with what they have/need
 - What is ASHRAE's relationship with that organization
- Lilas Pratt will create a strawman list with the criteria information for the committee to work with.

4. New Business

a. Review of [Awards, Presentations, Testimonials](#) (see attachment below)

- The committee has a compiled a list of awards for and presentations on Building EQ.
- Presentations have been made to ASHRAE regions and chapters and as conference seminars. These are replicable and mostly based on the DL presentation template.
- Virtual presentations have become more common.
- It would make sense to follow up with additional information to the chapters after a presentation is made. The committee should work with CTTC to determine what sort of follow up is appropriate and to create a procedure for follow up.

- One suggestion would be use the signup sheet from the meeting to ask if people would like follow-up information.
 - Any producers developed would also need to be communicated to all the Distinguished Lecturers that present on Building EQ.
 - Other presentations to note include:
 - Bruce Hunn presentation seminar on Building EQ to Rajasthan Student Chapter (Jaipur, India) on June 9, 2020
 - Hoy Bohanon presentation on Building EQ to the Kuwait International conference on Energy.
 - DL Presentation on Building EQ during the ICERD Conference, Kuwait on November 21, 2019- 9, organized by ASHRAE Kuwait chapter.
 - A number of testimonials have also been compiled based on the use and benefit of the Building EQ Portal.
 - For Brevard Public Schools (BPS), the value of Building EQ is the energy audit that allow BPS to show how tax dollars are being used and how monies should be used in the future to reduce operation expenses and taxpayer costs.
 - This is all about getting the word out. It takes a while for it to sink in. The awareness piece is a big part of this.
- b. Review of [Potential Revenue Sources for Portal](#) (see attachment below)
- There is currently no charge for the input report as it was considered appropriate for users to be able to get a printout of the data they had entered without having to resort to screen shots.
 - A suggestion was made that there should be a charge for the label report, perhaps \$50 to \$100. Only approved submittals are eligible to get a label report and it is unclear how many of those have downloaded this report. It might be easier to generate revenue by offering a nice plaque with the label for a fee. Again, it is unclear how big of a revenue stream this would constitute.
 - One barrier to use of Building EQ as a rating/label is that most areas where Building EQ is being used either don't require a label. However, high performing buildings may still wish to advertise a positive Building EQ Performance Score.
 - Another suggested revenue stream is to incorporate advertising onto the Portal. This is technically feasible and several screens on the Portal that all users have to pass through (such as the login and dashboard screens) have plenty of room for the incorporation of an advertising banner. It would be helpful to have an idea of the cost to modify those screens and include that information in the business plan. The committee will need to talk with Mark Owen about whether or not this makes sense from his standpoint. Knowing the traffic to the site would facilitate that discussion.
- c. Expanding Marketing Reach
- A simple survey to Portal users was suggested to ask about the use of various resources and services. The survey should be set up for distribution based on obvious trigger point and should be no more than three questions. The goal should be to find out what they value about the tool (i.e., What problem were you trying to solve in your building or for your client).
 - One value to the owner is to know that you have a building that is performing well in relation to its peers at a specific level – in a process that is rigorously determined and backed by ASHRAE.
 - Cost is another motivator for building owners – emphasizing that building EQ can help lower costs through increased energy efficiency will resonate.
 - This type of information needs to be captured in future case studies.

- Emphasizing the score might get more traction than emphasizing a building label/certification.
- EPA does a great job of marketing the value of ENERGY STAR. How can Building EQ be branded to get people excited about a Building EQ Performance Score that shows where you are on the road to zero net energy.
- Three areas, each with a different story, that Building EQ can explore for expansion are: insurance = risk, building owners = cost, engineers = energy.
- David Underwood has passed some names in the insurance industry in Zurich to Darryl Boyce who was scheduled to meet with those folks.
- Healthy buildings are another hot topic in building performance which can be addressed by promoting the IEQ survey/screening/observations aspect of Building EQ.\
- However, it is important to do this in a way that does not incur liability for the assessors performing a Building EQ Assessment. If an assessor or professional engineer “certifies” a building as healthy and/or safe, they could be held liable if someone subsequently becomes sick from the building.
- Real estate is another possible market that might be accessible through BOMA. However, it is worth noting that BOMA has no power over their members and that they feel that Building EQ is too complicated to fit with their BOMA 360 program.
- The committee should think globally and act locally by targeting local chapters, both for ASHRAE and for other associations. And, all of ASHRAE’s resources need to be considered and coordinated to build a story around Building EQ.

5. Next Meeting

- The subcommittee will continue to meet periodically as needed.

6. Adjourn – Meeting adjourned at 12:58pm EDT

Potential Organizational Leads

From: David Underwood

Sent: Friday, May 22, 2020 3:49 PM

Subject: bEQ business development subcommittee Feb 2

For my action item 5 the following listing of organizations may be relevant

AIA (2019)

American Society of Hospital Engineers (ASHE)

Association of Facilities Engineers (AFE)

ATECYR-ASHRAE

Australian Institute of Air conditioning & Heating

Building & Construction Association of Singapore

BOMA

Clinton Climate Initiative

ISHRAE

International Facility Management Association (IFMA)

National association of State Energy Officials (NASEO)

Pakistan HVACR Society (2019)

I trust this completes my action item.

Regards,

David Underwood, P. Eng., FASHRAE

Presidential Member 2015-2016

Portal Awards and Presentations

Awards from use of Building EQ

- Florida Department of Education Green School District recognition awarded to Brevard Public Schools for the work done with their ASHRAE Building EQ Pilot Program
- USGBC 2020 Green Schools Award, Transformation Category awarded to Brevard Public Schools for the work done with their ASHRAE Building EQ Pilot Program
- ASHRAE Grassroots Government Advocacy Award for advocacy on Building EQ to municipalities and universities in Florida – nomination for John Constantinide
- Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Awards, submissions pending for University of Central Florida (UCF) and Florida Institute of Technology (FIT) for use of Building EQ on their campuses

Presentations and Conference Seminars on Building EQ completed:

- Green Schools Conference & Expo
- Florida Schools Conservation Consortium, June 2019
- Brevard Sustainability Working Group
- ASHRAE 2020 Winter Conference
- ASHRAE Space Coast Chapter Training Seminar, October 2019, presented by Nate Boyd, John Constantinide, Jeff Benavides, Marcus Rozbitzky
- ASHRAE Region I CRC, Fall 2019, presented by Doug Cochrane
- ASHRAE Region II CRC, Fall 2019, presented by Doug Cochrane
- ASHRAE Region XI CRC, Fall 2019, presented by Doug Cochrane
- ASHRAE Region XIV CRC, Fall 2019, presented by Doug Cochrane
- ASHRAE Florida Institute of Technology Student Branch
- ASHRAE Trinidad Student Branch, March 2020, presented by David Underwood
- ASHRAE West India Chapter, April 2020, presented by John Constantinide

Presentations and Conference Seminars on Building EQ pending:

- Florida Educational Facility Planning Association (FEFPA), July 2020 Summer Conference, submitted by John Constantinide, Bruce Lindsey, Hamid Najafi
- Association for the Advancement of Sustainability in Higher Education (AASHE), October 2020, submitted by Dan Redmond, John Constantinide
- ASHRAE Minnesota Chapter, November 2020, to be presented by John Constantinide
- International Conference on Sustainability, Energy, and Environment, Honolulu, January 2020, submitted by Bruce Lindsey, Brevard County Schools

Testimonials for Building EQ:

Using Building EQ is a unique way to get support from student groups and others across campus for additional funds to improve our buildings. Some of the energy efficiency measures (EEMs) resulted in eliminating deferred maintenance issues ... a classic win/win result! Placing the focus and having the discussion on energy efficiency and carbon footprint reduction made it so much easier to address these issues.

Peter Strazdas, Associate Vice President, Facilities Management
Western Michigan University

I would highly recommend Building EQ, an ASHRAE platform, for the use in conducting energy audits and the benchmarking of structures performance. It was very easy to learn, extremely helpful in gathering and calculating data, and greatly enhanced the overall experience of this process.

Quinn Duffy, Chief Sustainability Officer,
Florida Institute of Technology

As the Brevard Public Schools Manager, Energy & Resource Conservation, we had reservations about transitioning from the Energy Star Portfolio Manager program to ASHRAE Building EQ. Having graduate engineering students analyze utility data, benchmark our schools, and most importantly, generate ASHRAE level 1 audit reports, proved to my staff and leadership team that Building EQ was a preferred tool.

Bruce Lindsay, PE, Manager, Energy & Resource Conservation,
Brevard Public Schools

What a resource! The importance of the Building EQ program and Portal to engineering students doing energy efficiency research for their undergraduate Sustainability minor at Florida Tech cannot be over emphasized. The introduction of the Portal and the patient mentorship of students by local ASHRAE chapter members has been invaluable. The senior research projects completed using Building EQ have resulted in two different ASHRAE Level 1 Energy Audit reports for major buildings on campus. The tool has trained our students to become better engineers for today's workforce and moves Florida Tech and our partners towards a better understanding of our carbon and energy footprints. This has been a win-win exercise for the university and the students. Whether facilities managers or engineering students, the Building EQ program and its portal are win-win tools. A local city government using university interns who were made aware of the tool now wants to use Building EQ for their municipal facilities. Additional cities with possible student internships are expected to also want to examine this tool, further introducing key decision makers to ASHRAE and this resource.

Dr. Ken Lindeman, Professor
Program in Sustainability, Florida Institute of Technology

ASHRAE Building EQ is an excellent portal for building energy professionals. Not only does it provide a user-friendly platform for the end-users to catalogue and maintain building energy performance data, but it also can be used as an effective teaching tool for engineering students interested in building energy and energy audit. ASHRAE's continued support of Building EQ is certainly a strong representation of its commitment in promoting sustainability in the building sector.

Dr. Hamidreza Najafi, Ph.D.,
Assistant Professor of Mechanical Engineering & ASHRAE Student Branch Advisor,
Florida Institute of Technology

Potential Revenue Sources (from Business Plan)

Revenue Expectations

Building EQ is breaking new ground for ASHRAE as the Portal is the first product where the technology of the on-line Portal developed by ASHRAE is delivered to the marketplace only via the “cloud.” As such Building EQ is leading the way for the Society as the committee investigates how to package that technology and develop revenue sources for ASHRAE from it.

The Building EQ program has a number of existing revenue opportunities that are both directly from the portal and indirectly through other ASHRAE offerings.

Direct revenue sources

- *Credential Verification:* A credentialed user is required to submit projects for an official rating. While BEAP and BEMP certifications are automatically verified by the system, the verification of professional engineers must be done manually. A one-time verification fee (\$15 members, \$25 non-members) is charged for this manual verification.
- *Portal Reports:* The auto-populated energy audit reports are sold for a fee (\$200 for Narrative report and \$50 for spreadsheet report). As the program gains traction, these reports are expected to be purchased in greater numbers.

Indirect revenue sources

- *Training Opportunities:* Training courses through the ASHRAE Learning Institute may be created to enhance Portal users to more effectively conduct Standard 211-compliant Energy Audits, using the Building EQ portal as the tool and format for the Level 1 Energy Audit process.
- *Certification:* Building EQ supports and enhances the ASHRAE BEAP and BEMP certification programs.
- *Membership:* The Building EQ program enhances membership value which will improve membership growth and retention. Non-member users of the portal are introduced to ASHRAE and the technical resources ASHRAE provides. By engaging university students in the use of the portal, Building EQ is introducing a new generation both to the HVAC industry and to ASHRAE as potential new members.
- *Publication Sales:* The Building EQ program builds on a number of ASHRAE standards and publications including Standards 62.1, 90.1, 100, and 211 and the Performance Measurement Protocols documents. This connection supports the use and purchase of these resources.

In addition to these existing opportunities, the Building EQ committee continues to investigate the feasibility and requirements needed to implement a number of other potential revenue streams.

Potential Revenue Streams

- *Service Packages:* Some users may wish to have access to more features such as enhanced reporting training, certification, access to ASHRAE’s technology portal or other resources. These could be packaged and offered for a monthly fee.
- *Database subscriptions:* Once the data base becomes robust enough, it would be possible to sell subscriptions to the aggregated data. Individual data would have to be protected, but the aggregated data would have value.
- *Licensing Opportunities:* Once the program is sufficiently robust and established, the portal could be licensed to cities, municipalities, universities, countries and other entities. The license would allow a customized portal unique to that client that may include customized features and a unique database allowing them to compare their buildings within their campus or community.

- *Partnership Opportunities:* Software developers who market products in the benchmarking, assessment, and auditing area may be interested in utilizing Building EQ's technology to enhance their own products. The partnerships could include an application protocol interface (API) for usage of the Portal technology for a monthly fee. Conversely, Building EQ may be able to increase Portal usage via an API from those software developers to the Portal.
- *Advertising Opportunities:* Advertising is moving away from print and towards electronic applications. Adding advertising to the Portal may be a way to take advantage of that shift.