

NYStretch-Energy Code COMMERCIAL WORKING GROUP Meeting

October 24, 2017 | 1:00 pm – 3:00 pm

Location: WebEx meeting

PARTICIPANTS

Attendees: Jim Edelson, Mark Lyles, Bing Liu, Gina Bocra, Emily Hoffman, Ian Graham, Jack Bailey, Jian Zhang, Jodi Smits-Anderson, Jeff Domanski, Tom Eisele, Don Winston, Marilyn Dare

Absent: Priscilla Richards, Joe Dolengo, Kevin Stack, Joe Hitt, Joe Hill, Tony Lisanti, Pasquale Strochia, Lou Petrucci, Steve Rocklin, Dave Abrey, John Ciavacco, Chris Sgroi, Kerry Jane-King, Michelle Tinner

AGENDA

- Roll call and introductions of new Working Group members – Jeff Domanski (IBTS)
 - Purpose and schedule update – Jim (NBI) & NYSERDA
 - Review and update on commercial modeling approach and analysis – Bing and Jian (PNNL)
 - Multifamily direction and considerations – Jim and Mark (NBI)
 - Update on Commercial Strawman topics and proposals – Jim and Mark (NBI)
 - Discussion and next steps – All
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MINUTES

Roll Call and Purpose and schedule update

Following a roll call of participants beginning at 1:00 pm, Jim Edelson provided a brief overview of the agenda and the effort and progress made to-date and noted the meeting will largely focus on the second round of PNNL commercial modeling performed to achieve the project goals since the 2nd Advisory Group which took place on 9/28/17.

Jim spoke to the Schedule presented (see slide), which proposed completion of the draft language for NYStretch-Energy 2018 in by the end of the year, and reviews by early May 2018. The modeling efforts will be discussed with the NYStretch Advisory group in the meeting to take place in early December (date to be determined).

Information on past meetings and resources shared with the working groups, including minutes and slide files, are located on the New Buildings Institute NYStretch 2018 Resources page at:

<https://newbuildings.org/nystretch/>

Review and update on commercial modeling approach and analysis – Bing and Jian (PNNL)

Jim indicated this portion of the meeting will be a high-level review of what has been accomplished by working groups and modeling efforts to-date to set up what needs to be accomplished in the second round of modeling and in setting up for model NYStretch-2018 code language.

Bing described how the first set of models were assembled, including the presentation of proposed energy efficiency measures (EMs) during the September Advisory working group meeting and receipt of feedback at and following that meeting, and from the technical working group meetings. Preliminary modeling results to-date towards the 20% savings goal for each modeling prototype were shown for the three New York State climate zones (see slides for details). Bing noted there had been much discussion about how to handle the miscellaneous loads for Large Office buildings, which is driven by computer center cluster and data center energy consumption, and that the modeling team had consulted with experts, including NYC working group members and the 90.1 committee, on how to handle data center standards. The Large Office “Misc” loads is expected to be reduced based on the proposed approach which will be shown in upcoming slides.

The “Energy Targets” slide presented comparison of Site EUI for IECC 2015, ASHRAE 90.1-2013, ASHRAE 90.1-2016 (estimate), and the ongoing NYStretch-Energy (2018) efforts. The slide needs to be updated to change the NYStretch 2016 label to “NYStretch-Energy (2018)” as it will be referenced. Jim indicated the values shown will be also be calculated converted from Site EUIs to Source EUIs.

Discussion/Stakeholder input

- Don asked for notice of meetings slides being posted to the NBI NYStretch Resources page.
- Discussion for clarity on what is represented in the Large Office “Misc.” loads revealed it included data centers, plug loads, kitchen appliances, and elevators. There was disagreement between Don Winston and Bing/PNNL on the amount of energy consumed on average by Large Office data centers, which Bing suggested is 56% of the building energy use. Don argued this must include all computing plug loads and pump energy for domestic water and would be a “substantial mistake” to attribute too much to data centers.

Actions:

- NBI needs to update the “Energy Targets” slide to change the “NYStretch 2016” label to “NYStretch-Energy (2018)” and the Site EUI values need to be converted to Source EUIs.

Multifamily direction and considerations – Jim and Mark (NBI)

Jim indicated that the discussion of the Multifamily plan – including modeling approach and proposed measures – will be brief on this call, with intent to focus in more depth on the 10/26 Multifamily working group call. The approach emphasizes including the most energy-saving measures and seeking continuity between low-rise residential and high-rise commercial buildings.

The “Proposals for NY Stretch” slide presents the top six (6) “traditional” energy saving measures. The proposed “common area” and “Efficient Exterior Lighting” approaches will refer the residential Multifamily to the Commercial requirements, while the menu of additional options would compare to the options being explored for Commercial and make the Multifamily low-rise options equivalent to those available in the Commercial code, depending on the modeling results. The preliminary discussions by NBI and Maria and NYC DOB on what will go into the two Multifamily models (10 and 20 story prototypes) produced the measures presented on the “Modeling Steps” slide. Bing

emphasized that application of measures to apartment buildings have been updated based on feedback from meeting in NYC, including removing some measures from consideration (e.g., #7 fan power limit).

Discussion/Stakeholder input

- Maria asked for clarification on the fan power limits and PTAC values, since they had been discussed with values identified in 90.1 discussions. Bing clarified that these values are for the Commercial applications and since not attached to central distribution units and subject to federal requirements, there is not sufficient opportunity for savings.
- Mark Lyles noted that the parking lot lighting option was proposed to be removed from consideration following discussion with PNNL, but seeks input from the working group on whether some aspect should be included (e.g., for 20-30 story buildings). Jack Bailey suggested a lighting option should be considered for parking lots (surface lots and garages), but Emily Hoffman indicated they rarely see garages or lots in Multifamily applications. Don suggested perhaps 20% of applications would include. Don supports inside NYC there would be no savings, but would be opportunity outside NYC, including for schools. As such, suggested Zone 4 should not include parking lot option.
- Ian asked if NREL building area weighted average by zone is used in the model to which Bing indicated yes it was not an average, but a construction weighted average which included apartment buildings from NYC.
- Mark indicated, as a result of feedback, they would look at the parking lot option for zones 5 and 6 and discussion with PNNL how to further incorporate into the modeling.
- Jian notes there are two measures impacting parking lot lighting (6 and 18) – the former deals with control of parking lot lights by occupancy sensor, the latter affects power of lighting (façade lighting, too). He suggests we may not want to include parking lots in NYC, but should include façade. Jack Bailey indicates there is not much exterior lighting in NYC buildings and would therefore not be meaningful there, but general agreement would be appropriate to include for zones 5 and 6.
- Maria suggested it was not right to exclude measures 6 (Fan power limit) and 13 (Ventilation optimization) from consideration. For the latter, while Jian provided further detail of the model assumptions with respect to the air handling unit (AHU) and VAV (variable air volume) metering and dynamic ventilation requirements in 90.1-2016 vs. 90.1-2013, sufficient ventilation is very important in Multifamily buildings, and the assumptions may not sufficiently capture. It was agreed to address this further in the 10/26 Multifamily working group call to leave time to focus on Commercial code requirements on this call.

Actions:

- NBI to discuss parking lot measure option for Multifamily settings with PNNL to determine how to incorporate into the modeling.
- NBI to add sufficient detail for 10/26 Multifamily working group call to address the proposed measures, noting how the prototypes don't reflect these measures.

Update on Commercial Strawman topics and proposals – Jim and Mark (NBI)

The NBI team presented the “Proposed 2018 Commercial Structure” noting that it was a revised version of the NYStretch-Energy 2015 framework. As before, it begins with the NYS base energy code and includes a Prescriptive path and Performance path. Will spend most time talking about prescriptive and measures proposed within, and that methods to be used must be identified within the coming weeks to allow discussion at early December Advisory group meeting.

Mark walked through the components of the framework, including the mandatory and optional compliance options, and the “Packages” options which will be modeled to determine how measures compare in terms of energy savings. This effort also included comparison against the 2016 New York City Energy Code to ensure the proposed measures were on par or more stringent, and to assure the four measures required in NYC (see slide for details) are addressed in NYStretch-Energy 2018 as part of a package or within the base code.

The “Modeling Compliance” slide shows NBI’s interpretation of the NYC modeling requirement of Appendix G / Section 11, which does not allow the IECC path. Discussion over Appendix G inclusion is detailed below.

Mark Lyles described the status of consideration of passive house ... interested in working with experts in Advisory and working groups to come up with a viable pathway and proposal for NYStretch-Energy 2018. Options considered are: as an alternative air barrier/envelope compliance path, which would qualify for most stringent package. Jim noted DOS needs to approve the ability to recognize a submittal based on passive house documentation, and that a request has been made for DOS input on the approach to use.

Mark described the cooling tower approach feedback received from the working groups which led the modeling team to reduce the requirement from 80 gpm/hp to 65 – 75 gpm/hp to account for system height and weight implications which need to be considered. Discussion on set point versus changes in overall system efficiency which followed is described below.

Discussion/Stakeholder input

- Maria suggested it could be better to select one path, and preferably Appendix G, since it was more developed and known (e.g., used for LEED and incentive programs) than Section 11, otherwise the process could be susceptible to gaming (i.e. loophole) and/or could cause confusion. Ian expressed concern with a one option approach since Appendix G is more stringent and that would prefer, to which Maria countered it depends on the building components (e.g. chilled water vs. steam) and they are different and complex modeling protocols.
- Ian expressed concern about mandatory number of proposed mandatory requirements, to which Jim noted that only the dashed lines are required. Ian also stated concern over the proposed two path approach does not make the code simpler, just more stringent. Jim clarified that only dashed lines are required and that Massachusetts only has Appendix G option. Ian indicated that the Massachusetts Appendix G is not the same requirement as it is based on 90.1 2007. Bing

stated that the new Appendix G is a new/novel concept and getting lots of attention, but still being determined how to incorporate by stakeholders.

- Emily indicated only one or two projects in New York City are using Appendix BM to submit for code compliance at this point.
- Jim indicated that NYSERDA and New York City will have to evaluate how to proceed in light of these two opinions.
- With respect to the passive house approach, Maria stated the NYSERDA Multifamily Program funded a very detailed analysis of PHI, PHIUS and Appendix G protocols, which was presented at the recent ASHRAE conference. The key finding was the simulation tools used by PHI and PHIUS were not compliant with requirements of 90.1 and they target buildings with high-performance envelopes and single zone HVAC systems, so don't have ability to model different HVAC system types in different thermal zones in a building. The study is available on the NYSERDA website. Mark indicated the modeling team is aware of those issues, and seeking to incorporate elements that could work and not be subject to such limitations. They are not proposing passive house as an alternative to NYStretch.
- Jodi asked if the concern is that the passive house approach, which typically gets to 60-70% better than code, is too aggressive. Maria replied that the concern is the inability of passive house protocols (not just modeling software) to model multi-system buildings, even relatively simple multifamily buildings with two HVAC systems/zones.
- On the topic of cooling towers, Ian asked if cooling tower condenser water release reset protocol is mandatory. Appendix G requires set point be held at 70, which means fans are going to run all the time. Where going: playing with set points is disingenuous ... rather ... with condenser water reset, can get colder water into chillers which would result in more than playing with efficiency of the cooling tower. Don is categorically opposed to the cooling tower tweaking, and only could support overall system efficiency. In Don's experience motors will rarely run at full load, and the result would yield a relatively small horsepower savings from a significant investment (hundreds of thousands of dollars).
- Mark asked Ian and Don for language to improve the cooling tower measure. Don described his cooling tower commissioning approach, which is based on wet bulb temperature and field tweaking based on local conditions. Bing and Don believe this may be the 90.1 standard. Don indicated the cooling tower case study shared ("Optimizing Design & Control of Chilled Water Plants"), which focuses on cooling towers in California, should not be considered as it is not applicable for New York setting and perhaps too manufacturer specific.
- The modeling team will collect feedback on the cooling tower approach and determine proposed approach.
- The conversation returned to discussing data centers. As discussed above, the data center approach is anticipated to reduce the data center load from 54% to 39% for Large Office Building based on the new Appendix G schedule (see slide for detail), which is within the Miscellaneous category.
- The "Exterior LPDs" slides show values which are based on ASHRAE 189.1-2017. Jack Bailey was asked to comment but requested the ASHRAE 189.1-2017 LPDs language, and noted no ILD members had seen this information. NBI indicated it would share. Don suggested team must keep in mind owner-developer security concerns which are often at odds with energy

performance desires. Ian noted the way the code is written suggests one cannot exceed LPD limits and still comply with the code. He suggests the NYStretch code allow flexibility by allowing use of an energy performance model if LPD values lie between the mandatory base code and NYStretch values.

- The suggested High Efficacy Lighting approach would add language to the Commercial code and change language in Residential code based on IALDs luminaire definition proposal to IECC and DOE's proposal to IECC (see slide for details). Jack indicated that the IALD committee believes the 75 L/w vs. 65 L/w would eliminate most of the LED retrofit lamps on the market from consideration. This would apply to new construction and retrofit conditions, so could require permit, but applies only to hard-wired fixtures in dwelling and sleeping units, whether commercial or residential, and hotel rooms (in IECC). The code does not specify a LPD for these space types, but rather a proportional efficacy requirement for fixtures installed. The proposed efficacy definition would update requirement such that incandescent and CFLs could not be used. Maria noted 90.1-2016 Section 944 applies only to dwelling units, not hotels or dorm rooms, and requires a 55 L/W lamp efficacy and 45 L/W luminaire efficacy.
- Jim summarized the three issues discussed on a separate lighting call which took place about a week prior to this call and shown on the "Pending Review" slide.
 - Correction was made to the first – the proposed "egress lighting" value (from 0.2 to 0.02 W/SF), but it was noted that this would be insufficient for the application and would conflict with building safety code (likely requires at least 0.12). Jack suggested it may be possible to change egress building code provisions, but needs to be looked at holistically rather than individual measures (including use of occupancy sensors in stairwells). Much discussion of safety and security requirements followed, with suggestions for use of lighting level setbacks and other strategies suggested for consideration.
 - The "minimum daylight zone" requirement was explained to not focus on Large Office Buildings, because Schools already exceed the requirement in the 2013 baseline, and to encourage the use of "daylight responsive controls" rather than requiring "daylight zones" at 75% of perimeter zones. The language will be shared with the Advisory group for evaluation.
 - For Energy Star appliances, the proposed language will be based on 189.1 and is considered for one of efficiency packages, wherein an installed piece of equipment (e.g. dishwasher) – or percentage of all installed equipment, when installed for sufficient time, could count as efficiency package. Emily expressed concern that NYC would not know how to enforce since appliances are not under DOB jurisdiction. Jim indicated the team is still looking at which pieces of equipment could be included. Ian suggested the language not be based on a requirement, but on an option to allow credit for installing equipment, similar to the LEED approach. Emily reiterated the enforcement challenge if not put into code.
- In response to feedback in earlier meetings on whether to include regenerative braking, Mark suggested they have sufficient research to move forward with proposed language and modeling as an option.
- Jim then described options proposed for lighting approaches in Existing buildings (see "New EB Structure – Title 24" and "Lighting Retrofits – T24" slides for details). Jack Bailey agrees there's

energy saving potential for existing building retrofits, but challenging to claim because sector does not file for such retrofit permits, rather treating work as “maintenance” efforts and is concerned that including would make it even more difficult for potential applicants to file. Emily agreed with Jack’s point and indicated this concern also applies to window replacements and re-roofing, as well.

- Jim described the “Commissioning System Replacements” which expands the current code requirement, and the “Level 3 Alterations” requirement, which he indicated is more controversial than the Commissioning approach because could go beyond the Local Law requirement. Jim clarified to Ian that this “Level 3” would apply when affecting 50% of the floor area, not the total value of the building.
- Jack Bailey asked whether the “Additional Efficiency Packages” are based on IECC and 90.1 compliance paths for buildings applying prescriptively. Jim indicated this was how the Massachusetts stretch code was structured.

Actions:

- NYSERDA and New York City to discuss Appendix G/Section 11 requirements.
- The Working Group was encouraged to submit suggestions for inclusion of passive house elements in NYStretch-Energy 2018.
- The NYS Department of State was asked to respond to NBI request on approach for incorporating passive house elements in NYStretch-Energy 2018.
- Mark Lyles/NBI to follow-up with Don Winston and others for assistance with cooling tower measure approach/language.
- NBI to post cooling tower case study to the NYStretch Resources site.
- NBI to post ASHRAE 189.1-2017 Exterior LPDs language to the NYStretch Resources site.
- NBI will examine NYC Local Laws to determine the appropriate “Level 3 Alteration” language to propose.
- NBI to share the “Additional Efficiency Package” language with respect to use of IECC and 90.1 compliance paths for a prescriptive approach.

THE MEETING CONCLUDED AT 3:15 PM.