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QUESTIONS & ANSWERS FOR MODULE 6: DEEP ENERGY RETROFITS: STRATEGIES FOR GUT REHAB OR FULL OCCUPANCY RETROFITS

APRIL 6, 2020: DAY 1 QUESTIONS

Question	Who Asked	Answered Y/N	Answer
Hasn't SUCF updated the directive so existing buildings also now have an EUI target instead of % reduction?	Indumathi Lnu	Y	According to Lisa Mitten, that has been made official just yet.
Is there a concern about using the flex tape due to wrinkles and folds that can catch water, decrease performance?	Jodi Smits Anderson	Y	The tape is generally used for the air barrier, but it definitely needs to be installed well.
How deep should the insulation strip on the wall/slab edge be? The image looks like it is about 2'.	Indumathi Lnu	Y	A minimum of 2" is typically sufficient to ensure comfort in this climate.
What stories/examples/metrics do you have for making the replacement window winnable?	Jodi Smits Anderson	Y	Lot's of different drivers here from end of life of existing units, to thermal comfort for occupants to acoustic comfort for sensitive populations or locations in high noise areas.
What is the durability of a triple pane window? How soon do they lose their seals?	Elizabeth Kolacki	Y	Always depends on the quality of the window. Good triple pane windows have the same expectancy as good double pane.
Are the windows non-operable?	Sean Connolly	Y	Should always be operable, especially in residential applications. We only recommend non-operable for special cases.
Window replacement and effects of losing infiltration and exfiltration for outside air in older buildings. What is the unintended consequence of the newer tighter windows?	Steven Schunk	Y	In any building with exhaust only ventilation, increases the air tightness of the assembly can result in overtaxed vans due to increased operating pressure and a reduction in airflow through the apartment. We are most concerned with multi-family applications in these cases. Even in standard new construction as opposed to high performance projects, we do not recommend exhaust only ventilation.
Is there a way to clean existing ductwork without installing multiple access doors?	Alison Kran	Y	Duct cleaning technicians have a variety of methods for cleaning large systems. I would

			contact a company to assess your particular setup and application.
Slide 123 Are you saying you need one head per room in your DERs?	Bill LaBine	Y	No, that's just how some projects have designed their systems.
How do you raise +/-110˚F AWHP to appropriate DHW temp (with electricity, not gas) to supply both heating and DHW from a single system?	Tom King	Y	The low temp hydronic system (110F) is only meant for space heating. For DHW you need higher outlet temps. If you send the 110F from the air source heat pump to a water to water heat pump located in the building you can boost the temps to 150F+
The building system was designed for HTHW at 400 degrees operating temperature and PSI respectively. By converting to LTHW, we face issues with boilers turning off if pressure falls below 300 PSI, any advice to accomplish without relooping the entire system?	Tom Kelly	Y but respond more thoroughly	One example could be to install a temporary high temp/high pressure jockey/primary loop for the boilers with a new Hx that interfaces with the main campus loop. That way the boiler still sees the right pressure range while you modify connected buildings and the main loop infrastructure. Then when you're ready you install the new lower temperature heat injection equipment (boilers/AWHP/GSHP/etc.) you build that plant and switch it over to the main loop, shutting down the jockey loop, Hx, and old boilers. This is just one example pathway. The first step is usually assessing the loop and seeing how much capacity it has at low temperature and/or low pressure, and analyzing how much heat recovery can be leveraged to lower the actual amount of heat that the loop needs to move. You have to make sure that the LTHW approach will work without increasing the piping size, but when that is confirmed then there should be ways of stepping over from the old boilers to the new system with well-planned staging.
Just to clarify, a hydronic system with a heat pump will typically run at 110F degrees max?	Michael Armida	Y	The max temp for air to water heat pumps in cold climates is around 110F when the heat

			pump is seeing its low outdoor temperature limits.
Can you get 180F from a heat pump while we transition our building to low temp?	Indumathi Lnu	Y	Not in the US currently.
If the original coils were designed at 180F how will 110F provide enough heat?	Michael Armida	Y	You have to make sure the loads in the space don't require more than 110F to meet the loads first. Then you have to make sure the equipment will operate properly at those lower temperatures. There's analysis to do upfront before converting anything.
Do you have any strategies for applying passive house principals for partial building retrofits?	Elizabeth Kolacki	Y	I think all the principles we discussed can be applied to retrofits. The trick is making sure you don't cause an issue when doing one thing at a time like the example I gave of replacing the windows and then no longer being able to use a window A/C.
What R-value should we aim for when re-roofing?	Lisa Mitten	Y	For larger buildings, the roof has a smaller impact on the load. In this climate for a taller building (6+ stories) code is often a good value to use. For lower buildings you could see savings in the R-50 to 60 range.
Have you considered drained EIFS assemblies in retrofit applications?	Michael Kramer	Y	Yes. Many of our EIFS projects use that type of system. It seems to be regional and by builder what is used on a particular project.
For the case study, did you include a redundant unit that could parallel into a system if a unit went down?	Tom Kelly	Y	Sorry, not sure which case study is being referenced.
What is the 8% fee in the construction costs slide?	Andrea Travani	Y	Builder's fee.
Rubin Hall- with interior insulation, were you able to get continuous thermal barrier? Is that where you used the 2' slab insulation?	Indumathi Lnu	Y	No. It's very hard to do that with interior insulation only. We were able to mitigate any condensation potential, however.
Do you think we need to push back on SHPO? How can we meet climate goals by 2050 by continuing to keep last century's buildings?	Indumathi Lnu	Y	This is a very important question in this day and age. It will take very carefully crafted

			arguments and proof that the character is not compromised.
Slide 224 what software do you use for Comfort Analysis?	Bill LaBine	Y	This was an ASHRAE calculator which is free online.
Is there a concern with slab curl at the edges by using poly directly under the slab? The question is referring to the 10-mill poly vapor barrier The poly is the vapor barrier.	Salvatore Renda	Y	Slab curling is a function of how the slab is cured, not the poly. Concrete is placed on steel decks all the time with proper attention paid to curing to limit curling. - Michael Kramer
Can you tell us who manufactured the historic retrofit windows in the former school?	Rick Alfandre	Y	Universal Window & Door in MA.
It looks like all case studies are using DOAS ventilation with hydronic/refrigerant loop for heating and cooling. Is an air-based VAV system a NO-NO for passive houses?	Indumathi Lnu	Y	Correct. We always decouple the ventilation from our heating and cooling equipment. It allows for proper sizing of the ventilation system and ensures the flows are achieved as designed. Using oversized ductwork to deliver ventilation air results in unbalanced systems.
For the Pirelli Bldg, could you isolate the kitchen from the rest of the building?	Tom Eisele	Y	For this case, no, because the kitchen is for direct use of the hotel. If we were in a MF building with a restaurant in the base, yes we could.
What is typically the range in % of the passive house or energy savings consultant's fee for a retrofit project from beginning to completion?	Andrea Travani	Y	It varies so widely depending on the project budget. For a 10M budget we wouldn't even be 1% for the entire process. For a small home it's a much bigger %. Also depends on the consultants!
What are your thoughts on installing a fluid applied cool roof in southern NY area? Advantages/Disadvantages? White or Grey color?	Tom Kelly	Y	Lots of good advantages. The larger buildings are cooling dominated, so measures to reduce that are desirable. Also helps with the heat island effect.
The R-value of the paint is something like 1 per inch making this application maybe and R of .012. There are so many professionals, including me, suspicious of claims of painted solutions. Should these be avoided if possible?	Jodi Smits Anderson	Y	We only use them in situations where there really is no other good solution for reducing thermal bridging. Typically it's where we have steel running from inside to outside in a

			building. It can help reduce condensation potential. Overall, we don't count on it for huge energy savings.
What is the name of the Aerogel spray product?	Bill LaBine	Y	Aarolon
Your comment about the controls on the Cornell "HOUSE" VRF system not being able to obtain control optimization information from, is this driven from the VRF equipment MFR? Or head end equipment and Control Integration? Who is the VRF MFR for that system used at the Cornell HOUSE Project?	Matthew Brubaker	Y	We were looking for detailed data on the terminal units as well as the outdoor units so we could do a detailed heat balance and evaluate system efficiency. The standard controller didn't have that capability. Mitsubishi is the mfr for Cornell's system. They have been working with us to develop the proper solution.
Long Term Maintenance Costs etc. and improve the decision making process on material selection, system design, etc. As a Facilities Management / Energy Manager at SUNY Cortland, it seems like the level of detail in the LCCA completed on projects is never as in-depth as some of the planning level case study examples you presented for NYU, or other building owners / clients. Since LCCA is a SUNY / SUCF directive requirement for all SUNY projects, is there essentially just something "wrong" with how the design / project directive is written that could be revised and then yield potentially better or more "usable" decision making information from the LCCA performed? Or, perhaps the LCCA is just not well executed in general, using possibly incorrect assumptions to essentially allow the design team and owner to arrive at conclusions that they want, as opposed to leveraging the logic based decision process that in the long run, would likely yield "better" decision? And in this case, better decisions would be decisions that align with the Net Zero Energy, and or Passive House concepts to lower overall carbon emissions. To summarize, or asked another way, what LCCA process do you feel has yielded the best informative outcome to help teams make good decision?	Matthew Brubaker	N	The best we have seen is when we have taken and in-depth look into the existing building operation, provided solutions deemed practical by the owner and the consultants and then did a comprehensive cost evaluation with a cost estimator. This last step is an iterative process with the consultants so that we can provide input on costs based on our real world experience. A lot of the time these estimators have not done anything to this level of efficiency and they need to guess at a lot of the scope. That's where your consultants can help.

Windows are a big point of discussion when owners look only at ROI.. Some replacements yield an ROI of multiple decades, and are totally dismissed. Windows are always the first to be VE'ed out.	Jodi Smits Anderson	Comment	There are a lot of good reasons for universities to invest in good windows, especially if noise is a concern. Also, costs for high performance windows have really come down over the years and selection has gone up.
The chart you have now is giving me good information; but we have a habit of NOT replacing systems when they are at end of life...	Elizabeth Kolacki	Comment	Hmmm. What is done then?
electric kettles are a lot faster than other kettles, but maybe not as fast as an on-demand at faucet water heater.	Jodi Smits Anderson	Comment	Interesting! We'll check that out.
Cool roofs can also extend life of insulation and equipment on the roof.	Jodi Smits Anderson	Comment	Agreed.

APRIL 7, 2020: DAY 2 QUESTIONS

Question	Who Asked	Answered Y/N	Answer
Slide 28 - what does the diagram mean where top outlet are linked? Plug-load controlling device?	Juhee Lee-Hartford	Y	Those would be the outlets that get shut off based on the controller. Bottom outlet would not.
Do you have a favorite smoke machine?	Bill Mitchell	Y	Ours is cheap. We get them from party stores. There are definitely better quality machines out there. They are easy to find on the internet.
Is it worth it to do window testing on existing windows to remain?	Megan Smailer	Y	Definitely. Improvements can be made to them to improve their performance.
Can you talk about liquid air barriers applications to exterior or interior brick surfaces? Full width. Especially where there is not space to provide an interior wall. I am curious about a full width brick wall where you would have to add exterior insulation such as EIFS to the exterior. I am concerned about damage to the existing brick or moisture on the interior.	Jay Lee	Y	If you are insulating from the exterior, you will be keeping the inside surface warm and therefore moisture on the interior is not likely. If bulk moisture does work it's way in, it will dry easily to the interior if there is no insulation on that face.

Do you have a recommended infrared camera?	Megan Smailer	Y	We use the FLIR. Professional grade cameras but not cheap. Check out ones they make for your smart phone.
Slide 62: Are there good 'Panelized' modular options coming out? - Scandinavia has some good companies...?	Bill Mitchell	Y	It's one of the highest priorities on NYSERDA's list right now. Stay tuned.
Slide 65 - Can you explain again the benefit of adding a metal angle at the base of the wall to draw more heat for comfort?	Juhee Lee-Hartford	Y	The metal angle draws heat from the interior to the cold edge of the floor thereby warming it up.
Can you further explain the "metal angle" detail that places it under the floor when insulating 1 - 2 feet (w/o insulation above)?	James Bischoff	Y	I believe the question regarding the metal angle may be related to the direction of thermal energy flow. I suspect it's not being understood that the temperature is being drawn from the interior space. - Pat Fitzgerald
When using a foam board assembly, what methods do you use to prevent trapping moisture?	Brad Cherin	Y	Not sure if this questions was for interior or exterior insulation. Sorry.
Do you have lab analysis done on existing materials to derive properties for your WUFI analysis?	Nicole Schuster	Y	Not typically. Our enclosures team is very good at indicating what the properties of particular masonry are based on location, age and application of the brick. If we are concerned after our inspections and our WUFI modeling and feel there could be a problem, we recommend the owner have the tests performed before doing the work. This happens occasionally.
If exist masonry bad, do you remove entirely before new exterior system installed? or just worst portions?	Megan Smailer	Y	Depends on what cladding system you will be using over the top. For something heavy, it might be worth removing it. If it is a lighter system like EIFS, repair could be sufficient. We recommend consulting a structural engineer for assessing damage.
Can you talk about upfront carbon on the envelope? wood fiber board in the envelope?	Naomi Beal	Y	There are some good tools out there right now. I mention a couple in the presentation toward the end. Essentially, wood based products especially with recycled content are

			the lowest, then mineral wool/glass products and then foam based plastics.
Do you need interior insulation if there is a possibility for external insulation?	Monisha Royan	Y	No. You really only need a few inches of exterior insulation to make a huge difference in performance in an uninsulated building. It's actually the best way to go – exterior only if it can be achieved.
Which method do you use to predict the moisture either internal or external?	M. Gaber	Y	We use a combination of WUFI Pro modeling and THERM analysis.
Any recommendations for window opening limiters in passive house windows?	Michael Burgess	Y	Most of our PH projects have them because they are over a certain height.
It would be great to see the list of high-performance window suppliers for retrofits and historical buildings.	Samantha Roesemann	N	We can post this.
Bringing the window out to the same plane of the insulation makes the elevation look flat and there is no depth to the elevation can talk more about ways to maintain the depth and character of the building similar to the historic application?	Jay Lee	Y	You do not have to do this. There is a lot of flexibility in window installation and a number of ways to handle them. A good consultant can analyze the install conditions for you and help you find a solution that fits your project.
What is the area percentage of the frame in a high-performance window?	Monisha Royan	Y	Depends on window size. An operable window frame can be 5" in height while a fixed is usually 2.5-3".
what are the differences between UPVC, WOOD, METAL windows, in your experience? Is the material choice dependent on the price of the window?	Jose Sosa	Y	Metal is the most expensive because it is the hardest to make efficient. PVC and fiberglass tend to be least expensive. Wood is in between.
is the hit on the PHPP for an uncertified door small enough that you can make it up easily? Does it depend on building size?	Naomi Beal	Y	Typically yes.
Isn't it true that PH buildings have less problems with moisture behind EIFS skin spalling off the finish because the continuous air barrier behind the EIFS keeps interior moisture from getting into the EIFS layer?	Christina Snyder	Y	This is true. There should be far fewer moisture problems in a PH building because the heat and air transfer through the skin is significantly reduced.
Is the mold due to condensation caused by improper ventilation and infiltration?	Monisha Royan	Y	To a good extent. Sometimes there is too much moisture generation in a space and

			sometimes the detailing is poor and results in cold spots. You can have mold problems in a home with good ventilation if the surface temperatures are low enough.
Slide 107: Why are occupancy controls sometimes preferred to sensors? Is it a cost issue?	Elena Belletti	Y	I think it depends on the application. I also think timers and schedules in a controller are more durable. Sensors can go bad over time.
Aeroseal: Can you throw out a cost per x square feet??	Bill Mitchell	Y	We see it priced per grill in our existing building projects. I'm sorry, but we don't have a good number to share at this time. We are currently working on a template to help our customers estimate this.
Have there been scientific studies of how much aerogel nanoparticles remain on the surfaces of the ducts (as opposed to wedged into the cracks as desired) after an Aeroseal process and whether those particles might come out into the air that people breathe from the newly sealed ventilation ducts?	Christina Snyder	Y	Well we know that it doesn't stick to flat smooth surfaces, so the interior of the ducts would fall in that category.
How often do car dampers fail? There are moving parts that can get locked in place in a CAR damper if they respond to pressure.	Gaspar Cabrera	Y	They can get dirty and should be vacuumed periodically. It's not as often as the filters in the ERV, though.
For CO2 demand control ventilation, what do you see as typical CO2 settings and any issues that you have come across/best practices to share?	Michael Miranda	Y	1000 ppm of CO2 is a typical threshold for demand controlled ventilation.
Which ventilated system do you recommend, total energy or sensible energy? And how much energy cost difference is between the two systems?	M. Gaber	Y	We typically review the sensible and latent efficiency of the equipment and choose the best for our particular project depending on our energy efficiency goals and the space type.
Are you aware that radon can come from common building materials like concrete and anything containing materials mined from the earth, and that manufacturers are not required to report radon emissions of their products, and that internal radon emissions in airtight buildings may not be sufficiently mitigated by code mandated ventilation levels,	Christina Snyder	Y	Yes. We do not do any regular testing for that however.

such that it is best practice to test building materials existing and new for radon emissions to prevent health issues and liability?			
VRF's: Do Indoor units need condensate lines?	Bill Mitchell	Y	Yes.
If you're using 0 GWP (global warming potential) refrigerants, is it still possible to use heat pumps successfully?	David Benjamin	Y	CO2 heat pumps are in the market, just not many in the US market yet. They actually work better at cold temperatures and have higher efficiencies.
Slide #128 when you say VRF can do simultaneous heating and cooling, can it relocate the heat to reduce wasted energy or is it drawing heating energy from outside and rejecting heat to outside from the cooling units? If it is possible to just use the HP to move heat within the thermal envelope, is it possible to store the thermal energy either short or long term with mass or phase change materials?	Christina Snyder	Y	VRF in heat recovery takes heat from one side of the system and passes it to the other side which increases the overall system efficiency.
Do you know of refrigerant options / air to water heat pump options in other countries which can provide supply water temperatures hotter than 110F on design heating days? If so, do you think they will be coming to the US any time soon?	Bryan Simpson	Y	Mitsubishi is bringing one to market in the US soon. Q1 of next year is the target. They are doing trials in the US now. They have been available overseas for 10+years.
Any Comments on thermal storage energy to offset the peak and reduce the equipment size? Short- and long-term thermal storage.	M. Gaber	Y	Definitely needed for heat pumps. They perform better under constant operations. Peak conditions are more difficult for them to respond to. Storage helps with this.
If you put integral HP water heaters into laundry rooms with condensing clothes dryers how do you use the waste heat to meet part of the hot water loads?	Christina Snyder	Y	Condensing dryers actually release heat to the space. A heat pump water heater would benefit from this.
Most ERVs we see are not controlling speed of rotation. is this a critical control you're seeing implemented? i would assume it is but clients don't see the logic.	Gaspar Cabrera	Y	We are in our high performance projects. We are using them to prevent freezing in the cores and to help reduce humidity levels.
For winter which is advisable ERV or HRV?	Monisha Royan	Y	Depends on the moisture load of the occupants. For high moisture space types, I would suggest an HRV unless you are using a central system where humidity control can be implemented.

What is a good support system to dehumidify the indoors space, in high-humidity load climates (Florida, Sri-Lanka project). thinking that we use ERV already	Jose Sosa	Y	We used a passive heat pipe to aid in dehumidification and to reheat the cold air coming of the dX coil.
How do you handle the latent load of the passive cooling system?	M. Gaber	Y	See previous answer.
What's the best cooling system in a data center?	M. Gaber	Y	A properly sized VRF system would offer a lot of flexibility. Problem is these systems are typically sized for future capacity needs and not the current needs.
Aren't rainwater systems expensive and difficult to maintain, even in new buildings?	Annette Barnes	Y	In an existing building, I believe they would be expensive to install. And yes, to reuse rainwater in toilets and the like, there is typically redundant plumbing. In cities with strict rules on runoff, there can be decent savings from using them, though.
How much heat loss does the DHW system cause as a result of recirculation relative to non-circulation?	M. Gaber	Y	These losses can be 30-40% of the overall DHW energy.
What techniques do you use to find void and unused chases for retrofits?	Samantha Roesemann	Y	Roof top and mechanical room visual inspections, plan reviews and building walk throughs generally help us identify the majority of these chases. The rest will require a little physical investigation
Have you found any low-cost through wall air conditioners that provide a fairly airtight separation and thermal break between inside and outside within the unit? There is a 12 story PHIUS multifamily project that just barely met the air-tightness requirement where nearly all the leakage was through the through wall AC units - you could see daylight through them. Through wall AC was cheaper than split AC, but nearly cost them certification.	Christina Snyder	Y	No, but Intus windows has created a special window for receiving a window A/C which has a triple pane window that can close over it in the winter.
Slide 186: EIFS system: can you please expand on the failure potential and how to remediate?	Robert McCabe	Y	EIFS failures were primarily due to substrate failures, lack of proper water management (flashing), and related design deficiencies. - Pat Fitzgerald

Slide 195: did you cascade kitchen exhaust through bathroom in every apartment or only the end ones? Seems like that strategy would cut down on the over ventilation the codes typically result in in MF passive house projects.	Christina Snyder	Y	About ½ of them.
Slide 192, How can you manage the refrigerant leakage in the VRF system if it there?	M. Gaber	Y	Please refer to Module 7 on refrigerant management.
Interior Kitchen and Interior Bathroom Exhausts combined are not allowed by Code in NYC. How did you get around that?	Raul Garip	Y	Well, this was just a study, but we have been very encouraged working with the building department and presenting ventilation alternatives where we feel the solution provides better indoor air quality than the code requirements. This would definitely be one of those cases.
Is there any required measure for indoor air quality?	M. Gaber	Y	Not at this time.
Along with the chart on Page 216, is there a cost association with carbon savings?	Samantha Roesemann	Y	No, they didn't want it included at the time. It is shown on slide 217.
Do you think the long-term paybacks in the USA are largely because fossil fuels are so heavily subsidized here? In Europe energy costs from utilities are much higher.	Christina Snyder	Y	Yes.
in slide 235 - the insulation around the steel beam is not going to cause condensation?	Juhee Lee-Hartford	Y	There is enough connection to the interior air that it will be OK. That's really only for fire code.
any historic interior finish challenges at SSSH?	Juhee Lee-Hartford	Y	Just lining up the windows so we weren't causing site line issues. There was one room with beautiful wood paneling that would have had to have been removed and replaced just because it was so beautiful. But there was no strict historic requirement there.
What modelling method did you use in slide 254 and what is the accuracy of the model?	M. Gaber	Y	The graphs and recommendations are based on modeling done in WUFI pro. It's not hard to use, but really should only be done by a professional experienced with hygrothermal analysis.

Have you considered zone control options in this case study? (just before PHFA)	M. Gaber	Y	Yes, definitely. I just didn't specifically call them out. Lighting and plug loads were big drivers.
Could you please explain about drain water heat recovery on shower drains again?	Monisha Royan	Y	The heat from the shower water leaving building is transferred to the incoming tap water on the cold side. This reduces the amount of heat needed from the HW loop to get it to the desired temperature.
I primarily work with 1-4 unit residential buildings with wood framing. Is there anything I should be considering that moves away from what you have covered today?	Brad Cherin	Y	Sorry. I would take the PH training for that. We developed this for SUNY because their buildings don't fit that type.
Are there any new smaller VRF units for low-load spaces? Apparently, Daikin can switch out mother-boards in their indoor units to reduce the capacity by 50%.	Michael Miranda	Y	Mitsubishi is coming out with a 4kBtu wall mounted unit and I believe Fujitsu has done so as well.
For an emerging architect who wants to pursue career in high performance buildings, what is your recommendation as a first step to be taken?	Monisha Royan	Y	I would get your certification in something like PH or Living Building challenge and then find a project that you can try it out on. Always best to find an experienced consultant to help you through the first one or two. Keep coming to presentations and conferences like these. You'll make a lot of contacts!
As for open sourced HVAC systems that will be digitally manageable across various buildings in a portfolio, do you have any products to recommend?	Samantha Roesemann	Y	
NY will introduce a carbon tax policy around 2025 which will increase dramatically with the time. What are the strategies to prevent charging more running costs o the building sectors? Are you planning to insert more renewable energy, such as decentralizing PVT and PV systems?	M. Gaber	N	Not sure I understand the question.
Were you able to get Sage (electrochromatic) glass into PHI certified glazing units and frames and not have problems with durability due to the high heat stresses on the windows? And were those windows USA made or European?	Survey	N	Not PHI certified frames. Frames made in the US.

Was the exemption you got for cascading the extract air from the kitchens through the bathrooms due to PH apartments not having exhaust range hoods, but rather re-circulation hoods with very good filtration?	Survey	N	This was just a study. No exemptions were pursued, however we have had a very good experience working w/ NYC's building department when it comes to high performance buildings.
RFP / RFQ information for evaluating quality of Facade Analysis? Is this "additional" services that could be competed by the design team? OR, would wall analysis be better completed by an additional consultant entirely? Is this a place where NYSERDA can offer specific project support / Technical Assistance?	Survey	N	Not sure I understand the question.
	Christina Snyder	Comment	
Check out 3DFS Company for Server Energy Efficiency... Great claims. Real savings?	Bill Mitchell	Comment	
Caution foaming under slate roofs: you don't want to rust out the nails...	Bill Mitchell	Comment	