Webinar

Best Practices in Building Maintenance: ULI Asia Pacific Member Leaders
Address COVID-19
Date: March 11, 2020

00:00:00 --> 00:00:05: Even officials. Next, I'd like to go over some housekeeping matters first.
00:00:05 --> 00:00:07: This webinar is being conducted with simultaneous translation in Korean.
00:00:12 --> 00:00:16: And your CEO. Second, you will be able to post questions to the speakers by clicking on the question icon at the bottom of the screen and again for those of you joining from Korea, you're welcome to submit questions in Korean.
00:00:34 --> 00:00:38: The Web and RI like to introduce the discussion leaders of the web and are today.
00:00:38 --> 00:00:40: So first we have Louis Chang who is the founder and president of Pure Living, a company based in Shanghai that offers expert advise on indoor air quality.
00:00:43 --> 00:00:45: And 3rd, we have Mr Lawrence Schoen who is the president and principal engineer of Shawn Engineering, is based in Maryland in the US.
00:00:53 --> 00:00:58: Second, we have Mr. Raymond Chow who is executive director of Hongkong Land Limited and he's also the chair of ULI Hong Kong SAR.
00:01:04 --> 00:01:07: And 3rd, we have Mr Lawrence Schoen who is the president and principal engineer of Shawn Engineering, is based in Maryland in the US.
00:01:16 --> 00:01:17: OK Ray, please go.
00:01:23 --> 00:01:24: Good morning, good morning everyone and thank you Ken for having me this morning.
00:01:32 --> 00:01:37: Hopefully everyone some real life experience of what we
have been doing in the portfolios that do we manage?
Perhaps I give some context to people we have in Hong Kong.
5,000,000 square feet of office and retail space, right? In the heart of Central Hong Kong.
We are considered a long time long term investor.
When we say long term,
we're looking at assets and managing assets for the long term,
and that we're thinking generational.
Um, just to give you the scale of what we do.
We have about 30 billion US dollars of assets sitting in Hong Kong with a revenue stream of but one billion US dollars every year.
So every single day I collect 2 1/2 million US dollars from how I collect those is based upon.
I've got to roughly about 606 hundred multinational office clients
and about 200 retail clients who expect the top best in class management services.
To help them manage their assets and manage the office in a daily basis.
Now what I'm going to do is really just give you some life experiences of what we've been doing.
My discussion will be on the softer side and terms of how we manage the assets at during this crisis that we're facing it with this coronavirus crisis.
So, um. If just suck,
as a general principle we we provide,
we believe health and safety for staff and customers is kind of paramount.
Number one in terms of our dealings in the in the the in the day-to-day asset management.
During this crisis. We also believe that we are an educator and a communicator and would provide education to two.
Clients and we try to give a almost like a psychologist give the our clientele a a sense of calmness.
Hopefully when they come to the assets that we are providing a limiting the potential of a contraction of the virus.

When they enter our buildings.

And also we're trying to facilitate the anything they require and help them through this very difficult time.

So what we do is we just say for looking this slide now.

We're going to. We provide staffing service providers safety which are grounded and somewhat detailed.

And then we we put some precautionary measures in and I'll go through the details of that regular update.

Customer service is really quite the most important piece. I haven't been able to have him take improvement.

You could agree on. Set A it is not enough positive particle.

So um staffing service providers safety.

So this as a provider party number one obviously we got take care of our clients and our staff.

So before everyone comes into the office is all our building management has to take a data temperature check.

They must wear surgical mask when entering the hunkele and our portfolio so so any any workers or any of our staff when they went into the portfolio they have to wear a mask and and also.

Sure that they got temperature taken.

They also need to declare what they've been and maybe self quarantine themselves.

Um and and especially around Hong Kong.

Now there's many main regions around us that has a lot of details.

So we we basically take a very very aggressive stance in terms of people entering the building.

As you can see in this in this picture here at the lobby of Exchange Square where the stock exchanges had we have thermal scanners and we also have individuals with small thermometer eutectic temperatures of people.

High touch areas like toilets listen escalators.

We basically are disinfecting this.
These errors substantially more, which basically means that we are have disinfectants and cleaners. We've actually heard, uh, probably about 2020 to 25 new cleaners and for our portfolio, which all they do is just disinfect the high touch areas. That's all they do. We also put carpet and entrances. Into the buildings and one of the key things is to really test kind of keep the communication level is very very high with our clients and that's work through WhatsApp and that's also through through circulars that we provide with them. Um? Some of the areas that we do is that we all the all the buildings actually in the main entrances we basically have. Has a, uh, a placement of these areas so no one can really enter the building without actually going through a thermal check, so this is the kind of 1st priority for people when they come into the assets into are built into our buildings. A lot of our clients have asked for us to help them with this and we basically increased the cleaning and we basically increased two times the fresh air flow into our buildings. Also, we believe that we need to get the air circulating. Quite aggressively, and also in order to air coming in, but also air going out exhaust. We've also increased. That's really kind of increase the circulation of the of the airflow. Do you like to help me? I can't move this sliding right now. Yeah, I think this is the most important piece of what we do. We need to give regular updates and customer service to our clients. We regularly give guidelines an and also when the
puts guidelines in place we give.

We basically reinforce that through WhatsApp or through our circulars to see what the latest updates are to give people.

Uh, understanding of where things are like and also we also consistently talk to our clients because everyone is in very, very concerned mode right now and we try to

minors Manager clients by giving them open communication.

So if a client did have a case in one of their officers, we would basically tell every single client in the whole building that there was a confirmed case and they keep and they really should be on top of the social media is one or two cases we had before the social media was spinning.

A lot of unfortunate information that was not true, so getting on top of these social media part and communicated with our clients is at your key and critical.

Can you start next time please?

Um, so we did have a unfortunate case that we there was a unfortunate case that will happen in one of our office for Zayn one of the retail units were by uh staff was of what they get almost confirmed.

So what we did very quickly was that we update all internal staff of the confirmed case that's internally for us and also for the clients.

We updated all our building management offices team and then

we basically immediately.

Vacate that floor so we work with the client to vacate that floor and we do a general, clean and disinfect the whole floor.

We also conduct and clean and disinfect all the ventilation system and air Handling units found.

Call an all the various other systems to ensure that ensure that it is told to the safe before the decision then is made them.

Do we bring back the office back into the
market so this is a lot of things that have happened that we do that and at the same time we do tell all the clients on this on the whole. Building that this is happening so there's no no concerns. And then if people need to mix decisions on what they want to do then they can do so. Can you go for next time please? Also, I wonder with things we do is we have a response committee which is a which is at the highest level at board level. This is a really frustrating for strategy if there are any key issues or major change in in the viruses of positioning. We have a committee at at the board level that gets together for making quick decisions to a operational committee that is our hit squad that goes into and ensure that the disinfectant and managed the situation as properly. We also ensure that our staff. Is is very safe, so we have now split officers. We have office one office in one building, half the half our operations is in another building. To assure that we saw that one building or one team gets ill that the other team kind of gets a still functional in our daily operations are are intact. Can you start one more please? And then we also just not doing what we're doing, and there's many, many things we could do, and I could take a take a few days later as some what time is running out, but we are looking in the future now. Unfortunately, we believe after stars and now coronavirus that they probably virus issue is here to stay or that there is going to be a continuous outbreak of these unfortunate situation. So we are now looking at various future alternatives to actually to put into the portfolio in terms of maintenance to self sanitizing. One handles whereby whereby each note each handle actually sells
sanitized and there was a technology out there right now getting getting looked at.

They were putting out to to basically escalators clean themselves to very high,
efficient, efficient HP air filters,
which I think are my other steam speakers will be talking about in the in a few minutes,
so I think I'm going to close it from there.
It's really just a very quick snapshot of what we doing this.
There's a lot of other things with you,
because of time constraints,
I just give you a quick snapshot of what we are and then and then I'm very happy to take a Q&A when the time comes,
right? Thank you Ray Larry,
please go ahead.
OK, I will need help with advancing the slides.
I don't see that arrow so.
Um, I will focus on the HV AC systems because that's my background.
Next slide, please and. Essentially,
keeping buildings healthy. Saving Energy is a good thing,
but keeping buildings healthy and comfortable and so people can be productive is the main reason that we have buildings.
That's been the focus of my activities for the last 30 or 40 years.
Next slide, please. So the first thing I'd like to make clear is that there is a limited amount that the HV AC system can do.
Um and. So there are multiple modes of transmission.
TV comma weising need that your girls soccer.
Rain in. Don't talk to get going here,
so Tom Petty, John. Where is Hampton new top talkers in Calgary
door? Taxi system
and they eat again in each
can travel perhaps one to two meters, and we can only affect that a little bit, and then the aerosol, which behaves like a gas and spreads throughout the air. Next slide, please. So in many diseases we don't really know the primary mode of transmission and it can take years for researchers to study. I new disease outbreak until we know which the primary modes are. There is some discussion among experts about how much transmission of COVID-19 can be by the Airbound route airborne route, and we really don't know yet. So the practical solution is to use what is called in hospitals. Infection control bundles use of multiple modalities simultaneously. So on the next slide. How you'll see the very basics of what a building operations team should do, and this has nothing to do with HV AC. But I thought it was helpful to show this and of course as Ray just described his company is doing much of this. I call your attention to the 4th bullet down, allow or encourage work from home. And so that has the benefit not only of having social distancing, but also if we keep the ventilation rate in the building up, you effectively get more ventilation per person, so therefore you dilute all the contaminants, including those that are infectious. So the real message here is cover the basics. First use the HV AC system to help. So next slide please. There's a lot on this slide, so let me. I don't have the benefit of a pointer, so if I can take your eye to the very right side of the screen where you see sort of the person on the right side of the bed,
Now this slide is clearly made for a hospital environment, but the principles apply. If the person on the right hand side of the slide sneezes or coughs or even speaks, there are particles of various sizes that come out of their mouth and nose, and the large ones. If you follow a little bit to the left and you look to the bottom underneath where it says bed, most of those large ones settle in one to two meters. And of course I would like to credit you, go leave from Hong Kong University for this slide. That's why he spelled meters using the Hong Kong way, not not how I would spell it. And then what happens is some of those droplets can be can evaporate the water around them. They become droplet nuclei. So if you look up a little bit, you'll see this phrase droplets evaporated to become droplet nuclei. Those are the ones that can then spread throughout the building system. And I will allow you to study the rest of this offline and move to the next slide. But the point is that we don't really know. As I said before, if the urban born route is significant for COVID-19, nevertheless using the principle of multiple bundles, multiple infection control bundles, it does make sense to take actions on the HV AC system, and that's what these bullets will direct our attention to. Number one, increase the outdoor air ventilation. As much as you can, as much as your systems will allow, different systems have different capabilities. If you're in a building that has only operable windows as the outdoor air ventilation, then I suggest opening those, but the exception is if the outdoors is highly polluted with particulates as we do have in some of our
major cities,
then I would not do that,
particularly on a day that has a high pollution levels
some buildings.
Use carbon dioxide to reduce the ventilation to save energy.
If you don't have a lot of people in the
building,
that carbon dioxide level will be very low.
If you have that type of system in this situation,
I suggest disabling it. Saving energy is secondary right now
to saving the health of the people in the buildings.
The next thing is to improve the air filter ratings
in ASHRAE.
We use a Merv ratings.
The EU uses rating. I would suggest at least Merv
9 or F5 if using the EU rating.
I'm not familiar with with other rating systems,
but I'm sure there are equivalencies for central systems.
I would go even higher than that.
Merv thirteen. F7. And once you get into those high
effectiveness filters,
it becomes very important for the maintenance people to
place
a seal.
Around the edge of a filter.
Otherwise air bypasses the filter and you really don't get
the benefit of it.
The next in order to enhance both the filtration and
the amount of outside air,
I suggest running systems for longer hours if possible.
24/7 continuously so that you get the dilution and you
get the filtration for more hours.
If your system next week.
If you have the other next slide,
but next bullet if your system has the ability to
humidify,
I would suggest keeping that humidity level above 40%
again as a short term measure.
Long term, there are some downsides to humidify,
but in the short term,
if you have the ability to do that.
Lastly, if for some reason you can’t use a lot of outside air or you don’t have central systems, then instead of putting floorstanding even portable recirculating HEPA filters is beneficial that will reduce all of control of the contaminants, including those that are possibly infectious. And particularly if the outdoor air is dirty with PM 2.5, then that’s when you don’t necessarily want to bring in too much outdoor air, because that has other downsides and other health effects. Next slide, please. Things not to do. Please don’t turn off the ventilation systems they have both the capability to filter and the capability to bring in good outdoor air. So the exception is. If I, I wouldn’t say turn off the ventilation system. If the outdoor air is too dirty, but I would say you might curtail the amount of outside air and use it more as a recirculating system if that with with the high filtration level that we discussed earlier. In the winter time, don’t over Humidify that has other downsides, so if you keep it above 40%, that’s pretty good. Turkey, Turkey deposited onto Genesis worker. Could you go to reduce alcohol? Could you go to? And it was an attendance should not be introduced into the indoor environment. Electronic air cleaners are difficult to compare to the media filters using those rating systems that I mentioned earlier. So use those with caution. Next slide, please. For high risk occupancy lips for high risk occupancies, this is this. Please leave that previous slide. Yeah, the upper room specialized actions for high risk occupancy. This this graphic shows you on the upper left you see radiation by ultraviolet light.
People need to be protected.

Usually there's a shelf that's below that light fixture that protects occupants.

But what this what you can see is each each of us generates a thermal plume, so our contaminants tend to go up to the ceiling, and that's why the upper room ultraviolet irradiation can be very effective for killing microorganisms.

These have to be installed. It's not something you can just buy and put in.

You need power up there and just special fixture. And you do need that shelf.

That perfect protects people. There are some other specialized.

Actions listed in the other bullets,

but I am running out of time so I will move to the next slide which is just.

This is intended for a residence, but if you look in what's called the bedrooms here and imagine that that was a one person office.

Portable air cleaner size for the room would be a good add on to your basic HV AC system.

So the next slide. Will be,

I believe, our summary, the HV AC system really is the icing on the cake.

The basic cakes is to take those direct contact infection control measures that I listed earlier and that Ray very thoroughly thoroughly covered.

Run your systems longer, keep them running, improve the filtration either at the central system, the local system or at a recirculating system.

And use outside air more of it.

If it's clean, keep the humidity level up to above 40%.

If your system has the capability.

Not all buildings do. There are enhanced techniques for high risk occupancies and if we don't get a chance to answer your questions,

I'm open to receiving questions online.

Thank you.

But thank you very much,
Larry. I should have mentioned that Larry is a fellow at ASHRAE which is American Society of heating, refrigeration and air conditioning engineers. So it's a very influential industry organization and he's a very prominent member of that organization now. Thank you Lewis and it's an international organization by the way, with 50,000 members not not restricted to the US, right? Thank you. Thank you, Larry and. Sir Speaker is Louis Chang, who is a UI member based in Shanghai. He is the founder and president of Pure Living. Louis.

Thanks Ken, I'm just make sure I have audio.

Can you hear me?

Yes, we hear you.

OK. Thanks, thanks everybody, it's great to be able to share a little bit and it's good that Raymond shared how companies are executing Larry introduce a lot of the research and theory I'm somewhere in between. We advise our clients on essentially how to bridge theory of around aerosols and having managing risk along with the realities of what building owners have to. So let me see if I can advance on this.

OK, there we go. Just as context. Pure living is a consultancy. So essentially we work with schools, building owners offices essentially to help them around the health and safety issues.

We focus a lot on indoor air, so today I'm going to be talking of course is all the modalities that Larry talked about. Touch, individual defense, identification of source cleaning. Today I'm going to. Focus a little bit more on the potential sort of routes of. Transmission, which has been identified as May or may not. He, um, a primer. It's not a primary source of transmission, but we know that the generation of aerosols means it's
something that a lot of both of our tenants of public and building owners are concerned about. Basically, how do we run our HVAC so some of what Larry talked about just now? He's allowed droplets. So one thing to understand is as viruses leave our bodies. They are on droplets. That's a larger size here. The virus itself is tiny. It's all the way over on the left side. But what happens is when the droplets leave our bodies, they are impacted by humidity. The dryer is the way the air moves. It tends to reduce the size from very very large, like runs down to about. The research shows us count about one or two microns, which means it can then. Float around. You can see here from 'cause the primary mode of transmission would be direct, which is why you want to keep the social distance. But you can see that there's also smaller. Chocolates here in that fine mist is what can travel further and that's really what we're looking at. What can we do to the H back to make it more effective in being a secondary barrier against any sort of transmission of these documents? So in general, right now there's a lot of regulations, government regulations, some of these also apply to schools and healthcare. Each of those is specialized. Sometimes we see. Policies that don't agree with each other and that's what causes pause the confusion. One of the biggest things I hear is that people are turning off their air condition altogether. And this is not a good thing, so here are some of the general principles of what we want to try and do. Going to go into a little bit more of the detail here. So what we're seeing is the reality is people are often erring on the side of being conservative and turning
off their systems altogether.

This results in people being very cold, in which case we cannot return back to normal. A normal working life and it can't be productive.

Obviously if you're freezing also then that.

You know? Ben oh hey,

Louise. Also, as part of bringing in the air, but you don't recirculate, you have higher energy costs, so I think the goal that we're trying to do is to have your building JCH fact that it was designed.

Hi Luis, we are having problem hearing you for some reason.

OK. Next slide, please. And one more slide.

OK. Um 4 for HVAC.

As Larry mentioned, there's we want to have high efficiency filtration.

Fortunately, a lot of buildings in China already have high efficiency, which means that they capture the droplets of moisture that have the viruses.

However, they sit on the on the filter and. It doesn't actually inactivate them, that's why. Please. So the UV UV light is in the right wavelength in the right contact time.

Is used can be very effective.

Cost effective system. Put the key thing here is that it doesn't shine in online.

It doesn't. Doesn't shine in a shine.

Shine shines on the viruses that are trapped in the back please.

There are other options, so when you bring it, the goal of HVAC, aside from its basic ventilation, heating, cooling in this sort of defense against any airborne viruses or pathogens is to be able to kill or inactivate viruses that can also be done by coming through an electrical field. These are different technologies that can be used.

Ionization, electrostatic, precipitation or IFD.

All of these are essentially the same.
They create a strong electric field for which the air flow passes through, and then those viruses, which are actually quite fragile are deactivated. The next slide, please. So this is just an example. One of the questions we get asked frequently is, is this worth it? How much is it going to cost? So we just use some examples of some representative market cost to give you a sense of what's the installation cost, what's the ongoing costs, but traditional media filters. Remember. Again they capture the virus and most of the times that's sufficient, but usually you're going to want to pair a media filter with. UV light, I can say that many of your buildings because of Asia. Will have will already have these media filters so all you need to do is add UV light once you're in a recirculating mode. For ESP and bipolar ionization, these are both technologies where the installation cost is is fairly high, but the ongoing OpEx is fairly low. Next slide, please. So last thing I think I want to talk about is around ensuring that these different technologies that are implemented actually work and how do you know whether your continue to do well in the future? Next slide, please. So verification is really three types of verification that you can do. Number one is live monitoring. Air quality monitors that many building owners I know in China is actually leading the world in terms of building monitors. Hong Kong land for instance we actually have monitors and one of Hong Kong lands centers in Beijing. These monitors can be put in the
ambient space or in the duct, and if your filtration is working well. It will tell you actually whether you have any leakage, whether your systems are not working well. Basically, if you've caught the particles you've caught the virus.

The second thing would be systems disinfection, so being able to. Measure the quality of your cleaning. If you clean your doorknobs, even clean your elevator buttons, you can actually do a live ATP count so there's a ATP real time meter that allows you to see how well is your cleaning staff working. I know some of the developers and building owners uses the last one is you can culture. They basically take a swab of your return air and be able to see whether or not the. You are getting live bacteria as a proxy for the virus.

I think a lot of times are focuses on perception, managing perception, communications monitoring is good because it essentially allows you management to be able to tell if you're doing a good job or not. And it also allows you to have something tangible that you can share with your tenants and occupants to give him that confidence and Peace of Mind. All these steps that we're doing as the last takeaway is that it's not something you can't wait this out. All of the steps that we're doing are useful for flu season every single year, so it's none of this is throw away.

So with that, I'll I'll turn it back over to Ken for questions. OK, thank you, Luis. Now we have about 6 questions, and I think there are two types.
One is more business oriented with which I think is better.

So Ray first for you we have questions about retail tenants suffering from significant drop of revenue.

How do you work with them to keep them happy.

Yeah, that's a good question.

I mean, unfortunately, Hong Kong is going through over the last nine months, going through a very big political crisis, when people on the streets.

Collins causing a disturbance and we saw at the end of this year end of last year that things are picking up unfortunate.

This coronavirus really hit really hard and actually the sales figures are very very weak.

Just give you some insight.

What you know sales are down anywhere from 70 to 90% in February with the height of the coronavirus on top line top line.

So it's very very. It's very, very unfortunate. Um, to answer that question, we obviously with all the measures we're doing to ensure that you know we can bring more people into the retail centers, but it is a very, very unfortunate situation. Obviously, one thing that we are working with the clients is to help them on rent relief.

For February we see that as as something as a partnership approach with our clients. Because if you have somebody to 90% revenue drop. On in February, you know, and this coronaviruses is totally unexpected.
term view.

And I say that when I first started my presentation that were long term investor that you do need to work in partnership with your clients to ensure that they work. So that's just a a financial relief on the on the business side.

For retail we do. We are doing a lot of other promotional activities besides rent relief.

We are helping putting kind of. Trying to help people with with with coupons like Uncle and so called coupons to try to help drive sales for them.

But it is a very difficult situation at home and with this parameters people do not want to leave the offices or leave their homes and you know so we we try to we try to bring the business to them now and working with our retailers to perhaps able to give more online activities to to them to do better, to do byproducts and bring them home but.

It is very difficult right now and like I said, I think the whole business retail business model is is going to going through a very very fundamental shift right now, specially when people get comfortable much more comfortable for not shopping and etc etc.

So I think it's it's. It's still wait to be seen, but just those are kind of the key measures that were doing.

Helping on the top line and also help you on the bottom line is trying to work with the partnership only through.

OK, thanks Ray. We have another question for you, it's about you mentioned in your talk the need for open communication with your tenants and visitors.

Have you had a situation where you got information about someone being infecting your building from the media 1st and then having to approach that tenant later?

We have not yet, but we have the indirectly have
when one of the first cases was in Hong Kong
was the was a family who had a dinner together.
And and they went to him,
got infected and I was on the news first.
But what we found out one of the affected individuals
was actually a worker in one of our retail restaurants.
And so that that that went through.
Obviously that came through the social media first,
but we didn't track it to the two or one
of our tenanted restaurants until much later,
but that. But then it went very quickly.
After that, there were no one.
I think this whole dynamics is no ones really hiding
anything,
but no ones trying to hide.
So people are quite open about it,
so as soon as they found out the restaurant found
out that that was one of the individuals they needed,
contacted us, and then we set our our standard
operating procedures in place.
We would close down the restaurant,
we we, we got everyone out the restaurant tours a
quarantine all their stuff for 14 days.
We went in and we cleaned.
We disinfected the whole premises and then then the
premises are shut down for 40 days because of quarantine
and they just recently opened again,
probably about 2 weeks ago after the 14th for 5050
day quarantine they reopened and it's been in back to
back to business,
right? So
again, how many days would you?
Would you leave the space vacant before you let people
in after you do the.
This infection, well
you re depends like I said,
usually within within one day it is it.
You know. He's usually for offices.
We do one day and then basically should up the
areas if we do fully then everything was there with
the ventilation with all the disaffected in on that floor
should take you know literally took a few hours and
then and then usually the next day it can be
occupied.
But the issue is that the do the people do.
The operators want to do that because there is a
14 day.
Quarantine kind of period or incubation period for this virus
as we speak.
So usually people that if they if they do give
a kid a dentist like a 14 day period,
usually on the on. Not because the the the
the place not fit for operation is just the fact
that human beings are quarantined for 14
days right? OK thank you and and I think this
will be the last question and this is for Larry
and the question is so the the the participant has
a question about the air conditioning system in high rise
buildings right?
So especially in the mid.
Laventure but occupants cannot control the temperature
since most buildings
have central system that control the temperature,
not allowing individuals to temperature.
So your insights and opinions are on this situation.
Well,
heads up that. It's unfortunately common that buildings are
buildings
with air conditioning or subcooled.
And there are multiple explanations that have been given for
it,
and I I don't. I don't know what's in any
particular building.
It could be something from limitations in the control system
that don't allow turn down when there's low occupancy.
It could be building operations,
personnel responding to the person with wearing the most
clothing
which could be top management.
If there are multiple reasons,
I'm aware that it creates comfort problems I'm not aware
But it is unfortunately very common that buildings there subcooled, right?

There is technology now which which many landlords, including us were implementing is that there is a temperature controls into certain zones even on the same floor. So not the whole building. So I could right now control my room. I could bring it up to just say 25 degrees Centigrade and then outside is sitting at 22 or whatever it is.

So there is technology now that is able to do that, so it's really just how the existing land or they went to implement that that into their into their buildings. There is technology or they were implementing aurorae. Right great Luis. A quick question. What kind of common mistakes or misunderstandings two do people make or or have regarding the use of HVAC in the current environment? The main one is that people turn this systems all off, so building owners need to make sure they have at least the outdoor air on at 100% status several times. The other one is that I know my own team in Beijing was in the building and they were told to turn all air conditioning off, including local air conditioning, fan coil units, split units. Any of these. I had a slide that that. Unfortunately it didn't make it into the deck, but it highlights the types of systems that can be used without any re circulation. These are ones that if you can think you enter into a room you turn on, you can change the temperature of the panel. That probably OK because that means it's just running the
heating in your own room and those are OK to use.

One of the takeaways is just that if building owners are able to put in any of these systems, either filtration, plus UV or electronic filters, these deactivate viruses, if they are. If they happen to be airborne and then you can use your building HVAC efficiently the way there was. It was supposed to be used for both ventilation and heating.

Right, OK, OK, well I think with that will end the web and R here I'd like to remind everyone that we have more webinars coming up in the next several weeks please. Try to attend those events if they are relevant to your business. With that, I'd like to thank the speakers, Ray Lewis, Ann Larry. Thanks for joining an and offering your gradients like thank you. Thank you for having me. Thanks everyone bye bye.