

Hannah Debelius: Excellent. Hello and welcome again to the 2021 Better Buildings Better Plants Summit. We're so glad to have you here with us this afternoon. Today, we will be discussing one of the most relevant topics for this last year; which is integrating health and efficiency through the many challenges of the pandemic throughout the last year-plus. So you are about to join the session for health, efficiency and building operations; Insights From the Pandemic and a Look Ahead.

Before we get started, there are a couple of housekeeping items I'd like to cover. The first is that this session will be recorded and archived in the Better Building Solutions Center. So after this, you'll be able to access the recording and Click on any Links that we shared today. Additionally, you've probably noticed that you've joined in Listen-Only Mode, which means that you're not able to unmute yourself. However, we'll still have plenty of opportunities for you to engage with us using the tool I'll talk about in a moment.

And if you have any audio or visual issues or other tech issues we can help with, you can go ahead and put that into the Zoom Chat and we'll be able to respond there with our tech support in the Zoom Chat. Next Slide, please. I'm your moderator, Hannah Debelius. And I am a fellow in the Building technologies Office at the Department of Energy and have the privilege of working with the Better Buildings program with our commercial real estate and higher education sectors along with a couple of other Better Buildings hats.

Today, we are going to starting off with some brief introductions and getting some Polls going for our audience to see who we've got on the line with us. Then we've got three wonderful presentations from speakers across commercial real estate sectors. Than we're going to spend the bulk of our time together doing some moderated discussion and then taking questions from the audience to engage all of our speakers on this topic of health and efficiency in the built environment.

So this is how you're going to interact with us. *[Laughs]* Today, we are using a Tool called Slido. So you can either go to your mobile device or Open up another Browser and go to slido.com. Then you're going to enter the event code, DOE. And from the Dropdown, you're then going to choose the name of our session; which, again, is Health Efficiency And Building Operations.

So the best way to interact with us, again, is right now Open up either another Browser Window or your mobile device and go to slido.com. The event code is DOE. You might need to put -- then Click a little button that

says Join. And you'll choose our session from the Dropdown, which is Health Efficiency And Building Operations. We've also just dropped a Link into the Zoom Chat so you can Click there as well for a little shortcut.

Hopefully while we're getting set up for that now, because we are going to switch over now to our first Poll. This is just to get a little bit more information about who we've got online with us today. We can go ahead and launch that Poll. The first question should be an easy one for you all. And that question is just, "What sector do you represent?" All right. So a lot of nonprofits on the line with us, contractors, more for real estate, government and state and local, higher education. multi-family. Please go Down. I'm curious to see that other hospital partners on the line with us. So K-12, the financial services, industrial manufacturing.

All right. Excellent. Well, I'm glad to see the Slido should be working for many of you. With that, thanks so much. We're going to be moving onto our next Poll, please. And in this, it's a little bit more in-depth here, which is that we're asking you to rate from 1 to 5 -- with 1 being not very important and 5 being very important -- how important health and wellness is to your building portfolio or organizations. All right. So far, we have about half of people saying that it is very important.

Again. That scale is, 5 is very important and 1 is least so. All-right. And about 1/3 of people have about a 4. Excellent. And it's definitely of course...we've been seeing especially over the last year a switch to a real emphasis on health and wellness through the pandemic and I think looking ahead as well. All right. Thanks. We have just one more Poll for you before we get into our panelists, if we can go ahead and launch that. This going to be an open word Poll. You can just write one or two words in there.

But if you could please share what projects or themes you think of when it comes to exploring health and wellness related to the built environment. It could be something you're working on or something you're thinking about. Green roofs. Yeah. I definitely work in an office with a nice clean roof you can walk on, which is certainly good for wellness. Indoor air quality. A lot about air quality, indoor air quality. Sick buildings. Mm-hmm. HVAC and filter's definitely something that has been talked about a lot over the last year. Yeah. Maintenance, IAQ, filter changes, air purification. Excellent.

Well, I think a lot of these things are definitely things we're going to be talking about in today's session. A lot of indoor air quality. Excellent.

Well, I think we can go ahead and Close that Poll, switch back over to our Slides. Thank you all so much for answering those Polls on Slido. And you can go ahead and keep Slido Open because that's also where we're going to be accepting questions. You can submit questions any time during this session for our panelists. And we'll be able to answer those at the last part of our session today.

Also, if you see another person's question that you like, you can go ahead and hit that Thumbs-Up question. And the more votes that something has, it moves it to the Top of the list so we can prioritize that in Q&A. And also, just one more housekeeping reminder. If you have any tech issues, you can put that in the Zoom Chat function and we'll be able to handle it. So thank you so much, again, to all of our panelists for joining us. I'm excited to jump in here.

So actually, we can go one more Slide because I'm going to go ahead and introduce our first speaker, which will be Jonathan Bauer. Jonathan Bauer is with The Tower Companies. And as the Tower Companies, Sustainability Manager, Jonathan leads initiatives to meet aggressive sustainability goals across Tower's portfolio. He manages the company's energy, water and waste programs, green building certifications and health and wellness strategies and engages tenants and Tower staff to promote sustainability best practices. So, Jonathan, go ahead and take it away.

Jonathan Bauer:

Thank you so much, Hannah. Can you hear me? All right. Well, thank you everyone for coming. I just have to say I'm super excited to be here. I don't know about all of you, but this has been an absolutely electric Better Building Summit starting with a great kickoff day. And I've just been excited throughout the week. So thanks for joining. And obviously, a huge thanks to Hannah and Andrea, that entire DOE Better Building Challenge team for putting all of this together. I know it's a lot of hard work, and you've done another excellent job in this virtual format. So thank you. Also, just want to add I'm very humble to be alongside Sara and Rishi today. Looking forward to what they have to say in the conversation. So with that, go to my next Slide please.

And before I dive in too deep, I just want to give a very quick overview of the Tower Companies. We are a family-owned and privately-held commercial real estate company based in the Washington DC area, and we definitely pride ourselves on sustainability, excellence and leadership. It's been a focus for the company for over 25 years now; back to the mid-1990's when we really got going on this. I'm not going to read all of the stats on this Slide. You can do that in your own time.

But essentially, we're about 6 million square feet of commercial office, multi-family residential and retail properties. The other thing I just want to note really quickly is, we're a developer, owner and manager. So that means that we're involved from the design and construction process all the way through to long-term hold of the building. So we build our buildings, and we hold them long-term. So we're very interested and focused on operations long-term in a building, and we're involved in the full life cycle which allows us to do some pretty fun and pretty aggressive things with sustainability and health. Next Slide, please.

Like I said. We're based in the Washington DC area. Not much here other than a couple snapshots of some of our properties. Next Slide, please. Folks probably recognize a lot of these, so I won't go through them too much either. But we like to standardize a lot of our approach, and this is some of the foundation of the program we've built. So 98 percent of our properties are LEED-certified; all platinum and gold and all re-certified in 2020.

So up-to-date. Over 80 percent are energy-certified with most of the buildings in the top-10-percent in the country. And then, over half of our properties at this point are Fitwel-certified, and I'm working on a couple others now. And then, of course the Better Buildings challenge we've been a participant to...2013 we hit both of our 20-percent energy and water reduction goals ahead of that 2020 target and working on the next 20 percent now. Next Slide, please.

All right. So before I dive in, I just want to give a little history of wellness and as it relates to Towe and how we think about this. This panel is so interesting because it's about the intersected efficiency in health, and that's obviously very relevant in the new world we are living in. But most of these concepts that we talk about now aren't very new. Some are but most are not. This is something that Tower has been, you know, thinking about for well over a decade at this point.

In this case study you see here, we partnered with Harvard Business School back in 2008 to produce this piece all about our headquarters building in Rockville, Maryland, which was built at the time. And it was designed with health at the core. How could a well-balanced building--one with daylight perfect orientation, surrounded by greenery with a state-of-the-art filtration system...how could all of those things impact people? We were asking that question then. It was really our first foray into this topic.

And people reacted. You can see the quote here from one of our staff

when they moved into the building. And so, the picture you see Below is one of our partners, Jeff Ravenson, presenting this at Harvard Business School in 2010. The rest is really history. We started taking on these concepts and things we've learned from that building and incorporating them across our portfolio and our existing buildings. Next Slide, please. But that said, there is this balancing act that we all are, you know, working with on a daily basis in our buildings. We learned a lot along the way. And we've known about this issue for a long time.

And there are some times where, you know, the scale tips in one direction or the other. I'm not going to sit here and tell you that in every single scenario 100 percent of the time we can have equilibrium of health and energy efficiency. Sometimes it does tip certain ways, like with the pandemic. A lot of buildings in the US and across the world tipped a little bit more towards healthy buildings and had to give a little bit on energy efficiency here and there. But what I do want to say is, there is a way to find balance.

And the dream scenario for building engineers and operators is to find that balance, especially in this new world. So how do we do that? I'll talk a little bit about it, but essentially we need good data, we need new data, we need dedicated people and then we need Smart technologies that can help us get there. It can be done, but we cannot do it the same way before the pandemic. We are now operating in a new and different world, so we have to apply what we've learned over the last year-plus to make this a reality. Next Slide, please.

So here's a real example that I want to dive into very quickly. I could talk about this for hours, so I'm going to go brief. Here's a real example at one of our properties 1828 L Street in Washington DC. What you're looking at here is a snapshot of some data from Prescriptive Data, which is a company that runs Nantum operating system, a Smart building technology we have piloted in this building.. We did that in collaboration not just with Prescriptive but also the Department of Energy and Lawrence Berkeley National Laboratory who's doing rigorous M&V.

And we'll release that to the public sometime in 2022 probably, so you can read more then. Essentially, high-level we're expecting a 10-percent energy savings with this system and about \$50,000 a year. And that's in a building that's already very efficient and energy source score in the high-80's. So what does this system do? Essentially, this system loves data. So we have thousands of BMS data points that are flowing into this system on a daily basis as well as occupancy sensors on every floor in each unique air handling zone, energy interval data, IQ sensor data.

And for us right now, that's just the tip of the iceberg. The beauty is, there's more we can add and layer and as we learn and go. So what are you looking at on this Slide exactly here? These are the fan speeds of every single air handling unit in the building. So this building has leased hours of 8:00 AM to 6:00 PM. So in the before photo, you can see we were starting those system all around 6:00 AM with a tiny bit of staggering, which is pretty standard BMS functionality. So what we have done and changed drastically is a start Smartup sequence using Nantum's Smart system.

And how does that work? So literally as I speak right now, Nantum is starting to scan the building. It's looking for operational conditions tomorrow. It's looking at, "What is the temperature and condition's going to be outside in our localized area tomorrow? What are the internal space temperatures? What is the historical functionality of each air handling unit given those conditions in the past? And using machine learning and AI, it can then predict what it will be in that condition tomorrow.

The system then re-scans the same thing the next day, confirms those values, spits out a schedule of exactly to the minute when each air handling unit should start to deliver the exact same comfort in temperature by 8:00 AM in the least hours. So that's essentially what you see in the after picture there. Quite a bit different. What we're seeing very consistently over the last six-plus months is, most of our units now don't need to start until 7:15, 7:20 and some even later than that to deliver the exact same comfort.

So again. The beauty of this is that it's fluid. As our operations change, as tenants change, as weather conditions change, Nantum learns, it remembers and it responds with really high precision and automates this function for building. So there's a lot of energy savings here. But let me just touch on that health aspect, 'cause I wish I could talk a lot more about it. But this sounds like energy efficiency a lot. Right? But when you think back to the seesaw, what we're implementing here is energy efficiency here without sacrificing health.

We are still having the same conditions. You know? We control all of these inputs. And we have the data to confirm that these parameters are meeting industry standards. We can look at temperature, humidity, carbon dioxide -- any other IAQ metric to make sure everything is in perfect balance. And we're really starting to learn how to use all of these data points, roll them into the technology and maximize it as much as possible. Next Slide, please.

So with that, I just want to talk really quickly about COVID19, our response and a little bit of our outlook. You know, like many of our peers we spent the last year thinking a lot about this issue being really engrained and involved; thinking about health, how it fits into our overall sustainability agenda. And this is not new, right? We've been thinking about health like this for three to five years across our industry.

But now, it's the number-one thing, and it's changed a little bit; focused on respiratory disease, of course. But it's accelerating so much good work. And I've been involved in our COVID task force really from day one and have learned quite a bit. And there was quite a learning curve as we went through this. So here's how I like to break down and make an analogy to COVID. And I think this works for kind of energy efficiency and building sustainability too. Our general COVID response is much like a symphony.

What do I mean by that? A symphony needs a full set. Right? Every instrument in a symphony needs to play its part. You need sheet music, and you need a conductor that lays the foundation of the symphony. That might be something like building management policies to set standards or communication protocols to your clients. You need the fundamentals to keep the pace to set the tone. Maybe that's percussion or bass strings in a symphony. In a building, that might be ventilation or filtration.

Then you want to layer in brass and wood winds, things that add more power and more movement. In a building, that might be UV and your air handling systems or bipolar ionization or any other technology out there. Last but not least, you need the violins and the flutes; the things that are the flashy and noticeable instruments. So, you know, that could be something like having Far-UVC in your actual building spaces, or it would be having a Fitwel viral response certification that's public-facing. Bottom line is, the symphony will not perform well if some of these elements are missing.

It's the same way in a building. This needs to be a layered approach to really provide a healthy building and a healthy environment. We cannot just do some of these things. We need to consider all of them and be holistic. So very, very briefly I'm going to walk through what you see on the Slide here. The first picture's a good example. It's 1707 El Street in DC. Pictures of our signage, communicating what we're doing with our tenants. Obviously hand sanitizer and signage to help navigate the building.

Top-Middle is 1828 L Street in DC. These are MERV 15 filters which

we've upgraded to across our entire commercial office portfolio. Next to that is an air handling unit system with UV installed. We have also done that across our entire portfolio. Bottom-Left is an elevator with a UV light bar, in the back at the Top you can see. That sanitizes the air and the surfaces in the elevator. Bottom-Middle, there's a fan in the back there with a HEPA filter on the wall. There's also UV lights in the ceiling that are a little bit tricky to see.

But they're there also filtering the air. And the last one is a little bit of an interesting experiment. It's actually a UV portal. It's placed in the fitness center. But essentially, what it is -- when you walk into a building or leave, you can walk through that for about 20 seconds and sanitize anything on your person when you leave the building should you choose to do so. So there's some of the initiatives. Last Slide I think, please, here.

And lastly, I just want to touch a little more on Fitwel. Did an awesome job launching this program after the pandemic. You know, really took hold. We've completed the Fitwel viral response module across our entire managed portfolio. And then, a handful of our buildings in the DC region were the first globally to do so. You know, this is a program that consulted dozens of health experts and real estate practitioners coming up with 21 unique strategies that are specific to mitigating viral transmission of buildings.

And this is so important because we can't -- this is like the concert hall of our symphony. Right? It can't just be Tower going out in the world and saying, "Here's the things we're doing." We need to align with professionals in the health industry and others who have studied this and verified this; that we have actually done the things we're saying we're doing; that our policies meet a standard; that we're providing the healthiest building possible, especially given the conditions we live in today.

And what I'll just leave you with is every building's different. Every building has a unique approach. But at large, the technology and the policies are out there right now to create healthy and sustainable buildings for the future. It's the call and the need of the time, and we need to elevate to this new expectation. And that's really our goal. Our goal is to manage our buildings just like a symphony. So with that, I'll turn it back over to Hannah.

Hannah Debelius: Excellent. Thanks so much, Jonathan. And I like your call to action at the end. It's also hard to believe that, Jonathan, you joined us for the closing summary of Better Building Summit last year to talk about a similar topic to see what Tower's done since then. Excellent. Next up, we have Rishi

Shah. He's the Director of Sustainability for Wyndham Hotels & Resorts. Before this role, Rishi ran his own consulting firm where he assisted hotels and other commercial properties with the development and implementation of energy strategies and operational best practices. So thanks so much. And, Rishi, take it away.

Rishi Shah:

Thanks so much, Hannah. A pleasure to be here with you, Jonathan and Sara. Can you hear me all right? I'll take that as a yes. Next Slide, please. Let's give a little overview about Wyndham Hotels & Resorts. You know, unlike Jonathan Wyndham and tower Corporation -- Wyndham Hotels & Resorts is an asset-like corporation, organization. We actually only own two hotels; The Wyndham Grand Bonnet Creek in Orlando and the Wyndham Grand Rio Mar in Puerto Rico.

While we third-party manage about 300 hotels globally on behalf of other hotel owners. And the remainder of our approximately 8,900 hotels globally are franchised under one of our 20 iconic brands, such as Wyndham, LaQuinta, Days Inn or Ramada Inn. So these are properties that operate in accordance to our brand standards but on their own operating procedures and best practices. So we can only influence them and guide them. Next Slide, please.

So now, where does sustainability and health fit in our strategy? Every day, we work to empower new experiences for travelers in a way that positively impacts the world around us. That's why we're really committed to social responsibility efforts. And we're really focused on four key themes that are the centerpiece towards our strategic approach to ESG principles in our business. Our commitment comes to life with these four pillars.

We embrace different perspectives in our inclusive, fun workplaces and hotels where everyone has a genuine opportunity to succeed. We are committed to the health and safety and well-being of our team members and guests. We care for the communities in which we work and we live. And we are accountable for our part in protecting the environment. It's these four pillars and our Count On Me service that really guided us during the pandemic in order to better serve our guests, team members and franchisees. Next Slide, please.

So now, for us we've implemented the Wyndham Green program to demonstrate our commitment of protecting the environment in which we live, work and enjoy. As part of our strategic vision, reflecting the values in the culture, we realize that it's essential to protect our natural capital of resources in order to deliver long-term sustainable value to our

stakeholders and our franchisees. Our main focus areas are as follows: we want to minimize our impact on the climate, change by reducing our emissions and environmental impact. We want to become energy-efficient and increase usage of renewable energy where feasible.

We also want to increase water conservation efforts and identify risks and opportunities because water is one of our scarcest resources. And we also want to increase our waste diversion efforts by better understanding the waste profiles at our hotels. Next Slide, please. We continue to promote our Wyndham Green program, which was really designed to show hotels how they can reduce their operating costs through efficiency, help drive revenue from environmentally conscious travelers, remain competitive in the market place and increase their brand loyalty.

We're working to fully integrate the Wyndham Green program throughout our value chain by engaging and educating executive and brand leaders, team members, design and construction partners, our franchisees and suppliers as well. Now our green program consists of two main elements. The Wyndham Green tool box and the Wyndham Green certification. Together, these are the two components that really allow us to measure our impact while aiming for continuous improvement across our Wyndham-branded properties. The Wyndham Green toll box is our online environmental management system that was designed to track, measure and report on energy emissions, water and waste performance globally.

Now, our brand of properties all have access to this and have the ability to measure and track the impacts of their efficiency projects that they implement, and we can monitor and benchmark their progress, allowing them to reduce operating costs while also reducing our collective impact on the environment. And our certification program is our own internal certification program which is comprised of five progressive levels, which have anywhere from five to seven best practices per level that address energy and water conservation, waste diversion, operational efficiency as well as guest, team member and franchise education and engagement.

The first three levels of the program really prioritize quick payback efficiency measures, some of which are no cost and low cost. Next Slide, please. Now, the past 14 months have certainly been a challenging time for us -- for all of us, especially for us in the travel and tourism industry. Now, our responsibility as a company -- now more than ever -- it to help ensure the future remains bright for travelers around the world, starting with our guests, team members and franchisees.

Now, our teams deliver great experiences. And we have to keep our teams

motivated, supported and appreciated. Which means being adaptive and nimble during the pandemic. We've taking a variety of measures, including flexible work schedules as home and work lives blur together for our corporate team members, as well as extending summer Friday office hours. For hotel team members on the front lines, we've created new ways to celebrate their work; like super hero-themed appreciation weeks, which have gone a long way.

We quickly launched the Count On Us Initiative, which is a new long-term, multi-faceted initiative to really help build confidence among our guests and to support franchisees to welcome back travelers safely to our hotels. And this is in alignment with our industry's HLA Stay Safe Initiative -- or, Safe Stay Initiative. I'm sorry. Now, with health and safety at the top of mind for guests, we've built in safety messaging and visual cues throughout the customer experience. Like if there's mass guidelines, hospital-grade disinfectants for public areas and guest rooms, hand sanitizing stations and social distancing signage.

In addition, our team has quickly worked to update our mobile lab in order to prioritize low-contact in-stay features and also is one of the first to offer mobile check-in and check-out and nearly 6,000 economy in mid-scale hotels throughout the United States. and this couldn't have come at a critical time as both travelers and hotel leaders looked for innovative solutions to help navigate the challenges of the Coronavirus pandemic. Key among some of those features are mobile check-in, check-out, digital room key and then in-staying interaction with the hotels. Next Slide, please.

Now, our response to COVID19 driven by our Count On Me culture also intersects with our commitment to reducing our environmental impact. To minimize contact during stays, housekeeping services were kept to a minimum unless otherwise requested or required by local law or ordinance. Which also helped to conserve both energy and water throughout the reuse of linen during stays. Now, the Wyndham Green program also offered hotels best practices around energy and water conservation waste diversion and operational efficiency.

What we also quickly rolled out tips to our hotels, to help reduce utility costs and consumption during these periods of low occupancy without compromising that guest experience or the property's physical health and systems. And with fewer guests to plan around, which means renovations, energy efficiency projects, could be accelerated or feasible. Those hotels that could do so were encouraged to take this moment, a low rock in the sea, as an opportunity to expedite some of those previously planned

renovations and other projects.

We recommended to owners that they not only focused on those areas that could help impact and enhance the guest experience but also help deliver long-term savings such as energy efficiency projects like lighting Retrofits and energy management systems and water efficiency. And it was our job to make them aware of those best practices so that they can make the best decisions possible. Thank you very much, Hannah. Back to you.

Hannah Debelius: Excellent. Thank you so much, Rishi. All right. And next up, we have Sara Neff. Sara Neff is the Senior Vice President for Sustainability at Kilroy Realty Corporation. AT Kilroy, she oversees all sustainability initiatives including solar and battery deal-making, energy and water efficiency, the award-winning green leasing program and more. So, Sara, take it away.

Sara Neff: Thank you so much. Thanks, everybody. I'm so excited to be here. And I'm assuming everybody can see me and hear me. Let me know if that's not the case. All right. So I'll just take one second on Kilroy. So Kilroy Realty is a publicly traded real estate investment trust. It is active on the West Coast of the United States. We have about 14 million square feet of mostly office and life science, little bit of multi-family and retail in there as well. So that's us. Next Slide.

So much like you heard in Jonathan and Rishi's talk, I'm so excited to be here. And thanks so much to DOE for having me. I want to talk a little bit about where we were on health and then where we're going...where we are and then where we're going. So I'm just going to time myself to make sure that I don't go over my time. Very good. All right. Next Slide. So this is where we were. Kilroy's health programs launched in about 2015.

And in about 2017 -- so we were doing well. You know, we were sort of figuring out air quality testing and whatnot. And then, my daughter started coughing herself to sleep every single night. And for those of you who are parents, it's a horrible feeling when you can't figure out what's wrong with your kid and help them feel better. Nothing was really working on her. She got put on this horrible thing, and that wasn't working, and then they put steroids in and then that wasn't working.

And it took six months for her to get diagnosed with asthma. And that was the first time I was like, 'Oh, my goodness. I'm wondering if it's the air in our house.' We happen to -- I live in LA and not too far -- though I can't hear it -- from a busy freeway. Figured out that that was the problem, put in an air filter and problem was solved. Which sounds like a great story, except it's not. Because we'd already had health programs. This is sort of

how little we were all connecting -- *[coughs]* excuse me -- health in the environment with...even though I did this for a living, I wasn't getting it. So it was early days about five or six years ago. Now we're a lot better. Next.

But right around that time is when a lot of research started coming out. You've heard -- Jon had mentioned that Harvard -- Joe Allen's lab there, about the impact of health and air quality on cognitive function. That research was coming out right around then. Stoke, who's a great sustainability consultant we work with a lot out of California, they were really helping to sort of connect that to the financial case. And so, you know, we were starting to understanding health. We were seeing maybe the impacts in our own lives. Research was coming out. Things were really improving. Next.

And so, this is how Kilroy had been doing health. So we have two health - - we have sort of two things that Kilroy...or, had been, before COVID, two things currently. The first was active design. Active design is anything that helps folks be more physically active in their spaces. That's everything from connectivity to transit to making it easier to bike. Like in this picture, we have people working outside and connections to the outdoors. Biophilia. We have -- making sure there's connectivity of public transit from where we're located in our buildings. So a major piece of health at Kilroy, up until now, has been active design. Next. The other thing is air quality monitoring. So this is not a very sexy Slide.

But this *[laughs]* is what my life looks like a lot. We go into our building, we test the air. We want to make sure we don't have CO2 above 550 parts per million. This was actually taken in my own headquarters, and you can see we almost have it except it...almost everywhere in the space. We have a couple spaces that are in the high - a little above 550. But everywhere else is looking really, really good. So we want an air quality report to look like...and this is really sort of -- active design air quality have been like the two major things that had really focused on prior to 2020. Next Slide.

These are some other -- this is another area. So this is sort of what health and wellness overall looks like at Kilroy. I mean, you can see everything here is usually either an air quality item or an active design item. So on the air quality side, you'll see MERV filters, you'll see the testing I talked about. You'll see low-emitting materials. That kind of thing. On the active design, we're talking about things like roof gardens. I saw somebody mentioned that earlier. You know, making sure people had break areas and you don't have to eat lunch at your desk. You know, fitness areas. You know, active stairwells, all that.

So this is basically the picture of what health looked like at Kilroy. We are very proud that the Center For Active Design had given us its best in building health award three years straight. We'd also gotten some kudos for having some early well projects as well. So things have been going well. Next Slide. And we are really happy to partner with Joe Allen's lab for their third study on the connection between cognitive function and health and the environment. So I was one of the lab rats. This is where my Fitbit comes from. This is my desk.

And we also -- a ton of us signed up at Kilroy. We got air quality monitors at our desks. We got our Fitbits Sending all of that data about our physical activity and how the air was and also our cognitive function, 'cause we were constantly taking little quizzes on our phones, and all that data was really helping the Harvard folks understand even better sort of how this all plays out in real life. So prior to COVID, prior to 2020, we'd made a lot of strides. We were understanding health. We were implementing it in terms of air quality active design, everything kind of flowed into that, and we were helping further research on the impacts of health in the built environment. Next Slide.

But we did have this problem where we had this tension that we'd been hearing about between energy and health. And what do we mean by that? Really, it comes down to the fact that, often if you want your air quality better, you've kind of got to run your building mechanical system, or you've got to get more fresh air through the building. Inside air is often twice as bad as outside air. But when you run air through a building, it takes energy to do that. It takes money to do that. And so, there was really a tension between health and energy efficiency. And it was pretty hard to navigate that tension in all of our projects. Next. Give him a little time. All right. Good. All right. So that's building health where we were. Now let's talk about where we are. Next.

Great. So now, all of a sudden COVID is happening, and all-of-a-sudden now we're having to think about tenant health and health and safety and making all that make sense. Next Slide. So this is really when we had to like get real on it and figure out how to make energy efficiency and health work. There was this major focus, obviously, on health. Changed everything kind of about what we did. It was one of these things where I think a lot of folks in my job though COVID hit and, "Oh, my goodness. Are we still going to have jobs?"

And then, we found out, "No. Actually, we were in charge of the COVID response." It was an interesting year. And here's what we did. So next. So

this is what it looks like. We wanted our departments to be safe and health. A lot of things went into that. You'll see here air filtration, the UV cleaning that you were hearing about from Jonathan, a lot of sanitation stations, whatnot. But outdoor air exchanges. Which were, again, making things pretty hard from an energy efficiency standpoint. Next.

But we did have some winds. So one of the things that...I mean, active design that had been really important was having open stairwells. This is something that had made many people very grumpy for security reasons at Kilroy, 'cause they have to pay for all the extra key cards, screening stuff to be able to get people on the right floor and not where they're not supposed to be. But open stairs were a great response during COVID 'cause they reduce congestion in the elevator. Then we're running the elevator less, and there's energy savings there. Next.

And then, some other things are sort of happening which are changing our energy usage during COVID. A major thing is density management. Obviously, as you guys have found, there is, "Not everybody's in the space all the time anymore. And how are we" -- so we started trying to figure out how to modulate our air for the folks that were there. Especially because we knew that there was going to be sort of increased space requirements. And we wanted to be very, very clear that we were going to have to get a lot Smarter about how we were ventilating our buildings. Next.

And now, in my last couple minutes -- 'cause I'm right *[laughs]* on time -- I'm going to talk about what's next. So next Slide. Right. So the next -- so here's some things that are happening that have been working really well. One of the things that we found during COVID was...this was a new construction. But there are fans now that were able to help us increase our fan speed while saving on energy. So it was really exciting. We had some new technologies come out for a building that we were building in San Diego where the original fan that we had to inspect -- there was a need for more outside air, which was making me very nervous about the energy model.

And then, we went to the market and found out that, "No. In fact, fan technology has improved to the point that we were able to find a fan that had more outside air and still saved us on energy. So that was a win-win. Next. And then, this is sort of where we're going. So as I was mentioning, COVID has really helped us understand the importance of modulating the air to the people who are there. You can see that the party office on the Left of your Screen is going to need a lot more air than the office on the Right of your Screen. Which is what my office often looks like.

And so, where we are is, we're starting to pilot the idea of modulating the amount of air in a per-office and a per-suite area for the amount of occupancy. So you heard earlier about the importance of sort of AI and artificial intelligence; learning about this. So basically, what we're doing is we're trending occupancy in -- currently we're piloting in private offices within Kilroy's own footprint and our own management offices. We're going to -- the system is going to learn about who is coming in and out and when they're usually there.

So after that trending period, we're then installing sort of a Retrofit of a damper into the ductwork, and then we're going to be modulating down on air flow when the system predicts that nobody will be there. And then if somebody does show up, it'll learn that behavior and then change. The idea is, we don't want people to be uncomfortable in their space, but we also don't want to be ventilating spaces that are empty. And so, we're all really needing to get a lot Smarter about how to make that work going forward. And next. And this is where we sort of really hope it's going. So we had energy efficiency and health really fighting before.

We're now finally seeing opportunities for energy efficiency and health to have co-benefits together where we have better tenant comfort or better health, for example, through a more efficient fan that's blowing even more outside air through but yet is reducing energy through making sur that we're modulating so that we're not over-ventilating where we don't need to. So this is where health is going. We are now aware of health. We're now aware of sort of therapies in terms of active design and air quality, and now we're final seeing the technology show up into the market. They're helping us really come up with great outcomes for both. So with that, I will turn it back to Hannah.

Hannah Debelius: Excellent. Thank you so much, Sara and Rishi and Jonathan for your insights. We're going to move over to a moderated discussion here. I've got some questions. So perfect. Yeah, if you all could bring your -- bring it back up. Wonderful. So you all, you know, touched on a couple of different tools. You know, Jonathan, you talked about Smart buildings. Sara, you've been -- the technology that you just mentioned about the fans. My question is, what tools are you utilizing to help realize the co-benefits of energy efficiency and health, or what are the most important tools? And maybe, Sara, I'll start with you for that question.

Sara Neff: Yeah. Absolutely. Thanks. So we still -- much like you heard previously in the presentation -- we really rely on folks like the Center For Active Design to sort of help us understand what health looks like. They were just a major and just fantastic partner through COVID so we could understand

that. So they have been able to publish sots of series of sort of tool kits and frameworks. And that's been really, really helpful for us. We still rely on third-party air quality testing.

So what we did was, during the pandemic, Underwriter's Laboratory *[laughs]* -- ah -- had a pandemic response module. And they came in and did on-site air, water and germ testing for us. And so, having that as like an off-the-shelf module that was ready to go when COVID hit was really, really helpful. So yeah. A lot of third-party tools have really been helping us as we navigate the new reality.

Hannah Debelius: Yeah, that makes sense. And where third-party tools or certifications...that does remind me about when, Jonathan, you brought up your Fitwel certification for...which I know you've all partnered with Fitwel in the past. But the viral response certification. And, Jonathan, I am curious a little bit more about if you're using that as a tool how you chose it or how you're utilizing it.

Jonathan Bauer: Yeah. I think the big thing, like, early-on that was really important is like we all wanted someone to tell us what to do. Right? Like, *[laughs]* there's so much flying at you like tech and ideas and all these things. Like, "What's real? What's not?" And so, when WELL and Fitwel, I think, both launched their programs around the same time, I think we all kind of jumped at the opportunity to look at that research and let them be the experts and tell us what works in buildings.

And I think it was critical in taking a huge, mass of information and boiling it down to the things that mattered the most. And we're using it to help communicate what we've done. It's like the umbrella of all these things that we're doing. It kind of touches everything. From communication to actual building policies and more. So we're definitely using it as a communication tool and to show a level of confidence that we haven't just said we're doing all these things -- right -- but, "Here's the backup and the process and the validation." I can't say enough about the third-party piece just being sort important to validate all this stuff.

Hannah Debelius: I think -- Jonathan, I think it was maybe eight months ago you and I were having a conversation, and I...just that week of NPR. I had heard NPR talk about Mercer team filters. And I just thought, like, "What? Like, wow. Just the evening news talking about HVAC filters. Like, this is wild." And all of our building operators must be getting so many calls and questions and wondering what to do in a totally new way than it was before. Rishi, do you have any other tools that you'd like to add or tools that you use for co-benefits with energy and health?

Rishi Shah: Yeah. No specific tools because part of the challenge for us is that our franchisees - every building is so different; with different technologies, different footprints. So it's hard to find a one-size-fits-all.

Hannah Debelius: Yeah. That makes a lot of sense. So the next question I want to ask is, you know, related a little bit on the flip-side of that. Which is, I'm curious. You know, what is one technology or tool that you wish existed on this topic of health and buildings? It could be completely -- it could be fathomable or completely unfathomable. *[Laughs]* But I'm curious. You know, wave a magic wand.

Sara Neff: Yeah. For me, it's an air filter but that magically requires less power to push the air through it rather than more but somehow cleans the air the same or better on the way through. I would love something like that. There was -- yeah. There was a product pitched to me like that a long time ago, and my company went belly-up, so I don't think it actually worked. But to me, that would be magical and in general something that's not invasive but that helps us -- I think we picked a couple of good technologies to pilot.

But the less invasive technologies that enable, again, us to really understand who - from a privacy-protective way -- who is in the space and then modulate the air as a result of that. 'Cause right now, everything still involves cutting into the duct work. And, you know-- or a controlled sequence on top of existing piles of control sequences. So it's a little bit tricky right now. So it would be nice if there was some magical way to help us easily understand density and react.

Hannah Debelius: Yeah.

Jonathan Bauer: Go ahead, Rishi. Were you going to jump in, or was that Hannah?

Hannah Debelius: It was me. But go for it, Jonathan.

Jonathan Bauer: Okay. I'm not going to steal Sara's idea, 'cause I think that's awesome. I hadn't honestly really given it much thought. And I think it's a really good point because, you know, you see the back side, "All right. Everyone's to upgrade to MERV 13, MERV 15, maybe higher if they can and then what?" Right? Like, maybe your systems can handle it, but you're definitely using more energy. And then, those systems catch so much stuff, so much particulate, you got to change them. And they're expensive. So long-term, you got to think about the mechanics of all these decisions. It's really easy short-term to be like, "MERV 15. MERV whatever." Right?

But down the line, it's harder. So our teams are like, "Can we add pre-filters that don't get as much of the particulate on the 15 so they last longer, so we can have more efficient" -- so there's a lot of different things now we're thinking about. But my idea for what I want -- and think there's a lot out there, people who claim they have this, but I don't think it's quite there yet -- is, I want a bulletproof indoor air quality index. I don't think we quite have it. I think there's a lot of companies with sensors who are trying to do this, who are attaching scores.

I think some of them are pretty good, but I don't think it's quite there in the sense that it only takes into account a couple metrics. And I really want like the full spectrum. 'Cause part of the problem is, when you're looking at 15 different indoor air quality metrics, "How do we boil that down, communicate that to people in our organization? How do we boil that down and eventually communicate that to tenants if we get to that point?"

It's really complicated even for people who are looking at it on a daily basis. So I think we need a much better, more comprehensive, bulletproof index that we can point to and say, "This is the one thing that's showing you that indoor air is actually good." Because some of them -- there's issues in there that the index isn't quite weighting appropriately. So I'm just waiting for that. See what happens.

Hannah Debelius: All right. Magical filters, magical data. Rishi, do you have anything to add to that?

Rishi Shah: Yeah. I like Sara's idea of the magical filters, especially maybe one that could kind of -- one-size-fits-all. Especially in applications with different sized HVAC systems and individual PTAC units. Something that could be addressed across the board.

Hannah Debelius: Makes sense. Well, hopefully someone on the line is taking notes right now and thinking about this. So I just want to know -- and some of you mentioned there have been a huge variance in occupancy. And even in the past two weeks since I've thought about these questions, things have changed a lot across the United States about pandemic response. So I'm really just curious, you know, what's the biggest thing you learned about your building from that varying occupancy? And how do you think that would affect your future building operation?

Jonathan Bauer: I'll jump in.

Hannah Debelius: So you unmuted, so you can go first. Yeah.

Jonathan Bauer: You know, one of the things we learned was that we didn't know what our true baseline was. You know, hotels weren't really designed for zero to low occupancy. They were designed for 60 to 70-percent occupancy in mind. And so, that was the first thing that we learned, was that, "What is" -- we didn't know what it was. And so, looking back at our 2020 data really was an eye-opener for us to see, "What was our true baseline?" Because there are certain things that still need to happen at hotels in order to maintain systems and maintain health and safety. And so, going back and looking at the data will be a good experience for us to determine, "What is that baseline, and how can we better reflect that in design standards moving forward?"

Sara Neff: Yeah. I'd just build on that. It was -- for me, yes, that baseline was fascinating and the fact that, like, the building was 90-percent vacant doesn't use 90-percent less power. But also, just the differences in operation. You know? It's not like our operations with the same level of vacancy reduce back the same amount. You know? We had some buildings increase in energy. We had some buildings have, you know, 5-percent occupancy but reduced energies by 3 percent. And so, we had to then go in and talk to the building engineering team and say, "Hey. What's going on?"

And, you know, one example was a building where she was like, "Well, the CEO of our tenant company said he just kind of likes working in all the different offices in the building, so he just wants us to ventilate everything all the time just in case he came in." You know, like, "Really? Like, maybe we can get a heads-up like that morning and then" -- you know, so we've learned that it was...the baseline was fascinating. Buildings are just not meant to ramp down. But also, major changes in operational behavior. Which were very eye-opening.

Jonathan Bauer: I'll add to that. And something I've heard Sara talk a lot about before, too, is being surprised that the tenants didn't use more energy than we thought. Like, you know, you look at the buildings like she was saying with lower occupancy and you just assume you're going to see like a 30, 40-percent reduction when tenants leave the building. And there's a lot of literature about there about tenants and energy use. I'm not saying tenants don't use significant amount of energy and that we need to partner with them. We do. It's still important.

But that's an issue. So what I've learned is that occupancy is king. Right? Like, we need to manage our buildings better based on occupancy, and that's why I'm so excited about this tech that I've been talking about,

because a lot of it's occupancy-driven. And there's so much we can do to radically change the way we operate a building based on who's there. Right? Like, why are we ventilating a space where there's three people the same way we're ventilating a space when there's 100 people? Like, we just don't need to do that.

So it's just our systems don't manage that way right now. So we need to layer in some more of these occupancy sensors and different technologies that can take the right information and make automatic changes to help us learn that. So occupancy is king. We got to watch it. We need to manage our buildings differently based on that data. It's also really good to know who's in the building and where. That's just like a general good data point and awesome - it's like fun to watch, so it's a good data point to have.

Sara Neff:

Yeah. I'll just add. You know, in terms of like hard numbers -- and this includes some life science stuff, and those guys were essential and they never left. So understand that those guys are mixed in. But we reduced water usage, which is right about kind of where I thought it would be. It was like about 35 percent...you know over the course of 2020. And energy went down about 13 percent overall in the whole portfolio. It includes some residential, and again those guys weren't leaving and some life science. But 13 percent. Should've been more. You know? And that's the space line that Rishi was saying; that this occupancy that Jonathan's saying...that's as operational is what I'm saying -- is that water went down because nobody's there to use it, but energy didn't go down in the same way.

Rishi Shah:

Yeah. For us, looking at our data year-over-year from 2020 to 2019 our energy consumption went down about 20 percent, and the water also went down about 20 percent as well. Wasn't as much as we thought it would, but it was a fair amount.

Hannah Debelius:

Mm-hmm. that's interesting. Yeah. Certainly when you're saying from a Better Buildings perspective seeing all the data come in this year and -- look at that and differences between sectors. They're just telling us how that all plays out. And I work also with the higher education sector and their kind of use for shutting down buildings because of summer break or winter break or whatever it is. And so, we've seen big decreases in 2020 because of that, which is interesting.

We never thought it would extrapolate to this. The last question that I have before we take some more questions from the audience...so a reminder for our attendees. You can still submit questions in Slido or vote for the ones that you're most interested in. But it's very clear that health has been on the

mind of everyone whether you're in building operations or not for the last year. But looking forward to the long-term, is health going to remain a priority with your portfolios? And if so, what do you think is going to be the big focus area for health in the long-term?

Jonathan Bauer: Can I jump in first on this one? 'Cause I-

Hannah Debelius: You can.

Jonathan Bauer: I feel like pretty bullish on this. Like, 100-percent yes. That's a very easy answer. I think like before the pandemic, it was already important. But now, it's more important. The way we think about this is, we want to have the healthiest building in town. You know? This is the new expectation. This is the new level of service that people are going to expect. And this whole pandemic, like -- this is so deep in our psychology. I just don't think we will function and think the same way when we interact with the space. And that's not going to go away. Right? So I feel like if you don't have a healthy building, your business is going to suffer. Like, something bad is going to happen. Right? You need to elevate to this.

And look. At the end of the day, this is all good stuff for people, and people are the lifeblood of our business. So, you know, if we can raise to that expectation -- right -- and deliver that it's going to be good for them and it's going to be good for their business, which is good for our business. So if you're not prioritizing this, I just don't think you'll be able to compete, especially in really competitive markets. At the tail end of the question, I think indoor air quality is really, for me, the one that is at the top. I think that's one of the most important things to help us understand how healthy a building is. There's a lot to it. And it's still early days.

Like, we've been thinking about indoor air quality for a long time, but now we're measuring it in such a different way and much more detail. It's like when, you know, we were looking at utility bills for energy back years ago, and now we have all these really complicated energy management systems where we're getting interval data. Now, IAQ is catching up. We're starting to learn what that means, starting to apply some of the learnings and actionable insights from that information. And that's kind of where we're headed, and I think that has to be at the top of a strategy 'cause it's a really good way to start measuring impact.

Hannah Debelius: Uh-huh. All right. Emphatic answer from Jonathan. *[Laughs]* So we'll see if our panelists agree. Yeah, Sara. Go for it.

Sara Neff: Yeah. I totally agree. I think that the - I mean, for those of us and I think Rishi did this and Jonathan did this too. You have to be strategic in your health investments during COVID. And I think that things that we all invest in are things that make sense after COVID. You know? There is always a cold and flu season every year. And I think we're now realizing a lot of us who have just spent a weird amount of time never getting sick that, like, "Oh, my goodness. I really do get sick when I walk around and interact with people and touching the surface and whatever."

And so, I think buildings that have implemented measures that really help reduce viral transmission, not just COVID but going forward, are just going to be more valuable. And the data point that I'll use or that is, in the middle of San Francisco -- which is a city that has had a bit of struggles during COVID and wildfires and whatnot. You know, we had a...it was a LEED platinum, weld-gold building. So health was really important to that building. It just sold. 750,000 square feet an fully leased. But it just sold for \$1.1 billion. You know?

I think the market really thought that that was the health about it in addition to the sustainability aspects showed a lot of quality that we're going to have staying power going forward. So absolutely. I totally agree. Health is going to be important in as much as it helps with things outside of COVID. Open stairwells are great. Right? People can take the stairs. They get more exercise. Great for COVID, great for non-COVID. Those kinds of measures are going to be the ones that are just going to stick going forward.

Hannah Debelius: Mm-hmm.

Jonathan Bauer: Yeah. I agree. You know, I think healthy buildings are here to stay. Healthy operational practices are definitely here to stay as well. You know, for us health and safety of our guests and our team members is paramount. And we want to make sure that our guests feel comfortable returning back to hotels and traveling again. Because if they're not safe, they're not going to travel or stay with us or any hotel. So I think certain practices are definitely going to stay for the national longevity and stay for the long run.

Hannah Debelius: Thank you so much. Well, tell us -- we are going to move over. We have a lot of wonderful questions coming in from Slido, so we're going to go ahead and move over to that. So if we could bring up the Slido questions here. All right. So our first question, not the -- not surprisingly IAQ focus. And that is, there is little regulation on peer review research for several of the electronic air cleaning devices mentioned today. How do you verify

that the device in your buildings are not harming tenants?" And if any of our panelists -- yeah. One jumped in. great, Jonathan. Go for it.

Rishi Shah: Go ahead, Sara. Go ahead.

Sara Neff: I was going to say, again, we partnered with Underwriter's Laboratory for a lot of this to just do testing within our own buildings to make sure that we got the results that we were expecting.

Jonathan Bauer: Yep. Same here. And I would say it depends on the device. You know, when we're talking about technology like UV, one of the reasons we kind of hitch to that is it's been around since 1920, and there is more research behind it, and it has been used in buildings effectively in the past. So there's a little bit more of a track record there. But you have to be really careful how you use it. Yeah. Like, UVC254.

Like, that shouldn't be touching humans. Right? Like, that needs to stay in your systems if you're installing it, and it needs to have safety measures in place like automatic shutoff if you open the door of the handling unit. You just need to be careful how you utilize it. But UVC222 is, you know, proven safe for human contact. So if you're putting that in a space, that should be fine. The other thing that we're doing beyond kind of UL testing is, with these real-time sensors we can measure things like ozone and other things that people say, "Well, what if you have an ozone problem because of your bipolar or your UV?"

Like, you can actually now measure that pretty accurately, and we're doing that in every single zone in one of our buildings now. Actually, all of our office buildings now have this as a way to measure this. So there's some data that we start using to kind of track and verify that too. But it's a learning curve, right? It's all-new tech. We need to be careful and learn as we go.

Hannah Debelius: Great. Thank you both. We're going to move onto the next question. Here, which is, "What building improvement measures have the most bang for our buck such as IAQ or healthy building?" This partner is a local government and thinking about how to prioritize or choose a phased approach. Jonathan, you can go ahead and start on this one 'cause Sara started on the last one. And, yeah, you can bop back in.

Jonathan Bauer: Sure. I mean, just the basic stuff for me. Like good ventilation. Right? Good filters at the highest level for indoor air equality I think are going to drive a lot of value from a health perspective. But then, it's like the other stuff that we haven't talked about as much today because there's a lot of

focus on the pandemic. But things like daylight, use in nature, access to healthy food, water. I mean, I think about water a lot and how much I don't drink during the day if I'm not actively thinking about drinking water but also near a water source.

It's like the very simple things that is in these certification programs like Fitwel and Well that have a huge amount of value that we just don't think about enough. Right? Like having your little indoor air quality sensor on your desk that you can look at. When you have a headache, open your window. It all matters. So there's a couple things I think about. Like, you physically feel better when you see the outdoors. Right? When there's daylight. And it's just a huge value, I think, in a building that's designed with all of that at the core.

Sara Neff: Yeah. And I would just build on that and just say I would just download the Fitwel scorecard and just go through it. It's developed by GSA and CVC together with Center For Active Design. I mean, start it with government buildings and see what the measures are that aren't in place that are the cheapest to do. It's easily accessible. It's not hard to understand. And I would just start there and see what's possible. Everything in there has a lot of scientific research saying that it's, you know...there's a health benefit in implementing that measure.

Hannah Debelius: Excellent. Thanks, Sara. Rishi, anything to add before I move onto my next question? Okay. Sara, the next question is clearly looking at you; which is, how did you land on the 550 parts per million CO2 target? Thanks.

Sara Neff: Easy Harvard told me to. So that's in the Cognitive Effects study that I mentioned early in my presentation. So if you need to look it up -- I can put it in the Chat. thecognitiveeffectsstudy.com. 550 parts per million is the level that they landed on for optimized cognitive function, and so that's the standard we use.

Jonathan Bauer: I'm so glad I'm not...because I've been kind of wondering, and I haven't gotten to that yet. But it's like, there's a lot of gray I feel like with the CO2 and a lot of the work out there. It's like 1,250. And it's like, "Well, at 1,250 I'm already like not feeling great. So is that really acceptable?" So that's interesting. I'm going to have to do a full deep dive on that.

Hannah Debelius: Excellent. And thanks. I see you just put the Web Address for that in the Chat. And I'll also mention that Doctor Jo Ellen, who Sara mentioned at Harvard, was a speaker at last year's Better Building Summit. So once again, you can find some of that in the Better Building Solutions Center.

All right. This question is also -- the next question is also directed to Sara. Got to lean forward. It's a little bit small. *[Laughs]* This person lives in Colorado, and air quality's very poor over the summer with the wildfires but also the outdoor air anyway. How do you balance between those two evils, outdoor pollution versus indoor COVID?

Sara Neff: Well, I am broadcasting in from Los Angeles, so I know what a wildfire air quality *[laughs]* looks like, and I know the answer to this question. The sacrifice is energy efficiency. The thing is, the outside air gets filtered through these fantastic air filters we've been talking about. So by the time it gets into the building it is free of those pollutants, and you can breathe in, and it is healthier...deals with your particulate matter being dispersed for COVID. It is just a bummer from an energy efficiency standpoint. So the outside air is filtered before it gets inside. So that's the balance. It's just hard on energy.

Hannah Debelius: Until we get those...

Sara Neff: Magical air filters that I was talking about. But I know-

Hannah Debelius: Exactly.

Sara Neff: I'd go outside for weeks and weeks at a time because of wildfires. So yeah. I feel you.

Hannah Debelius: Yeah. Absolutely. All right. The next question here is, "How do you determine where to end up on the health efficiency balancing act?" So, Jonathan, since that was your seesaw graphic, maybe we'll start with you on that.

Jonathan Bauer: Yeah. Sure. I was just looking back, 'cause I think I put a little reply back in the Slido. So I was looking back on the question on here too. How do you determine where to end up on the balancing act? So I think it depends on what's happening. Right? Like at the time. Like during the pandemic, of course, that changed the way people thought about this. Right? For us, we used a combination of tech and innovation to figure it out. And granted, right, we're not dealing with wildfires in DC where we're operating.

So we have some specific set of variables where we're at. But we found with a combination...and again. Back to the layered, holistic approach -- right -- if you can put in the right filters, if you can ventilate to whatever level you need to to provide that indoor air quality, if you can put in things like UV lights...through all of these things in combination, we found really

good balance. And actually, what our mechanical engineers told us when we installed UV was, "Like, you don't need to be blasting your building with 100-percent outdoor air all the time like everyone else is trying to, because it's actually hurting your air quality because you need that air to pass over your UV at a certain rate." Right?

So by doing that, we actually have found more balance, and actually we're able to dial back a little bit on energy efficiency and provide even better conditions inside the building with tech. So I just think it really depends on the building what the realities are, what kind of technology you have. Again. The Smart building system helps us balance these things. It helps us correlate all of these things and understand like, "Do we need to ventilate more? Is this practice out of line?" Right? We're looking at data to help understand that. So it's not easy. The balancing act is always going to be an engineer's nightmare. But it's possible, and we have more innovation to help us kind of analyze and look at it.

Hannah Debelius: Thanks, Jonathan. Sara or Rishi, would you also like to weigh in on that?

Sara Neff: Go ahead, Rishi, if you want.

Rishi Shah: I agree. Definitely is a balancing act, and it definitely depends on what the circumstances are. Obviously during the pandemic health was paramount, and definitely outweighed some of the sustainability efforts. But I think it definitely fluctuates.

Sara Neff: I would just say our focus is always on trying to find that magical technology that helps us really balance both. We've had some early successes, so it's just a constant looking for -- giving up less on the health side to really improve thing son the energy side or giving not so much energy and improving some of the health side. And that comes through technology as well as knowledge and how to operate buildings.

Hannah Debelius: Great. Thanks. So I think for our next question here I might start with Rishi sine you talked a little bit about communication at least externally. But this question is, "In pursuing help in addition to efficiency, have the internal stakeholders changed or the way you see internal buy-in?"

Rishi Shah: That's interesting. You know, I think it the pandemic has definitely shown us that getting the buy-in involves a lot more stakeholders across the organization; whether it's on the operation side, the legal side -- especially when it comes to our franchisees in our hotels. So there's definitely more people involved and a lot more opinions to bring to the table. So it's

definitely complicated things, I think. But definitely the results have been better solutions.

Jonathan Bauer: I'll add. Also put a little response in Slido. But for us, this hasn't really been different. Like, we're relatively small organization -- right -- in our regional area. So our stakeholders internally are pretty similar usually for this kind of stuff. But again. Like, health is the number-one priority. Like, this is the need of the time. Like, this is what we need to be responding to. Buy-in for us has been really strong, and I would venture a guess across a broad swathe of our industry it's been pretty strong, because this is what we need to be doing. It's a must-have.

And back to my earlier point about if we're not a healthy building, what happens? Like, we suffer. So I think at the highest levels and throughout the entire organization people understand at a high level these concepts and know that we need to have this. So all-around, I think buy-in has been there, and there's been a push to really innovate, a push to research, a push to understand. All of us have kind of, like, really changed in our roles in the way we think about this stuff. And I think the buy-in couldn't be stronger, honestly.

Hannah Debelius: Great. And I think I will move to the next question here since we have time for just one or two more. With adaptive control strategies for equipment operation, how does a building operator know that the building systems are operating normally?

Jonathan Bauer: That might be a little aimed at what I talked about, so I'll just start.

Sara Neff: I was going to say, I think it's maybe a little bit close to your Nantem experience potentially.

Jonathan Bauer: Okay. So the biggest thing I just want to say is, like, any time we install any tech -- right? Like, it's not just like you put the tech in and you walk away. Right? You can't just -- not all of this tech does its job on its own. You can't just say it's automated, so it's good. Right? Honestly, it just helps us be a little better at our jobs, gives us more information, does provide some efficiencies.

But there's always going to be people behind this; whether that's constant monitoring of the system, working with that partner to monitor the system, commissioning of that system regularly to watch how it works. And it all comes down to finding a partner who can help you do that. There's going to be bumps along the way. You're going to find things that didn't work, and you have to fix them. Like, the tech is never going to be perfect.

Right? But we still need it. It's still a good solution. It's never going to replace our people. We still have to watch it. So that's kind of our approach for now as we learn.

Hannah Debelius: Great. Rishi, Sara, anything before we move to our last question?

Sara Neff: Yeah. I can't overemphasize commissioning. It's really -- nothing works right on the first try. I'm just going to say that again. Nothing works right on the first try. You just have to get a commission, and you have to do measurement and verification to make sure that it's working correctly in and of itself what it's supposed to be doing as well as what's happening with the building. So we have a built-in MMV -- measurement and verification platform. We've had it for a long time with Gridium. And that's one of the ways that we go and check up on making sure that the building is operating within its own parameters but also that the technology is having the effect that we are hoping it has.

Jonathan Bauer: Can I add one more-

Hannah Debelius: Okay. Thanks, Sara.

Jonathan Bauer: You can start to correlate all of this against like work order tickets and things happening in your building so you can also really understand how the people feel about what you've done in the building. So there's other tools outside of like just looking at the mechanical and the systems and commissioning. Like, listen to your people in the building and respond to like what they're feeling.

Hannah Debelius: Okay. Great. As we kind of -- we have time for just one more question if our panelists are brief on this last one. Which is, "How do you mandate and enforce sustainability measures with that many franchises?" That might be potentially directed to Rishi. This may apply to those of us who have to deal with stakeholders who can't control the like tenants or students. So would those be leases or franchises? Maybe, Rishi, we'll start with you?

Rishi Shah: Sure. Yeah. And that is a challenge, especially with so many franchises across the globe. and especially 'cause franchisees are independently owned and operated, it is a challenge. But we work with our franchisees to partner with them in order to educate them and make them aware of the best practices and the benefits of those while also working with our operations and brand standards teams to implement certain design standards and operating guidelines so that these sustainability measures are a part of their operating procedures and part of their hotel's design.

And working with our quality assurance teams, they help to ensure that those franchises are adhering to those standards. But it is a challenge, and it's a continuous education and awareness campaign.

Hannah Debelius: All right. Great. Thanks so much, Rishi. With that, I think we're going to pop back over to our Conclusion Slide. But I will mention that the contact information for our panelists is at the end of this. So if your question was not answered, you can certainly reach out to us. Here's some additional resources related to this topic which you can find on the Better Buildings Solutions Center, which of course has 3,000 other solutions as well where you can search by location or topic and that sort of thing.

And if you loved the Summit so much and want more Better Buildings in your life this Summer, we highly recommend you check out the Better Buildings Summer Webinar series. In fact, on June 20th we have another session that's also a little bit on this topic. So I think that you'll enjoy that one if you've come to this session today. And to do that, you just go to Events and Webinars in Better Building Solutions Center. And finally, just a big thank you -- again -- to all of our panelists. This is such a relevant topic, and anything could've changed even leading up to this.

So we really appreciate your flexibility and joining us and all of your insights over what's been a challenging year. And for attendees, we've just launched a survey in Slido. So we'd love to hear some feedback about this session. Your answers will not be shared with other attendees as it was in early Slido Polls. So that'll be anonymous. And the Slido survey for that will be open until tomorrow morning. So thank you all so much, and I hope that you'll join us again tomorrow for the last day of the Better Buildings Summit.

[End of Audio]