

*Thomas Wenning:* All right. Good afternoon, everyone. And good morning to those of you on the West Coast or elsewhere with us.

So we have another really good webinar in today's little session. Thank you for joining. We have I think really an excellent panel that is going to be joining us. And we're going to be talking about something that I think is very relevant to today. It's the energy management practices that companies are using and implementing to get through, as the title says, the pandemic. But the reality is it's getting through 2020, right? It's been a wild year so far, and I think the pandemic is only half of it. But we've got a lot of really good and interesting things to roll out today. So we'll just get started here. Marissa, let's go to the next slide here.

Oh, for better or worse, you're stuck with me as the moderator. So I appreciate that. If any of you do have any doubts about me being a respectable member of society, at one point I was. Let's keep going, Marissa.

All right. So as many of you know, and it looks like we have quite a few regular attendees here joining us. This is part of a longer series that we've been running. And hopefully most of you have been joining quite a few of them. We've had one series early on in the year, and this is our second set actually. So we've been slowly ticking through a number of different topics, and it's really ranged the gamut. But the thing that I want you all to know is that all these past ones have been recorded. Today's is going to be recorded. These future ones that we're showing are also going to be recorded. So I know in talking to a couple partners, a couple of you out there, some of the foundational fundamental type of topics were really beneficial for others in your organization. So feel free to share that stuff everything we do, it's yours to steal, right? So don't hesitate to do that. But at the same point, make sure you join us. We've got some really good stuff. And today is hopefully going to be a very interactive type of event.

One thing I do want to mention here for those of you that were signed up for last week's field validation initiative, don't worry, that's not going away. The problem is that DOE is too excited and they're all jockeying to figure out how they're going to announce the program at this point. So we've got some really good things going on for our field validation initiative. Hopefully, we're going to be able to announce that here relatively soon, but obviously we can't be talking about it on the webinar and rolling out all the details before DOE gets the chance to shine, right?

So, today we're talking about energy management, but next week we're diving right into the MEASUR software tool, which hopefully all of you have already installed. But then we'll be \_\_\_\_\_ in the future? Who knows. We'll see. It depends on your feedback. Marissa, let's keep going here.

All right. So part of the fun stuff here. If you all could, log into Slido. It looks like a lot of you that are joining us here today, you're not new to this game. So Slido is a separate app that we're going to be using for our questions and answers. We have a couple polls that we're going to tee up here. So if you could, go over to Slido. It's S-l-i, dot, d-o, Slido. Or you can do the full Slido.com and that will get you in, with the event code of DOE, right? And so that will pull you in. And it's a pretty easy interface. You'll be able to log in some of your questions there. And again, we're going to be doing some of these polls. So if you can, take the next ten seconds, get your iPhone out or your Android, pull up another window on your computer and see if you can get logged in there. Maybe put something in there. Tell the world hello. Right?

So, while I give you a couple minutes to do that, I'm not going to launch – there we go. We got someone. I'm not going to launch a slide or a poll just yet, but we're going to here in a second, so bear with us. Okay, Marissa, let's go to the next slide. I think we have an agenda slide here today. Exactly.

Okay. So we've got a couple things that we're going to be going through today. The first one is we're going to be highlighting a report that me and my team here at Oak Ridge and within the Better Plants we've been working on to set up today's conversation. And we've got some really interesting results in my mind, and we've got some really good solutions and case studies which I think we're going to be diving into with our panelists here today. So once we get through that report findings, we're going to be going into our fireside chat with everyone. And really what I want all of you as participants to be thinking about right now, what are some of the toughest challenges you are facing right now? What are some of the questions as it relates to your energy management program that we might be able to help you with or we might be able to give you a second opinion or get somebody else's take on it, right? That's such an important aspect of the Better Plants Program, is just that sharing, that communication between partners. So be thinking of that because we want to use that and really be talking about some of the things that are pressing on your mind. Okay?

So with that said, before I jump into our report findings, it looks like quite a few of you are jumping on to Slido. So let's pull up a poll if you could, Marissa, and we'll just start with the first question that we had in here. Okay. So if you go over to Slido – and Marissa – there we go. There we go. So if you're in Slido, you should be seeing this right now. Has your organization experienced any of the following challenges this year? And we want you to just check through these. So the impacts of facility energy intensity due to safety reconfigurations. Obviously that's a big one. That's one that we're living and feeling in all aspects of our life right now. But what about some of those other areas? Have any of you had major impacts to your production either going down because – who knows, right? Maybe it's changing completely. Maybe you're producing a different product for the time being and making hand sanitizer instead of cosmetics. Or I've heard of some distillers, right?

What about energy intensity increases due to some of these production changes or that loss of knowledge and experience due to some of those furloughs? I know several of you out there were on an extended furlough, and it's something we hate to see. But it sounds like a lot of folks are coming back.

So in this we've got 17 respondents. This is good. And the strained and reduced budgets for implementing energy projects. All right, so that's a big one, absolutely. It looks like we've got a couple more coming in. And that's followed by, again, that loss of knowledge and experience. So we're going to chat about some of those things here in just a second. Marissa, if we could, let's go to the next poll, okay?

So, in thinking about your energy management programs, and for some of you your sustainability programs, because it's not just energy, it might be energy, water, waste. Some of you I know are dealing with carbon. How are things changing for you throughout this – I should say pandemic – this year, this crazy year that we're living in. And it looks like there's a little bit of a change. It's going to go in one direction or the other, right? I don't think there's another. Mostly it's going in one direction, more important, or relatively no change at all. So this is good. It's encouraging to see that your companies and your organizations, your management is not taking the pedal off of the gas and slowing things down. All right, this is really good.

Let's do one more Slido poll here. All right. So do you have a different understanding of your energy use now as compared to

earlier this year. So this has been a real rocker of a year. And for some of us, that has meant that we've taken a lot more time to look at our energy consumption to better understand a process, to figure out maybe what's operating in our facility when we're not doing anything in our facility, right? What is your perspective in terms of understanding how energy is used versus when things were normal, when life was normal? And it looks like this one is fairly split. About half and half. So some of you I think will have some more insight after today, right? But this is an interesting one as well. All right.

So let's jump back, Marissa, into our presentation. And I'm going to go through a couple of slides here where we're going to chat about some of the report findings. So as just a setup, we've put together a report. It's currently in draft. We're waiting on all the final official sign-offs from DOE. Everyone and their brother needs to give it the baby kiss of approval here. So it's in draft, but we do have it up and out on the streets if you want to take a look at it. But we're going to be chatting about what some of these takeaways were when we were putting it together.

So the big thing I want to stress here is that it's not me and my team here just telling folks or putting the solutions into a report and making things up. This is all based on the feedback from most of you all. So if you all remember back during the 2020 virtual summit this year, we had a couple questions. We had a couple polls. We were asking folks different things. And that was the basis of what we've put together in this report. We highlighted the challenges that were presented and brought up. And then as part of that we went back and we started talking with some more industrial partners. We talked to a few of you out there and started getting some of the feedback in terms of, okay, here's one innovative approach that you're using to address some of these barriers. And so this is just a compilation of that. It's the challenges and then it's some of the solutions.

So, Marissa, let's jump forward. We've got just a couple of high-level slides before we jump into our panel discussion. But the report findings, we really wrapped them into four different areas. There is the first area of dealing with that strained budget for energy projects. And when we did that poll, that was really high up there. Reduced budgets because all of the sudden that money is competing. Money is tight right now, right? And so that was one of the main challenges that was brought up.

A second one was this idea of increased energy intensity. So our energy intensity is going in the wrong direction in many industries. Not all, but many industries are not at the same levels of production they were previously. And so things are changing, whether that's because of production changing or that's because of some of the safety practices and procedures that we're implementing to keep people safe. Okay?

The third area is limited access to energy systems. As you can tell, I have limited access to my office. I'm coming at you live from my own home, which, hopefully we're not going to have any interruptions and visitors today. But this is the same thing many of you are dealing with. You're not able to get into your office. And in a lot of cases, engineers are not able to get into the production areas. Right? We're trying to keep our workers safe and as much as possible trying to keep them isolated from the outside world. That way we can keep our facilities running and we don't have to worry about getting a lot of people sick. So, limited access, living in a virtual world. That's a big challenge.

And this last one is that loss of knowledge and experience of senior staff. And this is, again, through some of those furloughs, in the cutbacks. And this is a big thing going forward, right? How do we help enable the transition of knowledge to the folks that are working on site, that are working on the facilities. Okay?

So we have a couple slides, I think we have four slides. I'm going to give you a couple examples of things that we have in this report for these areas. Marissa, let's go to the next slide real quick. Under this first one, the strained budget for energy projects. So one of the solutions in this area is really using this year, this time to focus on no and low-cost energy conservation measures, right? And so you might be sitting back there saying, Tom, duh, that's stupid. We always focus on that. Well, that might be true, right? But there's the old maxim of there's always low-hanging fruit and you're always there picking it. The problem is you can't just say you picked it and it's all gone, because that low-hanging fruit does come back. And that's that no and low-cost stuff for the most part. And this is a time where you think about procedures, you think about standard operating procedures and methodologies to make sure that you're always pruning the bush, right? To make sure that these things are coming back.

A big one that we're actually piloting with partners right now is these virtual treasure hunts and virtual assessments where you can still use the people that are on site to be looking for these

opportunities, so you can fill that project hopper. So that's a big one to really sidestep the CapEx projects and still be finding projects.

The second one, which I think is really interesting – and I believe two of our speakers today, their organizations have either implemented or are exploring this – is this alternative financing approach. And this goes by many names. There's ESCO, energy service companies out there that provide third-party financing. Sometimes it's known as energy as a service. And so there are some really good resources. We have a DOE Finance Navigator to help you figure out all these things.

But now more so than many years past, companies are actually looking – and it's something I would not have said or would not have believed five years ago. But there are quite a few companies that are pursuing these third-party finance options. And it's really exciting because it's a way to, again, get projects implemented even when you don't have the access to internal capital. Marissa, let's go to the second one here.

So the second one, if we remember, is that the increase of energy intensity caused by production or the safety practices. And so this is a very pressing one, and it is a challenge. And so on one front, we have some partners – and I believe Wade and Nissan have been doing a great job of this, and we'll talk more. But improving the shutdown procedures. So when you're not producing, whether it's during the weekend or during the third shift type of setup, really being diligent and implementing, again, practices, procedures to ensure that you're minimizing the amount of energy that you're using when you're not producing anything.

And then on a very similar approach is reducing that baseload energy. So identifying the equipment that's just left running all the time and figuring out, well, is there a way that we can knock that down? Because certainly on the COVID practice and the procedures, a lot of us are moving towards more makeup air, trying to get to a hundred percent makeup air. And I think we have some speaker today that will talk to that. But trying to figure out what's the balance, what are the other things that we can target in order to offset that. Marissa, let's step ahead one more slide here.

So we have this limited access to energy systems. Again, this is limited access to our office in some case. And so this is where there's a lot of utilization of technology. And technology options are starting to become more and more prevalent in this area. But

some of the leading companies in our program, they're using this effective online energy monitoring systems. So not to promote anyone here, but we're showing Schneider Electric's Resource Advisor. That's just one. There are many others out there. But there are mechanisms and practices where you can have companies come in and install these submeters in your system and you stream it all to a dashboard. That way it helps enable the energy manager. Even if you're not on site, you have the data, you have that ability to see what's going on in your facilities and in your processes.

Building off of that is the deployment of this automatic predictive maintenance technology. So when manpower is really being spread thin, how can we use some big data, how can we use some of the technology and sensors that are already out there to really do that next level of advanced maintenance practices, right, to make sure that we are focusing as much as possible where it's needed.

And then the last thing in this area that I wanted to mention is this idea of virtual energy assessments. And this is an exciting one. And hopefully most of you Better Plants partners have been talking to your technical account manager, because this is something that we're really trying to figure out how we can do it in an effective manner. We've been piloting virtual energy treasure hunts. We had a webinar on that not too long ago. And we've been thinking about, okay, how can you do a deeper dive into some of these traditional systems. So more to come on that area. But I know some of you out there have already been practicing this and figuring out, well, can you use a little – the virtual cameras that you strap to a helmet to go into a facility or have your folks on site and go into the facility and work together with the engineers. So this is an exciting one in this limited access world.

All right, Marissa, let's go to the fourth one real quick. So this fourth one is really the lost knowledge and that experience exiting due to the furloughs and reduced budgets. Some of you are retiring, right? And hopefully all of you really good folks are staying around forever, but I think that's unrealistic. So in the meantime, what are some of the things that companies are doing?

Well, again, some of our partners today can chat about this, but it goes back to the idea of building an energy management system. Again, it's a system, it's a process, it's a procedure. You don't have to necessarily rely on that one rockstar or all-star in your facility, you can systematically build essentially a playbook for your own organization. And that's what people have been doing. So when you can't get into the office and you're working from your home all

the time building that playbook that other people can then just follow and carry out, that's a really effective practice. And that obviously leads into the 50001 Ready Program and ISO 50001. So, some really good stuff there.

And then the second aspect is getting the training out to folks. And at least within our Better Plants world, that's part of what we're doing through our webinar series. But I suspect many of you know this, there is a million different webinars going on at any given point about any given subject. And so hopefully you're able to strategize and systematically dissect which one of those webinars and those topics are good for you to be attending versus others in your organization to, again, build that base level of knowledge so that way the next generation of folks coming into your facilities can hit the ground running.

All right. So that's more or less a summary of what we have in that report. Hopefully you all will go out and download it at some point, and hopefully DOE will finally give us the final kissing and blessing to put it on the DOE site. But until then, we'll have it as a draft. And there's some really good stuff in there. So, Marissa, let's go to the next slide real quick. Because this is the fun part. I think this is where it gets exciting. And hopefully our colleagues will start turning their cameras on.

But we have four panelists today, and they're all excellent. They're coming from really good organizations. So we're going to start in a little bit of a clockwise manner. And I'm going to start with David and I'm going to put him on the spot first. But to preface all of this, I'm going to have these folks introduce themselves and talk a little bit about what they are, what they're doing. But really I want them to try to summarize, at least for this first part, what's the one major challenge or issue, what's the one major takeaway that you have been focusing on at your organization during this crazy 2020 year, right? And so with that preface of what I want you to do here, I'm going to introduce David.

So David is the Director of Sustainability at Bentley Mills. So, a major flooring manufacturer, right? They have beautiful products. I think I have some in my home. They're great. So Bentley Mills is a fantastic partner. They're a goal achiever. They've won some of our Better Practice Awards in the past. Even on the energy as a service stuff.

So, David, I'm going to let you take over. What is the one thing, what are the couple of things that you've been focusing on and thinking about here lately?

*David Turkes:*

Thanks, Tom, thanks for \_\_\_\_\_ today. I'm looking forward to being able to convey our story, hear my fellow panelists' story and get some feedback. \_\_\_\_\_ things that we can do with this behemoth known as 2020? We're always looking at different energy management opportunities. And one program, as you mentioned, with the energy as a service agreement, is we are consistently monitoring our lighting projects that we finished in 2018. And that was something where we worked with actually one of the partners with DOE, and that is Redaptive, to where utilizing the energy as a service agreement, we switched out all of our light fixtures where at the facility and we're saving almost 1.6 million kilowatt hours annually. So of course seeing as how production schedules have shifted, how we're utilizing \_\_\_\_\_ throughout 2020, we're being able to kind of analyze further and further and seeing do we truly need this much lighting in this area, or can we adapt the schedules for when these lights need to be on. Could we potentially install more motion sensors? Could we really fine-tune this system to truly get the benefits of performance that we expected when we did the installation?

Another thing too that we're also kind of focusing on is not necessarily any direct intention, but it's also kind of just a direct application of where we are in the country. So we are a California-based manufacturer. We are kind of dealing with all the wildfire issues as well as the extreme heatwaves that have been going on. So as our utility is Southern California Edison \_\_\_\_\_ program and their Base Interruptible Program, to be more specific, where when they call \_\_\_\_\_ for any sort of demand response program, Flex Alert, we are essentially going to be responsive and say we have set limits across all three of our \_\_\_\_\_ that we have to get below a specific \_\_\_\_\_ level within 30 minutes. And with the massive heatwave we had about two weeks ago, those events could be called at any time. So it was kind of a running checklist every day of looking at the Cal ISO website to figure out what's our expected \_\_\_\_\_ on the system, are we running the risk of \_\_\_\_\_, can we adjust our production schedules, and then of course \_\_\_\_\_. I believe we had seven in the course of four days. It was always the quick scramble to go around to the facility, shutting off equipment, shutting off lights. Still ensuring safety of the employees, but making sure that we were able to hit our targets to be in compliance with the demand response program.

So also in a separate response to being part of those programs we are, again, able to identify different pieces of equipment, different processes that as we're shutting down we can, again, fine-tune that process since we're being put in that scenario to, again, figure out is this a bigger energy drain on the system \_\_\_\_\_, does this system need to be running? It kind of gives us more oversight as to how our systems really are functioning together, how our employees utilize those systems, and again, finding ways to keep minimizing our energy consumption, our overall carbon consumption, and, again, being better stewards of energy management, especially throughout this, again, behemoth of 2020.

So just a little overview as to how we've been approaching 2020 and how 2020 has been approaching us. And I hope I've offered some interesting insight as to our neck of the woods here.

*Thomas Wenning:* All right, excellent. Excellent. Dave, that's fantastic. All right. I'm going to switch over and we're going to go over to Wade. And so Wade is the Senior Energy Manager or Energy Engineer over at Nissan. And most of you know who Nissan is. I don't even have to tell you, right? They make vehicles. They make hundreds of thousands of vehicles.

And so Wade has been doing some fantastic things. And Nissan is another one of our goal achievers as of a couple years ago. And, similar to Bentley Mills, doubled down and had been very aggressive in terms of pursuing additional energy goals. So, Wade, I'll turn it over to you, my friend.

*Wade Willatt:* Thanks, Tom. So for us, we've had to tackle and find solutions to problems that we didn't even know existed. It started out when our plant shut down, our allocation process and performance tracking, we had a bunch of divide by zeros because we never expected to have a whole month with no production. So we had to go through and correct all of those and kind of rebuild some of our performance tracking.

But we also took the two-month shutdown to get very aggressive on turning equipment off. So we were successful in turning off equipment that we didn't ever think would be turned off. We had a \_\_\_\_\_ water system that's, you know, meant to be 24/7 providing cooling to paint process. And we disabled the chillers and thought we had disabled the system, but we had left the pumps on. And so there's just some iterations of learning. And if you didn't really design your controls around turning off a system, it may not do it effectively. And so the first time we'd turn them off, making sure

that we actually saw the impact and the equipment turn off in the way it was supposed to.

And then when we came back from the shutdown, we really had new challenges as far as increased ventilation and finding ways to still maintain temperature in our plants and not flood our air houses while increasing ventilation during the summertime. So that's been a big challenge in trying to find the balance of that.

And then as we go forward, we're trying to figure out what's the best way to get people reengaged, right? We had a very successful employee awareness campaign that we kicked off last year, and we saw a big impact. But now we've undone a lot of the things that were accomplished as far as getting people to turn stuff off on a regular basis. Now we tell them don't touch a light switch and leave doors open. And so we're trying to put together a plan of how do we get people reengaged and energy management when it's safe to do so and as conditions change.

*Thomas Wenning:* All right, Wade. That's really good. I think we're going to explore those a little bit more here soon. All right.

So next I'm going to go over to Helder Silva. And Helder is a good friend coming from ArcelorMittal. And I suspect most of you Better Plants partners might know who ArcelorMittal is. They are the world's largest steel and iron manufacturer, right? And so they have some incredible challenges in a whole different scale of things. But Helder is the Energy and Carbon Manager there and CTO for some of the stuff as well.

So, Helder, how are you running those major systems? What's the challenge there?

*Helder Da Silva:* Can you all hear me? I'm just double checking. Okay.

Because I work for the chief technology officer, the global chief technology officer for ArcelorMittal, the first challenge is the size of our footprint. We have operations \_\_\_\_\_ operations about \_\_\_\_\_ and close to 200,000 employees. About 15,000 in USA.

So the first point was to make sure \_\_\_\_\_. So \_\_\_\_\_ we did all the \_\_\_\_\_, depends on the situation, to make sure the COVID could not spread inside our plant. So we limited the number of people inside the plant, we did \_\_\_\_\_, we did all the possible social distance in order to make sure that people were as safe as possible from the virus.

Another point, the second point was \_\_\_\_\_ because \_\_\_\_\_ as fast as we have, we \_\_\_\_\_ going out so fast, the operational conditions changed. And we have several \_\_\_\_\_ inside our operation \_\_\_\_\_, who have electricity, who have \_\_\_\_\_, who have very big loads going back and forth. So the second point of this was to put guidelines to make sure our people can do their best in order to avoid this kind of threat. When I say threat, the operation or conditions change, it can open the door \_\_\_\_\_. So we did our best in order to \_\_\_\_\_ what points to check for our people to avoid \_\_\_\_\_ inside the plant. \_\_\_\_\_ the pattern changes. So \_\_\_\_\_ the place we did not have \_\_\_\_\_ before, we may have \_\_\_\_\_ today. So we need to avoid \_\_\_\_\_. So the guys did need to check what has been changed in terms of the steam distribution in order to avoid a dangerous situation.

The third point we did was cash conservation. We had less people inside the plant and we did not have \_\_\_\_\_. So what you can do \_\_\_\_\_ in order to save money. So we said \_\_\_\_\_ lessons from the 2008 crisis and we brought them back and updated and we did some guidelines for people, how to save money inside the plant during the downturn.

For example, I believe the lowest-hanging fruit is the electricity contracts. The electricity contracts is \_\_\_\_\_ more complicated to understand \_\_\_\_\_ company, but it has a lot of potential. For example, in some place instead of \_\_\_\_\_ in three or four days in the week, we spread operations during the seven days of the week in order to \_\_\_\_\_, saving money. This I believe is the lowest-hanging fruit.

Also we did – we promoted load management. Turn off what you don't need. And we had very good \_\_\_\_\_. For example, I believe the best example was \_\_\_\_\_ in Brazil. They saved about fifty \_\_\_\_\_ million dollars this year because of \_\_\_\_\_. Despite \_\_\_\_\_ most of the people there four days a week. So despite that, they were able to put together the \_\_\_\_\_, go to the \_\_\_\_\_ what could be done. And we should get about fifty \_\_\_\_\_ million dollars savings \_\_\_\_\_.

*Thomas Wenning:* That is mind-blowing, is what that is. \$50 million from one facility in savings. In savings.

*Helder Da Silva:* It's a very big facility. You have been there, right? It is a very big facility. It's about eight percent of our production. But despite that, every single \_\_\_\_\_ very low cost automation \_\_\_\_\_ to make the

most of that \_\_\_\_\_ situation but \_\_\_\_\_ to the \_\_\_\_\_ situation. So \_\_\_\_\_.

*Thomas Wenning:* Okay. Thank you, Helder. So, we are going to go to our final – but not the least of which – speakers, is Andrew Maude from Bristol Myers Squibb. So Bristol Myers Squibb, many of you may have seen them in the news nowadays, I don't know. They are a major biopharmaceutical. Okay? So doing things to help keep us all alive and ticking and well. So Andrew is coming with us, the New Jersey Director of Utilities. So coming in with a really unique perspective here.

Andrew, what have you been facing and seeing and dealing with?

*Andrew Maude:* Well, as a pharmaceutical company, unfortunately, you know, 2020 is the year of COVID-19. But that didn't mean every other disease went away. People still had cancer, diabetes, you know, every drug. So Bristol Myers Squibb was put in a tough situation. We can't just send our manufacturing plants home. Otherwise, people are going to die of all these other diseases. So it was very critical for Bristol Myers Squibb to maintain a safe operating facility. I think that was our number-one priority. So when it happened, a lot of effort went into, okay, who needs to be at work and who can we send home.

So the first thing was we went through – basically every manager went through their list of people. And anybody who was critical obviously stayed on site. And anybody who wasn't critical left. And then how would you ensure that stays in place? Because everybody knows you left your computer on your desk at work. Oh, I'll just go in tomorrow and collect it. Now, you know, you can't have anybody just coming in and out of the site. So we had a \_\_\_\_\_ with security. Luckily, we all have our electronic badges. So security did actually go in and deactivate almost 80 percent of our badges so that we wouldn't have non-essential people coming in.

I run the central utility plant, so obviously they have to say we have to maintain the steam and the chilled water for the manufacturing spaces, vivarium spaces. And so we work in New Jersey. It's a licensed state. All my operators have to be licensed operators. So, again, I can't just switch operators in and out. You know, even if there wasn't the license aspect, which is a major aspect, to get a new guy to come into a plant, you can't say, oh, okay, of you go. Run the boiler, run the \_\_\_\_\_ the chiller. So, keeping our essential staff safe in the plant was a major deal.

And we were very fortunate. We were able to successfully isolate the control rooms so that the only people who ever went into the control rooms were the operators and the chiefs. And we could isolate bathroom facilities, very important. We provided portable bathrooms outside so that if anybody was critical who needed to use the building, we could separate bathrooms because, you know, it gets in the water, you know, people washing their hands. And you can isolate that way. So we did good isolation there. Access into the buildings. We would have separate access locations for the operators versus other critical employees who had to come in. That way you're not going to be in the same spaces at the same time. You're not having non-critical – critical workers, but not – operators are not going to be in the same stairwells and that kind of thing.

So that was our first task, and that worked very well. We kind of got a good process in place. And that was great for about a week. And then something will break. And then you have to say, okay, now I have to get this person in and this person in. And these two things might break in the same place, so then we had to start looking at the work order planning, who was working in what location when. So then we could coordinate it so that if somebody was working on pump A and pump B was right next to it, you know, pump A would come in in the morning, and pump B repair guy would come in in the afternoon. So kind of scheduling our work orders to kind of keep the occupation density as low as possible. And that seemed to work, too. And that really got us through that first I would say month. And there wasn't really any energy programs going on. We were literally keeping the site going, making sure all our production needs were met for our drug manufacturer and some of our clinical manufacturing.

So then after about a month, we were then in a safe place where we could start, okay, now what would we like to do? So then we started addressing some of our projects. We have upgrades to our soft water systems, I have a new cogen going in. You know, the cogen was a very important project, but it wasn't a critical project for us to getting drugs to people. It didn't really impact that. So after about the month when we got through that red phase, that's when we could start readdressing some of these kind of energy-type projects, cogen projects, soft water projects. And that's when we started kind of making a little bit of progress rather than being strictly just to kind of stay where we are approach.

We could still talk about energy, we could still monitor energy. I run the bimonthly energy meetings. So everybody, even though

they were remote, everybody was still attending. We were still planning, still preparing. So that was good. We are fortunate, Bristol Myers Squibb has made a lot of investment in remote management of systems, so all our energy modeling, our BAS systems could all be operated remotely. So we could actually do energy management from our own homes.

My colleague, David Marianelli, he oversees the BAS systems. We were able to do a lot of energy management directly from the home. The guys didn't even need to come to site. They could go into the system, log on. Any areas where people were not there, we could set those back – if it were an office space, we could set them back to zero. If they were a lab state, set them back to reduced air changes. And if it was an occupied space, obviously implement safety measures, increased air changes, increased outside within limits following CDC guidelines on air exchanges. And it really did allow us to kind of manage energy very well. During that first month, we saved quite a bit of money. Unfortunately, I can't pull the number like Helder could, but we were saving approximately – in the areas where we had occupied space, our energy went up. But we had a lot of unoccupied space. And that decrease was about ten percent overall. So that was pretty good. And a lot of that was we could do it because we had real-time access remotely to all the systems, and that allowed us to make setting adjustments and level adjustments as we went along. So that was our big success.

*Thomas Wenning:* That's interesting. And I think I'm going to play off that. But before I do, I want to remind our participants out there, the folks that are watching, if you have questions, feel free to put those in the Slido and I'll try to work them in here as best I can.

So, Andrew, I think that is really interesting, this idea of using technology and using those online energy management systems, in your case that BAS system to be able to still work on energy efficiency. Doing the reporting, watching everything.

Helder, I think you mentioned something similar, deploying technology and doing this load management type of stuff. Wade and David, I don't know which one of you guys I want to start with. But have you guys experienced or do you guys do that as well? How are you getting over that working virtually aspect of things and trying to still look at projects and evaluate things? What are you doing on the virtual front? I'll start with David.

*David Turkes:* Sure. So on the virtual aspect, as you can see, I'm actually still at the mill, critical operations. I'm still here at the mill making sure

that machines keep running and everything. But from a virtual standpoint, definitely in regards to the sales team and how we keep them educated and keep them informed, especially with our local Los Angeles and Southern California teams. It's definitely a lot different when we're used to hosting presentations here. We have no \_\_\_\_\_ clients. So to be able to shift that opportunity and to shift that educational ability virtually, it's a little bit difficult, especially when you're dealing with the textiles, something that you can actually pick up and see and hold and look at pattern and design.

So we're moving more towards the custom simulations and the ability to say with our – actually, we have a tool online on our website called Insight where if you're looking at a particular space and you're actually looking at some of our products, you can go and take a picture of the rooms that you're working with and actually have the ability to drop in \_\_\_\_\_ of our products so you can still get a visual aspect of what that would look like. So for the virtual aspect of still being able to educate our team, educate our clients, still being able to offer those resources and still being able to keep as much of that interaction as we can. We don't want to lose opportunities just because we can't physically be there. But it's also making sure that we can kind of break the cycle of just between emails and video conferences and phone calls, still being able to maintain that connection, maintain the personality, and maintain the relationship. So it's definitely brought \_\_\_\_\_ here.

*Thomas Wenning:* Excellent. Wade, what about you? How are you guys – specifically energy program, how are you finding or doing things virtually? It looks like you're at home. Either that or you have a great office.

*Wade Willatt:* I'm at home, yeah. We already had made some progress on using the different technology and using meter dashboard and giving data to the upper levels so that they can see how we're doing. We were actually about 50 percent complete on a transition to a new building management system from an antiquated homegrown system where a lot of stuff was manually controlled. And so the plant shutdown and all that timing kind of worked out well for us because then it obviously accelerated our implementation of that. We had less things we had to deal with during normal production. So we've now gotten most everything transferred over and now that gives us ability to control from outside the plant. So I mentioned having to control the chilled water system. And I was getting up at 3 AM and coming down in my jammies and checking on the system, versus having to have someone drive out to the plant and turn on the system. So that was a big advantage to us.

And we kind of just lucked out a little bit on the timing. But we would have had to have a lot more people in the plant just to keep some of the equipment running or check on it if this had happened a year ago.

*Thomas Wenning:* Yeah. So let me transition a little bit. Some of you guys are using these online systems to look for things. Are you also doing things or anything virtual to find opportunities to keep that project hopper full? I think, Andrew, you mentioned you guys had that CHP project. And I suspect that was maybe on the books before this year.

*Andrew Maude:* Yes. That was on the books well before that. And that's a five megawatt gas turbine. And it was unfortunate, because we get the benefit from our turbines primarily in the summer and the winter, not so much in the fall. So we lost the summer just because in order to have a full construction team in to install the gas turbine and an HRSG and gas compressors. And it wasn't really practical to have that crew there and still maintain those kind of social distancing issues we needed. So that was put on pause, but it is back on track. Well, it's not back on track; there is a delay. But it is back in construction now, and we're looking for a December startup.

But we could still do a lot of the planning. Obviously sequence of operations, the sequence of operation. We could remotely sit in a team, group, and develop those. And one of the big successes we had very early on during the COVID-19 outbreak is because it's a large, high-pressure gas and steam system, we do a \_\_\_\_\_ analysis. And it was always the unwritten rule, had to be attended in person, you can't get value out of a PHA doing it remotely, you just wouldn't get – you know, it was deemed too many distractions and, you know, not being able to exchange ideas clearly and to be able to look at the \_\_\_\_\_. And the reality is that we were forced to do a full remote PHA for the project because, you know, nobody could meet in person. And it was really successful. And I think it opened the eyes to a lot of people, a lot of the engineers, a lot of the DHS people, a lot of the management that with the modern advances – and I'm saying even five years ago I don't believe you could have done PHAs remotely. I do think you had to be in person. But with the advances, with teams or Zoom and the way you can show stuff and share stuff and have one drawing on one screen and people all like this on a screen on another screen, you've got that interface, you've got that communication, you've got clarity of discussion. When you were asking questions and people were responding, everybody got it. The tools were good enough to do that. And that

was the first time – I think that's the first time Bristol Myers Squibb has done a full virtual process hazard analysis for a large project, and it was very successful. And it's opened the doors for us going forward.

*Thomas Wenning:* I think that's interesting, because that's so true in all of our energy management and energy culture, just challenging the status quo. Just because you've always done it one way doesn't mean you always need to keep doing it that way. Certainly this is the opportunity.

And so, Helder, what about you all? How are you finding opportunities or utilizing folks in the plant to find those opportunities? You were mentioning some load management activities that you all have been implementing. How are you filling the hoppers, though?

*Helder Da Silva:* Well, the first point was to put together a set of guidelines. And we put together some documents explaining how to do some initiatives, some \_\_\_\_\_ that could be \_\_\_\_\_ during the downturn. And we did some webinars and also we did put all the material inside the \_\_\_\_\_ that could be accessed by any ArcelorMittal employee globally. So for this point the plants took over.

So, many plants did a very good job, \_\_\_\_\_, as I said before, they did I believe the best, they showed the best performance. \_\_\_\_\_ seven other plants also did initiatives with \_\_\_\_\_ air, with the lighting, et cetera. So, very big footprint, as always. I don't expect everybody to do the same thing in 18 countries. So, some place they did very well. Some other places didn't, to be frank. Right? But I was very happy. I believe the work we did helping some place \_\_\_\_\_, as I said, to saving \$50 million.

*Thomas Wenning:* Which is unreal. I still think it's unreal. So just real quick Helder, with that guidebook that you put together, did that become part of your energy management toolbox –

*Helder Da Silva:* Yes.

*Thomas Wenning:* Which you all won an award for back in 2018, and is up on the Solutions Center.

*Helder Da Silva:* Yeah, exactly. \_\_\_\_\_ there was a \_\_\_\_\_ called \_\_\_\_\_. So what \_\_\_\_\_ that could be done with low cost and be done fast and be good investment. So we got that \_\_\_\_\_, we got the learning points

from the 2008 crisis. We did some updates. We include some other new points and created this suite of new tools for the plants.

*Thomas Wenning:* That's fantastic.

*Helder Da Silva:* So, many place – some place contacted us in order to \_\_\_\_\_, but not only to \_\_\_\_\_, but several other plants like Cleveland, \_\_\_\_\_, they did also a very good job.

*Thomas Wenning:* Okay. That's excellent. I do want to put in a plug for those project and practice awards, because I know at least three of your companies have gotten them for sharing this stuff. Right? It's up on the DOE site.

I have so many more questions, and we don't have enough time in this webinar. But I could chat with you guys all day because I'm super-interested. We did get one question. I think this is a good one to end on and just go around the room here. So this is a crazy year, right? I mean, the pandemic and then certainly David out in California, the wildfires are raging and climate change and hotter temperatures. Is there a silver lining? What is the silver lining as it relates to your energy programs or sustainability programs? Is there a silver lining that you all are seeing or able to take advantage of to advance your energy management programs or sustainability programs forward? What is that silver lining? David?

*David Turkes:* I'll kind of jump in here first, especially since you mentioned California and with the wildfires. WE no longer are able to kind of take a lax approach, especially when it's hitting you right here. It definitely brings of the conversation to the forefront on, yes, we're only one manufacturing facility, we are only one tiny piece of this giant puzzle. But are we able to \_\_\_\_\_ keep the conversation going, put more of the initiatives forward, get more people involved and just say here's what we've done, here's how we've been successful. What other opportunities might not be the lowest-hanging fruit on the tree, but what else can we be doing here internally? How can we do education outreach for our sales teams across the country, and how can we work even with our competitors? And when I say working with competitors, you know, from a sustainability standpoint, you're not really competing with each other. If anything, you're finding your own niche and you're finding a way to advocate and make things better in different approaches. But being able to sit together at the table and say here's how we've been successful, here's what we've been able to implement, here's how we're making sustainability better in our

industry. How can we share and support other companies in that method?

So, from a holistic approach, silver lining, the conversation has been more prevalent, it's been more interface, and it's been more the ability to share and educate and have these resources available not only just from the Better Plants Program, especially working with Kiran. He has been a great resource for us. But just being able to, again, see what we've been able to do, what we've been able to change, and \_\_\_\_\_.

*Thomas Wenning:* That is the spirit of the Better Plants partner. That's why you guys are so good. That's why you're so good. I love it.

Wade, how about you? What's the silver lining that you all are taking away from this world?

*Wade Willatt:* Sure. If you followed Nissan in the news, you know 2019 wasn't a very good year for us, either. And so we were already challenging ourselves to find new ways to implement projects outside of CapEx. And so COVID-19 has just made that even more important, put more emphasis on it.

So right now we have four different financing options that we're trying to pursue. You know, installment purchase sale agreement, \_\_\_\_\_ PPA, and then on bill repayment. And so there's all different projects. And we're just trying kind of a shotgun approach and see which method we can get all the way to execution and then try to get more projects like that. And so we have upper-level support for that kind of creative – well, creative financing would be a bad term for us, but the new financing methods. And so we are I think in the long-term going to really benefit from this difficult period of really focusing on cash.

*Thomas Wenning:* Challenging the status quo. I love it. Exploring new ideas. It's a great way.

Helder, how about you? Is there a silver lining that you all are learning and taking away?

*Helder Da Silva:* I believe the good point that I would like to say is that the COVID was a surprise. It create the worst-case scenario for us. At the same time we had a health crisis and an economic crisis. Our plants were short of people. Our production was down. And there was no availability of resources. One thing that – if you still money, we cannot \_\_\_\_\_ to the plant. So in this worst-case scenario, I believe

we did very good in terms of improvements, in terms of adaptation. To adapt contracts, to adapt operation. \_\_\_\_\_ make the products that we could do with the lowest possible cost.

And other things like before the crisis, we have \_\_\_\_\_ community inside ArcelorMittal. And \_\_\_\_\_ community is volunteer. So people volunteer to participate for the plants, from America to Asia. And during the crisis, we \_\_\_\_\_. People asked to participate. Our community increased by about 40 percent during the crisis because people asked to participate, they asked to participate with discussions, they asked to \_\_\_\_\_.

*Thomas Wenning:* Interesting.

*Helder Da Silva:* I believe it was a very good \_\_\_\_\_ in all this confusion of the COVID.

*Thomas Wenning:* So additional volunteerism and engagement, and then finding that additional flexibility. I love it.

*Helder Da Silva:* Yes. People \_\_\_\_\_ many people \_\_\_\_\_ this kind of thing, even with the partial employment, people \_\_\_\_\_.

*Thomas Wenning:* Excellent. Fantastic. Thank you, Helder.

Andrew, I'm going to finish with you.

*Andrew Maude:* I think I have three silver linings, actually. That's pretty good. One, like David, we have a lot of operations on the West Coast, and our facilities have been going through the same issues as David in terms of the wildfires. But what that does is bring to the attention all the way up to the CEO, global warming is an issue, reducing energy and carbon is an issue. So this year if anything, just told people, you know, even clearer the importance of energy and conserving energy and reducing your carbon footprint. That's number one.

Number two, the pandemic itself has cause Bristol Myers Squibb to entirely readdress how do we work. You know, who needs to beware in order for us to get our drugs to our patients? Do we need all these people in offices? Can we have people working remotely? And as soon as you start addressing how you work, as you make changes, you can get an opportunity to make energy savings and carbon reduction savings at the same time. You know, if we do this, not only are our people safer, but we still can have the same

productivity, but we're going to use less energy. So it's going to save us money. So that was the second point.

And I think the third point is kind of the next stage of the situation. I described the successes of our remote BAS systems and how we could literally run the plant remotely. The next stage, we're already thinking about artificial intelligence. Right now we have a guy at a desk saying, okay, who is in and who is out, where can I shut it down, where do I have to turn it up. You know, taking those platforms, these artificial intelligence learning platforms, connecting the security systems to the BAS system so that when employee A comes in, we know which zone he goes to, we can already ramp up the air so that he's safe when he's in it. But when he's out of it, it comes back down again. And taking those kind of AI next-gen steps. You know, not 2021, '22, but 2025, 2030. Kind of, you know, make even more savings by taking some of those systems and using artificial intelligence. I think those are the three for us.

*Thomas Wenning:*

That's fantastic. All right, well, we are out of time. Terrible moderating, that's what it is. I do want to thank all of our participants here. Wade, David, Andrew, Helder, I think you all had great stories to tell. You're doing some fantastic things.

I do want to mention to all of you who are still tuning in here, we have another good webinar next week. It's going to be on the DOE's MEASUR software tool. So learning how to do your own energy assessment and using that free and open-source software.

So if you do have any follow-up questions, you know, ping folks. One, I would say look at that report that we put out. And then secondly, here's the contact information for these fantastic gentlemen here.

So with that, I want to thank everyone, especially our panelists. Great information. Really appreciate your time. You all have a great day, okay? Take care, everyone.

*[End of Audio]*