Eli Levine: Hey and welcome everyone. Thank you for joining us today for day three of the Better Buildings and Better Buildings and Better Plants Virtual Leadership Summit. We're thrilled to have you here. This session is called Best of the Betters. It's focusing on highlighting our betters, our 2021 Better Practice awardees.

The Better Practice Award is presented to partners for innovative – let me turn the camera on, sorry about this everyone. But it's presented for innovative and industry-leading accomplishments in implementing and promoting practices, principles and procedures of energy management. So, we have some really great awardees. We instituted these awards a few years ago as a way to, on an annual basis, bring to light some of the amazing work that our partners are doing every day through the Better Plants program. So we have six winners this time around. Next slide, please.

Oh, next slide, this is me, Eli Levine. I've turned my camera on and I'm hearing that there's no audio. Can others hear me? I'll just wait for someone to chime in on the chat and assure that we're not having – okay. Well, others can. We'll work with you fine. Thank you everyone. So this is me you've looked at that photo entirely too long. Let's move to the next slide.

And these are more importantly our winners. We have six awardees to the Better Practice award this time around, so it's Bendix Commercial Vehicle Systems, Celanese Corporation, General Motors, Lineage Logistics, Saint-Gobain Corporation, and Steelcase. And this is really a stupendous group. We were overwhelmed with the number of high quality applications we got this year for both the Better Practice and the Better Project awards. They were incredibly hard decisions to make, but we're excited to have these six awardees here with us today.

What we're going to do is each of them is going to present for a shot amount of time and we will be using the Slido app, which I think we will get into on the next slide, to have them take live Q&A afterwards. So next slide, please.

So by now, hopefully you're familiar with this, but you put in hashtag DOE, www.slido.com or on the Slido app that you may have downloaded on your phone, and what we're looking to do is submit questions. Please, I encourage you to submit them in real time so if Luis is presenting from Bendix and you have something, don't wait. Get your question in and if we could ask you, because there's six different presentations, if you have a question that's directed at a specific project, please specify, "Hey, this is for

Bendix. Here's the question for Bendix." Or if it's a question for everybody, specify that too, but get them in early because that gives time for everybody else to upvote the ones that they're most interested in hearing about.

That's an option for you as well, that if you have a question that you're thinking about asking, that you can – and someone else may have already asked it, but you can click the thumbs up button and say, "This is something that I'd really like to see answered." So, without further ado, I'm very excited to turn this over to the presentations. Thank you all for joining us today. It really should be an interesting discussion. Thank you.

Luis Quinones: Hello, good afternoon. My name is Luis Quinones from Bendix Commercial Vehicle Systems and we are very honored to be here sharing our best practice awards of our Zero Waste to Landfill Verification Process.

And just a quick overview of our company, Bendix Commercial Vehicle Systems, it's a member of the Knorr-Bremse group. We develop and supply leading-edge active safety technologies, energy management solutions, and air brake charging and control systems and components under the Bendix brand name for medium and heavy-duty trucks, tractors, trailers, buses, and other commercial vehicles throughout North America.

Our company is headquartered in Elyria, Ohio and we do have manufacturing locations in Bowling Green, Kentucky, Hanover, Pennsylvania, Huntington, Indiana, Lebanon, Tennessee, Wytheville, Virginia, and Acuna in Mexico.

Our Zero Waste to Landfill journey started back in 2016 when we started to focus on our industrial waste, so back in 2017, we were able to divert all industrial waste from the landfill disposal, so basically the first step that we took was to attack those big numbers, those big streams; however, when we finished, we realized that we still needed to get more information, still needed to get more data about the rest of the waste that was coming out of our facilities.

So in 2018, we focused on implementing the dumpster dive process, spent materials audit process that gave us a lot of information, a lot of insight on the next steps that we needed to do in order to achieve a Zero Waste to Landfill verification.

Then, with all of this information and data that was captured with the spent material audit, we were able to build the business case for

waste to energy and this was achieved with participation from waste vendors and a lot of interest from our manufacturing sites. Once this business case got approved, we were able to implement it across our North America operations, so then by 2020, we just wanted to verify this claim, so we wanted to have a documented process, we wanted to have a documented methodology where we can have the proper checks and balances for the Zero Waste to Landfill practice and with a strong focus on the continuous improvement of this process. So basically what we want to do is keep improving in order to keep moving up the waste hierarchy pyramid that we all know.

And you can really see the results on the table that you are seeing on your right. You can see that by 2017, we were sending around 468 tons to a landfill disposal. And you see that number drop to 410, 273, and a lower point of three tons in 2020. So you can see that this process has been able to work on the continuous improvement scenario.

The actual verification process that was developed in 2020 is structured via eight credits or requirements that a facility must comply in order to achieve this verification. The verification also provides the framework for the continuous improvement of the process and any risk management activities in order to identify or resolve any deviations or any extraordinary events that may arise.

So, the first credit that a facility has to meet is that it has to achieve a 100 percent diversion from landfill, which is our main KPI. And it has to be in accordance with our Waste Definition and Reporting Guideline. And this percentage has to be achieved for at least three months consecutively in order to apply for the verification.

The second credit states that the facility has to have a documented waste management process that it's implemented and carried out on a daily basis. Credit number three, it asks for an accurate and complete data collection system for all waste streams generated and specifically calls out for quantification and tracking of the generation and the disposal of the waste of the facility and there's several options in order to track the waste. For example, we do have an environmental CIS or we do have some locations that are using a waste management software to keep track of the waste.

And then credit number four states that the facility must have at least a recycling program for the following commodities which are metals, cardboard, plastic, wood, e-scrap, and paper. And these regular recycling streams for a facility and they must be included

on the tracking system. So we do have to have weights and tracking capabilities for these recyclable materials.

Credit number five states that all associated waste vendors are evaluated via our TSDF facility evaluation and inspection forms and scorecards and they are included on the corporate approved waste management disposal sites and this process assures that we're doing our due diligence when we're dealing with waste vendors and really helps us to manage any change or any other issue that may arise with a waste vendor, for example.

So, for credit number six, we have that all shipping records for all waste categories must be maintained. Most of the times, these are legal requirements, so I mean, you just need to be able to backtrack or follow the paper trail and make sure that you are reporting accurate weights, accurate dates, the right type of waste you're sending. So this is a very, very important requirement on the verification process.

Then credit number seven states that the facility performs the Spent Material Audit at least once a year and you need to document any findings, any actions, any opportunities for improvement in our Spent Material Audit form and what this does is that this provides the framework to gather additional data and keep working in a continuous improvement, agile setup in order to keep moving up the waste hierarchy pyramid here.

The last credit, credit number eight, states that the facility has to provide waste management training to all of the employees. So it assures that the facility strives for the continuous improvement of the waste management program by increasing awareness throughout the workforce.

Also, you can see the Verified Facilities that we were able to do in 2020, which is our five manufacturing sites in Huntington, Indiana, our recently expanded facility in Bowling Green, Kentucky, and our corporate offices in Elyria, Ohio.

So, when a facility meets the eight credits, they get their diploma. They also get a banner that is displayed at the site. And as you can see there, we do have an initial certification date of August 2020, so you need to reapply for this verification every year, so right now, the sites that you can see there, they are already working in the resubmission for that 2021 process and this ensures that we do have at least that yearly review or that yearly checkup and that they are actions and that we're working on that, again on that

continuous improvement cycle.

So, that's all the time that we have. We would like to thank you very much for your attention and again, we are so honored to be sharing this Better Practice with all of the attendees here to the summit and we do want to take a little bit of time to thank all the Better Plants team, Eli, our program management, Chris Price 'cause it's such a great initiative and we really, really hope that we can have an in-person summit pretty, pretty soon. So, everybody stay safe and we'll see you here next session. Thank you.

David Reid: Hello everybody. Welcome. My name is Dave Reid and I oversee the manufacturing energy program for Celanese. Working with our sites and sustainability teams to promote energy efficiency and environmental sustainability at our manufacturing plants globally.

Celanese is a global technology and specialty materials company. We produce a wide variety of chemicals and polymers that go into products that people use in everyday living. First of all, on behalf of Celanese, I'd like to thank the Department of Energy for recognizing Celanese for this Better Plants Better Practice award.

As the focus on sustainability increases in the chemical manufacturing industry driven by investors, our customers, and in some regions, regulatory requirements, Celanese is working to improve its environmental systems in the ESG space to meet changing energy and climate landscape.

As part of this, a need to evaluate sustainability improvements early in the capital project cycle with the objective to design sustainability optimization into capital projects up front was identified as becoming more important. Historically, capital projects have been primarily driven by initial cost, internal rate of return, and project schedule. Projects do take sustainability into consideration, but not with the level of attention needed for the increased focus on sustainability today.

Also, after a project is approved, it's usually next to impossible to add scope or cost, even for good improvement ideas. Subsequently, sustainability improvement are often retrofitted into existing equipment, often at higher cost as productivity or sustainability projects after a project has been running for several years, not getting the benefit from day one.

So a need was identified to require capital project design teams to consider energy, GHG impact and waste and water conservation

early in the design process, enabling life cycle cost reduction and sustainability efficiency evaluation before final design and approval.

A sustainability design consideration checklist for capital projects was developed to evaluate the sustainability impact of capital projects and potential improvements to the project's scope using a consistent methodology across the company. The sustainability checklist enables better designs and better business decisions to be made to include optimization and efficiency upgrades in the projects.

So a small team of project engineers and sustainability champions was put together to build the checklist, input from other Better Plant partners assisted with ideas for the content of the questions in the checklist.

The sustainability checklist was developed in four main topic groups using a series of questions to trigger the design team to consider a broad range of sustainability aspects during the design review. The first group of questions focuses on manufacturing process technology. Is a more sustainable manufacturing process being installed than previous? Asking questions like, will the project lower GHG energy, water, or waste and have life cycle costs been considered in the deign process. A goal of this section is to understand the overall impact of the project and determine if technology improvements have been considered.

The second group of questions focuses on equipment efficiency for sustainability. Is the equipment specified to be as efficient as economically possible with question like have variable speed drives been considered or is best technology for team traps being utilized? And have some of these best practices in most effective technology been designed into the project.

This section focuses on process, but it also has building design, equipment sizing, and turndown capability of equipment as part of it.

The third section reviews measurement systems ensuring that consideration for all significant sustainability usage components are measured, recorded, and controllable with questions related to metering and sub metering, control elements and automation systems.

The fourth section is related to review of other sustainability

factors including product life cycle analysis impact, water balance, peak loads and even the availability of rebates or subsidies for energy reduction.

Based on the responses to the questions and the gaps in the opportunities identified in the checklist, the project design team can develop a list of potential project alternatives and a proposal to improve the sustainability efficiency analyzed for cost benefit or rate of return impact and included in the project analysis.

The checklist is completed at the design review step early enough in the design process so that the sustainability alternatives can be evaluated well in advance of project approval. The unit technology leaders and site sustainability champions are part of the review and approval process and based on the analysis, better decisions can be made to implement sustainability upgrades or enhancements. It's still up to the business, however, the business approvers, to decide whether to go ahead with the improvement alternatives. Consideration is given to incremental capital cost, life cycle energy and sustainability costs, internal rate of return on capital and support of site and company sustainability goals when finalizing the project scope, the project cost, and final approvals.

Whether or not the improvement opportunities and sustainability options are selected, cost information for the identified enhancements are documented and specific reasons for selection of final choices are included in the analysis. Options not selected can be used to build a pipeline of future productivity and sustainability improvement projects.

This checklist is relevant for new equipment and expansions, but is particularly important for maintenance of business projects that replace old equipment. So instead of replacing equipment in kind, engineers should be evaluating the cost effective replacements that improve sustainability and efficiency. The checklist gives a consistent methodology for an effective review and decision making.

So the checklist is really intended to drive behavior changes at the project scoping and design review phase, to consider and include sustainability driven optimization of projects, driving that life cycle cost and improve environmental sustainability.

The checklist also promoted better decision making at the project approval phase to include these optimizations with full understanding of what the scope is, the alternatives, cost and rate

of return. Currently, the expectation is that the checklist will be completed for all capital projects greater than $50,000.00, but we're looking at including it for all capital projects across the board.

The sustainability checklist can be easily adapted to other companies. It's a simple and effective concept and companies can develop a sustainability checklist tailored to their need with concepts that are relevant and specific to their businesses.

Again, thank you for your attention and recognition for this project.

Nathalie Palka: Hello and thank you to everyone who has joined to listen to this presentation. My name is Nathalie Palka and I'm here on behalf of General Motors to discuss our Eco Toolbox.

Now, before we get started, I wanted to take this time to thank the Better Plants program and the judges for selecting GM's Eco Toolbox for this award. We are elated to have received this recognition and we are truly grateful for our partnership with the US Department of Energy.

With that, we'll go ahead and get started with the presentation. So, similar to the evaluation of recordkeeping that has progressed from stone inscriptions, typewriters, the first PC computer, all the way to the complex big data analytics which we see today, GM's own energy management system has evolved throughout the years.

Taking it back before the 50001 Ready Certification, energy data was stored on individual PCs and plant shared drives that was really isolated from company view. Facilities had their own unique energy spreadsheets and tools that made it difficult to effectively benchmark performance among plants, understand true progress and areas for improvement.

In 2019, GM introduced the 50001 Ready program where individual facilities became certified. Now once this program was in place, GM then adopted the company 50001 Ready Certification which provided a holistic and structured approach to energy management.

Now building on this momentum, GM began further refining energy management practices by developing standardized data collection and documentation spreadsheets including the Eco Toolbox, which we're going to be highlighting today.

The Eco Toolbox was created as an extension of the DOE's 50001

Ready program and other industry best practices that really helped standardize energy management tools. Now, once this tool was implemented at each facility and in use, we continued to strengthen the benefits of such reporting by developing a dashboard using power VI. And in the future, we hope to implement the detailed corporate reporting practices using the dashboards to really reinforce informed decision making regarding future improvement efforts.

And overall, we continue to strive to leverage new technologies to ensure that we proactively incorporate enhancements which support efficient and effective data collection analysis and reporting.

Now, let's take a look at a more detailed view of this evolution. So the samples provided on the slide illustrate the multiple Excel data collection files, forms and tools which were used across facilities. Although it was a great effort to store energy management information, the system really didn't lend itself well to being able to effectively understand macro level insights. For this reason, GM developed a comprehensive roadmap file that effectively factored in all aspects of capturing energy data. This standardization and centralization of key data metrics was so effective GM continue to apply the lessons learned to other energy management practices such as the development of the Eco Toolbox.

The Eco Toolbox is a centralized repository that outlines energy and water best practices as well as shut down opportunities that should be considered by all facilities. The toolbox tracks the efforts made. It outlines future focus areas and it provides a holistic view of what is occurring at the plant level.

And the design structure tried to mimic standard user interfaces that simulate navigation practices like a web application and overall, this reporting tool made it easier for teams to understand what is needed, be trained on important GM KPIs, leverage the 50001 Ready tools and overall serve as a repository of energy management information.

Now let's take a look at the Eco Toolbox itself and what it provides. So the Toolbox was designed to ensure sites do not miss critical best practices and application opportunities. The design structure includes five separate components. The first one is the eco task checklist, which depicts plant level common treasure hunt, energy and water opportunities; the energy best practices, which illustrate department-level energy savings ideas; energy shutdown

opportunities which showcase department level shutdown and idling savings; and of course, similar shutdown and best practice modules are available for water also.

It's also important to note that these best practices were consolidated from a wide variety of sources and the information was derived from activities occurring across all GM facilities globally as well as from previous treasure hunts conducted across regions. In addition, with the work stoppages experienced over the past year during the pandemic, these shutdown opportunities became even more important to consider.

To use this Toolbox, energy managers select applicable best practices at the department level and they assign an implementation status, a percent complete and an energy impact to each one of them. Each applicable best practice is color coded to highlight opportunities and the checklist also calculates an implementation index for each department and for the site.

The tool also provides visibility into upcoming scheduled deadlines that allow facility managers to effectively manage their workload. And then finally, another feature includes a company-level dynamic ranking system, which identified opportunities with the highest impact to ensure focus is placed on the largest areas of improvement.

This information has been summarized in the final plant Excel dashboard, which shows the results of the department and the site level for both assembly and powertrain facilities.

It illustrates strengths and opportunities and effectively captures energy savings metrics. This summary is then used to communicate with the leadership team to ensure that commitments are achieved and effective action is taken to ensure projects are realized.

This dashboard summary is then included in this one-page report. The information is shared with the leadership team to present those top action items and their relative water, energy, and emission savings.

This ensures buy-in and authorization to move forward with the improvements, and again, this report is presented at the plant level. However, to further strengthen the efforts and understand the progress made on a macro level, we built a power VI portfolio dashboard that consolidates the energy data track by these

individual sites.

The dashboard automatically collects data from all participating facilities to generate this master summary. This multilevel dashboard is used to evaluate progress and identify energy and water savings opportunities.

And the dynamic reports allow energy conservation engineers, site utility managers, energy optimization leaders, and company energy directors to gain a deeper understanding of energy and water information between sectors and regions. It also allows an effective comparison between sites, assists in company benchmarking efforts, evaluates macro level progress and of course, critical saving opportunities.

Overall, this dashboard derived from the Eco Toolbox is a significant improvement to GM's energy management practices. Effective data measurement and KPIs that are understood across the enterprise are important to uncover creative ways to transform current practices, accelerate energy and water conservation efforts, and effectively work towards decarbonizing our facilities.

These reports and metrics are in place to then adjust performance and truly push the needle towards GM's company sustainability goals.

And this marks the end of our presentation. Again, I wanted to thank the US Department of Energy and the Better Plants program once more for this recognition. We would also like to take this time to acknowledge the team members who were critical to the development of this tool, so a big thank you to Ovelio Isambert, Bob Baird, Jackie Green, Paul Hartmeister, Rebecca Tody, Alfred Hildreth, Glen Huffman, Jolene Shiroma, and Kate Peterson.

Again, thank you for listening to our presentation. We hope you enjoyed it and have a fantastic rest of your day.

Jash Vora: Hi everyone. Thanks for joining. I'm Jash Vora, an associate technical project manager with the Data Science team at Lineage Logistics here to tell you a little bit about the data science team story.

Now a lite bit of background about lineage and the cold storage space. Lineage is the world's largest cold storage company. We own and operate more than 350 warehouses across multiple countries and continents. Now the cold storage industry in general

has always historically trailed in terms of what we call innovative practices. There are lot of reasons as to why this was the case, but I want to focus on a few key ones.

The first is that many cold storage companies only own a handful of sites and this limited scale really limits the benefits of deploying capital towards research and development. Another key reason here is that the vendor ecosystem surrounding cold storage was always significantly behind consumer technology and this really hampered the ability for cold storage companies to innovate and keep pace with industry at large.

Now, in order to address the scale issue, Lineage's drastic growth since its founding in 2008 and its large global presence now allows the company to deploy significant resources towards forward-looking projects in tech innovation. And this is exactly what the founders of Lineage did when they created the data science team in 2013.

Now, just to give you a bit of an overview about the team, currently data science has 20 full time members across three main verticals. We have a warehouse algorithms group, a transportation group, and also the research and development arm at Lineage. In addition to our full time members, we have regular and frequent collaboration with universities and research institutions across the United States.

Now, I hope what you're seeing here is alarming or unique, I should say, because we consist of physicists, statisticians, engineers, even marine biologists and this diversity of backgrounds is not by accident. In fact, it's by design and it's really enabled us to think outside the box and create innovative solutions. And I'll get more into our sort of foundational principles as we move forward here.

And actually given the diversity of skill sets that we have at data science, the team focuses on several different projects spanning a wide variety of domains. But I want to draw your attention to the equation you're seeing here, which is what we refer to as the money equation, essentially all of data science's work hones in on one of these four buckets, but really three of the main buckets here, we focus on projects that improve throughput and quantity in terms of storage at our sites and also address our two biggest cost centers, which are energy and labor.

Now, I also wanted to highlight the way our team has grown since

it was founded in 2013 and what I want you to take away from the slide is the fact that for a team that focuses on innovation like data science, it's extremely important to lay down certain foundational principles in the initial years. And I hope that non-linear growth of the team as you can see here catches your eye because it's extremely important that when the team is being founded, when a team like this is being founded, that significant time and resources are deployed towards making sure that the team's mission and outlook is clear and solidified before branching out or before expanding. And in fact, before 2019, we had fewer than ten team members and we've almost – we probably have more than doubled in size since then. So that just gives you an idea of the sort of gestation period that a team like this encounters in its initial years.

Now, our data science team was established with a set of key foundational principles that form a core part of our identity today. We service the innovation center for Lineage as a whole and this fact has been well established since the team was founded back in 2013. A big reason for why we keep this innovation going is the fact that we make a direct and deliberate effort to find and empower technical talent or what we consider subject matter experts from a wide variety of backgrounds, and I hope this was evident in the team structure.

One thing that also aids and augments the team's work is the fact that we consistently engage in research partnerships with universities, research labs and even private researchers. This really helps us not just validate our work, but identify areas for future improvement across our portfolio.

And lastly, and certainly most importantly, I just want to make sure that I emphasize the fact that the data science team at Lineage does not exist in a silo by any means. In fact, it's quite the opposite. We have extremely deep and valuable relationships and partnerships with other divisions in the company and what I consider most importantly with our warehouse operators at the sites themselves, none of our work would be possible without the constant communication and collaboration that we undertake with folk at the site because their input and their buy-in is incredibly important to realizing any sort of economic benefit or any sort of benefit really in the work that we do.

Which brings me to this triangle of often competing and conflicting values, but a triangle that I think is important for any sort of innovative team to hit on. For a team like Lineage's data sense team, you have to make sure that in addition to the technical

innovation, which of course is a given, all the projects that are undertaken have some sort of a business case or economic return attached to it. I mean, without this, it's incredibly difficult if not impossible to justify the deployment of capital and resources and people's time towards a project if they don't have tangible returns.

And lastly, I think in terms of sustainability, you know, the word takes on a lot of meanings, but in our case, I'm referring to specifically sustainable operations for Lineage as a whole, whether it's in terms of our energy usage and our emissions, but also for the conduct of the team, maintaining a sustainable level of growth and domain and outlook is incredibly important and again, I hope this is evident in our team growth through the years because it takes time to establish certain foundational principles for a team like data science. And I think as a team, we have done what I consider a good job in sort of marrying these three often competing values and it's important for any similar team to make sure that you A, recognize and B address these three points.

Focusing on Lineage's energy management initiatives, most if not all are born out of the efforts of our R&D team. There's two main components in the way the R&D team and data science approaches new projects. One is that every single project has an attached return on investment and an underlying business case. This is absolutely crucial to the way data science approaches projects as a whole. And the second is that we employ what is known as a pilot project model for most initiatives in which we would test out new technologies at one or two of our sites for rolling it out and making that bigger financial commitment.

And this approach has been wildly successful through the years from successes in energy procurement just last year to new patented blast cell designs, the thermal fly wheeling, which has been extensively covered in the media as well just because of its proven success.

And we've been fortunate enough to be recognized globally as a leader in innovation, not just in cold storage, but just technological advancement as a whole.

Here's what I'll leave you with. Every single project at data science lives and dies by its business case. This focus on technology and economics has helped Lineage create a very compelling story for itself.

Now the data science team's work once again would not be

possible without constant collaboration and communication with various champions across the company. We also benefit greatly from our structured framework around research and development and what I consider to be an enviable work culture.

I hope this serves as some sort of a guide for anyone looking to start a similar team regardless of the vertical _____ companies and thanks for our time and happy to answer any questions.

Sam Schneider: Hello. I'm Sam Schneider the process sustainability engineer with our Saint-Gobain North America EHS and sustainability team. We are here today to share the R&D Green Awards program.

Thank you to the US Department of Energy for recognizing this program with the 2021 Better Practices award.

Saint-Gobain designs, manufactures, and distributes materials and solutions that improve the comfort of each of us and the future of us all. Globally, Saint-Gobain continues to write the history of a company dating back more than 350 years. Now with 171,000 employees of over 100 nationalities worldwide, we bring wellbeing to people by creating great living places and improving daily life by designing, manufacturing and distributing materials and solutions which combine comprehensive sustainability, making the world a better home.

Saint-Gobain products are found everywhere in our daily lives. From the home to the office, in cars and infrastructure and high performance materials for health and many industrial applications. In the US and Canada, we have over 130 facilities including manufacturing plants, R&D centers and offices. Sustainability is one of our core values. Providing solutions for sustainability in the _____ environment and working to decarbonize industry. Globally we have set ambitious 2030 objectives on the pathway to net zero by 2050 carbon goals.

Today, we're here to discuss some of the great work that came from our R&D center in Northborough, Massachusetts. One in four Saint-Gobain products sold today didn't exist five years ago. Incorporating sustainable thinking and recognition into R&D offered some opportunities to drive positive change in new product development.

I'll hand it over to Elizabeth Toll to introduce herself and tell us more about the R&D Green Awards program.

Elizabeth Towle: _____ Elizabeth Towle and I'm a research engineer in the competency research labs working on wet coatings.

For the past three years, I have worked at Saint-Gobain Research North America, one of Saint-Gobain's largest industrial research labs.

Located in the greater Boston area, as _____ North America is home to more than 400 employees working at the leading edge of innovation. Researchers are SGR North America are preparing for the future by designing tomorrow's products and processes across a wide variety of markets and technical disciplines with a growing focus in doing so sustainably.

As passion on this site grew for sustainability, a small team of employees who wanted to have an impact founded the SGR North America Sustainability Committee in 2016, which has since grown to a volunteer team comprised of 25 members and four subcommittees. Our committee has worked on local cleanups, supported our community garden, participated in conferences, conducted lab specific energy and site waste audits and installed sustainable technologies.

In addition to making the research facility operate more sustainably, we have recently been working to expand our impact in our research and development work. We saw an opportunity because the center is well suited to solve technical challenges and the R&D work that the researchers are doing could actually have the largest impacts, much greater than that of our committee focusing on the R&D center's relatively much smaller environmental footprint.

At the end of 2019, we began brainstorming about how R&D could have the greatest impact on sustainability. As Sam mentioned, one in four Saint-Gobain products was developed within the last five years, so a greater impact on the company's goals can be made by incorporating sustainable thinking early in the design stage. New, innovative products and tweaks to existing products can have a huge impact on our manufacturing processes in the myriad of ways listed here.

One of the challenges we faced was not having any direct influence on the R&D budgeting process. With this in mind, we decided to implement an award program that shines light in existing projects and incentivizes engineers to work on sustainability related projects.

Coined the Green Awards, this program allows researchers to focus on the sustainability aspects of projects and drive sustainability changes. I worked with a committee of five R&D professionals to execute the 2019 and 2020 Green Awards. One difficulty in implementing the Green Awards program was that many of the researchers did not recognize the sustainability impacts of their own projects. So the awards program also acted as an education opportunity for our researchers as it helped to reframe these projects with this sustainability lens. For example, rather than thinking about material reduction solely for cost savings, the impact to reducing in scope three emissions included shipping and raw material usage to deliver a product with the same functionality.

We've had nearly 20 exciting projects submitted from researchers supporting a dozen business units. Projects were screened by our committee and five finalists were selected each year. Finalists presented in January to a team of judges along with others interested. Our judges included leaders in sustainability, business, research and development, HSC, and academia as well as local sustainability committee members. The project presentations given by the five finalists this year drew significant interest from the R&D community with over 75 researchers attending to learn more about each of the projects and see the selection of the winner.

The finalists have included projects that had sustainability impacts across the board, waste reduction, energy savings by reducing throughput time, novel recycling methods, support for energy saving technologies, decreases in Co2 emissions in scopes one, two, and three, reduction in raw materials and improvements in worker safety without generating additional energies

The winning project this year focuses on steel reheating, which usually occurs in radiant tube furnaces that combust natural gas. Through a retrofit burning solution, the energy consumption and CO2 emissions are reduced by nine percent and NOx emissions are reduced by 25 percent. The 2020 retrofits were expected to reduce energy consumption by 1.2 gigawatt hours, cutting out 230 tons of CO2 and 1.5 tons of nox. A global extension has potential increase the impacts 100 times or more in the coming years.

I will now hand it back over to Sam to discuss the continued impacts and expansion of this program for Saint-Gobain North America.

Sam Schneider: This program was implemented at the site level by one R&D facility and team. After two years of implementation, the Green Awards program has had great success in sharing the sustainability story of the R&D research projects, drumming up interest and connecting across the company. Because of the success of the program at the site level, the Green Award was recognized as an overall sustainability project, WWE, Waste Water and Energy belt by the corporate sustainability team in 2020. This is the first time a WWE belt was awarded to an R&D facility, as the awards were initially designed to recognize operational improvements at Saint-Gobain's manufacturing plants. The R&D team produced a video to accept the award, which was shard across the company and had over 600 views. The SGR team presented at the annual sustainability conference, which was virtual this year.

Because of the impact of the program, the corporate sustainability is building up on this awards idea to recognize R&D researchers with awards across North America. This is an expansion on Saint-Gobain North America's current awards program, which recognizes operational, wastewater, and energy, WWE metric decreases with _____ _____. Corporate-wide awards for product sustainability, employee engagement, environmental impact, and supply chain will be offered for 2021 data and projects _____ the Green Award program and continuing the momentum across SGNA's R&D facilities as well as allowing other business groups to apply.

Thank you so much for attending our presentation and we look forward to any Q&A at the end.

Kimberly Boes: Hi everyone. Today we're going to be talking about Hack the Pack, which was a workshop to reimagine packaging at Steelcase. We hope you enjoy.

First of all, thank you to the Department of Energy for recognizing and awarding Steelcase's Hack the Pack as a Better Practice. It has been such a fun experience and we are excited to share this work with others.

For those who may not be familiar with Steelcase, we were founded in 1912 in Grand Rapids, Michigan and have grown to be the world's leading manufacturer of furniture, architecture and technology products for the workplace, with over 11,000 employees in 45 locations across 17 countries. For over 100 years, we have been researching, experimenting, listening and observing to make products that solve problems starting with our very first

patent for a fireproof steel wastebasket in 1914. A lot has changed since then but what hasn't changed is that we are still in the business of transforming work, worker, and workplace.

Brian Sholten: We've done packaging improvement projects in the past, but it seems like those solutions often turned out to be win-lose solutions, so they'd be better for our customer, but worse for the company or better for the environment, but worse for the customer. The thinking behind Hack the Pack was that we could come up with a win-win-win packaging solution so solutions that were better for the environment and better for our customers and better for the company. That led us to this central question, how might we find ways to reduce our packaging waste impacts, save money, improve experiences for our customers, and improve quality through delivery?

In order to accomplish this, we realized that there were many stakeholders that needed to be involved in the process. We invited dealers, people from our distribution channel, packaging engineers, folks from our sustainability team, and people from quality to all be a part of the process. At Steelcase, we make hundreds of thousands of different style numbers, but we asked each one of these groups to nominate just two style numbers that represented some sort of pain for them. We asked them to identify that pain point when they identified the style numbers.

So for quality, it was around damage and where do we have damages to our product when we ship them. For sustainability, it was around single use plastics and where can we eliminate that? For packaging, it was around complicated or problematic packaging designs. For distribution, it was around logistics and complications and material handling. And for our dealers it was around what happens at the job site, the unboxing process and the assembly process of our product.

Casey Dupuie: Once we have the lists of the nominated products, we placed our internal order and had them ship to our workshop location. This really helped us to simulate a normal customer logistic experience and see what our packages really go through to get to their destination. With all of the products in hand and our cross-disciplinary team on site, we got to work. One by one, we went through each product asking the teams to explain exactly why they nominated the product that they did. What about it was specifically painful to them?

And after hearing all of the concerns, we began to unpack the

items and throughout this entire process, the team was holding a really great dialogue. We talked about a lot of different things. We talked about packaging design and what worked and what didn't, packaging materials, how many different types of packaging materials were we using and what were they made of? And then finally, we were talking about waste and disposal options.

There's often a large discrepancy between what's theoretically recyclable and what's practically recyclable. And so we talked about the disposal methods that were most likely to be available to our customers in the field.

And throughout this whole thing, our team started bringing up ideas that they believed couple make the pack better for them, and others would either agree to the comments or share how that particular change could negatively impact a different portion of the value chain. It's shown us just how interdependent all of it really was. But by the end of the day, once all of the products were reviewed, we realized just how many opportunities we had.

And so I asked the teams to take four sticky notes and wrote on the products that they felt would have the most significant impacts to Steelcase, to our dealers, and the environment, to help us to prioritize the work for the year ahead. And it was really cool because the vote was unanimous on all four products.

Mark Steffes: So, what were the outcomes from Hack the pack? First, we reduced over 13,000 pounds annually of lumber from single wall packs and moved to a primarily paper based solution. Second, replaced our large heavy sofa units on pallets, thereby improving the quality and safety of our people. No longer do our distribution folks and dealers have to move the units manually. It is now being done with the use of a high-low. Third, we made great strides on reducing our packaging SKUs on our sofa units by standardizing on pack materials. This was a 25 percent improvement with our goal set for an 85 percent improvement by fiscal year '23. And lastly, we eliminated large EPP and EPS foam blocks from one of our packs with a migration to a paper solution. This is not only a great sustainability story, but it also saved us $350,000.00 annually with more projects just like this one to come.

Kimberly Boes: Thanks for listening to our presentation today. We are looking forward to a second Hack the pack hopefully later this year.

Eli Levine: Well, thank you so much everyone. It's really, really great. Those were really great presentations. All of your AV skills far exceed

my own. I was very impressed with how well you communicated such wonderful things and it is really one of the things that makes, or at least on a personal note, working in the Better Plants program is so gratifying is that you have all of these amazing manufacturers who are making just the gamut of different things that you could make and their strategies for how to drive employee engagement or how to really generate waste savings, water savings, energy savings, so many of them were applicable to each other and there really is a lot of that can be learned and replicated in other facilities as well. So I hope you feel that way as much as I do as well.

We got a number of good questions already. I encourage you to continue to submit questions. We may have time for more quietness than the eleven we've gotten so far. I also give credit for those of you who have used the upvoting button, because that makes my job a lot easier insofar as I can tell where is a lot of interest and popularity and which questions you want to see answered.

So, I guess with that, Luis, I'll – I guess before I turn to that, one of the things that I'd like to ask all the different panelists, I felt that Steelcase made the point in the last session that the success that they had through the Hack the Pack exercise is going to catalyze further action on their part, you know, both with their continued Hack the Pack and with other sustainability efforts in the future. Is that something that others have seen, that other awardees have seen at your companies too, that the success you had with one of the things that you were doing has brought momentum around to do more things in the future. Does anyone want to speak to that?

Luis Quinones: To that point, Eli, I can talk a little bit about it.

Eli Levine: Sure.

Luis Quinones: So, as other question that I'm seeing about the wasted energy, if it's allowed on our Zero Waste to Landfill verification, it is allowed at this point, but going back to your point about bringing in more stuff and really working towards that continuous improvement of the overall system, is that with this Zero Waste to Landfill verification it basically allows us to communicate it better, getting leadership really, really engaged into this process, which is going to allow us to move up on that waste disposal to try to move away from the waste to energy and becoming – I mean improving on this zero waste process, right, so it's – it's a very, very good communication. It's very, very good for our leadership to be involved in this, so that's – that's the way that it's worked for us to

bring more awareness and help us to move up from wasted energy to actually zero to waste to landfill there.

Eli Levine: Fantastic. Can any of the other awardees, are any of you interested in speaking about how your success with this award or your activities that led to you receiving this award may help you in future activities that you have coming up, coming after this?

If not, I'm happy to dive into these specific questions and call on folks.

Just a reminder for all the awardees, this now is a good time to unmute yourselves and possibly put yourselves on screen as well. So, I guess I'll – for the General Motors team, for Nathalie and Al, you know, the top rated question that had about ten thumbs up so far is how hard or easy was it to operate the energy management in your Power BI dashboard? Did you need help from developers? Did you need to train operators or other employees?

Nathalie Palka: Yeah, so I mean, June – GM did use internal resources to build this Power BI dashboard. No core IT developer knowledge is needed to use this software; however, you do need to understand it quite well to be able to manage such large amounts of data. There are a number of different training, free training resources on the Power BI tool online that you can leverage, but again, you definitely need to have a strong knowledge base in the tool before attempting the dashboard.

With that being said, in terms of training, we did provide a brief training to all of the energy managers who would be leveraging this dashboard and I think it – once it is created, it's quite intuitive to use, which I think is fantastic and you can slice and dice the information however you see fit. So, once that training is provided, I think the buy in and the use of this tool has definitely grown.

Eli Levine: That's great. Thanks so much Nathalie. That makes a lot of sense and that is really cool to see. Al, I mean, sorry Luis, you may have addressed this a minute ago, but just to clarify, can Bendix send waste to waste - can Bendix send waste to a waste energy facility to qualify for Zero Waste to Landfill, and if so, is there a limit?

Luis Quinones: Yes. So right now, we are allowing zero waste to energy disposal. Under this verification and there's no limit right now to that.

Eli Levine: Awesome. Thank you. Dave over at Celanese, I really liked your project checklist. I think that's really cool and something that I

think will be replicated by a lot of our other partners as well. You know, what level approval in the Celanese operation did you need to, the project checklist is now positive for sustainability?

David Reid: So typically, the checklist is tied to the project approval, so when the project runs through the approval process, the checklist goes with it, so the level basically of approval of a project along with the checklist is dependent on the project itself.

So for us, the different projects go to different approval levels, usually depending on the level of the capital spend. So at that point, the decision is made to go forward with the project to incorporate any of the ideas that have come up as a result of the checklist or even, you know, as a business decision to not do some of these things.

So it goes with the level of the project approval.

Eli Levine: That's great. Relatedly Dave, Could you discuss how you were able to convince management to, you know, to integrate the sustainability checklist activity?

David Reid: Yeah, so this was interesting. So initially the checklist came up through a subgroup of our energy council, so it was really focused on energy with the same thought process in mind to focus on, you know, what can we do at the capital, early in the capital project design to improve energy.

But as we've moved, you know, so it was a bit of a push from the energy team to get out to sites and some of the sites had started to use it but as our focus on ESGs really increased over the last twelve months or so, we were looking for – the ESG team was looking for examples where we could take to, you know, our sustainability space, and this was one of the things that they latched on to and said, "Hey this is a great thing to do. Let's expand it to sustainability."

So we worked on, you know, expanding it from energy to sustainability and it's really driven by our ESG council which is an executive level group. So it's really, you know, a bit of push from us initially but as our focus on ESG is coming, it's really being driven top down now.

Eli Levine: That's great. Jash over at Lineage, one question we had, how does the data science team integrate with the folks who are responsible for energy waste etcetera, on a day-to-day basis?

Jash Vora: Yeah thanks. That's a great question. Before that, super quick want to thank the DOE and Better Plants. It's great to be here and it was really interesting listening in on everyone else's presentations. I hadn't seen those before, so that's super great.

The question about integration, I think I alluded maybe a little bit in the presentation but, you know, our team definitely doesn't exist in any sort of a vacuum or a silo. Every single project that our research and development team undertakes is done in collaboration with our site operators, folks who manage, you know, the refrigeration systems at the site to the engineering lead for those sites.

We are always in lockstep and making sure that we have not just the buy-in but the support and collaboration with the folks who actually make these machines and make these systems work at the site so it's very much an active sort of collaboration process. And just super quickly, I like the question, the latest question as well about these projects being driven from top or the bottom. I think in in the case of Lineage, it's certainly more of a cooperative bottom-up approach. I think the innovation here is definitely driven by the team but the implementation and execution comes 100 percent in collaboration with the folks at the site who actually carry the work out.

Eli Levine: That's great Jash. I appreciate you pivoting to that question. That's a really good question, the one that I spent a lot of time thinking about and seeing the different strategies for our different partners.

I'd like to, maybe I can bring in the Saint-Gobain team on this one too and then I'll Celanese, Lineage and everyone else weigh – or I guess Lineage just did, but Celanese and others weigh in as well.

Sam, what have you seen? You guys are doing all sorts of cool stuff that always gets your different plants competing against each other and thinking about different strategies for how they're going to drive, you know, energy, water, waste savings or water, waste, energy specifically for you guys, at your plants. You know, are you seeing these things? Are you seeing your projects being initiated and driven from the top down or more of a cooperative approach from the bottom up?

Sam Schneider: I think it's really a combination of both, as you saw for this project, this is the Green Awards originated at an R&D site, so that was very much driven by the _____ level green team. And we also

have a sustainability champion at each of our 130 manufacturing plants in the US and Canada, so those folk really helped to drive things that are coming from the corporate level down, but the competitions really do help too. Everybody likes a little bit of competition and likes to see their plant's name on the leaderboard.

Eli Levine: Great. Dave, any thoughts that you have fort his one as well, about Celanese?

David Reid: Yeah, I think again, it's cooperative in general. I think when you can get the top down support, it really helps the projects to move forward, but I think a lot of these projects come from kind of grassroots where people are thinking of ideas on how they can improve their plant or a process in their plant. So we come up with a lot of ideas but we really get the momentum and the traction when there's support from our ESG committee or an executive committee.

Eli Levine: That makes sense. For Casey and the team at Steelcase, you actually got two questions back to back and I may have you field both and just have to answer them at once. The first was, was there a trial and error process for your new packaging? Did you run it by consumers for product experience? And then the second question was, who in your organization authorized and supported the Hack the pack events or were there any recommendations on how to pitch this to management? The person confided that, I think I'll struggle to convince my management to bring so many people together. So _____ you want there. I know I threw a lot of different questions at you.

Casey Dupui: That's okay. So yes, there is definitely a trial and error process with any new packs that we design. So, anything that we change concepts of, it goes through a lab testing procedure. If it fails at any point in those testings, it has to go through a tweaking process, and then it goes through a lab test again. Once it passes that lab test though, it moves to an over the road test. So we will ship it from one of our locations to another and see how it does actually over the road.

From there we will initiate some feedback from our dealers, so they are the ones who are unpacking the products and putting our products together. And so we've been working with them pretty closely so we can get some feedback on are we heading in the right direction or do we need to tweak some more.

In terms of who authorized this project, so Brian Scholten who was

the first person to speak on what the Hack the Pack workshop was and who we included in this workshop, he was the one who actually authorized this project and he is in a unique position within our company. So he works on a lot of cost reduction projects as well as a lot of projects that are a little bit more creative or unique.

And so he was the one to pull this together. He has a lot of connections throughout the company and so when we decided to move forward with this, he reached out to all of the folks that we mentioned, so quality, sustainability, packaging and asked them to submit a couple of folks from each team. And basically Brian being a part of this cost reductions team saw that there was a lot of potential here. And so within his management he said yes immediately once we explained what the project was and the opportunities that we thought were out there.

Eli Levine: Fantastic. I may do – we only have about six minutes left, so I'm going to do a bit of a lightning round for a lot of our panelists here.

Nathalie, can anyone in the company access the Power BI dashboard or is it limited to specific individuals?

Nathalie Palka: Yeah, so that access is provided upon request. Of course we focus on site utility managers as well as energy managers, but similar to a SharePoint site as well, anybody can access or request access to the tool.

Eli Levine: Great.

For Luis, there was a question of , let me just find it here sorry, are the waste recycling audits unannounced or do you usually schedule them?

Luis Quinones: We usually schedule them because you need to prepare a little bit. You need to select an area. You need to make sure that you are collecting the right bins or the right waste from the area. And then one of the other things that has helped us a lot in this process is using the same employees that are using those bins to gather the information and that way, you get a lot of insight from the actual waste that is going to those points of collections, and that helps a lot in gathering all that data, that info that is pretty important.

Eli Levine: And Luis do you include scrap metal in your recycled totals?

Luis Quinones: Yes. Yes, we include everything.

Eli Levine: Great. For the Saint-Gobain team, is sustainable thinking central to the product development process now that you have the green awards and how are the new products factored in into energy reduction goals?

Sam Schneider: Yeah that's definitely become even more important to us as we work towards net zero 2050. We have interim 2030 goals that do loop in product stewardship scope three and LCA, which really ties that into R&D, the words themselves definitely help to – you know, when people weren't thinking about their project as something that had an impact on sustainability, that really helped to show them that their project was indeed having not just cost savings in some cases, but also having a sustainable impact.

Eli Levine: And then related to that, and I do just love getting you guys to talk about this because I will posit that there's arguably no company that has more fun handing out their awards than what you guys do at Saint-Gobain, but are your awards geared towards individuals, teams, or whole facilities? Who do you have give out the awards? I know they asked, is it the plant manager, the VP or the CEO?

Sam Schneider: Yeah, so the WWE awards, the Waste Water and Energy Awards, which I think this question is about, is for the whole facility and there's metric based awards where we've seen improvements in these areas in the annual reported data. And those are given out to the whole facility and there's an application process and usually we have an in-person award ceremony where our CEO and our VP of environmental health and sustainability gets dressed up in fun attire and hands them out.

This past year, we did an awards video which was also really fun. We had the sites receive the awards and they also got really into it and had some cool props and other – they challenged each other to take on the fight next year.

Eli Levine: See, yeah, she understates how cool and creative and how much everyone gets into getting their plant's name etched on the wrestling belt. It really is a tribute to all of their hard work, to how much they get everyone bought in on how fun and engaging this event is.

I think we do have a number of really good questions, but I'm unfortunately going to have to wrap it up there. If – I'll use the last comment that I saw in there saying for all I Plan on stealing many of your ideas and will try to implement then in my own

organization. And then they ask about recommendations on the first step for each of your activities.

If we could turn to the next slide here, Clifton, I think – let me just move out a slide. So oh, we have the summer webinar series. I encourage you all to sign up for that. Next slide.

Here is everyone's contact information, so if you're – I know this is a really good group of people if you're interested in following up with any of them directly they'd be happy to, and one of the other things that we will be doing with all of their awards is turning them into replicable case studies and implementation models on the website as well.

So that's a great place to get started on our Better Building Solution Center, not only to read about all of these upcoming IMs that we'll be posting but all of, you know, for many of these folks they have won Better Project and Better Practice awards in the past. They have done other replicable case studies for us. It really is a phenomenal group and I encourage you to spend some time on our Better Building Solution Center.

I'd be remiss if I didn't note above there that we have our own social media feeds for Better Plants DOE and our own LinkedIn page too. If I could give a short shameless plug for you to follow us, we have a whole bunch of folks who are competitive about the number of followers that we have and we're using this to really amplify a lot of their success in the leadership.

So you've seen a lot of the companies showcasing and telling their stories on social media as well these days. So I want to encourage everyone to do that as well.

Thank you all one more time for being with us here today. I hope you will join us for the activities tomorrow. We have a really great session that's called the round robin where we're bringing in leaders from our partners and NGOs to talk about a lot of these pressing topics that you heard about today and really facilitate small group discussion where you can share with each other and ask questions and all of that, so I encourage you to join us for that session and all of the other sessions that we have upcoming today and tomorrow.

Thank you once again for everyone who's here with us today. Thank you again. Congratulations to the awardees and I look forward to seeing you all in the upcoming sessions.

[End of Audio]