

*Eli:*

...at the US Department of Energy. We're thrilled to have you with us here today as we're starting off the first of our quarterly webinar series for the Waste Reduction Pilot. We have been great leaders here today. Clifton, I'll ask you just to advance to the next slide. So as we get started here, I wanted to thank you all for being here and wanted to let you know that we are recording this webinar today.

So if you aren't able to make this webinar, if there's a future webinar for this waste reduction pilot that you're not able to make, know that they will be recorded and posted to our website for you to be able to listen to at a future time. So, as you know, this is a new initiative, part of the Better Building and Better Plants Initiative that we're piloting right now. We're up to 31 total partners. Since the last time we spoke at our kickoff call, we've had two new partners join, Sprint and Steelcase, which I'm very excited about.

We have a Waste Pilot website that you see displayed there that has all the information about the folks participating in the pilot. And we went ahead and posted three presentations by some of our outstanding better plants partners, Bristol-Myers Squibb, Flowers Food, and Volvo Trucks. They presented at a recent conference, the World Energy Engineering Conference, so the AW World Conference last October. So they presented about their about their waste reduction initiative, so that that might be an interesting information for you to learn more information about.

So, Clifton, next slide. What are we hoping to do today with these calls? A few things. We want to spotlight leadership. We want to share best practices. By agreeing to participate in this pilot, you all are stepping forward and we want to help amplify your positions as the leaders in the field of waste reduction that others can learn from and that you can all learn from each other. So we're very excited today to have one of our Waste Reduction Pilot participants speak and present, and share their waste reduction story.

Next up is to present valuable resources. We want to you, by participating with the Department of Energy through this pilot to understand the lay of the land and know what resources are at your fingertips, but because that will also help inform us about the proper role that the Department of Energy can play to develop further resources that may be of assistance to you. So I'm excited that one of our colleagues in the advanced manufacturing office is going to present about this very new exciting initiative that the

secretary just announced that may be of interest to you or some of your colleagues as well.

And then, lastly, we want to provide a forum to allow you guys to share challenges and opportunities with each other. Please talk about what you're seeing in your buildings and your plants, what challenges you're having, you know, what you're excited about, any questions you have for each other. This is a – you guys are all part of a cohort that can learn from each other and we want to provide a forum for you to do.

So with that, that's enough talking for me. I want to turn this over to our first speakers, and I will turn – I will allow them to introduce themselves. But this is Tenderloin Neighborhood Development. And they really have a wonderful story, and it's been it's been great getting to know them. So this is **Rucie Shah** and Magdalena. Rucie and Magda, I will turn this over to you and allow you to speak.

One last thing before we get going, I think with our goal for this, we're not we're not trying to mute any of the participants on the call, but our goal is to allow the three presentations to go and then we'll have a forum at the end for any questions. But should there be anything that was so pressing right now that you just want to catch them while it's fresh in their presentation, we're not muting you.

But not if you know you're going to be driving through a tunnel or having a neighbor that's gonna be crunching up all sorts of stuff that's going to be loud next to you, just please mute your own phone. So with that, I will turn this over to Rucie and Magdalena. Thank you guys so much for being a part of today.

*Rucie:*

Thank you, Eli. I appreciate the introduction and background. *[Inaudible due to audio cutting out]*. We are an affordable housing **ownership** based in San Francisco. And I have my colleague, Magdalena Szymanska. She goes by Magda. And she's our waste area expert, so we are going to share our waste management approach. Keep in mind, it's not perfect, but that's why I think we all are here, to learn from each other and to make progress. Can you move to the next slide?

So I just want to share more about TNDC. As I mentioned, we are a multi-family affording housing owner and \_\_\_\_\_. We have 45 properties in Tenderloin. If you have ever been to San Francisco, I would encourage you to visit the very interesting and challenging

neighborhood. We serve about 6,000 tenants, \_\_\_\_\_ which are from populations. We have a variety of population that is serve, include the seniors, family, youth. It's a mixed population.

We also serve an extremely low income population. More than 80 percent, actually, our population make less than \$20,000.00 a year. Imagine surviving in San Francisco at that income. And with that comes many challenges on sort of \_\_\_\_\_ people on top of their minds. Also, we believe housing is the big picture, right, but our work doesn't end there.

We have rooftop gardens on our building and agriculture program for tenants to get access to fresh produce. We also have onsite tenant services to support them. Like we said, we want to move beyond housing. *[Inaudible due to audio cutting out]* because we want the most efficient and affordable housing \_\_\_\_\_ \_\_\_\_\_.

*Female:* Hello, I'm sorry to interrupt, but this is **Quayla Kong**, and it's difficult to hear the presentation.

*[Side conversation about poor reception]*

*Rucie:* So I'm going to jump to the next slide sort of **in Q&A** and talk more about who we are if there are questions, talk about growing challenges. So sort of going back to the idea, as we are part of this pilot, I want to highlight why we are managing waste. If you look at sustainability and sort of **of gratuities**, we pay 100 percent for waste. There is a clear good incentive here. Our tenants are the waste user. TNDC is paying for waste. There is a clear financial sort of motivation to definitely look at waste management and about how we manage it.

We spend over 1.5 million dollars, which is over our budget for 2019, \$100,000.00 over our budget because there's numerous challenges. So that motivated us to start strategically looking at ways as part of the Better Buildings challenge, we have mostly focused on energy and water. Since 2019, waste has become a big priority for us. Also, it's driven by our regulatory obligations.

In San Francisco, it is mandatory multifamily buildings to have recycling and composting infrastructure. \_\_\_\_\_ \_\_\_\_\_ have to provide those services to tenants. And then, of course, sustainability, we want to be a part of the solution for climate change as well. And reputation. We are considered leaders in affordable housing in San Francisco, and in sustainability,

specifically on energy and water. And waste is something that we want to keep up as well. You can go to the next slide.

So as part of our framework, we decided we need to have a goal, otherwise, we're gonna make progress. So our goal is a volumetric goal, ten-year timeframe, to increase diversion rate. And I'll talk a bit more about diversion rate, how we calculate that to 60 percent by 2028 with a baseline, right now, of 34 percent. So it's actually pretty aggressive compared to our energy and water goals as part **EBC**, which is 20 percent reduction in ten years. This is **26**, so we \_\_\_\_\_, but definitely looking to learn from you all as partners in this pilot.

We can go to the next slide. As part of our waste initiative, we are looking at a three-pronged approach. As I've mentioned, across 45 buildings, waste infrastructure is critical for us. We have building built in 1920, and we have, over time, to our newest building in 2019. So there is a whole variety of infrastructure in our portfolio when it comes to waste management. The second big piece is data tracking and monitoring.

We understand how we're being charged for waste, what are the split incentives, what are the challenges. It's hard for us to look at that initiative, sort of, and how to make progress. And the current piece is engagement. As I said, we pay for waste, but we are not the waste producers. Engagement plays a huge role because this is more for a human focused approach. So those are sort of key basic areas that we are focusing on. Next slide, please.

I want to talk a bit more on our first sort of prong, which is infrastructure. In older buildings, built in 1920, recycling and composting was not even on our minds. So we only have one shoot per floor as a landfill shoot. So it's tremendously difficult to build infrastructure for recycling and compost. And if we don't have that, of course, we cannot expect tenants to recycle and compost. They're not making it easy enough for them. So we're still figuring out new options for the older buildings.

We have been able to put bins in – in the second photo on the right, you can see we have squeezed some bins in the trash room, in the main trash room on the ground floor. That's, of course, not the best approach if you have to walk down floors to recycle and compost. Can we have the next slide? So understanding these challenges, they're making progress with infrastructure on new buildings. So the photo on left is from latest building built in 2019. We have decided to take a three-chute approach.

So it's mandatory to have access to recycling and composting. Per floor, every trash room has three chutes, which are marked appropriately. So our hope is we're making it easier and more accessible for tenants. On the right photo, it shows sort of a building not too old, but not ready to take the future approach.

So in the existing trash rooms, we are playing around what's the space availability and how can we put bins in a way that still tenants have access to **screens** on one floor. So there is a larger recycling bin per floor, and sort of a smaller compost bin per floor. Can I have the next slide? So moving onto to sort of data tracking and monitoring pieces, which has been eye-opening for us as we embark on this initiative.

Because in San Francisco, we only have one waste vendor. It's a monopoly. We have to work with them. It's Recology. And, previously, theirs were being auto paid from our corporate office. Nobody was really taking a deep dive into what we are paying for, how is the billing structure. Magda and I started looking at this as sort of our basis of data, and I want to share a few things which are sort of unique even in San Francisco and portable housing.

So with Recology, we have a volumetric subscription for one property. But you can see in the top part, we have subscribed for trash, recycle, and compost. And the services are based on a whole lot of metrics around population type, how many units, etcetera. Really, the key thing here is to understand diversion rates, which is the basis of our goal, too. So, we are looking at diversion rates, which means the volume of recycle and compost divided by the total volume of all the three waste streams.

So, the more we have a diversion rate, we get a diversion discount. This is an incentive for owners that live here in San Francisco to increase their compost and recycling **system**. And there are a few caveats that only unlock sort of are **superficially** found if we have a minimum diversion rate of 25 percent, and so that is sort of also our target as we look at our portfolio to make sure every building is at this minimum level even though this is way far off from where we want to be at a 60 percent diversion rate. This is a minimum benchmark.

Also, with the new mandate, we are seeing lot of audits happening at our sites by Recology and the city. So we are getting fines for contamination. Contamination is an extremely tricky issue because we get this bill on a monthly basis. It's on a real-time situation. We don't know exactly on which day or which bins were

contaminated. We just know the compost service was contaminated. That's why are we engaging with city and Recology a lot to better understand what's happening at our sites. And we also use this now as an engagement tool, which we'll talk a bit later.

Can I have the next slide. So, I'm gonna pass it onto my colleague Magda, and, she, as a waste expert, she's gonna share a bit more on what we are doing every month with tracking and monitoring.

*Magda:*

So, we created our own spreadsheets to track our waste data. So on the screen, we see a simplified version of it. So we are entering data here on a monthly basis, so together with the bill. And we are monitoring all three suites, so \_\_\_\_\_, recycling, and compost. For each theme, we are monitoring how many gallons we produce, how much we pay for it. We also include cost for every \_\_\_\_\_ and contamination fees.

And this \_\_\_\_\_ diversion rate, which is very important for us because it's what our goal is based on. And we would like to see how the diversion rate is changing. For our internal use, we also wanted to see how our housing property is doing versus the 25-person expanded \_\_\_\_\_ level. And, additionally, we divided a \_\_\_\_\_ portfolio into four groups. It's families, seniors, and \_\_\_\_\_, which \_\_\_\_\_.

Most important for the waste tracking because the different factors of the relation of building is presented with different challenges. For example, in SLO buildings, they usually don't have their own kitchen. There is one common or shared kitchen per floor. So this is presenting a significant setting is going to be affecting the problem of compost \_\_\_\_\_ versus, for example, \_\_\_\_\_. And from all of this data, we are transferring to a \_\_\_\_\_ manager on the two numbers, which is gallons per stream and the **total** amount. Please, next slide.

*Eli:*

Magda, I might just ask you to speak a little bit closer to the microphone.

*Magda:*

Okay. Sorry for that. Is it better now?

*Eli:*

Yes, much.

*Magda:*

Okay. So on the left, we see the screenshot of our Energy Star Portfolio Manager. For the first year ever, in addition to energy and water, we are tracking, now, our waste here. Our entire 2019

data is all in already. As I said, the number of gallons and the amount of our first stream. What is needed here from other perspectives is the place or the option to add the diversion rate, which this is how we'll be tracking our progress to our goal.

And we also notice that in ESPM, we see the **day backing tones**, there's a problem, but this is something we can work on for the replacement. On the right, there's another \_\_\_\_\_ for **DNDC**, so we quarterly waste variance report. So every property is receiving this optimized report to see their property diversion rate. Also, the other diversion rate for the building of the same kind, so family, seniors, or SRO.

There is also a place to see if the cross-contamination and EPS, how might that cost us. And, also, the bill – how much we pay the bill and how that is compared to the plan budget in **PCR**, within the budget or no. This is a new item for us. We are still working on this to present or create the best form and to provide the best information and useful information to our sites. Next slide.

In addition to the quarterly variance report, we also created a document with the property's e-mail address and phone numbers so our staff can reach out to our folks who have waste management. We distribute this to all properties, so every site \_\_\_\_\_ \_\_\_\_\_. We are also collaborating with Recology, so our waste vendor, and, also, San Francisco Department of the Environment and its Zero Waste Program.

So these two organizations provides workshops and \_\_\_\_\_ are refraining on proper recycling and proper composting. These activities are provided through the multiple languages with paying importance to our \_\_\_\_\_, and at no additional cost for our profit. Additionally, both of the organizations provides different signage in multiple languages, also, multiple firms and sizes.

And we are definitely encouraging our sites to use its resources, like \_\_\_\_\_ \_\_\_\_\_ who engages in our supervising US information and updates, and provide opinions so that our site staff is not on their own. They are \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_.

*Rucie:*

I just want to stress, as Magda mentioned, engagement both for our staff and residents, is a key to the success of our waste initiative, both with resources that we have developed ourselves, but also rely on externally here in San Francisco to tag on those resources. Next slide.

Sharing sort of some highlights from our resident engagement program. The photo here shows an old building. It's the senior building, where they don't have recycle and compost bins on every floor. But the ground floor there, we have set up compost for tenants. And, surprisingly, seniors love composting, so they do make use of the space and our site staff are engaging them. They have raffles and whatnot to make it a bit more fun.

And we are also engaging our social service staff onsite because they work with tenants all the time on financial needs and other assistant services. They are our partners in sort of enforcing this recycling and composting \_\_\_\_\_. They don't see the burden, the challenges, unless it communicated to them on how it's impacting their building and building budget, it's hard to show them that connection. Can we have the next slide.

Just to sort of wrap up and share some of our successes. It's definitely a work in progress. We're really proud, as part of our initiative, we were able to bring up race as a priority in the organization, and with the management team. As I mentioned earlier, we were laser-focused on energy and water, but as also part of the **BBC** pilot, we are demonstrating commitment to waste management.

We are seeing, so far, since we started this program in 2018, increased diversion at some sites. And that's definitely translating into cost savings, which is something built in the budget. Also, Magda and I have learned a lot being engaged with the city agencies. As a group, too, we are hoping to learn more, which increases our knowledge and capacity to better manage the intuitive.

And then demonstrate local leadership in affordable housing, tackling sustainability challenges. It's hard given the knowledge and capacity. But because of our experts, city agencies are looking up to us to share what we are doing and how other organizations can start managing waste better. And another success is our tracking system, as Magda mention, is still figuring out what's the best system for us.

We're looking at Energy Star Portfolio management for them pieces. We also are having our in-house Excel-based system that our data analysts are working to automate that based on that platform. And going to challenges, infrastructure and cost are number one because we can do so much given the current



infrastructure of our building. And so it's a work in progress, and we need to find better options for recycling and composting.

Split incentives, as mentioned earlier, too, there is not a clear connection with who pays and who produces the waste. Population served, as you can imagine, with homeless populations, they do have mental issues and we need to understand that waste is not a number one priority for them. There are many other challenges that that they're dealing with, so we need to factor those as we build our goals.

And then building and metrics, this ecology, it's still a volume metric production. It actually really doesn't matter if this is empty or half full because we are not seeing this on what volume we subscribed to, and it's not real-time. So that's still a challenge we are working with the vendors to pilot a few priorities with centers on our main yard larger bins, who are actually using the capacity to implement how can optimize service level.

So that's a pilot that we've been working on this year to overcome, especially the building challenge, and understand the metrics better. So, with that, I want to wrap up and happy to answer questions and also get recommendations. Thank you so much.

*Eli:*

Wonderful. Thank you so much Rucie and Magdalena. That was really great and we appreciate you starting us off with this. In the efforts of time, let's just keep moving. So, Clifton, next slide. I'm very excited to turn this over to my colleague, Melissa Klembara, who's leading an exciting new initiative on the innovation side of what the Department of Energy does; the Plastics Innovation Challenge. So, Melissa, I will turn this over to you.

*Melissa:*

Yeah. And sorry for – the date says 20 – a date in the near future. So it's actually happening now. So it's actually February 2020. Anyway, so giving you a quick overview of the Plastic Innovation Challenge. I'm not sure how many folks on the phone are familiar with the recent announcement by DOE to do a a lot of investments in plastics innovation.

And what we mean by that is developing, you know, covering the whole kind of supply chain, like, collection and sorting technologies, trying to avoid plastics ending up in the oceans, as well, and how can we you know prevent those plastics from ending up in the ocean. How do we then, once we collect these plastics, create value propositions for recycling because, right now, a lot of plastics are mostly downcycled.

If they are eventually recycled, a lot of the large percentage of plastics that are collected for recycle don't actually get recycled. So we're looking at new deconstruction technologies for biological and chemical pathways to depolymerization these plastics, and then how do we do we kind of kind of repolymerization or upcycle them into higher value products that ultimately help improve the energy intensity and would encourage future recycling because you created a valuable end product.

And so we're also looking at how do you design products from the beginning for recyclability, or how do you also build in biodegradability or a biomass-derived or bio-based polymers into recycled plastics or new plastic. And, so, ultimately, what we're trying to do is develop this research so that the technologies get commercialized, and we're supporting the domestic plastic industry in the United States.

What we want to do is basically keep the carbon in play because we're – you know, it's ending up in the ocean, ending up in landfills. It's not being recycled high value products. And so how can we create this carbon that were losing, how do we keep it in play for our manufacturers to keep using it in a way that improves the life cycle energy intensity and overall improves the environment impact? So if you go to the next slide.

The specific types of work that we're doing under this broad classification challenge is we recently just announced the notice of intent for an funding opportunity. It's actually being confronted by the advanced manufacturing office, AMO, and the bioenergy technology office. I'm actually with the advanced manufacturing office. I work with Eli. So we're working in partnership bio energy. And the topic areas would be in these kind of three kind of broad topic areas of how do you create highly recyclable or biodegradable bioplastics.

How do you create novel methods for that deconstruction and upcycling that I talked about. And then we have an existing consortia led by our national labs; NREL, Oak Ridge and Los Alamos, and we want to encourage industry, universities, and other national lab to collaborate with that existing consortia to tackle these challenges in plastic waste. When this funding opportunity is posted, it'll be posted you EERE exchange, where all of our funding opportunities are posted. So just keep your eyes peeled for that.

We also recently had, in December, a workshop, a two-day workshop, on the circular economy of plastics, which was really informative and continues to help inform the advanced manufacturing office and the bio energy technology office, and DOE, in general, on where we need to be conducting research on plastics for the circular economy. Next slide.

So, I did mention already that we started as national lab consortium led by NREL, Los Alamos, and Oak Ridge. It also involved MIT, Montana State, and Colorado State University. So we have a website set up. If you want to learn more information, you can go to BOTTLE dot-org. We are focusing on those kind of three main pillar areas depolymerization, repolymerization, and design for recyclability and biodegrade ability.

And so if you are interested in becoming a partner, you know, there's no real – you can be part of the consortia and learn more about consortia, and form partnerships on projects in the future. It be great to have a lot more industry involved in this so that we're addressing the challenges as you see them. So we encourage you to go to that website and learn more about the BOTTLE consortia. Next slide.

So I already mentioned the FOA. That's coming out hopefully in a few weeks. That's gonna be upwards of 25 million. Our office, AMO, is contributing more than half of that. We also have an SBIR topic in the area of novel utilization strategies for ocean plastic waste. So, ocean plastic waste because it may have other kind of contaminants, more salt on them, and bio balance on them, how do you do conversion of those ocean plastic wastes into a high value end product. So that's what that SBIR topic is focused on.

So letters of intent were due about a month ago, but we're pretty excited about a lot of the ideas that we got, and we look forward to evaluating the full application. We also have an existing large consortia called REMADE that led by Rochester's Institute of Technology. So that is focused on a broader array of not just plastics, but also fiber, metals, etcetera.

So REMADE does have – they do have a breadth area on plastics or polymers, they have a request for proposal that was recently posted. So if you want to learn more about that and joining REMADE, you can go to the website there. We also have another institute called RAPID that's focused on process intensification. And, one, they recently released a request for proposals as well. I believe it closed about a week or so ago.

But they also had a topical area in plastic upcycling. So we're having a lot of complimentary activities across the advanced manufacturing office portfolio, and two of our consortium, REMADE and RAPID, with these new kind of more targeted investments through the BOTTLE National Lab consortia and the BOTTL FOA, and the SBIR topic.

So there's been upwards of, you know, over 50 million dollars, close to actually 70 million dollars invested in the Plastics Innovation Challenge since it was announced. Next slide. So I mentioned that we already have this this workshop in plastics for the circular economy. We, AMO, have a lot of investments in composite recycling, and how you can use additive manufacturing, or, like, for polymer feedstocks, for secondary feedstocks for additive manufacturing.

So we had two technical tracks focused on that. The report from the workshop should be posted in the coming weeks. The link was shown earlier, on an earlier slide. So if you're interested in learning more about the workshop through the report or seeing some of the presentation, that will be available shortly. We're also planning an industry roundtable on the Plastics Innovation Challenge probably sometime in late March in Pittsburgh, where there's going to be an ex-lab event led by the National Energy Technology Lab.

It is also Carnegie Mellon University Energy Week. So we're still, you know, thinking through that and putting that together to continue to communicate to a broader set of industry partners, national labs, universities, what the Department of Energy is doing in the Plastics Innovation Challenge, continue to get feedback on the direction that we're going in, and continue to build partnerships for ideas, for research that we do to be incorporated into existing consortia or future funding opportunity announcements.

And I think that might be one of my last slides. Next slide, please. Yep. So I already said all this. This is just, you know, we can send these slides out later. But this is just a nice little summary slide of the type of work that we're doing at the Department of Energy so far. There's also a NSF EFRI solicitation out on the street or eliminating end of life plastics. We, the DOE, aren't funding that but that might also be an interest on some of the folks on the phone. So happy to answer any questions if time allows, but I think that is it for me.

*Eli:* Wonderful. Thank you so much, Melissa. I know that for a lot of us in our space, in the Department of Energy, it can feel like some of the technical assistance, Better Buildings, Better Plants partnerships exists in a parallel universe to a lot of the R&D and innovation. And hopefully through pilots like this and webinars like this, we can make it a little bit easier for people to build awareness and hopefully leverage the great work you guys are doing.

So if anyone has any more questions or needs more information about how your company may get involved or if you're sitting there being like, yeah, I'm not the R&D or the innovation person, but I know my colleagues are interested in this, we're happy to share Melissa's contact information and help get you better involved with the BOTTLE challenge or any of – the REMADE or some of the other institutes, or any of the other funding opportunities that that the Department of Energy is investing on in this important space.

Because we're trying to cram so much information into a short call and still leave a little bit of time for you guys to talk amongst yourselves, I want to turn quickly to my colleague, Ethan, with the next slide to just give a little bit of an update on the reporting form that we've been working on. So, Ethan, over to you.

*Ethan:* Thank you, Eli. Hello, everyone. We can go to my next slide. So, of course, many of you are already involved in the Better Buildings, Better Plants Program. You're familiar with the data collection forms we have. We wanted to create something new for the waste pilot study. I know that many of you are using EPA's portfolio manager, and if that is working for you with regard to the waste pilot, waste reduction pilot, feel free to continue using that.

But if you're looking for a spreadsheet to collect information, we have created one, and it'll help us aggregate information on our end. There are four pages to this spreadsheet, and we'll be send it out to everybody, I believe, later this month. We seem to have iteratively been working on it for a while, and we seem to have settled on a final format. But there will be an instruction page, reporting page, which is of course the key component of it, an energy recovery worksheet for those who are doing waste energy conversion.

There is a bit of a glossary on waste types and metrics. And then there's a sample that I've put together that hopefully will be instructive. So if you go to the next slide. This is a screenshot of

the top half of the reporting form. And you'll see over on the top right, the waste management hierarchy. Some of you may be familiar with this inverted pyramid. And the idea behind it is that most of your waste, you address through reduction and reuse. And then you would do as much recycling and composting as you can. Energy recovery is option for some folks.

And, of course, the last option and the least amount of material that you want is to treat and dispose of, which we think of as sending it to a landfill, if you will. And so I've got little arrows showing how that lines up with the different columns. And you can see that there's one for the baseline year, which would be whatever year you have chosen to be your baseline. It could be last year. It could be this year. It could be ten years ago, whatever you've been working with, and then the reporting here, which, of course, would be the current year.

And you also see towards the bottom, some lines about waste diversion rates and waste intensity rates we'll talk about in a bit. I'll go ahead to the next slide. And this might be a little bit easier to see. There are some drop down lists. You can generally tell where there's a dropdown list because the field is a light green. And so for the units that you use to track waste, we can do tons, pounds, cubic yards, cubic meters, and then different waste types, things like cardboard, paper, glass, metals, things like that. There is a dropdown list. You can select for each of those.

If the field is light green, it has a dropdown list. If it's light brown, it auto calculates and so it'll total up so you can see that in that screenshot as well. And the next slide will have the energy recovery tab. Some of you may be sending material to municipal incinerator, and you can capture that information here. If you have onsite generations, such is a cogeneration or CHP facility, you can capture that information as well.

Some people might actually have a wood burner where they're using wood to create, in a burner furnace or something, to create steam or something. So, again, this is optional. If it helps you, great. If it's not applicable, don't worry about it. The last – the next screen is, as I mentioned, the waste types. On the left side, there's a list of about three or four dozen. You see the first handful there. And that's what feeds into the dropdown menu that I pointed out on the first one.

And then on the next one over, you see the units, and, again, that feeds the dropdown menu for that as well. You'll notice at the very

bottom, there's a word "other". And, on both of these, the last lines say "other" if you have a waste type or unit that you'd like to feed into the dropdown menu, you can just type over the other with whatever your metric is or your waste type is. It'll automatically feed into that dropdown menu. And that's it.

If you have any questions, and if you have trouble developing a waste intensity metric or something like that, Bruce and I, and the TAMs and AMs are here to help you and look forward to working with you as you collect your data and report it in the months and years ahead. Thank you.

*Eli:* Wonderful, Ethan. Thank you so much. That was that was really well-presented. So, now, we will open this up to everyone. You've done a wonderful job so far of muting your phones and taking in, what was no doubt, a lot of information from a lot of different sources. But, now, it's an open forum. Any questions for Rucie, Magda, Ethan, Melissa, anyone who's presented so far? And then after we've moved from that, then we'll open it up to more of an open floor on what you're seeing in your own plant and buildings.

*Tim:* Hi. This is Tim **Colt**.

*Eli:* Wonderful. How are you doing, Tim?

*Tim:* I'm doing good. So the question that I deals with waste reduction, when you have different categories, and so, let's say, it's plastic, what happens at the end use when, say, the consumer isn't very diligent and they're putting aluminum in with plastic, and the plant takes and sends it back now for recycling. Do they got a penalty from the recycler, or do they just get a verbal lashing? What kind of happens with products that haven't really been sorted out properly at the plant level? So, I guess, it's really for the plant folks.

*Eli:* Does anyone on the call want to answer that they've seen in that case?

*Hannah:* This is Hannah **Deblias** from DOE. And I'm not sure if this is precisely your question, but I'll say that from my experience, previous experience working in the higher ed space, when we would send recycling to a recycling facility that was rejected because of contamination, we would incur a fine from the recycling facility. The same with when we would send things to compost. And that, for compost, that could also result in no longer

having the privilege to send things there. But I'm not sure if someone else has other input on that.

*Magda:* Hi, this is Rucie. I just want to add even though we're not **upper hand** in the residential space, it's similar to what Hannah said. Also, Recology, our vendor, when we send our recycling into them, they have their own sorting. So they would start to extend their cans or facility cans that's highly contaminated, they send it straight up to land fill. And, of course, fines are occurring.

*Eli:* Thank you.

*Male 1:* I have a quick question for Ethan.

*Eli:* If you're \_\_\_\_\_, can you identify yourself? *[Laughter]*. Go ahead, **Sachem**.

*Male 1:* So I think this hierarchy in the reporting form is actually great, and energy recovery, you know, it's actually waste to energy, so that is **very covered**. But, in many cases, actually, in fact, all cases, whatever waste manufacturers are generally being onsite. When they actually reduce, or reuse, or develop manufacturing activities, recycling activities, so there are that basically additional benefits, upstream and downstream, in their supply chain.

Within the manufacturing facility, itself, when they reduce their waste, a lot of energy and **GNG** emissions are reduced because of that waste reduction. The same thing with manufacturing. So life cycle energy impacts your life cycle GNG emissions point of view, \_\_\_\_\_ in that, so many possibilities. And definitely our approach, our form, we won't be able to capture that kind of impact. I just wanted to, you know, mention this, so that all of us are aware of that.

*Ethan:* Sure. Yeah, I mean, I think we're looking at what I would consider inside-the-fence benefit, but, certainly, if somebody is aware of what is going on – what benefits are happening within their supply chain, we're interested in learning about that. Capturing that kind of information is difficult, and creating a form for it, even more so. *[Laughter]*. But, yes, there are some – it didn't show up in my screenshots, but there are some blanks later on in the pages where people can enter as much detail as they care to about the benefits that they realizing from their activities.

*Male 2:* This is \_\_\_\_\_. A quick question for Melissa. I wanted to get a sense from you, if you could share with the group here, for the



BOTTLE initiative, how big of a priority is this for DOE, and do you know if it's also possible to derive fuels, biofuels from plastics?

*Melissa:*

It is a big priority. So biofuels – so plastics are petroleum-based, and so if you're going to pyrolyze or gasify plastics, it's not going to count as a biofuel. And so you could, though, it is happening now, where you can make bio-based plastics but the performance of those plastics doesn't have the same characteristics as petroleum-based.

And so what we're trying to do is try to get the performance of bio-based plastics and improve, so that for the whatever the intended end use is, it actually serves that market and whatever the purposes for that for that plastic use. But then, also, build in, kind of, potentially design for about a biodegradability, or even go kind of mixed, you know, part biomass, part petroleum-based, so that you try to get the best performance advantages for that the plastic for whatever the intended end use is.

And then, also, see if you could design for the recyclability of that, kind of infinite recyclability, if that's even possible, of that product. But going from a plastic – petroleum-based plastic to biofuel, unless you go through like an organism for it through the CO, CO<sub>2</sub>, it wouldn't really count.

*Male 2:*

Okay. All right. Thank you.

*Eli:*

Any other questions? Well, with that, Clifton, I'll turn to the next slide. There we go. And then, here, I want to – we'll click into the next slide for a moment. I just want to make you aware, I'm sure you've seen the announcements, our annual summit is upcoming. It should be really great. I know that we have a lot of us here are working really hard to bring in some really interesting speakers and to make it really exciting event.

We're going to have a dedicated panel session focused on waste reduction, and there should be a lot of other resources for water waste energy reduction when you're there. So I believe they're still space for the early bird discounted tickets, but if you haven't yet signed up to participate, I really would encourage you to. It's really going to be a great event.

So we have about four minutes left. So I'll ask you, Clifton, if it's possible to turn back to the previous slide. As long as we have a cooked all ask you if it's possible to turn back to the previous slide.

As long as we have a captive audience here, we'll open the floor and see if any – I recognize that opening the floor and asking people to share may be challenging, and we'll see how this works or if there's a better way to structure it for next time's webinar.

But we'll at least open up the floor and see if anyone wanted to share anything on the biggest challenges you're facing, or something you're excited about, or ways that the Department of Energy can continue to support your efforts. So in the remaining few minutes here, I wanted to leave the floor open for people to share.

*Male 3:*

Yes, this is \_\_\_\_\_ from General Motors. And the biggest challenge that we are facing now is the company's transition from one program called **Life Feel Free** to what is called now Zero Waste. And the big difference is to not use waste to energy or \_\_\_\_\_ as a mean of degradation. I think this is also very exciting because it puts everybody outside their comfort zone. And one way that the DOE could support us is defining what waste means.

We align ourselves with the Zero Waste International Alliance and the definition for zero waste. And I would like to see your thoughts about, you know, putting standards and guidelines to get around zero waste.

*Eli:*

Well, thank you for sharing that. That's really helpful for us. And I think, as we've expressed before, you know, one of the reasons that we decided to pilot in this direction was to hear from industry hear from you, and understand the proper role of the Department of Energy could play, and really, you know, let your experiences allow us to define what leadership is.

So I think you're absolutely correct that in what you're feeling is valid and that hopefully that that is an important role the Department of Energy could play in terms of helping to set a bar for itself as the we know what we're for waste reduction. But I made a note, and hopefully my colleagues did, too, for the Zero Waste International Alliance to learn more about their resources and what they're asking folks to do.

And hopefully we can work with them and see if there's an opportunity to align if that makes sense. But hearing that there was someone else who wanted to speak, as you chimed in, I'll stop talking and give her the floor.

*Rucie:* Hi, this is Rucie, again. And I feel that I've done enough talking, but I have a question. I would love to understand from partners or from DOE if there is any guidance on mid-tech, sort of technology, resorting or find out for \_\_\_\_\_ on more sensor-based technology? It's \_\_\_\_\_ residential and looking through other burning partner's feedback.

*Eli:* Rucie, I'm not sure I caught your question. Could you just repeat that one more time? Or, my colleagues, if you did get and you're able to respond, that works, too.

*Hannah:* This is Hannah. I think she was asking about if there are technologies for sorting. And I will say from my little corner of the world in DOE, I haven't seen that yet. But if any partners have, you know, let us know. And, also, if any partners want to share that with us over e-mail, it's almost something we could, you know, incorporate into a future conversation.

*Rucie:* Thank you.

*Eli:* Well, with that, it's now 2:30 on the east coast here. So I wanted to thank you all for joining this webinar. The webinar, we're eyeing May for the next one of these. So if there's any feedback you have on this one or if you were interested in being the featured presenter like Rucie and Magda did this time, please let us. But, otherwise, thank you all so much for joining us today and for your interest in this topic, your leadership in the field, and we very much look forward to working with you moving forward. So thank you very much, and I will see you all at the Better Buildings, Better Plants Summit.

*Rucie:* Thank you.

*Male:* Thank you. Bye.

*[Side conversation]*

*[End of audio]*