Trash Talk: Fresh Takes on Food Waste

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Ariana Brocious: I'm Ariana Brocious.

Kousha Navidar: I'm Kousha Navidar.

Ariana Brocious: And this is Climate One.

[music change]

Ariana Brocious: Food loss and waste account for as much as 10% of global greenhouse gas emissions and cost $1 trillion annually, according to the United Nations. But here's the number that gets me: about **a third** of all food grown on the planet gets **wasted**, rather than eaten.

Kousha Navidar: I've heard that fact before but, wow, it's staggering. We know that in developing countries, waste usually occurs between the field and the store, because of things like poor infrastructure, lack of refrigeration, and broken supply chains.

Ariana Brocious: In rich countries, most waste happens after food reaches the store, where consumers don't want to buy imperfect food – or they buy too much and don't eat it all before it spoils. This is a thing that unfortunately, we're all familiar with.

Kousha Navidar: Uh, yeah. Don't make me go look in my vegetable bin.…

Ariana Brocious: I definitely have some slimy lettuce in my fridge.

Kousha Navidar: Literally one of the reasons I got so into smoothies last year. I'm like a garbage disposal putting all the nearly turned spinach and bananas into my drinks every day.

Ariana Brocious: But imagine how much pollution, deforestation and starvation could be reduced if

we got this problem under control at scale!

[music cue]

Kousha Navidar: This week, we look at three companies with fresh takes on tackling food waste. Some, with the help of artificial intelligence. And this is cool to me personally because I spent some time working with AI years ago when it was much more scrappy. And now it's really developed into a useful tool.

Ariana Brocious: Yeah, I'll admit to being a pretty big AI skeptic. I remain quite concerned about generative AI's increasing demands on water and power, and the way it seems to be sneaking into all parts of our lives. But hearing about some of the ways these companies are using AI to reduce food waste is pretty encouraging.

[music cue]

Kousha Navidar: You're probably familiar with Nest, the first smart home thermostat. Nest's co-founder, Matt Rogers, went on to co-found another company called Mill – which makes a home food recycler. Now the company is expanding to AI-enhanced, commercial scale recyclers that will turn food waste from Whole Foods stores into chicken feed – which will then get fed to Whole Foods' chickens.

Ariana Brocious: Matt Rogers joined Climate One's Greg Dalton for a conversation in front of a live audience at the Commonwealth Club in San Francisco. Rogers recalled how living through Hurricane Andrew at age 10 started his journey into climate and environmental awareness.

Matt Rogers: I actually remember it like it was yesterday. It was a pretty pivotal point in my life and actually my climate journey. So I grew up in Gainesville, Florida, which is kind of right in the middle of the state. And we didn't really have very many hurricanes. On the coast they had quite a few. Sure. But, uh, hurricane Andrew was pretty ferocious. And, uh, we had these glass skylights over our living room and I remember the, the glass literally like leaving the house and like in the rain pouring in the home and you know, my parents having to explain kind of what was going on and why. And you know, that was like a storm of the century.

Greg Dalton: Pretty scary for a 10-year-old.

Matt Rogers: It was really scary for a 10-year-old. But then we had several more like that. When you have a storm of the century, every couple years or every year, that's when you start to take note.

Greg Dalton: Yeah. You're probably best known for co-founding Nest, the thermostat company. When you co-founded Nest, what was your inspiration for doing that?

Matt Rogers: I've always been a builder. You know, even as a child, I loved to build things and, uh, when I was at Apple in the 2000s building iPods and iPhones, it became very clear that technology was changing and the power that we had in our hands, you know what eventually became the iPhone, was remarkable and the things in our home didn't look at all like that. I was living in a townhouse in Los Gatos and, you know, I had the most beige things on the wall that you can imagine from Honeywell, probably from the 1980s.

Greg Dalton: You got a squint at 'em to see the numbers.

Matt Rogers: It literally made no sense. Yeah. Like the guys who were making the iPhone living with these beige plastic boxes on their wall. It was very, very clear that we could build something a

lot better. So my then boss at the time, Tony Fadell and I, we left and you know, we started on what we thought was the most important thing in the home, which was heating and cooling. A lot of folks kinda laughed at us at the time, like, hey, like the inventors of the iPhone are working on air conditioning.

Greg Dalton: Furnaces are not sexy.

Matt Rogers: Uh, they're not, but actually they're really important. You know, at the time, I think the stats are still true. Heating and cooling is about half of the energy we use at home. It's a massive part of our global footprint, and it's a huge cost for folks. So it made a lot of sense to put the A team on it.

Greg Dalton: And you sold that to Google for 3.2 billion. You were close to 30 years old. What was that like? You know, letting go of your baby and, and, and hitting that kind of at, at such an early age?

Matt Rogers: I tend to not celebrate wins when they happen. I kind of just move on to work on the next thing. And I stayed at Google for another five years to help build and shepherd that business, but at the same time, also you know, especially reflecting on my upbringing, my wife and I spent a lot of time on how we could give back. And after we sold the company to Google, we almost immediately started a family foundation. We started doing impact investing and really leaned into climate in a very big way.

Greg Dalton: Yeah. And we'll get to some of that, impacting that, that different part, political, philanthropy, et cetera. So you, you, you're fabulously wealthy, uh, you're 30 years old. You create this cool thing. You took something that's kind of, you know, ancient and made it cool and hip and, and then you, you decide to go to food waste and chicken feed. I just, yeah. Explain that one for me.

Matt Rogers: It's kind of the same, the same thought process. You know, we look at our waste every day and we think we can't do much about it. It's one of these things that isn't, it's a daily problem. And we all kind of take it for granted. And the way my brain is wired is to look at those kinds of things and think differently. So in the middle of the pandemic in 2020 when we were kinda living all in our own waste and my house was full of fruit flies, it was very obvious that there could be a better way. And, uh, spent a lot of time on zooms and phone calls with my now co-founder Harry, talking about could we do something quite different and through many twists and turns that's what eventually led to the starting of Mill.

Greg Dalton: Right. And there's food waste at all stages from, from the farm at the store in the refrigerator. I'm sure there's some moldy hummus in my refrigerator right now. you know, we make enough food, it's a tragedy. We make enough food to feed the world, but it doesn't get to the right places. And a lot of, so much of it's wasted.

Matt Rogers: Yeah. We waste about 40% of the food we grow, which is astonishing. You think about it.

Greg Dalton: It's, it's a crime.

Matt Rogers: It's, it's ,it's embarrassing. And all of our parents and grandparents told us growing up not to waste food. Yeah. But yet we do. I think I'll get this close to right. We waste about $400 billion a year in the US on food waste, like that's like the amount of food we throw out. Yeah. It's like more than the GDP of most countries.

Greg Dalton: Right. And so you, you chose to, to attach not surprisingly that the consumer facing

part of that, right. A lot of people have those little green composting things, which are alright.

Matt Rogers: Yeah. They're kind of awful. And, and that's what we started Mill. And, you know, going back to how I thought about building Nest, you know, you start with the most important and the hardest thing first. Because if you could do the hardest thing first, you know, you could do anything after that. So we started with building a product for people at home to make it easy to recycle food. And, you know, I had one of those compost pails on my counter and my house was full of fruit flies. So, we set out to design a product that was beautiful, never smelled, and incredibly easy and fun to use something that people would actually use every day.

Greg Dalton: Right, okay. And you're calling this food recycling or composting? Is there a difference?

Matt Rogers: Actually, I'm using different words on purpose. So composting is a natural process that, you know, takes organic matter and kind of returns it to the soil as a kind of soil additive, uh, as a fertilizer. Food recycling is something that effectively we are inventing, in that we're creating multiple pathways for food to be recycled. Either food could go to compost and feed the soil, or food could go to animal feed and feed animals. Food could actually also be used to make energy. There's lots of things we could do with food, so we are actually trying to make a bigger category than just composting.

Greg Dalton: Okay. I think I've read something like three or 4% of food is composted in this country's very small, but, but a growing number of jurisdictions, cities, counties have some curbside collection. There's laws in California, Vermont, so for those who have curbside collection, it gets collected by a truck. It goes off to often trucked far away. Industrial composting. Right. Okay. So, that creates sort of black gold and it comes back to those cities. So are you trying to displace that? Are you saying you're better than that, or you're just an alternative for people who don't have that option?

Matt Rogers: We looked at where else in the world things are working better and South Korea I think is the best in the world at handling waste, I think maybe it's a matter of national security. They're a peninsula and they import calories. So in South Korea, 95% of their food gets recycled either into animal feed to feed chickens and pigs or to feed the soil. And we looked at kind of the elements of that system and we said, what are the things that we could build here in a, kind of, in a US context that better fit our lives? And part of that was a product for our homes, but also part of it is, is a system, you know, an ability to collect this material, get it to its highest and best use in your local community.

Greg Dalton: You say it's, it's, it's nicer and better than the green pail that some people have, put fruit scraps in there, then what happened? It dehydrates it, right? It's not actually composting. So it takes the water out. And then what?

Matt Rogers: Yeah. So part of our special sauce as, as product designers is can we make a product that is easy and fun that you'll actually want to use? And the technology that we ended up going with is dehydration. And the reason why is what makes food waste gross is when it gets wet and gloopy, when it again starts to rot and grow mold and attracts fruit flies. When you take the water out of food, all that gross stuff stops. But also what's nice is it gets light and airy. It's easy to transport. It doesn't go bad. It's shelf stable. So what we actually found almost by accident in solving the grossness problem is a new way to make logistics possible. You know, part of what makes food waste difficult to manage as a society and why we don't often have green bids at our curb to collect food waste is 'cause it's very expensive, because it's wet and it goes bad really fast.

Greg Dalton: Okay, so I put this in here, it's dehydrated. And then, then are you gonna collect it from me or I'm gonna put it in my garden? Because part of the dehydration is you've also removed some of the nutrient and the, and the value, biological value of that by taking the water out.

Matt Rogers: So, what's great about dehydration is actually it keeps all the nutrients in there, like all the calories, the, the micronutrients and the macronutrients are all still there. What stops is the, the clock on going bad at rotting. So what's nice now is you have lots of different options and things to do with this. A lot of our customers, most of our customers actually use it in their own gardens at home. They use it as a soil additive, as a fertilizer. For those who don't have a garden, you could put it in your municipal green bin. Something that's happening more and more in the country. for those who don't have any options. Mill actually built a collection system so that people could get this food waste back to a great place for it to be recycled.

Greg Dalton: And you also have a partnership with Whole Foods that turns their fruit, vegetables, and scraps into chicken feed.

Matt Rogers: Oh yeah. This is really exciting. So we started with the hardest thing, which is can we solve it at home? But we always envisioned doing this at mega scale and grocery stores waste a ton of food, actually literally like about a ton per store, per day, which is astonishing to think about. So yeah, we're working with Whole Foods as our first customer, but, but actually many more customers coming on a much larger scale mill and the entire full recycling loop to get it back into chicken feed or to feed the soil.

Greg Dalton: That makes sense for them. They, they take ways to make an input. I also wanna get just for a moment back to the curbside, you have a lifecycle analysis on your website, which is the idea of the, sort of looking at the inputs. How can customers use it? You know, is this better than the alternative? And I couldn't really understand it. So I asked a professor at UC Berkeley, who basically said, if you have your own yard for composting or curbside collection, keep doing that because that exists. But if you don't have that option, Mill can offer incremental reduction in climate, harming emissions. Is that accurate?

Matt Rogers: That's accurate. So most folks don't realize that when food waste goes in the trash, it's not a neutral thing. It's an actively bad thing, really bad it, you know, when food waste goes to landfill, it degrades anaerobically and creates methane. And for those who don't know, methane is like 80 times worse than CO2 from a warming perspective. Super pollutant, super pollutant, super bad. So, you know, keeping food waste at a landfill is paramount. So that's why we kind of go to extra efforts to create all these different pathways and ways of using food waste. Instead of just throwing it in the trash.

Greg Dalton: Indeed. I recently went to Recology where recycling is collected here in San Francisco and they have humans taking out the bad things from the stream. Then they have these AI things picking out the things of high value, metals. So there's human and AI doing the recycling part. You're kind of the parallel part with food. How does AI fit in?

Matt Rogers: AI has been a remarkable tool for our industry. So we're building a camera into our commercial scale mill bin, and what it's able to do is provide a real time stream of what's being thrown away. So if you think about for a grocery store, they can start getting real time information on what's being thrown away, then act on that information. And AI could, could automatically say, oh, we ordered too many bananas this Thursday, next Thursday. Now we know, let's order fewer bananas. Or for our hot bar, we're throwing away a lot of biscuits. We need to bake fewer biscuits because we're wasting that many and people aren't buying them. So AI's allowing us to effectively prevent waste from happening, which is ultimately the best thing we could do. You know, getting at

that $400 billion that we just talked about, about wasted food. Ultimately we wanna prevent wasted food altogether.

Greg Dalton: I realized that, you know, AI is not one thing. It's kinda this umbrella term and there's predictive AI, which could make, you know, weather forecasts or cancer screenings. And there's generative AI, which uses a lot of energy to produce fake videos and other things. So you're leaning into AI as a force for good. So how worried are you about AI's negative impact, knowing what you know about technology and energy and climate?

Matt Rogers: I mean, I've been working with AI for a long time. I've been working on it before it was called ai. Yeah, back in the nest days. We called it machine learning and we launched the Nest learning thermostat, You know, technology's a tool and really like, you know, the value of the technology is in the hands of the people who are building it. And it's incumbent on us as entrepreneurs, as technology leaders to use technology for good.

Greg Dalton: So many climate solutions require behavior change, and this has been really hard to get a large number of people to do a little that eat a little less, drive a little less these nudges. So what have you learned or what actually makes people, you know, make change versus just kind of virtue signaling or expressing concern?

Matt Rogers: I've been working on behavior change my entire career, actually. You know, going back to my time at Apple, my, my work at Nest, you know, for those who've had Nest thermostats at home, that green leaf that you saw on the dial was a little nudge to kind of send you in the direction of saving energy.

Greg Dalton: And does that work? Is like that only work to a certain, oh, that, that, that's a carrot or it's a, it's a, I don't know, identity reinforcer, a little bit of virtue signal?

Matt Rogers: It does work. So again, I've, I've been out of Nest for a while, almost a decade now, but, nest thermostats save about 20% off your heating and cooling bill, so they save quite a bit of energy. But really when it comes to behavior change, the key is to make things better. And, you know, Nest thermostat is better than what came before. A Mill bin is better than a countertop compost pail. An electric car is better than a gas car for sure. A Beyond Meat burger is worse than a hamburger, and that is why people do not eat that.

Greg Dalton: Right? It has to be better. People will go for better. They won't necessarily go for more virtuous.

Matt Rogers: That's right. Yeah. Virtuous signal gets you a little bit, but really that does not get you widespread behavior change. And I think about when you mentioned, you know, don't eat meat. One day we might have plant-based meats or cultured meats that taste as good and are as nutritious, but that is not where we are today.

Greg Dalton: And by cultured meat, you mean like lab-grown actual cells that it, it's like a, a beef without a cow, but it's grown in a lab.

Matt Rogers: Right. Beef without a cow is a great way of putting it.

Greg Dalton: Right. And there's tuna without a fish and, you know, all sorts of things. That was kind of in vogue for a while. Recently, not so much lately. Is that something you see as promising?

Matt Rogers: With my other hats on, uh, as a technology investor and philanthropist, , these are still categories that we invest in that still exist. They're still very early stage and are still very

expensive. But the idea is that one day, you know, as the technology improves, as things scale, one day that a lab grown hamburger will be as cost effective as a cow who's raised in the field. Right. But we're not there yet.

Greg Dalton: Right. And put a lot of ranchers outta work and have a lot less remissions and they could, yeah. There's a dominant narrative that Silicon Valley is no longer investing in green tech or clean tech for lots of different reasons. There's been a couple of, I guess, of waves of a lot of money from Silicon Valley going into clean energy. Then it pulls back and it comes back in again. What are you seeing right now?

Matt Rogers: Uh, we are changing the words, but we're still doing the work. And I think about the last time this happened, so the Clean Tech 1.0 boom and bust, we started Nest just in that kind of time of bust and we never called Nest a clean tech company. Yeah, we were building a thermostat and the primary purpose was to help people save energy. But we never called it a clean tech company. And I think about, you know, mill,

Greg Dalton: Why, why not?

Matt Rogers: Why not? Because it's really about identifying what people are buying is and what the category is, and you know, how you think about shopping, things like clean tech or IOT, these are like investor words. Yeah. These matter very little to normal people. You know? The average person doesn't buy something because it's a clean tech product. They buy it because it's gonna be helpful and valuable to their family.

Greg Dalton: Okay. And so, so you say Silicon Valley still investing in green? So is that example of, is there green hushing people are doing it, but they're not talking about it?

Matt Rogers: Or we're calling it what it is. You know, we're working on energy or we're working on transportation or working on food and agriculture. You know, all these things contribute to the climate and the environment. But there are just a much more focused way of talking about it.

Greg Dalton: So if you were pitching Nest or Mill today, would you use different language?

Matt Rogers: The way I talk about my company today is I'm building a waste technology company. And you know, inherently by reducing waste and preventing waste, we're doing a good thing for the planet.

Greg Dalton: Americans like technology, they don't like waste. Okay? And you're solving a problem.

Matt Rogers: It's a very bipartisan thing to do. Uh, there's actually no pro waste group out there.

Greg Dalton: 'cause everyone had a mother who said, don't waste.

Matt Rogers: Right. And actually with Mill today, I spent a lot of time in DC working with folks on both sides of the aisle. It's a complete bipartisan thing. Everyone out there is saying we should prevent food waste and we should do the right thing with food.

Ariana Brocious: We'll hear more from Nest and Mill co-founder Matt Rogers after a break. I have to say, dropping off my stinky, sloppy bucket of compost at the city collection site every week is my least favorite chore, so a dehydrator/food recycler like Mill sounds great. But if the goal is to make this standard for American households, the price tag is going to prevent a lot of people from buying one. They currently retail for a thousand bucks.

Kousha Navidar: Ooof. That's a lot. Well, our goal here is really to highlight the big ideas, not one particular product. And there are other similar products that you can get for less.

Music: In

Ariana Brocious: Coming up, Matt Rogers on the role of philanthropy and investment in amplifying the talent we need to create solutions:

Matt Rogers: We have so much climate work we need to do, health work, you know, social inequality, education. There are so many issues we have as a society. This is literally what philanthropy was designed to do.

Ariana Brocious: That's up next, when Climate One continues.

Ariana Brocious: Help others find our show by leaving us a review or rating. Thanks for your support!

Music: Out

Ariana Brocious: This is Climate One. I'm Ariana Brocious. Let's get back to Greg Dalton's conversion with Matt Rogers, co-founder of Nest, the smart thermostat, and Mill, a food recycler. They chatted in front of a live audience at the Commonwealth Club in San Francisco.

Greg Dalton: Along with running Mill, you run an investment philanthropy and activism organization called Incite. So tell me how you juggle these different hats and how you think of those things fitting together, you know, advocacy, philanthropy, and impact investing.

Matt Rogers: So it, it all comes down to, at the core, around talent and trying to help talent, working on really important problems for society with all the different tools we could provide. And, a lot of my colleagues forget how many tools could exist. Either they're only investors or they're only entrepreneurs, or they only run a foundation and do nonprofit work. My wife and I try to think quite creatively about finding talent in all aspects of society, whether they're building companies, working in government, doing research and trying to give them the tools, whether they're financial tools, support, mentorship connections to help them accomplish their dreams.

Greg Dalton: And so in finding talent, how much of that is letting go of control even though you're providing some resources?

Matt Rogers: For me, it's actually the opposite of control. It's really about, enabling and, you know, we, when we find a great entrepreneur or social entrepreneur or activist out there, they're on a mission and you know, if we could provide rocket fuel to them, uh, they could get to their dream faster. And we've now done this a couple times, and I think about maybe one of my favorite examples of this, about 10 years ago. I read an article that a grad student at Berkeley wrote. This guy Noah Deich, he wrote an article about removing CO2 from the air, and that this is something that's critical to the climate equation. The IPCC says, Hey, at some point we need to start removing emissions if we're ever gonna meet our targets. Yeah. And I sent him an email saying like, well, what, what do you need to do to do this? And he said, the entire federal government is only spending about $10 million a year on this. And if we're gonna get to any scale, this is gonna be hundreds of billions, if not trillions of dollars one day. So Noah and I got together and I helped him start a nonprofit called The Center for Carbon Removal, which eventually became Carbon 180. I funded a scientific study at the National Academies to study carbon removal. I seed funded about a dozen companies that were

gonna build in the carbon removal space and then eventually took that National Academy study to Congress and funded a bunch of congressional candidates to look at that, which eventually became many pieces of the IRA.

Greg Dalton: Inflation reduction act. Yeah. Yeah. Which had some of that. And so carbon removal is the idea that we kind of suck it out of the air. 'Cause there's, we're not gonna reduce emissions, Behavior change isn't gonna get us there. So we need this, I'm a bit of a skeptic about that. It's very expensive. And also there's concerns that it creates a moral hazard, which is, you know, the fossil fuel companies would love to have this. Like, we can keep on polluting and we'll make money putting it up there and someone else will make money taking it down.

Matt Rogers: I'm an all the above approach kind of guy, and looking at the amount of shots on goal we need to take to hit our climate goals, we need everything.

Greg Dalton: Well, maybe a little bit of an insurance policy?

Matt Rogers: Or even, even if we do everything, we've still already polluted enough that we need to take CO2 out. We have to undo the pollution we've done in addition to cutting emissions dramatically. you know, the reason why I, I use this as an example is it was less about us controlling and driving something it was really about recognizing the talent in Noah and what he saw out there, and then giving him the rocket fuel and all the different tools in the tool chest to go accomplish his dream.

Greg Dalton: You also invest in Arena, which trains people to run for political office and disrupt the political landscape. So what are you trying to disrupt and how?

Matt Rogers: More talent. And you know, one of the things that my wife and I often talk about is, you know, can we bring in. More new talent in –

Greg Dalton: The old farts ought to get out of the way?

Matt Rogers: I think that some of their time has come, but also part of what makes a great democracy is new voices. And, you know, we need more young people involved in politics. It's kind of an undeniable thing, and it's especially difficult if you have no background in it, no network in it. So, you know, the reason why my wife Swathi created the Arena, why she was one of the co-founders there, is to provide a platform and tools for someone who has no experience in politics to get involved.

Greg Dalton: Right. The premise there is that younger people were being fresh ideas that they'll somehow be able to shake some of the incumbency and dissatisfaction so many people have with politics. 'cause politicians are making promises they don't deliver on, people get disgusted with the system.

Matt Rogers: That's right. We started the arena back in 2016, and for example, Senator Andy Kim now was a, was from the original Arena class and now, now he's the senator in New Jersey or Lauren Underwood in Illinois, or Lena Hidalgo in Texas. There is a group of young folks who didn't have any political experience and now many of them are in Congress, in the Senate or mayors of cities. And some of them actually have run for president.

Greg Dalton: And so much of politics these days is performative about, you know, showing up on social media, not necessarily governing and doing the hard work. Right. So do you train them to be performers to get into office or are you training them to actually, 'cause you know, running for office is very different than the nitty gritty of like doing legislating and, and running a, a city or a state.

Matt Rogers: Yeah. Part of the way I think about it is about talent. And when you think about talent in a company, you think about, you know, being a great manager, being a leader, uh, how to build teams, you know how to run a business, That same ethos could exist in other parts of society. And part of the approach we take at Incite is, how can we approach talent and give them all the tools and yeah, leadership development and trainings and how to communicate, but also, how to govern, how to build a team, how do you hire a team? You know, these are things that especially if you're just entering politics, don't necessarily come naturally.

Greg Dalton: So how do you think about your own influence and power?

Matt Rogers: Oh, I tend to think about it a lot. I was raised with a pretty big sense of responsibility. I was the oldest of three boys. I had to take care of my, my brothers a lot. And when I had this big windfall selling Nest to Google. You know, one of the first things my wife and I did was put together our foundation and start to think about our impact and –

Greg Dalton: A lot of people just like, oh, give it away when I'm dead.

Matt Rogers: I heard this from a lot of my colleagues too, like, oh, or philanthropy is something you do when you're old. And, you know, we were 30 at the time and, one, like our minds are still sharp and our networks are still really active. Like, now's a great time to get started with philanthropy. We attended so many of these like giving pledge gatherings and those kinds of things. And rather than just pledge, we said, Hey, how would you do the work? And I, if anything, I hope a lot of my very wealthy billionaire colleagues get the message and do more too.

Greg Dalton: Thank you Matt Rogers for your leadership and for all you're doing.

Ariana Brocious: Now we're going to hear about a restaurant taking an innovative approach to reducing waste – not by composting their leftovers, but by actually sourcing ingredients that would otherwise be left, ahem, on the table. Climate One Producer Megan Biscieglia has our story.

Megan Biscieglia: In the Mission District of San Francisco sits a funky color drenched explosion of a restaurant called Shuggies.

One of the dining rooms is entirely green - walls, marbled tables, booths, even the 16 hand-shaped chairs sitting in the middle of the room. It's fun and moody!

Kayla Abe is one of the owners. She's the creative genius behind the design and has worked in sustainability for many years. She comes from a long line of farmers.

Kayla: Somehow I, I thought that I came into food things on my own, um, which is totally ridiculous. and it is kind of cool now to return to the same field, but at a wildly different angle.

Megan Biscieglia: Shuggies is a climate positive restaurant. That means they use ingredients other restaurants generally don't consider -- like misshaped, off color, or surplus produce, lower-on-the-food-chain seafood, and offcuts from local ranchers. They use things like "spent" oatflour, a byproduct of oat milk, to make their pizza crust. And they even serve up invasive species. Abe's partner, David Murphy, is the restaurant's co-owner.

David: Waste happens almost every step of the way in like the life of a vegetable or fruit or any food that's produced. The system is kind of designed in this really kinda screwy way. It's not about the benefit of the planet or the person, it's the benefit of the dollar.

Megan Biscieglia: For farmers and producers, it's often easier and more affordable to toss slightly

blemished produce or meat offcuts, rather than figure out how to sell them. Abe and Murphy pay farmers for these perfectly edible ingredients and make beautiful food.

Today's menu features dishes like the **Spring Fling** - Roasted sunchokes with a herby snap pea serrano emulsion, sauteed pea tendril, and a dilly sunchoke crunch. And the **Bloom' Cabbage** - made with lonely mountain savoy cabbage, asian pear, pistachio crumble, and cured yolk.

David: Lonely Mountain needed to get rid of like two crates of savoy. And like, we always show up at the end of the market on purpose. and we are like, okay, what you got?

Megan Biscieglia: The restaurant has gained a lot of praise from diners. Shuggies has been named on Best New Restaurant lists from Esquire, Bon Appetit, and New York Times. Naturally, Abe and Murphy initially met at the farmers market.

David: She was interviewing chefs for the newsletter that Foodwise puts out. And, um. Yeah. Then I was like, oh yeah, she, she likes me.

Megan Biscieglia: Abe had been working for an organization now called FoodWise, a nonprofit that puts on farmers markets and other educational programming. Murphy had been a chef for over a decade - working in Michelin and James Beard-award-winning kitchens. They both spent a lot of time talking with farmers and this recurring issue of food waste kept surfacing - they'd hear the same story again and again.

David: At the end of the market, He's like, here, take this. I'm like, wow, I, I don't, I don't need a ton of turnips and like, he's like, if you don't take it, nobody's going to. I'm either gonna have to throw it away or, you know, or, or compost it.

Megan Biscieglia: That was in the early to mid 20-teens, when more and more data was coming out around the implications of food waste. Project Drawdown ranked reducing food waste as one of the most impactful things we can do to fight climate change.

Kayla: Not only was it this like larger existential issue, um, but farmers worked so hard and they were losing out on so much income from all of this product that they laboriously grew and harvested and transported to the market that is maybe slightly blemished, maybe is in excess. it just felt so sad and unfair it felt like.We, we should act and, and we could.

Megan Biscieglia: And it's not just upcycled produce on the menu. Shuggies serves up dishes like sustainably-sourced arrowtooth flounder, and invasive species like wild boar.

David: Realizing that the wild boars in 56 outta 58 counties here in California, they root up more CO2 than any other wild animal here in in the United States. They destroy entire habitats. They, they contribute to soil erosion. They just like destroy the earth. And that was a domestic animal that got loose and just turned feral. So, uh, it is incumbent upon us because we let those guys loose. It's incumbent upon us to utilize them, to create the demand.

Megan Biscieglia: The Wild Boar Chop is served with roasted thomcord grapes, frisee salad, stonefruit, and black plum powder. When they first started thinking about Shuggies, Abe and Murphy talked about going full vegetarian, but ended up deciding against it.

David: That is like absolutely a hundred percent what's the best for the planet. But what we didn't wanna do is alienate everybody else. We wanted to bring everybody along with us in this mission. If we can insert all this beautiful flavor and all this beautiful produce or all these different types of meats and off cuts and everything, and it's incredible and it tastes great. That is when you have

success, that is when like what you're doing is gonna speak to like the broader public.

Megan Biscieglia: Between their previous company - Ugly Pickle Co - and Shuggies, they've diverted over a **hundred thousand pounds** of food from entering a landfill.

David: You don't, you don't have to be preachy. The food does all the talking for you. People are like, oh my God, this is what? Wow, what is it? Then you describe the dish. You say, oh, it's a tuna rib crudo, and it's got, you know, this fun little ade on it, a little bit of pickle Thai chili, none of it sounds very food wasty, but then like the presentation and everything, when you go to scrape down the side of a piece of a skeleton of a tuna, you're like, wow. This is the craziest presentation of crudo I've ever seen, and it's also beautiful.

Megan: Murphy and I went to the kitchen so I could see some of the food we'd been talking about, starting with the tuna rib.

David: I didn't call it tuna skeleton crudo, uh, I didn't call it spinal cord crudo. I called it oh, tuna rib. That sounds nice.

Megan Biscieglia: This is some of the best sushi grade tuna that you can get, but it's still attached to the carcass, which is rarely, if ever, delivered to restaurants. Usually they just get the tuna **steaks**.

David Murphy: This thing that we just painted down with is a stock, uh, that is made from all the rest of the parts of, the fish, uh, that we don't utilize for the actual crudo itself. and then over the top here is some fun little crispy. seaweed with some little rice puff. Uh, kumquats. I love people's eyes. And then also explaining the dish, um, explaining how to eat the dish. 'cause people are always like, what do I do? What do I do?

Megan: Yeah. I've never seen anything that looks like that at all.

Megan: It looks like a sculpture of sorts...

Megan: Why have I never seen this in a restaurant before?

David: Uh, because nobody, nobody ever asks the question. Chefs just aren't asking the question. They think that people don't want this kind of stuff. People don't want this kind of stuff because they don't know that it exists. And once you try it, you're like, oh my God, I want this, you know, I want this forever.

Megan Biscieglia: I can 100% confirm that it was absolutely delicious. Abe has spoken to Congress about food ecosystems, and she and Murphy want to work with other chefs and companies to help them incorporate upcycled ingredients.

Kayla: The restaurant is our classroom. It's an educational space where we're trying to put this issue in front of people through their plates, and it is so much more dynamic than a bus campaign or like a government initiative. Um, but the goals are the same.

Megan Biscieglia: And as they work on broader systems and behavioral shifts, Abe left me with some sage advice that we can all do now:

Kayla: If you see something really ugly at the store. Like buy that one, buy the really ugly one that other people probably won't go for. Um, because the other stuff will be no problem to sell.

Megan Biscieglia: For Climate One, I’m Megan Biscieglia

Music: in

Kousha Navidar: Coming up, a company using AI to help commercial kitchens reduce waste and improve their bottom lines:

Page Schult: So, you know, say, look, we have the taco beef and the chicken tenders. When you're serving taco beef, nobody eats chicken tenders. If you wanna like waste less food and spend less time and money on something that's going to landfill, how about we think about changing your menu?

Kousha Navidar: That’s up next, when Climate One continues.

Music: out

Kousha Navidar: This is Climate One, I’m Kousha Navidar. Quick story: coolest field trip of my life was in 5th grade. Upstate New York. This organization called Nature’s Classroom took us, I guess you’d call it glamping? In the woods. One of their big lessons was don’t waste food. And they called it “Ort.” And I kid you not, to this day, when I think of food waste, I think of “Don’t waste the Ort!”

Ariana Brocious: Ort. I literally had to look this up. It means a food scrap left at a meal. Great crossword puzzle word.

Kousha Navidar: So it was cool to learn about the work of Topanga, a company that’s using AI to reduce food waste in commercial kitchens. CEO Page Schult says by predicting and modeling consumer demand, they can cut how much is thrown away by up to 70%. The company is also working to replace single-use to-go containers with reusable containers, starting on college campuses.

Kousha Navidar: Most people probably don't think about an economy built on dealing with trash, but it's huge, right? Like can you just tell us what the scale is of the global waste economy?

Page Schult: It is huge. I agree trash is often an afterthought, but, one way I like to look at it is. We all eat and drink a lot of food. It's about $382 billion each year of food that is wasted before it's ever has the chance to be consumed. So to me that's a pretty meaningful amount of food that's wasted and a meaningful amount of money. and there's a lot of other ways to slice and dice that.

Kousha Navidar: So nearly 400 billion, like I think you said, 382, and that's billion with a B that is wasted every year. So this is just food that is made and then nobody uses it.

Page Schult: Yes. So that's a lot. That's roughly, you know. 120 billion meals that are being wasted every year. And you put that into context with, okay, so why do we care? Well, if you think about, you know, one in seven Americans that's just in our country are often living in hunger. There's a huge opportunity to kind of reclaim that lost food and replace it with folks who would love to eat.

Kousha Navidar: Yeah. So your company started as a milkman style grocery delivery service. What did that look like?

Page Schult: It looked like a lot of blood, sweat and tears trying to figure out, uh, how, how to build and run a market. My co-founders and I, at the start of COVID, we were working in different spaces and we were really thinking about this trash problem I think it a lot of people can probably relate to. All of a sudden they were ordering a lot more delivery and takeout and kind of watching that

packaging pile up. And we started thinking, what's a world where that doesn't have to just be trash? So we were working with some local farmers in the Los Angeles area to procure their goods in bulk, package them in reusable containers in our market and send it out to customers and we would pick up the empty containers each time we dropped off your next order. And yeah, that's where we really got to understand like how much food is being wasted, how much packaging doesn't have to be wasted, and, and all the good stuff that comes from diving in and trying to solve a problem.

Kousha Navidar: You know, it's interesting 'cause I feel like there's a good economic reason why milk men stopped delivering milk and glass bottles like to individual households 50 years ago. What made you think that model could work today?

Page Schult: Yeah, it's interesting. I think there's like a few different elements of economic challenges at play. One is on the packaging in and of itself, which is that, you know, you have to be getting the same product. Each week in order for like us to drop off the container, pick up the container and be able to reuse it, right? There has to be some level of standardization. I think when grocery stores really became the norm of shopping, branding took over. Every packaging needed to look and feel different. So that really shifted the usability. And then also like people started living further and further away from, you know, where they would commute and spend their life. And so the logistical side of going to each household to pick and drop something up just got a lot more complicated. But also there is a new way to build a similar system that reflects the world that we live in today. And packaging too has gotten a lot more expensive. You know, tariffs are real. Packaging is largely made overseas. It's imported. When you're looking at food businesses where it's a dollar and cents business. Having an $8 meal where a dollar of that is a piece of packaging you have to pay for and it's just gonna be used once, there's a huge opportunity to try and make that more valuable.

Kousha Navidar: Yeah. When you say dollars and cents business, you mean like the margins are so slim?

Page Schult: The margins are so slim. and you know, I think a lot of people who get into the food business, it's not a get rich quick play. It's because they love serving and delivering meals and experiences to folks. And so trying to take some of that pressure of the business and the economics off is a huge opportunity.

Kousha Navidar: And most of your business, Topanga's business, is now on college campuses and you provide reusable containers, and more importantly, maybe you provide reusable container management for dining halls. So not just the widgets, but also the system that manages the widgets. Can you walk me through the lifecycle of the package? Like what happens when a college student goes and grabs lunch and, and gets the container?

Page Schult: Yeah. Our goal is to make it as seamless as possible to get a reusable container. So, you know, a lot of college campuses these days, they're using platforms like GrubHub, so students can walk out of class, order their hamburger and fries to go, pick it up and be on their way to their next class. So we integrate within that system. Once a student places that order, we get a little QR code that represents who that student is. A lot like checking out a library book, the operator who's preparing your hamburger, nice and fresh scans that QR code on the order receipt scans the QR code on the container, checks the Outback container to the student and then places it on the shelf for pickup. The student then picks it up, enjoys their food, gets a text from us saying, Hey, welcome to the program. You have three days to return this container. Click here to figure out where to drop it off. And it's really pretty easy.

Kousha Navidar: You have somewhere between like 97, 98% return rate, right? How do you do that? Like what? That's, that's wild. That's so like, especially for college kids, like they're returning

their stuff 98% of the time.

Page Schult: Yeah. I know it, it does, it shocks a lot of our clients during the sales process. They don't believe it until they see it. Yeah. I mean, it is super. It's super kind of simple behavioral economics, and a lot of the frame is there's a carrot and there's a stick, and the carrot is that you know, you won't be charged if you participate. We are tracking you, so there's visibility into what's expected of you. We can remind you when and where to return this piece of packaging. Then some of our clients like to also use the stick, which is if you don't return this container, there'll be a late charge. A lot like a library book. By and large we see those that choose to charge versus that don't, don't have meaningfully different return rates. It's really based on what's gonna be right for your community and your audience.

Kousha Navidar: Oh, so even on campuses where they don't have the late fee, they still are able to achieve that 97, 98% return rate.

Page Schult: Yeah, they are. Which is incredible. You know, we do see a lot of campuses have campus ambassador programs or have, you know, sustainability clubs or dining clubs on campus that wanna start to like be a voice and be spokespeople for the program, which is amazing.

Kousha Navidar: Yeah. What do students say about using other students' containers?

Page Schult: Like, Ooh, that's gross?

Kousha Navidar: do say that? Yeah. Yeah. Is it like an eww, that's gross?

Page Schult: Yeah, I think that, I think that's a common assumption. Um, but the reality is, is that we're all going to a restaurant and eating off of plates that have been used by others before. Same with the dining hall. The containers are going through the exact same cleaning and sanitization process. so it really is no different. I think it's once you try it out. You recognize that. But yeah, I think it's a common conception because we think of, to-go packaging as such a, like one and done. We don't think of washing it and cleaning it and reusing it.

Kousha Navidar: Yeah. You know, when I was in college, the dining hall was the center of gathering and you would go and there might be like different stalls, but you kind of just got a, a tray and often it was like restaurant dishes, like you're mentioning when you sat down with your friends. You know, it's been a bit since I've been in college. What's the vibe like now? I mean, is takeout just the norm where you're just taking it and leaving the actual dining hall?

Page Schult: It has shifted. It's shifted a lot, um, since I graduated where you used to really just think of this like residential dining hall with these shared tables and buffet line that's very much still alive and well, I think there is a lot more to-go in that environment. So you don't necessarily sit and dine and chat. You kind of go grab your food and leave. But I think the biggest change over the past 10 years has been the rise in, you know, what we kind of term retail dining, where, you know, there's the Chick-fil-A on campus or there's this GrubHub mobile ordering where you're intentionally ordering something to grab it as quick as you can and and get on your way. So that has had a huge surge over the past 10 years, broadly, especially over the past five, six years since COVID and I think that is similar to what we were seeing at home when we were starting the Milkman's market. I think schools started realizing, Hey look, all this packaging is filling our trash containers. Now we have to pay more for dumpster and tipping fees. We're paying more for packaging fees. We gotta figure out a way to do different.

Kousha Navidar: Yeah. And of course Topanga works beyond college campuses as well. And I'm

wondering for you, what's the potential for similar reuse with partners like GrubHub?

Page Schult: Yeah, it's interesting, we have done a handful of like pilots and tested in more of an open market landscape with some QSRs and coffee shops.

Kousha Navidar: Can you pause there just for a sec? Open market, you mean like a college campus is closed? Like it's its own –

Page Schult: yeah.

Kousha Navidar: You're at an airport. Right?

Page Schult: Yeah, exactly. Like if you're at an airport, you're eating at the

Kousha Navidar: You're at the airport, right?

Page Schult: Yeah. Like you're there until your flight takes off. Similar with the college campus, like even if it's in an urban environment, you're kind of living in the same five miles for the majority of your time. Open market to me is more, you know, I live in Los Angeles, I live in Culver City. I don't go to West Hollywood very much. Maybe once a month I'm over there, you know, that's where it's kind of a little more open. And so that's where it's interesting from a, again, consumer behavior perspective of in that open market space, we saw that people who opted in who were like, yes, I wanna try reusables had just as high return rates, 98, 99%, but getting a critical mass to opt in was a lot harder. Also that logistics piece. Suddenly like that person is now responsible for driving 10 miles over to West Hollywood to return the thing. versus in a college campus, you walk down the hallway and you drop it off and like your job is done. So there's definitely different trade-offs. and I think it's really different depending on like where you live and, and what legislation is at play too.

Kousha Navidar: So when you think about like a vision or just like the potential, when you look at partners that are functioning in these open markets, what do you see? Do you see it as, as still definitely a possibility and it's more just about building out infrastructure, making behavioral changes.

Page Schult: Yeah, I, I think it's definitely a possibility and I think it is just understanding what success looks like. I don't think it's necessarily a quick win. I think it's intentional, like let's build a system that is gonna work for years to come. So what you invest in it, you'll get out of it. I think there's a lot of great examples. You know, Germany has passed some national legislation a few years ago where every food service operation that offers to-go, had to present a reusable and a single use opportunity for take it away.

Kousha Navidar: I'm happy you brought that up because that scaling element is definitely a thing that I think about 'cause single-use plastic. I mean, we know it's, it's convenient, it's cheap. You can throw it away. And I think importantly, like you mentioned, most of our infrastructure is built around it and you're asking people to completely change their behavior. So I guess in the Germany case, there is this example of, hey, it's gonna come from law. You have to adapt or at least give an option for it. So what's your counter argument to people who say, Hey, listen, this is how it is, and reusable stuff is just too hard to scale.

Page Schult: Yeah, I mean I, I think my honest counterargument is that if you think it's too hard to scale, then you're probably not suited to scale it. To be honest, I think it's like similar. If you think about any major opportunities to try to do something different, it takes time. And it is hard work. It's hard work to say, here is the new way of doing business. I think. You know, it's very similar parallels. If you think about electric vehicles, like all the infrastructure, you know, suddenly, then, okay, we

need chargers, and then we also need a system to make sure the Chargers are working so that somebody who arrives a hundred miles at a charger, that's their last chance for a refill. Doesn't get to one that's broken down and it's kind of a full systems effect and you have to think of it as systems change.

Kousha Navidar: What do you think about the capitalism side of it? Can the circular economy be profitable?

Page Schult: Yeah, I think it definitely can be. Again, I think it's, it is at its core, it's. Thinking through different economic models, right? And so when we're working with our clients we're saying, Hey, look, today you're buying a hundred thousand pieces of compostable packaging a year for 25 cents. You could buy 500 reusable packaging for 75 cents. Like let's do the math. If those last for a thousand times and you do X number of orders a day, think of how quickly like you've surpassed breaking even. and that's a huge opportunity, I think ultimately why a lot of our clients love the sustainability benefit of our two products, the cost savings, like can't be denied. And same on the packaging side. That's, that's the goal with food waste is, Hey, look, you are wasting $500 a day on food that you don't have to waste. Let's like help you track it, mitigate it, and, and you'll get that back.

Kousha Navidar: Yeah, and your company, in addition to the reusable packaging, you've been developing an AI smart scale to reduce food waste. particularly in like large institutional kitchens, but of course college campuses, which we've touched on, but also there are hospitals, there are hotels. How does that work?

Page Schult: Yeah. A majority of food that's being prepared in these large kitchens today, people are going in looking at what they need to make for the day and doing it. Sometimes there's an intervention at the end of the day where somebody needs to get out the pin and clipboard and write down, you know, X amount of taco beef, y amount of cheddar cheese. I threw these all out at the end of the day. That's a pretty dated way of operating in today's world. So we've kind of introduced a AI computer vision smart scale that with a tap of a button, you put a tray of what you're about to throw away on. We capture images of it, we capture the weight. We're integrated with your menu. So we can say, Hey, look, that's a taco beef. You wasted 20 pounds at lunch, 30 pounds at dinner. That's kind of what the capturing moment looks like.

Kousha Navidar: Oh, interesting. So it is multiple things at once. It is not just an inventory system to be able to connect what you're making to what you're wasting and the ingredients. It is actually also physical, like a camera system that automatically captures that information for you. Right?

Page Schult: It is also that kind of like data capture moment to replace having to ask somebody to write that down. Exactly. Exactly. And, sure, we could tell you that you wasted 20 pounds of taco beef, but. what does that do? Unless we tell you and you're gonna serve it again next Monday, serve 20% less. Right. So again, the systems thinking piece, it's, it's hard to say you just wanna solve one problem without them suddenly realizing there's 20 other things that are related.

Kousha Navidar: When we talked about the reasonable containers on the college campus, use the example of like student A who always orders the hamburger on this day, and that can help forecasting for ingredients. Is that also part of the AI system that you're describing, or is that something different?

Page Schult: Yeah, exactly. It is part of that too. So, you know, say, look, we have the taco beef and the chicken tenders. When you're serving taco beef, nobody eats chicken tenders. Then we can help you understand next time you're planning a menu, if you wanna like waste less food and spend less

time and money on something that's going to landfill. How about we think about changing your menu? So based off historical performance and consumption.

Kousha Navidar: Yeah, you seem like a great person to ask this next question too, and, uh, I'm, I'm really interested to hear your answer about it. I, like many people, maybe yourself included, uh, have some, have reservations about AI. Right. A kitchen is a really human place.

Page Schult: Mm-hmm.

Kousha Navidar: How does AI integrate with humans in your perspective?

Page Schult: Yeah, I think, um, I think it's a really complicated question in today's day and age, to be honest, but I think it's a fascinating one and one that we should all be debating. Um, from a kitchen perspective. You know, a lot of our clients have looked at or tested robots, so like a physical thing that is replacing the human and is frying the french fries. I think they found by and large that. Sure, that's nice. It doesn't actually replace all the other steps to be done, right? They still need somebody to plate the french fries, to serve the french fries and to confirm that there's no allergens. So where we see the opportunity for AI is for taking off the work that humans don't want to do or aren't best suited to do. So a lot of operationalizing a kitchen and reducing waste is just a data problem. It's understanding a lot of data, a lot of patterns, and what needs to change or shift. People don't wanna work in a kitchen because they're data scientists, right? They wanna work in a kitchen 'cause they like food, they like serving people, they like that environment. So our goal is to make the data portion digestible and delivered to you so that you can focus on the side of the kitchen environment that humans love to be a part of.

Kousha Navidar: Yeah, that makes total sense. Oh, uh, did you use digestible on purpose?

Page Schult: It's a good play, yeah.

Kousha Navidar: Perfect, perfect pun for this. Paige Schult is CEO of Topanga. Paige, thanks for your work and thanks for talking to us about it.

Page Schult: Yeah, thanks

Music: In

Kousha Navidar: And that’s our show. Thanks for listening. Talking about climate can be hard, and exciting and interesting -- AND it’s critical to address the transitions we need to make in all parts of society. Please help us get people talking more about climate by giving us a rating or review. You can do it right now on your device. Or consider joining us on Patreon and supporting the show that way.

Ariana Brocious: Climate One is a production of the Commonwealth Club. Our team includes Greg Dalton, Brad Marshland, Jenny Park, Austin Colón, Megan Biscieglia, Kousha Navidar and Rachael Lacey. Our theme music is by George Young. I’m Ariana Brocious.

Music: Out