

Make Way for the Future of Sanitation

May 9, 2024

Discovery Center

transcript is auto-generated. Please excuse grammatical errors and misspellings

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>> Welcome.

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>> Welcome, everyone.

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We're going to ask people to take a seat and fill up the front and second row, if you can.

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We're going to get started here in a minute.

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Hi, everyone.

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Good to see everybody here.

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Welcome.

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I'm Sarah Bloom, I'm the curator of the exhibitions here at the Discovery Center, and I had the amazing experience of working on the current exhibition a better way to go toilets and the future of sanitation.

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Thank you all for joining us on such a gorgeous afternoon.

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Thank you for being here.

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And good morning, good evening to everyone who is joining us virtually.

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We have a lot of folks here virtually as well.

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I want to start with a land acknowledgment.

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The Discovery Center sits on the traditional unceded territories of the Duwamish we honor and recognize this land continues to be their home and it's only meaningful with informed actions and authentic relationships.

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A big thank you, I hope you all had the chance to go to the partner tables.

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A big thank you to all the partners here tonight, global Washington, King County waste Water Treatment Division.

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Half, splash, the global alliance, water first and water environment Federation.

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If you haven't had a chance to stop by their table before the event, please do so after the talk.

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I also want to thank our ASL interpreters, Megan and Taylor, and I also want to thank our amazing AV team in the back, Calum, Adam and Christopher.

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Tonight's program, as I mentioned, is inspired by the current exhibition a better way to go toilets in the future of Sanitation.

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So in this exhibit, we really try to take the visitor on a journey of what it means to have resilient, reliant culturally sustainable Sanitation systems for everyone everywhere the half the world needs a toilet and the other half needs a better one.

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Safe and clean Sanitation is improved education, access to health and safety and dignity for all.

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So as you go through the show, you'll see a lot of amazing technologies and innovations.

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We really try to highlight compelling stories of communities and individuals.

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We have even have some art installations in this exhibition and then some digital interactives that really showcase, really, the breadth and the depth of the work that the foundation alongside with its partners and grantees in both local and global communities have been doing all along.

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So I want to say I'm super proud of this collaboration between the Discovery Center and the Water, Sanitation, & Hygiene team as well as many of our grantees and partners to create this exhibition for our visitors, and I'm super excited that we're going to get to hear from one of our key partners, Doulaye Kone tonight, I can't wait to have him up here.

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Our speakers tonight, Doulaye and Rachel, will be discussing the global issues around sanitations and then how these challenges are really interconnected with so many ripple effects on education, on climate, and on disease.

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So before I bring up our incredible speakers, I do want to share a short video with you all that really demonstrates how the foundation supports partners and people so they can really try to achieve their full potential, and this particular video that we're about to show you really showcases at the center of it how the toilet is really kind of a game-changer in terms of really connecting Sanitation to education in a South African in particular school.

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We'll showcase the video.

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I get a lot of joy watching this video, and we actually showcased both Birolu, and go with the freeze frame when they show the pieces of it that's what's in the exhibit.

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It's super exciting.

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I want to welcome our amazing speakers, Doulaye Kone, interim director, Water, Sanitation, & Hygiene, and Rachel Cardone, director of program investments at the Resilient Water Accelerator.

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So Doulaye leads the efforts for safe sanitation for 3.5 billion who currently live without it.

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He and his team work to disrupt the decades long status quo in the sanitation sector by supporting the development and commercialization of the transformative technologies, including the reinvented toilet and create a clear, cost-effective pathway to deliver these technologies at scale to people around the globe.

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And Doulaye has more than 20 years of experience in the sanitation sector and spent 13 years leading technology innovation efforts on the Water, Sanitation, & Hygiene team.

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Rachel leads programs and initiatives to bridge climate finance with water-related resiliency investments in low and middle income countries.

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Prior to this she was deputy director of Stanford's water health development where she focused on strategy design program operations and partnership development.

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She also is a foundation alumni and she's done quite a bit of work earlier in her career.

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Rachel was a driving force in the creation of the Bill and Melinda Gates Foundation Water, Sanitation, & Hygiene program.

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With all that, welcome Doulaye and Rachel.

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>> Rachel: Hello, hello.

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Thank you so much for coming.

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So I was asked to describe myself.

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So, hi, for accessibility reasons.

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I'm wearing a blue jacket.

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I have long brown hair and I'm wearing gold earrings.

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I'm Rachel Cardone.

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>> Doulaye: Hello, I forgot my hair at home.

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I don't have long hair.

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Wearing blue.

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>> Rachel: I also wonder, is there a second microphone, just I know we had tested two microphones.

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So thank you, everyone, for just your patience.

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Okay.

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I have watched this video multiple times, and I still well up in tears it's such a joyful video.

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Before we dig into the program sanitation and also water sit for a minute and think how that made you feel and if it changed your thinking about the role of sanitation in your life.

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And so just, I want you to think about that as we get started.

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In part because I also want to ask Doulaye about this video.

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I mean, for me, when we started the sanitation program, we were very much focused on sanitation, and here it's showing all of the effects of sanitation, which touches on so many of the other programs that the foundation also supports.

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So I'm just wondering if you could also speak to how this video resonates and sits with you not just in terms of the technology but also the benefits that it provides.

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>> Doulaye: Thank you.

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And thank you, Sara, I don't know where she is.

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For the nice introduction.

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I think one more point she needed to add on your CV is all the workforce, because you brought me.

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So that needs to be on your CV as well and many other people who are working here.

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And I have a few more colleagues in the room.

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So if you can turn around and see those people, raise your hand.

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In case you have questions later, these are the people you need also to talk to.

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Good.

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For the team which made this video, I really want to congratulate them.

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I love the video.

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And I love Umphile on the video and she's conveying something that my own daughter would tell me, school toilet and public toilet, every time we go out what it looks like when we go hiking, and I know some of the toilets, no, no, I don't want to go here.

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And bringing clean toilets in schools, it has a huge impact.

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Yes, we work on technology, but at the end of the day, to see that this can actually transform lives, the way people live, the impact it can have in a community, it's very inspiring.

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Very, very inspiring.

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So we can think of it as this is one solution, but I think it's way more than what we describe as a toilet to this.

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Very inspiring to me and thank you for everyone who built that great story.

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>> Rachel: It's a tremendous piece of communication, too.

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Oftentimes in the sanitation space, it's very dry because people don't like talking about sanitation.

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It's often this very invisible thing.

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We're so lucky we get to flush a toilet.

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We get to flush and it disappears and we don't have to think about it.

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A shout-out to King County Waste Water is here.

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Lots of great partners here doing incredible things to your poop.

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Which brings me to one of the first conversations I had with Doulaye, I don't remember if it was when we brought you over for a meeting with intellectual ventures, a million years ago, and/or if it was when you were first here, but we were talking about Seattle, basically, and you had come in from the airport and you looked at me and you said, you know, Rachel, there's open defecation here too.

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Open defecation was a whole campaign to end open defecation, which happens when people don't have access to a toilet.

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That's one of the first things you observed about Seattle.

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And so I know before you came here, you had decades of experience also and many sanitation stories.

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But as we weave this thread between the work that the foundation does and also our work here as citizens of Seattle, right, or living in Washington State, just wondering if there's a story that resonates with you or that you want to share on your sanitation journey of these connections.

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Sorry, this is a really complicated question.

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It was easier in my head.

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I'm sorry.

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>> Doulaye: Thank you.

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Yes, I came here, it was 2011, and I was living downtown, downtown Seattle and walking to the foundation office.

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It was not this building.

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It was another one closer to Lake Union.

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And then we moved to this one, and I took a different path.

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And you were right.

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So I was surprised to see in some part of the city human feces.

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And for me coming from, was coming straight from Codavar, other places in Europe, but was coming from there, but to see such a modern city with this type of challenge was very unsettling.

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And a lot of things has changed since then.

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I'll go through the same places, things are very, very clean since then.

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The city has been rebuilt and many places have been rebuilt.

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And if I reflect back on some of the experience you want me to share, I want to go back to the video, because one of the reasons I really changed and tried to work in this field is because my whole life I've been confronted to sanitation system.

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I use every type of system to open defecation when you don't have a toilet, I grew up in communities where you didn't have a toilet.

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So have you to use what is available in nature.

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And unfortunately this is happening still today and we have billions of people in the world today without safe sanitation systems.

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And when I see a person in the U.S., and this is more than half the sense of the global population that don't have a safe sanitation system.

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When I was 12 years old, I went to middle school.

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I upgraded in status in sanitation system.

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This is the first time I was facing a flush toilet.

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And I remember my first time standing there asking myself whether I should really poop in this drinkable water.

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Super clean.

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Never seen this before.

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So it was very difficult.

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Very challenging.

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My kids are born here and they're used to this and they can't think of a different solution, but if I bring them to a latrine, it would be a struggle.

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So for me it was very challenging to really think how you can mix poop and water, drinkable water.

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So to take the path forward, I learned later all this is creating disease and people die and I changed my career because of that.

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And how can sanitary engineering help remove this barrier.

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That's what drove me into this area.

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The reason I like the video is because not only doesn't suppress what makes a toilet cool to use, it removes the path gen.

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Gives you water and doesn't create any crud, and it gets kids inspired.

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So you can turn things around with great technology.

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People don't maybe know what the technology is doing, but it's like this service to them.

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If I go around in Seattle, thanks to King County, you mentioned, it feels like when we're using systems today, that's exactly the same thing we are having, but what we are not seeing here is all the challenges in the back.

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And here we think we have a toilet which is in our room and we don't think of the extension of the toilet.

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The huge infrastructure that goes out.

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And every day you use a bathroom, when I use a bathroom I have to think about those people who are working down there to clean whatever we put in their system.

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So I won't go too far, but these are some of the things I want to share on this question.

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Thank you.

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>> Rachel: Yeah, no, of course, I would love to turn it over to the Mentimeter if it's possible.

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So we have a Mentimeter poll just for audience participation, too, which is, it will be open throughout this event, at least our part of it.

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We'd love to get your thoughts and your ideas, particularly also for our virtual audience, please participate and share so we can also collect some of your reflections and insights in how we can also create a better sanitation future for everyone, whether we're using flush toilets or not flush toilets, or maybe flush toilets that are a different idea of what a flush toilet could be.

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There's a couple of examples when you go check out the exhibit.

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So I'm kind of curious.

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I want to turn attention here.

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>> Doulaye: I want to ask a question.

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I shared my story but I think it would be cool to hear maybe some, your story as well because you've been in this field, I think, as long as I've been as well.

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And traveled to many places and you live here in the U.S. Can you share with the audience what your experience has been so far.

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>> Rachel: So, sanitation is one of these things -- okay --

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this is a little bit of a segmented story.

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When I left the foundation, my mother, bless you mom, wherever -- don't be listening to this -- but my mother was like thank God, can you go back to working on water again?

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And I was like, heck no.

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Come on.

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Actually, sanitation is the cool part.

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She said I'm just so tired of hearing about it.

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She's very enthusiastic and great and is very supportive of my career.

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However, the thing is that water and sanitation -- I entered wanting to work on water issues.

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However, I entered working on water issues because of my experiences -- I was a backpacker for two years after college.

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And I didn't know what I wanted to do when I grew up.

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So I took the LSAT thinking I would be a lawyer.

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And then I -- but I didn't want to invest and be more in debt.

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I paid for college so I had a lot of student loans.

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I said, before I make this decision to go into more debt --

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because I'm American -- I want to know that I actually want to be a lawyer.

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Let me go travel around the world.

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I spent two years traveling through southern Europe, the Middle East and eastern and southern Africa as an independent backpacker.

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What I noticed through that trip is everything went back to water and sanitation.

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If I was interested in gender issues.

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If I was interested in -- there was like a flavor of the month.

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Economic development.

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Interested in politics.

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The underlying current was water or sanitation.

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And I got sick, and I had malaria and so I sort of woke up one day and I said I think this is what I'm seeing, this is what I need to work on.

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And my career then became around water because everybody was working on water and nobody was working on sanitation.

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And nobody really wanted to work on sanitation.

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So you would have a water and sanitation program, whether with a nonprofit or a donor or whatever, governments, but really there was nothing around sanitation.

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So when I came here to work at the Gates Foundation, it was very exciting because we originally started as a learning initiative to try and explore different ways of meeting the foundation's mission and making a difference in the world.

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And when we came at the idea of, wait a second, nobody is paying attention to sanitation, this is a huge opportunity for the Gates Foundation's mission and it aligns with the Bill and Melinda's interest what not.

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Hey let's do this.

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That became very exciting.

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When I look back -- I left the foundation in 2012, and just little things excite me.

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Like when the new foundation campus, when this campus was built and the purple pipe came in using recycled water, that's so exciting.

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It's a little thing, but it means so much.

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It's indicative of this transformation that we desperately need to get the world away from water borne sewage.

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That's my journey.

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It's a long-winded one but it's been old.

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>> Doulaye: You're still young.

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>> Rachel: Still young.

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Still young at heart.

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But so could we shift and let's talk about this exhibit.

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So I hope that all of you have either had the time to go look or that you will take the time tonight and that you will tell your friends and that you will come back, because I can tell you with -- I'll just tell you.

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This is an incredible exhibit.

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And I hope that if you don't see how incredible this exhibit is and the opportunities it brings, come back until you have that aha moment, because it will come when you read all these things and you participate.

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And so I know that we're not supposed to pick our favorite children or our favorite technology.

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So I'm not going to ask you that.

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But I wanted to ask Doulaye, what excites you?

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Because you've been part of this process.

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And Sara, incredible job and Discovery Center, you guys did such an incredible job communicating this story.

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So I'm just curious, what excites you about this?

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>> Doulaye: Thank you.

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I didn't visit the exhibit until the opening day, and I know the team was working on this like super hard.

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It was a collaboration.

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So all I did was what I could review in the office.

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I didn't come to look here at the rendering.

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First was the opening February 28th.

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I was taken away.

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The reason is a lot of times when you're in conversation on sanitation or water and sanitation, you speak about only one topic.

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And this tells the whole story.

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It's like the full story of where does it start, how does it start, how it happened, what type of challenges, what solutions others are putting forward, what is working, what is not working, and what tomorrow looks like.

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And what is coming and how you can go through it.

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It's all in a small space.

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It's so inspiring for me.

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That story, that's my inspiration.

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>> Rachel: We're maybe proselytizers for this exhibit.

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I love your energy around this.

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I had the same experience.

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A lot of times I saw this toilet technology was in 2012 with the reinvent the toilet fair.

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And some of the technologies were the size of semi truck containers and now it's the size of a toilet, it's amazing.

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And it may seem like a long time that oh wow 10 years and we're still moving forward toward this future and creating it, but tremendous work has been done.

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And so I think that's exciting.

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So I want you to think as well.

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And you have pens and you have pencils and cards.

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As we move through this next phase of the questions, which will maybe get a little more technical, write down your questions, or observations, or thoughts, because we'll be collecting those and reading them and the foundation will take those as well.

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We will have a Q&A period but also please mention that there are index cards and pencils for you.

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So all of this stuff, all of this technology stems from some meetings that happened like 10 years ago around this reinvent the toilet challenge, and there were lots of meetings to discuss design parameters.

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So in this ideation space of, hey, we're going to work on sanitation, what is the vision?

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What's the dream?

00:42:23.000 --> 00:42:32.000

And so there were these TPPs or design parameters for those, but I don't remember what those are.

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So I'm just wondering, could you refresh my memory of what was the sort of anchor on which a lot of this technology then aspires for.

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>> I'll go back to one of the meetings you mentioned in Bellevue, when I came here in 2009, first time was invited for a science meeting with Bill and other engineers and scientists in that room and was the first time.

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Before that I was in academia.

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I was teaching in Europe and doing research.

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And I'm sitting in this meeting.

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It was the first time I find a group of scientists asking questions I couldn't answer myself.

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It was why sanitation systems still release pathogens and it's leading to disease in communities and how could that be the result.

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There's a lot of technology.

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A lot of things that are working, but how can we supplement it?

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What would be like the next generation of technology to complement the limitation of the existing system.

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I left that meeting so inspired.

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And the team went through a strategy program and then put these ideas together.

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Okay, they're going to do everything on sanitation.

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That's when I joined.

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That's when we found you on the team and others, and the thing we focused on is we didn't know whether it would work.

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Really, to see a video like I saw today that was displayed back then in 2010, 2011.

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This was like a long shot dream, like a big bet.

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If you can design a toilet that can run without water pipe coming in, without a sewer system going out, that can be aspirational to people, which means if everyone wants a flush toilet how can you design a toilet that can be self-contained and operate with a flush toilet, and how do you make that cheaper?

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So we had all this criteria, make it cheaper means it's five cents per user per day.

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Today it would be seven cents with inflation, and it has to run without electricity.

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We realized that's going to make it more expensive.

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We had to budget for a little bit of electricity to run the system, but the system should actually be able to generate water for the user and should not be drinking water like people.

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Your toilet, drink more water than you.

00:45:26.000 --> 00:45:30.000

So your toilet at home, 30 percent of your water bill.

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Every single flush is more than what we drink every day.

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And we save that water and can we build the system that is self-contained for the family, for community and these are the design specs and we started with system.

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We sometimes look it won't work at the city level to the system that works at the school.

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If you go to the exhibit, what we were saying earlier, you will see prototype of the next generation of sanitation system.

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Next generation of self-contained toilet, that can go in people's homes, sitting here in the exhibit.

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>> Rachel: I also really appreciate the plants and the idea that there's also this regenerative opportunity to just the oxygen I was working from that room this afternoon.

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It's delightful.

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>> Doulaye: Yeah, when you start the exhibitions here, it starts with the first section you have a different name of poop in languages, and then it moves into the biology of going.

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I love that section.

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Okay.

00:46:51.000 --> 00:46:59.000

We are the first machine in the sanitation system.

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Think of it, everything you're eating.

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[LAUGHTER]

00:47:02.000 --> 00:47:07.000

>> Rachel: More fiber.

00:47:07.000 --> 00:47:09.000

More fiber ¶

00:47:09.000 --> 00:47:10.000

>> I need to be focused.

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>> Rachel: Just filling time here.

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But it's true.

00:47:12.000 --> 00:47:29.000

It's true.

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>> Doulaye: We are the first machine in this process what we eat, the body turned this into material that has energy, that has nutrient, that has valuable resources.

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The problem is it comes with a lot of pathogens.

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If you visit the exhibit, you will see, we're making vaccine for typhoid and for the virus, polio and cholera.

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These are diseases made with human feces.

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If you want to use it for fertilizer, it's not good and gets people sick and a lot of people die for that.

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But those machines can take exactly the same resources, excrete, human feces, turn that into reusable resource.

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Urine is water.

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You can recover water and you can save it for fertilizer.

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The solid, there's many ways you can turn the solid into resources that can go back to nature.

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You can turn this into bio gas.

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You can turn it into ash.

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You can turn it into biosolid and that's the end of the exhibit where there's a showcase of how you can make the end of the treatment chain safe enough to actually design beautiful landscape.

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It's amazing what the companies are doing with this project.

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>> Rachel: There's this piece of it, I think what you were saying just reminded for me why I am I feel like a little bit of a walking advertisement for this exhibit.

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But really truly.

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Sanitation is really hard because you're coming at this from a human health perspective.

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We don't want cholera, and it's not that hard.

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I mean, once cholera is in your community, it spreads like wildfire.

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So the fact that we are able to be so safe in Seattle and places like Seattle that have solid sanitation systems, like, it's like the outbreaks of disease, we don't want them but because we don't have them, we don't always really appreciate the benefit of what we have, if that makes sense.

00:50:04.000 --> 00:50:13.000

So that's why this is so cool the idea you can have a closed-loop toilet that's small or a package treatment plant, sorry, Andy, pointing at, the treatment that has that size that you could move into a densely populated community and your outflows is just really cleanish water that's clean enough that it's not going to transmit disease.

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That's the real nut of this that's just really hard and that you're cracking, which is just again very thrilling.

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But what are the -- one of the things before having the session I chatted with the folks from the Discovery Center who are the ones leading the tours, who are chatting with people every day, with school tours, with general public, and the number one question they get asked is: Cool stuff, when can I have it in my house?

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And so I know with those design parameters, we were talking earlier about how several of them have actually been met in terms of the feeling of a flush.

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But there's some that you're still working on.

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And I'm just wondering if you could talk to that what are those barriers that you're focused on now so that we can have these toilets in our houses?

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>> Doulaye: Thank you.

00:51:21.000 --> 00:51:23.000

Before I say when this would be available, I think it's worth really mentioning great efforts happening in the U.S. There's a tremendous growing force of industry, public utilities, several government agencies driving an agenda for on-site water use.

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It's amazing.

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The reason this is happening, climate change is not more --

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this is not new to anyone now.

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We all know water is not available, the resource is not available everywhere.

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It's very expensive to get secured water.

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So utilities are thinking if water is coming to people whom has drinking water and is going to service all these facilities in people's homes, how can you tap that on site reuse it for other purposes so that you can recycle as much as you can.

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That's a very growing program and opportunity into the U.S.

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The system you're going to see here exhibited are very complimentary to those being deployed.

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The innovative solution going into the market with this technology going to complement as well.

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Have applications in the U.S.

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and most of the other countries.

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Bringing technology to market, this is every industry.

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Nothing to do with sanitation.

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Your first model is always very expensive, and you need to find customers and markets which are willing to do that, which are willing to take that, communities who are not afraid of new technology and can take that.

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So that's where we're going to go to go first.

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You saw the system in South Africa.

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It has to be tested somewhere first because it can be actually localized for South Africa.

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People can -- some of the challenges is bringing costs down significantly.

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If we can do that we'll see a large market.

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In two to three years that's our projection.

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We have companies who have licensed these technologies.

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They're making their whole plan.

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I won't be making any announcement on behalf of the company.

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That's their own commitment to do that.

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But I know here in the U.S. we have very important companies who are looking at this very seriously and making plans for the next two, three years to at least start deploying house level solution into the market.

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>> Rachel: So working on energy, working on cost, cost being the biggest issue.

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And then trying to figure out if I can summarize, right, and then trying to figure out where are the viable markets that could start being those early adopters of these technologies, maybe because they have a regulatory structure, maybe not.

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To be able to then start transforming this technology and again I just want to reiterate, we're using victorian solutions and the victorian era might not have seemed not that long ago 50 years ago but we still have a very Victorian model of sanitation that's 200 years old or something.

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>> Doulaye: 250 years old.

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>> Rachel: This is the new frontier, very exciting.

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We're at a stage, as I open, where it's time for audience questions or an observation.

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What I want to do you have index cards and pencils at your chairs.

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I'd love if you can take a minute.

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I want to ask Doulaye for final reflections, but think about what questions you have or comments.

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And just take a minute to write those down.

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That way we can collect them and that way we can also make sure that we hear all of your ideas.

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We also will have a Q&A period for live questions.

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And for the online audience, I have a question.

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Is there a chat function happening -- there is.

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We'll also be harvesting some questions from our online audience.

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But before we wind down.

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We have a few minutes left.

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As you're thinking, do you have any final reflections, Doulaye?

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>> Doulaye: Yes, I was reading the words there, and there's one which is listen to women's needs.

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And that's a topic we don't pay attention to very often, and if you listen to the first video --

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I'm going to go back to that --

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the reason it is focused on that young girl who was like similar age as my own daughter at home, is it has to be safe.

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And it doesn't matter whether the technology is cool, but it has to be safe and it has to be safe for young girls.

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It has to be safe for women and very often if you are part of a team which is only dominated by male designers, like 50% of society, and the other's not contributing, you do a lot of mistakes.

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Want to equal that feedback whether we're taking this very seriously and these are the key messages we're pushing to the partners.

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>> Rachel: Thank you.

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>> We've got some questions coming in.

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I think we'll maybe pass the cards up to you, Rachel and Doulaye.

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But while we're collecting them we have one question.

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What if any work is being done to educate local community about safe, unsafe sanitation and reducing risks where possible?

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Just any work being done to educate around advocacy or thinking about the local community, where are we educating our communities around safe and unsafe sanitation.

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>> Doulaye: I take this for a program that we -- right now we're not running any program in the U.S. Won't be able to talk about what is happening.

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I know what the partners and a lot of government agencies are doing.

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We have splash here doing similar work in many countries.

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We have King County.

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I receive a lot of flyers from you guys how to behave and so we have that.

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So we're well served by these partners.

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But when it comes to the Gates Foundation, because we show this South Africa video, I'm going to go back to that.

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We have done similar work in many other countries where the education outreach piece is really embedded in government programs.

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It's not the Gates Foundation who is going to raise awareness and educate communities.

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You have in most of these countries a lot of resources available within government, within the civil society, who are deeply embedded in rolling out programs and supporting program advocacy to raise awareness and really educate communities on best use and best practices of that.

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So it's been a very strong engagement of our program.

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We are at the state where we feel very, very proud of foundational contribution in this area and we are outsourcing those work going forward to those partners who have now, they have other resources, other than myself and the voice and the power to continue doing this.

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>> I would just add, I live in Jefferson county, so I live in port Townsend.

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And there are a lot more maybe diverse sanitation systems out there than in King County.

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I think that part of it is being aware of where your poop goes and talking and go take a tour actually.

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Go take a tour of Bright Water.

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Totally shout-out to King County.

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Go take a tour and learn.

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If you have kids, ask your kids' schools to take a tour to learn where these things go because they can become advocates for alternative approaches and isn't it cool that there are biosolids.

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You go to the garden store, let's buy that.

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These are the sorts of ways that we change that culture.

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So these are really good questions.

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I'm really excited by this.

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Okay.

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So first I'll start with maybe a technical one.

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So Doulaye how much water is lost with a flush with a closed-loop toilet?

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>> Doulaye: That's a very good one.

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This is one that I say inspired and like most -- when we say closed-loop that means there's no water coming out.

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There's water coming out.

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Every single time you use a totally, every time you use a toilet you have the same water going out.

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But it's clean water, because once your reserve, your tank is filled with flushing, every single time you produce new water that would go out.

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And it's excess water the system would produce.

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That's makeup water that keeps your reservoir completely full.

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If it needs one or two people pee to keep that reservoir full, if more people are using it, that's excess water going out.

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And it's clean.

01:01:28.000 --> 01:01:32.000

The community of people as well.

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>> Rachel: I'm trying to summarize and synthesize the questions as well.

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So there are a lot of questions here that ultimately could be categorized as business model kind of questions or operating model questions.

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So what do you do if you have a closed loop toilet and it breaks down, who fixes it?

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Hang on, there's a couple more.

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What is the cost?

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And how am I going to pay for it?

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Are you thinking about supplier credits?

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Or what are the different mechanisms and business models that accompany these because it could be such a different system, meaning a different model, than the public utility model.

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But maybe it could be a public utility, too.

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I think I can speak for -- my work at Resilient Water Accelerator hosted by global water aid, nonprofit working on water, these are questions we're working on, what are the business models, what are the functioning mechanisms, how can we connect these water sanitation and water reuse innovations with financing and climate finance.

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There were probably five or six questions I read that were all of that same vein.

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I'm just kind of curious, instead of going one by one, what do you think about -- what are your observations or thoughts about that and what the foundation is doing and then what others are doing in that space.

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>> Doulaye: I don't have a good answer for that, what's the business model, what's the service model and how much cost to service.

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Simply because this is like a growing field now.

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We have a lot of case studies.

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So here, for example, in the U.S., like most progressive cities like San Francisco would have regulations in place, pending in place to actually help buildings adopt new solutions.

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So with regulation and policy, you can do a lot of tariff regulation, and you can do a lot of tariff setting, and many cities or countries are not even at that level yet.

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That's like one area where investment, development, need to continue to get the right policy in place, to get the right regulatory framework in place, standard setting, product regulation, these are all services needed to make sure this is not just a technology landing in people's home, but it has to come as a packaged service and with a clear cost and a model that would allow those families, those communities or school, to actually pay back the service and the maintenance and all that.

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So I don't have a good answer for yes this is a model.

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When we start rolling out our scale, larger scale, a lot of this data would actually become very, very clear.

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So from our program, we want to be working with policies, regulatory to build that frameworkk.

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>> Rachel: Can I add to that?

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Love it.

01:05:10.000 --> 01:05:11.000

One of the things I want to encourage in this space that I get excited even on some of the frontiers of what's happening in this country, like -- this is not sanitation, but with lead removal right now, where there's a lot of federal money for lead removal, is shifting the ideas how do you protect the public good, public health, let's say, in this case but with different ideas for how you do that while engaging public and private entities.

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Because sometimes we have --

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there are a couple of questions what's the Victorian model.

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The Victorian model is centralized waste water treatment where you bring a all the pipes, you put a lot of pipes in and you move it -- you remove the waste from a neighborhood, put it into a centralized treatment plant and then you treat it and then you discharge it back into nature.

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And so all of these systems are decentralized and may be required distributed management and distributed regulated, but we also have to be thinking about where are the innovations in IT technology that could allow for better regulation or allow for more real time being able to get someone to your home if something is not working.

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Like, rethinking what is public, what is private and what are the roles of the different sectors I think is also at the frontier of how we use these technologies, because the systems that

we built to manage a centralized waste water treatment plant at a network system are not going to be fit for purpose for this frontier.

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And so as maybe to the general public, what I would say is keep an open mind for how things get done but also make sure that the quality and the public health standards are being met.

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Like, we can't compromise on that, but we maybe can compromise on other things.

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Yes, Deborah, are we finished?

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>> No, not yet.

01:06:38.000 --> 01:06:42.000

>> Are there more questions because these questions are so good.

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>> I want to take one from the online audience.

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Thanks for all the questions.

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We'll definitely take all of them and try to respond virtually post program.

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But we do have a question.

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There's a couple on line.

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We're not going to get to all of them.

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But thank you for this conversation.

01:07:04.000 --> 01:07:13.000

I'm from Kenya, in our village schools schools with toilets retention is high and performance very high.

01:07:13.000 --> 01:07:15.000

My question is there a program that supports communities where water is scarce, especially in very remoment places in the world.

01:07:15.000 --> 01:07:20.000

Thank you.

01:07:20.000 --> 01:07:26.000

>> Doulaye: Is the question asking if there's a program at the Gates Foundation?

01:07:26.000 --> 01:07:27.000

>> I think you could either say Gates Foundation or if you know of an example.

01:07:27.000 --> 01:07:30.000

>> Doulaye: Okay.

01:07:30.000 --> 01:07:32.000

>> Rachel: You want to tackle what's happening in Kenya?

01:07:32.000 --> 01:07:36.000

You can start -- we might have the same answer.

01:07:36.000 --> 01:07:45.000

Let's see -- what are you going to say, Doulaye.

01:07:45.000 --> 01:07:57.000

>> Doulaye: So because the question is on the rural, and our program is focused on urban.

01:07:57.000 --> 01:08:17.000

The reason we focused the program on urban because we really want to fix and to solve economic and market failure of sanitation systems.

01:08:17.000 --> 01:08:24.000

The reason one of the key reasons 4.5 billion people don't have safe sanitation systems today is because there's no model to pay for on site sanitation system, which is completely different than sewer.

01:08:24.000 --> 01:08:37.000

And utilities, governments have not figured out -- this was the previous conversation -- how you do that.

01:08:37.000 --> 01:08:40.000

So we want to fix that and now leave it to market and government to actually identify how the system can be deployed later in smaller communities, rural communities.

01:08:40.000 --> 01:08:43.000

You have to pick where you make a win.

01:08:43.000 --> 01:08:44.000

So the program we run in Kenya mainly in urban areas.

01:08:44.000 --> 01:08:47.000

We have partners.

01:08:47.000 --> 01:09:00.000

We're not the only one supporting them.

01:09:00.000 --> 01:09:01.000

I think I can say safely program like synergy that is serving today more than 54,000 people in Nairobi.

01:09:01.000 --> 01:09:24.000

These are very good example.

01:09:24.000 --> 01:09:27.000

Other places you have solutions being displayed here with Lixir and Luatt, who are really great technology to actually make sanitation systems much better than urban and in rural communities as well.

01:09:27.000 --> 01:09:29.000

>> Rachel: I want to add thank you for watching this from Kenya.

01:09:29.000 --> 01:09:41.000

I know that's very early in the morning.

01:09:41.000 --> 01:09:43.000

So thank you for joining us and for all the participants who are coming in late at night and early in the morning, we see you because we work crazy hours too, and we know.

01:09:43.000 --> 01:10:05.000

It's very much appreciated.

01:10:05.000 --> 01:10:26.000

The other thing I'd just say look into container-based sanitation, part as you say Doulaye is around population density to service the containers but container-based models may be something you should look into for rural and dryer places.

01:10:26.000 --> 01:10:29.000

>> Doulaye: The person who asked the question is looking for partners, I would say one of our partners is UNICEF for this type of intervention, what visions partners who work in this area, the habitat.

01:10:29.000 --> 01:10:34.000

Partners working in this area.

01:10:34.000 --> 01:10:48.000

So we, the Gates Foundation get in the area with a program we want to resolve.

01:10:48.000 --> 01:10:49.000

It doesn't mean that it's not important for us, but we also have a lot of partners covering those issues.

01:10:49.000 --> 01:10:50.000

>> Rachel: All right.

01:10:50.000 --> 01:10:51.000

Is that it?

01:10:51.000 --> 01:10:52.000

Are we at time?

01:10:52.000 --> 01:10:53.000

>> Time.

01:10:53.000 --> 01:10:54.000

>> Rachel: We're out of time.

01:10:54.000 --> 01:10:57.000

I know, fast.

01:10:57.000 --> 01:11:02.000

Here's what I'd like to propose.

01:11:02.000 --> 01:11:06.000

So Doulaye, are you going to stick around for a little bit longer?

01:11:06.000 --> 01:11:11.000

So Doulaye and I are going to be sticking around.

01:11:11.000 --> 01:11:21.000

I don't know if they're still here, but a few of the sanitation team members as well.

01:11:21.000 --> 01:11:28.000

So please wander through the exhibits and then find us, and if you have questions, just please approach us and ask and we're happy to chat with you.

01:11:28.000 --> 01:11:29.000

With that, yes -- what else?

01:11:29.000 --> 01:11:31.000

>> Thanks.

01:11:31.000 --> 01:11:35.000

So just a few closing remarks.

01:11:35.000 --> 01:11:36.000

And thank you both, Doulaye and Rachel.

01:11:36.000 --> 01:11:40.000

Let's do a round of applause here.

01:11:40.000 --> 01:11:44.000

[APPLAUSE]

01:11:44.000 --> 01:11:47.000

>> Incredible conversation, thank you for sharing all your personal stories and experiences with us.

01:11:47.000 --> 01:11:49.000

We're so excited that the exhibit's up.

01:11:49.000 --> 01:11:54.000

And just a quick question.

01:11:54.000 --> 01:11:55.000

How many people have never been to the Discovery Center before that have been in the room here?

01:11:55.000 --> 01:11:56.000

Okay.

01:11:56.000 --> 01:11:57.000

So a few.

01:11:57.000 --> 01:11:58.000

A lot of people have been here.

01:11:58.000 --> 01:12:16.000

Great.

01:12:16.000 --> 01:12:25.000

Make sure you share about the exhibit with your -- I'm standing too close to the speaker. I also want to just mention we have an upcoming program focused on fermented foods because the foundation one of our grand challenges is fermented foods.

01:12:25.000 --> 01:12:32.000

One of our staff will be speaking with a person from Seattle Washington June 4th you'll get an opportunity to taste a lot of incredible local foods.

01:12:32.000 --> 01:12:41.000

And the last thing, I just want to share, we love to get feedback from you tonight so we can continue doing programs like this.

01:12:41.000 --> 01:12:42.000

So we have a link that we'll show but we also have a written one you can do by hand, and make sure you come and visit our partners.

01:12:42.000 --> 01:12:51.000

We have at least half an hour more.

01:12:51.000 --> 01:12:56.000

There's food and drinks up in the exhibition, visit the exhibit, and yes, if you have any questions please let us know.

01:12:56.000 --> 01:13:21.000

Follow us at discovergates.