New toilet technology after 150 years of waste (Update)

August 14 2012, by DONNA GORDON BLANKINSHIP

Marcos Fiovavanti, of the Ecuador-based "Fundacion In Terris" group, talks about the "Earth Auger Toliet," which is operated by a mechanical pedal and chain system, on display at the "Reinventing the Toliet" Fair, Tuesday, Aug. 14, 2012, in Seattle, which is part of a Bill & Melinda Gates Foundation competition to reinvent the toilet for the 2.6 billion people around the world who don't have access to modern sanitation. (AP Photo/Ted S. Warren)

(AP) — These aren't your typical loos. One uses microwave energy to

transform human waste into electricity. Another captures urine and uses it for flushing. And still another turns excrement into charcoal.

They are part of a Bill & Melinda Gates Foundation competition to reinvent the toilet for the 2.5 billion people around the world who don't have access to modern sanitation.

Scientists from around the world have taken up the challenge, and the foundation announced some projects Tuesday that will be getting more money to take their ideas from the lab to cities.

There, local entrepreneurs will use the new technology to turn pollution into cash.

"We couldn't be happier with the response that we've gotten," Bill Gates said.

To pass the foundation's threshold for the world's next toilet, it must operate without running water, electricity or a septic system, not discharge pollutants, preferably capture energy or other resources, and operate at a cost of 5 cents a day.

Bill Gates, right, looks at a device that uses solar energy to treat human waste, as he tours the "Reinventing the Toliet" Fair, Tuesday, Aug. 14, 2012, in Seattle, which is part of a Bill & Melinda Gates Foundation competition to reinvent the toilet for the 2.6 billion people around the world who don't have access to modern sanitation. (AP Photo/Ted S. Warren)

The United Nations estimates disease caused by unsafe sanitation results in about half the hospitalizations in the developing world. About 1.5 million children die each year from diarrheal disease.

Scientists believe most of these deaths could be prevented with proper sanitation, along with safe drinking water and improved hygiene.

The foundation expects to field test its first prototypes within the next three years.

Most of the prototypes on display this week in the open courtyard of the foundation's Seattle headquarters turn solid waste into energy. This is both a practical and pragmatic solution to the solid waste puzzle, said Carl Hensman, program officer for the foundation's water, sanitation and hygiene team.

Many recycle waste into other usable substances such as animal feed, water for irrigation, or even just energy and water to run their own systems.

Kara Nelson, left, of the University of California at Berkeley, talks about the "pHree Loo" toliet, which is designed to safely disinfect sludge waste, as it sits on display at the "Reinventing the Toliet" Fair, Tuesday, Aug. 14, 2012, in

Seattle, which is part of a Bill & Melinda Gates Foundation competition to reinvent the toilet for the 2.6 billion people around the world who don't have access to modern sanitation. (AP Photo/Ted S. Warren)

Some, like the winning project from Caltech, use chemistry and engineering to completely transform the waste.

Clement Cid, a Caltech grad student from Trouillas, France, said it has been intellectually rewarding to work with scientists from a variety of specialties.

"You can come up with great ideas," he said, adding that the toilet fair offered more opportunities for idea sharing.

Other projects on display were not so high-tech, including one from the London School of Hygiene and Tropical Medicine that sends black soldier fly larvae inside latrines and even home toilets to process waste, resulting in high quality, environmentally friendly animal feed at a cost of a penny a day.

Tove Larsen, second from right, of Eawag, the Swiss Federal Institute of Aquatic Science and Technology, talks about their diversion toilet at the "Reinventing the Toliet" Fair, Tuesday, Aug. 14, 2012, in Seattle, which is part of a Bill & Melinda Gates Foundation competition to reinvent the toilet for the 2.6 billion people around the world who don't have access to modern sanitation. (AP Photo/Ted S. Warren)

The fly larvae project is already being field tested in Cape Town, South Africa, and the inventors are working on a kit to sell to entrepreneurs. They have had inquiries from Haiti, Sudan, Kenya and Ghana about adopting the approach.

"At the end of the day it will look very low-tech, but there's a lot of science behind it," said Walter Gibson, a medical biochemist who is part of the development team.

The Gates toilet focus started just about a year ago, and including grants announced Tuesday, $370 million in foundation dollars have been committed to reinventing the toilet. Hensman said the foundation decided to hold a toilet fair this week to show how far the scientists have gotten in that time, and to give them an opportunity to learn from each other and potentially collaborate.

Among those scheduled to attend the toilet fair were government ministers from African nations, utility workers and potential financial partners like UNICEF and Oxfam.

Reinventing the toilet has the potential to improve lives as well as the environment.

Flush toilets waste tons of potable drinking water each year, fail to recapture reusable resources like the potential energy in solid waste and are simply impractical in so many places.

Gates predicted the result of this project would reach beyond the developing world.

"If we do it right, there's every possibility that some of these designs would also be solutions for rich and middle-income countries," Gates said.

More information: www.gatesfoundation.org/waters … iene/Pages/home.aspx

Citation: New toilet technology after 150 years of waste (Update) (2012, August 14) retrieved 21