

एक नया शौचालय, एक नयी सोच

REINVENT · THE · TOILET FAIR

MARCH 2014 • INDIA



AGENDA

FRIDAY, MARCH 21

Registration

8 a.m. to 10 a.m.

Conference Center Foyer

Exhibits open

10 a.m. to 6 p.m.

Lunch

1 p.m. to 3 p.m.

Durbar

Cocktail Reception

6 p.m. to 9 p.m.

Shah Jehan and Durbar

SATURDAY, MARCH 22

Registration

8 a.m. to 10 a.m.

Conference Center Foyer

Exhibits open

10 a.m. to 6 p.m.

Lunch

1 p.m. to 3 p.m.

Durbar

Awards Ceremony and Closing Remarks

4 p.m. to 5 p.m.

Shah Jehan

Reinvent the Toilet Challenge

In 2011, the Bill & Melinda Gates Foundation launched the global Reinvent the Toilet Challenge (RTTC) to bring sustainable sanitation solutions to the 2.5 billion people worldwide who don't have access to safe, affordable sanitation.

The global RTTC aims to create toilets that:

- Remove germs and disease from human waste.
- Recover valuable energy, clean water, and nutrients.
- Operate off the grid, without connections to water and sewer systems, or to electrical lines.
- Cost less than 3 rupees (\$.05 cents [U.S.]) per user per day.
- Promote sustainable and financially profitable sanitation services and businesses that operate in poor, densely populated areas.
- Are truly aspirational next-generation products that everyone will want to use—in developed as well as developing nations.

Global RTTC Program Expands to India, China

In 2013, the Gates Foundation, in partnership with the Government of India's Department of Biotechnology (DBT), under the Ministry of Science and Technology, jointly funded the Biotechnology Industry Research Assistance Council (BIRAC) to launch RTTC: India. Also in 2013, the Gates Foundation launched an RTTC program in China. Both of these country-specific programs are designed to harness strong in-country research and development capabilities to solve this global challenge.

The RTTC: India program is exclusively for Indian organizations. While it follows the specifications of the global challenge, it is tailored to the approaches of Indian partners.

The RTTC: China program will support Chinese investigators to drive research, development, and production of the "next-generation toilet."

EVERY DAY, 2.5 BILLION PEOPLE WAKE UP WITHOUT ACCESS TO TOILETS, RISKING THEIR HEALTH AND SAFETY.

The Reinvent the Toilet Fair: India is an opportunity to change that.

Featuring partners of key Government of India ministries, and the Bill & Melinda Gates Foundation, the fair showcases innovative products and approaches that aim to bring safe, affordable, and sustainable sanitation to those who need it most. These include efforts to create toilets that are not connected to water, sewer, or electricity; to improve the collection, treatment, and disposal of human waste; to address behavior change; and to raise awareness of this critical issue for governments, stakeholders, and local communities.

This year's fair in New Delhi is co-hosted by the Government of India's Department of Biotechnology and the Bill & Melinda Gates Foundation, with the support of India's Ministry of Housing and Urban Poverty Alleviation, Ministry of Urban Development, and Ministry of Drinking Water and Sanitation. India is uniquely positioned to be a global leader in the development of new sanitation technologies and a range of other innovative approaches to achieve sustainable gains in sanitation in India and abroad.

Through the Reinvent the Toilet Fair: India, we hope to stimulate discussion and spur partnerships to bring affordable sanitation solutions to those in need.

Students waiting in line to use Eram Scientific Solutions' children's Delight e-toilets at the Manacaud School (Thiruvananthapuram, India, 2013).



ABOUT THE EXHIBITORS

The Reinvent the Toilet Fair: India features groundbreaking work from a number of groups including: projects working on Reinvent the Toilet Challenge grants from the Bill & Melinda Gates Foundation; Foundation Grand Challenges Explorations grantees; and others who are working on safe, affordable sanitation solutions, as well as organizations working to raise awareness of sanitation issues.

Kweku A. Anno, founder of Biofilcom, left, and Caleb K. Ansah at Dzurwulu Primary School installing Biofil toilets (*Accra, Ghana, 2014*).



Reinvent the Toilet Fair: India Exhibitors

Reinvent the Toilet Challenge Projects (Grantees of the Bill & Melinda Gates Foundation)

Since 2011, the Bill & Melinda Gates Foundation has awarded 16 Reinvent the Toilet Challenge grants to researchers around the world who are developing “next-generation” toilets that are environmentally safe, sustainable, and affordable.

Grand Challenges Explorations Projects (Grantees of the Bill & Melinda Gates Foundation)

Grand Challenges Explorations is a grant program that fosters innovative, early-stage research to expand the pipeline of ideas that can lead to much-needed global health and development solutions. Awarded in 2011, these grants support projects working to develop sanitation solutions in one of four areas:

- Latrine pit and tank emptying
- Energy recovery from fecal sludge for safe, affordable treatment and disposal
- Sanitation solutions for water-challenged areas
- Easy-to-clean, attractive, and affordable latrine and squatting platform technologies

Additional Exhibitors

These include academic, nonprofit, and private organizations working on a range of projects that are critical to increasing access to and uptake of safe, sustainable sanitation solutions in both urban and rural areas. The work of these partners includes sanitation products and services, and advocacy and behavior change programs. Some of these exhibitors are funded by the Gates Foundation.



Workers inspecting the soil at Ga-Mashie aerobic composting facility (Accra, Ghana, 2014).

Exhibitors

AEROSAN

Aerosan: Low-Cost Sanitation for Emergencies

USA, Canada, and Haiti

Single toilets and multiple-unit arrays are designed to be used for emergency situations like natural disasters or refugee camps. The Aerosan processing component can be used for composting, drying, or other off-grid processing, since all excreta are completely contained. No water or electricity is required. Squat and pedestal styles are both available.

Received funding from the Bill & Melinda Gates Foundation

AMERICAN STANDARD BRANDS

Affordable, Aspirational Sanitation Products for Sub-Saharan Africa

USA

Building on the success of the SaTo latrine pan in Bangladesh, American Standard Brands is now working to develop an affordable, aspirational sanitation product that meets customer needs in sub-Saharan Africa. The goal is to develop a product that enables simple construction of a more hygienic latrine, improves the user experience, and supports a sustainable business model.

Received funding from the Bill & Melinda Gates Foundation

ARGHYAM

India

***Behavior Change Communication (BCC) for Sanitation:** Arghyam's BCC campaign strives to generate sustained demand for household toilets and to encourage people to use toilets by promoting behavior change.*

***Addressing the Value Chain of Sanitation: Center for Urban and Regional Excellence (CURE):** Arghyam has awarded a grant to CURE to scale up appropriate toilet designs in Agra's slums. The project is designed to foster strong community involvement and promote healthy sanitation choices across the entire value chain.*

***ACCEPT Society: Soil Biotechnology Treatment (SBT):** Arghyam has funded the installation of an SBT plant at the campus of ACCEPT Society, an AIDS-care hospice on the outskirts of Bangalore, which has enabled the recycling and reuse of treated wastewater within the campus, reducing the dependence for water on external sources.*

ASIAN INSTITUTE OF TECHNOLOGY

Solar Septic Tank and Hydrocyclone Toilet

Thailand

***The Solar Septic Tank:** A solar septic tank that enables faster degradation rates of organic matter in human waste and greater disinfection efficiencies as compared to the conventional septic tank.*

***The Hydrocyclone Toilet** separates solid and liquid portions of flushed water before treating in different units. Separated solids are heated at the desired temperature for a minimal duration to disinfect and produce a safe-to-reuse solid. The separated liquid is disinfected using electrochemical technology without chemical additives to generate a pathogen-free liquid for agricultural reuse.*

Received funding from the Bill & Melinda Gates Foundation

BEIJING SUNNYBREEZE TECHNOLOGY INC.

Waterless Toilet and On-site Waste Processor

China

The goal of this waterless toilet is to use existing technologies that are economical and easily repaired. It is initially intended for countries where the sun can generate at least 2 kilowatts of heat to dry and sanitize fecal waste into fertilizer. Solar cells can power the device in sunny countries, while wind or other electric sources can power the toilet and waste processor in areas with less sunlight.

Received funding from the Bill & Melinda Gates Foundation

BIOFILCOM

Biofil Toilet System

Ghana

The Biofil Toilet System uses aerobic digestion to decompose fecal waste. The digester can be connected to water closet toilets in homes, schools, and offices. In dense urban areas where water lines are not available, a micro-flush toilet bowl can be connected to the digester. The system also incorporates a water-sealed flap that eliminates odors and flies. The project includes field testing of the digester, user preference studies, and development of a scalable business model that will be attractive to investors.

Received funding from the Bill & Melinda Gates Foundation

CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH)

Caltech's Self-Contained, PV-Powered Domestic Toilet and Wastewater Treatment System

USA

An onsite wastewater treatment and recycling unit that can be powered by solar panels or by connection to the electrical grid. The fully integrated electrochemical treatment system generates hydrogen as a by-product of waste treatment and features a microfiltration component for water reuse and recycling.

Received funding from the Bill & Melinda Gates Foundation

CENTRE FOR ADVOCACY AND RESEARCH (CFAR)

From Basti to Bhawan

India

This on-field implementation program has aimed to increase cooperation and coordination among a cross-section of stakeholders, from government bodies to implementation agencies to municipal bodies in Delhi, Jaipur, and Kolkata, with the goal of improving sanitation services for at-risk communities. By facilitating interaction among groups large and small, public and private, we hope to address major sanitation concerns in these settlements. Thus far, successes include improving garbage collection in difficult-to-reach settlements near Kolkata; the repair and cleaning of ducts to ensure proper drainage in Jaipur, benefiting nearly 2,000 households; and improving access to toilets in Delhi's urban slums, benefiting more than 10,000 people living on the edge.

Received funding from the Bill & Melinda Gates Foundation

CENTRE FOR ENVIRONMENTAL PLANNING AND TECHNOLOGY (CEPT) UNIVERSITY

Tool for Performance Improvement Planning (PIP)

India

CEPT's PIP tool has been developed to help organizations and governments prepare a performance improvement plan. Unlike most project reports prepared in India, the plan generated is a service-oriented, multiyear decision-making tool that simulates the impact of interventions on service delivery, costs, and financing requirements, which allows for better utilization of existing assets.

Received funding from the Bill & Melinda Gates Foundation

CENTER FOR STUDY OF SCIENCE, TECHNOLOGY AND POLICY (CSTEP)

A Platform for Integrated Sanitation Investment Planning

India

A proof of concept decision support tool that facilitates an integrated approach to sanitation investment planning for urban local bodies in India, the CSTEP platform provides stakeholders with information about existing and new technologies. This knowledge allows them to compare alternatives and assess the benefits and costs in order to make more informed decisions. The generic design allows the platform to be utilized in any area where the required data is available.

Received funding from the Bill & Melinda Gates Foundation

CENTRE FOR POLICY RESEARCH, NEW DELHI

Scaling City Institutions for India (SCI-FI): Sanitation

India

Through research, SCI-FI: Sanitation aims to inform and support the formulation and implementation of the Government of India's urban sanitation programs and investments. The research program will study two cities in two different states to understand the reasons for poor sanitation and inform and support the state and city governments in modifying their urban sanitation programs so that they are supportive of alternative technology and service delivery models, with the goal of increasing access to safe and sustainable sanitation in urban areas.

Received funding from the Bill & Melinda Gates Foundation

CLIMATE FOUNDATION, CORNELL UNIVERSITY, SANERGY, TIDE TECHNOCRATS, AND THE PRASINO GROUP

Conversion of Human Waste into Biochar Using Pyrolysis at a Community-Scale Facility in Kenya

USA, Kenya, and India

This biochar reactor processes human solid waste into valuable end products: energy, heat, and a soil amendment to improve crop growth. The reactor is engineered such that it is self-containing and needs no external power, water, or sewerage.

Solid and liquid human waste get collected separately in Sanergy's vertical sanitation chain in Nairobi. By processing the solid waste at high temperatures, all the harmful pathogens are eliminated. The solid waste is quickly converted to biochar, a valuable end product with the look and feel of coal. Biochar, a type of charcoal made from organic waste, can serve as a carrier for fertilizers, as a fuel briquette, or even as a filter for water or air—valuable commodities in Eastern Africa!

Received funding from the Bill & Melinda Gates Foundation

CRANFIELD UNIVERSITY

The Nano Membrane Toilet

United Kingdom

This household toilet is designed to turn urine and feces into clean, safe water. The toilet has a waterless flush that blocks the user's view of the waste and prevents odors from escaping. Hollow-fiber dense polymer nano-membranes enable water to be removed from the waste, leaving pathogens concentrated on the solids and allowing the water to be safely used in the home. The solids are then coated using a nano-spray mechanism that further contains odors and allows safe handling. The whole system runs off human power generated using a bicycle or hand crank, and has an aspirational design.

Received funding from the Bill & Melinda Gates Foundation

DEFENCE RESEARCH LABORATORY, DRDO, INDIAN MINISTRY OF DEFENCE

DRDO Bio-toilet

India

This scalable toilet system provides eco-friendly management of human fecal matter. The technology consists of a specially designed anaerobic tank and a natural secondary treatment bed for effluent water. A highly efficient group of bacteria digest human fecal matter into colorless, odorless gases and effluent water that is safe to reuse. This treatment process saves water, needs no energy, and is maintenance-free.

DELFT UNIVERSITY OF TECHNOLOGY

Sanir: Upgrading Human Waste with Plasma-Driven Gasification

The Netherlands

This community-based sanitation system processes water on site and upgrades urine and feces into energy at an omni gasification plant. Human waste is dried, converted to syngas, and fed into a fuel cell. This process destroys pathogens immediately and generates enough energy to power the system, creating a sustainable cycle. Other focal areas in the project are the design of a water-diverting toilet and a community sanitation center, as well as the recognition of women empowerment, branding, and sustainable business modeling.

Received funding from the Bill & Melinda Gates Foundation

DEPARTMENT OF INDUSTRIAL DESIGN, SPA DELHI

"Soch"alaya – The Thinking Toilets

India

A tremendous opportunity exists for design to improve quality of life, preserve the environment, reduce disease, and uphold human dignity. With this mandate, the Design Studio at the department of Industrial Design, SPA (Delhi) began Project "Soch"alaya, or "The Thinking Toilets," and spent 10 weeks addressing diverse domains, reinventing the toilet, and designing sanitation systems.

DUKE UNIVERSITY

Anaerobic Digestion-Pasteurization System

USA

This household-scale sanitation solution uses anaerobic digestion to convert waste from toilets into biogas. It features a biogas-powered heater-heat exchanger system that eliminates pathogens from the treated waste. The system's effluent can then safely be used for irrigation.

Received funding from the Bill & Melinda Gates Foundation

DUKE UNIVERSITY AND THE UNIVERSITY OF MISSOURI

Neighborhood-Scale Treatment of Sewage Sludge by Supercritical Water Oxidation

USA

This neighborhood-scale sewage treatment system utilizes supercritical water oxidation (SCWO) to sanitize human waste. It does not require prior dewatering or drying of fecal sludge, and it effectively eliminates all types of harmful organisms while producing clean water that can be reused. SCWO is an emerging technology showing promise in treating problematic wastes such as chemical weapons, hazardous wastes, and sewage sludge.

Received funding from the Bill & Melinda Gates Foundation

EAWAG (SWISS FEDERAL INSTITUTE OF AQUATIC SCIENCE AND TECHNOLOGY), DESIGN BY EOOS

Blue Diversion

Switzerland and Austria

The Blue Diversion is a next-generation urine diversion dry toilet that provides water for flushing, hand washing, and personal hygiene. Urine, feces, and used water are separated at the source. The used water is recovered on site in a self-cleaning ultrafiltration unit and reused. The toilet features a business model, linking the family-scale toilet to a community-scale resource recovery plant (RRP). Urine and feces are transported to the RRP where marketable urine-based fertilizer is produced by partial nitrification and distillation. The business model encompasses the entire sanitation value chain, and constitutes a profitable business opportunity.

Received funding from the Bill & Melinda Gates Foundation

ERAM SCIENTIFIC SOLUTIONS PVT. LTD., CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH), AND DUKE UNIVERSITY

eToilet Imperial Model

India

Eram has created a self-cleaning and electronic public toilet facility that incorporates a sustainable sanitation approach through the integration of mechanical processes and mobile technologies. This allows for entry control, cleaning, and remote maintenance monitoring capabilities. It also incorporates multiple revenue generation options, such as pay-for-use and advertising capabilities. The proposed system features automatic sterilization, self-cleaning and -washing, a pressure-assisted vacuum sucking mechanism, water minimization using sensor enabled systems, and an atmospheric water generator.

Received funding from the Bill & Melinda Gates Foundation

FSOI DEVELOPMENT FIRMS: AGI ENGINEERING, BEAUMONT DESIGN, DCI AUTOMATION, AND SYNAPSE PRODUCT DEVELOPMENT

The Fecal Sludge Omni-Ingestor (FSOI)

USA

The Omni-Ingestor program is a suite of technologies that include specialized pumping mechanisms, de-trash, de-grit, de-watering instruments, and treatment systems. These technologies enable vault emptying services to access pits and tanks that cannot currently be reached with mechanical pumping systems, empty the contents of both wet and dry vaults, reduce sludge transportation costs, increase profits, and operate sustainably.

FUNDACIÓN IN TERRIS AND CRITICAL PRACTICES LLC

The Earth Auger: Urine Diverting Dry Toilet

Ecuador (FIT) and USA (CP)

The Earth Auger is an affordable urine-diverting dry toilet that has functional and user-friendly features designed to increase the acceptability of dry sanitation. The various models, which require no water or energy, accommodate both high-density and rural communities, and can fit the financial constraints of low-income residences.

Received funding from the Bill & Melinda Gates Foundation

INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Zero Discharge Toilet System

India

A multi-user toilet facility that combines hygienic safety, user-friendliness and environmental protection with significant water saving, the Zero Discharge Toilet System is similar to conventional flush toilets, but the processing of waste and water used is radically different. The waste solids and liquids are separated under the toilet pan by a solid-liquid separator, with the solids forming a slurry suitable for composting. The separated liquid waste is clarified in another tank by flocculent settling and is reused for toilet flushing.

INSTITUTE FOR FINANCIAL MANAGEMENT AND RESEARCH (IFMR) AND QUICKSAND DESIGN STUDIO

Project Sammaan

India

An urban sanitation initiative, Project Sammaan is dedicated to redesigning and improving toilet facilities in slum communities across India, beginning in Bhubaneswar and Cuttack. The ultimate goal of the project is to identify which solutions will produce the most attractive, sustainable, and hygienic alternatives to open defecation for slum residents.

Received funding from the Bill & Melinda Gates Foundation

IRC INTERNATIONAL WATER AND SANITATION CENTRE

WASHCost Calculator

The Netherlands

The WASHCost calculator is an easy-to-use tool for evaluating the life cycle costs of sanitation and water. With benchmarks set by experts, the tool generates a comprehensive report with an evaluation of capital and recurrent costs, affordability to households, and service levels. Results are easily shared and will facilitate discussion about financing services and collecting any missing data. As more data becomes available, the tool grows smarter—and so do results.

Received funding from the Bill & Melinda Gates Foundation



Delivering the Eawag/E00S Blue Diversion toilet for field testing (Kampala, Uganda, 2013). Photo © Eawag/ E00S

JANICKI INDUSTRIES

Omni-Processor

USA

The Janicki Omni-Processor is a small combined heat and power plant that burns dry fecal sludge and waste products in a fluidized bed combustor. The heat from combustion is utilized to generate high-pressure steam that is expanded in a reciprocating piston steam engine connected to a generator, producing electricity. The exhaust from this engine (process heat) is used to dry the incoming fecal sludge.

LOOWATT LTD.

The Loowatt System

United Kingdom and Madagascar

The Loowatt system is a patented waterless toilet system that generates energy and fertilizer. A simple toilet seals human waste into anaerobically digestible polymer film lining material. Loowatt is developing and installing end-to-end system hardware, including toilets, anaerobic digesters, and digestate-to-fertilizer treatment facilities, in Antananarivo, Madagascar. The Loowatt system works in a wide variety of contexts and is also being piloted in the United Kingdom as an alternative to chemical portable toilets.

Received funding from the Bill & Melinda Gates Foundation

LOUGHBOROUGH UNIVERSITY

Reinventedtoilet@lboro

United Kingdom

A user-friendly, fully operational household toilet system that transforms feces into biochar through the hydrothermal carbonization of fecal sludge. The toilet's configuration eliminates the hassle of separating urine and excreta, and can also process other organic waste, such as sanitary napkins and food products.

Received funding from the Bill & Melinda Gates Foundation

NATIONAL UNIVERSITY OF SINGAPORE (NUS)

Low-Cost Decentralized Sanitary System for Treatment, Water, and Resources Recovery

Singapore

A three-way urine diversion sanitary system that transforms feces into biochar through pyrolysis; recovers energy via microbial fuel cells; recovers and cleanses water from urine via evaporation, condensation, and sand/zeolite filtration; and produces fertilizers from concentrated urine.

Received funding from the Bill & Melinda Gates Foundation

NORTH CAROLINA STATE UNIVERSITY

Hygienic Pit Emptying Using a Modified Auger – “The Excrevator”

USA

A modified power auger for safe and hygienic waste extraction can be used to empty a typical pit in one to two hours. The device, which can increase efficiency and safety, can be easily transported by hand and operated by two people, allowing for the pumping of remote pits that are inaccessible by vacuum truck.

Received funding from the Bill & Melinda Gates Foundation

POLLUTION RESEARCH GROUP, UNIVERSITY OF KWAZULU-NATAL; ETHEKWINI WATER AND SANITATION, ETHEKWINI MUNICIPALITY

Data Acquisition and Field Support for Sanitation Projects

South Africa

The Pollution Research Group at the University of KwaZulu-Natal, in partnership with the eThekweni Water and Sanitation Unit of the eThekweni Municipality, is focused on characterizing the physical and chemical properties of excreta streams from dry on-site sanitation systems or from decentralized low-water consuming sanitation systems.

Received funding from the Bill & Melinda Gates Foundation

POPULATION SERVICES INTERNATIONAL (PSI), WATER FOR PEOPLE, AND PATH

Supporting Sustainable Sanitation Improvements in Bihar (3 Si); Parry's Modular Latrine; the Rammer

India; Uganda; Malawi; Rwanda; Bolivia; and Peru

3Si: Supporting Sustainable Sanitation Improvement: These organizations are committed to providing access to desirable, affordable latrines for rural households in the Bihar province of India. The toilets are designed to improve usage, particularly among women, and improve access to quality toilets. Households unable to afford the cost of the toilet are also supported through existing microfinance institution networks and fund managers.

Parry's Modular Latrine: Parry's Modular Latrine is a complete pour-flush latrine package that allows customers to assemble their product much like a children's building kit. This innovation comprises interlocking, pre-cast concrete components, resulting in a quick, simple assembly process in which the final quality is guaranteed. The product's evident durability has earned it the moniker “Dura-San.”

Rammer: The Rammer is a next-generation Gulper omni-ingestor that goes deeper and is cleaner than the original, yet retains the important qualities of having low costs, being locally manufactured easily, and being simple to maintain, while remaining lightweight and not worth stealing.

Received funding from the Bill & Melinda Gates Foundation



Patrick Apoya with Water and Sanitation for Africa (WSA), left, and Peter Janicki, founder and CEO of Janicki Industries, viewing the feed auger on the Janicki Omni-Processor (Sedro-Woolley, United States, 2014).

RTI INTERNATIONAL

Participating Firms: Roca Sanitario, S.A., Duke University, Colorado State University, AppTech Solutions, NASA, U.S. Naval Research Lab, and NEERMAN

WiC

USA, Spain, and India

WiC is an off-grid toilet that converts human waste into burnable fuel, storable energy, and disinfected, non-potable water, all without requiring piped-in water, a sewer connection, or outside electricity. A robust, ultra-low flush squat plate design is used to create a water seal that reduces odor. The project includes field testing and evaluation of the prototype in India beginning in mid-2014 to ensure that economic, cultural, and political factors inform the development of the finished toilet system.

Received funding from the Bill & Melinda Gates Foundation

SANERGY

Sustainable Sanitation in Africa's Urban Slums

Kenya

Sanergy offers an innovative systems-based approach to building out the entire sanitation value chain in urban slums. Sanergy fabricates small-scale yet high-quality modular urine-diverting dry toilet sanitation centers. Facilities are franchised to local microentrepreneurs, who generate viable incomes from charging residents a nominal usage fee. Sanergy then collects sludge from these facilities daily, and converts it into a portfolio of high-margin products: organic fertilizer, renewable energy, biochar, and animal feed.

Received funding from the Bill & Melinda Gates Foundation

SANTEC

GF-1 All Solar Unit

USA

This is a multi-family toilet system that utilizes the distillation of liquid waste and dewateres solid waste to produce clean water and usable biofuel/fertilizer. The self-sufficient unit is solar powered and utilizes a wireless Internet or GSM connection for maintainability. The system utilizes globally available and proven component parts for scalable implementation.

Received funding from the Bill & Melinda Gates Foundation

SCOPE

Ecosan Urine Diversion Dehydration Toilet (UDDT)

India

Ecosan's UDDT is a two-chamber, environmentally friendly, on-site sanitation option, built above ground and usable in water-scarce areas. Feces, urine, and wash water are collected separately. Ash or sawdust is applied to feces after defecation to sanitize the waste. The diluted urine and sanitized feces can then be used to increase farm productivity, saving energy and closing the loop on sanitation.

Exhibitors

SESAME WORKSHOP

'S' is for Sanitation

Bangladesh, India, and Nigeria

Sesame Workshop is developing a multimedia intervention to promote positive sanitation and hygiene behaviors in children ages three to seven and their caregivers in Bangladesh, India, and Nigeria. The project will provide critical sanitation and health messaging on latrine use, wearing footwear to the latrine, hand washing to break the oral-fecal route of disease transmission, and the safe treatment and storage of water. The project's multicountry approach blends mass media elements and community-based components that are unique to each country.

Received funding from the Bill & Melinda Gates Foundation

STONE INDIA LIMITED

Aerobic Biological Toilets

India

An Aerobic Biological toilet is one that completely digests human waste through aerobic digestion, facilitated by air draft in a multichamber bio-digester tank. The waste is converted into non-toxic, non-contaminating, non-pathogenic, odorless, neutral water, which is safe for the environment and can be used as an irrigation nutrient.

SULABH INTERNATIONAL SOCIAL SERVICE ORGANISATION (SISSO); SULABH SANITATION & SOCIAL REFORM MOVEMENT

Sulabh Technologies

India

Sulabh Technologies utilizes four innovations to promote personal sanitation: a two-pit pour-flush compost toilet known as the Sulabh Shauchalaya; an excreta-based biogas digester; the Sulabh Effluent Treatment technology, which recycles and purifies waste water by filtration of effluent through activated charcoal followed by ultraviolet rays; and Sulabh-designed public sanitation facilities. Working in tandem with the Sulabh Sanitation & Social Reform Movement, SISSO has constructed 1.3 million Sulabh toilets and more than 8,000 community toilet blocks. More than 15 million people use toilets based on the Sulabh design every day.

In addition, Sulabh International has constructed 200 excreta-based biogas plants to recycle and reuse human waste for such uses as cooking and electricity generation. The Effluent Treatment methodology reduces biochemical oxygen demand to less than 10 milligram per liter, safe for discharge into bodies of water.

SULABH SCHOOL SANITATION CLUB

Sulabh International

India

This campaign is focused on building a children's movement to promote sanitation in schools. By creating a school sanitation club, members become advocates, articulating and expressing their water, sanitation, and hygiene needs and spreading word to their own families and communities about proper sanitation and health. The campaign also focuses on the unique problems affecting girls, by giving girls a chance to discuss puberty and menstruation in a safe setting. The club also develops sanitary pads for distribution to menstruating girls in other schools.

UNICEF INDIA

Take Poo to the Loo

India

"Take Poo to the Loo" is a digitally led, fun, and interactive campaign designed to persuade toilet users to raise their voice to influence public opinion in support of an end to open defecation in India. The campaign aims to harness the voice of young people through fun on-ground activities that lead to participation and pledge-making via social media and actions at the local level.

UNILEVER

Oya: Community Waste Pyrolysis

United Kingdom

Oya is a neighborhood-scale treatment system that processes human waste in combination with household, industrial, or clinical wastes. The central technology is pyrolysis, which decomposes organic matter with heat in the absence of oxygen to produce energy and inert ash. No water or energy inputs are required. The system is currently undergoing trial in the United Kingdom.

Received funding from the Bill & Melinda Gates Foundation

UNIVERSITY COLLEGE LONDON AND IFAK

NewSan Prototype

United Kingdom and Germany

NewSan Prototype is a tool based on material flow analysis to simulate resource fluxes related to human excreta from households to final disposal or reuse sites. It simulates and visualizes the complete sanitation chain, ranging from user interface (toilet) through transport, treatment, and final utilization and disposal options. Among several model outputs are nutrient fluxes, energy consumption and generation, and capex/opex of the systems. NewSan will be useful to support integrated sanitation planning and design by engineer and consultant specialists from sanitation, and to assess commercial opportunities within the sanitation chain by municipalities, investors, financiers, donor agencies, and private sectors.

Received funding from the Bill & Melinda Gates Foundation

UNIVERSITY OF COLORADO BOULDER

Sol-Char Toilet

USA

This toilet uses concentrated solar energy to transform both fecal material and urine into disinfected, commercially viable end products such as solid fuel, heat, and fertilizer. The system uses parabolic dishes to concentrate sunlight, which is delivered to a reaction chamber via fiber-optic bundles. Fecal material is transformed into char, which can be used as a soil amendment or as solid fuel, while urine is thermally treated to produce nitrogen-rich fertilizer.

Received funding from the Bill & Melinda Gates Foundation

UNIVERSITY OF TORONTO

Sanitation NoW!

Canada

This is a 10-user on-site sanitation appliance that collects, rapidly disinfects, and recovers nutrients from human waste. The disinfected liquid stream can be used as fertilizer on a family garden, while ash from the smoldering process can be used as a soil conditioner.

Received funding from the Bill & Melinda Gates Foundation

UNIVERSITY OF THE WEST OF ENGLAND (UWE), BRISTOL

Urine-tricity

United Kingdom

The Urine-tricity project is designing a urinal that utilizes urine to produce electricity. Electricity is produced as a result of microbial breakdown and treatment of urine waste, which reduces the organic load and kills pathogens, thereby improving sanitation while creating a commodity.

Received funding from the Bill & Melinda Gates Foundation

WASH UNITED AND WORLD TOILET ORGANIZATION

WASH United and World Toilet Organization

Germany and Singapore

WASH United is a social impact organization based in Berlin, Germany, that harnesses the power of sport superstars, interactive games, and fun and positive communication to turn sanitation into an aspiration and make good hygiene cool. Working with a wide set of partners—from global sports federations to UN and governmental agencies—WASH United currently operates in India and in six African countries: Ethiopia, Ghana, Kenya, Lesotho, Tanzania, and Uganda.

The World Toilet Organization (WTO) is a global nonprofit organization committed to improving toilet and sanitation conditions worldwide. In 2001, the WTO established World Toilet Day and the World Toilet Summit, with the World Toilet College following in 2005, and SaniShop in 2009. In 2013, the United Nations officially recognized November 19 as World Toilet Day.

Received funding from the Bill & Melinda Gates Foundation

WORLD BANK WATER AND SANITATION PROGRAM, INTERNATIONAL FINANCE CORPORATION, AND KENYAN MINISTRY OF HEALTH

Selling Sanitation

Kenya

This exhibit showcases a range of plastic latrine slabs designed for both new toilet builds and retrofits that are easy to clean, long-lasting, affordable, and transferrable to a new pit. Through consumer research and iterative user testing, the slabs have technical features that make them desirable and user-friendly, such as butterfly footrests that allow flexibility in foot position and use by children; self-drainage, thereby not letting urine pool on the surface; standardized modified keyholes that minimize the risk of children falling in; and a dual hand/foot-operated lid to keep flies out and control smell.

Received funding from the Bill & Melinda Gates Foundation

3S – A DIVISION OF SARAPLAST PVT. LTD.

Johnny's Box and the Sixer

India

A single-seat toilet offered in two varieties, squat or Western-style, Johnny's Box is 100 percent recyclable and includes a unique patented snorkeling gas vent, gravity flushing, and a hand-wash basin. The restroom can be easily transported by one or two people and comes in both a septic-connected and a mains-free model.

The Sixer is a uniquely designed low water-usage urinal that accommodates up to six users, and is ideal for public places and large gatherings. The device is easy to install and is made of 100 percent recyclable material.



A young boy washing his hands in a community toilet refurbished by Samagra (Pune, India, 2014).

Reinvent the Toilet Fair: India Co-Hosts and Supporters

Co-Hosts

Government of India's Department of Biotechnology

The Department of Biotechnology (DBT) under India's Ministry of Science and Technology has given a new impetus to the development of the field of modern biology and biotechnology in India since its establishment in 1986. The department promotes and accelerates the pace of development of biotechnology in the country by providing support for Indian universities, research organizations, infrastructure establishment, bioclusters, and the promotion of public-private partnerships. The department has made significant achievements in the growth and application of biotechnology in the broad areas of agriculture, health care, animal sciences, environment, and industry, with the goal of benefiting society and the environment. India is uniquely positioned to be a global leader in the development of new sustainable sanitation solutions. The department is committed to partnering with all the relevant Government of India ministries to use science and technology to find impactful solutions.

The Bill & Melinda Gates Foundation's Water, Sanitation & Hygiene Program

The Bill & Melinda Gates Foundation's Water, Sanitation & Hygiene (WSH) program works to develop tools and technologies that can lead to sustainable and substantial improvements in sanitation in the developing world. The WSH program focuses on South Asia and sub-Saharan Africa, and works extensively in India due to the significant opportunities in the country to greatly improve sanitation. Guided by the belief that every life has equal value, the Bill & Melinda Gates Foundation works to help all people live healthy, productive lives. In developing countries, it focuses on improving people's health and giving them the chance to lift themselves out of hunger and extreme poverty.

With the Support of

Ministry of Housing and Urban Poverty Alleviation

The vision of the Ministry of Housing and Urban Poverty Alleviation is that of an equitable, inclusive, and sustainable civic-sensitive growth of towns and cities free from slums, that provides adequate affordable housing, means of productive employment, dignity, and a decent quality of life to all inhabitants, including the poor. With this as its key focus area, the ministry devises policies and schemes and supports initiatives and activities at various levels to address issues of urban employment, poverty, and housing in the country.

Ministry of Urban Development

The Ministry of Urban Development is focused on creating economically vibrant, inclusive, efficient, and sustainable urban habitats. Aimed at helping promote cities as engines of economic growth through improvement in the quality of urban life by facilitating creation of quality urban infrastructure, with assured service levels and efficient governance, the ministry formulates policies; sponsors and supports programs; coordinates the activities of various central ministries, state governments, and other nodal authorities; and monitors programs concerning all the issues of urban development in the country.



Department of Biotechnology
Ministry of Science and Technology
Government of India

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**Ministry of Housing and
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**Ministry of Urban
Development**
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