Transformative Sanitation Technologies: A New Path To Safe Sanitation For All

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Many parts of the world will continue to lack access to sewers.

2030 sewer access projections

- 0%-20%
- 21%-40%
- 41%-60%
- 61%-80%
- 81%-100%

Note: countries in gray do not have data reported.
Source: JMP 2017 Report; BCG analysis
Khulna City, Bangladesh (1.5 million population)

Safe Sanitation - means entire sanitation value chain
Transformative Technologies: 3 sub-portfolios

- **REINVENTED TOILET**
  - Single-unit (SURT)
  - Multi-unit (MURT)

- **OMNI INGESTOR**

- **OMNI PROCESSOR**
  - Household scale
  - Multi-unit scale
  - Pumping and processing
The Reinvented Toilet is a modular, transformative technology that offers a non-sewered sanitation solution, eliminating the need for a piped collection system. The aim is to: destroy all pathogens onsite and recover valuable resources, operate without sewer, water or electricity connections and cost less than $0.05/user/day.
Our core processing technologies

- Electrochemical
- Wet oxidation
- Dry combustion
- Biological

Examples:
- Caltech
- Loughborough University
- Cranfield University
- University of South Florida
- eawag
- Duke University
- JANICKI BIOENERGY
- UWE BRISTOL
- ADB
Nano-membrane Toilet (Cranfield University)

IWA Project Innovation Awards – Gold winner!!

http://www.nanomembranetoilet.org/
**Use Cases: MURT**

– Scalable; capable of servicing 50-800 users per day with one system.

**Key Features:**

– Unique electrochemical cells process mixed wastewater
– Process effluent can be reused as toilet flush water.
– Compatible with any type of flush toilets (squat pan, western style, etc.)
– At least one commercial partner prototype can be fully containerized

**Commercialization:** *Partnerships with large and small companies, open to additional partnerships*

– Test licenses in place with multiple commercial partners with path to commercial license. No commercial licenses negotiated to date.

**Learn More:** [http://hoffmann.caltech.edu/](http://hoffmann.caltech.edu/)
Loowatt – Laguna PTS Pilot

Toilets, Refills and Containers | Waste pre-processing equipment | Mobile app & web platform

Capture ➔ Storage ➔ Transport ➔ Treatment ➔ Reuse

Utility Partnerships: Expertise and Standard Operating Procedures Across Value Chain

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https://www.loowatt.com/
Biofil toilet
The era of innovation in the toilet industry has come. On May 24th, 120 experts from 33 countries met on top of the World, in Nepal and approved a new standard ISO 30500 that set requirements for toilets that kill pathogens, and do not produce any waste. #ReinventedToilet

Dr. Doulaye Kone
Deputy Director, BMGF WSH
Chairman, ISO PC 305
What is the omni-processor?

- A component of a fecal sludge treatment plant (FSTP), or combined WWTP/STP and FSTP providing the treatment element in the FSM value chain
- Results in safe and effective treatment of fecal sludge (pathogen free)
- May generate valuable outputs (e.g., electricity, fertilizer, water, ash, etc)
- May require less land / foot print than traditional treatment
- Ideally energy neutral
Janicki omni processor (JOP) Technology
patented technology designed for city level use, produces usable outputs

• JOP TECHNOLOGY TO BE ADAPTED BY THREE DIFFERENT COMMERCIAL PARTNERS

Learn More:
• Janicki Bioenergy: https://www.janickibioenergy.com/janicki-omni-processor/how-it-works/
• Ankur Scientific: https://www.ankurscientific.com/
• CRRC: http://www.crrcgc.cc/en

Current JOP Version 2 characteristics – varies by commercial partner adaptations
• Population served: ~ 300k-400k people (v2 size)
• Kills all pathogens; no harmful emissions
• Produces:
  - Electricity: 300 kW (250 kW net)
  - Dry sterile ash (fertilizer)
  - Distilled / potable water: 80,000 liter/day
Tide technocrats OP technology

- Population served 15,000 – 30,000 people
- Kills all pathogens, pyrolyzing sludge at 600 to 800 degree Celsius
- No harmful emissions
- Pyrolysis process outputs Sterile Bio-Char 4kg.hr

Narsapur, AP (Tide OP)
Warangal, Telangana (Tide OP)
Wai, Maharashtra (Tide OP)
Bangalore, Karnataka (Tide OP)
Reinvented Toilet represents a potential $6B+ global annual revenue opportunity

Technology currently in pilots and ready for commercialization

Ecosystem of partners and enablers exist to plug into

Extensive market intelligence conducted to inform business model

STeP and BMGF continue to develop market and enabling environment to maximize opportunity

2030 projections

BCG Analysis
People come to visit our FSTP thinking it’s a new park

Need Successful Demonstration Sites

Khulna, Bangladesh
Business opportunities for innovations
Inclusiveness; Gender Equity; Data & Measurement

Capacity Building

- Develop knowledge and expertise on FSM amongst sanitation professionals, policymakers and other stakeholders

CWIS City Investments

- Proof points in archetype locations demonstrate how cities can 'bend the curve' to achieve inclusive, sustainable sanitation

Local Financing

- Establish sustainable mechanisms for cities, entrepreneurs and households to finance FSM solutions

Service Models

- Demonstrate how cities enable financially sustainable service models in sanitation including PPPs, utility models, etc.

City Wide Inclusive Sanitation at Scale

Platforms for Replication; Institutional and Regulatory Environment

Market Development for Transformative Technologies

Policy & Advocacy

Financing: Multi- & Bi-Lat; Domestic

Inclusiveness; Gender Equity; Data & Measurement

Last updated: October 11, 2018
Thank you

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