



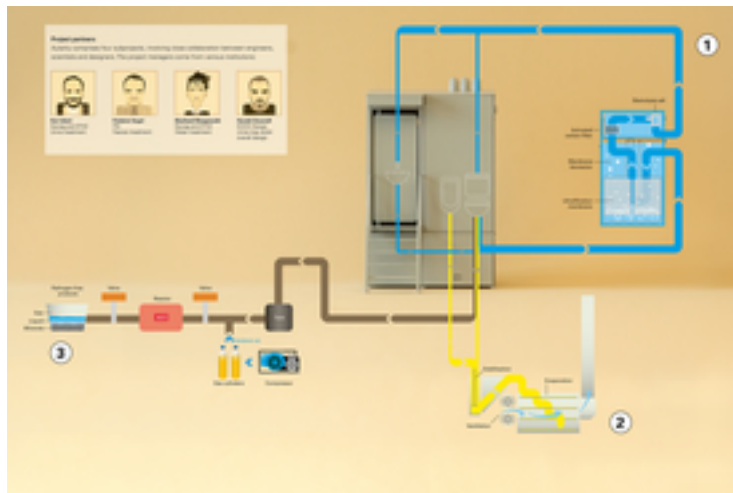
Reinventing the toilet

November 19, 2019 | Stephanie Schnydrig

Topics: Wastewater | Water & Development | Society

It's World Toilet Day today. What may sound curious is intended to draw attention to a serious problem. Because worldwide, one in three people lack access to appropriate sanitation. In the Blue Diversion Autarky project, researchers are developing an off-grid toilet, with on-site treatment allowing valuable resources to be recovered.

With the Blue Diversion Autarky toilet, faeces, urine and wastewater are separated at source. This means that the three streams can be independently treated according to their particular characteristics: pathogens can be removed more effectively, water can be recycled both for flushing and for handwashing, and nutrients can be recovered.



This is how the technologies for treating the different streams work in the "Blue Diversion Autarky" toilet.

(Graphic: Peter Penicka, Eawag)

Water treatment

The core of the water treatment system is the membrane bioreactor, in which contaminants are degraded by microorganisms. Bacteria and larger microorganisms are retained by the fine-pored ultrafiltration membrane. The activated carbon filter removes colour and odour from the water. The electrolysis cell produces chlorine – a long-term disinfectant – from dissolved salts still present in the water.

Urine treatment

Stabilisation of fresh urine with calcium hydroxide not only prevents unpleasant odours and the loss of nutrients but also inactivates pathogens. Water is then removed from the urine by evaporation. The resultant product is a concentrated nutrient solution, which can be used as a fertiliser.

Faeces treatment

Portions of faeces are conveyed by compressed air to the reactor, where they are heated to around 400°C under high pressure. Under these conditions, the organic matter, including all pathogens, is broken down into gas, water and minerals, which can potentially be used as a fertiliser. This process is known as hydrothermal oxidation (HTO).

Related Links

Blue Diversion Autarky – Wastewater Treatment off the Grid

SRF-Video

«[Eine Toilette, die trennt](#)» («A toilette that separates»). A Video of the Swiss Television to the World

Toilette Day. Only available in German.

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<https://www.eawag.ch/en/info/portal/news/news-archive/archive-detail/reinventing-the-toilet>