



Biomimicry is a **design practice** that teaches humans how to **fit in** on the planet by looking to nature.

Biology → Design

Design → Biology



WORLD >

Global population to hit 8 billion this year, U.N. says

UPDATED ON: JULY 12, 2022 / 8:14 AM / CBS/AFP





>50% of us lack safe access to a toilet

1.5 billion have no access

2019: 110 million toilets were built in India



Home along Lake Agawam, one of the most polluted lakes in New York state. Photograph: Desiree Rios/The Guardian



**30-50% of potable water
in the US is flushed.**

Bangalore generates more than **1.5 billion** litres per day of raw sewage but only has the capacity to **treat 40%** of it.

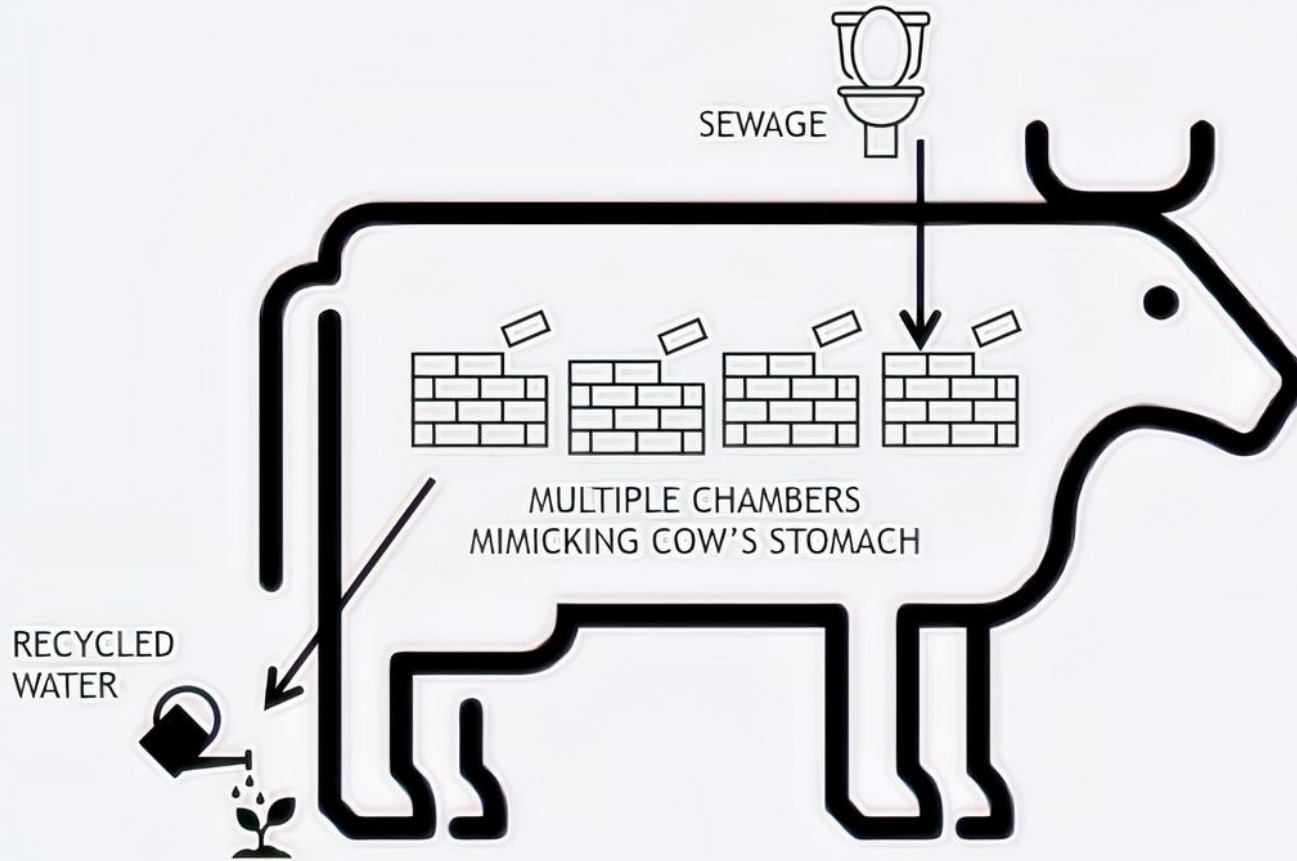
The **other 60%** of untreated sewage finds its way into lakes through the stormwater drain system



This is a design problem.



Digestion like a cow: EcoSTP



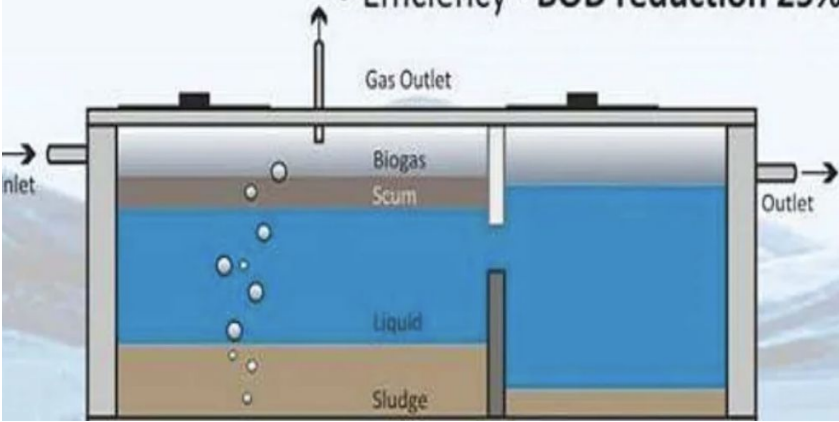
<https://www.bbc.com/news/av/science-environment-58017501>

Stage 1:

Bio Settler

- Solid-liquid separation of the effluent
- Anaerobic bacteria decompose the pollutants

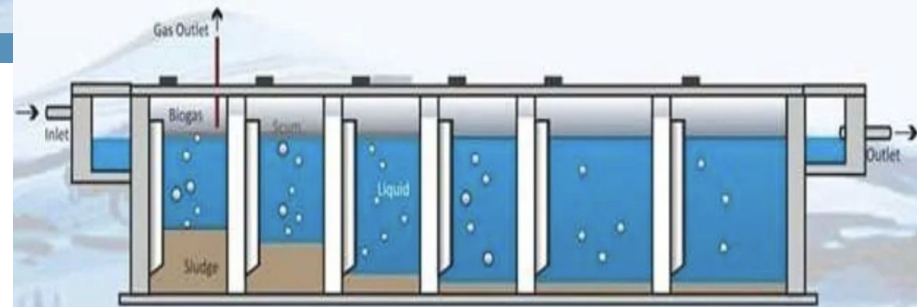
- Efficiency - **BOD reduction 25% - 40%**



Stage 2: FBR

Fluidized Bed Reactor

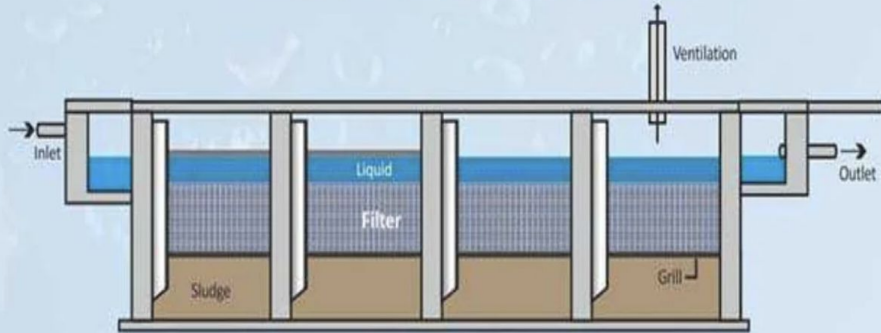
- Up-flow of wastewater in a series of baffled chambers
 - Activated sludge at the bottom of each chamber
-
- Efficiency - **BOD reduction 70% - 90%**



Stage 3: FFR

- Is a fixed bed or fixed film reactors.
- The filter is made out of gravel, slag or plastic elements.

- Efficiency - BOD reduction 70% - 90%

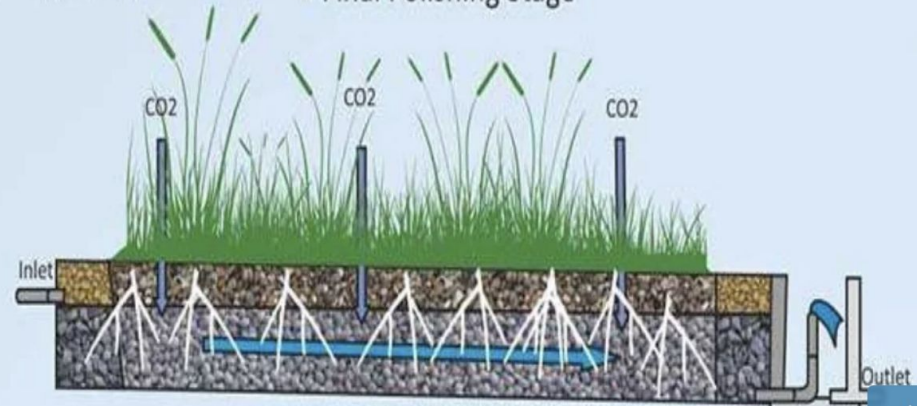


• Patent Pending

Stage 4: PGF

Planted Gravel Filter
(Optional)

- PGF is made of reed planted filter bodies
- Removes NPK
- Final Polishing Stage





Eco-Machine at The Omega Center in Rhinebeck, New York © John Todd Ecological Design

ZERO POWER, ZERO ODOUR AND ZERO CHEMICALS.

Imagine a world of clean water. Water is gold!
Together let's convert our sewage to gold.

IMPACT METER

SEWAGE TREATED
so far

818 ML

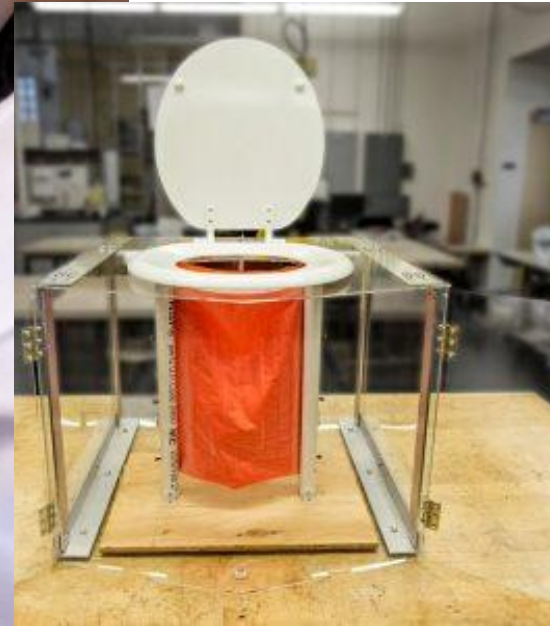
POWER SAVED
so far

1390 MWH

COAL SAVED
so far

1112 TONNES

ECOSTP[®]
sewage to gold

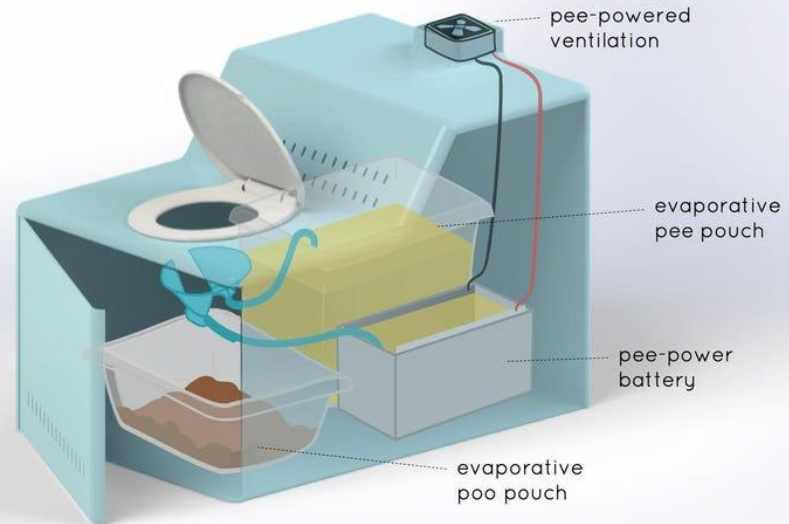
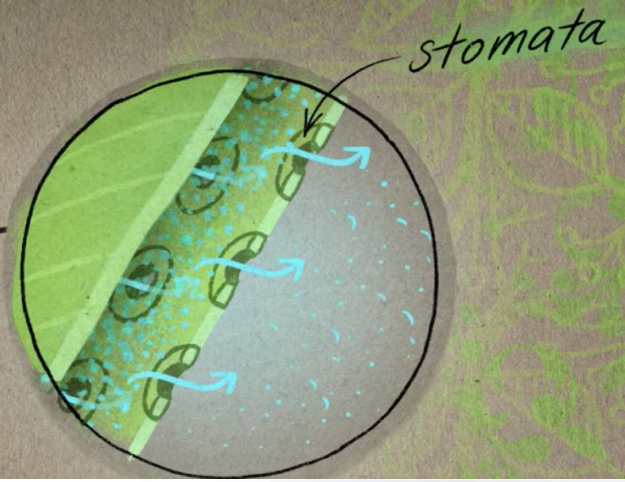


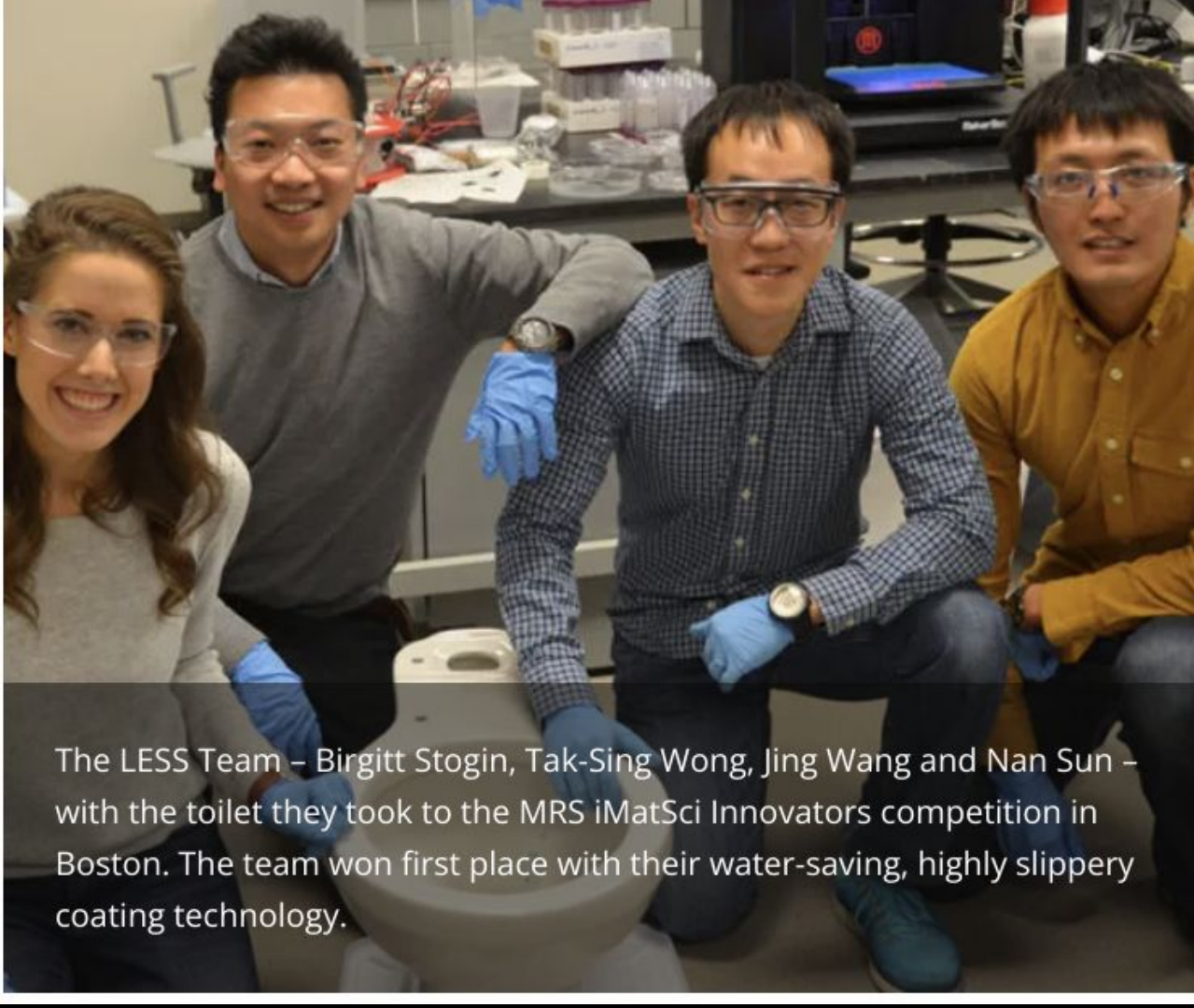


evapotranspiration



EVAPORATION



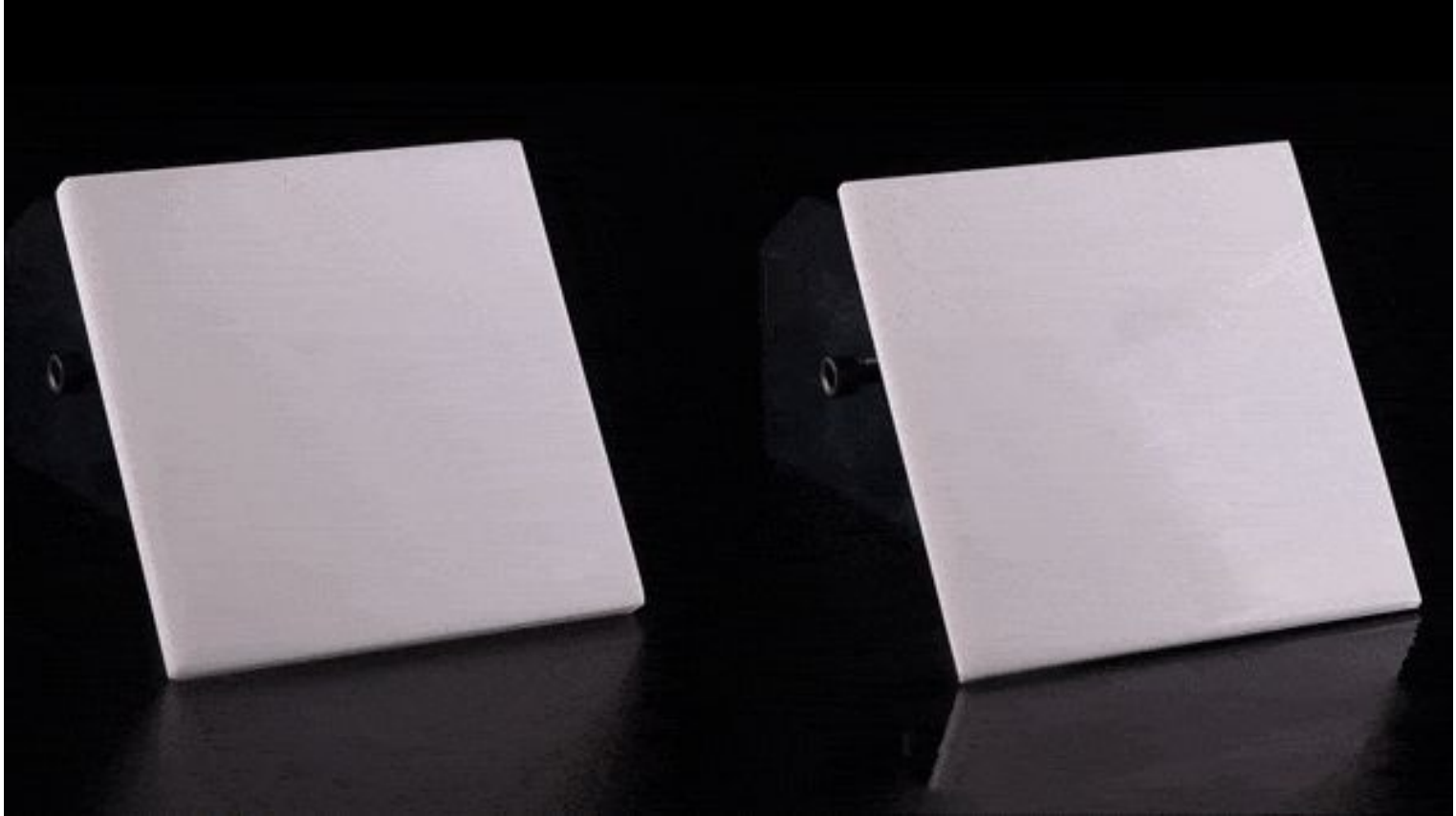


The LESS Team – Birgitt Stogin, Tak-Sing Wong, Jing Wang and Nan Sun – with the toilet they took to the MRS iMatSci Innovators competition in Boston. The team won first place with their water-saving, highly slippery coating technology.



Peristome
Pitcher Plants

Nepenthes bicalcarata



Jing Wang and Tak-Sing Wong, Penn State

Functions: how does nature ...

- Filter
- Break-down
- Evaporate
- Reduce surface tension