



BALEEN

the filter-feeding kitchen sink



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The first fully integrated kitchen sink biodigester for domestic biodegradable waste.

A self-regulating, multi-stage anaerobic digester with smart management that is tailored to any living environment, whether a large household or apartment within a multiple dwelling building. The entire system can be installed in place of a standard domestic kitchen sink, producing fertiliser and biogas that can be used by the homeowner. Alternatively, it can be installed into apartment buildings, operating as a hub-and-spoke system, with each resident still disposing of their waste in their kitchen sinks. This flows down to the plant room, where a scaled-up version of the digester can be custom installed to digest and repurpose the waste, using the biogas to supplement the building's heating system.

Key Features

- Seamless integration of biodegradable waste disposal into the kitchen sink
- Up to 30 mins of cooking gas generated per day
- Self-regulating, intelligent self management using AI control
- Intuitive user feedback for system warnings and progress tracking
- Rich organic fertiliser can be used or automatically flushed away
- Low maintenance operation
- No reliance on local authority collection
- Sealed unit has no foul odor or pest attraction
- Works in any climate
- Keeps your general waste and recycling bins dry and uncontaminated

- Capably digests: *all food waste, cooking water, rinse water, cooking oils and greases, compostable plastics, greasy cardboard, biodegradable wet wipes, compostable coffee pods...*
- In future, given enzyme development progression, it has the potential to be able to digest PET, polystyrene and more.

BALEEN sink discretely installed in an apartment kitchen



BALEEN sink with functional components on show



HOME

User putting food waste in the unit



User cooking on the gas generated



User filling watering can with fertiliser

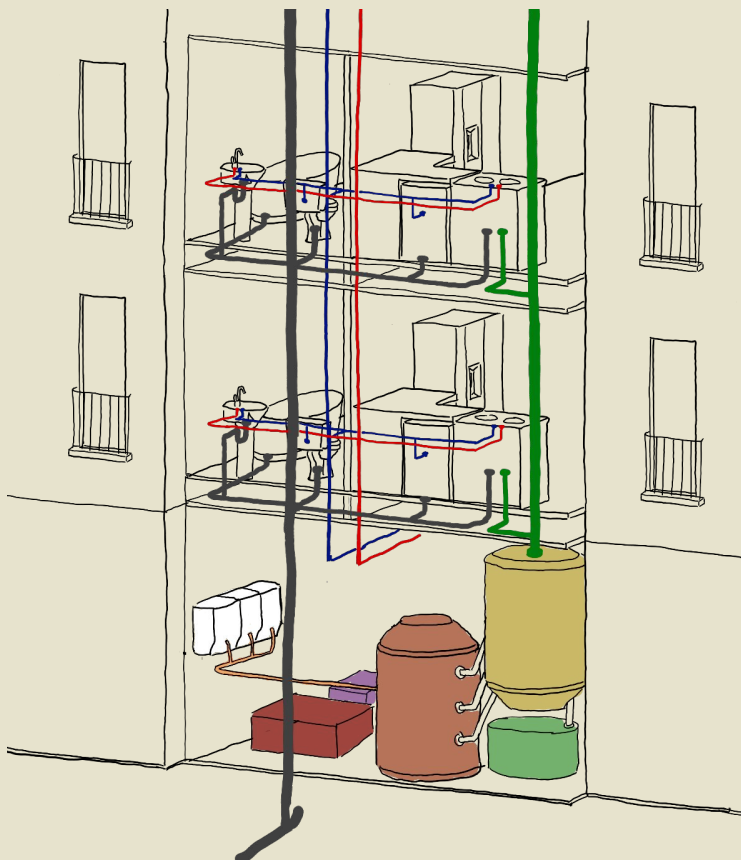


User removing a bucket of biomass



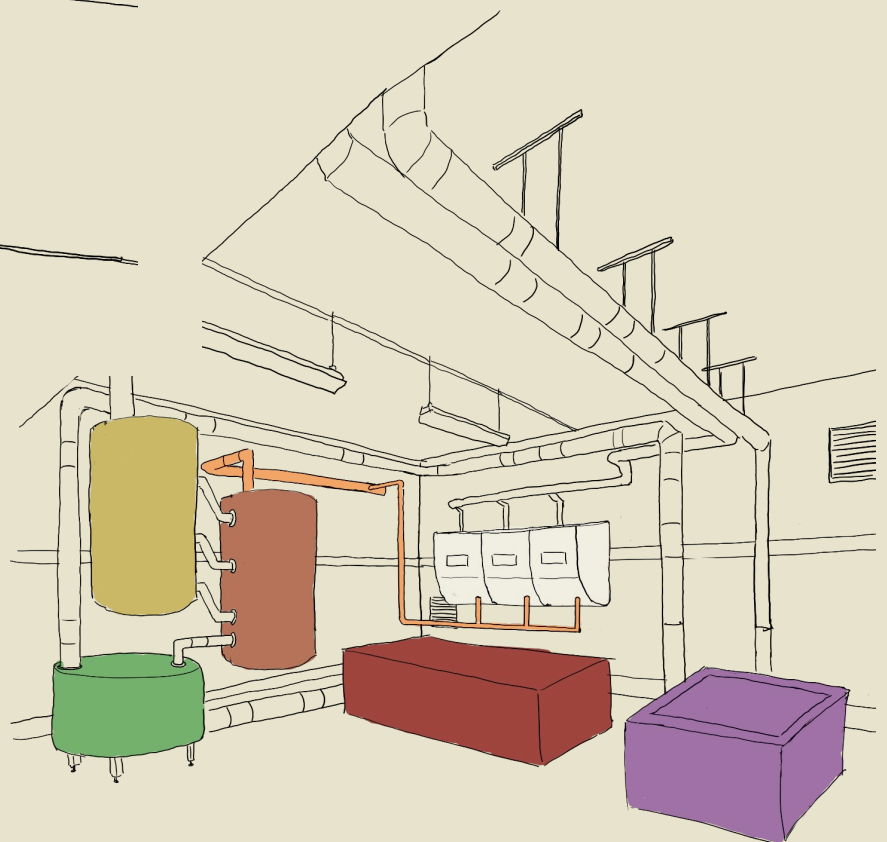
PLEX

User putting food waste in the unit in a high-rise apartment block.



The pipe network in a residential building, with a green pipe indicating where the macerated waste travels down into the plant room.

The augmented plant room is the factory room of the apartment block, where all the buildings utilities are managed, power comes in and waste goes out. The BALEEN AD system is installed into the plant room, digesting waste direct from the sinks and generating biogas to supplement heating for the building. Liquid fertiliser and biomass can be collected and used in the community or sold.



Technical Functions

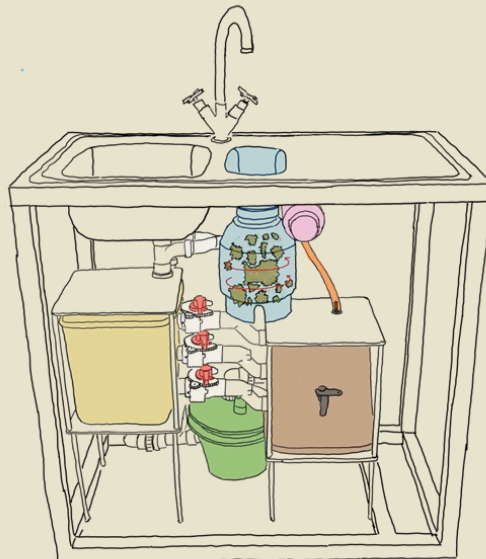
1. Disposing

All this gets washed straight down the sink with tap water!



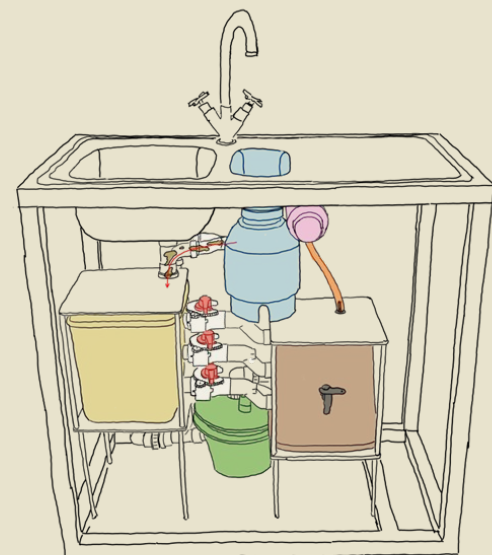
2. Macerating

This is then macerated to turn it into an organic soup.



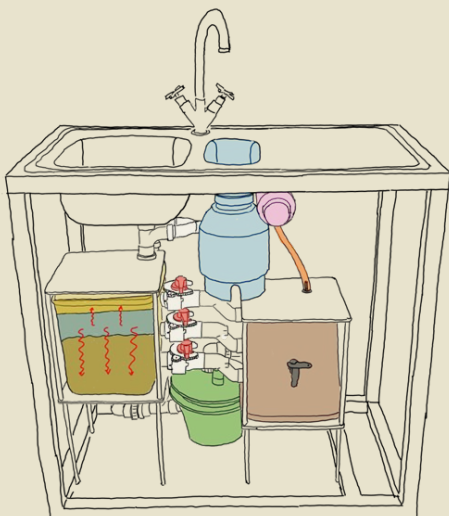
3. Sorting

The system checks the waste is safe to enter the system, then sends it into the separating tank.



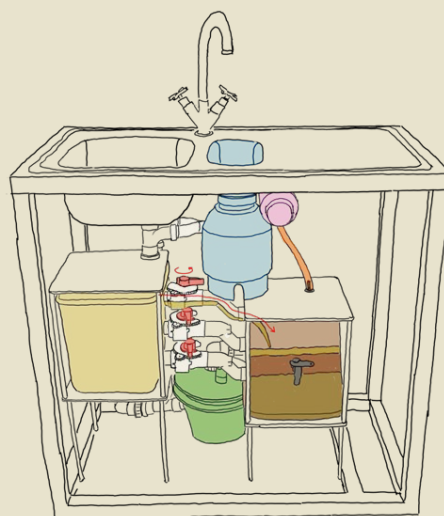
4. Separating

The different types of waste separate into layers due to their relative densities.



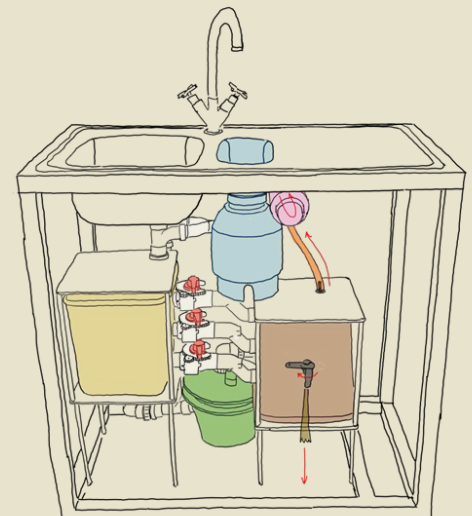
5. Feeding

The system intelligently manages what and when to feed the anaerobic digester.



6. Digesting

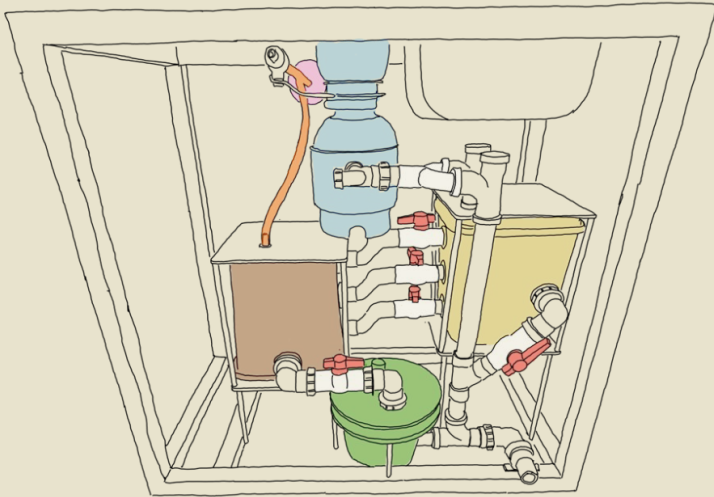
Anaerobic digestion generates liquid fertiliser, biogas and bio-sludge.



Technical Functions

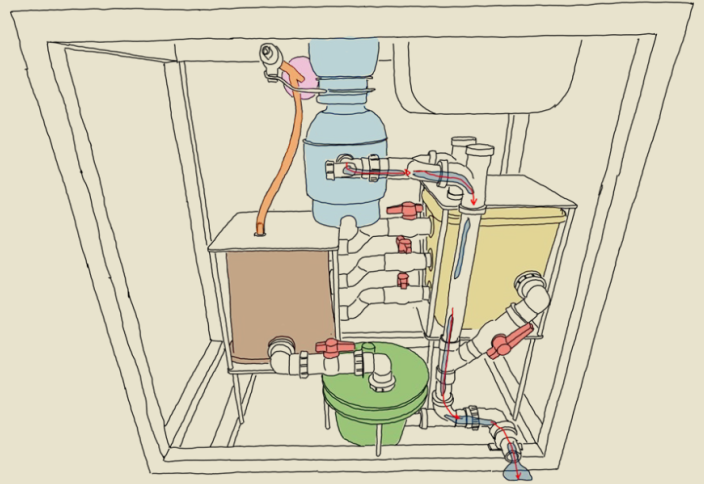
(the back side of the system)

The open pipe in the bottom right leads down the regular drain.



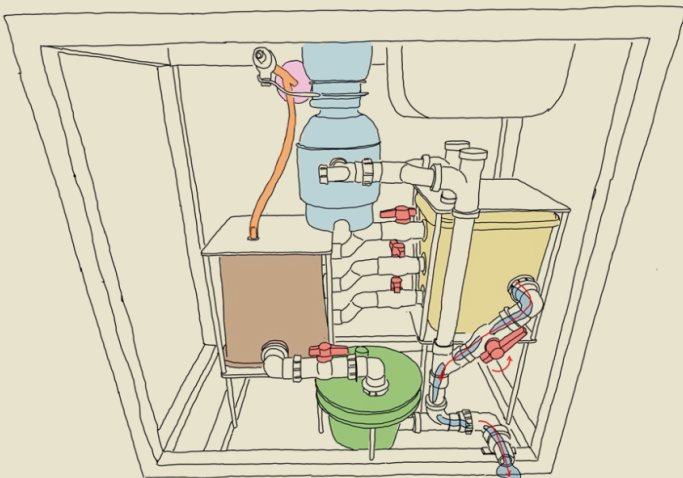
3b. Diverting

Any feed deemed unhealthy for the system (e.g. lots of bleach) is automatically diverted away, down the drain.



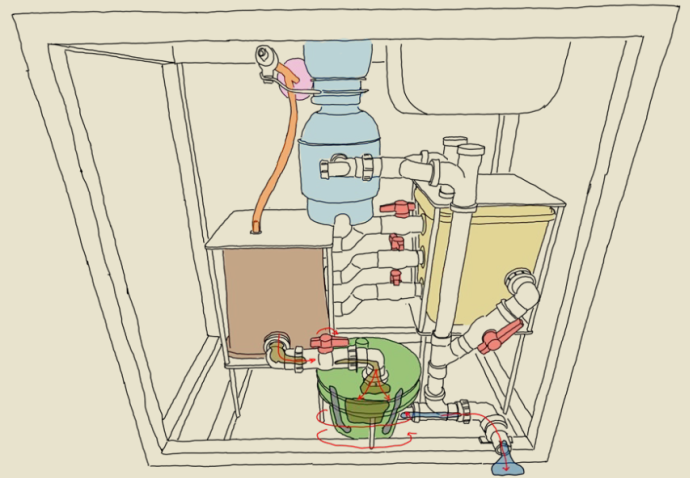
4b. Draining

Excess water in the system can be drained to sustain a healthy feed rate.



7. Centrifuging

The bio-sludge from the digester is sent into a centrifuge, which spins to dry the biomass, which can be used.



Prototype BALEEN HOME system v1

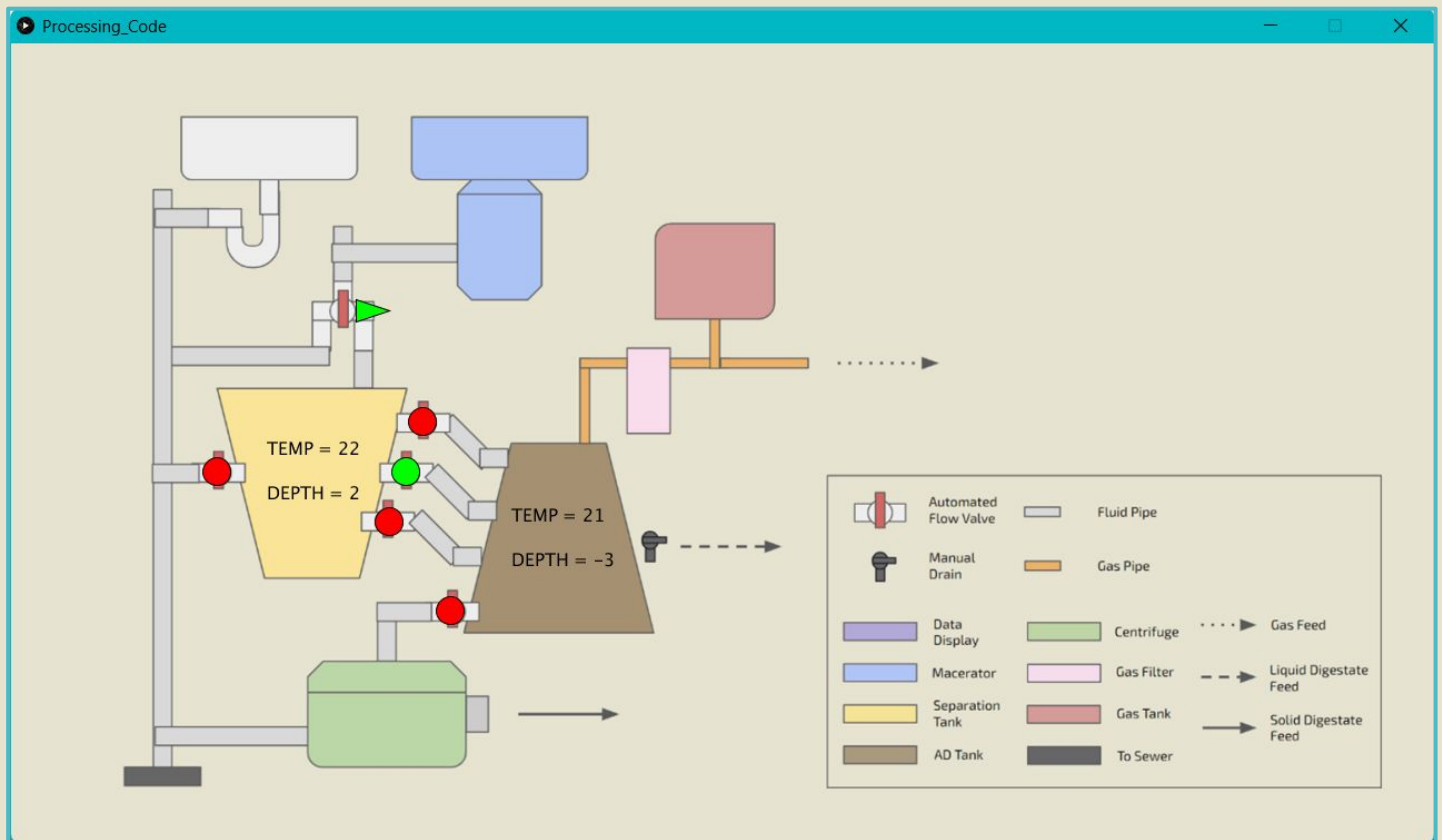


Demo Video:

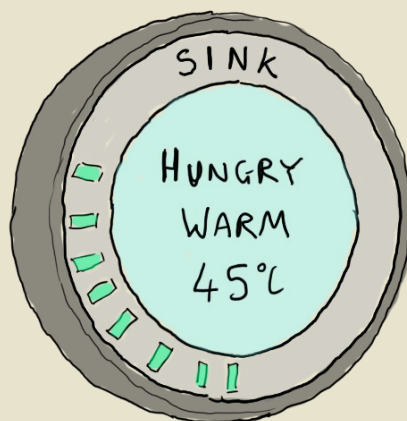
<https://vimeo.com/823929532?share=copy>

Prototype BALEEN Digital Twin v1

This technical interface shows the data being collected from the system in real-time, including environmental conditions and the state of the valves. This data feeds back into the software to automatically control feeding and discharge rates.



Concept Digital User Interface



- Encourages people to reduce their negative impact
- Guides users in how to use the system properly
- Warns of any system issues or failures
- Making the users feel rewarded for their behaviour
- Informing them of the positive contribution they are making

Digital Interface Prototype

<https://www.figma.com/proto/J6YNrXvVZplyDmWbTczYR2/Untitled?node-id=1-2&scaling=contain&page-id=0%3A1&starting-point-node-id=1%3A2>