# Wastewater recycling instead of disposal

September 11, 2018 | Andri Bryner
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**Wastewater smells foul and is full of pathogens. For these reasons it is usually removed and disposed of quickly. The out-of-sight-out-of-mind strategy is, however, costly and opportunities are lost. At Eawag's Info Day, experts in practice come together with researchers who are seeking new answers – for example, on how nutrients or heat can be recovered from wastewater.**

Switzerland is rightly proud of its wastewater treatment strategy. It guarantees hygiene in communities, protects water as a ressource (eg. for drinking water) and successfully prevents over-fertilisation of rivers and lakes. But this comes at a price: the replacement value of the Swiss wastewater infrastructure amounts to more than 120 billion francs. New challenges, for example the removal of micropollutants or climate change, are not make the system less costly. In addition, it is becoming ever clearer that wastewater is not simply a hazard to be removed, but it also embodies resources such as heat or nutrients that it would be more sensible to recycle instead of literally flushing them away.

How these materials can best be recovered, as well as the limits of this recycling, is the topic of discussion today at the Eawag Info Day in Dübendorf among ca. 200 experts from scientific fields, administration, policy and practice. They are focussing on the topic "Wastewater as a resource" and will be exchanging knowledge about future-oriented technologies for the recovery of valuable resources from the unpleasant brown brew.
More info available in the Proceedings [pdf, in German].

## Take energy, for example

There is a great deal of energy in wastewater that was previously absorbed in the water for hot showers or washing. In new buildings today, this is the major source of energy leakage. In both decentralised

situations, before it leaves the building, and centralised – for example in a main collecting channel – such energy can be partially recovered. The fact that the wastewater is then somewhat cooler is, in addition, an advantage in these days of ever-warmer brooks and rivers. Such recovery installations have to be planned early on, otherwise other energy sources have an advantage. Energy is also present in faeces, which contain a lot of carbon. An Eawag project shows how in countries in the global south, pellets are manufactured from faecal sludge and used for heating the kilns used in tile manufacture. The advantage of this concept is that it can become a small business for entrepreneurs, with the view to operating long term. Electricity can be produced from wastewater with ever-greater efficiency via gas from purification plants, produced in anaerobic degradation processes. As wastewater treatment plants thus become energy suppliers, their providers in a liberalised market are suddenly faced with new questions, such as When would the recovered energy be better used at source and when should it be sold for profit?

## Costs and values are not the same

Wastewater recycling sounds good, but opportunities and costs have to be realistically evaluated. The total wastewater disposal in Switzerland costs about 300 francs per resident per year. By contrast, electricity can be produced from sewage sludge for around three francs per head, and the phosphate in wastewater is currently valued at around one franc per head of the population at world market prices. No one, in other words, will get rich from this practice. Only when the whole picture is examined, and priorities supported by society are set, does the balance sheet start to look better. A switch from the present wastewater disposal to modern wastewater recycling keeps damaging micropollutants out of the most diverse waters and avoids the emission of greenhouse gases. In areas where water is scarce, it can be worthwhile to produce drinking water from wastewater, and innovative fertiliser production in treatment plants can lead to new opportunities in agriculture. This is not easily expressed in tons or francs, but must be part of the cost/income equation.

Research into these questions and the discourse between research and practice must be driven forward so that the recovery of energy, nutrients and water can one day be as successful and natural as conventional wastewater treatment has been up to now. The Eawag Info Day 2018 contributes to this quest.

## Further information

We would be glad to introduce you to potential partners, either at the meeting venue (Eawag-Empa campus: AKADEMIE, Dübendorf) or by telephone. Contact the Eawag media officer: Andri Bryner 058 765 51 04 / 079 721 19 93.

## Photos

Free of charge only in connection with a report about the Info Day, no archiving.

*Air-stripping installation for nitrogen recovery at the Opfikon wastewater treatment plant. Photos: Eawag, Peter Schönenberger (left), Eawag, Aldo Todaro (right)*

*Air-stripping installation for nitrogen recovery at the Opfikon wastewater treatment plant. (Photo: Eawag, Yvonne Lehnhard)*

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*In Senegal and Uganda kilns are heated with pellets made from dehydrated faecal sludge. (Photo: Eawag, Linda Strande)*

Presentations and some impressions (photos) from Info Day 2018.

## Related Files

Proceedings (in German) [pdf, 726 KB]
This Media Release as pdf [pdf, 75 KB]

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