

alpS - Centre for Climate Change Adaptation
Programme: COMET – Competence Centers for Excellent Technologies
Programme line: K1-Centres
COMET subproject, duration and type of project:
W03 EnerWater, 04/2014 – 03/2017, multi-firm

W03 EnerWater – energy efficiency in drinking water and wastewater cycles.

Drinking water and wastewater contains large amounts of energy. However, energy has been a minor concern in these systems leading to underestimated and unharnessed energy potentials. The alpS-project EnerWater is developing models and systems to explore and utilize energy potentials efficiently. This leads to decreased demands and increased production targeting on closed energy circles and diminished dependencies on large energy suppliers.



Waste Water as an Energy Source

Deployment of water and wastewater treatment is responsible for the largest part of municipal energy demands. However, large amounts of water always contain huge energy potentials itself. Smart pump and storage management could mitigate alternating energy production out of renewable energy sources. Wastewater in particular harbors large amounts of chemical bound energy and heat which is barely used nowadays. The heat which is trapped in wastewater is comparable to municipal and industrial heat demands and demonstrates an unused storage facility.

Chemical bound energy in wastewater is noticed as pollution and gets treated as such. The application of anaerobic digestion facilities enabled the possibility to transform chemical energy into methane gas which can be used by combined heat and power units. This fuel offers local and renewable energy out of existing bio matter and infrastructure. Yet this energy is needed for actual wastewater treatment in total but research shows that, in wastewater, amount

of captured energy exceeds the energy demand of wastewater treatment by far. Hence, most of the wastewater treatment plants have the ability to transform their selves from a net energy consumer to a net producer. Therefore a wastewater treatment plant needs to take over the role of an energy manager besides their duty of wastewater treatment.



Modelling and Optimising

To reach this goal, the alpS-project W03 EnerWater studies in energy and water and their efficient utilization. In the alpine region of Austria and Italy associations for wastewater treatment, drinking water supply and energy experts work together to decrease energy demands and increase energy production and recovery. Economic issues of optimizations must be taken into accounts and improvements must be achieved without the disturbance of purification efficiency.

Standardized evaluation tools are developed and used to understand existing plants and spot energy “hot-spots”. Furthermore, energy models

are being developed to simulate optimizations and evaluate whole technologies for both energy efficiency and purification performance. Here, energy efficiency counts double since not only great consumers become autonomous but in addition excess energy can be produced and deployed to the grid.



Fig. 1: From Waste Water to Energy (alpS)

Impact and effects

This project creates conscience for energy in water cycles and delivers systems to explore optimization potentials easily and reliable and simulates optimizations. Collected knowledge out of standardized evaluation can be used by other operators to promote local and resilient energy management in a proceeding climate change.



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Further information on COMET – Competence Centers for Excellent Technologies: www.ffg.at/comet
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