



Fraunhofer

ISI

FRAUNHOFER INSTITUTE FOR SYSTEMS AND INNOVATION RESEARCH ISI

INNOVATIVE WATER INFRASTRUCTURE FOR HOUSING ESTATES

Sustainable use of resources is an important issue and must be taken into account also in the housing stock. Cross-sectoral synergies, for example between water and energy infrastructures, can play an important role.

Fraunhofer Institute for Systems and Innovation Research ISI

Competence Center
Sustainability and
Infrastructure Systems
Breslauer Strasse 48
76139 Karlsruhe, Germany

Contact

Dr. Jutta Niederste-Hollenberg
Phone +49 721 6809-115
jnh@isi.fraunhofer.de

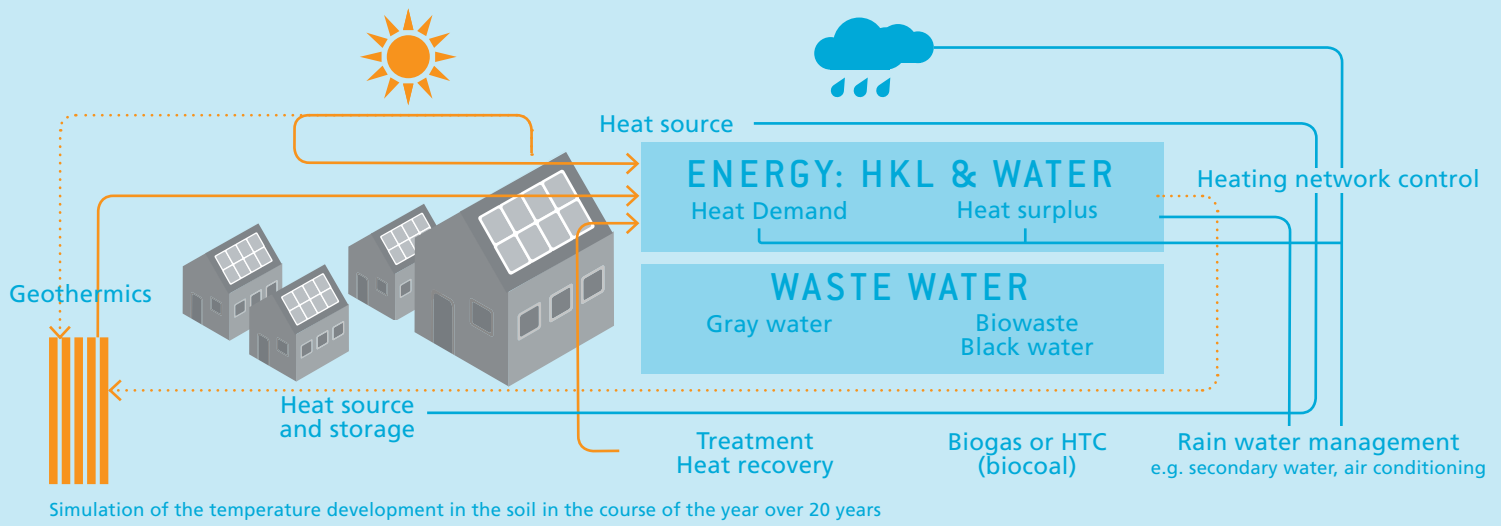
Dr. Thomas Hillenbrand
Phone +49 721 6809-119
thomas.hillenbrand@isi.fraunhofer.de

www.isi.fraunhofer.de

PURPOSE

For an existing housing estate dating from the 1960s, the main renovation alternatives are drawn up by the relevant housing authority. The aim of the studies is to develop different sustainable options for the future use of the housing estate, taking the existing building structures into account. There are different conceivable options ranging from refurbishment of the existing buildings, minor structural modifications to extensive changes or demolition and new builds.

Alongside energy-related renovations, another main topic considered by the Fraunhofer ISI is the sustainable development of the area's water infrastructure. This includes water supply, sewage disposal and rainwater management. A particular focus is formed by possible synergies with the energy concept, for example heat recovery from wastewater or from partial wastewater flows (grey water).



INNOVATIVE WATER INFRASTRUCTURE FOR HOUSING ESTATES

SETTING

Various research and demonstration projects have been carried out recently in Germany with regard to sustainable water infrastructure design in residential areas. The aim is to demonstrate new and more sustainable ways of dealing with drinking water, rainwater and wastewater. These approaches are set against the backdrop of the changes surrounding our water infrastructure systems such as climate change-related impacts on precipitation patterns (increased droughts and heavy rainfall), demographic changes (declining population combined with continued increase in settlement area), advanced ecological requirements (energy and resource efficiency, rainwater management) or the drop in

the water consumption of households and businesses. These changes result in increased operating problems and, depending on the local conditions, mean the existing water infrastructure has to be adapted.

APPROACHES

At the same time innovative technologies are available (membrane technology, heat and nutrient recovery etc.) that enable new adapted concepts. Various innovative water infrastructure concepts that are currently being developed or implemented in demonstration projects show that advanced purification and re-utilization of wastewater is possible even on a smaller, more decentralized scale.

Some concepts assume the separation of different wastewater streams. Separating the "black water" (toilet wastewater), for example, makes it much easier to purify the remaining wastewater stream ("grey water") because of its significantly lower level of pollution. The proposed project aims to work out which approaches are best suited to the given boundary conditions.

STATUS

Ongoing project

CLIENT

Housing authority