

Project Fact Sheet

Project Title **Development of a multifunctional and combined large-scale seasonal pit storage for heating and cooling**

Keywords Thermal energy storage, Multifunctional pit storage, Seasonal storage, Optimizing energy storage systems

Project Details

Project Start	2018	Duration	3 Years
Grant Scheme	Funding for applied research and development for universities of applied sciences (Programm zur Förderung der angewandten Forschung und Entwicklung an Hochschulen für angewandte Wissenschaften – Fachhochschulen)	Project ID	VIII.2-F1116.IN/19/2
Funding Authority	Bavarian State Ministry of Education, Culture, Science and Arts		
Project Budget	259,647 €		
Project Leader	Prof. Dr.-Ing. Wilfried Zörner		
Contact Person	Katharina Bär		
Project Partner	IN-Campus GmbH		

Description

Within this project, the investigation of the re-use of artificial, large-scale basin systems, in order to utilize them for the storage of heat, and the examination of storage scenarios that can be applied in practice, is carried out. The project analyses therefore the possibility to use those systems at an old refinery area, where in future, a modern campus for research and development projects will be built. As the new buildings have a higher overall cooling than heating demand, a complex and strategically useful energy supply can only be realized if a flexible heating- and cooling energy management system is used. Here, the re-use of artificial basins owes the advantage of cost-savings. The overall goal is to develop a multifunctional heating and cooling storage compound, to not only consider seasonal variations, but also to buffer short-term demands and combine them with a variety of energy suppliers. For that, the project goals aim at: (i) analysing existing large-scale energy storage systems and discussing the utilization of the artificial basins as well as assessing this scenario with respect to heating and cooling, (ii) developing a strategy for heating and cooling that considers the specific conditions of the location using numerical modelling, (iii) working on constructional modifications for the artificial basins to have a highly efficient storage system in practice. As an innovative approach, the usage of an additional insulation (thermal and hydraulic) that increases the efficiency of a storage system, is discussed. Moreover, the combination and linkage between different types of basins (i.e., with varying size and geometry) is analysed in order to have multifunctional storage systems that consider short-term heating and cooling demands.