Project name	Institute of Physics in Berlin-Adlershof
	
Keywords	Rainwater Harvesting for Building Climatization, Decentral Storm water Management, Green Facades, Energy Efficient Adiabatic Exhaust Air Cooling, Terra Preta
Start of project	1997, in operation since 2000
End of project	long term monitoring
Contact person or organisation	Berlin Senate for Urban Development, Brigitte Reichmann TU Berlin, Institute of Architecture, Marco Schmidt project website: www.gebaeudekuehlung.de
Short project description / project function	The Institute of Physics of the Humboldt University Berlin is an exceptional project of ecological urban development featuring various innovations of sustainable construction. The focus of the project is on a concept of decentralized rainwater management, building greening and elements for energy efficient cooling and ventilation. The project includes an ongoing monitoring of the water consumption of different plant species of the façade greening system and of resultant evaporative cooling of 8 air conditioners and 450 climbing plants along with its effects on the overall energy consumption of the building.
Water	Rainwater is stored in cisterns and used to irrigate a façade greening system and to generate evaporative cooling in air conditioners. One of the main goals of the decentralised rainwater management is the retention and re-evaporation of rainwater. Rainwater is stored in 5 cisterns in two courtyards of the building, and primarily used for the irrigation of the façade greening system and the adiabatic cooling. Some of the roof surfaces are extensively greened. The Façade greening also harnesses evapotranspiration to improve the microclimate inside and around the building.
Energy	During summer months, rainwater is used in 8 air conditioners being sprayed on the building's exhaust air whereby fresh air entering the building is cooled through a

	heat exchanger. The use of rainwater means to save both drinking water and waste water. This process of air conditioning of a building is effective in cooling incoming air to a temperature of 21–22 degrees C with outside temperatures of even up to 30 degrees C, without having to revert to technical cooling systems. With 700 kWh of energy conversion in evaporation of one cubic meter of rainwater, operating costs for the two absorption chillers of 105 Euros are saved. Besides these giant savings, the natural water cycle is closed providing "real" cooling compared to conventional systems.
Biomass	n/a
Project benefits	This research is designed to draw up recommendations for an optimal and economical management of the building's mechanical systems with an emphasis on an innovative and sustainable use of the resources water and energy as well as on the reduction of operating costs. The monitoring, evaluation, optimization and documentation of project-related experience should provide basic conditions for the long-term implementation and further development of innovative and economic technologies. Practical results and user-oriented findings are worked out and documented for future projects to support their design, construction, operation and maintenance.
Project level	Pilot project
Financial scale	n/a
Environmental conditions	Climate zone: cold temperateGeographic Coordinates: 52° 31' N / 13° 24' E
Altitude	38 meters above sea level, no access to local rainwater sewer systems available
Description of special local conditions	No access to local rainwater sewer systems available
Context Zero Emission Buildings	Evaporation of water is an economic and effective means for the air conditioning of a building. Adiabatic cooling systems can practically be seen as substitutes for conventional air conditioning technologies. Synergies can also be achieved by using rainwater to avoid wastewater amounts because rainwater is free of lime. Greening a building's roof and façades, one of the passive cooling systems, results in significant additional evapotranspiration. It has a high potential of reducing the building's surface temperatures thereby improving the microclimate inside and around the building. In Berlin-Brandenburg 80% of precipitation is redirected into the natural water cycle by evaporation.