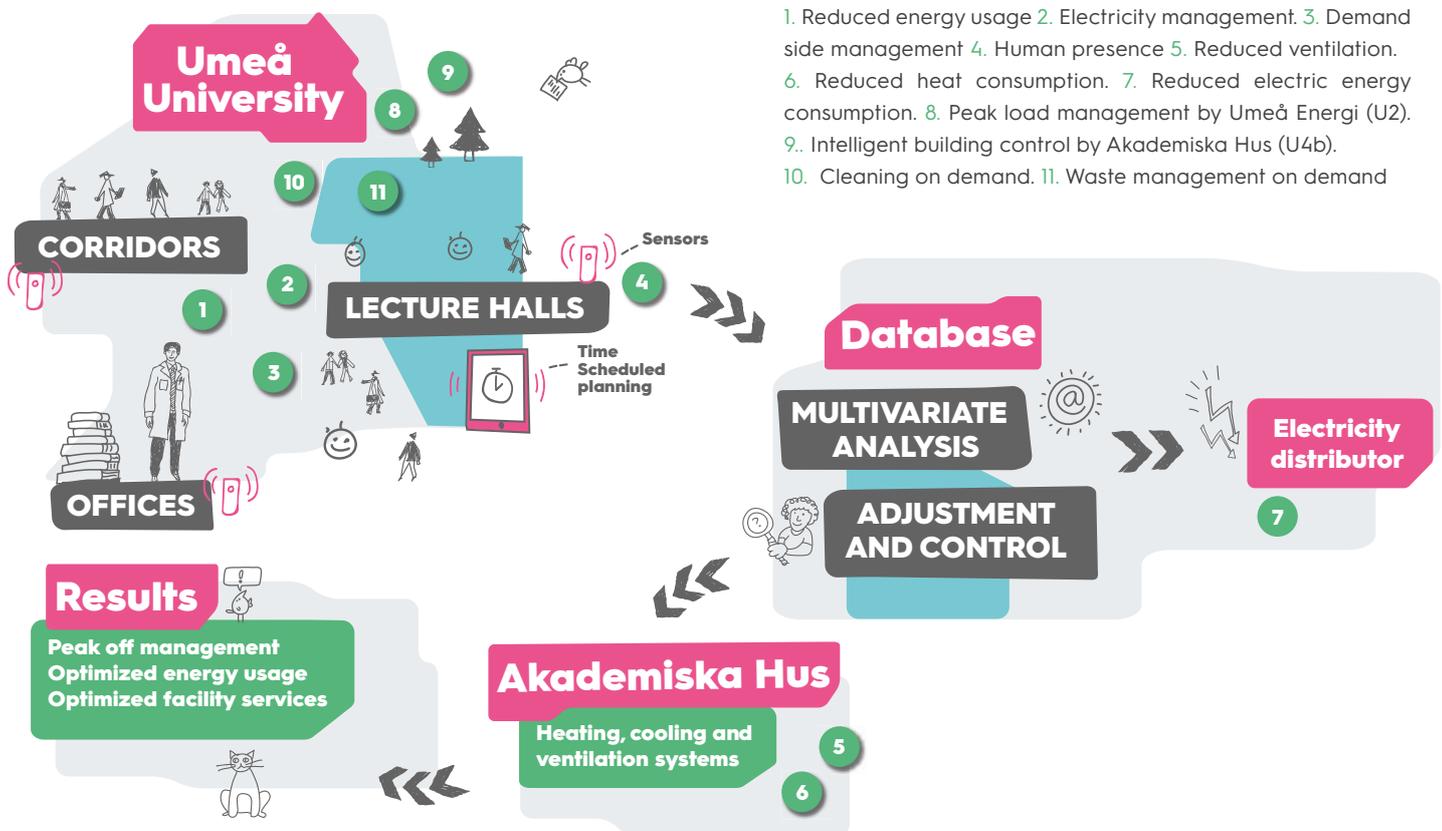


## Demand Side Management

Umeå

Energy management and ICT



In this solution we use multivariate analysis tools to predict the need for heating and cooling. This will support the decision-making process regarding tenant area usage in the most efficient way to reduce energy usage, and also to optimise facility services such as floor cleaning, technical standby and waste management - which traditionally operates on schedules and contracts. Within the university, the Social Sciences Building, with its manual energy management system, and the Natural Sciences Building, with its automatic energy management system, have been chosen as study objects.

### Main partners involved:



# FACTSHEET U9

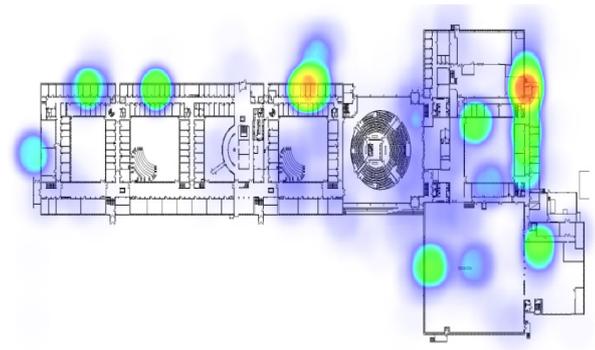
## Demand Side Management

### How does it work?

An intelligent and integrated system of sensors will predict energy use and service facility in university buildings. Different kinds of sensors will either be installed in rooms or used if they are already installed. Data such as human presence, temperature, light, CO<sub>2</sub>, etc. will be collected over time in order to find which key parameters impact energy use (with the further aim of developing models/IKT platforms to manage and reduce energy use, i.e. regulate the ventilation system vs. human presence).

Based on predictions of real life behaviours and/or managed behaviours, we can lower energy consumption during the hours when facilities are off-peak.

The models will also be set up to improve the management of services, such as cleaning and waste management processes.



### Estimated impacts

- Reduction of CO<sub>2</sub> emissions
- Positive influence on energy usage
- Better service management
- A safer university during evenings and weekends

### Replication potential

The goal of this solution is to find a model for further reducing the climate impact from the university buildings, and to optimise services. The solution could also complement other energy solutions at Umeå University (U2, U4b).

Akademiska Hus owns and manages 3.2 million square metres of property in Sweden and their goal is to reduce the amount of bought energy by 50 % before 2025 and eliminate the CO<sub>2</sub> footprint from energy use in their buildings. As this also includes the tenants' use of energy, the upscaling of this solution will be vital for reaching the goals. The nearby hospital has a goal to lower the energy consumption by 15% by 2020 and will seek to implement this solution, which can be used in any building in the future. However, buildings require HVAC (heating, ventilation, and air-conditioning) systems and the possibility of logging and collecting sensor data over time (i.e. through wireless networks).

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