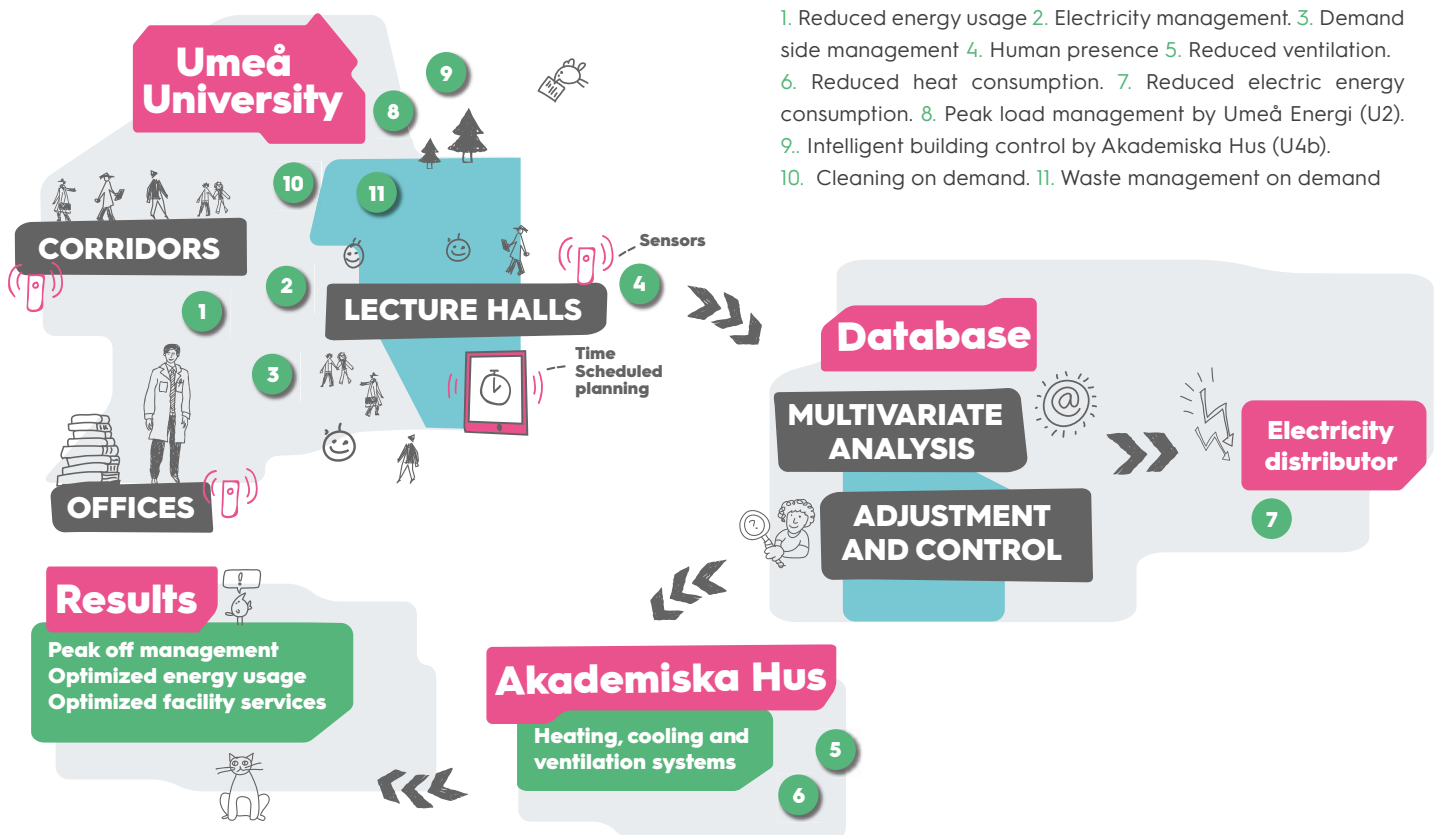


Demand Side Management

Umeå

Energy management and ICT



1. Reduced energy usage
2. Electricity management
3. Demand side management
4. Human presence
5. Reduced ventilation
6. Reduced heat consumption
7. Reduced electric energy consumption
8. Peak load management by Umeå Energi (U2)
9. Intelligent building control by Akademiska Hus (U4b)
10. Cleaning on demand
11. Waste management on demand

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, CO2, 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 CO2 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 (U4, U6, U2).

Only the Lighthouse city of Umeå - an area about 1 000 000 m² - could be an object for this technology. Sensors are quite costly, so the costs incurred would be the set-up of the ICT platform and a system to manage energy use. The technology could be used in any building in future, however, given that buildings require HVAC systems and the possibility of logging and collecting sensor data over time (i.e. through wireless networks). Finding key model parameters is also essential for making it possible to have a scalable solution.

Contact:

Lisa Redin, **Umeå Universitet**, lisa.redin@umu.se



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