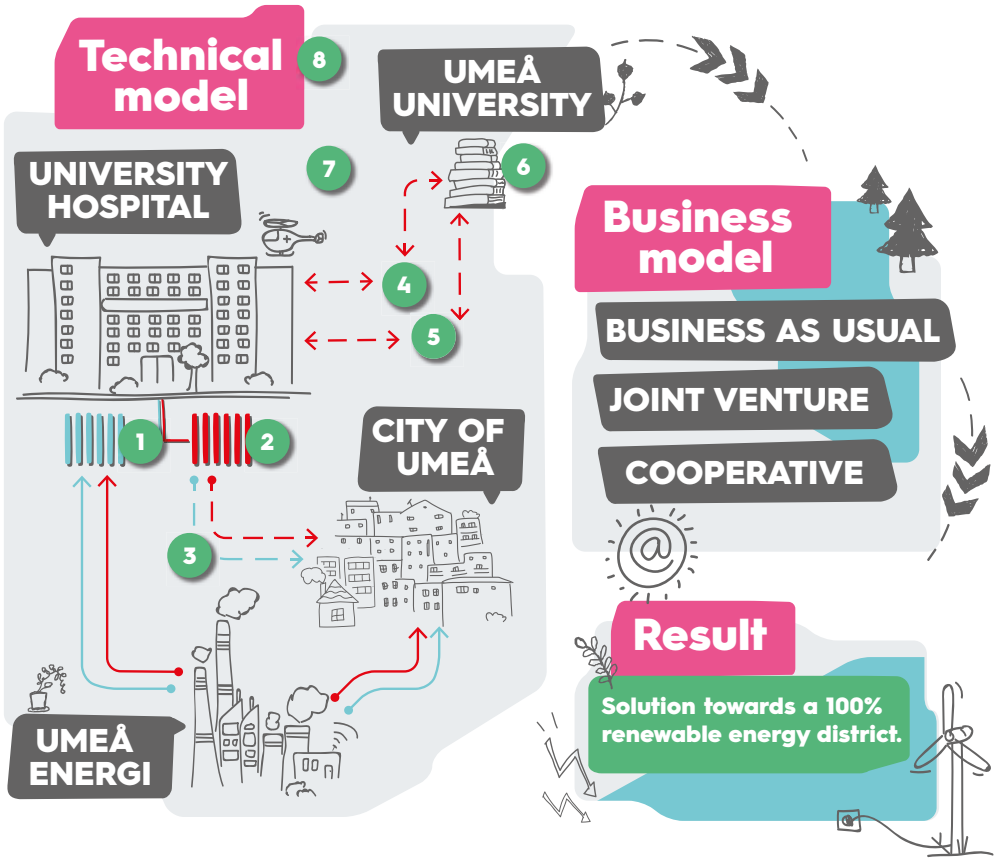
FACTSHEET U1+U3

RUGGEDISED

Smart City connection to 100% renewable energy and geothermal heating/cooling storage and exchange

Umeå | **Smart thermal grid**



1. Reduced energy consumption at University Hospital of Umeå
2. New geothermal energy storage
3. Delivery of energy to the city of Umeå
4. Shared use of common thermal energy storage tank
5. Common biomass boiler
6. Reduced energy consumption at Akademiska Hus
7. Peak load management
8. Optimal overall production strategy

U1 – The project aims to develop a new business model that enables the storage and exchange of energy between organisations. The ultimate goal will be to create a new model that seeks to reduce climate impact while simultaneously increasing economic gains.
U3 – The aim is to create a new business model on how storage and exchange of energy between organisations can be used as a climate-smart solution for the University district as a whole, with both economic and environmental gains.

Main partners involved:

Västerbottens läns landsting

AKADEMISKA HUS

UMEÅ ENERGI

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731198. The sole responsibility for the content of this document lies with the RUGGEDISED project and does not necessarily reflect the opinion of the European Union that is not responsible for any use that may be made of the information it contains.

FACTSHEET U1 + U3

Smart City connection to 100% renewable energy and geothermal heating/ cooling storage and exchange

How does it work?

Demonstrate a business model to add value to shared energy solutions, to optimise photovoltaic (PV)/solar energy production and battery storage, with possibilities for control and optimisation based on a smart grid concept. Challenges include: quality issues and optimisation from an overall perspective; and how could we further develop monitoring, power quality, and prevent disruptions etc. All actors have to be involved in the process of optimisation in a co-operative manner. Actions include: an analysis of peak load and energy durations at an aggregated level in the district; defining and establishing optimisation boundaries for top load shaving; energy optimisation, and more.

Establishing a business model test bed means:
1. Identifying value proposition, cash flow, stake holder dependencies, risk mitigation and more.
2. Defining the key properties of a new business model
3. Test bed setup.
4. Monitoring for evaluation and conclusions.

The County Council of Västerbotten has built a facility in order to reduce energy costs for heating and cooling at the University Hospital of Umeå. Geothermal energy storage delivers a total of 7 GWh heating energy and 5 GWh of cooling energy per year. In terms of capacity and size, it is one of the 30 biggest facilities in the world.

By simulating the storage we can see how much more heating/cooling we can export during different times of the year. Simultaneously, we would build a model that connects all the energy needs of the thermal grid in the University area (where we investigate where more/cooling heating is needed, and if fossil fuels are used for production). We can then compare the extra amount of energy from storage with the requirement in the thermal grid, and look at technical solutions to make this happen. The goal is to deliver a business model showing how companies would co-operate.

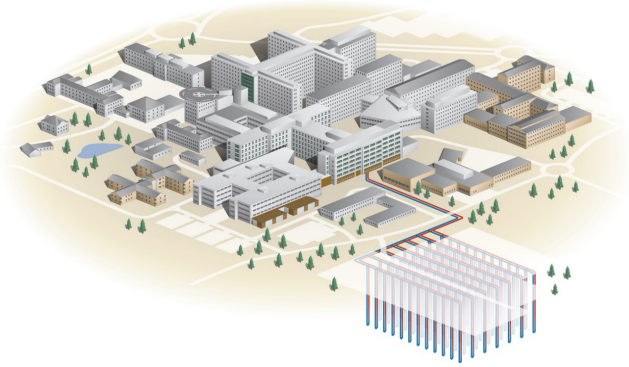
Estimated impacts

Reduction of greenhouse gases due to better use of energy resources in the district.

Replication potential

If we are successful, the new business model (and its stakeholder relations component), along with the automated adminstration technology, could be adopted in virtually any European city.

The goal Is to deliver a business model that shows how the company's could connect with each other to reach a win-win settlement. Depending on the energy data in the areas investigated the solution will be different.



Geothermal energy storage

Contact:

Jorgen Carlsson, **Umeå Energi**, jorgen.carlsson@umeaenergi.se
Jakob.Odeblad, **Västerbotten County Council**, jakob.odeblad@vll.se