The Potential of Borehole Thermal Energy Storages in the Swedish industry

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Research question
What is the potential of using BTES for storing of industrial excess heat (Swedish industry), assuming a positive economic outlook for involved parties?

- As quantity and quality of generated heat differs, both industry-wise and between the various processes found at the specific site, the technology may be suitable for some industries meanwhile not for others, and only when integrated in certain ways.

How to solve it?
Simulations using IDA ICE including its BTES module.
BTES-integrated heat recovery system at Xylem, Emmaboda
Internal heat distribution network
Storage outcome March 2012 – June 2017

Acc. heat injection
Acc. heat extraction
Adjacent (10 m), d=100 m (GT3)
Mean storage temp. (Calculated)
Storage outcome, further visualization

A lower than expected heat injection because of lower than calculated quantities and/or quality of the excess heat generated at the site has hindered the storage from reaching temperatures necessary for heat extraction.
Possibilities from using a heat pump for heat extraction

Theoretical COP vs available energy

Available energy [MWh]

COP = 8
Teachings/to consider

• Fine enough model, where the system is modeled as a whole - as if the BTES is connected
• Heat pump for heat extraction?
• Heat pump for heat injection?
• Designing of storage based on state of the art