FOUNDRYBENCH

Supported by: Intelligent Energy Europe

Heat storage – Storage of recovered energy for heating of premises, minimizing variations in the heat system and reducing peak load

AX CONSULTING

TEKNOLOGIAKESKUS HERMIA - Interfacing the Future -

IfG

MEEHANITE

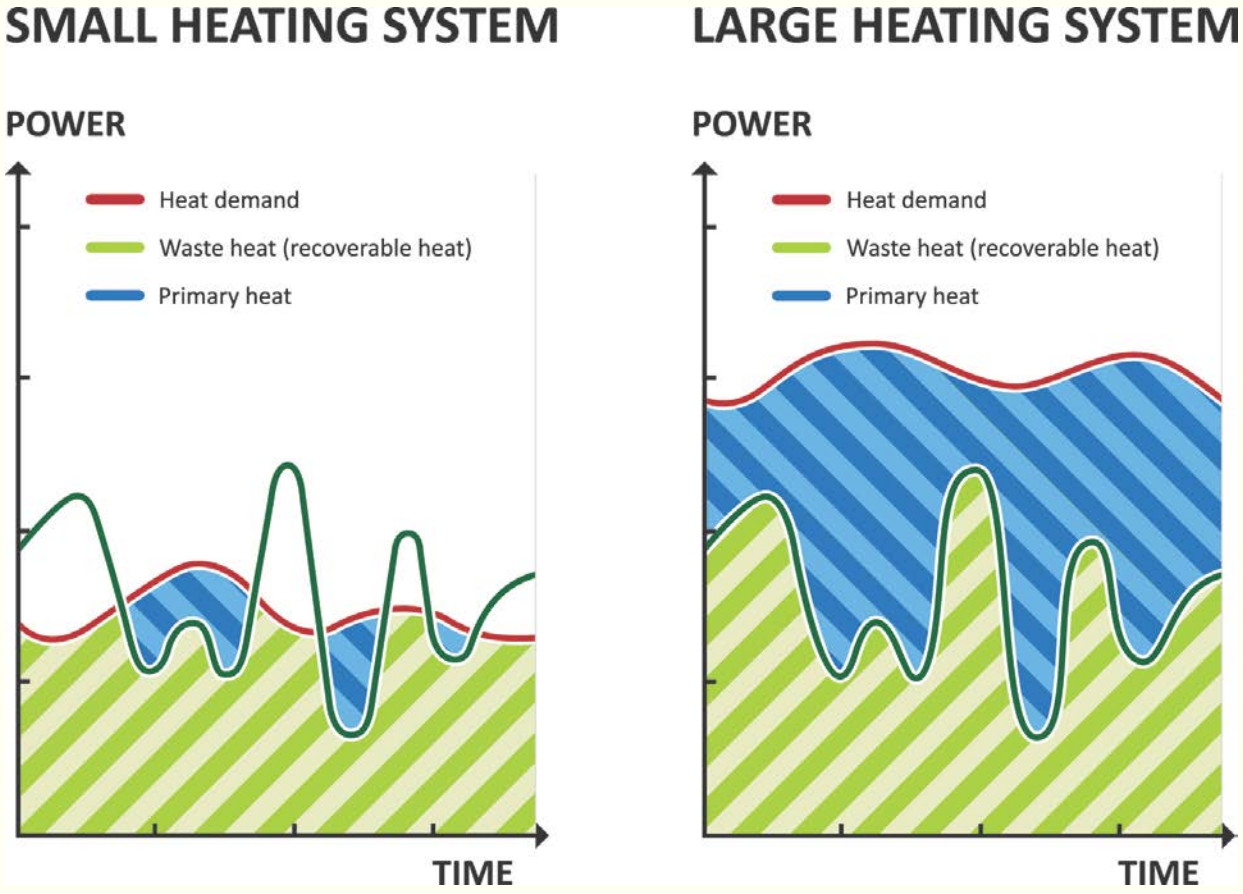
swerea SWECAST

inasmet tecnalia

Possibilities to recover heat – Questions to ask

- Where could the recovered heat be used (heating/cooling)?
- Is it possible to store some of the ”waste” energy?
- Is there a potential to find recoverable heat with high temperature (approx. 70 °C) in my foundry?
- Can I increase the temperature of recoverable heat?
- What should the size of the storage be?
- Which storage method is most approriate for me?

The need for heat storage



Due to the variation in available recoverable heat from e.g. furnaces there is a need to store heat to allow maximum amount of heat recovery.

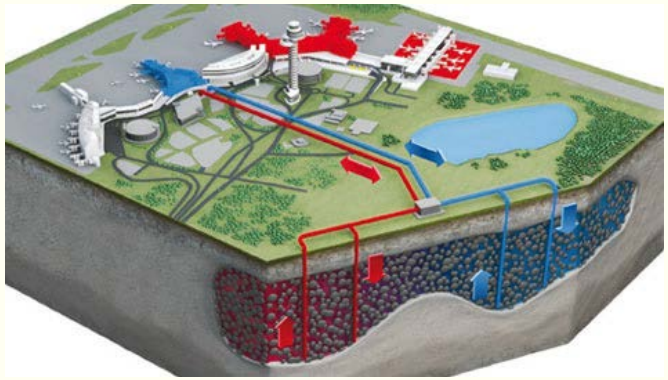
A large heating system allows for recovering of more heat.

Methods to store heat

- Storage over the day, the week or the season. Depending on the available heat and the heat demand.
- Storage of heat on a daily or weekly basis: accumulator
- Storage of heat over the season: e.g. BTES, Borrhole Thermal Energy Storage, aquifer or basin.

BTES & Aquifer

- Storage over seasons.
- Requires large amounts of recoverable heat to reach an acceptable efficiency.



Best practice case

- ITT Water and Wastewater in Emmaboda experienced the same challenge as all foundries in northen Europe, the surplus of heat at some times of the year or the day and deficit at other times.

- Excess heat from furnaces was only recovered partly at summer season, waste heat that was not needed for hot water was cooled in a cooling tower.

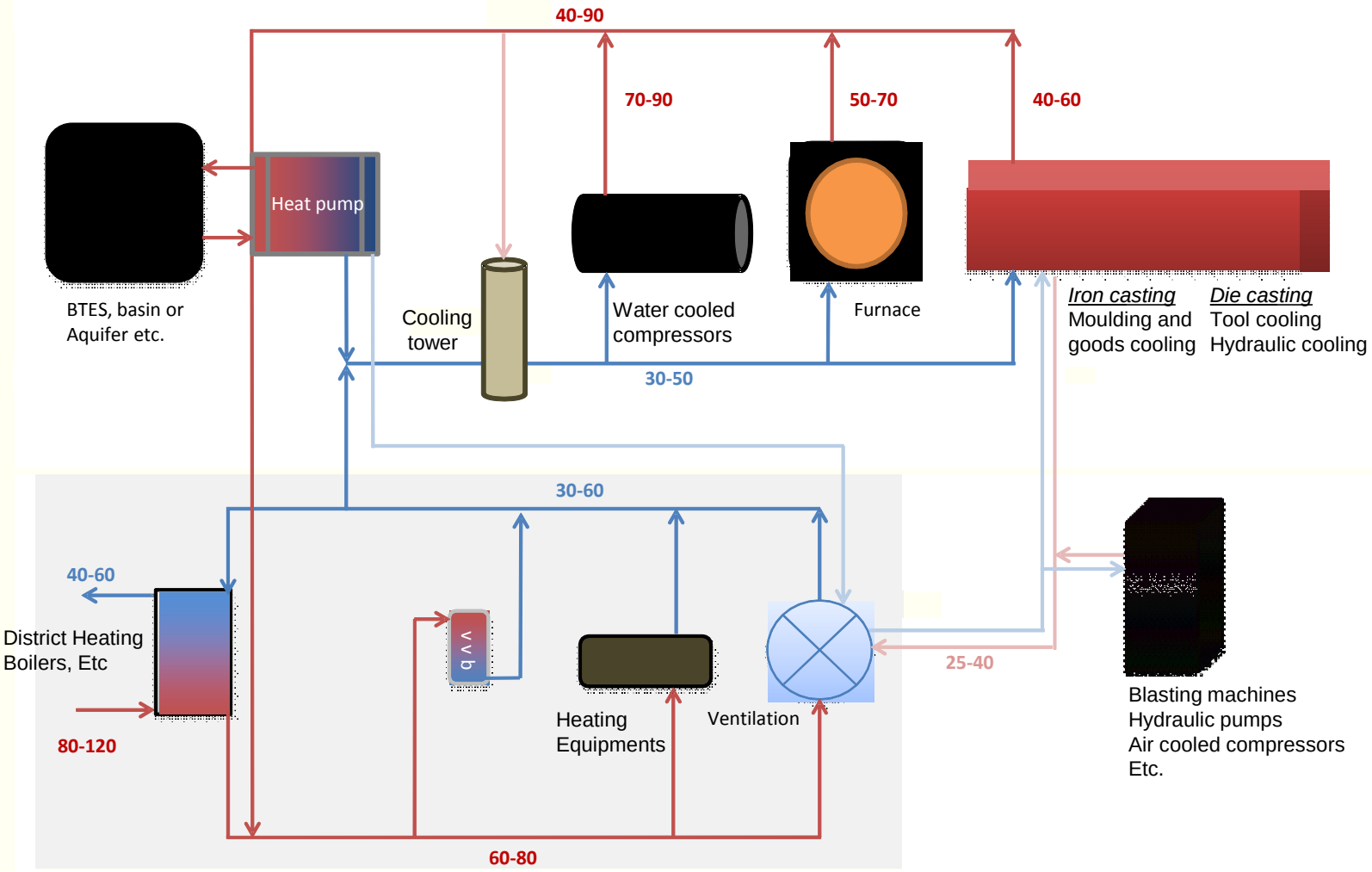
Best practice case

- In order to have a possibility to store the energy between seasons a Borehole Thermal Energy Storage (BTES) was constructed. The BETS consists of 140 vertical boreholes, 150 metres deep with an internal space of four metres. The storage allows for an energy saving of about 2500 MWh per year (the total calculated amount of energy storage is 3800 MWh, 1300 MWh losses). The maximal effect is estimated to 2,2 MW.

- Waste heat generated from the two furnaces in the melt shop (and other processes) is pumped down into the BTES during summer season and is stored in the ground water. When there is a need for heating at the cold season of the year, heat from the BTES can be pumped into the internal heating circuit.

- The investment in this case was 1032768 € and with some contributions from the government the payback time is 60 month.

Priciple flowchart with BTES



Thank you for your attention!