University of Applied Sciences and Arts
Northwestern Switzerland

Finest Swiss Bakery

Optimization of energy costs for a bakery in The Gambia

Initial Condition

The charitable foundation Baluo has set itself the goal of enabling young people in The Gambia to live an independent life through vocational training and creating job opportunities. The foundation Baluo established and operated a bakery in Yundum, a suburbia of Banjul, until it had to close a year ago due to the exorbitant electricity prices in The Gambia.

Project Goals

- energetic analysis of the bakery and the baking processes
- concepts for an energy optimization of the baking processes and possibly adaptations to the production machines
- concepts for a self-sufficient energy source and alternative power sources for the ovens

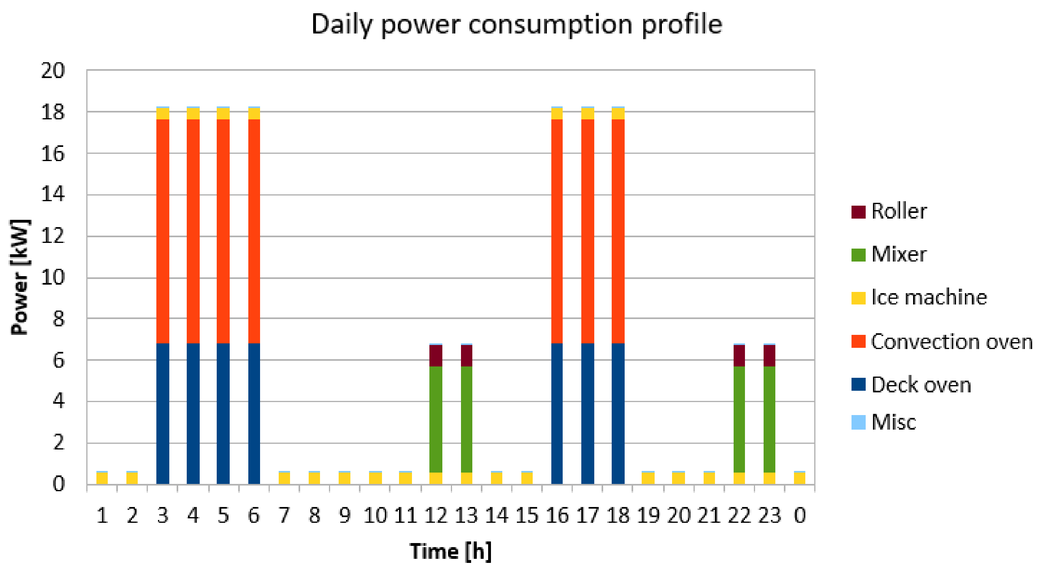
Bakery in The Gambia

Proving room

Distribution by bicycle

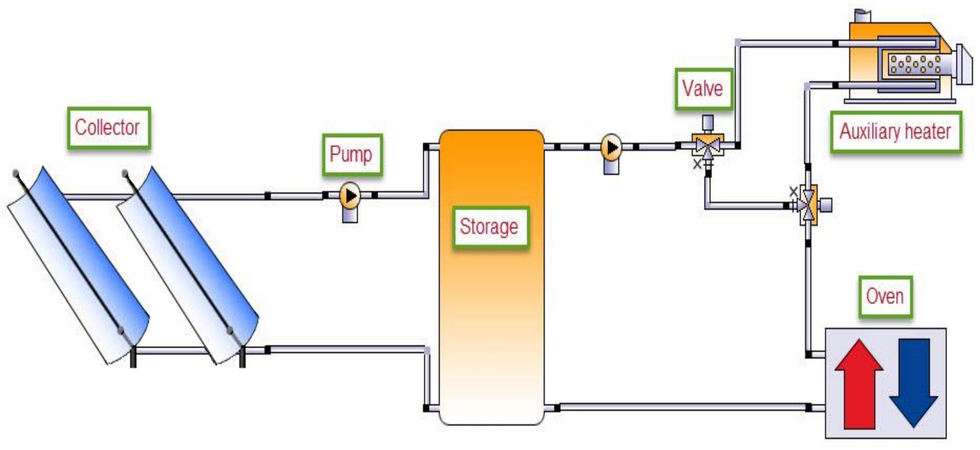
Measurements

This chart shows the electric energy consumption in the baking process. That consists of the energy used to heat up the ovens, the roller, the mixer, the ice machine and the other electric consumers.



Thermal oil

The thermal oil powered convection oven is the cleanest system option as it is completely self-sustained and only needs additional support from a diesel burner on a few days per year.



Result

A concept with a convection oven powered by fossil fuel would be the easiest to directly implement. The fossil fuel powered oven can be modularly modified and an additional thermal oil circuit running through sun collectors on the roof can be added completely self sustained concept is the thermal oil powered convection oven.

Recommendations

The main target of the charitable foundation is to make the bakery operate again. There are two possibilities:

- A fossil fuel concept paired with the PV-system and the replacement of the ice machine
- An attractive alternative is the thermal oil system and the modular variant of it

Project number: EUT-P4-10223
Project leader: Simon Summermatter
Project team: Marco Borer, Michael Grässle, Kushtrim Hazari, Philip Jensen
Project coach: Klaus Eisele, Karen Schrader