

Case Study: Energy Demand and Supply

by *Gerrit Muller* USN-SE

e-mail: `gaudisite@gmail.com`

`www.gaudisite.nl`

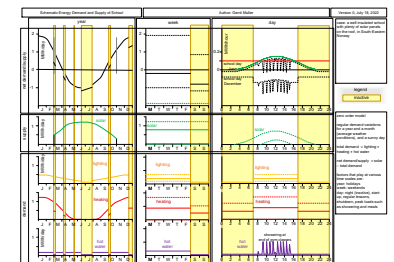
Abstract

This is a case study in conceptualizing supply and demand of energy. Many engineers lose themselves in extensive traces of usage data. These traces are quite useful for analyzing variations and peaks in demand and supply. However, they may obfuscate insight in the repeating patterns.

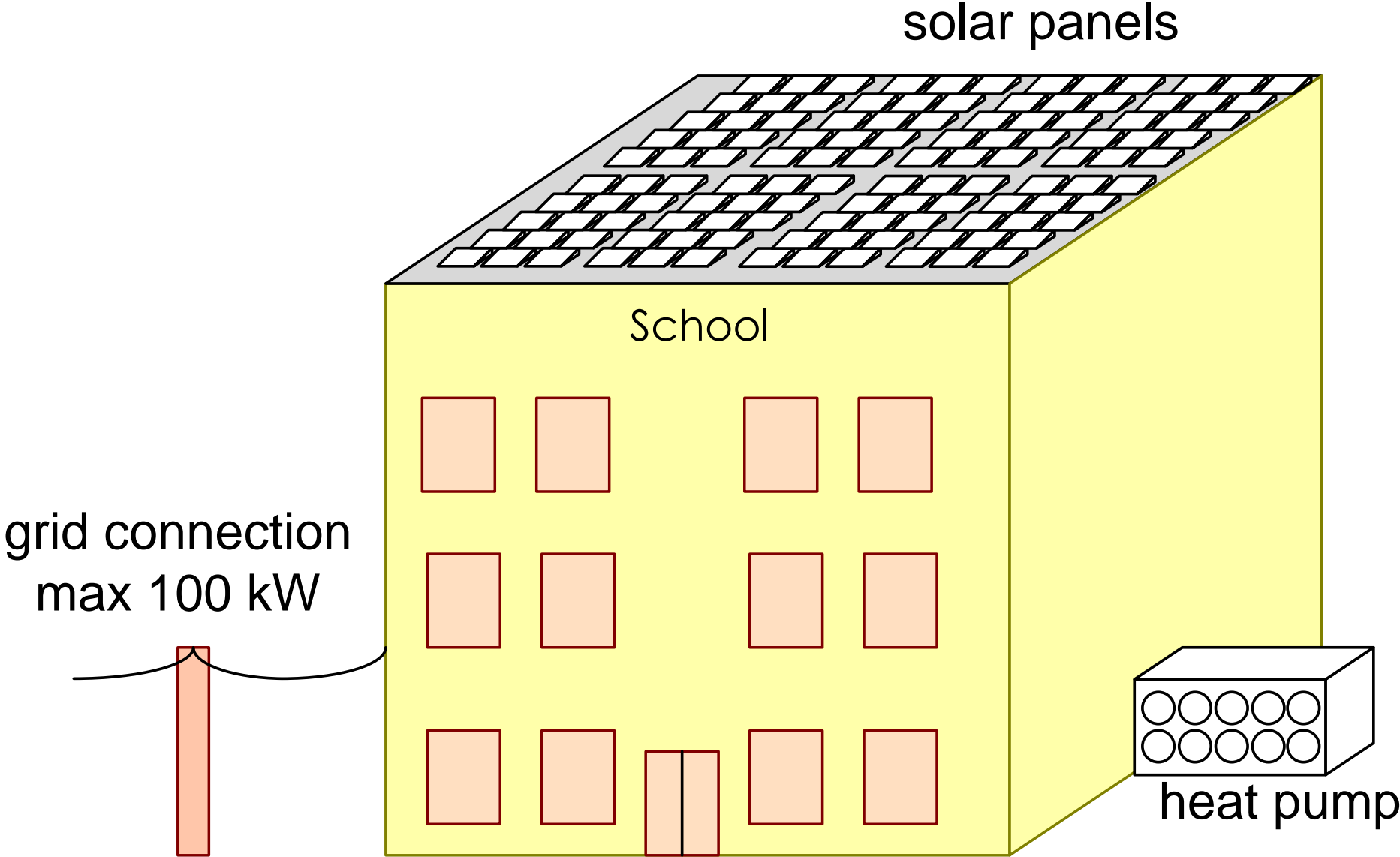
Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

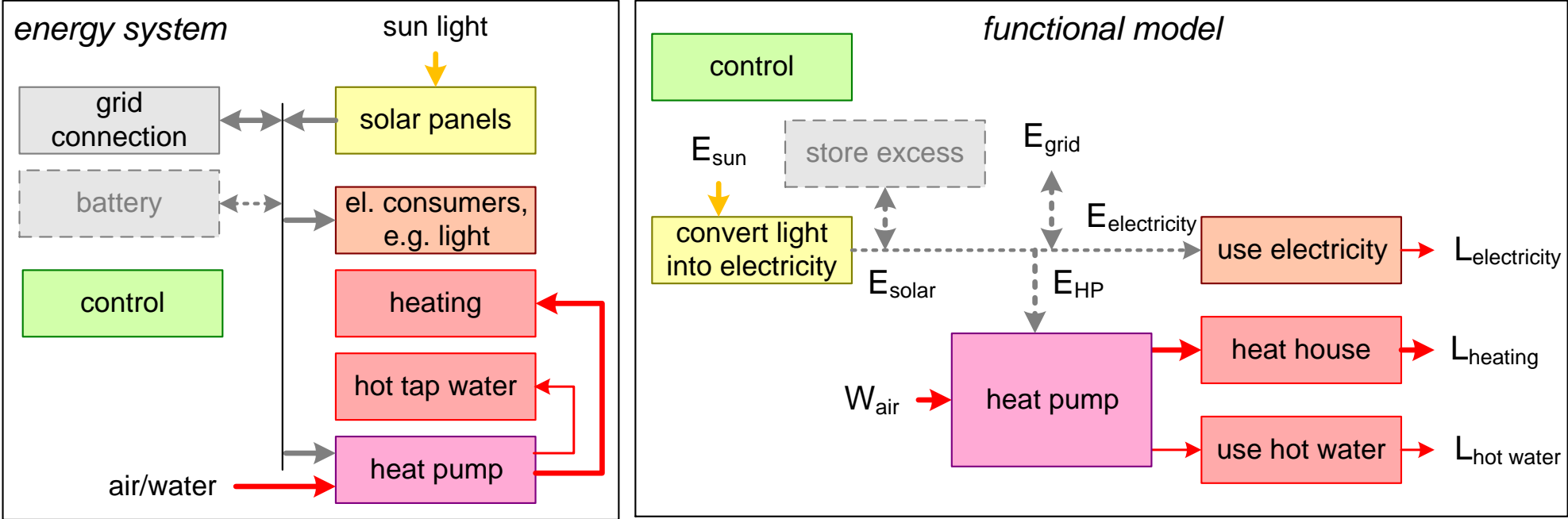
July 19, 2022
status: preliminary
draft
version: 0



Case Overview



Case Models



case: a well insulated school with plenty of solar panels on the roof, in South-Eastern Norway

legend

inactive

zero order model

regular demand variations for a year and a month (average weather conditions), and a sunny day

total demand = lighting + heating + hot water

net demand/supply = solar - total demand

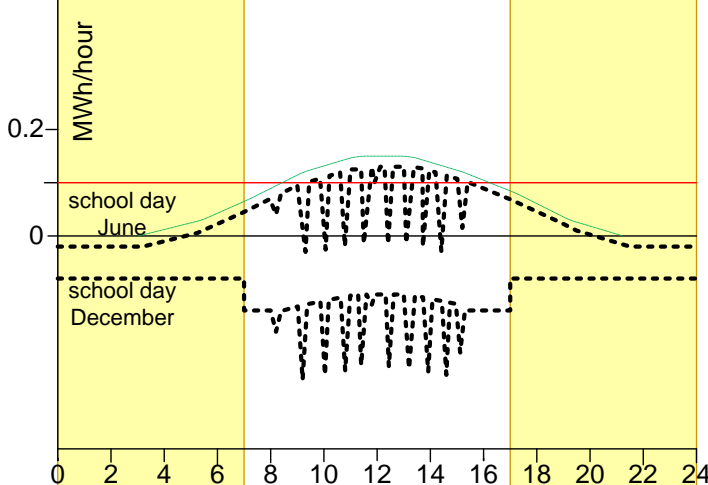
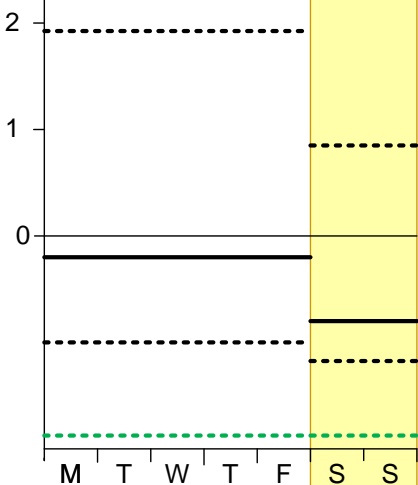
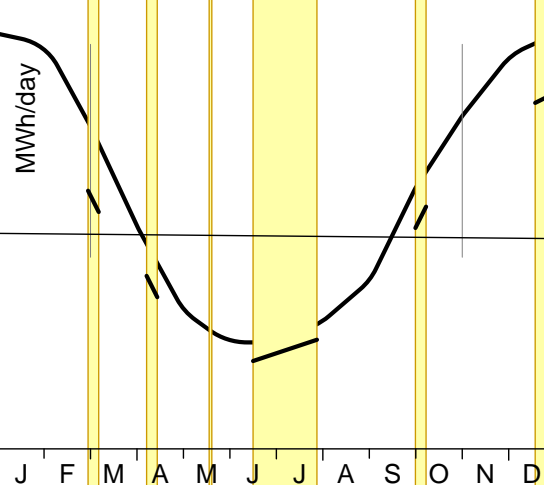
factors that play at various time scales are:
 year: holidays
 week: weekends
 day: night (inactive), start-up, regular lessons, shutdown, peak loads such as showering and meals

year

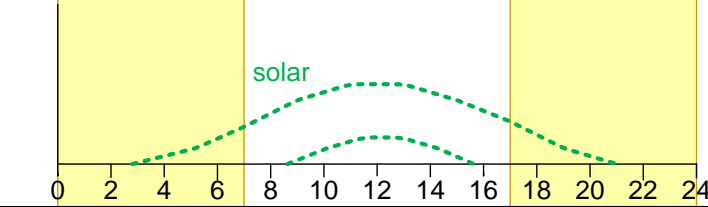
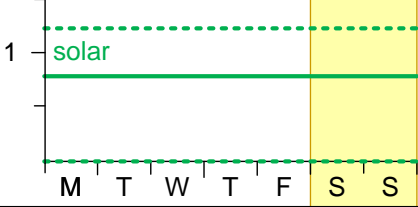
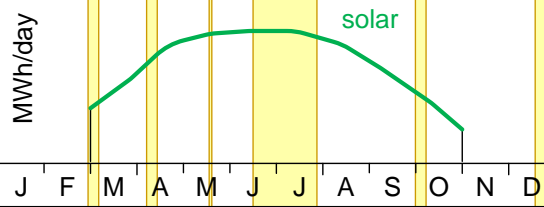
week

day

net demand/supply



supply



demand

