Smart facade system with solar energy storage modelling.

Author: Edvarts Daniels Emersons, master student.
Supervisors: assoc. prof. dr. Ruta Vanaga,
prof. dr. Andra Blumberga. RTU,
assoc Prof Dr Vaidotas Vaišis.

Introduction

To achieve goals *of climate neutrality by 2050* **building energy emissions** have to be decreased with better insulations and heating energy systems have to become more efficient.

Phase change material with it's property to **store thermal energy** can be very beneficial in systems that go through repeated transients off on and off periodic cycles.

Research

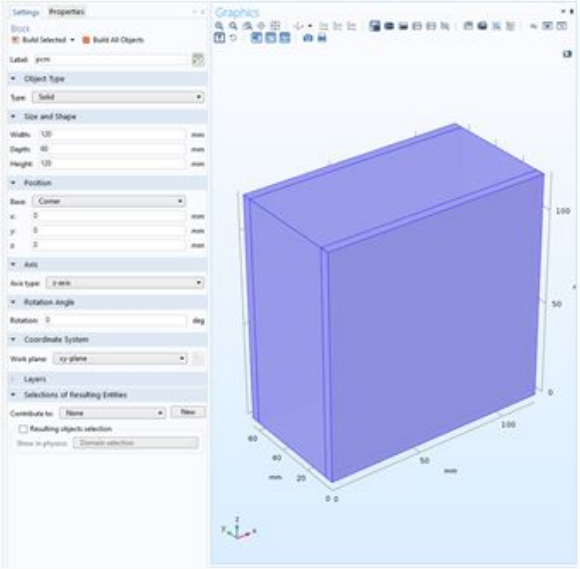
The study analyses and compares an impact of different variants of the internal design of the thermal energy storage unit on the heat exchange process in a model, representative segment of the thermal energy storage unit filled with phase-change material.

Analysis is devoted to computer simulations of the distribution and time evolution of the temperature and heat flux in different box models throughout the year.

Simulation modeling

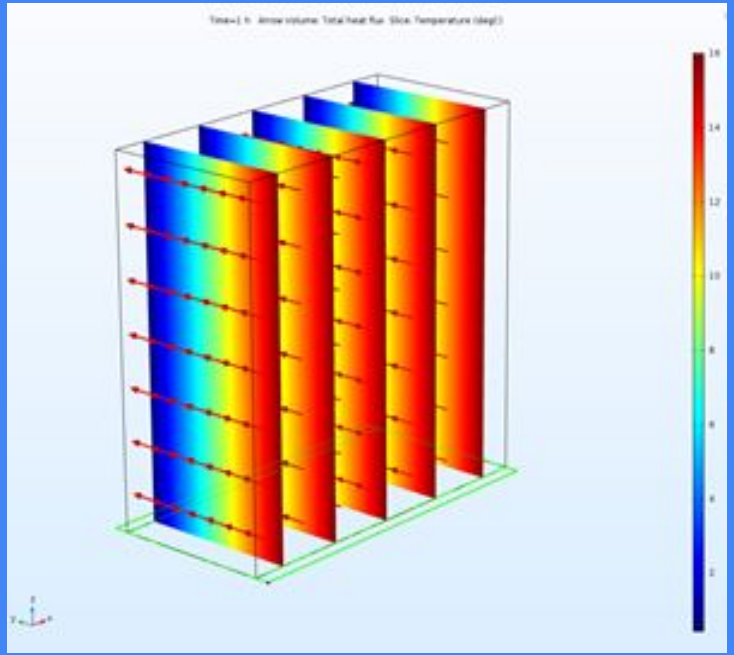
Computer simulations are performed by the COMSOL Multiphysics software (COMSOL Inc., Stockholm, Sweden).

A model of a box without the PCM coverage was compared with models of box with PCM.



Expected results

- *Eliminated extremes of the air temperature inside the model*
- *Better energy storage than non-pcm models*
- *Building energy efficiency increase*



Thanks!

Contact me:

Edvarts Emersons

edvartsemersons@gmail.com