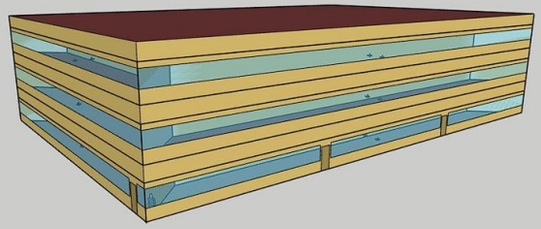
Thermoenergetic performance of a building with phase change materials in future climates



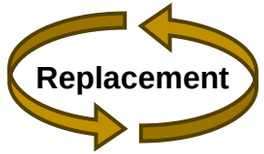
DOE's **medium office** building prototype (steel frame).

***Morphing* process** of climate files using **CCWorldWeatherGen**

A2 Emissions Scenario

Projected climates 2050 & 2080

Phase change material (PCM) **SP24E**

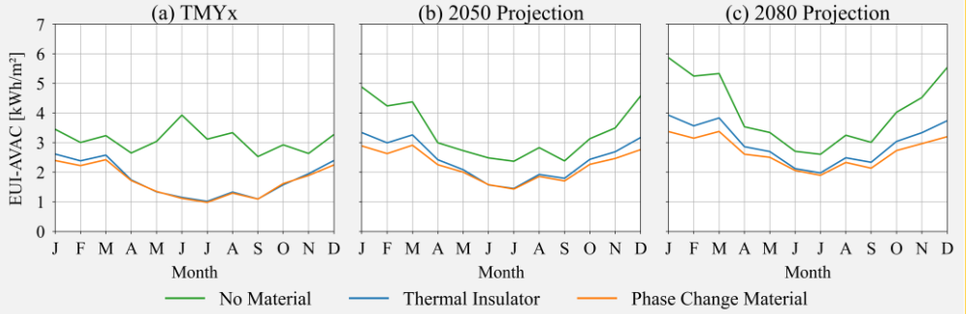


ASHRAE 90.1 (2019) **thermal insulation**

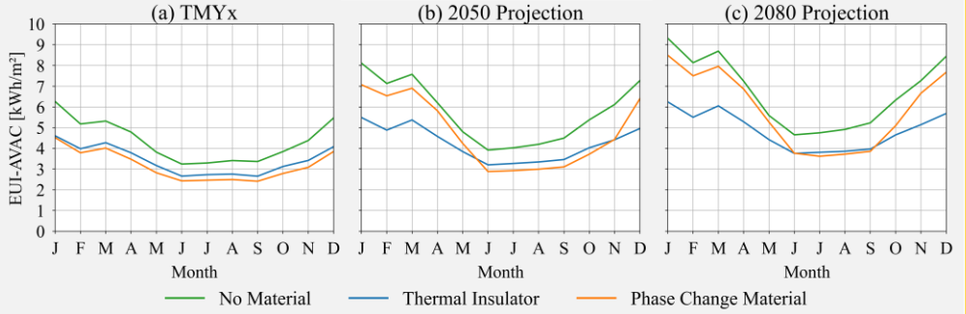
Curitiba, PR (**3A**)
Rio de Janeiro, RJ (**1A**)

EnergyPlus

Curitiba, PR



Rio de Janeiro, RJ



PCM *vs.* Insulation

Annual HVAC EUI comparison

Curitiba, PR

2050: -8.2%

2080: -10%

Rio de Janeiro, RJ

2050: +12.1%

2080: +20.7%

PCM performs better in Curitiba (mild climate) compared to thermal insulation in projected climates but worse in Rio de Janeiro (warmer climate), unable to go through phase change

Energy and Built Environment

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