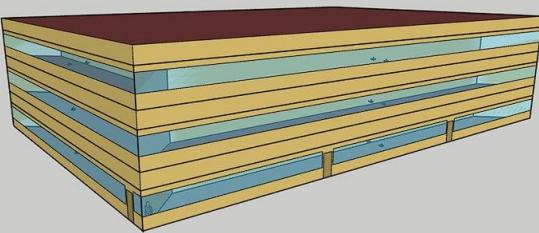


Thermoenergetic performance of a building with phase change materials in future climates



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

Phase change material (PCM) SP24E



ASHRAE 90.1 (2019) thermal insulation

Morphing process of climate files
using CCWorldWeatherGen



A2 Emissions
Scenario

Projected climates 2050 & 2080

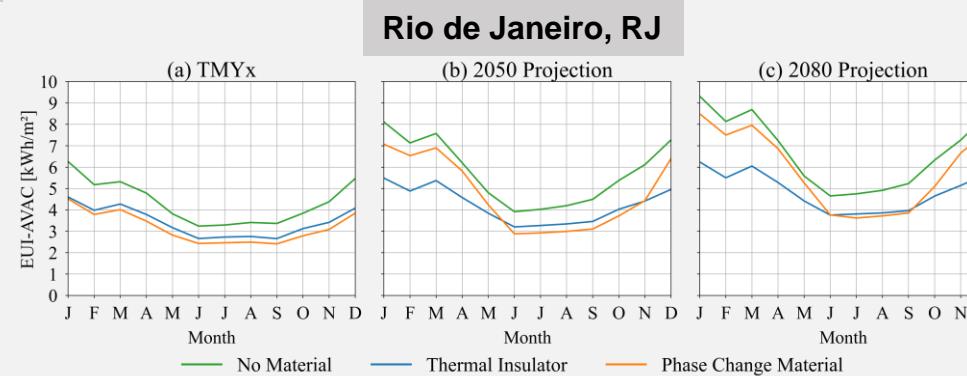
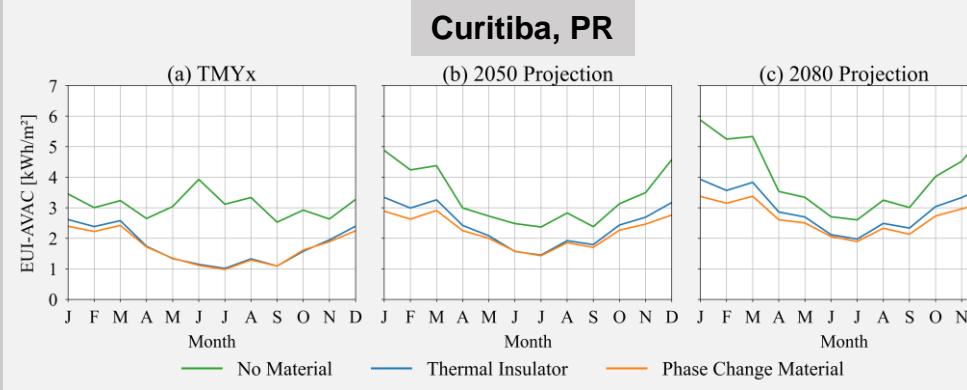


Curitiba, PR (3A)
Rio de Janeiro, RJ (1A)



Energy and Built Environment

Lorenzo O. Filippini, Letícia J.
Rodrigues, Marcelo Schramm
(2023)



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

**PCM vs.
Insulation**

Annual HVAC EUI
comparison

Curitiba, PR

2050: -8.2%

2080: -10%

Rio de Janeiro, RJ

2050: +12.1%

2080: +20.7%