Een betere energietransitie begint met PCM

Ir. G.A. van Dorp
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Elk gebouw wordt een thermische accu

PCM Klimaatplafond

PCM Klimaatplafond

Resultaat

Rijksvastgoedbedrijf

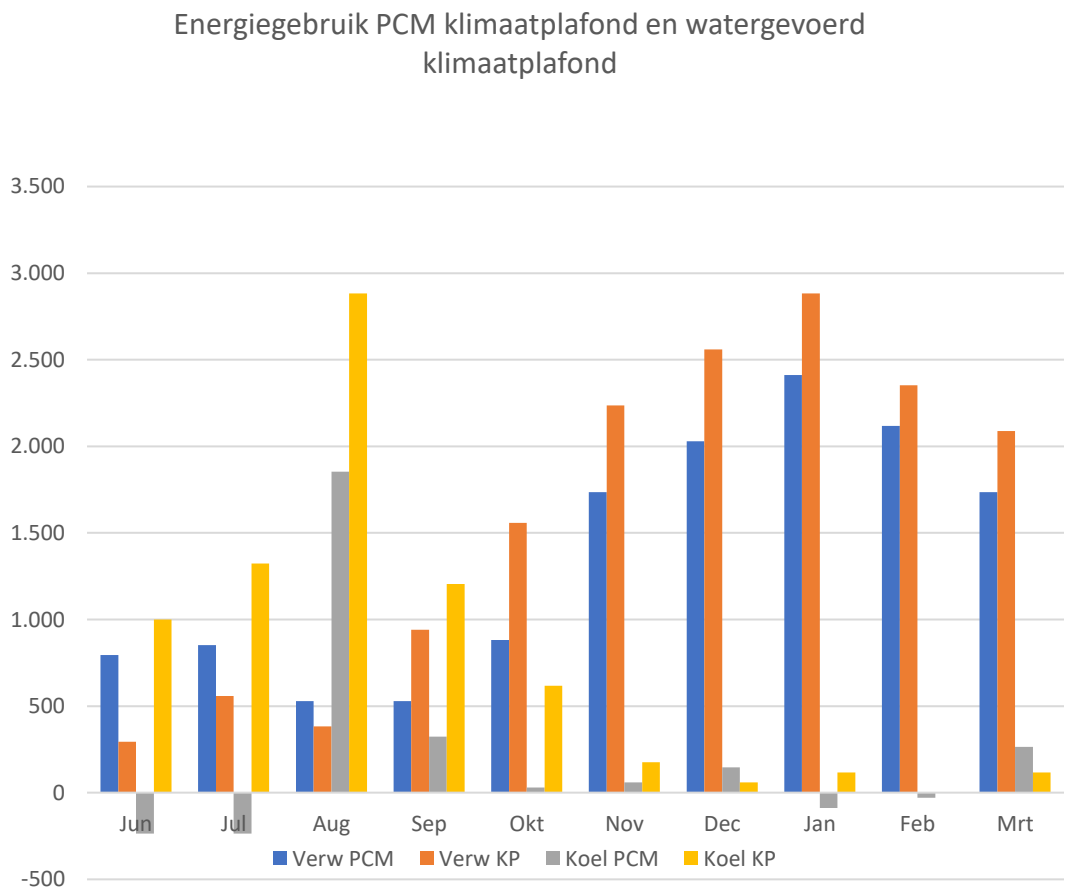
VAN BEEK

AUTARKIS

Appels – appels vergelijk PCM Klimaatplafond ten opzichte van traditioneel klimaatplafond:

1. Besparing 74% op koeling
2. Besparing 16% op verwarming

Resultaat: ‘standaard’ 1990 kantoorgebouw Paris-proof (<50 kWh/m2/jaar)



PCM Klimaattoren

Resultaat

Onderzoek TU Delft: ventileren + PCM koelt met equivalent COP van > 27

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ARTICLE

Performance of a Phase Change Material Battery in a Transparent Building

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ABSTRACT

This research evaluates the performance of a Phase Change Material (PCM) battery integrated into the climate system of a new transparent meeting center. The main research questions are: a. "Can the performance of the battery be calculated?" and b. "Can the battery reduce the heating and cooling energy demand in a significant way?" The first question is answered in this document. In order to be able to answer the second question, especially the way the heat loading in winter should be improved, then more research is necessary. In addition to the thermal battery, which consists of Phase Change Material plates, the climate system has a cross-flow heat exchanger and a heat pump. The battery should play a central role in closing the thermal balance of the lightweight building, which can be loaded with hot return or cold outdoor air. The temperature of the battery plates is monitored by multi-sensors and simulated by the use of PHOENICS (Computational Fluid Dynamics) and MATLAB. This paper reports reasonable agreement between the numerical predictions and the measurements, with a maximum variance of 10%. The current coefficient of performance for heating and cooling is already high, more than 27. There is scope for increasing this much further by making use of the very low-pressure difference of the battery (below 25 Pascal), low pressure fans and the ventilation system as a whole.

PCM Woningbouw

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