



EnergyPlus Hysteresis PCM Model

**Cooperative Research and
Development Final Report**

CRADA Number: CRD-16-639

NREL Technical Contact: Edwin Lee

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In accordance with Requirements set forth in Article X: REPORTS AND PUBLICATIONS A.(2), of the CRADA agreement, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

Parties to the Agreement: NRGsim Inc.

CRADA number: CRD-16-639

CRADA Title: EnergyPlus Hysteresis PCM Model

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	NREL Shared Resources a/k/a Government In-Kind
Year 1	\$ 130,000.00
TOTALS	\$ 130,000.00

Abstract of CRADA Work:

Under the CRADA NREL will provide assistance to NRGsim to debug and convert the EnergyPlus Hysteresis Phase Change Material (“PCM”) model to C++ for adoption into the main code package of the EnergyPlus simulation engine.

Summary of Research Results:

The primary result of this research is the ability to model enhanced physical processes for building envelopes with phase change materials. The work was completed as a full enhancement to EnergyPlus, including discussions with the core development team, review sessions, and the delivered code was accompanied by updated documentation and tests. The capabilities to model phase change materials in EnergyPlus were enhanced in conjunction with the agreed statement of work. The primary enhancement is the ability to input dual curves to capture the physical hysteresis effect seen in phase change materials. The EnergyPlus engine can now be used to better model this technology as a potential energy savings and demand shifting technology. In addition, as part of this work, that code was updated to make it suitable for future inclusion in other phase change applications within the building energy simulation domain.

The code is included in NREL’s public repository of EnergyPlus at <https://github.com/NREL/EnergyPlus>.

Subject Inventions Listing:

N/A

ROI #:

N/A

Report Date:

10/25/17

Responsible Technical Contact at Alliance/NREL:

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Name and Email Address of POC at Company:

The Small Business Voucher program at the Department of Energy funded this project. The point of contact for buildings-related project awardees under this program is:

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