Which type of sustainable rooftop technology is best in cold climates?

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Sustainable rooftop technologies—including green roofs, white roofs, and solar photovoltaic panels—can provide great environmental benefits, but studies of these technologies often look only at their use in hot climates and do not assess their full environmental consequences.

A new study that compares the technologies in the cold Canadian climate shows that photovoltaic panels demonstrate the highest environmental performance in all impact categories considered and is the preferred option from an environmental perspective. Green roofs result in fewer beneficial environmental impacts, but are the only rooftop technology that reduces both heating and cooling energy use. And although white roofs—which are made of light colored roofing materials—are an outstanding option in warmer climates, they have a net negative environmental impact in cold climates due to their high solar reflectance that reduces the amount of heat absorbed.

"Environmental performance of building technologies is very dependent on climate conditions. Therefore, conclusions from technology assessments elsewhere were not necessarily valid in cold climates such as Canada," said

Dr. Joule Bergerson, senior author of the *Journal of Industrial Ecology* study. "Our study builds on the existing knowledge of rooftop technologies and provides recommendations directly relevant for our context."

More information: Cubi, E., Zibin, N. F., Thompson, S. J. and Bergerson, J. (2015), Sustainability of Rooftop Technologies in Cold Climates: Comparative Life Cycle Assessment of White Roofs, Green Roofs, and Photovoltaic Panels. *Journal of Industrial Ecology*. DOI: 10.1111/jiec.12269