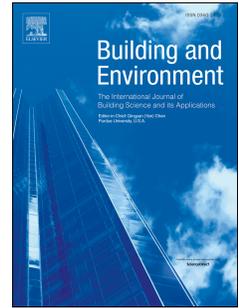


Accepted Manuscript

Achieving a low carbon housing stock: An analysis of low-rise residential carbon reduction measures for new construction in Ontario

Christina Ismailos, Marianne F. Touchie



PII: S0360-1323(17)30448-1

DOI: [10.1016/j.buildenv.2017.09.034](https://doi.org/10.1016/j.buildenv.2017.09.034)

Reference: BAE 5113

To appear in: *Building and Environment*

Received Date: 14 July 2017

Revised Date: 29 August 2017

Accepted Date: 29 September 2017

Please cite this article as: Ismailos C, Touchie MF, Achieving a low carbon housing stock: An analysis of low-rise residential carbon reduction measures for new construction in Ontario, *Building and Environment* (2017), doi: 10.1016/j.buildenv.2017.09.034.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Achieving a Low Carbon Housing Stock: An Analysis of Low-rise Residential Carbon Reduction Measures for New Construction in Ontario

Christina Ismailos¹, Marianne F. Touchie²

Department of Civil Engineering, University of Toronto, Canada

35 St George St, Toronto, ON, Canada M5S 1A4

¹ christina.ismailos@mail.utoronto.ca

² marianne.touchie@utoronto.ca

Abstract

Residential buildings contributed 14% of Canada's greenhouse gas emissions in 2014, making this sector pivotal to climate change mitigation. In 2016, the provincial government of Ontario, Canada mandated a net-zero carbon standard for new "small buildings" by 2030, meaning the low-rise residential sector must undergo major changes to meet this target. Through an energy modelling analysis of a typical single-family home in Ontario, this study demonstrates the potential carbon emissions savings of different reduction strategies, including changes to the building envelope and mechanical system. The most effective strategies include increasing building airtightness, installing additional exterior insulation, and switching to an air source heat pump for heating and cooling. These strategies were then analysed based on the incremental cost above a house built to the building code baseline. In terms of cost per kilogram of carbon mitigated, the most efficient strategies are further insulating the basement, adding additional exterior insulation, and increasing the efficiency of the heat recovery ventilator. Finally, a policy discussion demonstrates that carbon reductions implemented at the design stage must be verified and monitored post-occupancy using policy tools such as energy reporting and small-scale performance studies.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات