Accepted Manuscript

Title: Energy transition potential in peri-urban dwellings: Assessment of theoretical scenarios in the Swiss context

Authors: Judith Drouilles, Sophie Lufkin, Emmanuel Rey

PII: S0378-7788(17)31710-3

DOI: http://dx.doi.org/doi:10.1016/j.enbuild.2017.05.033

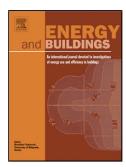
Reference: ENB 7614

To appear in: *ENB*

Received date: 25-7-2016 Revised date: 30-4-2017 Accepted date: 14-5-2017

Please cite this article as: Judith Drouilles, Sophie Lufkin, Emmanuel Rey, Energy transition potential in peri-urban dwellings: Assessment of theoretical scenarios in the Swiss context, Energy and Buildingshttp://dx.doi.org/10.1016/j.enbuild.2017.05.033

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.



ACCEPTED MANUSCRIPT

ENERGY TRANSITION POTENTIAL IN PERI-URBAN DWELLINGS:

Assessment of theoretical scenarios in the Swiss context

Judith DROUILLES, Sophie LUFKIN, Emmanuel REY

Laboratory of Architecture and Sustainable technologies (LAST), Institute of Architecture (IA), School of Architecture, Civil and environmental engineering (ENAC), Ecole Polytechnique Fédérale de Lausanne (EPFL)

ABSTRACT

This paper investigates the theoretical capacity of the Swiss peri-urban dwelling stock to meet energy efficiency requirements through incremental scenarios. The notion of "typical dwelling" allows the assessment of housing energy efficiency at the country scale. The "2,000-watt society" concept and federal policies provide the assessment framework of the daily-mobility and housing operational energy demand along with embodied energies of the dwelling stock. The typical dwellings' current performance for several territorial entities highlight the extent of the challenge the peri-urban housing stock is facing today. Therefore, the paper investigates which conditions would allow the peri-urban typical dwelling to meet "2,000-watt society" intermediary targets. Eight incremental scenarios present theoretical improvements of mobility and housing. They assume an evolution of social practices and individual behaviours, as well as the development of improved technologies. Results show a drastic reduction of primary non-renewable energy (PNRE) demand and greenhouse gas (GHG) emissions for both mobility and dwelling-related consumption. The main findings are that the current MINERGIE-A label is sufficient to build energy efficient buildings, but the current mobility practices remain very far from targets. An optimization of trips and a broader recourse to low carbon conveyances are required to reduce the overall environmental footprint.

1. ABBREVIATIONS

A_E: energy reference area

ARE: Federal office for territorial development

D-EE: (dwelling) embodied energy

DHW: dwelling hot water

D-OE: (dwelling) operational energy

FSO: Federal statistical office

GHG: greenhouse gas

HAVC: heat, air ventilation and cooling

IDM: induced-daily-mobility

IDM-OE: induced-daily-mobility operational energy

IMT: motorized individual transport

LA: living area

Download English Version:

https://daneshyari.com/en/article/4919048

Download Persian Version:

https://daneshyari.com/article/4919048

<u>Daneshyari.com</u>