



CO₂ emissions reduction potential from space and water heating in the Hungarian public buildings

Katarina Korytárova¹, Diana Ürge-Vorsatz¹

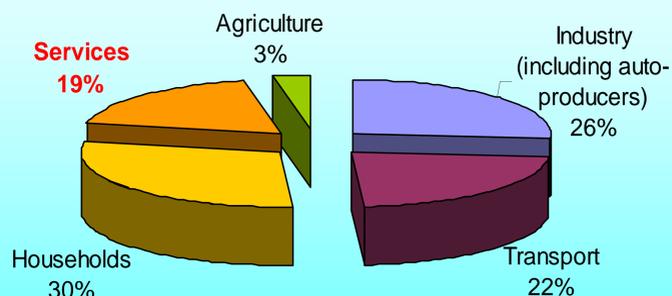
¹ Center for Climate Change and Sustainable Energy Policy, Central European University, Budapest, Hungary

Contact: korytarova_katarina@phd.ceu.hu, vorsatzd@ceu.hu

Introduction

• Aim of the study: to estimate the mitigation potential from space and water heating in the Hungarian public buildings.

▪ The tertiary sector, covering the public and commercial sector, is a significant contributor to Hungarian CO₂ emissions [8].



CO₂ emissions in Hungary (2005)

▪ Current building mitigation research lacks comprehensive analysis of public sector, mainly due to the lack of data on energy use.
 ▪ The current study bridges this gap by providing data on specific energy requirement for a large array of building types.
 ▪ Space heating is predominant in this sector, supplied mainly by natural gas.

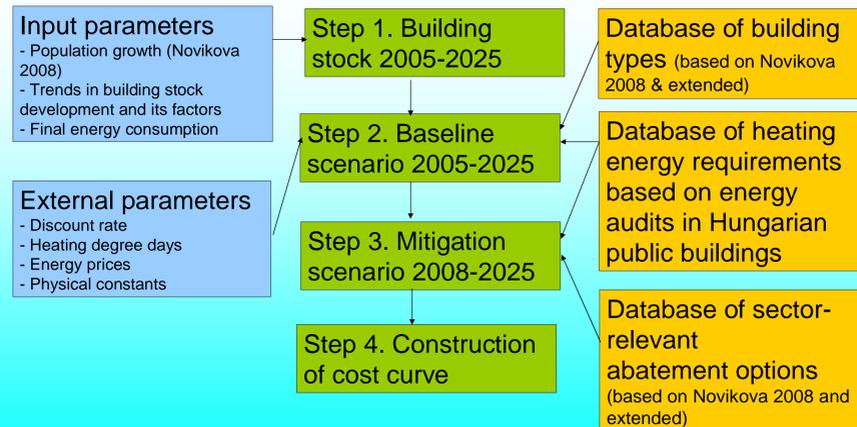
Overall results

If all options examined would be implemented:

▪ 858 kt CO₂ would be reduced (42% of baseline 2025 emissions)
 ▪ 4.3 TWh of final energy would be saved, and
 ▪ 2.1 billion Euro would be saved on energy costs.
 ▪ For this to happen, total investment of 3.6 billion Euro would have to be spent over the period 2008-2025.

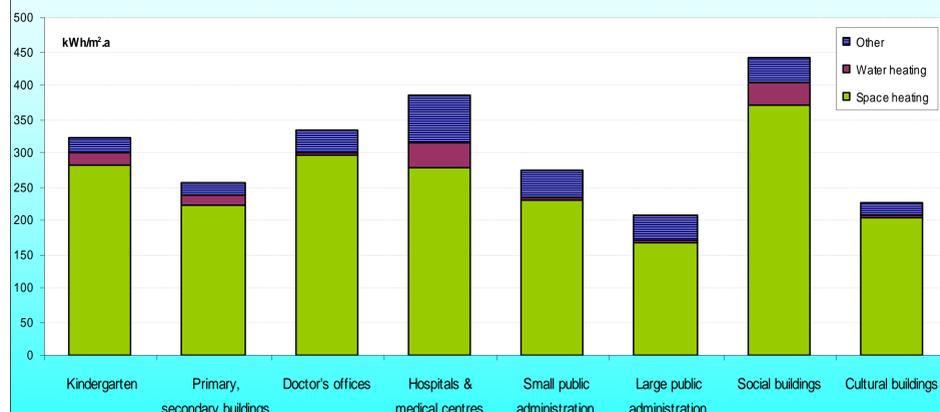
▪ Half of the total potential can be achieved at negative cost.

Methodology



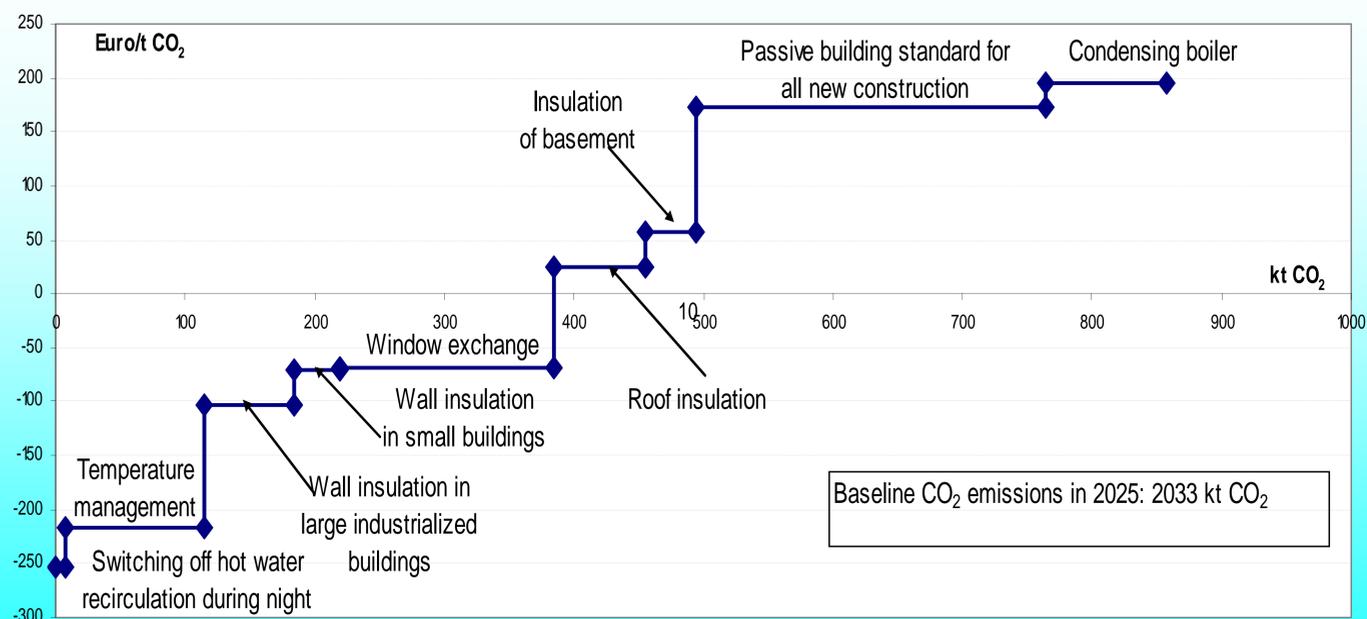
Specific energy requirement in Hungarian public buildings

• Specific energy requirements are calculated based on the set of appr. 100 energy audits of three different sources.



Detailed results - CO₂ reduction potential in 2025

CO ₂ mitigation potential in cost groups	Cumulative CO ₂ savings in 2025	% of the baseline CO ₂ emissions	Cumulative investments	Cumulative energy cost savings
Euro/t CO ₂	kt CO ₂ /yr.	%	mil. EURO	mil. EURO
<0	450	22%	943	1090
<20	484	24%	1064	1164
<100	580	29%	1517	1409
>100	858	42%	3573	2143



Main conclusions

- Existing public buildings in Hungary are highly energy intensive.
- Total CO₂ mitigation potential: 858 kt CO₂ emissions (42% of baseline emissions in 2025).
- Potential achievable at negative costs: 450 kt CO₂ (22% of baseline emissions in 2025).
- The potential can be even higher when renewables are considered.
- Very important option is temperature management in public buildings, 80% of which are currently overheated.
- However, only thorough retrofit ensures the full potential. Therefore building shall be retrofitted as a whole, not as a sum of windows, walls and boilers.
- For this, the follow-up of the study looks at the retrofit through performance-based analysis.