



Future proofing residential apartment buildings

Robustness assessment of energy measures to achieve 'Zero-on-the-meter'

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Background

The importance of the energy performance of a building design increases due to agreements on international, European, and national level. For example:

- (av.) energy label B by 2020 for housing corp. stock [1]
- European ambition: nearly zero energy buildings by 2050 [2]

Towards 2050, the Zero-on-the-meter (ZOM) concept could be a current solution for existing houses. The goal of the ZOM-concept is to generate at least as much energy as the total energy consumption of the building. The Dutch government supports this concept by agreeing on a financial arrangement; the EPV (energy performance indemnity). As compensation for the investment, the occupant pays max. €1.40 per square meter monthly extra rent instead of an

energy bill. This should not result in higher costs for the occupant compared to the situation before the retrofit. The requirements are shown in Figure 1. Exceeding the energy budget leads to extra costs for the occupant.

The existing Dutch building stock contains approximately 2.700.000 apartment buildings [4], of which ca. 75% do not contain energy label A or B [5]. However, the first ZOM retrofit has been performed. This project is being monitored since January 2017 by Nieman consultancy. The Dutch housing stock contains ca. 14.000 'intervamflats', a prefabricated type of apartment building [6].

If the pilot project is resulting in the aimed zero-on-the-meter is still unknown. For robust future projects, more insight into the operational risks is necessary.

Metered energy [kWh/yr]

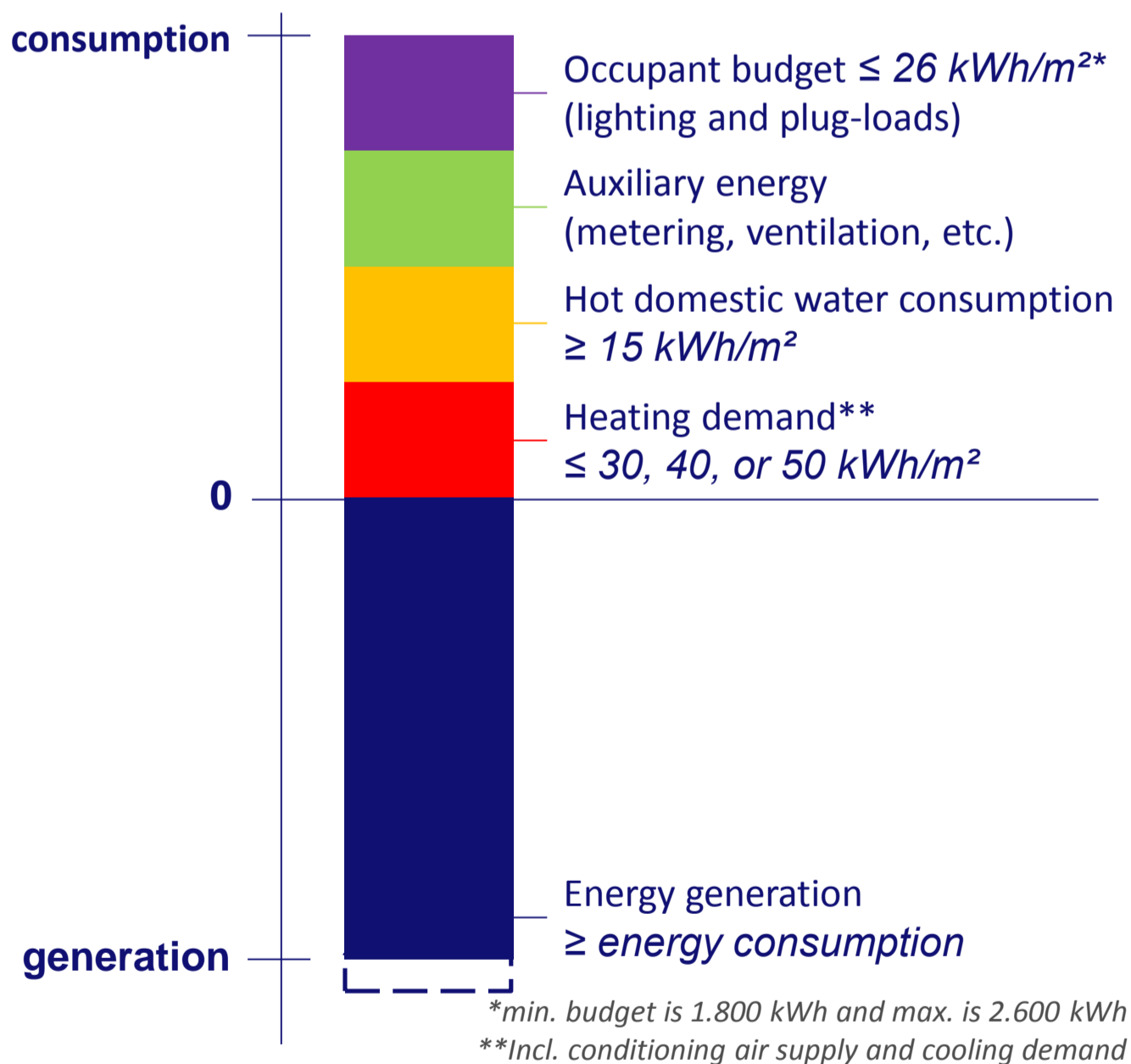
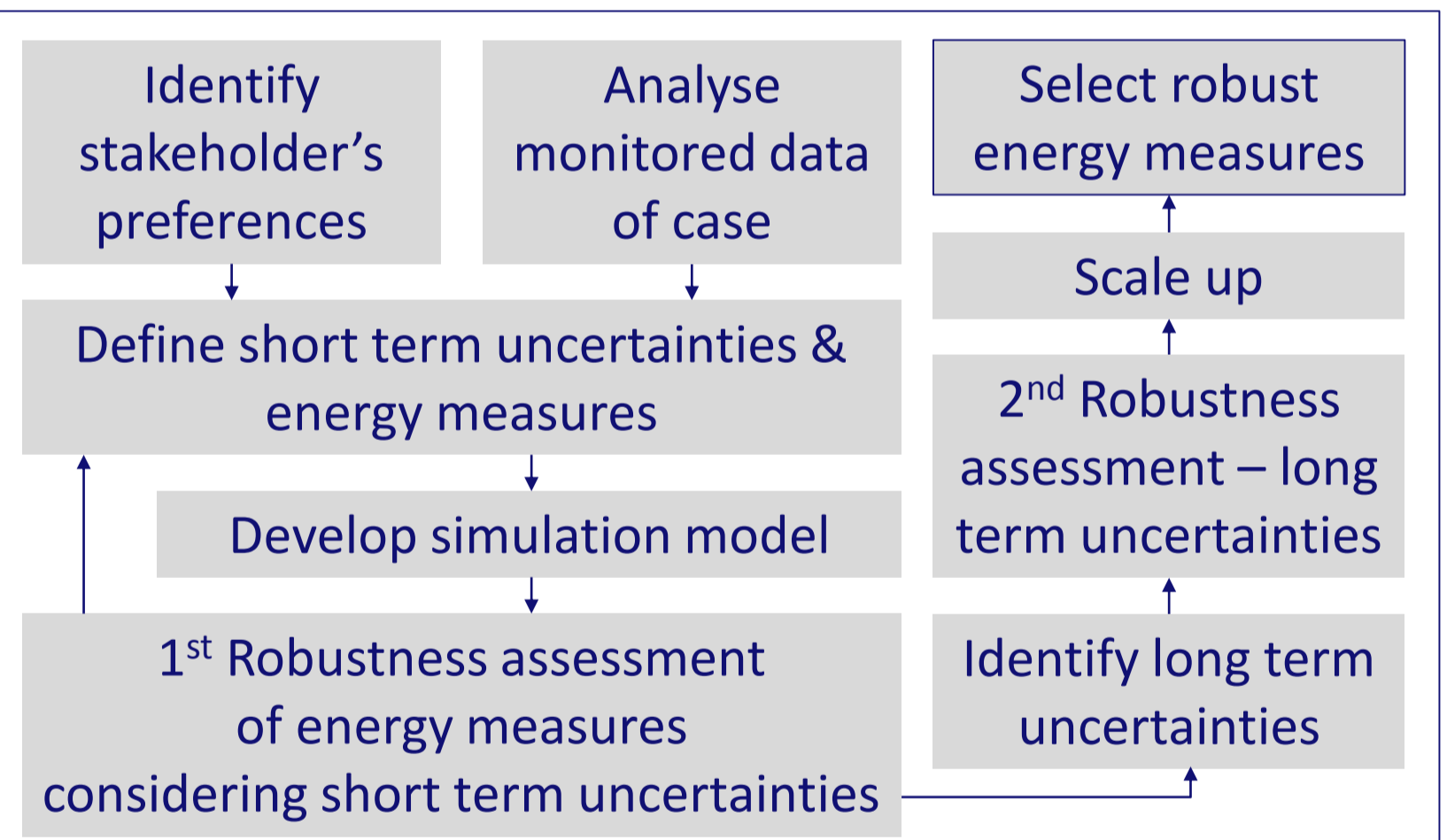


Fig 1 – Visual representation of the EPV-requirements in which the heating demand defines the max. EPV value. A heating demand lower than 30, 40, and 50 kWh/m² result in a maximum EPV of €1.40, 1.20, and 1.00 per m², respectively [3].

Aim of the research

- assess performance robustness of energy measures to apartment buildings
- insight in the energy performance deviations for defined uncertainties

Methodology - a methodology based on [7]



References

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