

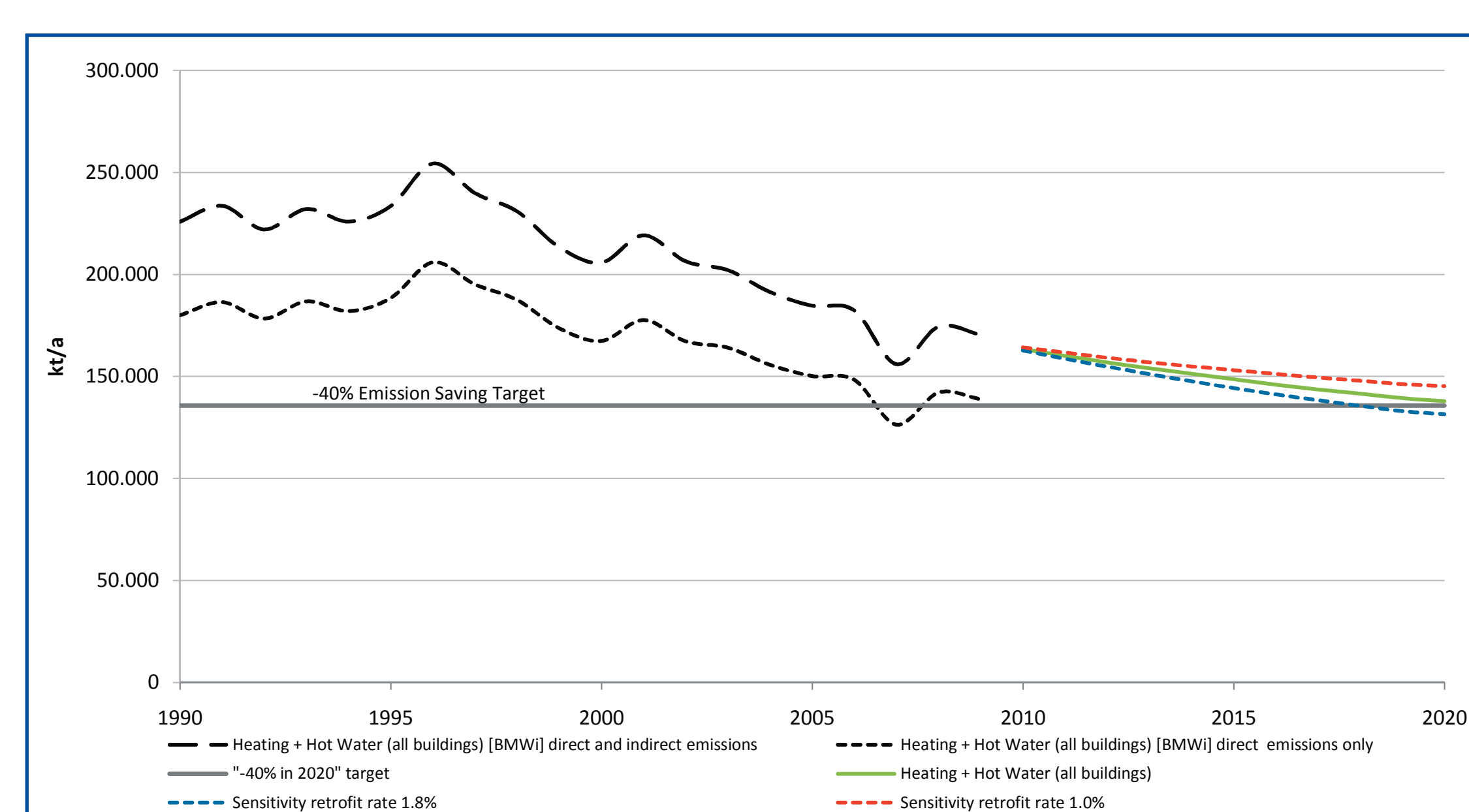
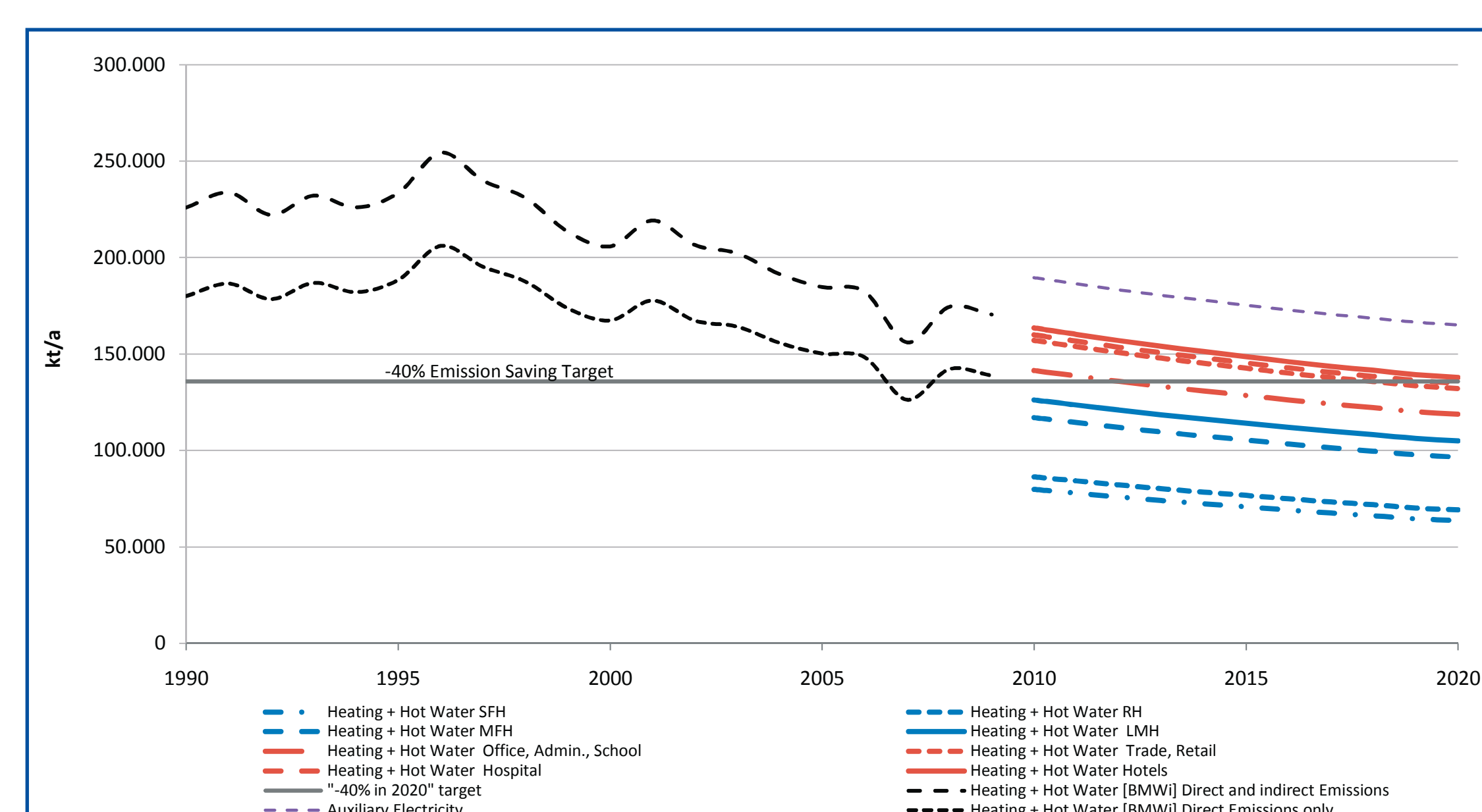
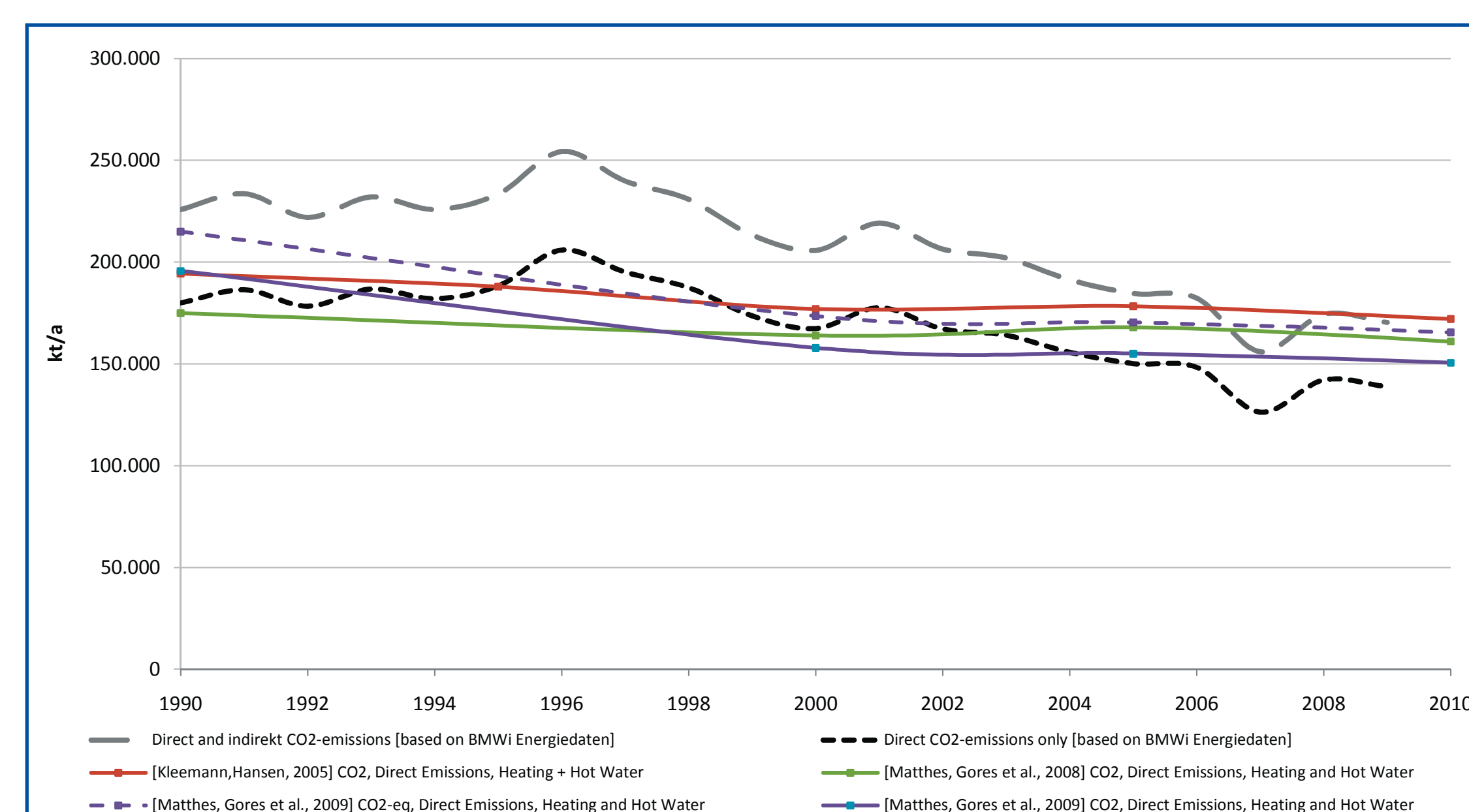
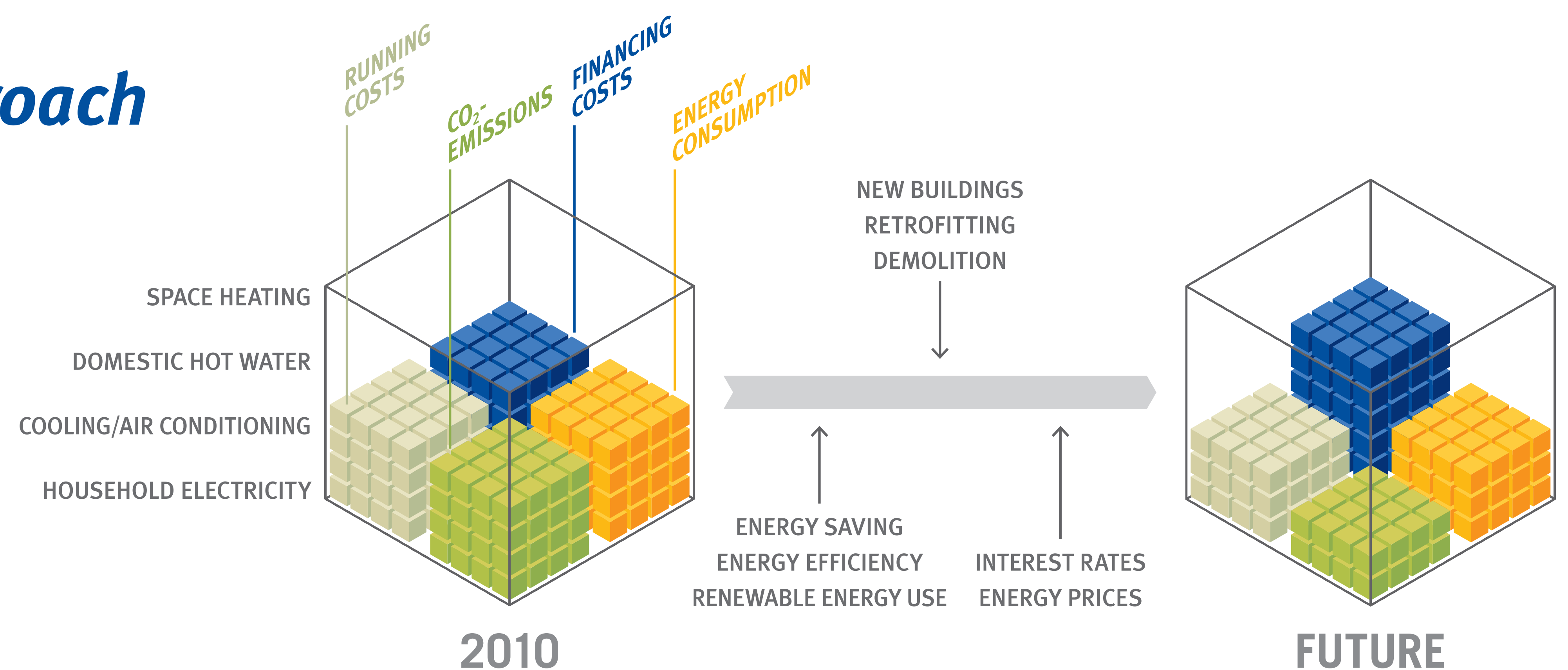
40% CO₂ Savings in the German Building Stock up to 2020

Integrated assessment scenarios with the Built-Environment-Analysis-Model BEAM²

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Research Task and Approach

Aim of this study is the development of a reference-scenario for the German building stock from 1990 up to 2020 and to assess, whether the -40% CO₂-emissions saving target based on 1990 values can be met. It shows the impact of all policy measures which are in place until 1.1.2010



Methodology

In a first step, existing studies for the building sector are assessed in an ex-post evaluation. The effectiveness of policy measures in place is shown based on the underlying studies.

Based on that, a scenario calculation from 2010 to 2020 is been carried out, that forecasts the effects of the policy measures which are in place until January 1st 2010. The scenario is set up with the Built-Environment-Analysis-Model BEAM², which has been developed by Ecofys. Main results of the scenario calculation are the development of floor areas, heating demands, end- and primary-energy demands as well as CO₂-emissions.

Ex-post Evaluation 1990-2010

The CO₂-emissions in the building sector are not directly given in all details in statistics, but can be calculated based on end energy data from the “BMWi-Energiedaten” (Federal Ministry of Economics and Technology), taking into account appropriate emissions factors. The following figure shows the emissions path in comparison to several studies, which partly use different methodologies.

Ex-ante Evaluation 2010-2020

As the CO₂-emissions up to 2020 are a main result of the research, the following figure shows the development of the emissions for heating and hot water purposes. It is shown according to the building types, for both the historic data from BMWi-Energiedaten and the forecast until 2020.

The impact of different retrofit rates (1.4% +/- 0.4%) on the CO₂-emissions is been shown in the following figure. The constant line shows the 40% CO₂-emissions saving target for 2020, based on the 1990 values.

Furthermore the sensitivities for an i) increasing impact of climate change and ii) constant population development are shown in the study. Apart from the CO₂-emissions shown here, heating energy demands as well as end- and primary-energy demands for heating purposes, hot water and auxiliary energy are calculated.

Conclusion

To make sure to reach the target in 2020 (reduction of CO₂-emissions from 1990 to 2010 by 40%), existing policy measures should be applied consequently and in some areas it is useful to set up additional policy measures.

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