

Impact of Carbon Tax and Earmarked Tax Revenues on the Feasibility of Energetic Refurbishments for Single-Family Houses

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Simple (optimistic) example (Germany)

- Energetic Refurbishment SFH¹:
 - Investment costs: 60,000 € (36,000 € refurbishment, 24,000 € energy related)
 - Energy cost savings:  1,000 €/a (1,500 €/a before, 500 €/a after)
 - Amortization:  24 years (energy related),
60 years (full costs)

Not included:

- Price increase rates energy costs
 - In the past rapidly rising; in estimations often increase rates of 5%/a and more 
 - Recent years almost constant
- Discounting 
- State funding grants
- Maintenance & future component replacements

*1: Single family house

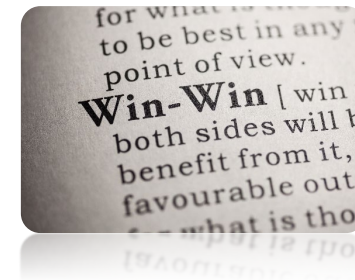
Barriers when increasing the modernization rate



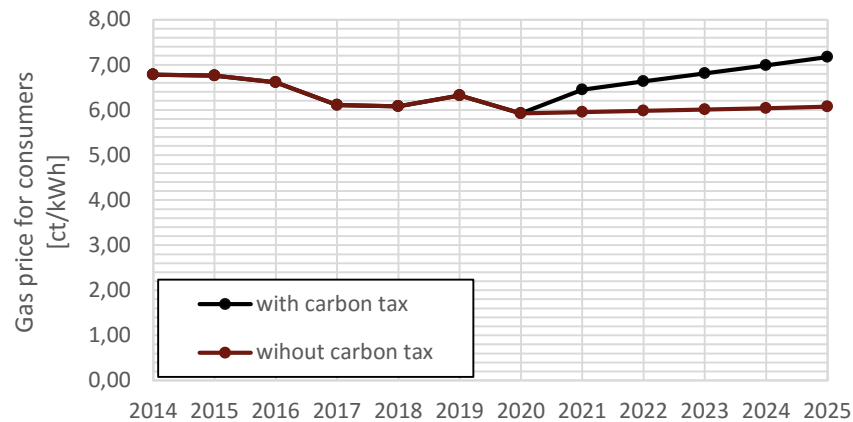
- Refurbishment must be deemed necessary
- Even then amortisation period critical without substantial funding grants
- Funding grants are not used

Solution?

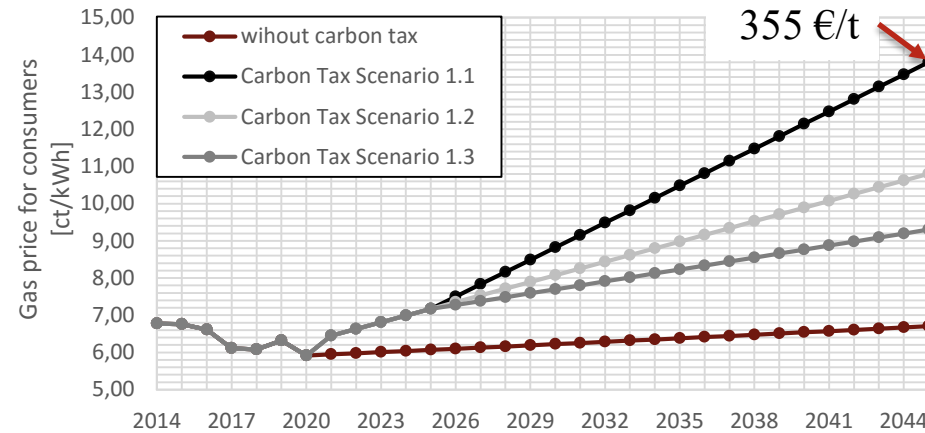
- Adjusting the current framework to make refurbishments a profitable undertaking
- Energy costs are the best lever to increase profitability
- Carbon tax can be used for this
- **Earmark** the tax to modernization
 - Higher taxes improve profitability and increase financial return flows
 - Makes it easier to avoid the tax at the same time



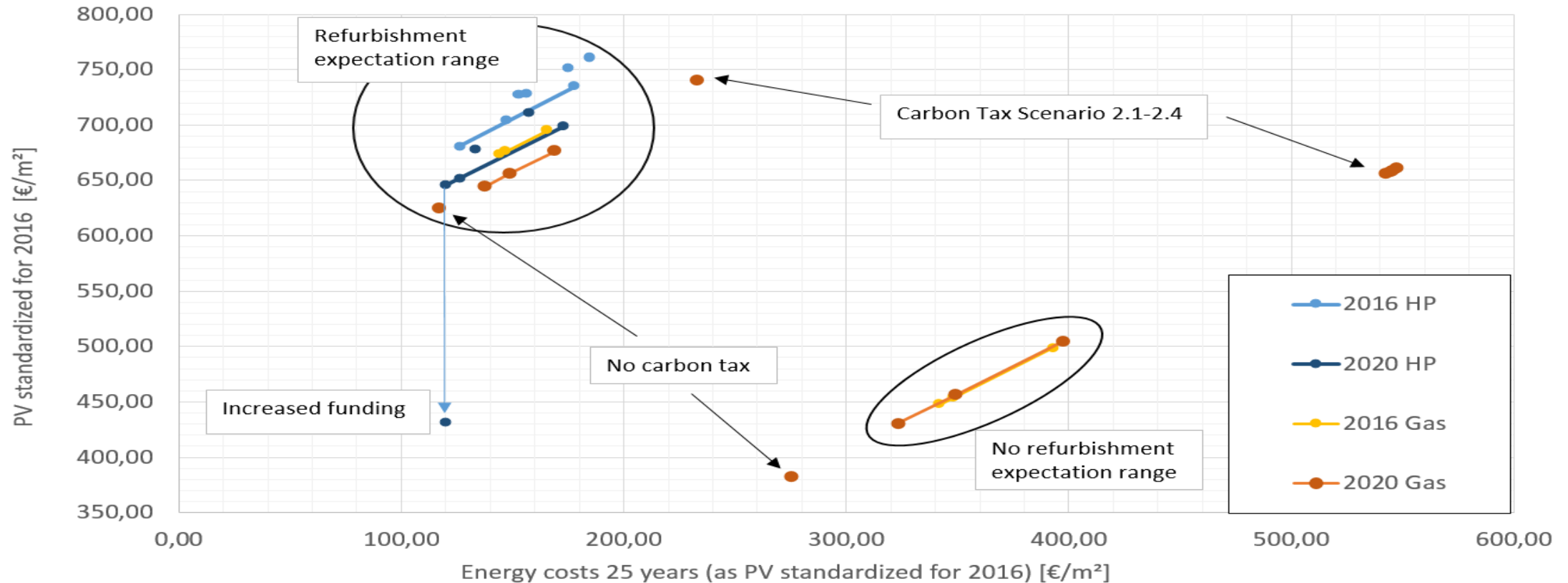
- Carbon tax introduced to the german building sector
 - 2021: 25 €/t; 2025: 55 €/t
 - Levied on energy sources like gas or oil
- Impact on energy prices



after 2025?



3. Analysing the current economic situation



- Simple replacement of heating system favourable when refurbishment not deemed necessary
- Current carbon tax has only a small economic effect

- Significant carbon tax increases would be necessary

Earmarking the carbon tax instead

Carbon emission building sector 2018:

Gas	57 Mio. t
Oil	38 Mio. t
Coal	2 Mio. t

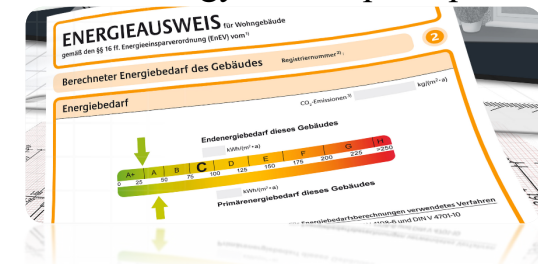


2,417.5 Mio. € (25 €/t)

Equally split one time grants *(MFH benefit more)*:

- 9,227 € for every SFH (~150m²) modernization
- 24,605 € for every MFH (~400m²) modernization
- Additional funding grants 10-15%, 9-10 years reduced amortisation
- Factorizing carbon tax effect by **x52** within first year
- Doubling the price ...
- A target oriented splitting would further increase impact

e.g. based on carbon emissions
in energy consumption pass

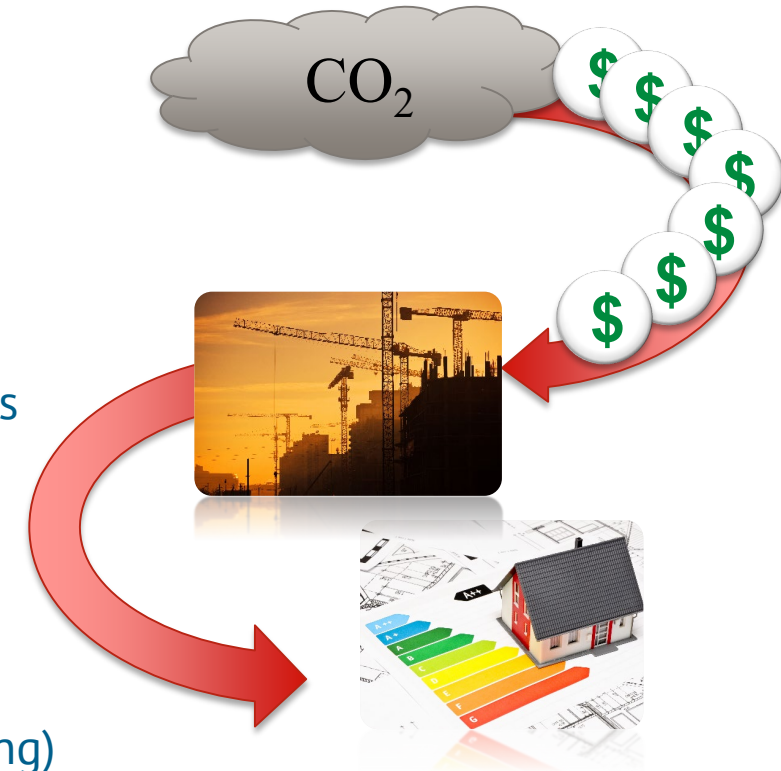


Currently building stock not on course

- Extensive use of gas in standing buildings and also in new construction
- Higher modernization rate necessary

Earmarking carbon tax

- Would have effect instantly **(x52)**
 - Target oriented distribution further incentivizes low-carbon technologies
 - Application through:
 - Energy consumption pass (easy but delayed)
 - State funding (KfW) application
- Substantial carbon taxes would be necessary (without earmarking)
- The current carbon tax would already have significant impact (with earmarking)
- Potentially reduces the delay of refurbishments
 - Instead refurbishments may be pulled forward for economic reasons



Thank you for the attention!

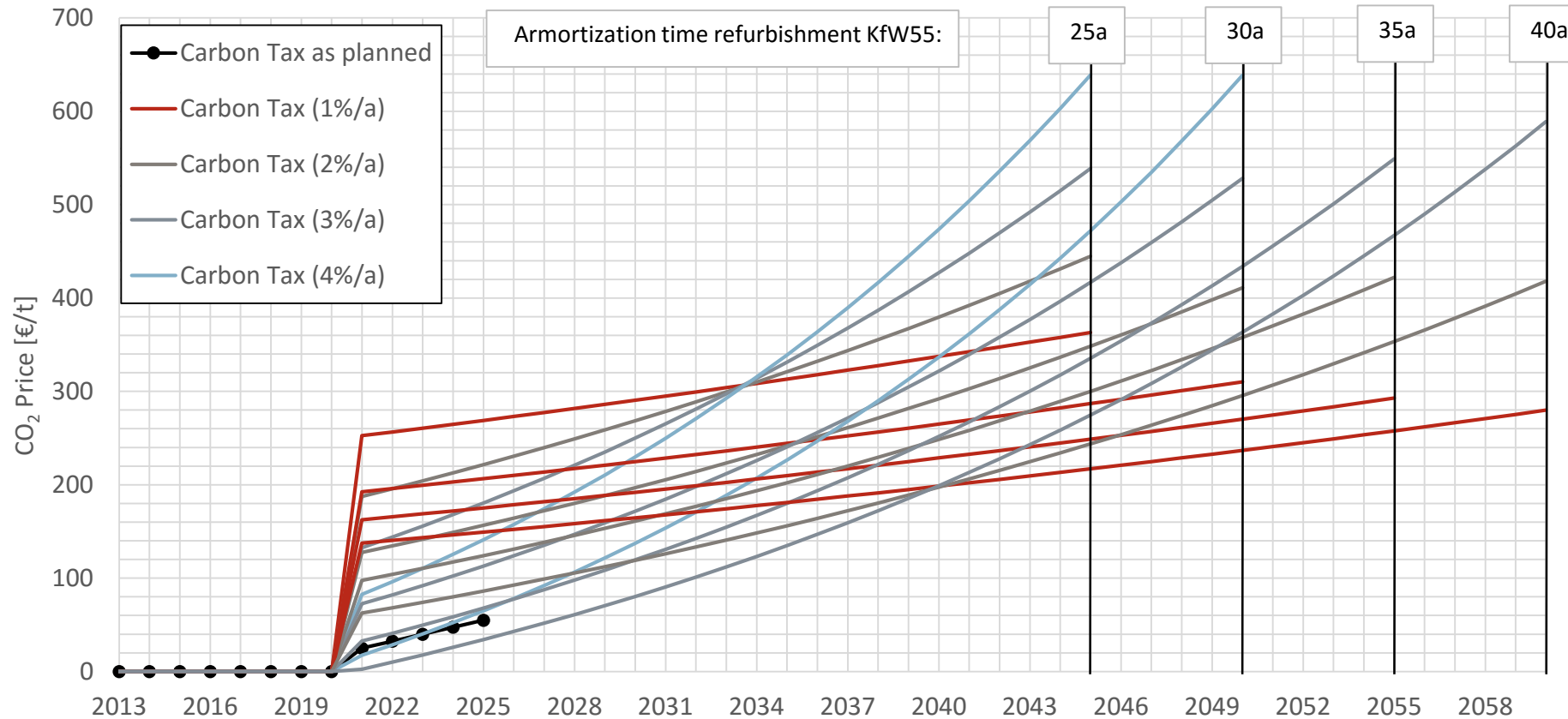
Any questions or remarks?

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3. Analysing the current economic situation



➤ For significant changes drastically higher carbon tax necessary