

The impact of energy efficiency on Belgian house prices

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EEMI Bauhaus event
May 30 2022

Why are house prices an important topic for the National Bank of Belgium?



Economic activity



Financial stability



Inflation



Household wealth



Housing affordability



Energy efficiency

This presentation analyses the impact of energy efficiency on Belgian house

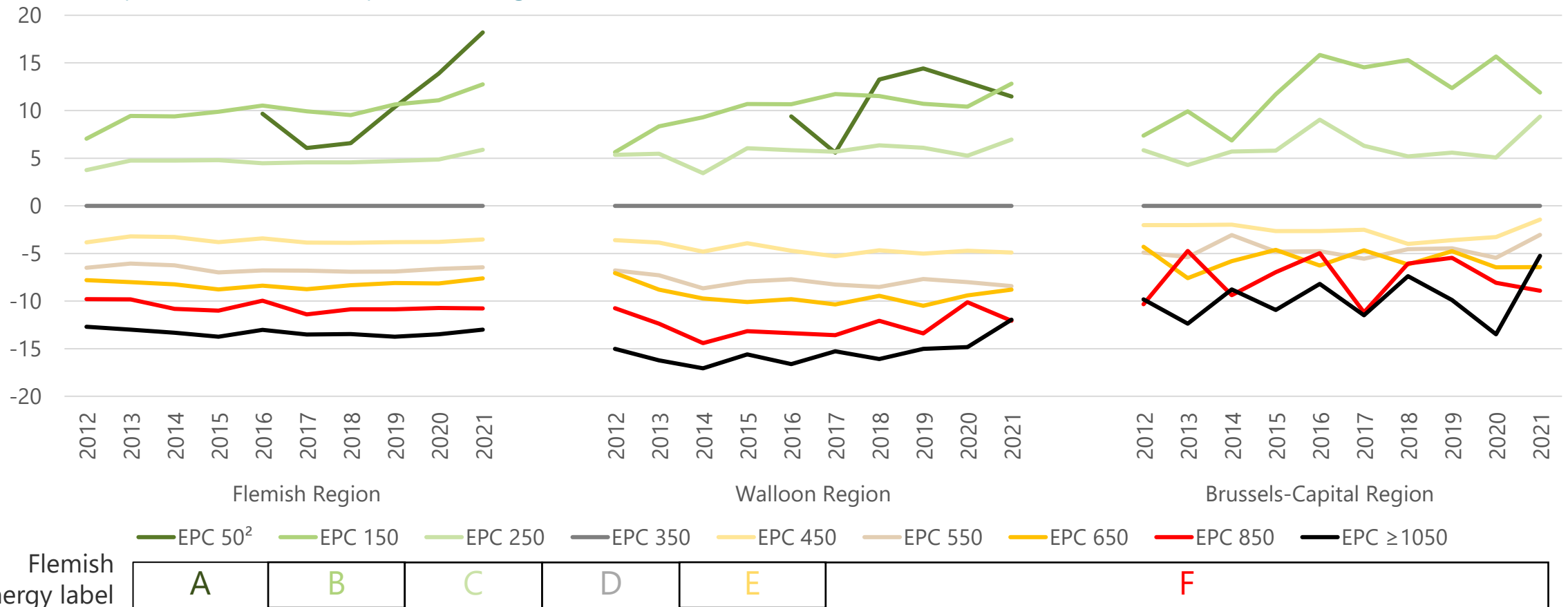
- Outline
 1. The estimated price premium of energy efficient houses
 2. The improvement of the energy efficiency of dwellings over time
 3. The impact of energy efficiency on quality-adjusted house price indices
- Unique dataset for Belgium
 - Combination of the property transaction dataset and the energy performance certificates datasets
 - Transactions of existing houses (new builds are not included)
 - Sample period 2011Q3-2021Q2

The estimated price premium of energy efficient houses



The price difference between low and high EPC scores has widened and is likely to further increase due to the high energy prices and energy efficiency standards

Estimated energy efficiency price premium of houses¹
(in %, price difference to a comparable dwelling with an EPC score of 350 kWh/m²)



Source: Reusens, Vastmans and Damen (2022).

¹ The estimated price premia have been roughly corrected for the impact of unobserved quality and comfort characteristics, but should still be interpreted with a lot of caution. Note also that our years are shifted backwards by two quarters (e.g. our year "2021" corresponds to the period 2020Q3-2021Q2).

² The price premium of EPC 50 for houses is omitted for the period before 2015 and for Brussels houses as it was based on too few observations.

Estimates of the energy efficiency price premium differ strongly between studies, because they analyse different time periods, countries and control variables

Average price premium of the A and B rating bands in comparison to D
(Literature overview of Copiello and Donati, 2021)
(in %)

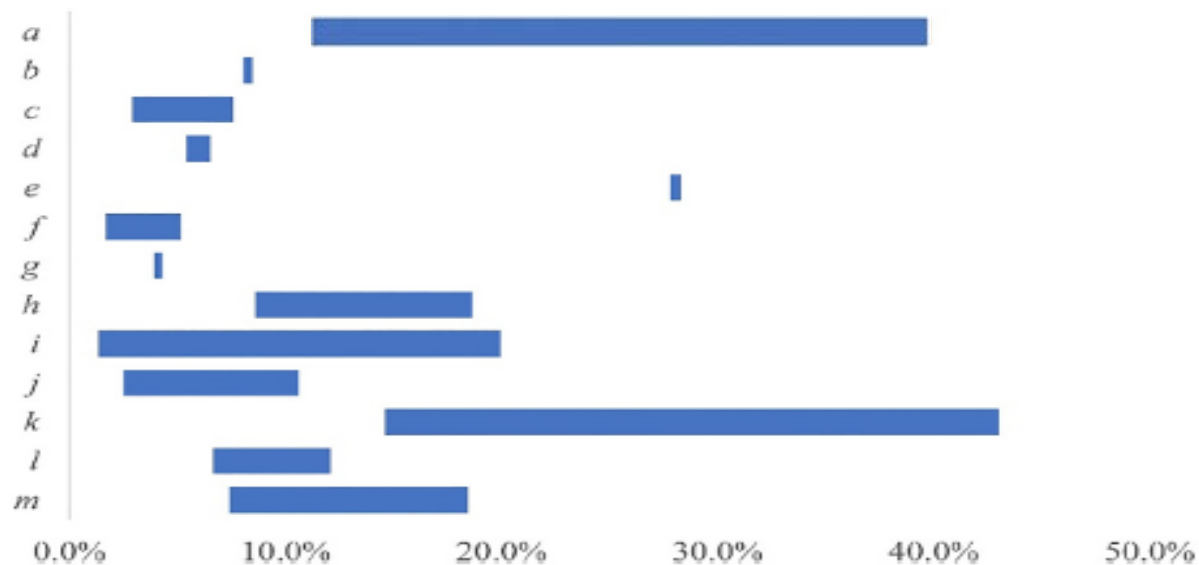


Fig. 10. Average price premium of the A and B rating bands in comparison to the D one (*a* Authors' study; *b* Brounen, Kok [78]; *c* Hyland et al. [80]; *d* Fuerst et al. [88]; *e* Davis et al. [89]; *f* Fuerst et al. [90]; *g* Bonifaci, Copiello [61]; *h* Fuerst et al. [93]; *i* Fuerst et al. [94]; *j* Jensen et al. [97]; *k* Manganelli et al. [30]; *l* McCord et al. [111]; *m* Evangelista et al. [113]).

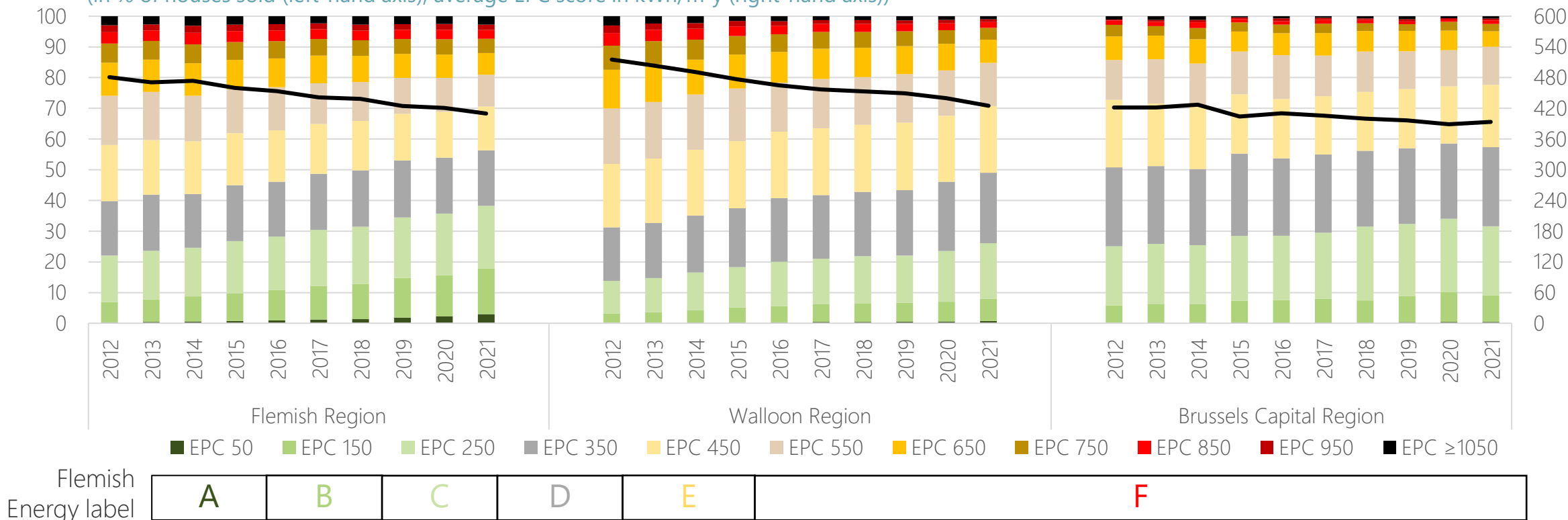
A hand is shown holding a house-shaped object that has been overlaid with a thermal or energy efficiency heatmap. The heatmap uses a color scale from blue (low energy loss) to red (high energy loss). The roof and walls show significant red and orange areas, indicating high energy loss, while the windows and doors are dark purple, indicating lower energy loss. The background is a blurred image of a hand holding a coin, with faint circular patterns overlaid.

The improvement of the energy efficiency over time

The energy performance of the houses sold has improved over the past decade, but it will need to improve much more to reach the 2050-goal of label A

Energy efficiency EPC score of the sold houses, by year of sale¹

(in % of houses sold (left-hand axis); average EPC score in kWh/m²y (right-hand axis))



2050 target: on average label A (= EPC score of 100 kWh/m²)

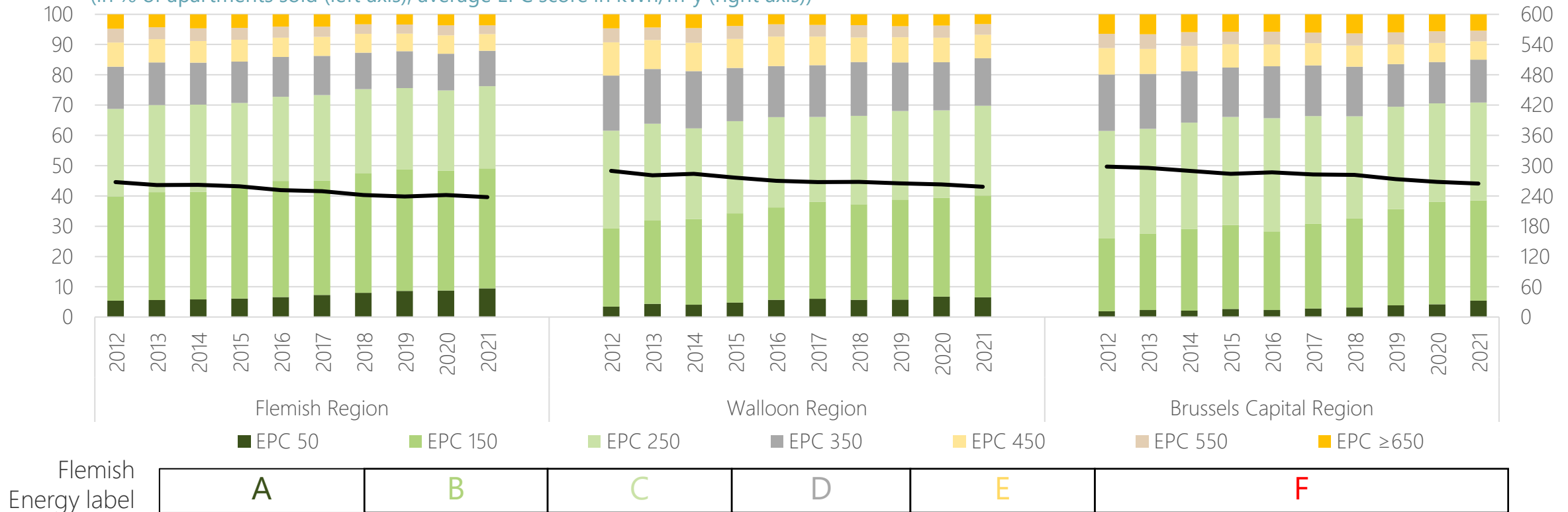
Source: Reusens, Vastmans & Damen (2022).

¹ The average energy performance of the entire housing stock is likely better than that of our sample of dwellings sold. Energy renovation often follows a property sale (and in such cases is not yet included in the EPC score of the sold dwellings). Moreover, new builds are not included in our dataset of dwellings sold.

Although apartments have a lower EPC score thanks to their building structure, it has improved less and only few apartments already meet the 2050 label A goal

Energy efficiency EPC score of the sold apartments, by year of sale¹

(in % of apartments sold (left axis); average EPC score in kWh/m²y (right axis))



2050 target: on average label A (= EPC score of 100 kWh/m²)

Source: Reusens, Vastmans & Damen (2022).

¹ The average energy performance of the entire housing stock is likely better than that of our sample of dwellings sold. Energy renovation often follows a property sale (and in such cases is not yet included in the EPC score of the sold dwellings). Moreover, new builds are not included in our dataset of dwellings sold.

The renovation of the dwelling stock to energy label A by 2050 is a big challenge

- The energy renovation of Belgian dwellings to label A by 2050 will require:
 - Investment of € 250-400 billion (on average € 50 000 - 80 000 per dwelling)
 - Every year 3 % (=170 000) of dwellings should be renovated to label A
- Impediments to be overcome
 - Labour shortages in the construction sector
 - Half of families cannot finance a deep energy renovation
 - Payback time of energy renovation can be long
 - Split-incentives between landlord and tenant



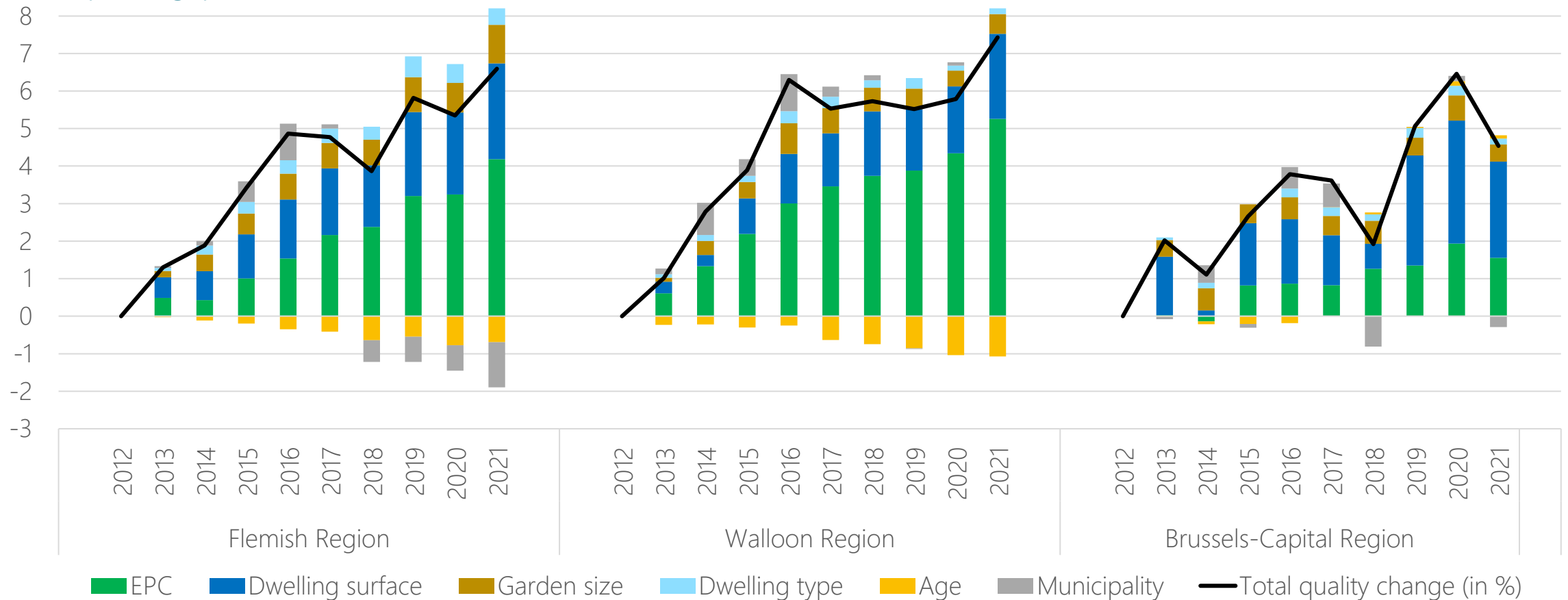
A hand holding a house icon with an upward-pointing arrow and a line graph overlay.

The impact of energy efficiency on quality-adjusted house price indices

The quality of the houses sold has steadily increased over the past decade and mainly reflects the improvements in the energy performance

Contribution to the quality change of the sold houses¹

(in percentage points, 2012=0)



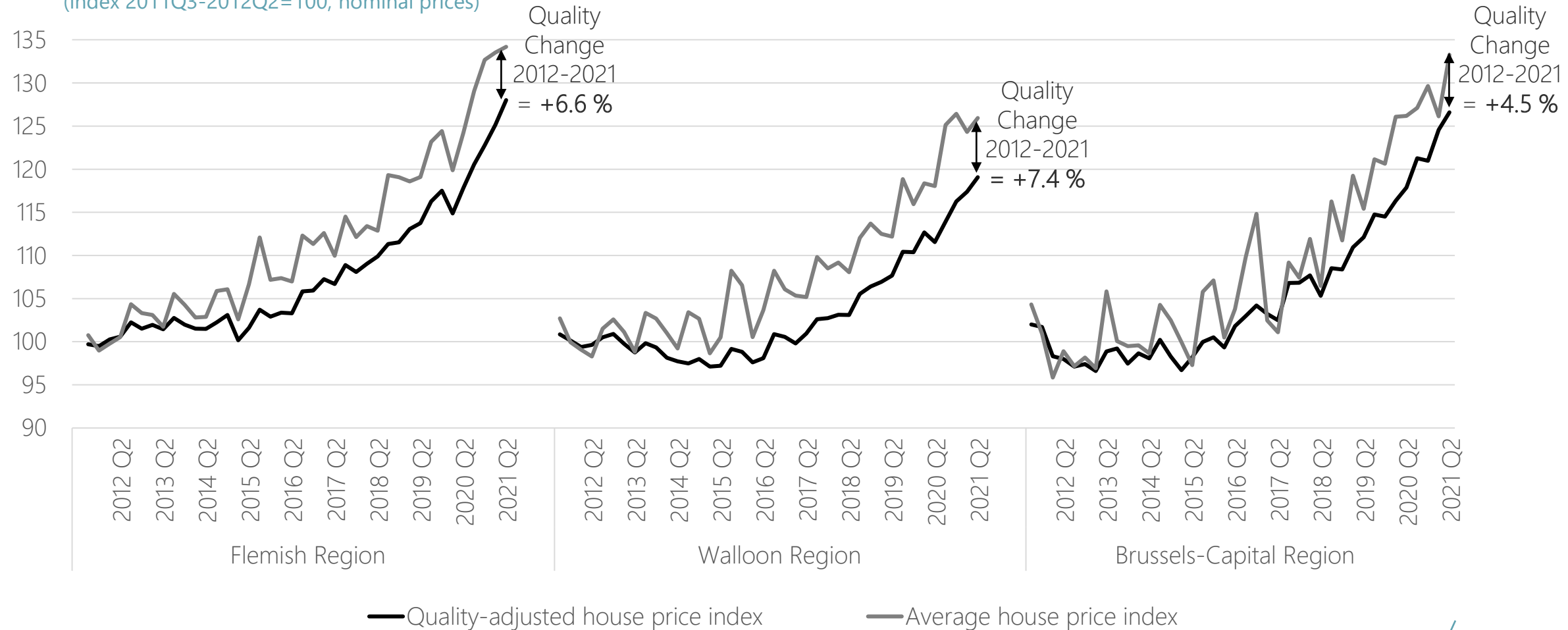
Source: Reusens, Vastmans & Damen (2022).

¹ The quality of the houses sold should be broadly interpreted as the value of their dwelling characteristics. Note also that our years are shifted backwards by 2 quarters (e.g. our year "2021" corresponds to the period 2020Q3-2021Q2).

The price of an identical house has increased about 7 % less over the past decade compared to average sales prices

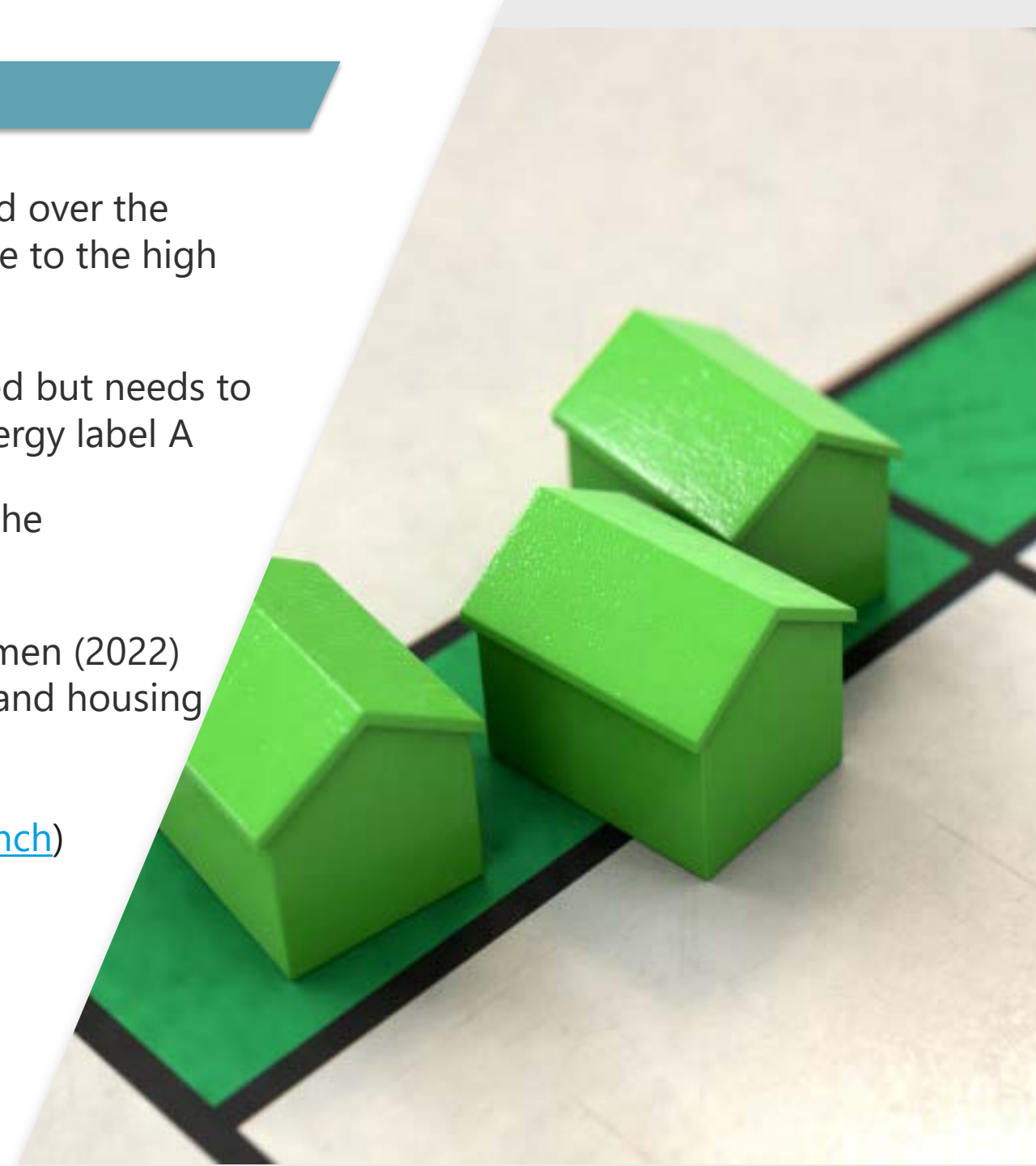
House price indices in the three Regions

(index 2011Q3-2012Q2=100, nominal prices)



Conclusion

- Price premium of energy efficient houses increased over the previous decade and will likely further increase due to the high energy prices and energy efficiency standards
- The energy performance of dwellings has improved but needs to improve much more to reach the 2050-goal of energy label A
- Quality-adjusted house price indices should take the improvements in energy efficiency into account
- Further information in Reusens, Vastmans and Damen (2022) The impact of changes in dwelling characteristics and housing preferences on house price indices
([NBB working paper article](#))
([Data and non-technical summary in Dutch or French](#))





Thank you for your attention

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