IMMO ELIZA:
DATA ANALYSIS

INTRODUCTION:
TEAM & PROJECT

The Team:
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The Project:
ImmoEliza wants to become market leader in Belgian real estate
Strategic focus: improving accuracy & speed of property valuation

Our task:
- Build predictive model for property prices
- Data Analysis (N2) deliverable: understanding dataset before modeling

Guiding questions:
1. What notable insights emerge from Belgian real estate data?
2. Which variables have strongest influence on property prices?

IMMO DATA:
SCOPE & STRUCTURE

Dataset's basic characteristics

- total number of observations: 75508
- total variables: id + 29
- data types:
    - quantitative continuous: 10
    - quantitative discrete: 3 (zip code, nmbrs)
    - nominal/categorical: 9 (e.g. subproperty type)
    - binary: 7 (flags)
- target variable: PRICE

DATA QUALITY ASSESSMENT & PROCESSING

Key Insight

– Missingness –
- Not random but clustered by property type, subproperty type, region, & EPC
- Some missing values carry strong predictive information (e.g., land surface)
- Preserving or flagging missing values helps models capture price signals

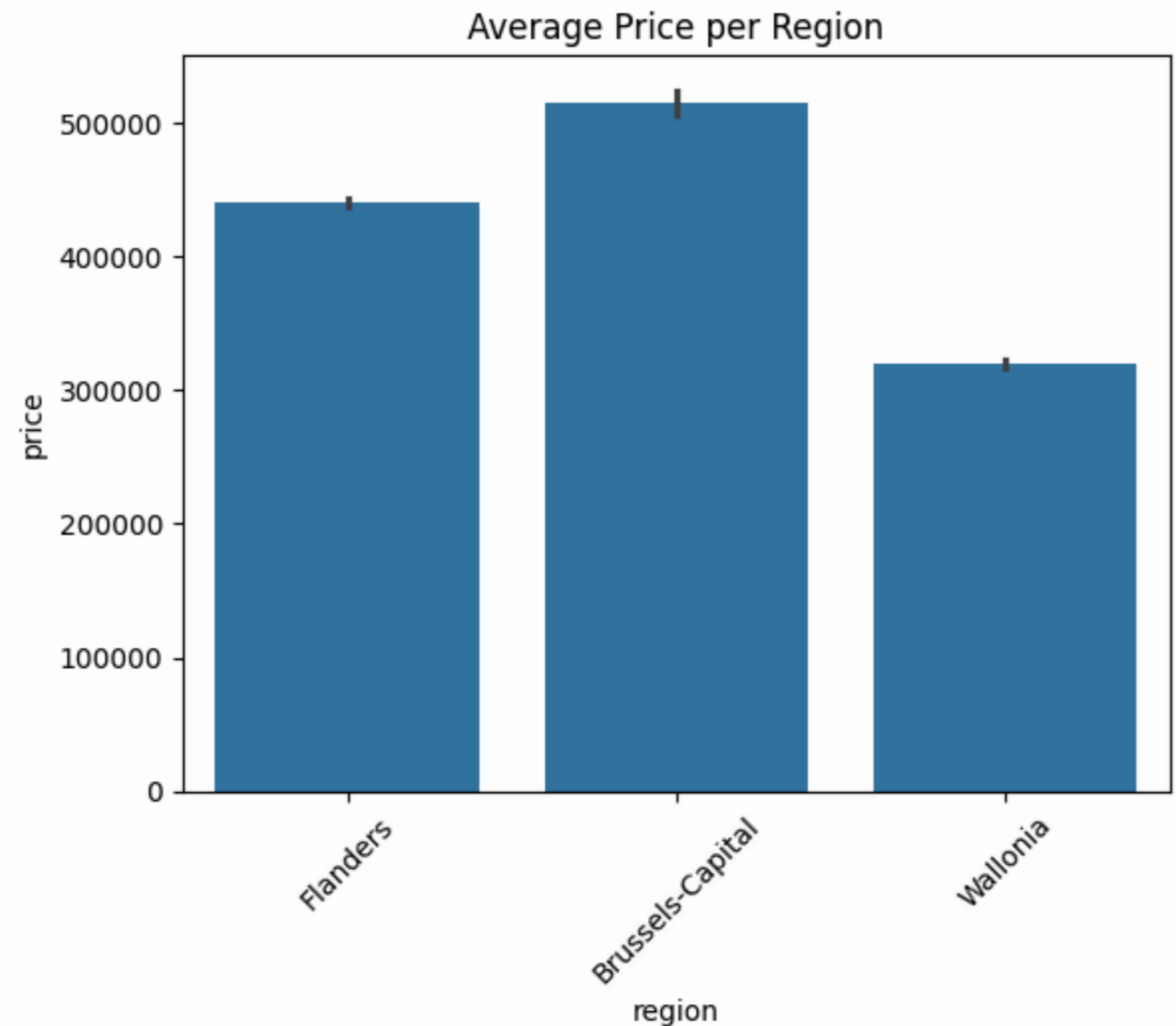Missing values themselves can help predict price

- The dataset is ready for analysis while preserving predictive signals
- Any subsequent modelling can account for meaningful missingness without losing important information

Missingness = phenomenon of data being absent
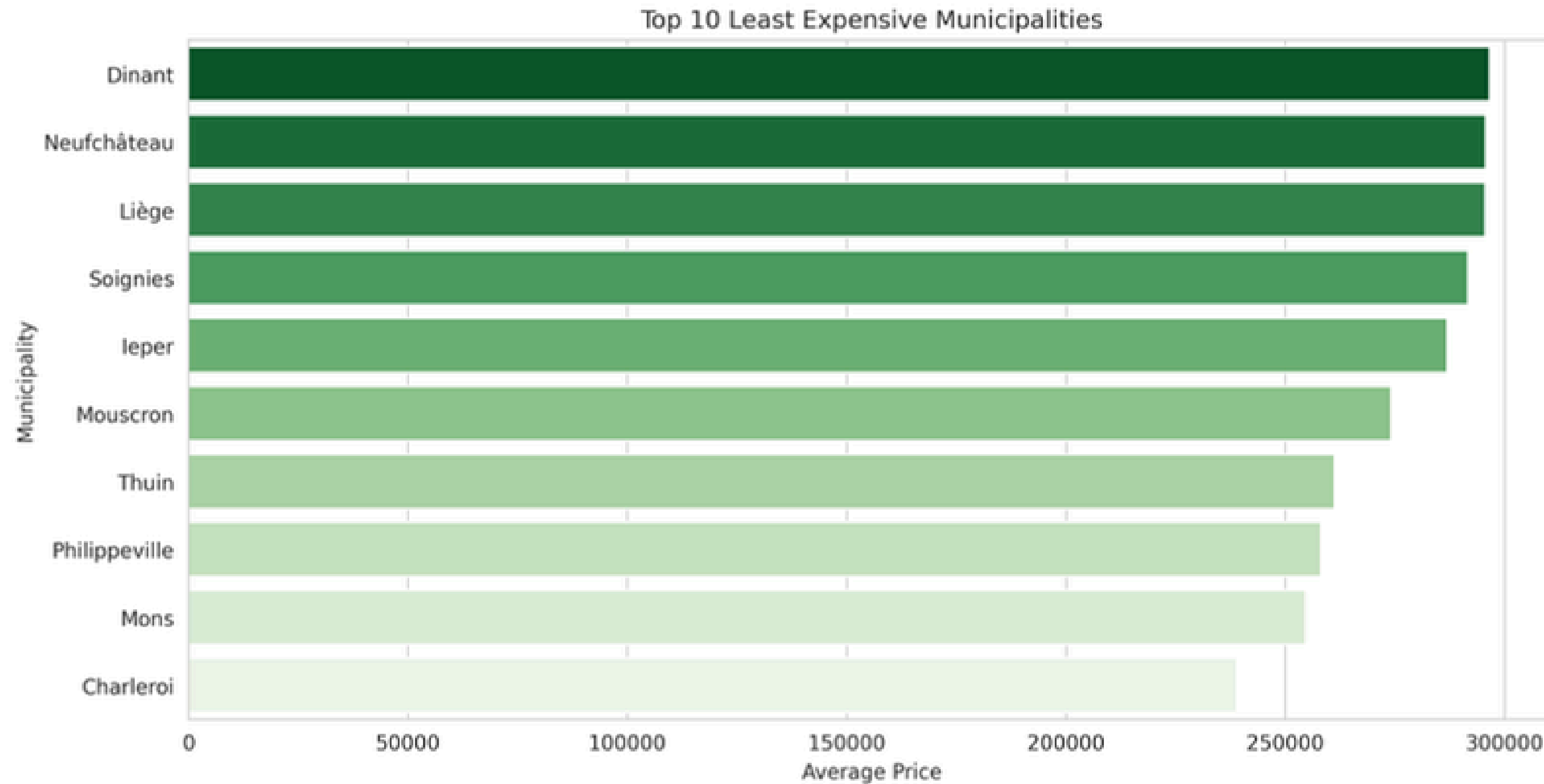
PRICE LANDSCAPE:
AVERAGE PRICE PER REGION

- This graph shows the top 3 average property price across
- A clear graph of what clear price gradient: Wallonia has the lowest by the far most expeisve

Average Price per Region

PRICE LANDSCAPE:
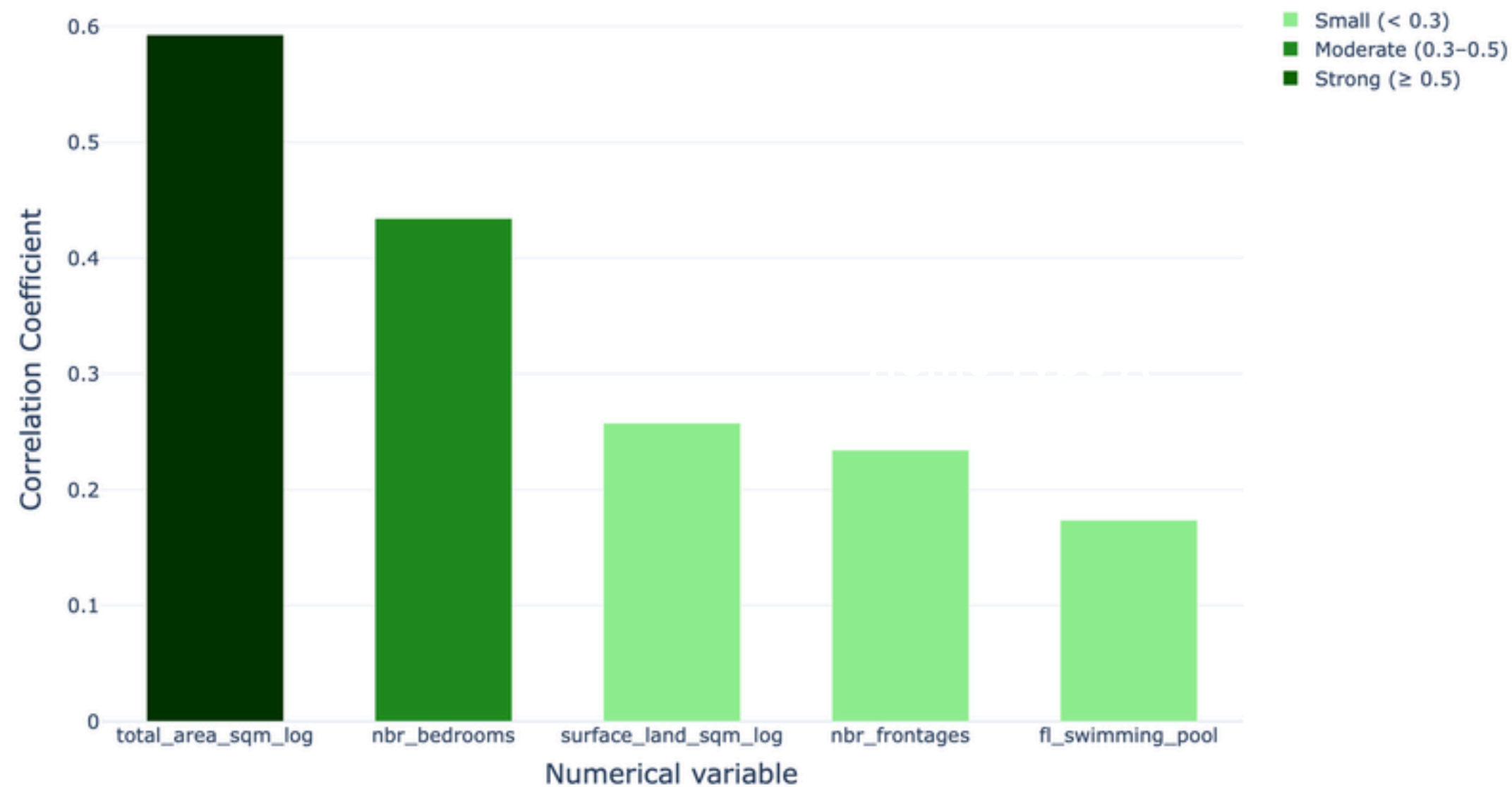## THE LEAST EXPENSIVE MUNICIPALITIES

Top 10 Least Expensive Municipalities

UNDERSTANDING DRIVERS OF PRICE:
NUMERICAL PREDICTORS
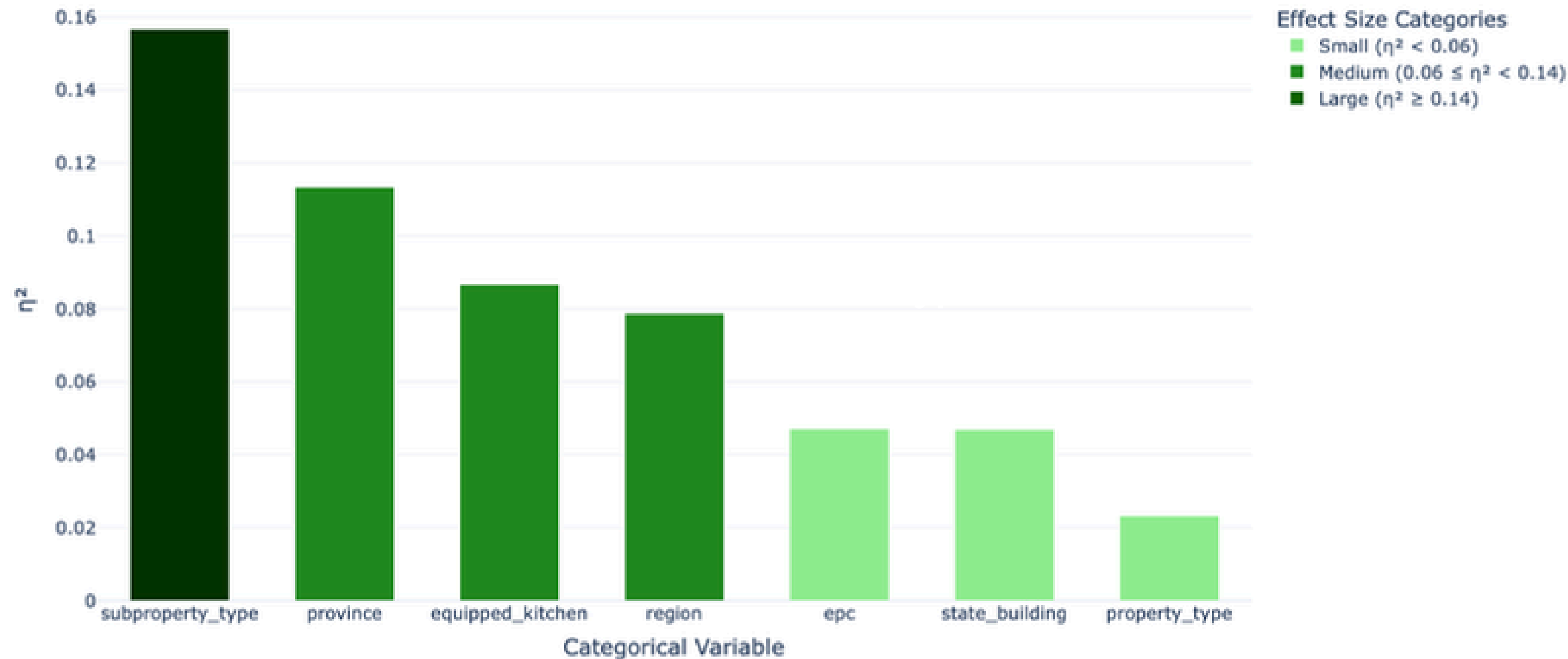
Importance of Numerical Variables

- Living area – highly valued as it provides core usable space.
- Bedrooms – matter as they determine practical capacity for families.
- Land size & façades – moderately important, adding value in suburban/detached markets.
- Interior space – prioritized over exterior/structural features, reflecting buyer preference for functional living areas.

UNDERSTANDING DRIVERS OF PRICE:
CATEGORICAL PREDICTORS

Importance of Categorical Variables

- Sub-property type: strongly impacts price, capturing high market segmentation;
- Province vs Region - there are stronger differences in the provinces (e.g. specific local conditions);
- Equipped kitchen - possible proxy for renovation level and quality;
- Energy performance certificate (epc)
- State of the building - possible self-reported bias;
- Property type - the broad distinction explains little variance;

UNDERSTANDING DRIVERS OF PRICE:
WITHIN PROVINCES & SUB-PROPERTY TYPES

Top 3 drivers in 3 sub-property type groups

- Apartments & Studios

Total area (very strong), **Bedrooms** (strong), Locality (large to very large), Terrace (moderate)

- Houses, Duplexes, Villas, Townhouses, Mansions

Total area (very strong), Locality (very large), **Bedrooms** (strong), Province/Region (very large for luxury types)

- Special types (Farmhouse, Penthouse, Apartment Block, Country Cottage, Castle, Chalet, Loft, Bungalow)

Total area (very strong), Locality (very large), **Cadastral income** (strong to very strong), Outdoor/amenity features (terrace, garden, land)

Top 3 drivers in 3 province groups

- Antwerp, Brussels, Limburg, Flemish Brabant

Total area (very strong), **Bedrooms** (strong to very strong), Sub-property type (very large), **Cadastral income** (strong)

- East Flanders, Liège, Hainaut, Namur, Walloon Brabant

Total area (very strong), **Bedrooms** (strong), **Cadastral income** (moderate to strong), Frontages/land/terrace (moderate)

- West Flanders

Total area (very strong), **Bedrooms** (strong), **Cadastral income** (very strong), Surface land (strong)

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KEY INSIGHTS & RECOMMENDATIONS

Conclusions:
- Property prices in Belgium (globally and across provinces and sub-property types) are primarily driven by **living area.**

- **Sub-property type** matters mostly at global level.

- **Interior space** prioritised over exterior.

- Localisation matters.

Recommended actions:
- Tailor pricing and marketing by sub-property type.

- Highlight key interior features and area.

- Highlight province-specific amenities (e.g swimming pool in Hainaut, terraces in Brussels).

- Use province-level targeting.

- Validate self-reported features or consider objective inspections.

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THANK YOU
FOR YOUR
ATTENTION