



# Prices and residential energy consumption in Ukraine

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# Motivation

- **Ukrainian challenge**
  - Energy independence and EU integration
  - Gas and electricity price escalation during 2014-16 and resulting fuel poverty
  - Large potential for EE (old building stock, poorly insulated)
  - Climate conditions (very cold winters, very hot summers)
- Domestic consumers - second biggest consumer of energy in Ukraine (25% electricity, 40% heat)



Source: Ukrainian Map Server

# Research questions & Approach

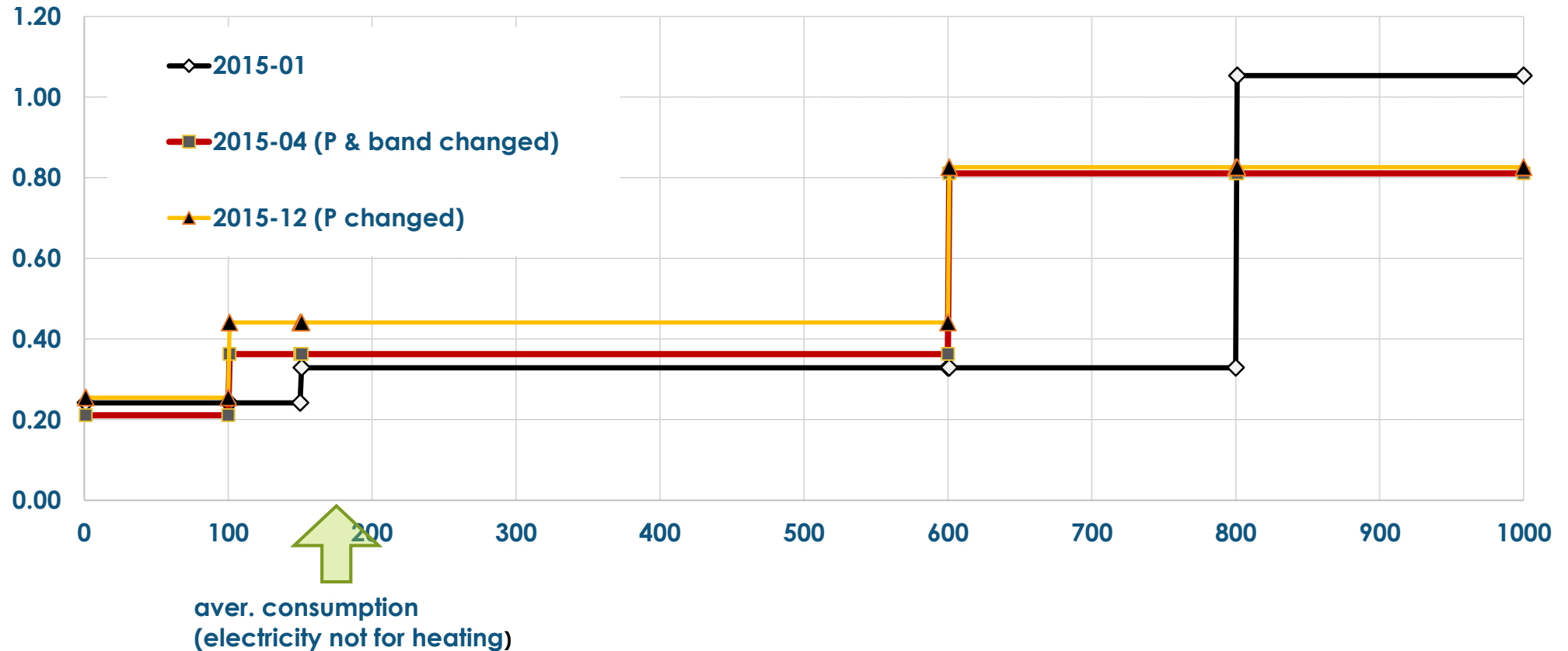
▶ Electricity and gas prices have grown rapidly so...

1. have people reduced energy use at home?
2. have people made EE upgrades at home?

▶ Approach:

collect data from households before, during and after the big price increases (i.e., the last three years)

# Electricity price UAH per kWh a month, per consumption band



# Data collection & Sample

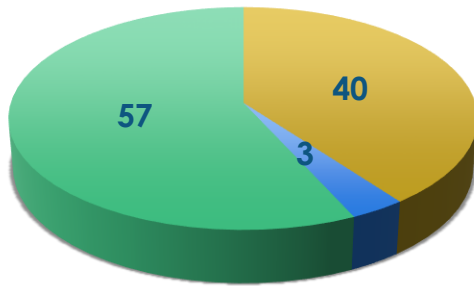
- ▶ Original Survey of households
  - ▶ General population living in Uzhhorod city
  - ▶ Data collection in April-May 2016
  - ▶ Pen-and-Paper Personal Interviewing (PAPI)
  - ▶ 500 respondents living in multi-family dwelling and single-family homes
  - ▶ Quota sampling based on three categories: (i) city districts, (ii) type of dwelling, (iii) family size

# Our instrument

- ▶ Household survey questionnaire:
  - ▶ Section A. Description of the home, including thermal insulation and retrofits
  - ▶ Section B. Space Heating (type, fuel, age of the equipment)
  - ▶ Section C. Gas (detailed bills)
  - ▶ Section D. Electricity (detailed bills)
  - ▶ Section E. Expectations about future prices
  - ▶ Section F. Socio-Demographics

# Descriptive statistics of socio-demographic variables

Type of dwellings, %

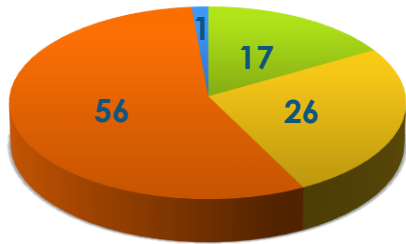


- Single-family home
- Semi-detached or row home
- Apartment in multi-family building

Variable	N	Mean	Std. deviation	Minimum	Maximum
Family size	500	3.386	1.48	1	15
Year of building	433	1976.4	17.46	1903	2015
Space area (m2)	500	79.9468	54.90	16	599
Number of rooms	499	2.84	1.32	1	10

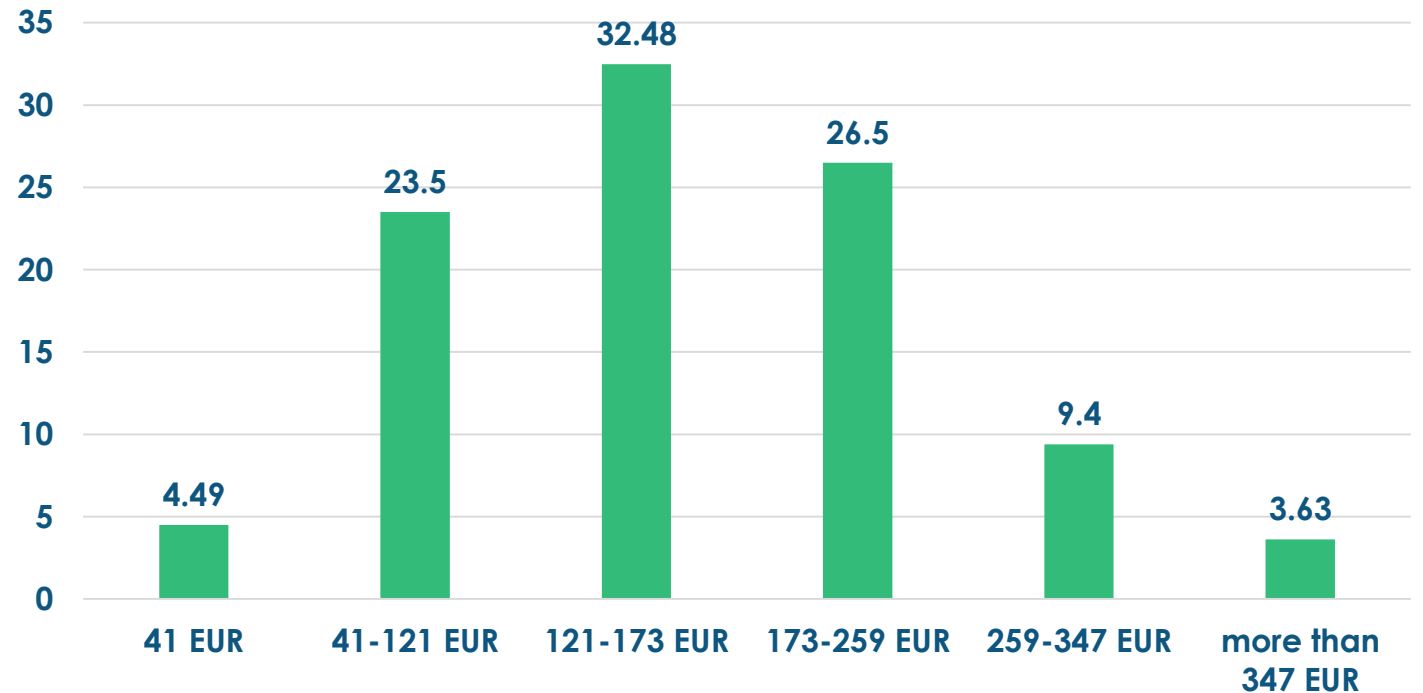
# Descriptive statistics of socio-demographic variables

Education share, %



- Secondary education
- Professional-technical education
- High education (Bachelor, Specialist, Master)
- Other

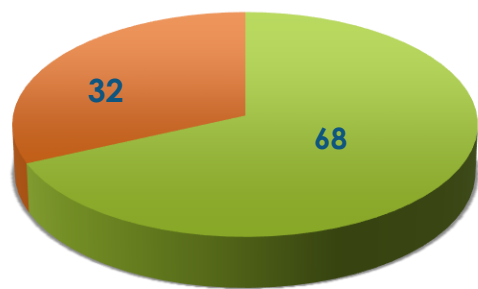
Total monthly family income, %





# Descriptive statistics -- insulation

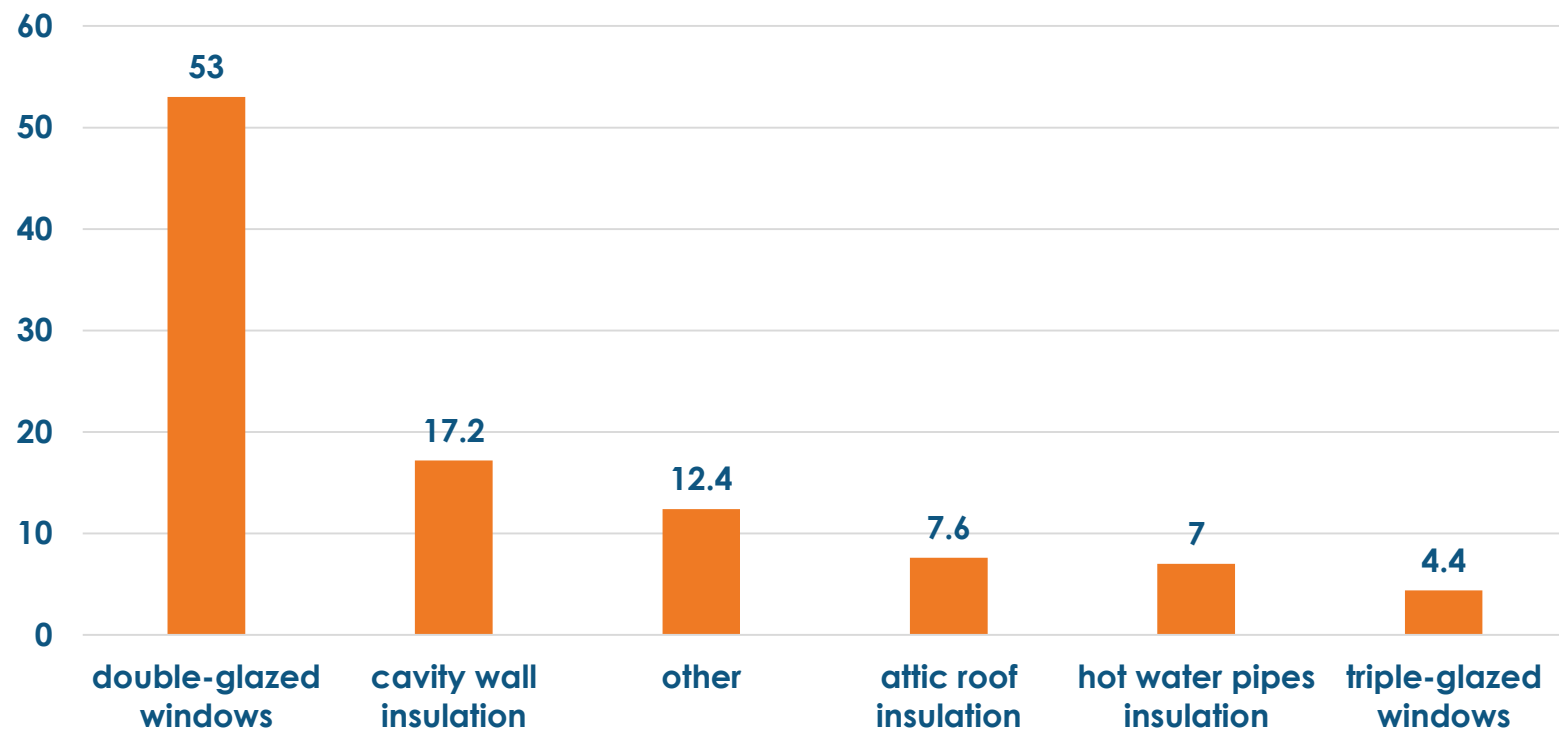
Share of families that insulated their house, %



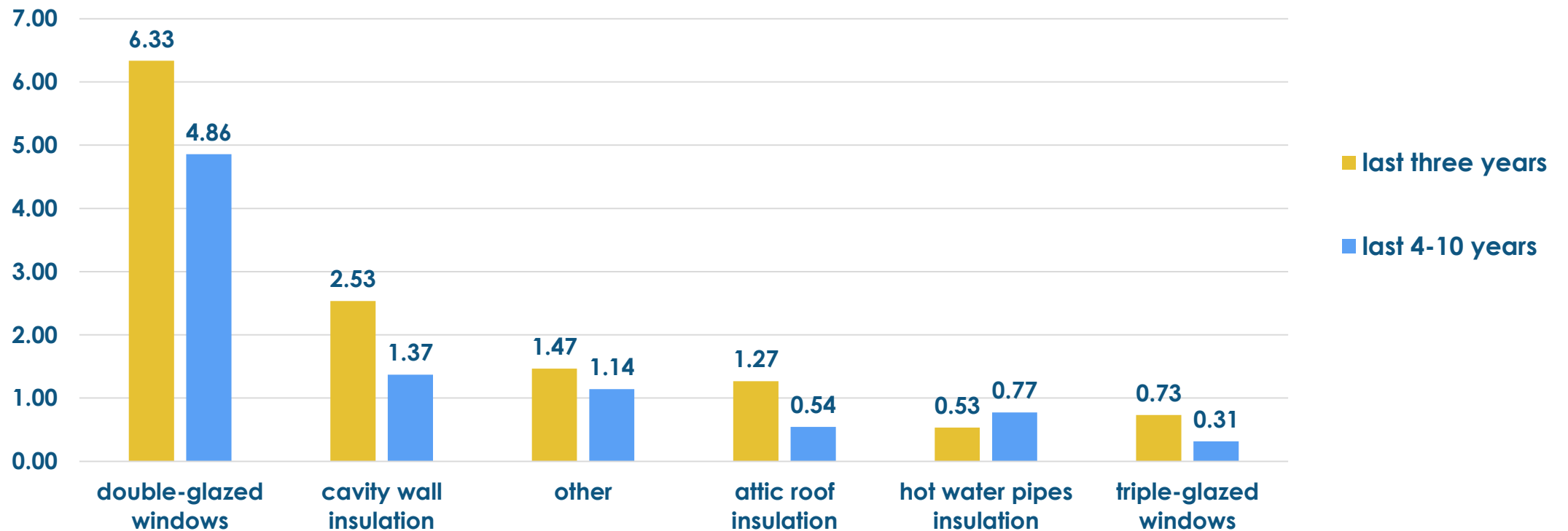
■ Without retrofits

■ With retrofits

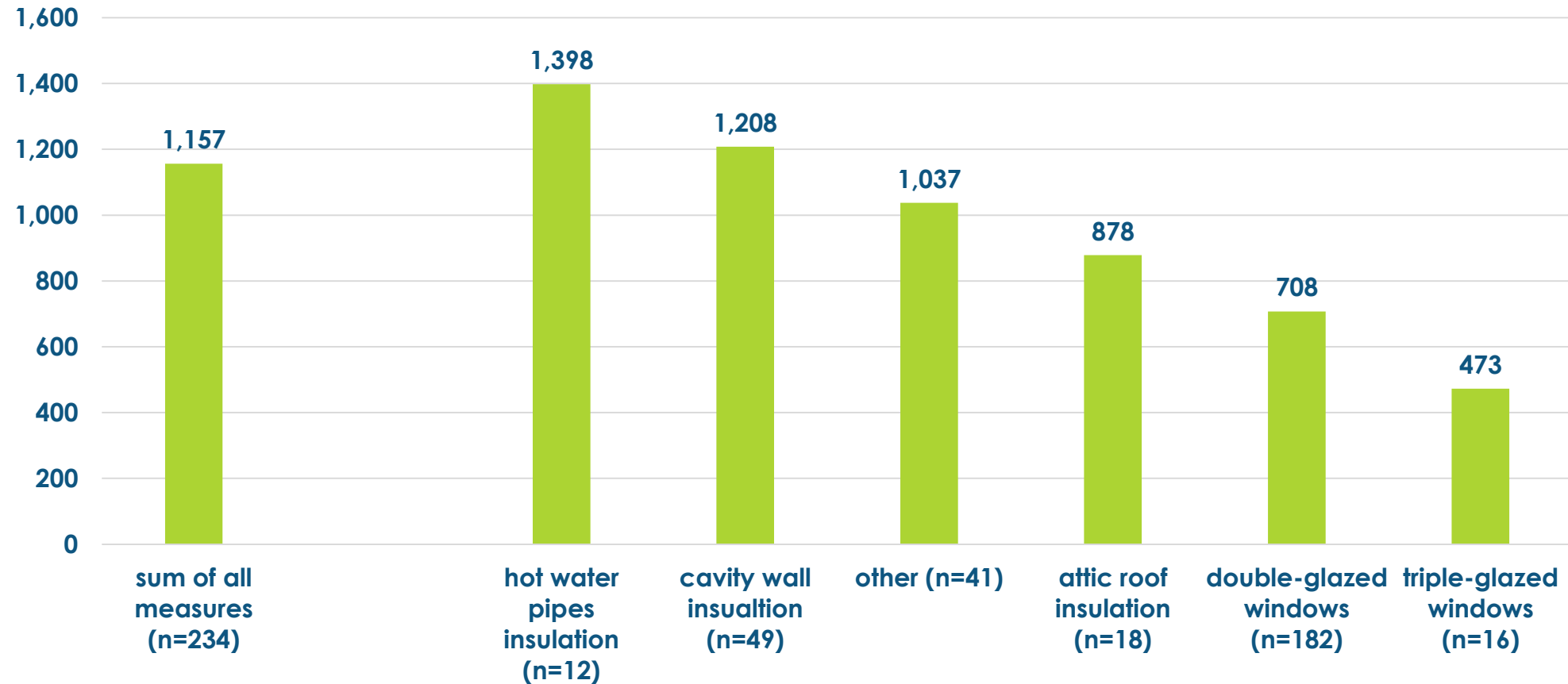
Share of dwellings with specific types of insulation, %



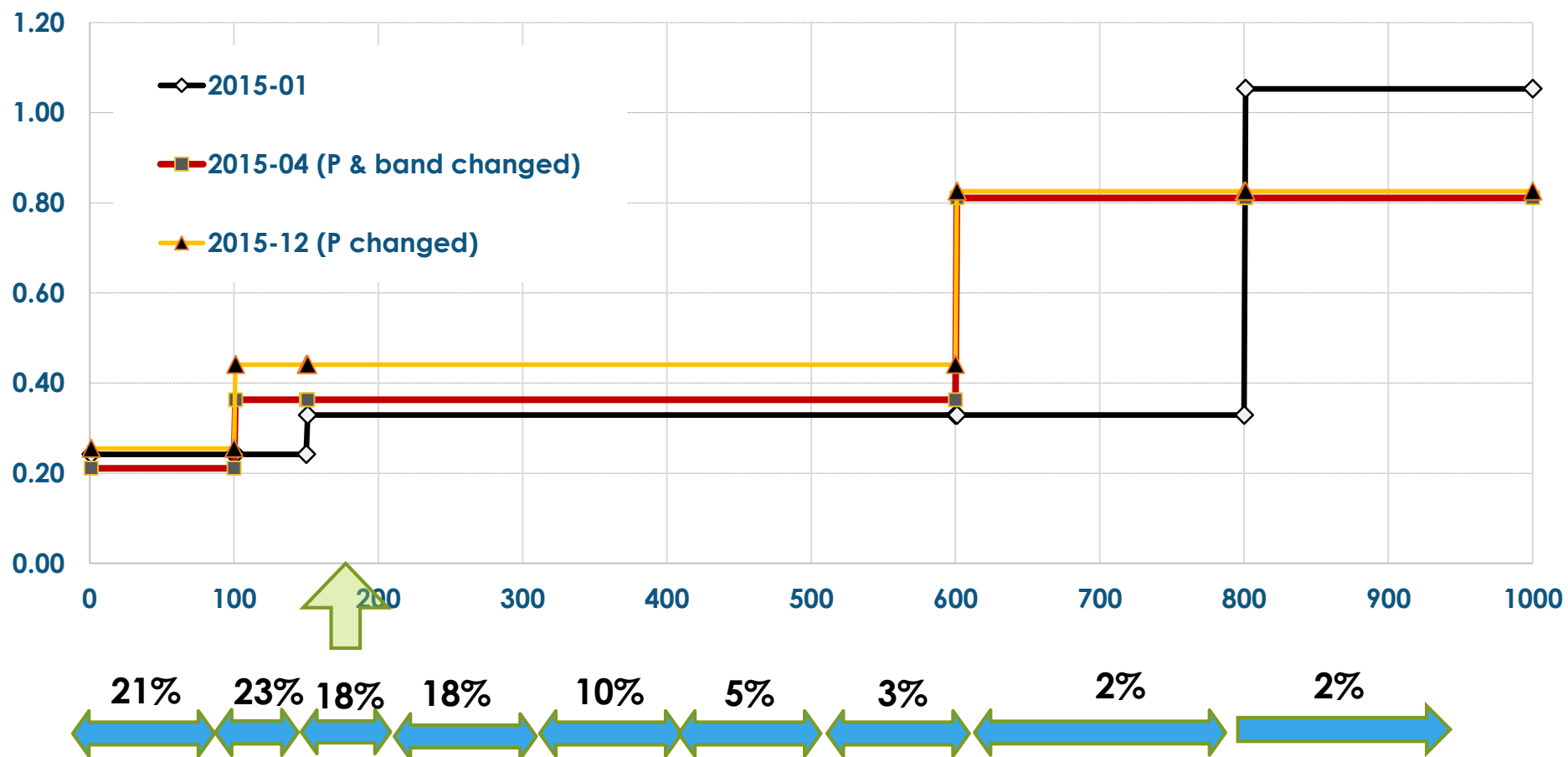
# Annual rates of EE upgrade installation, %



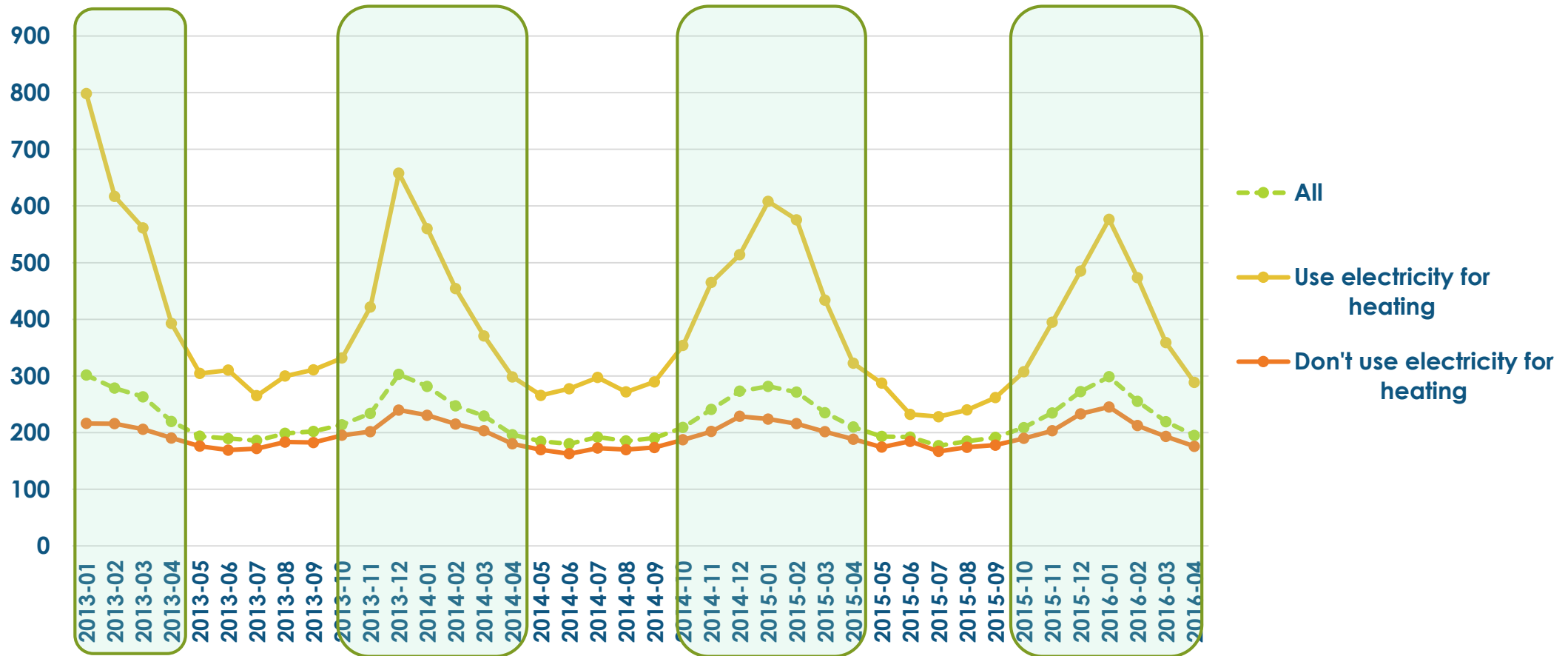
# Capital cost of insulation measures, 2014 UAH, EUR



# Electricity price UAH per kWh a month, per consumption band

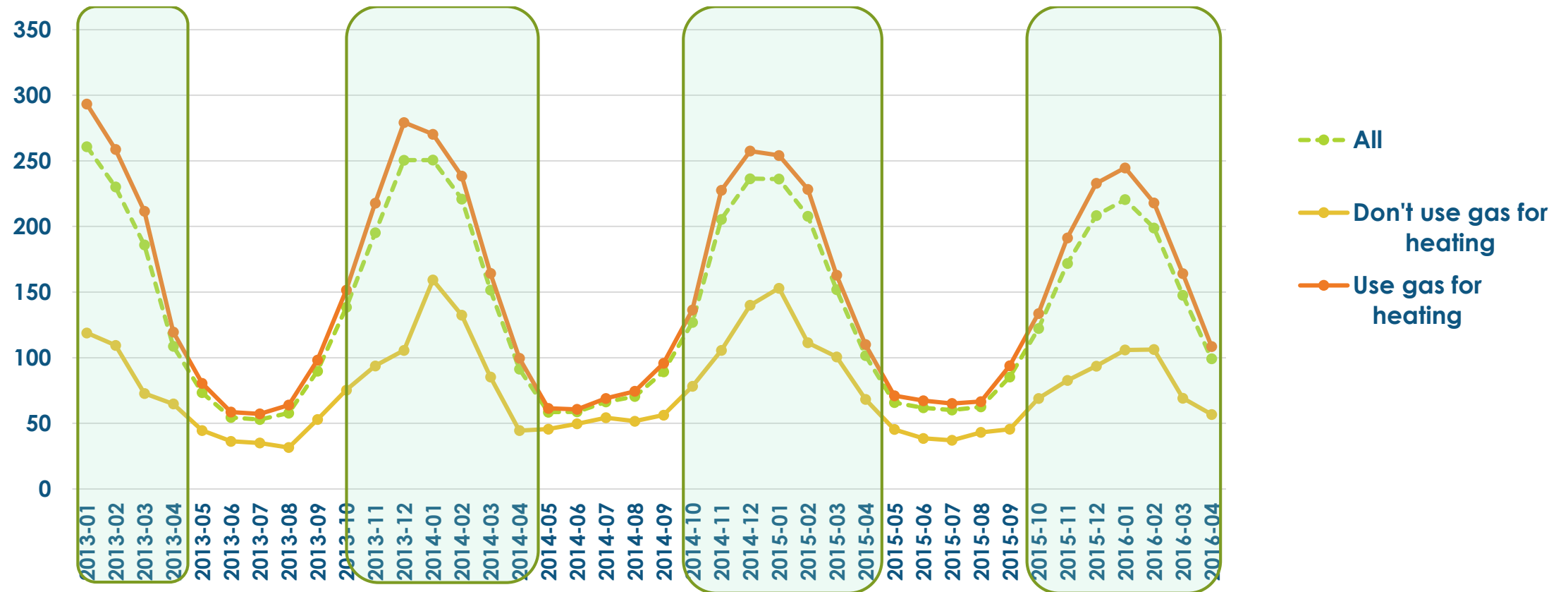


# Electricity consumption January 2013 - April 2016, kWh



# Gas consumption

## January 2013 - April 2016, m3



# Caveats/future work

- ▶ Downward trend in consumption, but we must disentangle the effect of weather and EE upgrades from that of the prices
- ▶ Will estimate proper demand function with quantity as a function of prices, income, weather and EE upgrades

# Acknowledgement

- ▶ ECOCEP
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Thank you for attention