FUEL POVERTY IN HUNGARY.
Measurements, experiences and policies.


Prof. DIANA ÜRGE-VORSATZ
SERGIO TIRADO HERRERO
Center for Climate Change and Sustainable Energy Policy (3CSEP). Central European University (CEU).
Framing the concept

• The co-benefits of energy efficiency in buildings
  – The benefits of fuel poverty alleviation

• Prevent the negative social consequences of the transition to a low-carbon economy
  – Increase of energy costs (e.g., renewables, CCS, carbon tax)
  – Present vs. future generations

• “Perhaps the debate about the three pillars of sustainable development has been too often phrased in terms of trade-offs and much less in terms of win-win opportunities” (Schiellerup, 2010)
The concept of fuel/energy poverty

<table>
<thead>
<tr>
<th>Reference</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boardman (1991, p. 201, in Morrison and Shortt, 2008)</td>
<td>“Inability to obtain adequate energy services for 10% of a household income”</td>
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<tr>
<td>Healy and Clinch (2002, p. 331), after Lewis (1982)</td>
<td>“Inability to heat the home adequately because of low household income and energy inefficient housing”</td>
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<tr>
<td>Buzar (2007, p. 225)</td>
<td>“A household is considered energy-poor if the amount of warmth in its home does not allow for participating in the ‘lifestyles, customs and activities which define membership of society’”</td>
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<tr>
<td>European fuel Poverty and Energy Efficiency (EPEE) project (2009, p.4)</td>
<td>“A household’s difficulty, sometimes even inability, to adequately heat its dwelling, at a fair price”</td>
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</tbody>
</table>

- Inability to **afford enough energy services** for satisfying the **household’s basic needs**, namely **heating**
Fuel poverty is “perhaps the strongest adverse social impact resulting from the inefficient consumption of energy in the domestic sector” (Healy and Clinch, 2002, p. 329)
Energy prices vs. household incomes

**Consumer Price Index** (CPI), price index of goods and services considered in CPI calculations, and rate of increase of wages and pensions in Hungary (2000-2009)

Source: Tirado Herrero and Ürge-Vorsatz, forthcoming
The energy performance of buildings

Inability to afford adequate heating vs. low quality housing* (self-reported)

*Leaking roof, damp walls, floors or foundation, or rot in window frames of floor

Correlation coefficient – $r: 0.68$
Measuring fuel poverty in Hungary
Primary indicators

EXPENDITURE APPROACH: % of energy expenses vs. net income

9.7% of households net income spent on energy, as an average for the period 2000-2007.
In 2007, the average household of the 8 lower income deciles spent 10% or more of its net income on energy
Measuring fuel poverty in Hungary
Primary indicators

SELF-REPORTED APPROACH: inability to afford enough heating

12.4% of the population declare to be unable to keep their homes adequately warm (2005-2009)

Source: EU SILC

- Expenditure-based measurements seem to be higher than self-reported fuel poverty rates
- Self-reported trends do not follow the expected pattern of development for the late 2000s.
Measuring fuel poverty in Hungary
Secondary indicators

ARREARS ON UTILITY BILLS (self-reported)

FUEL POVERTY-RELATED HOUSING FAULTS* (self-reported)

*Leaking roof, damp walls, floors or foundation, or rot in window frames of floor
Measuring fuel poverty in Hungary
Secondary indicators

USE OF TRADITIONAL FUELS FOR SPACE HEATING

Source: KSH
A socio-economic characterisation of fuel-poor households

Review of *household attributes* related to fuel poverty in Hungary

<table>
<thead>
<tr>
<th></th>
<th>PRIMARY INDICATORS</th>
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<th>SECONDARY INDICATORS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Expenditure-based</td>
<td>Self-reported</td>
<td>Arrears on utility bills</td>
<td>Fuel poverty-related housing faults</td>
</tr>
<tr>
<td>Lower income</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
<td>++</td>
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<tr>
<td>Pensioners / Elders</td>
<td>++</td>
<td>++</td>
<td>- - -</td>
<td>+</td>
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<tr>
<td>One-person household</td>
<td>++</td>
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<td>-</td>
<td>+</td>
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<tr>
<td>With children</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>=</td>
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<tr>
<td>Without children</td>
<td>=</td>
<td>+</td>
<td>-</td>
<td>=</td>
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<tr>
<td>Mono-parental families</td>
<td>n.a.</td>
<td>++</td>
<td>++</td>
<td>+</td>
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<tr>
<td>Large families (3 or more children)</td>
<td>=</td>
<td>+</td>
<td>++</td>
<td>+</td>
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<tr>
<td>Located in peripheral regions</td>
<td>+</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
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</tbody>
</table>
Inability to control indoor temperature
thermal discomfort

Fixed flat rate, no individual meters

Many DH networks are now obsolete and need modernization both on the heat supplier and on the consumers’ side

Prefabricated panel buildings in suburban areas

Some consumers fail to pay regularly the tariff: indebtedness

Low-income population

DH providers do not easily allow to switch to other fuel or company
Deprived rural Roma communities
In the outback

Poor rural community in NE Hungary: few income-earning opportunities (60 EUR per person per month)

Large traditional single-family houses.
High specific energy consumption for heating (above 300 kWh/m2.year)

Heating and cooking: firewood. Only 1-2 rooms are heated in winter. Indoor air pollution

Lighting and appliances: electricity (5 to 10,000 HUF per month). They switch on the fridge only when they buy meat

Strategies to deal with fuel poverty:
-Illegal firewood collection (arrest, fines)
-Illegal connection to electricity grid

No access to commercial credit or information on energy efficiency. The issue of informal money-lenders
Who are the most affected?

- **Lower income population**
  - High energy expenses vs. income ratio, lower quality housing

- **Monoparental families**

- **Pensioners / Elders**
  - Most *EWDs* are people over 60 years old
  - **Switch off the heating** instead of delaying payments

- **Households** connected to **district heating** (DH)
  - Large fixed costs, inability to get disconnected

- **Rural poor**
  - Impact of increased *firewood prices* related to biomass use in renewable power generation
  - **Roma population**: electricity theft and illegal firewood collection
Strategies to deal with energy affordability problems

- Maintaining low indoor temperatures is only one of the solutions adopted by households...
  - reducing the consumption of other basic goods and services (e.g., education or food);
  - reducing the fraction of the floor area heated;
  - fuel switch, mostly from natural gas to firewood, a less convenient but cheaper fuel;
  - payment arrears and increased indebtedness with energy suppliers; and
  - electricity theft and illegal firewood collection.
Policy elements

• **Support** to **households** and **consumers**
  – DH and gas price support schemes
  – Poorly targeted, wrong signal to consumers, money saved is not invested in energy efficiency

• **Residential energy efficiency** programmes
  – Panel, Öko and **Climate Friendly Home** programmes
  – Suboptimal retrofits *lock in* the energy savings’ potential of the building stock and may **not fully eradicate** fuel poverty

• **Energy supply expansion** projects
  – Allegedly aimed at improving the energy security
  – ‘Nabucco’ pipeline / Strategic gas reservoirs
  – Effects on long-term **energy (gas) prices**
Advanced residential EE solutions are available...

PASSIVE HOUSE
- Annual **heating** requirement less than 15 kWh/(m²a)
- Combined primary energy consumption (heating, hot water and electricity) less than 120 kWh/(m²a)
... and they generate additional co-benefits

Employment effects of deep and suboptimal renovations in the Hungarian building stock

Total employment impacts for 2020

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Induced impacts from energy savings</th>
<th>Induced impacts from lost jobs created by reduced demand for energy</th>
<th>Indirect impacts from reduced demand for energy</th>
<th>Direct impacts on energy supply sector</th>
<th>Induced impacts from additional jobs created by investments in construction</th>
<th>Indirect impacts from investments in construction</th>
<th>Direct impacts on construction sector</th>
<th>Total impacts</th>
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<tbody>
<tr>
<td>S-BASE</td>
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<td>S-DEEP1</td>
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<td>S-DEEP3</td>
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<td>S-SUB</td>
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Some conclusions...

- **Fuel poverty** is not a pervasive phenomenon in Hungary, but affects **selected social groups**
  - Lower-income, elders, monoparental families, DH-connected households, rural poor including ethnic minorities
  - Insular geography of fuel poverty (Buzar, 2007)

- **Various strategies** other than switching off the heating are applied by households to deal with energy affordability problems
  - Households minimise welfare impacts depending on their perception of risks, availability of fuels, conditions, preferences...

- **Rethinking the concept?**
  - Fuel poverty is not only suffering from inadequate indoor temperatures, but also being forced to adopt welfare-damaging solutions to deal with energy affordability constraints.
THANK YOU!

Further contact: 3csep@ceu.hu
Fuel poverty in Hungary. Measurements, experiences and policies.

ADDITIONAL SLIDES
# Co-benefits of residential energy efficiency

## Primary vs. ancillary, non-energy or co-benefits

<table>
<thead>
<tr>
<th>Type</th>
<th>Category</th>
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<tbody>
<tr>
<td><strong>Direct impact on the welfare of residents</strong></td>
<td><strong>Increased thermal comfort</strong></td>
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<td><strong>Health benefits: reduced EWM and winter morbidity</strong></td>
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<td></td>
<td><strong>Savings in utility expenses</strong></td>
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<td></td>
<td><strong>Improved indoor environmental conditions</strong></td>
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<td></td>
<td><strong>Reduction in outdoor noise infiltration</strong></td>
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<td></td>
<td><strong>Improved safety conditions and lower maintenance costs</strong></td>
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<td></td>
<td><strong>Enhanced ability to rent or sell the space</strong></td>
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<tr>
<td><strong>Regional environmental effects</strong></td>
<td><strong>Reduced outdoor air pollution</strong></td>
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<td></td>
<td><strong>Lower resource consumption and waste disposal</strong></td>
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<tr>
<td><strong>Nationwide or system gains</strong></td>
<td><strong>Service provision system benefits</strong></td>
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<td><strong>Reduced energy dependency</strong></td>
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<td><strong>Employment effects</strong></td>
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<td><strong>Productivity effects</strong></td>
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<td><strong>Lower long-term energy prices</strong></td>
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<td><strong>Technology forcing</strong></td>
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Own elaboration after selected sources
Characteristics of fuel poverty

• The purchase of energy is income-inelastic
  – Lower income households experience proportionately higher heating expenses

• Not all poor households are fuel poor and vice versa

• Energy efficiency: it is possible to bring households out of fuel poverty while reducing their energy consumption
  – Connection with key environmental issues (climate change and regional air pollution)

• Health impacts (EWM and increased morbidity)
What about electricity?

- 40% of a Hungarian household’s average energy expenses are from electricity seldom used for heating in Hungary...
  ...but a household’s budget is not divided into separate compartments.

- Improving the efficiency of lighting and appliances requires less initial investments than improving the thermal efficiency of the dwelling
  – Smaller energy saving potential and less co-benefits

- Strategies to deal with affordability problems
  – Illegal connection, arrears on bills, forced disconnection
  – Both consumers and utility companies affected
Energy prices vs. household incomes

**Gas prices** for residential consumers (20 to 200GJ per year)
EU27 vs. CEE and Hungary (2007-2009)

Source: Eurostat
Energy prices vs. household incomes

Electricity prices for residential consumers (2,500 to 5,000 kWh per year). EU27 vs. CEE and Hungary (2007-2009).

Source: Eurostat
Energy performance of the residential sector

Households’ specific energy consumption (all uses) per sqm. scaled to EU average climate. Hungary vs. EU 27 (2000-2007).

Source: ODYSSEE
The energy performance of buildings

ODEX energy efficiency of households.
Hungary vs. EU 27 and CEE (2000-2007).

Source: ODYSSEE