Energy efficiency support programs in the residential buildings sector: The Hungarian experience

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Outline

- EE in buildings and climate change action
- EE in economies in transition
- Hungarian context
- Model projects:
  - SOLANOVA
  - Village Block
- Barriers
- Support programs
- Green Investment Scheme
- Concluding remarks

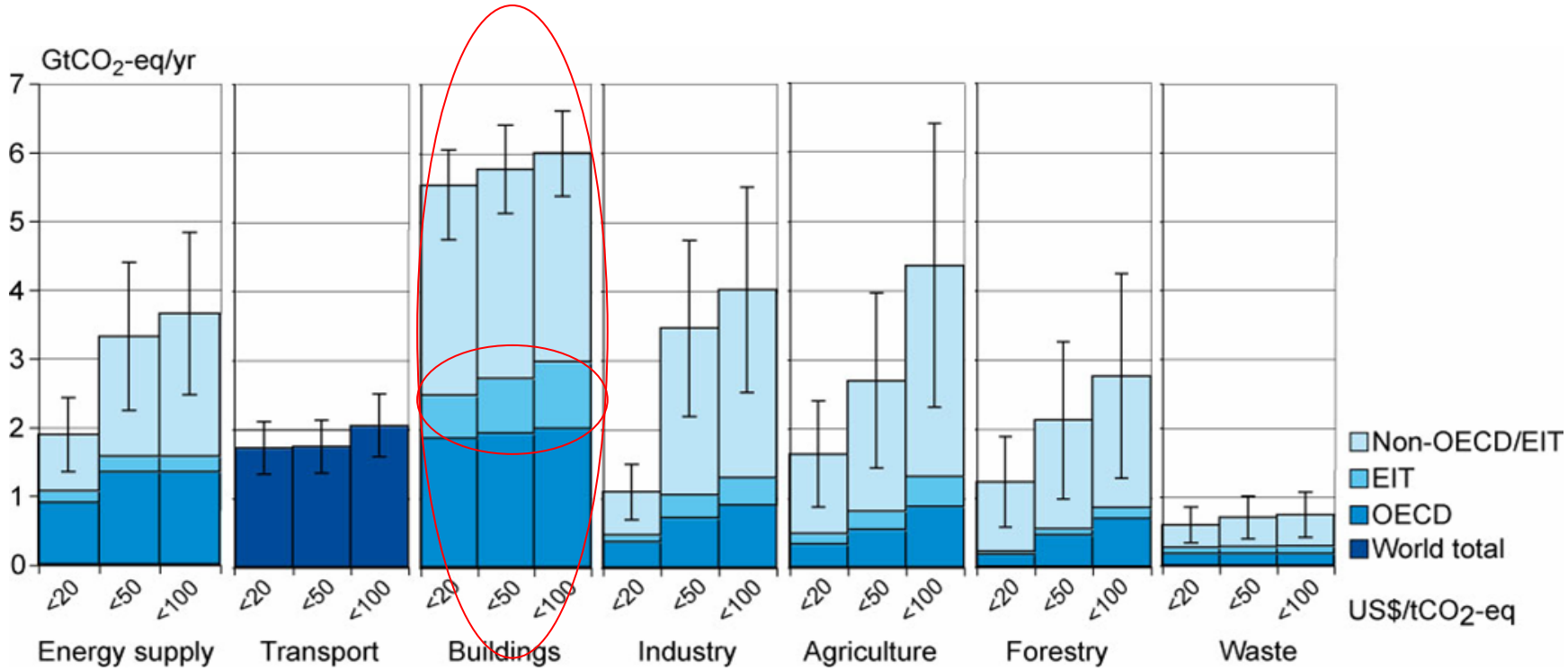
Source: baubid.hu

EE in buildings and climate action

- In the short term EE plays a key role in climate change mitigation
- Buildings sector in economies in transition
  - Large low-cost potential for EE improvement
  - Negative cost potentials are larger than those in all other sectors combined

Source: Ürge-Vorsatz, D.; Metz, B. Energy Efficiency (2009) 2:87-94

Energy efficiency in buildings – comparative GHG emission reduction potential



Source: IPCC 2007c, Fig. SPM6

Large potential in economies in transition – Reasons?

- Decades of subsidized energy prices
- Very poor building stock from the energy perspective
- Large proportion built with industrial technology
- District Heating (DH) widespread but also in need of modernisation (both supplier and consumer side)

Source: Ürge-Vorsatz, D.; Metz, B. Energy Efficiency (2009) 2:87-94

Hungarian context

Source: stockphotopro.com

Residential buildings sector in Hungary

- Largest final energy consumer
- Source of 30% of total national CO_2 emissions
- Cumulative effect of various existing technologies – 29% of total residential GHG emissions can be saved at negative cost until 2025

Source: Novikova (2008)

Features of panel buildings

- No adjustable meters on the flat level to measure district heating (DH) use
- DH significantly more expensive than other forms of heating
- Paying year round
- General poor condition of buildings
- Fuel poverty and social implications

Model projects –
SOLANOVA
Village Block

SOLANOVA project - Dunaújváros

Source: koos.hu and passive-house-magazine.info

SOLANOVA - Characteristics

- Carried out between 2002 and 2005
- Financed by
  - European Union
  - Hungarian state
  - Local authority of Dunaújváros, DH company
  - Flat owners
- Aim: to bring to (or close to) the passive house standard
- 42 flats
- Heating energy use 220 kWh/m2/year
- Energy use for heating decreased by 85%, to 39 kWh/m2/year

SOLANOVA - Measures

- External façade insulation
- Roof insulation (21-29 cm) and basement slab insulation (10 cm) U=0.13 W/m2K
- Double glazed windows on the North side (U=1.2 W/m2K), and PVC frames and ALU doors in the commercial areas
- Triple glazed windows with integrated shading on the South and the West sides (U=0.9 W/m2K)
- Ventilation system equalized according to flats, with heat recovery (90% laboratory efficiency)
- Solar collector system (72m2)
- New, low power, two-pipe heating
- Water efficient fittings
- Green roof

Village Block - Óbuda (Budapest)

Source: m.blog.hu

Village Block - Characteristics

- Carried out in 2009
- Part of STACCATO pilot program of the EU to renovate block houses in Budapest, Sofia and Amsterdam
- Financed by
  - Local authority, including EU support – 40%
  - Hungarian state – 33%
  - Flat owners – 27%
- Aim: to achieve
  - more than 50% energy savings
  - verifiable CO_2 emission reductions
- Largest residential building in Hungary: 315m long, 884 flats, 15 staircases, 3,000 inhabitants
- High visibility location

Village Block - Measures

- Individual heating meters, smaller modern heating center
- External façade insulation: 10 cm insulation system (insulation capacity exceeding the standards of newly constructed buildings)
- Roof insulation – double layer water insulation with fire bands
- 1,800 windows replaced with new, 5 chamber plastic model – U<=1.36, installment of air inlets to avoid mould
- Solar collectors on the roof for water heating, connected to the district heating system – 1515 m^2, 1,128MWh capacity

Barriers to deep refurbishments

Barriers to deep refurbishments

- Economic/financial barriers
- Hidden costs/benefits
- Market failures
- Behavioral and organizational barriers
- Information barriers
- Political and structural barriers

Based on Koeppel and Ürge-Vorsatz 2007

Support programs to improve energy efficiency in residential buildings in Hungary

Source: activerain.com

Characteristics of the sector

Ownership structure:

o Flats typically occupied by owners

o Some private flats rented

o Social housing provided by local authorities

Building types:

o Panel / block buildings - one-fifth of building stock built with industrial technology during the 60s-80s

o Multi-family brick buildings - conventional technology

o Single-family houses - conventional technology

EE support programs

- Panel Program – for whole panel buildings, largest budget

  (2001-2008 HUF 40bn = EUR 144mn)
- National Energy Saving Program – for individual flats (conventional technology and panel)
- Eco-program – single measure: heating system modernization
- Climate Friendly Home Program - from 2009, comprising earlier programs, financed by GIS

  (HUF 28.2bn = EUR 102mn)

Panel Program (2001-2008)

- Whole building based
- Financing: 30% by state, 30% optionally by local authority, rest by flat owner
- Flat owner communities – consent of 90% needed
- Original aim: to reduce energy costs
- But: no incentive included for complex measures or RES; not connected to verified CO_2 emission reductions
- High and increasing transaction costs
- Uncertainty
- Other building types neglected

Importance of complex measures

- Financial barriers: more communities choosing single measures or simple packages
- BUT: some single measures resulted in increase in energy use
- Complex measures are more effective (as demonstrated by SOLANOVA and Village Block) but also more expensive
- New programs under GIS – requirements and incentives for complex measures

Green Investment Scheme - GIS

- GIS connected to sale of AAUs under the Kyoto Protocol
- Greening of “hot air” – GIS ensures carbon revenues result in verified emission reductions
- Targeting the buildings sector: Climate Friendly Home Program

<u>Climate Friendly Home Program</u>:

- Continuation of previous separate programs
- Requirement for CO_2 reductions (with monitoring and verification)
- Additional rewards for complex refurbishments and RES

Measures contributing to better environmental and social results

Key messages

- Large, cost-effective climate change mitigation potential in the buildings sector in economies in transition
- Successful model projects exist
- BUT: barriers to deep refurbishments
- Large-scale EE support programs in Hungary
- GIS key opportunity- rewards complex measures:
  - Increased environmental integrity: CO_2 reductions
  - Reduction in energy costs – social implications
  - Opportunity to expand to conventional building types

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Questions, comments?

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