Energy retrofitting of private homes: a challenge

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ICIS: Maastricht University’s scientific institute for sustainable development

*vision* to provide through research and education the knowledge base for *policymaking and innovation* in the pursuit of sustainability

*mission* to contribute to *knowledge development, innovation*, and *action* for sustainable development at local and regional levels, as a basis for global sustainability

- multidisciplinary staff
- interdisciplinary approach
- transdisciplinary attitude
Retrofitting: ???

- ‘providing something with a component or feature not fitted during manufacture or adding something that it did not have when first constructed’

- For a building: improving the building fabric, and upgrading building services.

- Not: changing the windows or introducing LED lighting

- Energy retrofitting: improving the energy performance of the building as a whole
Examples of retrofit measures

• Loft insulation to reduce heat loss and improve comfort
• Wall insulation
• Basement ceiling insulation
• New ventilation system (with heat recovery)
• Upgrading boilers
• New heating systems
• Roof improvement
Energy retrofitting: not from a technical perspective

CURRENT RETROFIT RATES: 1% /YR (Building Performances Institute Europe, 2016)
REQUIRED: AT LEAST 3%, PROBABLY MUCH MORE (EC, 2015)

• To retrofit or not... that’s the question
• Circumstances for success
• Possible approaches
• Decision-making
• Cost

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Two projects in detail

ACE Retrofitting

• Focus on accelerating energy retrofitting of **condominiums** in North West Europe

ENLEB

• Focus on **neighbourhood approaches** for energy retrofitting (rental and privately owned houses) in the Netherlands and Flanders

More projects at ICIS on Energy

• HEEC, Energise, RaakPro WoF, Glocull
ACE Retrofitting
Accelerating Condominium Energy retrofitting

Aberdeen, Antwerp, Frankfurt, Liege, Maastricht, Paris

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Changeworks, Energy Cities Network (lead), Maastricht University
Energy retrofitting in condominiums: A common challenge for EU countries

Many buildings constructed before 1980, with low energy efficiency

Financing engineering of a renovation project is complex

A complex and unattractive market for building professionals

Long decision-making process to develop a renovation project

Avoiding lock-in situations: whole-building-approach

A key sector to reach cities’ energy and climate targets
Objectives of the ACE Retrofitting project
(running from September 2016 to March 2020)

Accompanying co-owners and co-owner associations (‘demand’)

Making demand and supply meet:
Cities acting as facilitators

pooling and increasing the competencies of building professionals (‘supply’)

©Rodho

Interreg North-West Europe
ACE-Retrofitting

European Regional Development Fund
10 Focus groups in the 6 cities: what do people flag?

Preliminary results

• Subsidies not reliable/not continuous
• Decision-making as a group is problematic
• Old people do not want to invest, but also young people...
• Insufficient legal incentives/sanctions
• Not enough known about the various options
• No clear data about the benefits
Focus groups in the 6 cities: what do people flag?
Preliminary results

And also, there must be some better way to insulate the front door of an apartment so that draught doesn’t come in. I just can’t find that solution.

In our common landing the light is controlled, I suppose, by the council. But I read years ago we shouldn’t have the light on all day. But now it seems to being on all day and night.
Energy retrofitting in your condominium

First steps
- Determine your capacity to manage an energy retrofit project
- Be inspired by general examples

Taking-off
- Get to know your building better
- Convincing your condominium into action

The real thing
- Ensure the project team has the right capacity
- Communicate with your neighbours
- Obtain specialist information on technical, financial and legal issues
- Contact an expert for a full assessment
- Set up a project team
- Condominium votes for retrofit
- Develop a Project management plan
Financial barriers for condominiums

- Energy retrofit is a big investment: Mostly financed by reserves, but sometimes these are not existing or not efficiently managed.
- Not clear what costs and benefits are.
- Address split incentive owner/renter.
- Transferable loans are needed; financial structure for the whole building is needed.
- Too many parties to be contacted, no “single desk” : confusing and not efficient.
- Condo budget-management is often not transparent.
Financial models report

Various models:
• Own savings
• Energy performance contracting
• Leasing
• Topping up
• Service cost model
• Crowd in vestment
• ..... 

Framework for assessing financial models
ENLEB
EnergieNeutraal en LEvensloopbestendig Bouwen

Avans Foundation, Eindhoven University of Technology, Hellas Rectifiers, Maastricht University, TIORC cooperative

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KampC (lead), Thomas More University, University Colleges Leuven-Limburg, Zonnige Kempen
Neighbourhoods and demo-houses

- Help citizens to retrofit their house
- Develop an integrated concept
- Based on co-creation and self-support
9 Neighbourhood baselines

Social
Economic
Building types

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Current activities: Co-creation in a variety of neighbourhood & demo approaches

• What does an approach consist of?
• How does the approach fit with the neighbourhood characteristics?
• What level of participation is needed throughout the customer journey?
• What new business models are useful for the supply chain
Some other products (WIP)

Tool: menu of options

Ontwerp concept mobiele DC-unit

International Centre for Integrated Assessment and Sustainable Development
Key elements of the two projects

• Increase energy retrofit rate
• Focus on the societal side
• Involve students
• Connect scientific knowledge to practical problems
• Acknowledge different interests and look for acceptable solutions
Thank you!

Current Research

**ENLEB**
ENLEB is a project in which Flemish and Dutch partners work together to encourage citizens to make their homes energy neutral and adaptable to meeting changing needs through all life phases.

**ACE Retrofitting**
ACE Retrofitting (Accelerating Condominium Energy Retrofitting) will help condominiums to overcome legal, social and financial barriers of retrofitting.

**STASUS**
The STRASUS (strategic sustainability for logistics) project aims to "gamify" the creation and, above all, the active implementation of a sustainability strategy (CSR) for small and medium enterprises (SMEs).

**HEEC Project**
The project is part of Joint Scientific Thematic Research Programme (JSTP).

**Smarterlab**
The SmarterLabs project aims to develop a Smart City Living Lab approach to

**TRANSIT**
TRANSIT is an ambitious research project that will develop a theory of.