

International Energy Agency

Annex 75 | Cost-Effective Building Renovation at District Level Combining Energy Efficiency & Renewables

Energy in Buildings and Communities Programme

Workshop on Upscaling Energy Renovation to the District Level

Delft, The Netherlands – September - 25th 2019

Faculty of Architecture and the Built Environment – Delft University of Technology,

Subtask D: Policy Instruments, Stakeholder Dialogue, and Dissemination

WORKSHOP SUMMARY AND MAIN FINDINGS

Within the framework of the IEA EBC Annex 75 meeting in Delft, a half-day, a stakeholders' workshop on how to upscale home energy renovations to the district level, was organised. During a workshop, the Annex 75 approach was introduced, and the participants' insights were used to identify a number of drivers and barriers for policy and market development. The workshop was organised in collaboration with international projects ([IEA EBC Annex 75](#), [Interreg 2 Seas Triple-A](#)) and national institutes ([Rijksdienst voor Ondernemend Nederland](#), [Climate-KIC](#), [TU Delft Urban Energy Platform](#)).

The workshop consisted of two parts. First, a series of lectures and then two interactive sessions. The interactive, breakout sessions focused on policy instruments and business models, respectively. A list of the lecture topics and speakers is presented below:

The IEA EBC Programme: supporting policy and business development

Daniel Van Rijn, The Netherlands Enterprise Agency (RVO), The Netherlands

The Annex 75 project: objectives on policy and business development

Manuela Almeida, University of Minho, Portugal

How to operate Amsterdam on clean energy?, Tess Blom, TU Delft, The Netherlands

District heat roll out and neighbourhood approach pilot Prinsenland / Het Lage Land, André De Groot, City of Rotterdam, The Netherlands

Group renovation of owner-occupant's houses in Mechelen, Ighor Van de Vyver, City of Mechelen, Belgium

Integrated tool for empowering public authorities in the development of sustainable plans for low carbon heating and cooling: The PLANHEAT tool, M.A.Fremouw, TUDelft, the Netherlands

The role of ESCO's in large scale renovation, Johan Coolen, Factor 4, Belgium

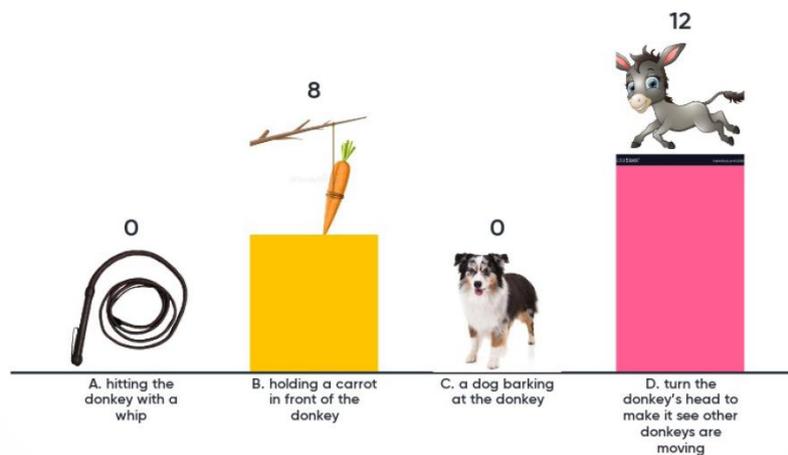
Climate Mission initiative, Rene Pie, Klimaatmissie, The Netherlands

Breakout Session 1:

Policy Instruments for energy efficiency renovation

What do you think is the most effective way to move an unwilling donkey?

 Mentimeter



 20

Session format:

- Round 1: review of 15 policy instruments supporting neighbourhood renovation. Each participant got one sheet of paper describing a policy instrument and its scope; participant had to think in individual work about examples, strengths and weaknesses;
- Round 2: the filled in policy instrument sheet was presented and discussed with a person next to oneself
- Round 3: the filled in policy instrument sheets were presented and discussed in a group of four; participants reflected on what policy instruments are best suited to upscale home energy renovations to the district level and voted for the best of the four instruments.
- Round 4: all policy instrument sheets were pinned on a wall and participants studied them and voted again for the best suited one of all 15 instruments. Afterwards discussion in plenum about results and another, final vote
- Moderator: Erwin Mlechnik, TU Delft, The Netherlands

Policy Instruments, their Scope, Examples as well as Strengths and Weaknesses

(Votes for best suited instrument for upscaling to district level)

1) Inspections and Permits (5 Votes)

Scope: The local authority actively checks the performance of housing in districts regarding safety, comfort and energy and penalises owners of buildings with insufficient performance.

Examples:

- Brussels, Belgium: waste segregation (fined in case of wrong segregation)
- California, US: benchmarking of buildings
- Singapore: checks regarding safety and comfort (e.g. check for mosquito breeding + things placed on balcony / fined in case of noncompliance) & energy bill disclosure (above or below the average / no knowledge about penalties)

Strengths:

- People are more aware
- Usually, method works well as there could be a surprise inspection anytime
- Mandatory policies to a certain extent (especially if not economic input required) a good way to control user behaviour

Weaknesses:

- Great effort for cities/ administrators

2) Urban Energy Planning

Scope: The local authority designs an urban redevelopment plan of a neighbourhood including the uptake of energy efficiency and renewable energies. The energy performance requirements of buildings and/or energy grids are fixed before (re)development in this area can start.

Examples:

Not discussed

Strengths:

Weaknesses:

3) Grants for Energy End Users (3 Votes)

Scope: The local authority supports the uptake of low-carbon technologies by energy END USERS (citizens, residents) by offering financial grants.

Examples:

- CA, USA: rebate for LEDs

- CA, USA: financial support for hot water system

Strengths:

- Easy to implement
- End users do not need to pay (high) initial investment

Weaknesses:

- Probably higher costs compared to market-based solutions

4) Grants for Building Owners (4 Votes)

Scope: The authority supports the uptake of low-carbon technologies by offering grants to BUILDING OWNERS (not necessarily citizens or residents).

Examples:

- Antwerp, Belgium: VME-Grant for apartments; Masterplan study with a grant of max. 7.500€

Strengths:

- Not every individual homeowner or resident needs to take a separate loan.

Weaknesses:

- Investments sometimes too big; especially for large apartment buildings
- It doesn't necessarily engage people to low carbon technologies

5) Low-Interest Loans (0 Votes)

Scope: The local authority offers a reduction of the interest rate of national or private loans for implementing renovation measures in a district.

Examples:

- Sweden: In the 1970s-80s when interest rates were high

Strengths:

- It makes it more attractive to do energy renovations and will probably lead to a higher grade of implementation

Weaknesses:

- It has to be funded in some way (e.g. increased taxes) and is not necessarily accurate (deadweight effect)
- Steering effect limited, if interest rates are very low (like now)

6) Tax Incentives (1 Vote)

Scope: The local authority rewards highly energy-efficient buildings with lower building tax. The national authority rewards the uptake of energy-saving measures with lower income tax.

Examples:

- Switzerland / Sweden: tax incentives through a carbon tax

Strengths:

- The higher the investment, the bigger the reward
- If aligned along carbon emissions, it is a very precise instrument

Weaknesses:

- Tenant-landlord-dilemma (who profits/who carries the burden)
- Regarding income tax: if no or very low-income tax is payed, there would be no advantage (high earners might profit the most / social injustice?)
- Not a very direct and "catchy" method

7) Development Fund (1 Vote)

Scope: The local authority supports a revolving fund to renovate buildings or infrastructure to high energy standard in a district.

Examples:

- Belgium (not sure if on national or local level in only one or a few cities): revolving fund for renovating houses of owners with low income that cannot get a loan (no paying back until death or selling of the house).

Strengths:

- Precise instrument
- Chance to reach low-income target group that would not be able to invest with other measures like low interest rates etc.
- If revolving mechanism works, it is a cost neutral instrument

Weaknesses:

- If revolving mechanism is based on returns through energy savings, this is quite unreliable
- If revolving mechanism is based on mortgage loans, the return into the fund is a lengthy and hard to plan process
- Demand is questionable, if there is a low interest phase (only makes sense in countries with high owner/ self-user-rate)

8) Support for Actors Activating Demand (11 Votes)

Scope: The local authority actively supports actors to inform and consult citizens regarding energy efficiency and renewable energies. Subsidies can for example be related to awareness raising,

providing easy access, initiating citizen initiatives, activating demonstration projects, supporting citizen contests to compete in saving energy.

Examples:

- Aachen, Germany: City initiated Energy renovation agency "altbau plus" that brings together various local actors in the field to inform and give advice about possibilities in energy renovation

Strengths:

- "bottom-up-process": based on and rigidifies existing local network and its knowledge in building renovation (sustainable effects).
- Central actor makes issue more visible
- Visible support of local authority might generate trust (no commercial interests)

Weaknesses:

- Activities rely on funding of local authority (what if change of local government?)
- Lengthy process that relies on motivated and determined spokespeople and a general openness for the cooperation and the issue

9) Support for Local Supply Chain Activation (5 Votes)

Scope: The local authority supports networks of actors to unburden citizens regarding the implementation of energy efficiency and renewable energies. Groups (formation) of companies can be supported with innovation grants, subsidies for consultancy/ training and for initiating collaboration initiatives (e.g. one-stop-shops, ESCOs).

Examples:

- Rotterdam, NL: One Stop Shop (presented in the work shop) / "Woon Wijzer Winkel"

Strengths:

- Combining multiple benefits (stimulate economy, more jobs, cheaper measures)

Weaknesses:

- Longer payback or loses, if new businesses fail

10) Public Tendering of Urban Redesign (1 Vote)

Scope: The local authority tenders the renovation of a neighbourhood using energy and environmental performance criteria. The tendering focuses on design – for example an architectural competition and initial stakeholder consultation.

Not discussed

11) **Public tendering of home renovation services** (9 Votes)

Scope: The local authority tenders the renovation of a neighbourhood using energy and environmental performance criteria. The tendering focuses on the execution by qualified actors. In the case of a one-stop-shop service, the contracting party guides the inhabitants through the whole renovation process and develops activities for initiation, consulting, contracting, execution and/or quality assurance.

Examples:

- Hauts-de-France / Picardie, France: home renovation and use of public tenders to find contractors and sometimes architects to find those who will be involved

Strengths:

- All the actors have the same level of information which makes it more fair
- It is easier to compare
- Trust & neutrality/ more professionalism than if it was done by home-owners.

Weaknesses:

- Too complicated for constructor
- It takes more time and home-owners might be interested in a quick process

12) **Development roadmaps** (1 Vote)

Scope: The local authority identifies a vision, networking and learning for the redevelopment of an urban area.

Examples:

- Zurich, Switzerland: 2000 Watt Society → Target/vision for the whole city regarding envisaged energy consumption

Strengths:

- Clear Focus on a target
- Gives reasons/ highlights the sense in doing something and thus might lead to sustainable mindset change

Weaknesses:

- Risk of rejection
- Length of process / short term effects are not likely

13) **Public information campaigns** (5 Votes)

Scope: The local authority develops or procures media to support the citizen's renovation journey including energy efficiency and renewable energies.

Examples:

- Mechelen, Belgium: e.g. mobile information truck in public spaces / present solutions and show how to move forward with help of real cases (as seen in the presentation during the workshop)

Strengths:

- Lowers the first step to start considering sustainable solutions.
- Helps to make ideas and concepts more concrete and tangible

Weaknesses:

- Unlikely to have fast and direct effects
- Might not reach people that have no initial interest in the issue

14) District Consultancy Centers (5 Votes)

Scope: The local authority subsidises neutral consultants who offer energy end users to get information and help with the choice and implementation of retrofitting measures. The local authority installs or procures mobile or fixed consultancy centers and guidance for (groups of) homeowners in a district.

Examples:

- Mechelen, Belgium: (as in the presentation during the workshop)

Strengths:

- Neutrality and trust (personal talks can be more encouraging). However, it can be a cultural thing to trust a local authority managed consultancy center.
- Home owners get manifold choices

Weaknesses:

- Home owners need an initial motivation to let themselves be educated about measures.
- The consultancy might be seen as a rather top-down approach

15) Co-Creation Processes (1 Vote)

Scope: The local authority organises networking and dialogue between supply and demand side actors for a district. A goal is to create 'ambassadorship' for a district renovation, to activate groups of homeowners and support co-creation processes leading to risk minimisation and kick-starting initiatives.

Examples:

- [none]

Strengths:

- Integrated approach / bundling of local knowledge
- Sustainable change in mindset might be the result (but is also a high hurdle for those processes to function)

Weaknesses:

- Risk of endless talking and no action / small steps and quick results are unlikely

Remarks / Conclusions:

- Before the breakout session, the participants voted for **policy actors** and **residents** as stakeholders that are most important to activate to successfully upscale home energy renovations to the district level. After the presentations in plenum and the breakout session, though, the participants perceived policy instruments that address the **supply side** directly or that use the supply side as medium to reach out to home owners as best suited (e.g. Instrument 8 "Support for actors activating demand" with 11 votes)
- This was seen as more sustainable compared to direct funding for owners or residents (less free riding + probably no change of mindset or **sustainable raise of awareness** along with direct funding)
- However, direct and investment measures as well as legal bans or mandatory policies were associated with fast results.

Impressions from the Breakout-Session on Policy Instruments:



Breakout Session 2:

Business models for energy efficiency renovation

The session started with a brief introduction about the Annex 75 and particularly Subtask D. The importance of Business Models (BM) for energy efficiency renovations was explained, along with the elements that are needed in order to establish a Business model. Finally, the overview of the BM archetypes identifies so far by the literature review (catalogue) were presented, as the basis for proposing the BM for district renovation

Table 1: Matrix of Business models archetypes

	Values proposition	Customer relation
Traditional/atomised market model	energy cost savings, Single measures focus	Dedicated personal assistance. Finance is arranged via a third party with little involvement in the retrofit process
Market intermediation model	energy cost savings, Single measures focus	One point of contract for sales, typically by an intermediary. Additional interface for finance
One-stop-shop	energy cost savings and home improvement Multiple Measures or comprehensive retrofit	One point of contract for sales of the full retrofit package Finance may be provided and arranged by the retrofit provider,
Energy services agreement (ESA)	Multiple Measures or comprehensive retrofit. Emphasis on energy services of temperature and hot water volume. Home improvement and comfort Energy savings performance contract (ESPC)	ESPC/ESA structure to fund retrofits. Lender captures energy savings and charges back to the property owner
Revolving fund 'Gebouwebonden financiering' (GGF)	Multiple Measures or comprehensive retrofit. Financial incentives for owners	Special Purpose Vehicle (SPV) receive new investment funds from different sources and to invest these in energy efficiency and low carbon measures in households

The aims of this breakout session were the following:

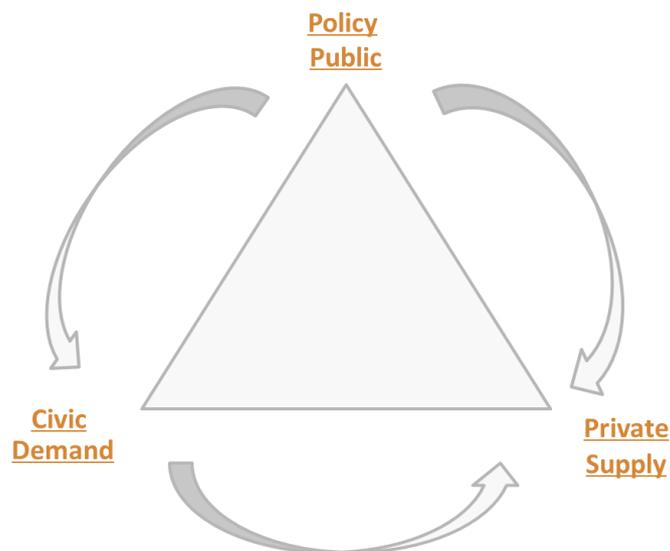
- To get an overview of existing stakeholders structures in the countries/regions/cities of the participants
- To get the participants to reflect on barriers to upscale energy renovation to the district level.
- Which are the main stakeholder involved?
- Main motivation

- Financial mechanism (how were the projects financed, what is the payback?)
- How to get those models to the district?

Round 1: Stakeholders mapping

Distribute the key stakeholders of renovation according to the actor analysis triangle.

Would this distribution change when moving from building to district scale?



The key stakeholders provided in separate sheets were the following:

- Policy actors (municipality department x, government body, innovation agency, ...)
- Users/investors (individual owner, housing association, building managers, asset manager, project developer)
- District-related actors (Community/occupants organisations, ...)
- Energy Network Solution Suppliers (Distributor System Operator, Energy supply company, energy agency, ESCO, renewable energy companies)
- Renovation Solution Suppliers (Planning and construction parties, urban planners, architects, design team general contractors, products suppliers, ESCO, contractor, energy monitoring, facility manager, installation provider, one-stop-shop, ...)
- Other intermediaries (public bodies, trade organisations, NGO's, consultancies, research institutes)

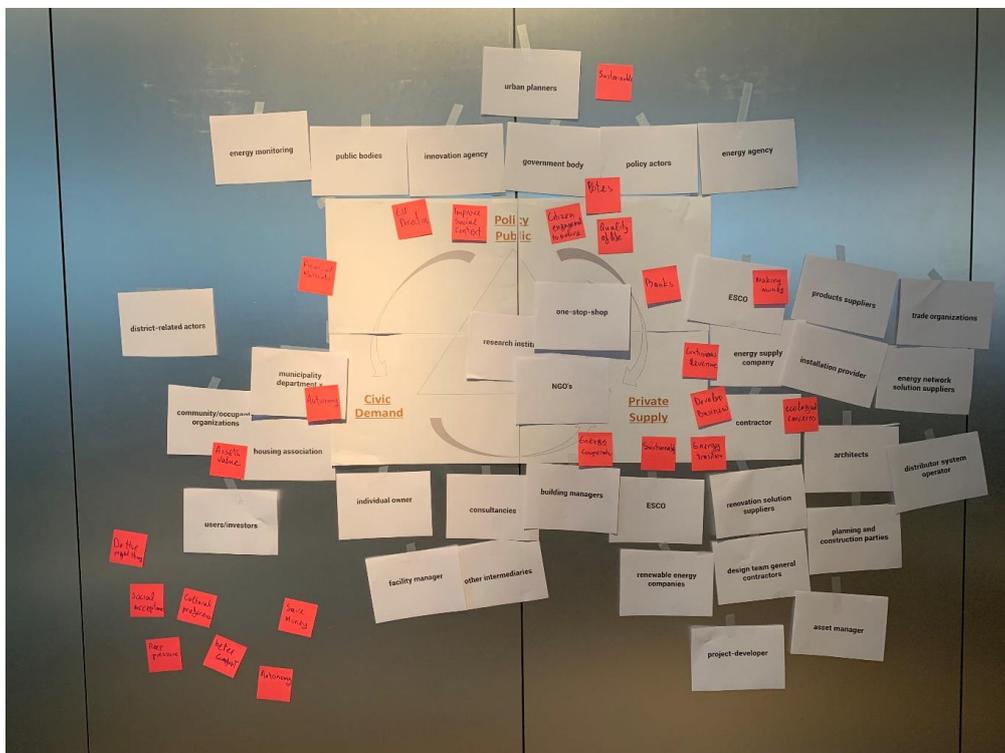
Round 2: motivations, barriers and opportunities

Discuss in plenary the following:

- Motivations: for the stakeholders, according to the previous mapping
Use **post-it's** to populate the actors' triangle with motivations for renovation, to match stakeholders
- Barriers: which are the main barriers/bottlenecks to renovation
- Opportunities: what characteristics of a BM can address those barriers



Stakeholders analysis: Mapping and motivations



Motivations according to the stakeholder position

Barriers

The barriers are defined by the stakeholder, who leads or initiates the renovation process and they depend on who the owner and decision-maker is. The barriers identified during the discussion are the following.

- Separation between energy supply and renovation/building performance
- Conflict between energy production/supply and energy savings
- Information to people in order to decide
- Business as usual is easier/more profitable
- Legal framework
- Uncertainty/ Instability
- Unpredicted performance
- Financial risk for business
- Financial burden/risk for business
- Complexity in stakeholder communication
- Process management
- Time of renovation
- Long-term planning
- Small window of opportunity due to owners' turnover
- Market segmentation
- Long term financial risks
- Different owner structures need different business models

Solution: Characteristics for business model

Looking at the existing BM archetypes identified, the group discussed how they can be

- Financial load, linked to the building, instead of the owner
- Greenbonds or greenfunds create demand on retrofitted buildings from the financial market
- Performance guarantee from the technical solution supplier and energy supply
- Different financial interfaces for different type of owners

Conclusions/remarks

- Ecologic conscience is well developed these days but still not trigger for huge and uncertain investments. Clever planners wrap them as co-benefits in a regular renovation cycle.
- Renovation in general but especially on district level are connected to extensive processes which are driven by outside standing actors like researchers. The intrinsic motivation from affected actors is usually quite low
- The legal framework needs more incentives to invest more money in CO2 reductive measures, such as a CO2 tax
- Concessions from the municipality- eg. higher building density if certain standards are reached- can accelerate energy-efficient renovations

- There is a rising demand for green finance products. Funds are investing in Buildings with certain ecologic standards or defined renovation schedules to reach these standards. Maybe whole districts could be also interesting for such investments.
- Changes on a meta-level like the ones mentioned above are needed to develop solid business models and get the market going.