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Energetic Refubishment of multi-family buildings – experiences and concepts in Germany and CEE

Knut Höller, 10.9.2018, Berlin

Facilitator

energie waechter

IWO's network and member structure

EBZ

ista

IPB.B

Die Wohnungswirtschaft Deutschland GdW

VEGIS IMMOBILIEN

DV

VIESMANN climate of innovation

dena Deutsche Energie-Agentur

LUNOS

EFL EUROPEAN FEDERATION FOR LIVING

BBP

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Refurbishment in Eastern Germany – challenges after 1990

- **Energy deficient building stock** in East Germany after reunification
- Need for increased energy efficiency due to **rising energy prices**
- Climate protection & **„Energy revolution“**

Source:
Center of Competence for Major Housing Estates, Berlin

1. First steps: to initiate the process.




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Situation 1989/ 1990

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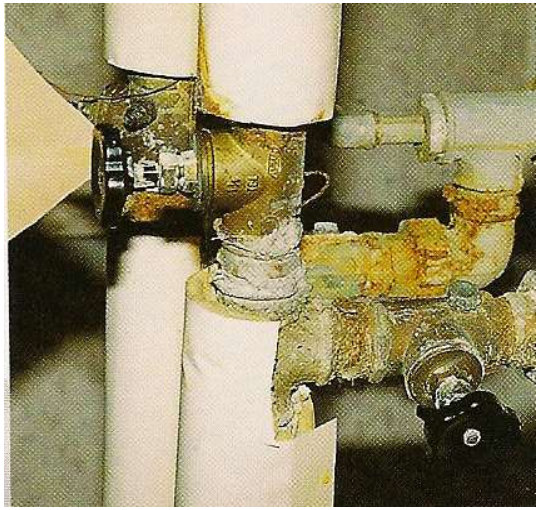

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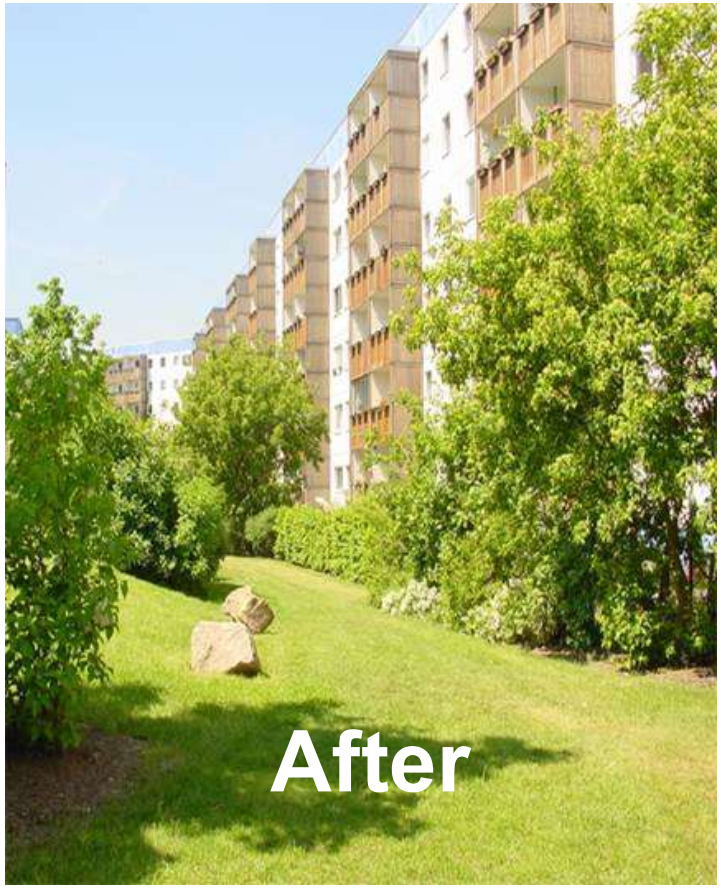


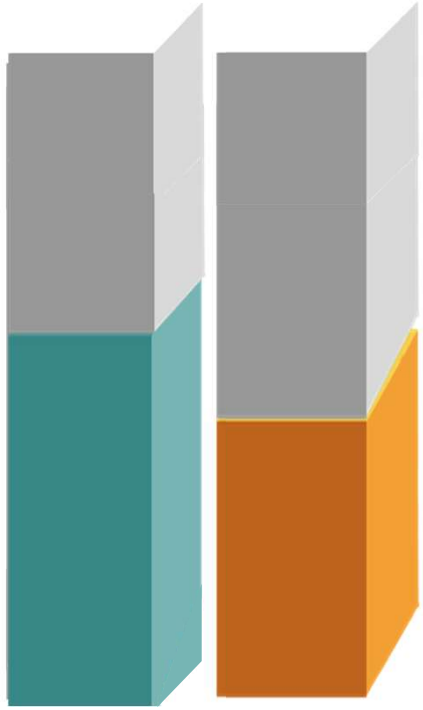
Source:
Center of Competence for Major Housing Estates, Berlin

Experiences with refurbishment in Berlin

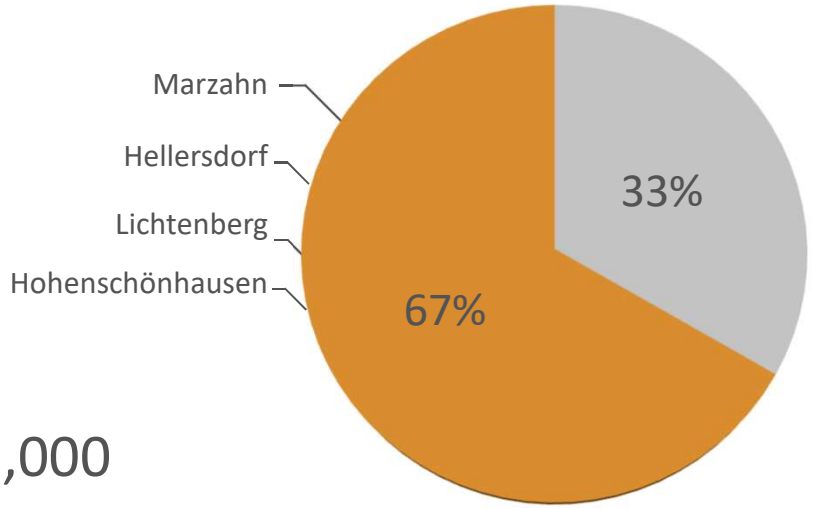
Housing in Berlin

631,000 Flats

360,000 Build after 1945



273,000 Flats in panel buildings



2/3 of residents in former East-Berlin lived in panel buildings

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Experiences with refurbishment in Berlin

Early decision

Berlin decided quickly :

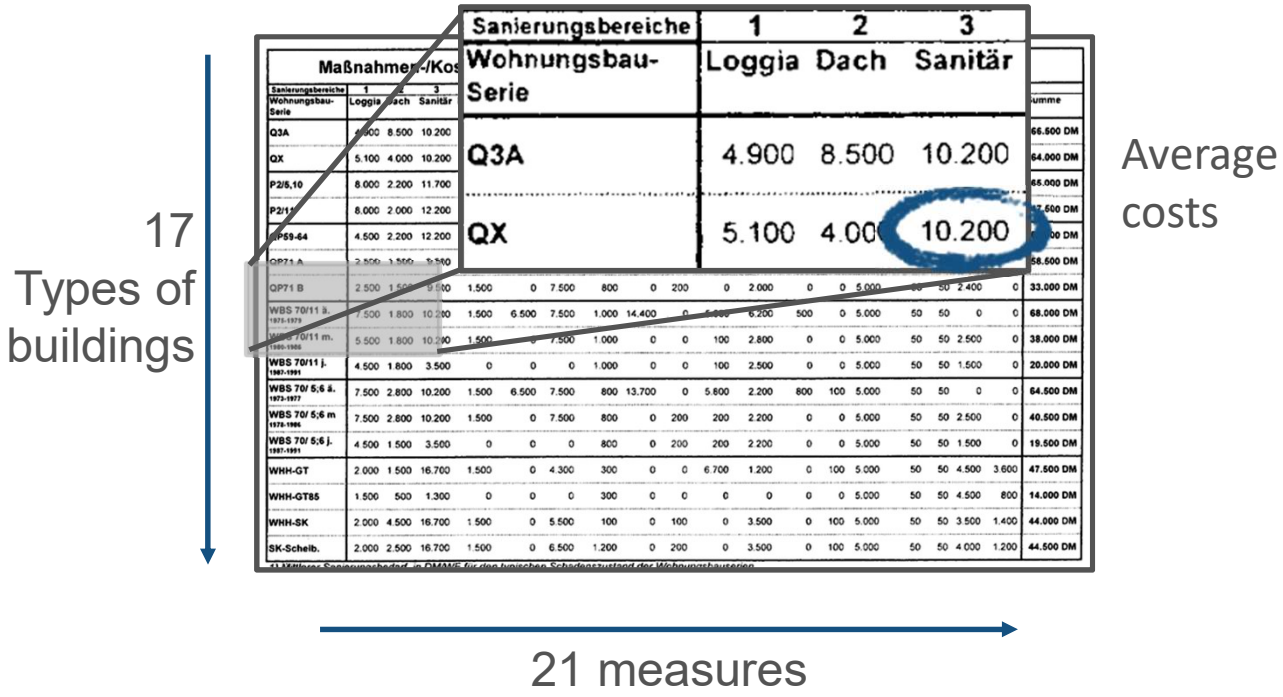
„We need to act!“

Refurbishmend and Modernisation of the building stock

Early 90s: Berlin Senate commissioned extensive studies to determine the rehabilitation and modernization needs of different building types.

Experiences with refurbishment in Berlin

Measure-Cost-Matrix



- **Prices varied from 7.000 €/flat** (newer buildings) to **34.000 €/flat** (Type QP 59).
- This matrix was the basis for the Berlin support programs.

Experiences with refurbishment in Berlin

Refurbishment started…

October 1993:
Pilot phase of the refurbishment program started

1993

Complex and comprehensive Refurbishment within ten years

1994

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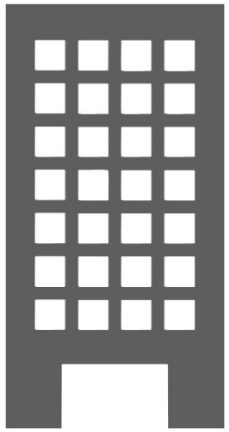
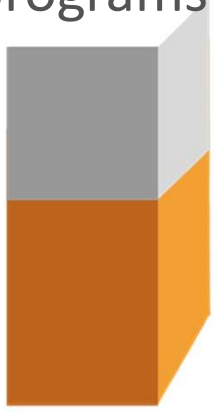
Experiences with refurbishment in Berlin

212,562
flats
refurbished



1998

>70% of Berlin‘s housing stock participated to the different refurbishment programs



2014

75-80% of the housing stock in Berlin and in East-Germany are complex refurbished

Experiences with refurbishment in Berlin

Reasons for Success

Main principle:

First refurbishment and then privatization.

- **Transfer of property and re-organisation of housing administration.**
- **Improvement of the neighborhood.**
- **Refubishment and modernisation of the housing stock.**

Experiences with refurbishment in Berlin

Higher living comfort.

Identification with the living area.

Improvement of the neighborhood.

Also important:
Higher **payment morality**

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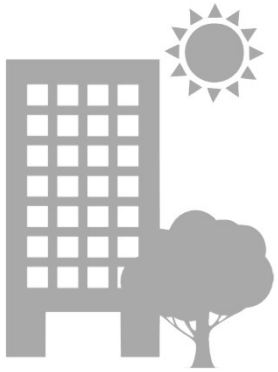
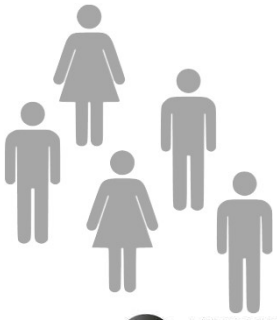
Experiences with refurbishment in Berlin

Methode and Instruments

- **Cooperation of stakeholders within an integrated approach**:
  - Housing companies
  - City departments / administration
  - Planer and Architects …

- **Urban area conceptes (Quartierskonzepte)** as basis in the individual city areas for development of an own identiy.





- **Management of urban areas (Quartiersmanagement)** under consideration of **partizipation** der of the residents and stakeholders during the whole process.

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Experiences with refurbishment in Berlin

Financing principles

- Almost all refurbishment measures were financed through **longterm loans with reduced interests rates (at that time ~5%)**.
- Every loan was registered in the land register.
- If nessary: **additional guarantees** were provided by the state or the municipality
- **Support programs on two administrative levels:**
  - Federal Government
  - Land Berlin

Experiences with refurbishment in Berlin

InstModRL“: Berlin’s support program

- **KfW**: „main financing“
- **InstModRL:**
  long term subisidies on interest rates for buildings, where refurbishment costs could not be refinanced only due to rents and the KfW „main financing“ = **„on-top“**

Experiences with refurbishment in Berlin

How did it work in practice?

- **Credit rating** of owner, e.g. municipal company or cooperatives, was quite well.

- Costs per flat for complex refurbishment were around **23.000 €**, including
  8.500 € for energetic Measures.

Experiences with refurbishment in Berlin

How did it work in practice?

Average rent included

135 €

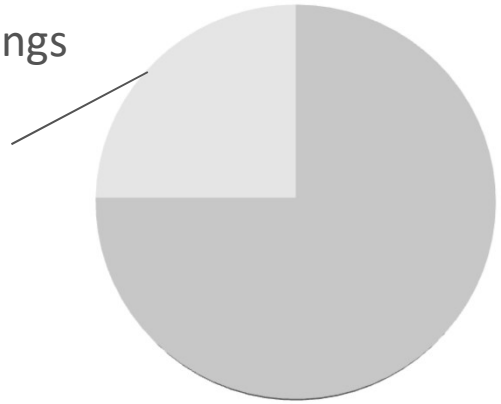
- Measures were financed via the rent.
- Rents was allowed to rise 11 % / year.
- Simultaneously: Sinking costs for heating.

refurbishment costs

Rent in refurbished buildings is around

~ 25%

of the household income



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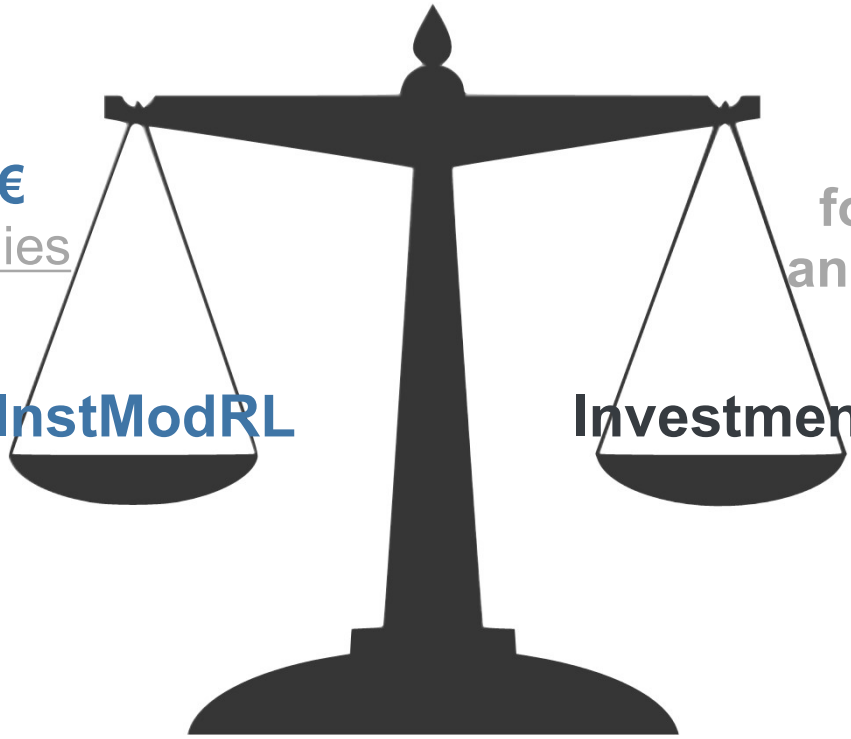
Experiences with refurbishment in Berlin

Result of refurbishment program for panel buildings

650 Mio. €
for subsidies to reduce interest rates



6.2 Mrd. €
for refurbishment and modernisation of the housing stock

Support/subsidies led to a tenfold increase in investment!

Refurbishment in Eastern Germany – results

- Reform of housing sector in Eastern Germany
- (almost) successfull implementation of complex refurbishment of multi-familiy buildings (approx. 80 % of the housing stock was refurbished – approx. 8 T€ / dwelling for energy efficiency measures)

Today:
- Energy Efficiency = high priority in Germany
- Developed market – many SME‘s;

- Energy efficient new construction **and** refurbishment is regulated by law (EnEV)

- Nevertheless refurbishment rate is still low, esp. in other building segments

Energetic Refurbishment in Germany today

- Until 2050 transformation of the German building stock into a nearly climate-neutral state by 2050 (reduction of the heat consumption).

- All developed target states achieve the overall goal of reducing the non-renewable primary energy demand in 2050 by at least 80% with respect to 2008.
- Doubling of the refurbishment rate
- Technical reality:
  Highly efficient standards are already possible today.

Require:	✦ **legal:** z.B. Energy Ordinance EnEV

Promote:	✦ **Financial:** programs of KfW, the federal states (Länder) and municipalities ✦ **Information** and transparancy ✦ **Research** and development of know-how

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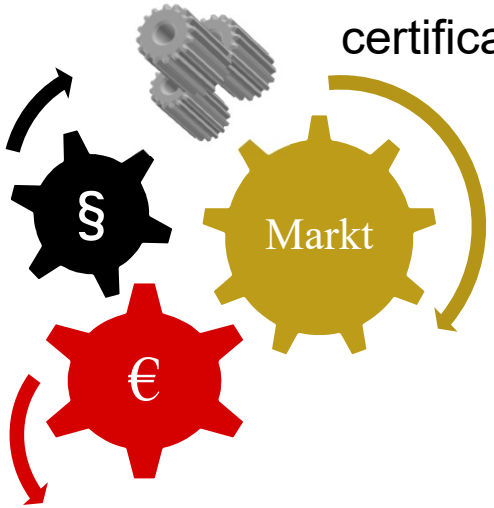
POLITICAL INSTRUMENTS IN GERMANY

QUELLE: DENA

Price and quantity control (taxes, certificates etc.)

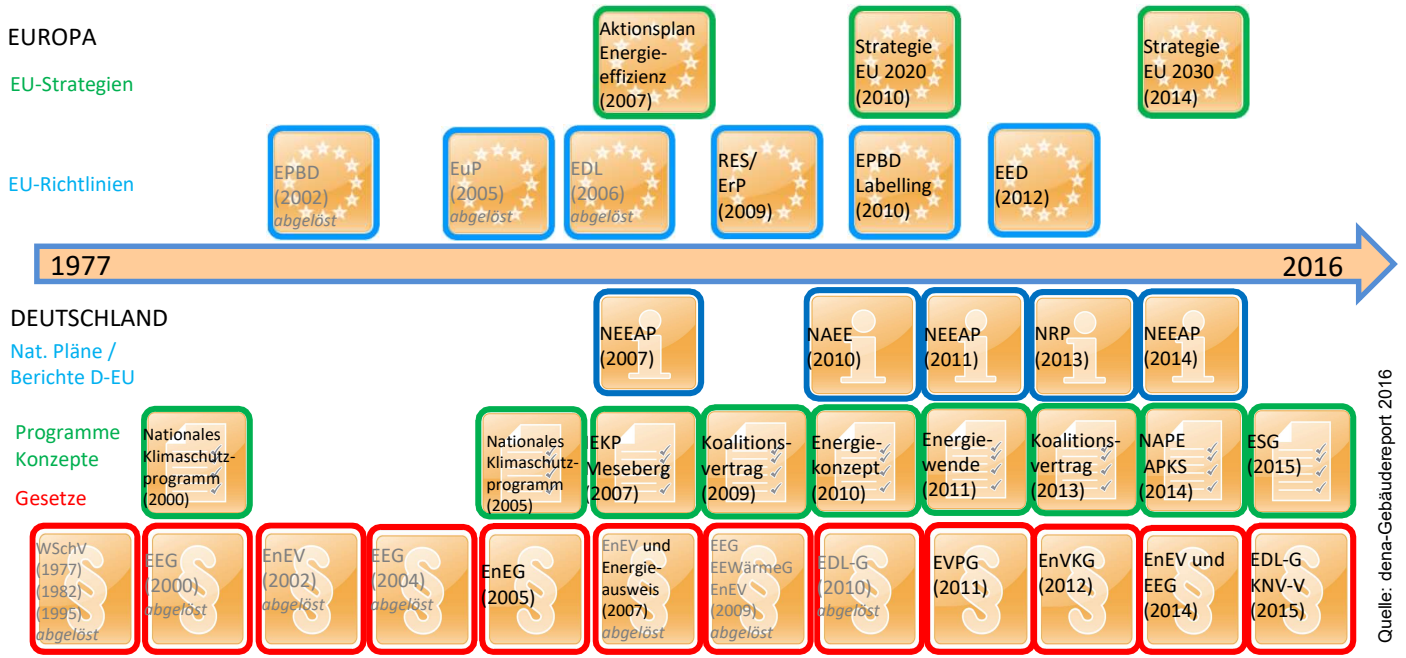
regulatory law



Market instruments (energy passes, energy rating, energy consulting, information campaigns etc.)

Support

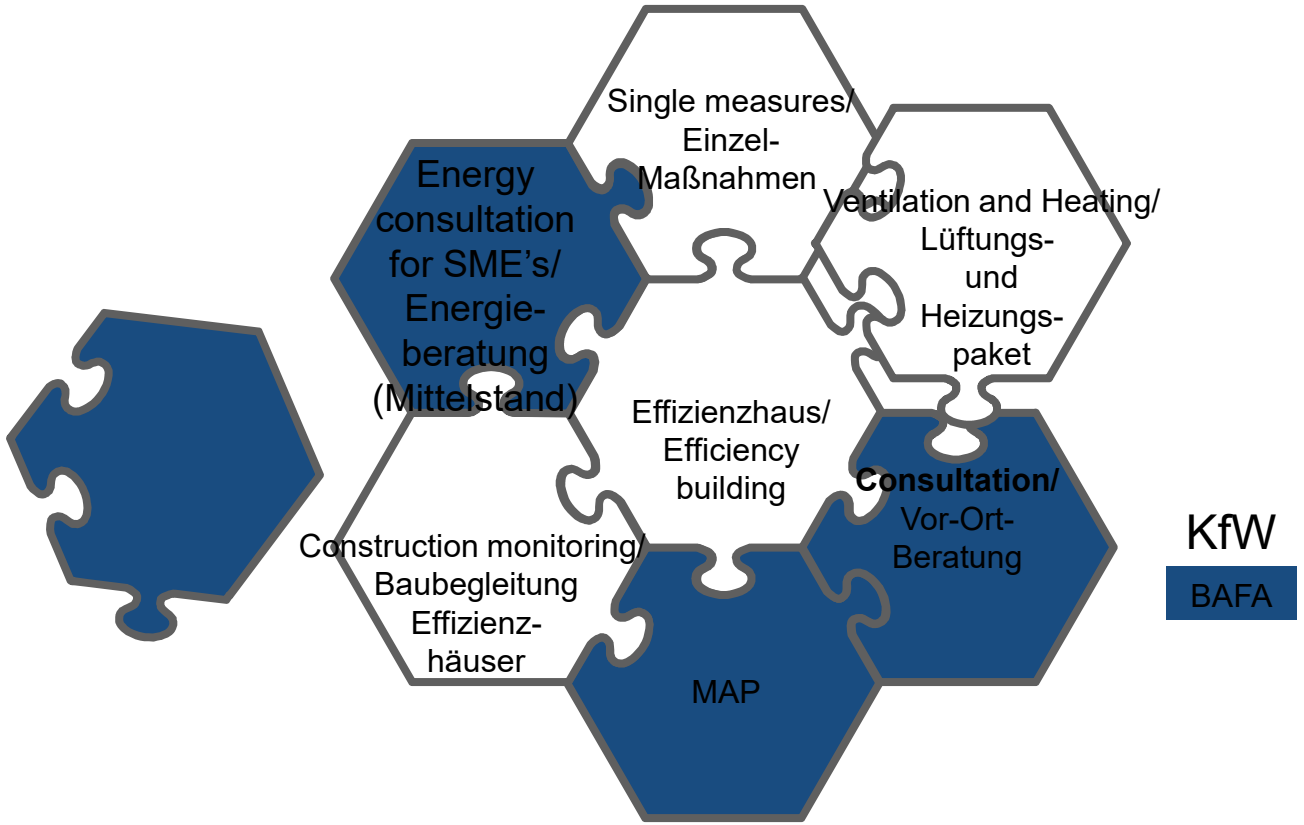
DEVELOPMENT OF REGULATION: OVERVIEW



Quelle: dena-Gebäudereport 2016

European and national regulation for implementation of energy efficiency targets in buildings.

FINANCIAL SUPPORT IN GERMANY QUELLE: DENA



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Central & Eastern Europe - A differentiated picture – often slow transformation processes and urgent need for renovations

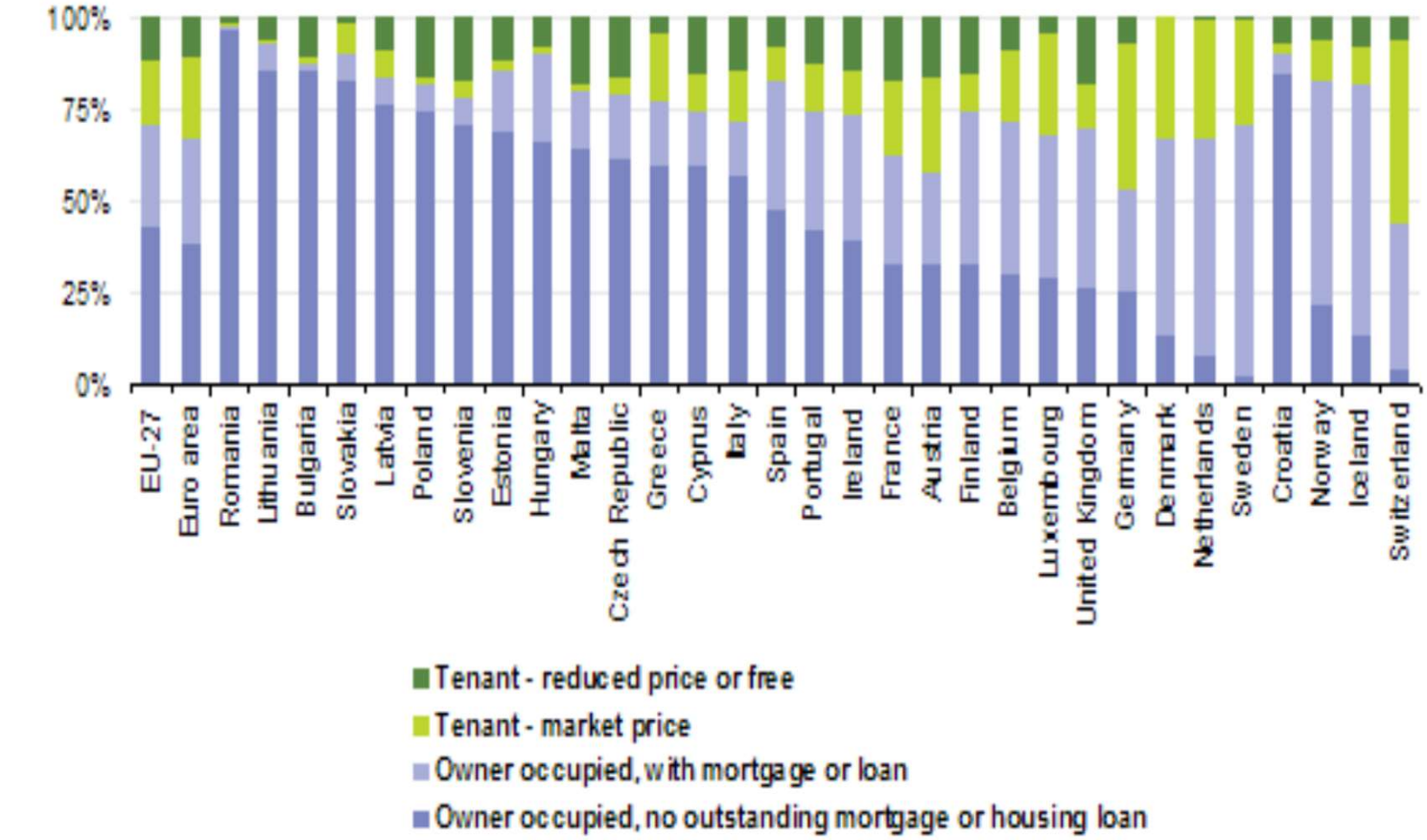
The building stock tends to consist of multi-storey family buildings from Soviet times - in which most **dwellings** were **privatised** after the collapse of the Soviet regime. In many an Eastern European country, only a minor share of **dwellings are social housing**.

While shares differ from country to country, a large part of the people in the Eastern European region today...

- live in apartments in multi-storey buildings that urgently need modernisation
- own their apartments while they are prone to a “tenant’s mentality”
  - are dissatisfied with (communal) housing management
  - lack awareness for their potential means to influence building and apartment maintenance
- are energy poor or at constant risk of energy poverty
  - high and rising energy prices
  - are paying a high share of their incomes for energy bills – despite the fact that energy is subsidized.
  - suffer from the effects of energy losses in the building system

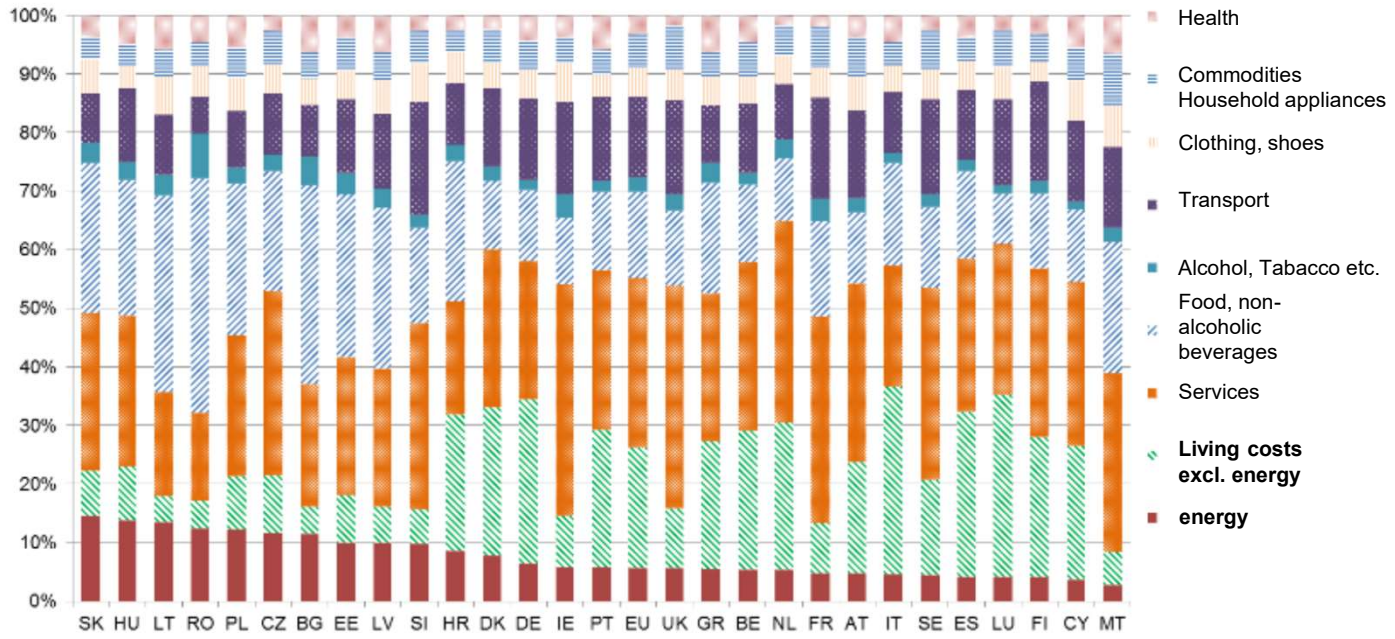
Source: Heinrich Böll Foundation 2016
https://energytransition.org/2016/09/the-ukrainian-crisis-can-be-solved/

Share of homeowner‘s in EU

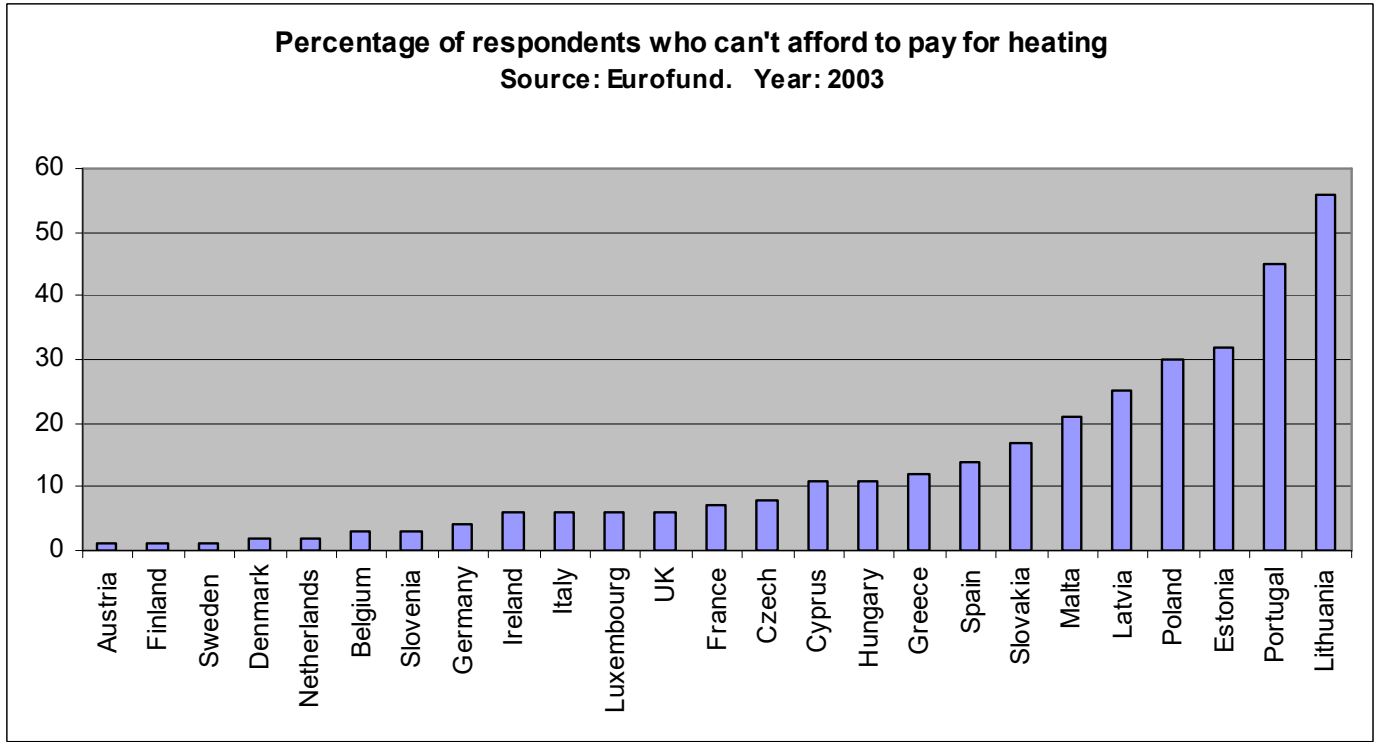


Source: Eurostat (online data code: ilc_lvho02)

Household expenses in the EU - Shares per consumption goods (2014).



Source: GdW presentation based on Eurostat, April 2017



Source: Eurofound's First European Quality of life Survey, which gives data on percentages of people who cannot afford to pay for heating in the 27 EU member states

The necessary refurbishment of buildings is a complex and complicated challenge for home owners.
They urgently need additional assistance !

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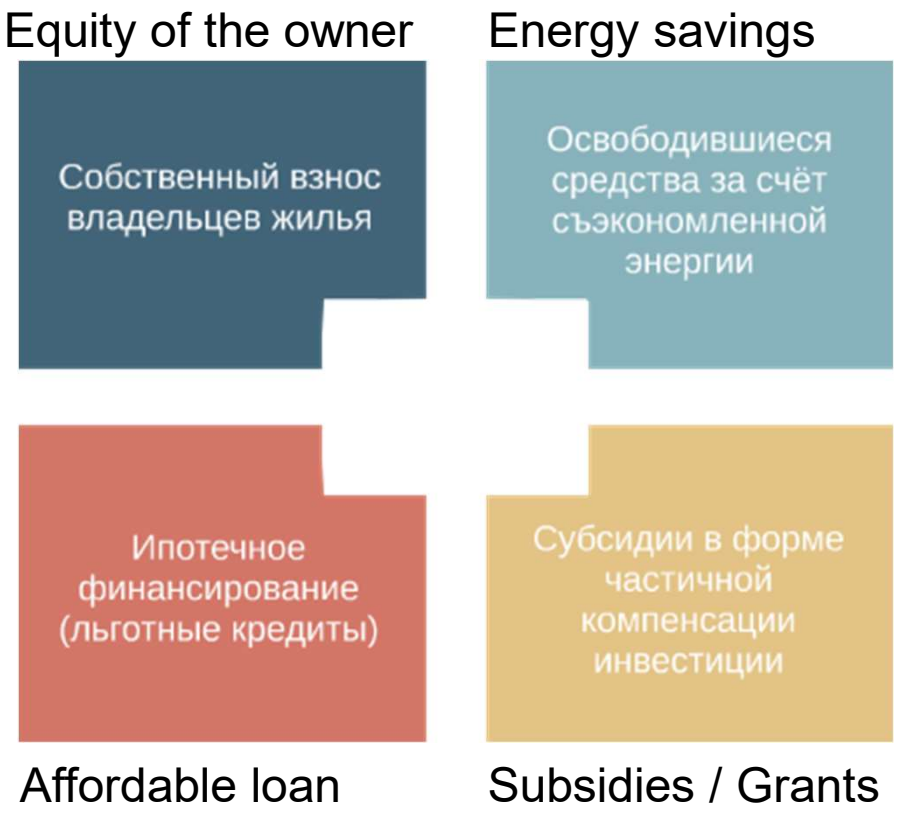
Optimized combination of different sources of financing



Result: Increased comfort with low current heat costs

- Increase of the market value of the building and apartments due to the complex energy-saving rehabilitation and quality assurance of the construction works
- A significant and long-term reduction in the cost of heat energy and thereby greater independence from tariff increases
- Increased comfort and comfort in winter, due to insulated walls and windows

Result: Increased comfort with low current heat costs

- Increased comfort and comfort in the summer, thanks to improved sun protection
- Improving the quality of the microclimate, and with it hygiene facilities, it is important especially for allergy sufferers
- Each energy-efficient refurbished building contributes to reducing CO2 emissions and thereby protecting the climate

Complex approach offers high potential for solution

Improved Housing System / Legislation to meet home owners needs

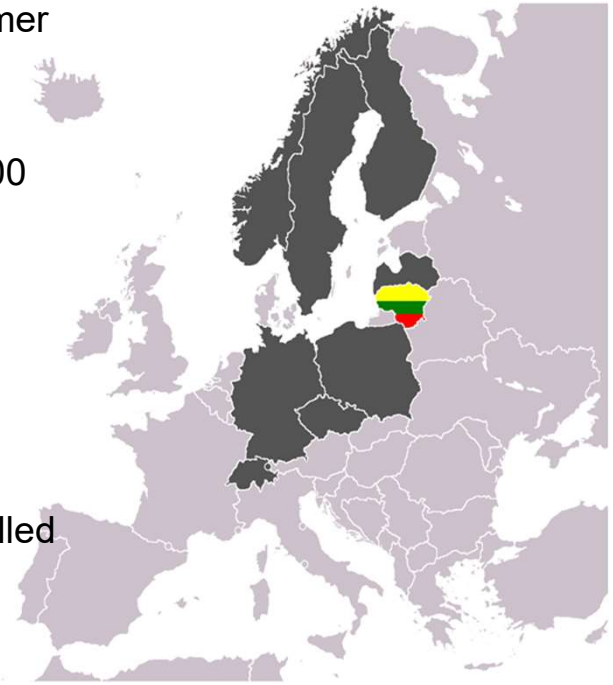
Effective technical planning and implementation procedures

Affordable Financial Concepts for home owners and tenants

High and sustainable energy savings

The Lithuanian example: key statistics

- situated in Northern Europe
- average temperature is -5 C in winter and +17 C in summer
- population - 3 mill.
- 66% of population lives in multi apartment buildings built before 1993 (> 38,000 multi family buildings and > 800,000 apartments)
- 97% privately owned, only 3% municipal rental stock
- 65% of buildings supplied by district heating



Most buildings already have installed new heating substations.

2/3 of the apartments already replaced windows and installed some more simple energy efficiency measure

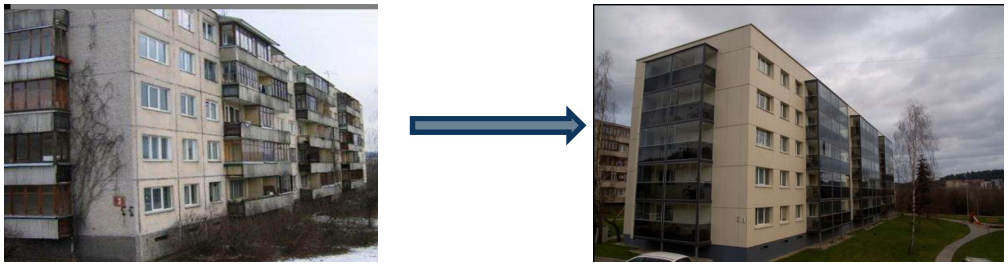
Source: BETA

Multi-apartment buildings renovation (modernization) program

Multi - apartment buildings renovation (modernisation) Programme approved by the Government of the Republic of Lithuania in 2004

The Programme aimed to increase energy efficiency in multi-apartment buildings
Responsible authority: Ministry of Environment
Administering authority: Housing Energy Efficiency Agency
Projects: energy efficiency actions in common parts of multi-apartments residential buildings
Beneficiaries: owners of apartments in multi-apartment buildings

Source: BETA



Program conditions

- constructed before 1993 *(3 or more apartments)*
- main purpose – energy efficiency
  - *at least 20% energy savings*
  - *least Energy Efficiency Class C*
- energy audit + energy performance certificate + investment projec
- majority of owners vote for modernisation 50%+1
- renovation according to investment project
- supervision of works is obligatory

Source: BETA

Program funding conditions (1)

- subsidy covering 50% of costs for technical documentation, supervision of works and project administration
- soft loans with fixed interest rate at 3% through a financial institutions. Loan maturity up to 20 years.
- Soft loans are administered by commercial banks and provided by using EU funds, State budget and commercial banks funds
- no collateral is needed, credit against cash flow

- Subsidy for the investment:
- 15% of modernisation costs if energy savings 20% (State budget)
- additional 15% of modernization costs if achieved energy savings 40% or more (Climate change programme)

Source: BETA

Program funding conditions (2)

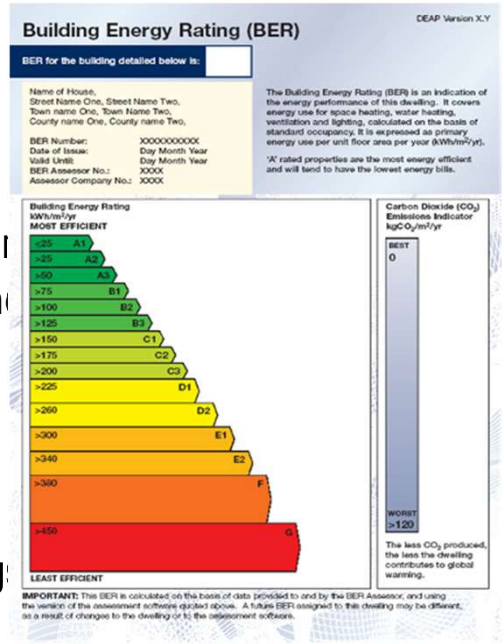
- Government in performing its social policy, compensates the majority of costs for heating and water to financially vulnerable population – low income families

- In implementing the programme for the renovation for low income families entitled to compensation for heating, the state cover**s 100%** of costs of:
- technical documentation preparation
- technical supervision of construction
- repayment of the credit and interest rate

Source: BETA

Eligible measures

- insulation of the walls, roofs
- replacement of windows and entrance doors
- modernization of the heating system
- renewal of the ventilation or installation of recuperatio
- installation of alternative energy sources (solar, geoth
- glazing of balconies
- renewal of other systems – lifts, electrical system, cold and hot water pipes and etc.



These package of measures guaranty the energy saving

on the package of measures final decision are taken by the homeowners

Source: BETA

Programme models (1)

There are two models for the modernisation of multi-apartment buildings in Lithuania

1. Home owners on their own initiative prepare investment projects, take a loans and implement modernisation

The main problems of this model:

- lack of homeowners initiative
- fear to take a loan
- mistrust on the results after the upgrading

Source: BETA

Programme models (2)

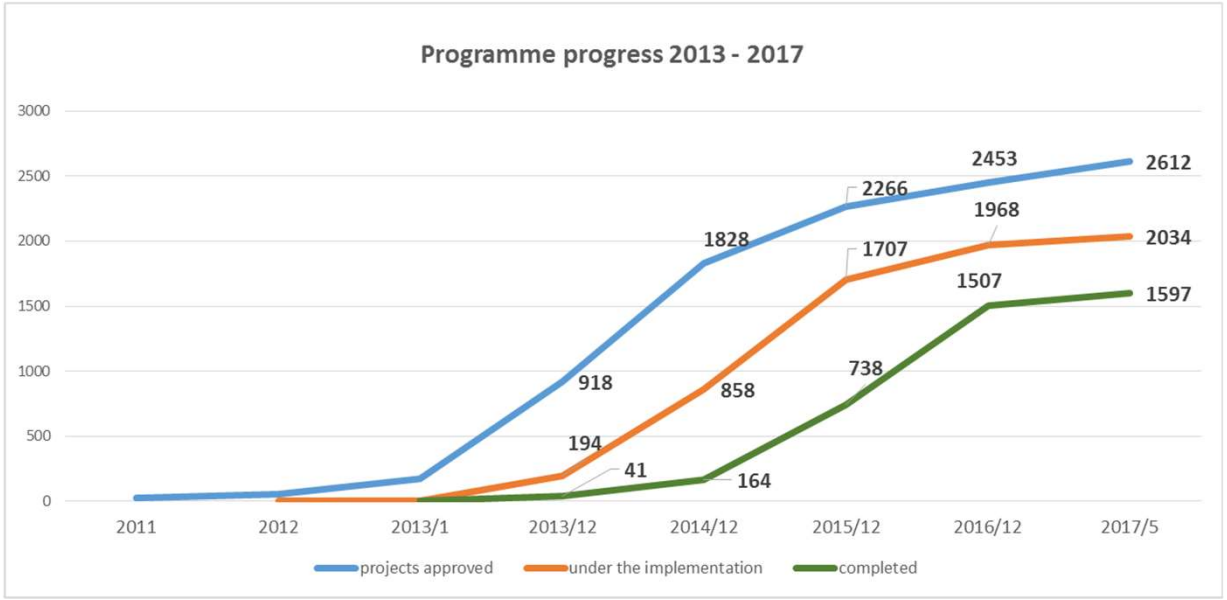
2. Investment projects are implemented based on the Energy efficiency programmes approved by the municipalities:

   - investment projects are prepared on the municipality initiative
   - projects are implemented by the Programme administrator appointed by the Municipality
   - loan is taken by the Programme administrator
   - programme administrator organizing procurement, taking all the responsibilities on the implementation and financial management

this program model was introduced at the beginning of 2013

Source: BETA

renovation program results (1)



- since 2013 completed **1597** projects *(more than 45.000 apartments, 2,33 mio.m²)*
- currently **437** multi - apartment buildings (12.500 apartments) are being upgraded
- **578** projects started implementation procedure
- plans for renovation – **500** buildings annually

Source: BETA

renovation program results (2)

- 99% of buildings implemented complex energy efficiency measures *(insulation of walls, roofs, windows replacement, modernization of heating systems)*
- Avg investment - 267.000 EUR/building, - 185 EUR/m²
- energy savings (actual) 50 – 70%, in some buildings more than 70% (max. 87%) or avg. 72,2 kWh/m² annually
- more than 50% of homeowners wish to renovate their building according to the results of social survey done on 2016

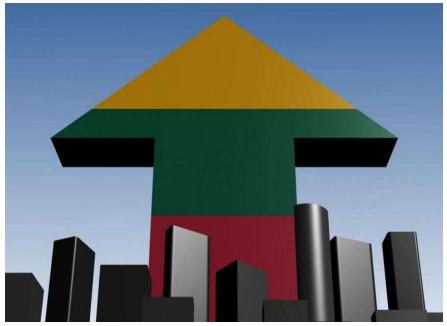



Source: BETA

effect to country's economy

Current investment in renovation directly affect economic processes in the country:

- ❑ the energy efficiency Programme investment value - more than 500 million EUR
- ❑ development of construction sector (the renovation program currently involves more than 300 companies of the sector)
- ❑ creation of new jobs (it is assumed that nearly 10 thousand new jobs were created over the last several years)
- ❑ changes in the real estate market (value of apartment in a renovated house is increased about 20-25 percent)
- ❑ Program influence into the State budget is positive for earnings of VAT, profit tax, labour income, etc.



In 2013-2016 investment in the renovation programme of apartment buildings totaling to more than 500 million Euro amount to nearly 20 percent of the turnover of the Lithuanian construction industry of the last year

Source: BETA

Organisational system of the program

NATIONAL:

- Ministry of Environment, Ministry of Finance (Investment Committee)
- Housing Energy Efficiency Agency (BETA)
- Financial institutions
- Central Procurement Office (CPO)

LOCAL:

- Municipality (inefficient building selection, Program preparation, appointing Program administrator, supervision)
- Program/ project administrator (appointed by the municipality or homeowners)
- Engineers consultants (preparation of investment projects, support on procurement and supervision of works)
- Contractors
- Owners of apartments

Source: BETA

Housing Energy Efficiency Agency (BETA)

Housing Energy Efficiency Agency established on 2001

Legal status – public institution

Founder – Ministry of Environment

To be close to the client BETA has established 10 branch offices

The main goals of the Agency:
support to the owners of apartments and municipalities with project/ program preparation and implementation

- technical administration of the project:
  - evaluation of the project documentation
  - supervision of project implementation
  - monitoring
- administration of State subsidy provided to the project implementers
- preparation of standard documents and other instruments needed for a Program implementation
- organization of trainings and public information activities

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Source: BETA

Process (1) application

- investment projects are prepared by engineering consultant companies on the request of housing administration company/ HOA

- Engineering consultant companies should have a qualified specialists at least licensed person for the preparation of energy performance certificate and financial specialist

- Housing Energy Efficiency Agency (BETA) is appointed institution for the Program administration including investment projects evaluation

- applications including investment project are presented to BETA based on the Ministry of Environment call

Process (2) procurement

- project administrator appointed by the owners of apartments or by the municipality organizing tender for contractor and supervisor of works (required) based on the Public Procurement low *(by using CPO electronic procurement instrument or standard procurement procedure approved by the Ministry of Environment)*

- before signing of the contracts procurement documents should be approved by BETA (ex-post)

Source: BETA

Process (3) quality assurance

For a quality of works is responsible project administrator

Support to the project administrator are provided:

- for a quality of works by supervisor of works (licensed by the Ministry of Environment) – requirement
- for a supervision of construction process support are provided by BETA project implementation quality division
- also State supervision activities (limited) are made by Territorial planning and Construction Inspectorate under the Ministry of Environment

Source: BETA

Lessons learned

- in implementing this type of Program is very important to establish appropriate legal, organizational and financial system and identify right technical solutions
- one of the main conditions for the successful implementation of the program – capacity building of all participants of the program
- pilot projects - a recommended step before the launch of such type of multi-renovation program
- municipalities able to develop and implement this kind of multi-renovation programs, but it should be developed appropriate measures and instruments

Source: BETA

A.Mickevičiaus str. 1, Šalčininkai

Year of construction: 1977
Number of apartment: 40
Heated area: 2233 m²
Implemented: central gas boiler, insulation of walls and roof, installed heat cost allocators,

Investment: EUR 248.000
Energy savings: 71%, Class C

Source: BETA

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Klaipėdos str. 118, Panevėžys

Year of construction: 1977
Number of apartment: 54
Heated area: 3024 m²

Implemented: central gas boiler, insulation of walls and roof, installed heat cost allocators,

Investment: EUR 464.000
Energy savings: 61%, Class C

Source: BETA

Turistų str. 45, Ignalina

Source: BETA

Year of construction: 1986
Number of apartment: 30
Heated area: 1639 m²

Implemented: central gas boiler, insulation of walls and roof, installed heat cost allocators,

Investment: EUR 552.000
Energy savings: 69%, Class B

Ventos str. 59, Mažeikiai

Year of construction: 1980
Number of apartment: 50
Heated area: 1843 m²

Implemented: central gas boiler, insulation of walls and roof, installed heat cost allocators,

Investment: EUR 322.000
Energy savings: 74%, Class C

Source: BETA

Federal Ministry for Economic Affairs and Energy

MITTELSTAND GLOBAL ENERGY SOLUTIONS MADE IN GERMANY

Facilitator

energie waechter

Federal Ministry
for Economic Affairs
and Energy

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Thank you for your attention!

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