

# Thermo-renovation: Opportunities & Barriers Experience of Latvia

Prepared by:

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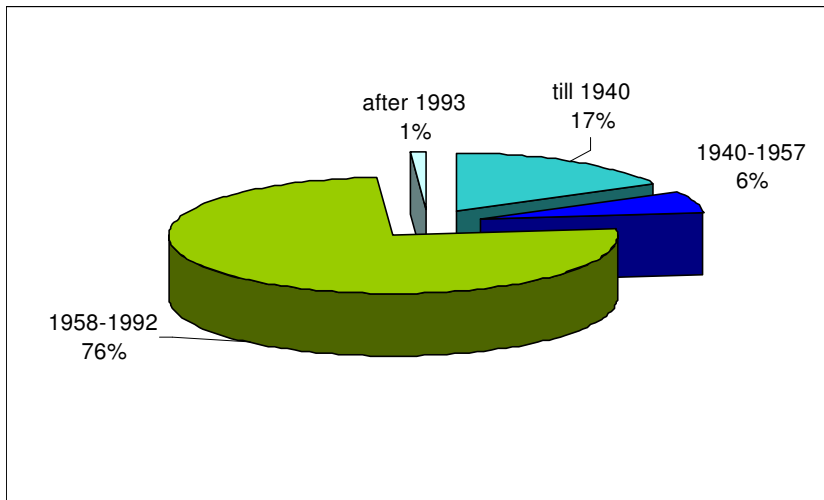
Energy Resources Laboratory  
Institute of Physical Energetics

Meeting in Gdansk, Poland,  
8'th July 2009

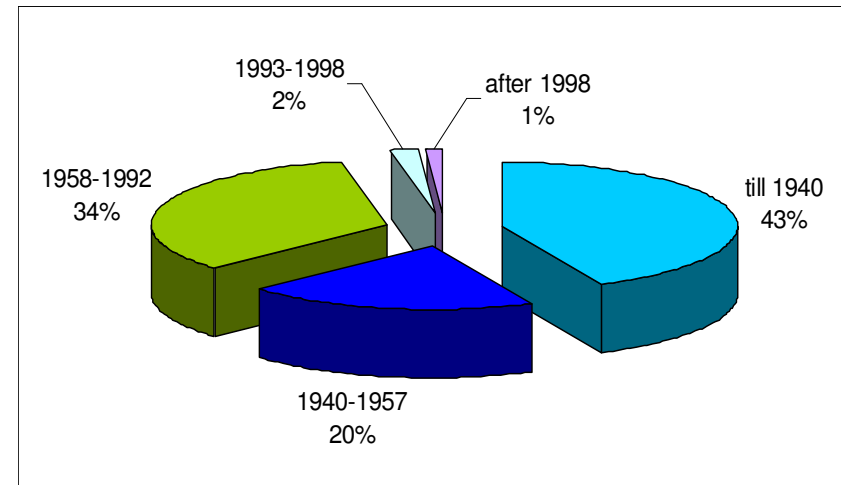


# Why do we need building renovation?

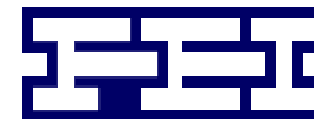
## The age structure of buildings in Latvia



**The age structure of multi-family houses**



**The age structure of individual houses**

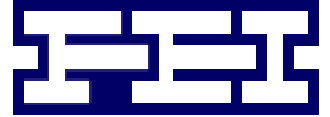


## Heat consumption per m<sup>2</sup> in typical residential buildings

Building serial number	Number of tested buildings	Heat consumption per year kWh/m <sup>2</sup>		
		min	average	max
103	37	124,18	174,22	224,30
104	10	134,96	198,85	218,69
467	14	155,79	176,06	193,39
602	27	155,76	181,00	212,62
2-6 floor buildings after year 1945*)	6	187,52	199,38	211,53

\*) – heat consumption for this type of buildings is not typical because the number of tested buildings is too small.

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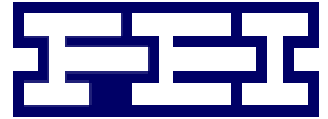
# Regulatory Framework

Some positive changes took place in financing of Energy Efficiency Projects in Housing Sector in last years:

1. Cabinet of Ministers approved:
  - a. Law on the Energy Performance of Buildings & Regulations,
  - b. Regulations Nr. 59 in February 2008 “State Budget co financing of energy efficiency activities in dwellings” on the amount of co financing and the rules of procedure. In this Regulation is noted that:
    - 284,6 EUR (200 Ls) for multifamily house auditing and
    - 20% from total investments for the multifamily house renovation project.

This co-financing should be available from this year (2009).

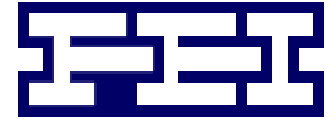
2. From this year it is enough to **have 51% of apartment owner's** agreement to take loan in Latvian Banks. Realised Project applicants faced a problem to reach at least **75%** apartment owners agreement to take loan and to start whole renovation of dwelling (it is required by the bank in case there is no any additional security provided).



## Latvian Energy Efficiency Strategy for the years 2008 - 2010

According to the [Latvian Energy Efficiency Strategy for the years 2008 - 2010](#) (2007) following goals should be achieved:

- Energy audit realization in multi - family houses (more active in this year);
- Energy audit realization in public and municipal buildings (very slow);
- Reducing average energy demand in buildings from 220 – 250 kWh/m<sup>2</sup>/year to 150 kWh/m<sup>2</sup>/year in 2020;



## Renovation approaches

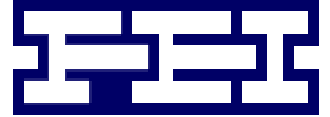
- ✓ **Basically there are two approaches for building renovation projects implementation in Latvia:**
  - step – by – step renovation
  - complex renovation
  
- ✓ Both approaches analysis were based on building renovation activities in Latvia:
  - Cesis, Broceni, Riga, etc.
  
- ✓ Both approaches were analyzed from point of view of:
  - technical measures taken
  - energy saving effects achieved – based on monitoring results
  - barriers for project implementation

## Broceni, Cesis (step – by – step renovation)



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## Housing renovation for energy saving

The projects are located in different regions of Latvia – Riga, Cesis, Broceni, Liepaja and Salacgriva.

The projects owners in realised projects were:

- Associations of apartment owners – in this case association took a loan and accordingly they went through all the formalities including all administrative, technical and financial actions (projects –Riga, Cesis, Sigulda).
- Municipalities (Broceni, Liepaja, Riga) – in this case municipalities are responsible and for all payments and all actions.

The discussions showed that in both cases the Projects owners noted that it was right decision and both schemes could be useful.

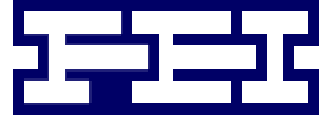


# Examples of complex renovation

## Riga, Celmu str. 5



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## Riga, Celmu str. 5

### Main parameters of the building :

- Number of floors – 5
- Number of apartments – 60
- Number of tenants – 151
- Heating area – 2972 m<sup>2</sup>
- Hot water – provided all year around

### Measures implemented :

- Windows changed, m<sup>2</sup> – 541
- Walls insulated, m<sup>2</sup> – 2023
- Top floor ceiling insulated, m<sup>2</sup> – 780
- Thermoregulation installed on each radiator, pieces – 190
- Thermal energy meters installed on each radiator, pieces – 190

**Total investments – 148 560 €**



## Broceni, Lielcieres str. 34



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## Broceni, Lielcieres str. 34

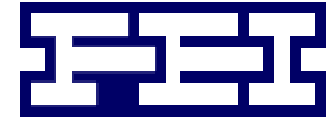
### Main parameters of the building:

- Number of floors – 5
- Number of apartments – 42
- Number of tenants – 110
- Heating area – 2200 m<sup>2</sup>
- Hot water – provided all year around

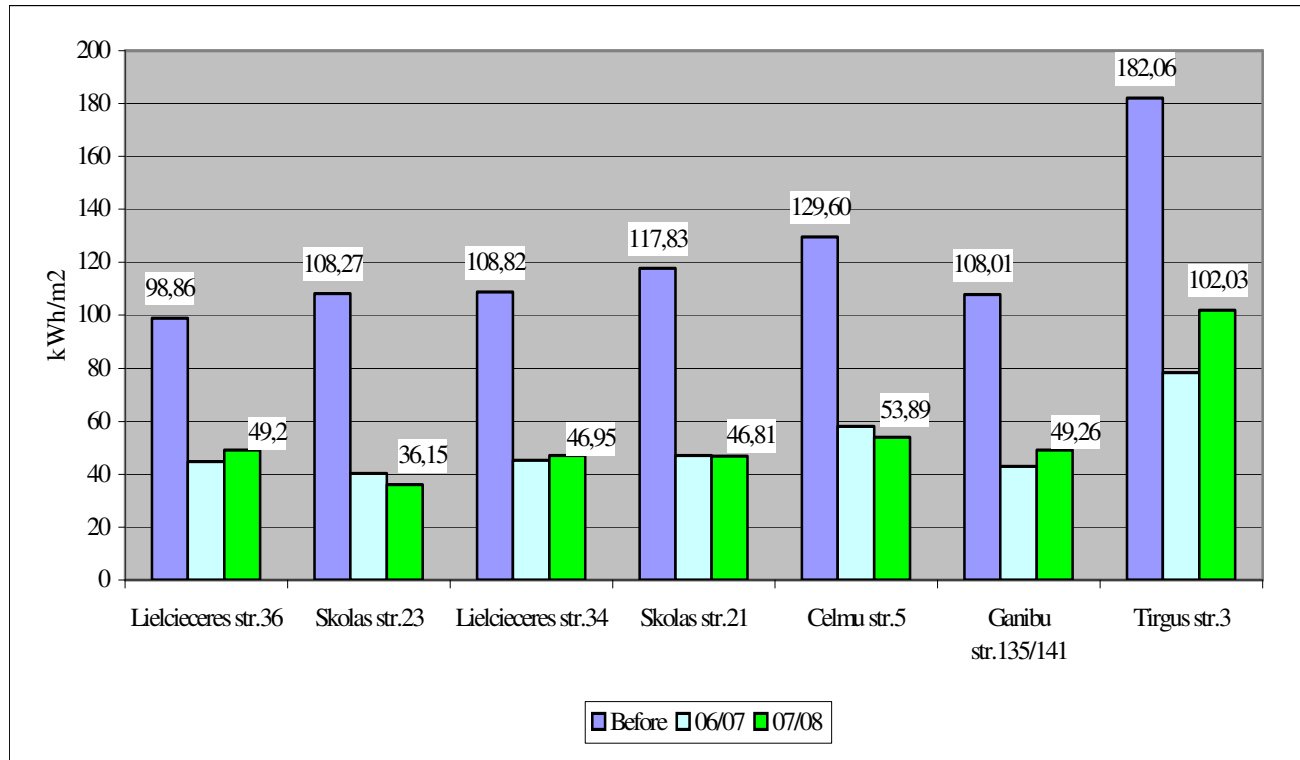
### Measures implemented:

- Windows changed , m<sup>2</sup> – 470
- Walls insulated, m<sup>2</sup> – 1730
- Thermoregulation installed on each radiator
- Thermal energy meters installed on each radiator
- Basement ceiling insulated, m<sup>2</sup> – 522

**Total investments – 180 150 €**

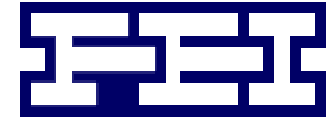


## The main results of the projects

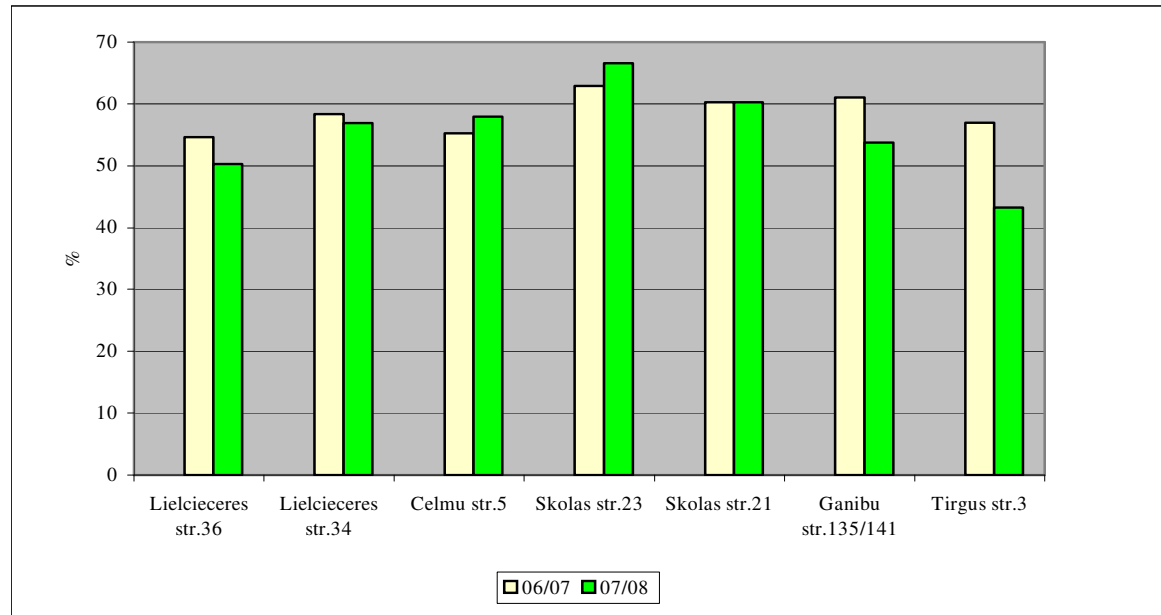


In all projects after renovation of buildings specific heat consumption of buildings is below 70 kWh/m<sup>2</sup> as it was originally planned, with the exception of the building on Turgus str. 3, where the top floor and basement ceiling insulation had not been done and therefore the specific heat consumption of the building after heat insulation is 102.3 kWh/m<sup>2</sup>.

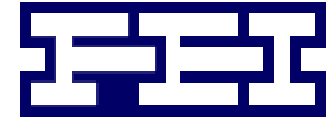
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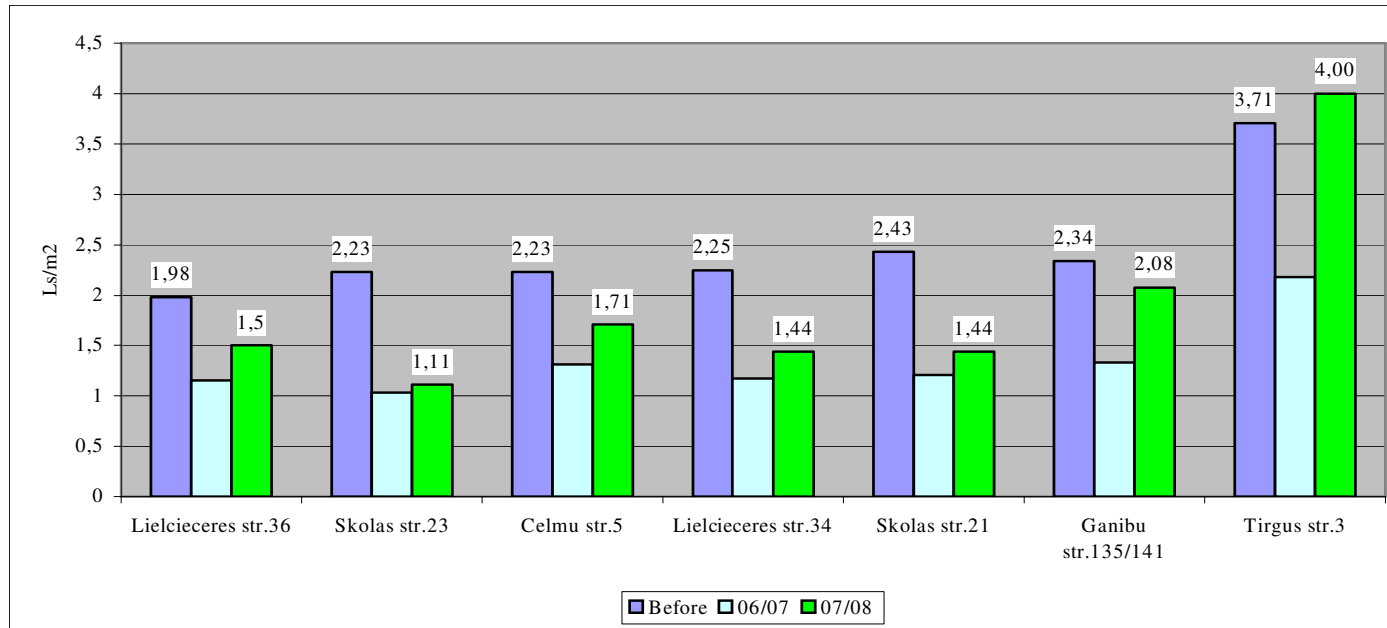
## Reduction of CO<sub>2</sub> emissions



In the heating season 2006/2007 all 7 housing renovation projects show total emission reduction of **553 t of CO<sub>2</sub>** in comparison to before project data. In the heating season 2007/2008 the total emission reduction reached up **529 t of CO<sub>2</sub>** in comparison to before project data.



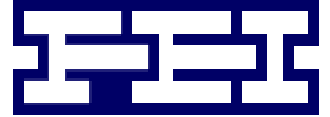
## Costs for heat per m<sup>2</sup>



Almost in all projects heat costs per m<sup>2</sup> have been reduced – from 11 % up to 50%, but in comparison with previous heating season the costs per m<sup>2</sup> in heating season 2007/2008 have been increased. In Turgus Str.3 heat costs per m<sup>2</sup> has increased to 8% because also the total heat cost has increased in comparison to previous heating season 2006/2007.

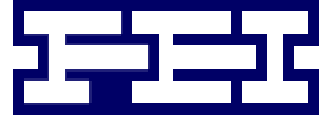
(1 LVL = 0,7028 EUR)





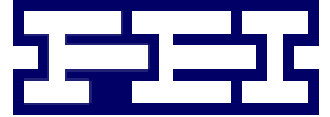
## Main problems and challenges

- ✓ Project applicants faced a problem to reach at least 75% (now 51 %) apartment owners agreement to take loan and to start whole renovation of dwelling (it is required by the bank in case there is no any additional security provided)
- ✓ It is very difficult for inhabitants to agree to take loan for investments in common property. There are very different people that are living in the same house – for some of the planned payments are acceptable but for some are too high
- ✓ Inhabitants are not ready to invest in common property and still do not realize that it is their common obligation
- ✓ Projects required complex renovation of dwellings. That is correct from technical point of view but it requires also high investments. Not all inhabitants are ready for so big credit payments that are necessary to finance complex renovation
- ✓ Inhabitants don't have collective borrowing experience therefore are very skeptic to participate and to take loan
- ✓ It is a time consuming process – from project idea to real implementation



## Construction work Quality assurance (very important)

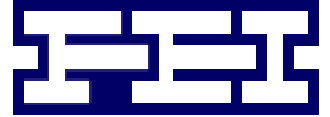
- EU certification for construction materials,
- Technological requirements for renovation works,
- Insulation materials with high level of heat isolation (some best practices exist already),
- Ecological insulation materials use.



# Renovation approaches

## Comparison of approaches:

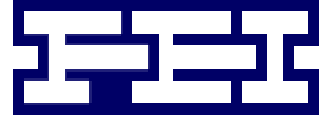
- **Step-by-step:**
  - role of standard building renovation measures is crucial – to ensure that expectations on energy saving potential will be achieved (in opposite case it will be very difficult to convince inhabitants to take the next renovation steps)
  - easier to convince inhabitants especially in case when total payment will not increase – energy savings fully cover loan principal and interest repayment
  - usually in long term perspective more costly and more time consuming than complex renovation



## Renovation approaches

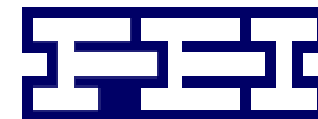
### Comparison of approaches:

- Complex renovation:
  - from technical point of view more appropriate approach
  - more difficult to convince inhabitants – payments usually increase



## Future perspectives of EE projects financing

- Housing sector has a great potential for reduction of heat energy consumption and GHG emissions in the future, but it is very complex and challenging
- EU Structural funds will play an important role in facilitation of investment into increasing of EE in the housing sector
- Involvement of private sector (like PPP etc.) and Green investment schemes could be very good financing mechanisms for EE project financing



# Thank you for your attention!

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