From Energy audit to real savings.

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Wels 3. March 2011.

Estonia

Area: 45 227 km² (the Tartu Peace Treaty of 1920 defined 47 549 km²)

Coastline: 3794 km

Land borders: 343.0 km with Latvia and 338.6 km with the Russian Federation

Distance from Tallinn

to Helsinki: 85km;

to Riga: 307km;

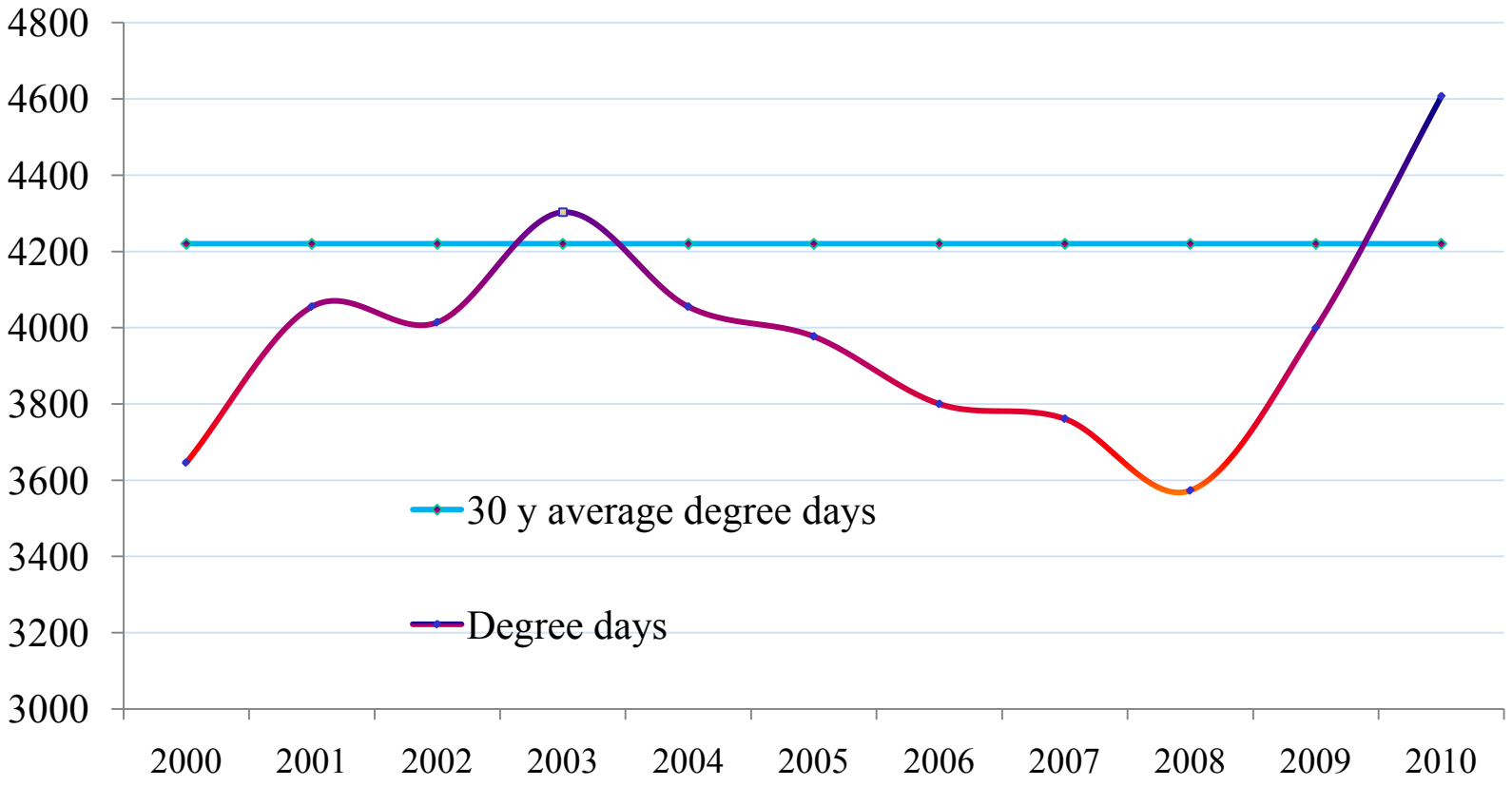
to St.Petersburg: 395km;

to Stockholm: 405km

Statistics about housing in Estonia

- 98% of all the apartments privatized
- Ca 9900 apartment associations and cooperatives today
- 60 % of the housing stock is built between 1960-1990, 30% built before 1960
- **65% of Estonian population (1,3 mil.) lives in apartment associations and cooperatives**

Estonian degree days

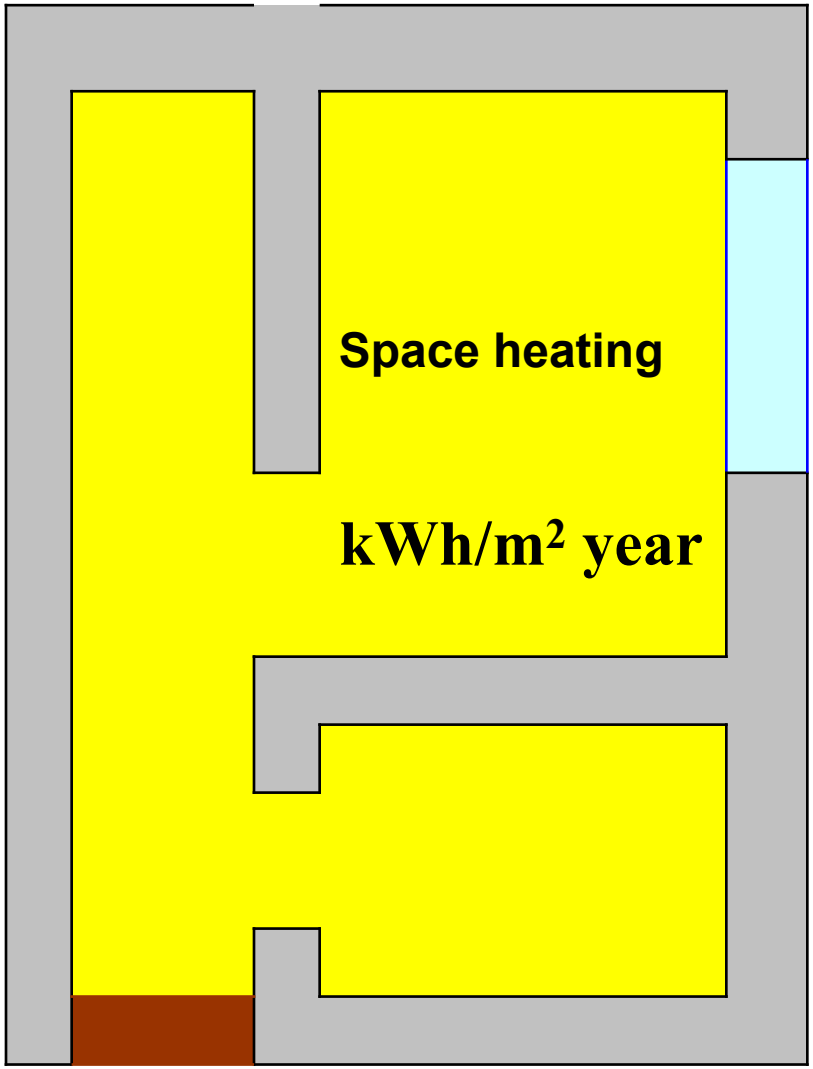


Energy - you can see it.

Explanation

- **Specific heat** – space heat only, corrected with weather data – space heat data have been corrected with long term average degree days, internal temperature has been used on + 17 C level.

- Heated area **(yellow)** – definition has been used for consumed heat data comparision.



Windows

Natural ventilation

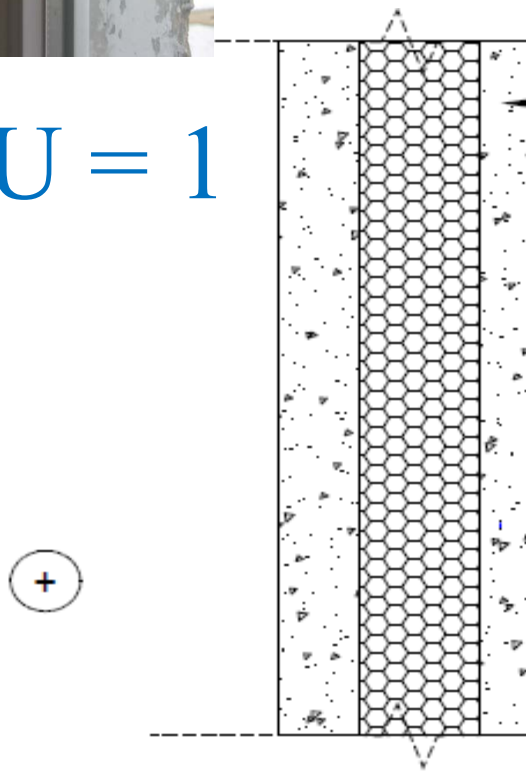
No ventilation


11

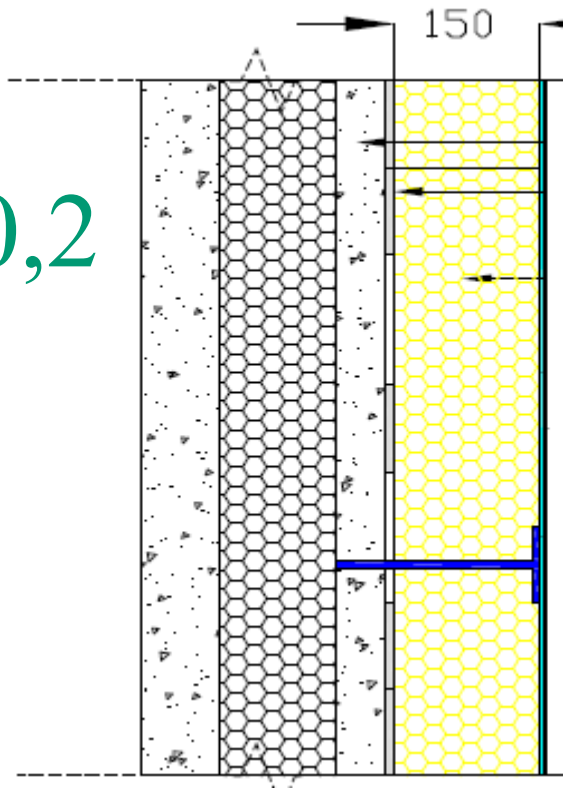

09/03/2009

Walls

U = 1

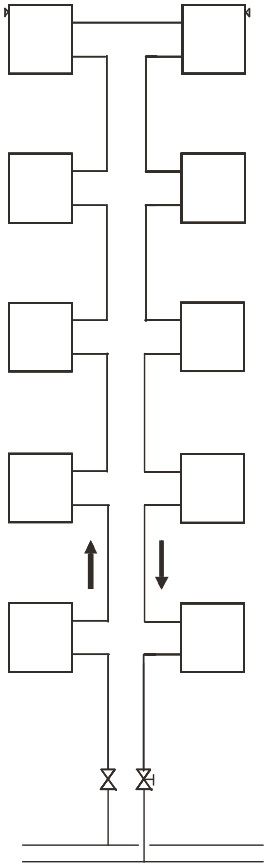


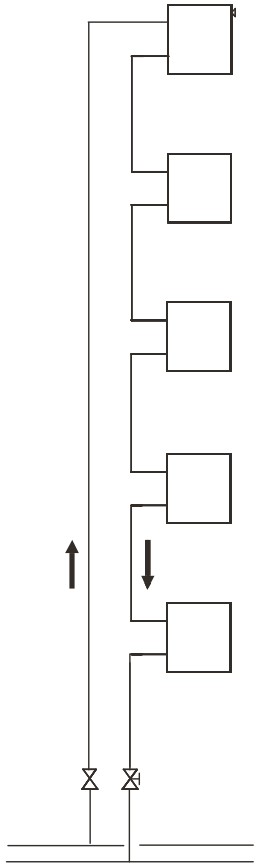
U =0,2



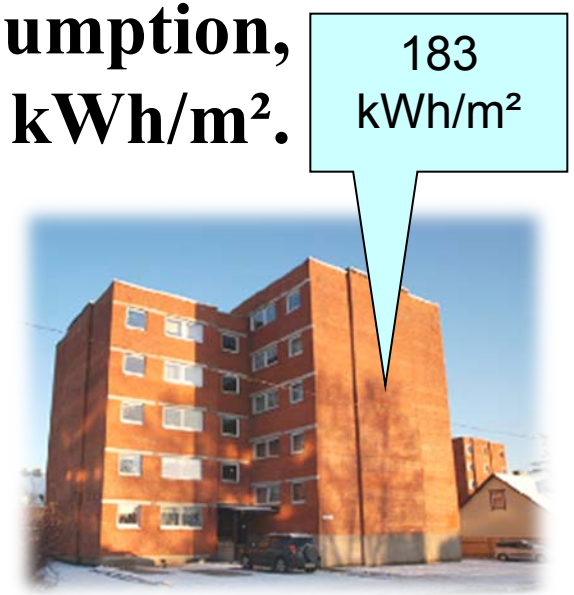
Roof

Heating system





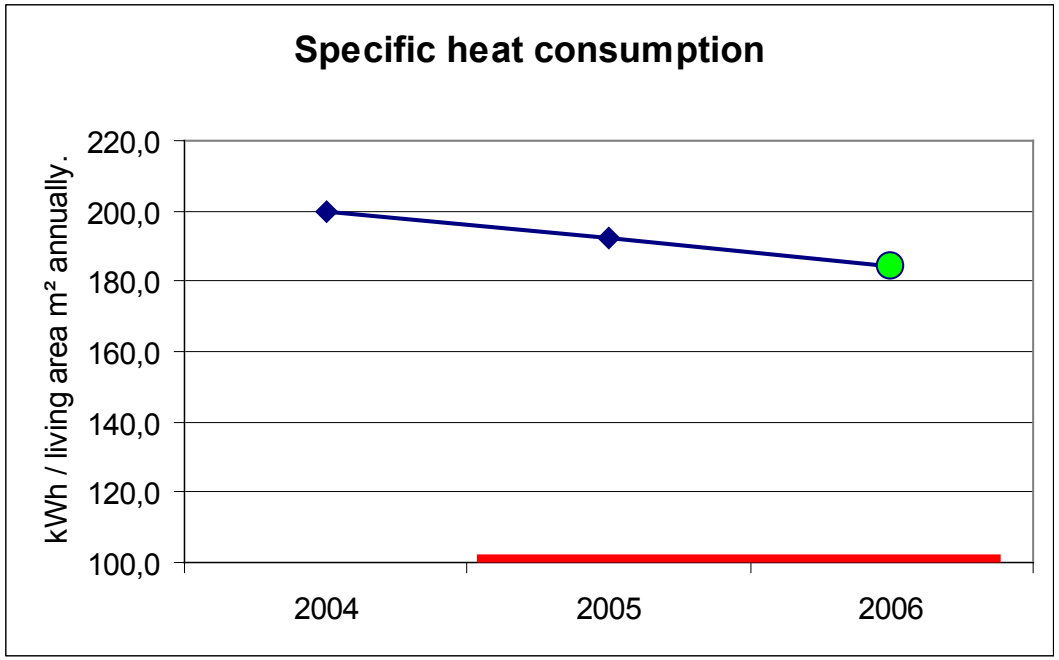
Specific heat consumption, kWh/m².



Examples from implemented energy saving measures (1).

9. floors, 72 flats.

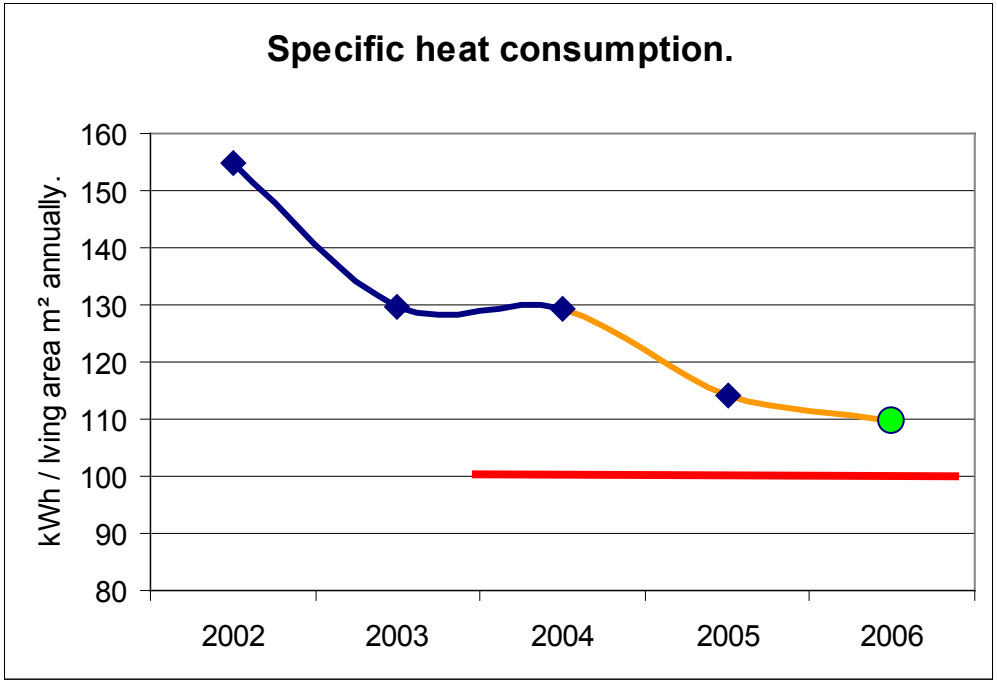
- Roof and end walls insulated on 2004, windows partly replaced, heating system balanced and regulated from thermal sub-station from 2005.
- Regulation on end users level still missing.



Examples from implemented energy saving measures (2).

5 floors 80 flats.

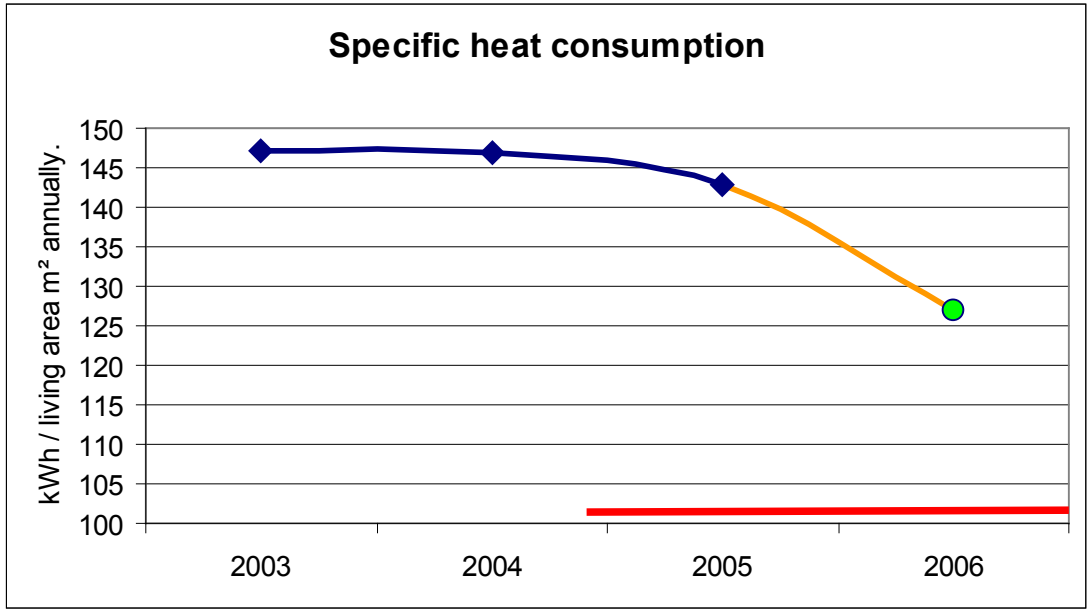
- External walls insulation and windows replacement until 2004, pipes insulation in basement, heating system balancing and sub-station automatisation afterwords.



Examples from implemented energy saving measures (3).

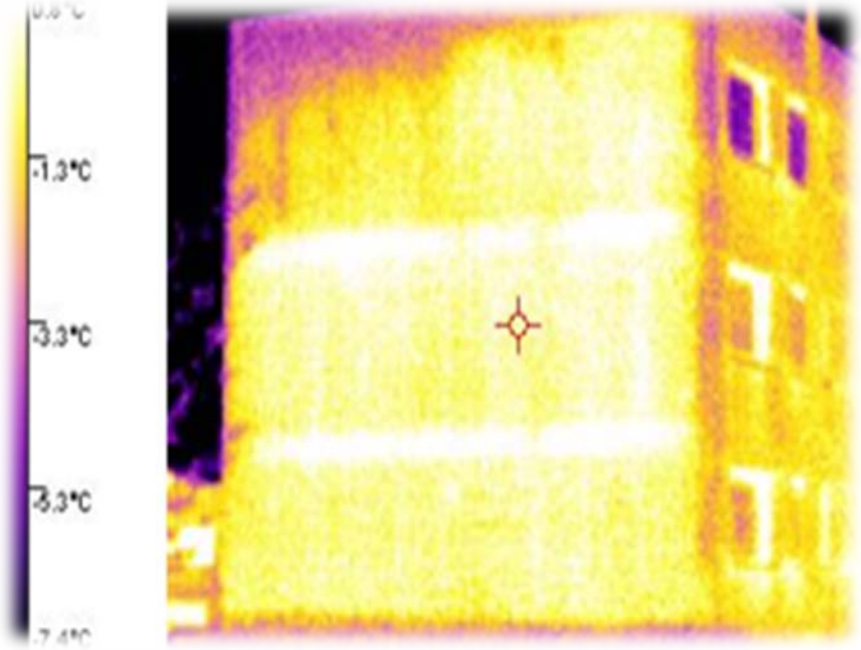
5 floors 75 flats.

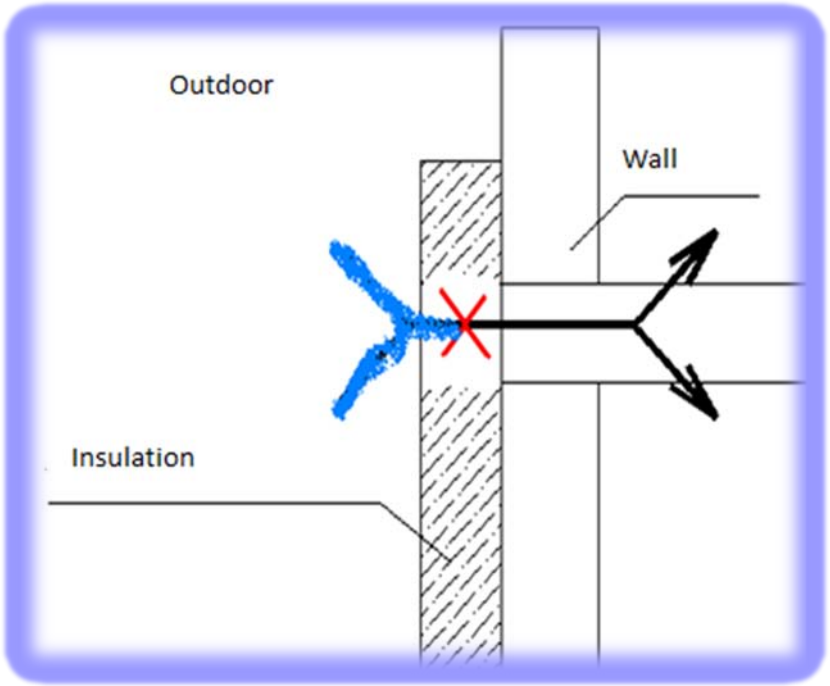
- All external walls insulated, basement and staircases windows replaced until 2005.
- Afterwords heating system regulation , but not on radiator level.



Walls (envelope) insulation

- Without possibility to regulate heating system – mostly for destroying thermal bridges.

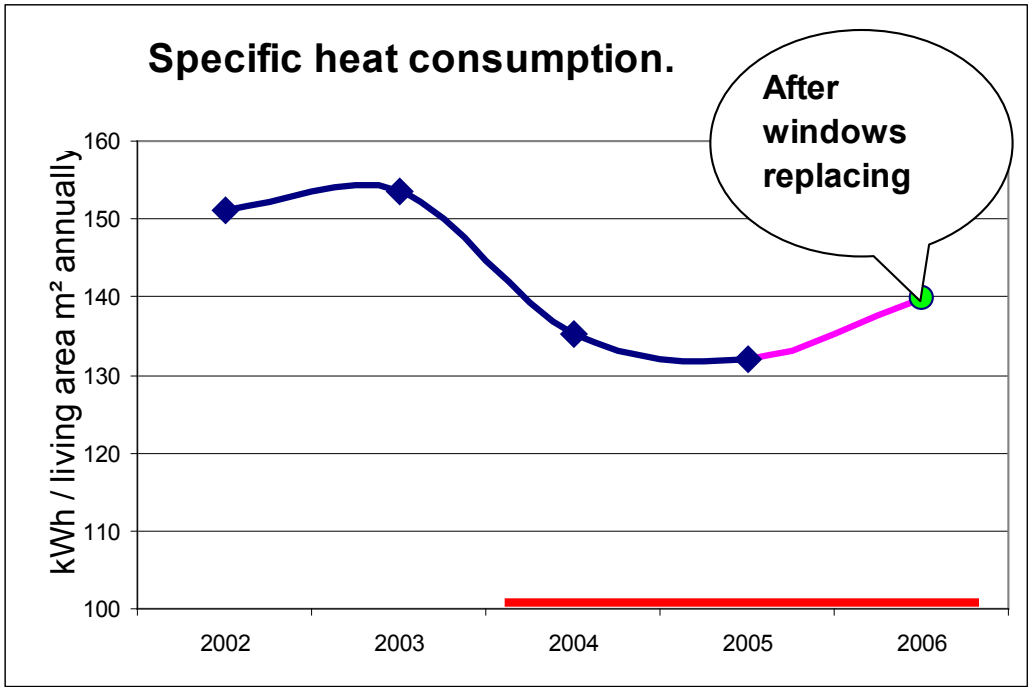




Examples from implemented energy saving measures (4).

4 floors 56 flats.

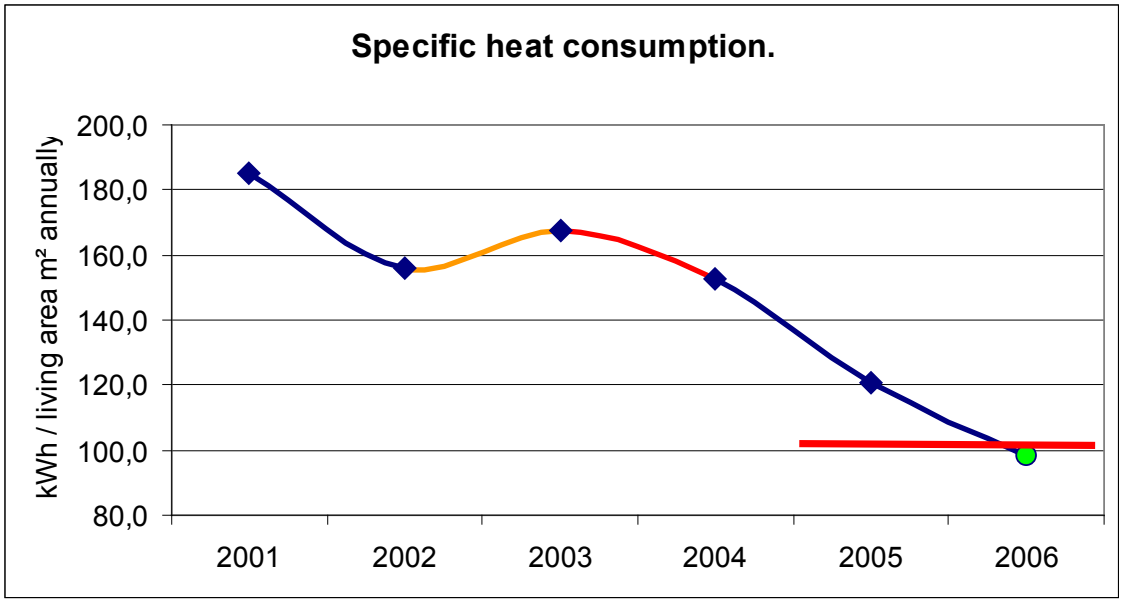
- Total external walls insulation on 2004, after windows replacement on 2005 consumption rised (luck of ventilation or indoor temperature regulation with windows?)



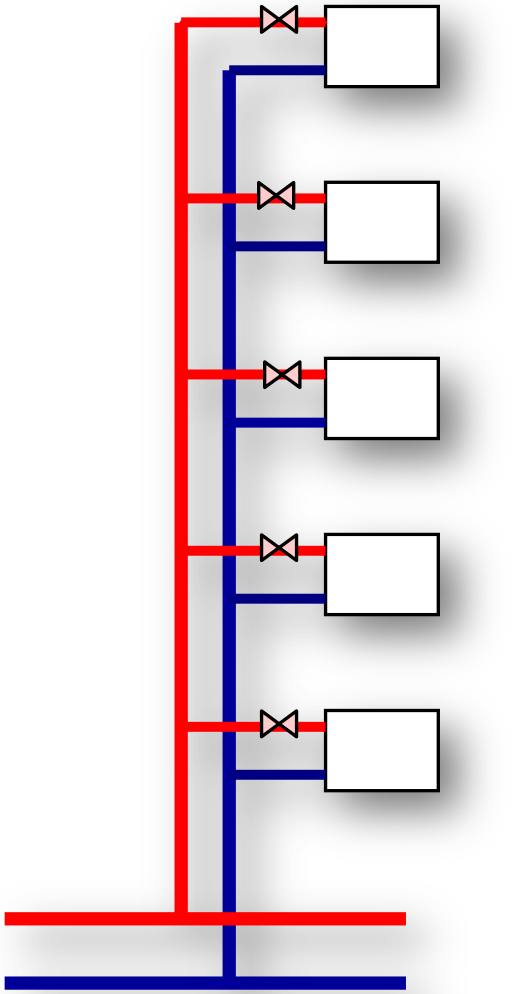
Examples from implemented energy saving measures (5).

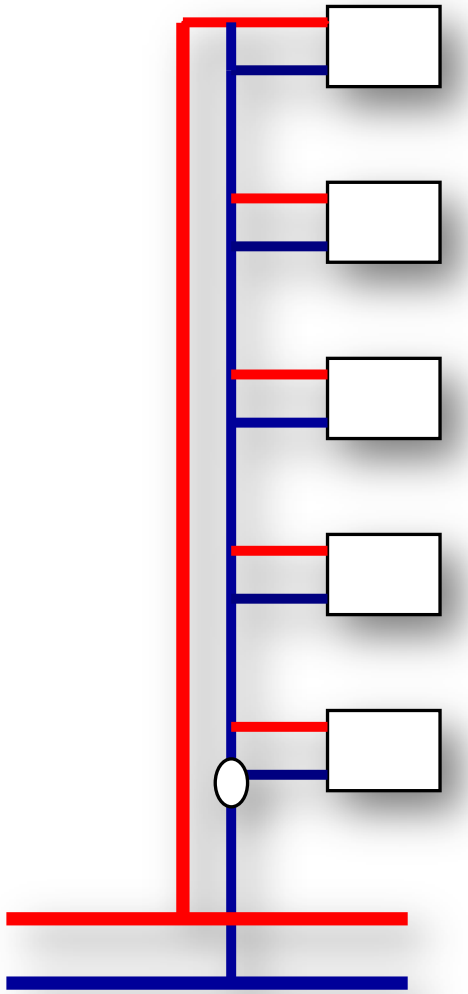
9 floors 72 flats.

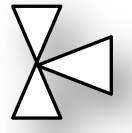
- All external walls insulated and windows with ventilation system replaced on 2001,
- heating system renovated until the end users level (thermoregulator) on 2002,
- 2003 heat allocation system was installed (saving motivation!).
- Savings 45%



Heating after renovation



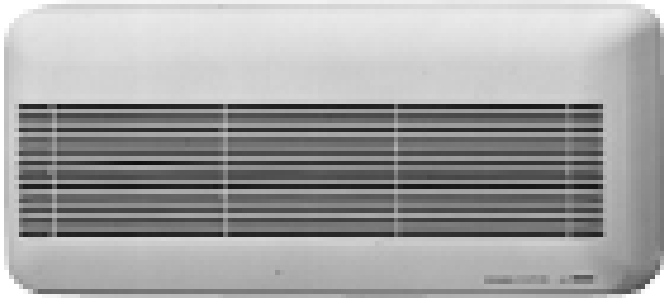




Ventilation after renovation

Building based system – heat recovery with heat pump

Appartement based system – heat recovery with heat exchanger.



Complex renovation

- Total envelope insulation (prefabricated panels!)
- Total windows replacement (U max 1,1)
- Heating system renovation, regulation on radiator level (thermostatic valve)
- Ventilation with heat recovery system (80% min).

Economic view.

- To get on the specific heat consumption level about 60 kWh/m² the investment need is about 130 EUR/m².

Thank you for attention!

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