Financing energy efficiency in Romanian buildings

Technical solutions in the thermal rehabilitation of buildings – what policymakers need to know

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Who we are

• PU Europe is the European association representing PU (PUR/PIR) insulation manufacturers;
• PU is the premium insulation material offering highest insulation values with lowest thickness;
• Products represented:
  - Boards;
  - Spray foam;
  - Block foam;
  - Sandwich panels;
  - Structural insulated panels;
  - Pre-insulated pipes;
  - Industrial insulation.
Cost-efficient savings potential of the existing building stock

60-90%
Existing buildings

- Are Complex systems
- May cause fuel poverty
- Are heterogeneous
- Offer the largest savings potential

Require a holistic approach
Buildings are complex systems and require a holistic approach.

Technologies for improving the Energy Efficiency of Buildings exist today providing a negative cost solution for building owners across Europe.

Source: EuroACE
Building performance certificate - the starting point

- Includes the energy performance of a building and reference values such as legal standards and benchmarks.
- Is accompanied by recommendations for the cost-optimal or cost effective improvement of the energy performance. This includes
  a) major renovation of the building envelope or technical building system(s); and
  b) individual building elements.
- Recommendations shall be technically feasible ... and may provide an estimate for the payback periods or cost-benefits over its life-cycle.
Trias Energetica – the basic principle

1. Reduce energy demand to a minimum (thermal insulation of envelop, control systems)
2. Cover remaining demand through renewables
3. Top up with fossil fuels, if required
Determine cost-optimal levels

• Look at life cycle costs rather than initial investment costs;
• Determine cost optimal level of renovation;

• "Cost-optimal level" means the energy performance level which leads to the lowest cost during the estimated economic life-cycle (including energy-related investment costs, maintenance and operating costs);
Avoid lock-in effects

- Favour deep renovation to reduce life cycle costs and avoid lock-in effects:

- Pitched roof (25-50 years)
- Façade insulation (25-60 years)
- Windows (30-50 years)
- Boiler (15-25 years)
- Photovoltaic (15-25 years)
Minimise heat transfer through building envelop

- Includes walls, floor, roofs, doors, windows
- Holistic approach: all elements, summer - winter
- Favour high performance insulation to reduce thickness of building elements;
- Check orientation of windows (heat losses versus solar gains);
- Use blinds to avoid unwanted solar gains;

Share in total building energy consumption

- Space heating and cooling
- Lighting & electrical appliances
- Water heating
- Cooking
Build tight – ventilate right

- Air tightness of the building envelop influences energy demand;
- Use products and design solutions that ensure air tightness;
- Consider air tightness tests (blower door test);
- Ensure adequate natural or mechanical ventilation;

Source: TNO

absolute leakage distribution in $N_{50}$
Steps following building envelop optimisation

1. Building control systems to reduce energy demand
2. Check sizing of heating / cooling systems
3. Consider use of renewable energy production on site
4. If required, design heating (cooling) system using fossil fuels
Ensure excellence in workmanship

The sum of efficient products does not automatically ensure efficient buildings

Installation phase crucial for achieving highest savings levels

Make sure all construction workers are duly qualified
Change the behaviour of users

- Explain basic functioning of building systems;
- Explain what needs to be done / avoided to achieve savings in practice;
- Avoid bounce-back effects (for ex. light is left on as energy-saving lighting systems are used);
Thank you for your attention

www.pu-europe.eu
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