PROBLEMS AND SOLUTIONS FOR EFFICIENT AND ECONOMICAL USE OF ENERGY

## More energy services with a lower cost:

energy saving — saving money — comfort — care for nature and climate

## LOSSES OF ENERGY - RESERVES FOR ENERGY EFFICIENCY IN BUILDINGS

Buildings consume one third of the energy produced on the planet. Heat and electricity are the main energy services that we need in buildings. Because of futile waste and inefficient use of energy, we pay its excessive supplies. Excessive energy consumption leads to excessive production of energy mainly by burning fossil fuels. This leads to increased emissions of carbon dioxide and pollutants into the atmosphere, to growing greenhouse effect and to climate change.



#### The main types of energy consumed in residential and public buildings

### ASSESMENTS FOR LOSSES OF THERMAL ENERGY IN BUILDINGS



#### **ENERGY IS LOST AT ITS PRODUCTION, ITS TRANSPORTATION, AND ITS CONSUMPTION**





#### Losses of heat

Losses of electricity



**PROBLEMS AND SOLUTIONS FOR EFFICIENT AND ECONOMICAL USE OF ENERGY** 

More energy services with a lower cost:

energy saving — saving money — comfort — care for nature and climate



<sup>450-550</sup> cm

Expanded clay light-100–200 cm weight concrete 40-65 cm Wood Aerated concrete 35-60 cm 10-17 cm Mineral wool Expanded 8–15 cm polystyrene

Brick

Thicknesses of building materials needed for wall insulation according to current standards.

#### WHAT TO BEGIN WITH?

150–250 cm

To find the «weakest» points in terms of energy efficiency, it is necessary to perform a simple infrared survey of the building. Spots of yellow and red show where heat is lost to the atmosphere. These spots need to be insulated in the first place.



### Choose materials for thermal insulation of your apartment or house with the least toxicity to protect your health and the environment!



**PROBLEMS AND SOLUTIONS FOR EFFICIENT AND ECONOMICAL USE OF ENERGY** 

More energy services with a lower cost:

energy saving — saving money — comfort — care for nature and climate

## **EFFICIENT AND ECONOMICAL HEAT SUPPLY**

In theory, central heating is more energy efficient than the individual one. But in practice, there are considerable losses of energy both at production and transportation of heat to a consumer. Therefore it is reasonable to consider local sources of heat





### THE EFFICIENCY OF HEAT SUPPLY IN BUILDINGS CAN BE IMPROVED

by installing a heat control unit with automatic adjustmnt of the heat transfer agent temperature in dependence on the outside temperature. Savings reach 50 %.

### INDIVIDUAL HEAT CONTROL INCREASES COMFORT AND REDUCES COSTS

The experience of European countries and Russia shows that heat savings due to individual control and monitoring reach 20–35 %, average reduction of payments — 25–55 %, and for some tenants — up to 70 %.



PROBLEMS AND SOLUTIONS FOR EFFICIENT AND ECONOMICAL USE OF ENERGY

## More energy services with a lower cost:

energy saving — saving money — comfort — care for nature and climate

## **EFFICIENT AND ECONOMICAL USE OF ELECTRICITY**







#### **AUTONOMOUS POWER SUPPLY**

Additional measures to enhance energy efficiency of building include installation of solar photo-voltaic sources and wind turbines. Typically, photo-voltaic elements are mounted on the roof, but there are options for their placement on the walls and even on the road surface. Wind turbines are rational for remote individual houses in the open countryside or on hills at the distance from the power lines more than 500 m.



PROBLEMS AND SOLUTIONS FOR EFFICIENT AND ECONOMICAL USE OF ENERGY

## More energy services with a lower cost:

energy saving — saving money — comfort — care for nature and climate

# **SAVING WATER** Saving water is both savings energy spent on water treatment and transportation, sewage and wastewater treatment and saving energy spent on water heating Water-saving (massage) shower head Aerator Reduces water consumption by controlling shower holes. Aerator adds air in water, thus keeping the water jet This increases the water pressure, produces massage effect and gives the feeling of water supply adequacy. Water-saving shower head allows to save up to 50 % pressure strong, but significantly reducing water flow. Aerator saves water when being installed on the shower of consumed water when taking shower by 60 %, on the tap in washing sink — by 70 %, in kitchen sink — by 50 % Water taps with photosensors Switch on water only when hands are close to the tap and switch it off otherwise. Taps with motion sensors prevent wasting many liters of water, even if one constantly forgets to shut the water off when brushing teeth or washing hands **Portion taps** Automatically shut off water in a shower or tap after a set time period. Good for use in public buildings Water-saving appliances Choose home appliances that save water. For example, a dishwasher is though an expensive, but effective way to save water and energy by washing dishes. Toilets with two flushing modes also help to save water **Closed-circuit water supply** Possible only for industrial buildings and private homes. Allows to use wastewater again, for technical purposes only

#### Behavioral methods to save water:

- monitor the state of plumbing in your apartment and timely repair failures, especially repair leaking taps;
- when choosing faucets give preference to lever ones;
- washing dishes, do not keep the tap water running constantly. One can wash dishes in the sink with closed drain filled with water;
- use dishwasher and washing machine only when fully loaded;
- when brushing your teeth or soaping in the shower, turn off the water;
- take shower; it needs 5 to 7 times less water than taking a bath.

