

# The fifty/fifty-Project in Berlin



Energy Audit – Pupils examine  
their Schools

# Independent Institute for Environmental Concerns (UfU) e.V.



## **Climate Change & Environmental Education**

Environmental Education

Energy saving and renewable energy sources



## **UfU - Workshop**

Prevention measures against leisure noise

Environmental accidents in the former GDR



## **Landscape Ecology**

Sustainable use of water

Research on Bio-Indicators



## **Environmental Law & Participation**

Research on the practice of citizens' participation

Moderation of Environmental Problems



**UfU**

# Key issues of the Dep. Climate Change & Education



- Energy saving and use of renewable energy sources at schools
- Climate protection projects with children and youth at Kindergardens, youth hostels, leisure homes
- Connection of educational and practical measures of ecological school management
- Production of teaching aids and information brochures
- Further education for teachers
- Energy counseling

# Preconditions for a School to start an energy-saving Project

- Interest in ecologic improvement
- The will to become active
- Financial incentives, if there is a success
- Professional support  
(as offered by UfU)

# Was does UfU offer?

- Consultations for schools and school administrations
- Workshops and seminars
- Production of teaching materials
- Internet presentation und mailing list about energy saving in schools  
[fifty-fifty@liste.ufu.de](mailto:fifty-fifty@liste.ufu.de)
- Support service und consultation on-the-spot



# Fifty/fifty – system of incentives

- **What is fifty/fifty?**
  - **Save energy by user behaviour modification, not by major investment**
  - **50% of the money saved is paid to the schools at their free disposal**
- **Fifty/fifty in Berlin**
  - **Implementation of the system of incentives in the different boroughs since the school year 1996/97**
  - **Participation of 220 schools so far**
  - **Savings of more than 600.000 € per year**



# Energy saving by user behaviour modification

- **Everyday life**
  - Light only when and where it is needed
  - Correct use of thermostat valves
  - Airing rooms by opening the windows briefly but widely
- **Use of technical facilities**
  - Adjusting the lighting in the corridors
  - Lowering room temperature at nights, weekends and holidays
- **Cooperation with the school administration**
  - Make necessary repairs
  - Optimise the automatic heating control
  - Suggestions for investments

# Saving potential of a school *of average size*

- Savings of 10 - 15 %
  - 100 MWh in heating
  - 10.000 kWh in electricity
  - 40 t CO<sub>2</sub>
  - 5.000 Euro

or:

Savings of 80 – 90 %



# Implementation of fifty/fifty in a School - Analysis

- Form an „Energy Team“ with representatives of all groups of users
- Get to know the energy situation of the school building
  - **Make an Energy Tour of the building**
  - **Measure the use of energy in the building**
- Identify potentials for energy saving
- Compile a catalogue of measures for energy saving

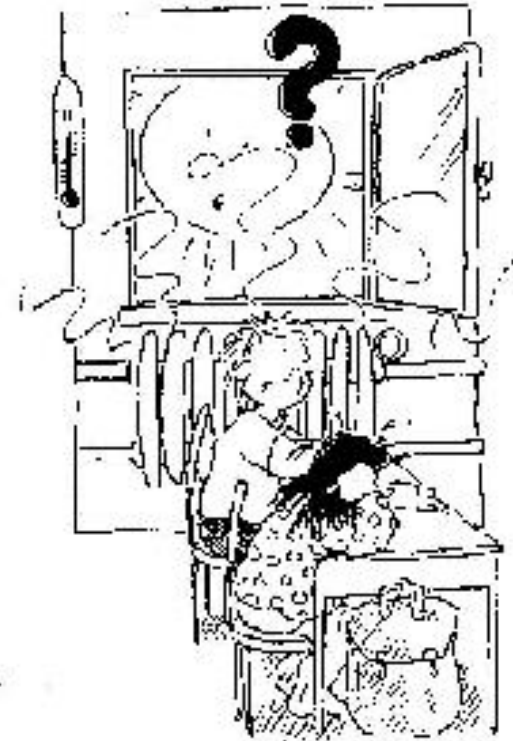
# Energy Tour I

- Energy supply
  - Heating system
  - Which parts of the school can be heated separately?
  - Electric meter
  - Where is energy used or wasted?
- The state of exterior of the school, attic, windows, facade, roof



# Energy Tour II

- **Classrooms**
  - **Temperature**
  - **Thermostat valves**
  - **Open Windows**
  - **Lighting**
  - **Tape recorder, refrigerators and other electric devices**
- **Corridors and staircases**
  - **Temperature**
  - **Automatic lighting**



# Measuring the use of energy

- Measuring the light intensity
- Lights (number, consumption)
- Other electrical devices  
(*consumer load???*)
- Temporal temperature gradient, temperature lowering at night and weekend
- Spatial temperature gradient

Participation of at least 20 pupils is necessary.

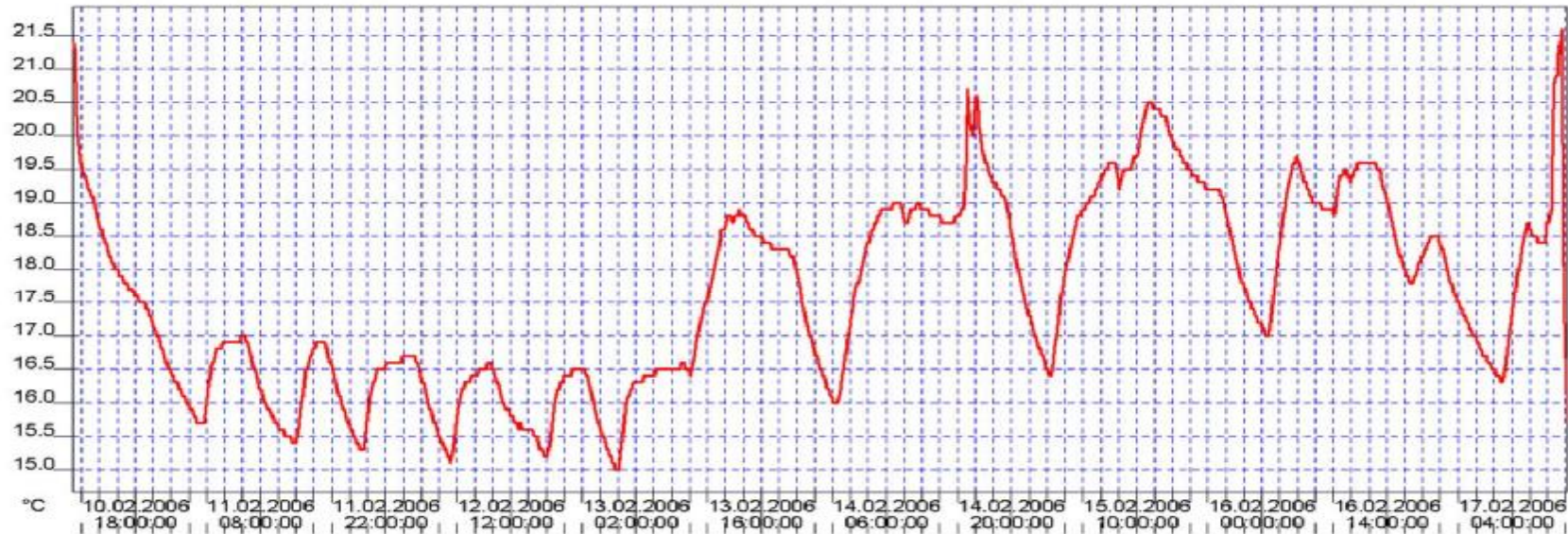


# Measuring Energy



# Temporal temperature gradient

|                                |   |            |       |       |           |       |
|--------------------------------|---|------------|-------|-------|-----------|-------|
| Charlotte Salomon GS           | Bedingungen   | 20.02.2006 |       |       | Seite 1/1 |       |
| Startzeit: 10.02.2006 11:05:00 |   | Min:       | Max:  | Mit:  | UG        | OG    |
| Endezeit: 17.02.2006 10:15:00  | K:1 [°C] Channel 1  | 15.00      | 21.60 | 17.64 | -30.00    | 70.00 |
| Kanäle: 1 (1)                  |   |            |       |       |           |       |
| Meßpunkte: 1004                |   |            |       |       |           |       |
| K1: SN 37450573                |   |            |       |       |           |       |
| Genauigkeit:                   | K1: Acc: +/- 0.8 [-30..-20] +/- 0.5 [-20..40] +/- 0.8 [40..70] °C |            |       |       |           |       |

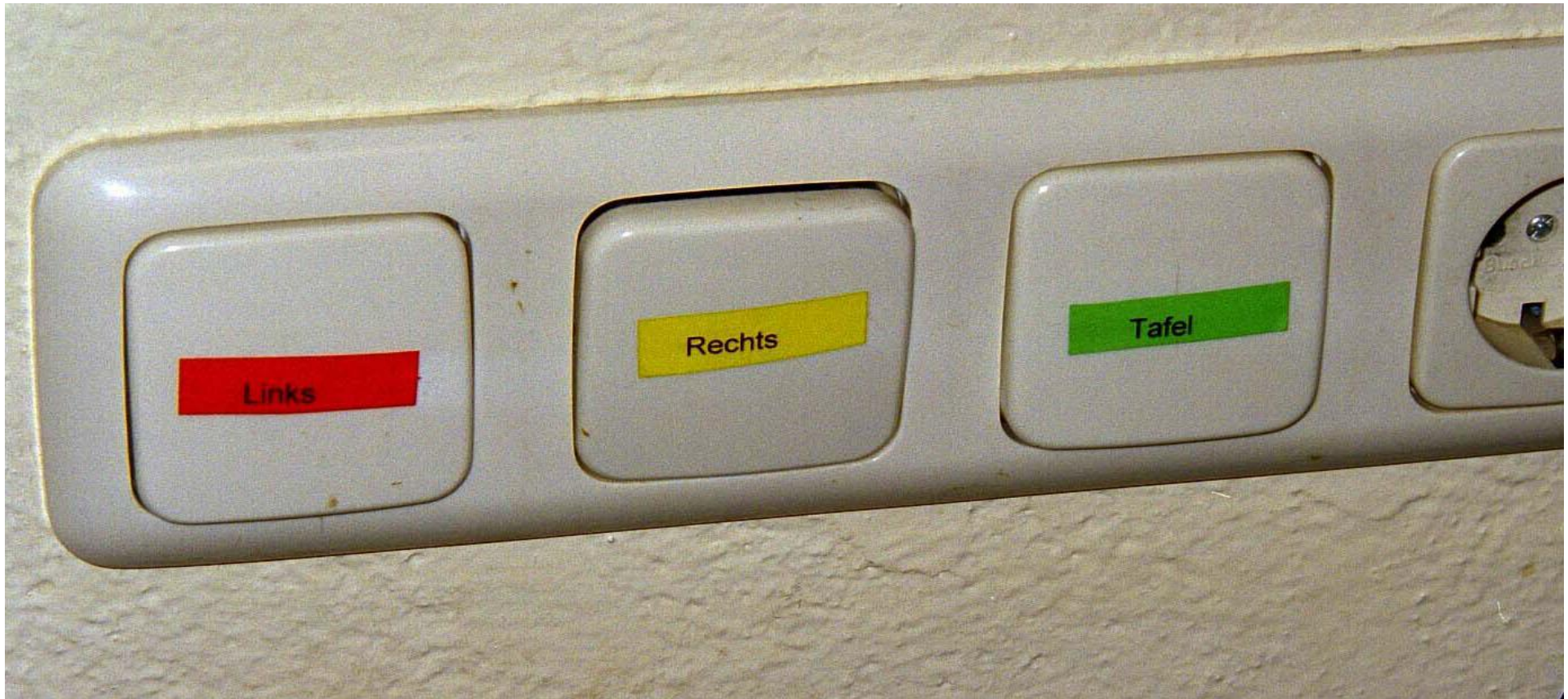




# Measures for saving energy

- Implementation of energy saving measures by the energy team and the caretaker
  - **Adjustment of the heating system**
  - **Adjustment of lighting in corridors and on staircases**
- Information of the school public (pupils and teachers)
  - **Posters about energy consumption, energy saving measures and saving achievements**
  - **Info sheets regarding every day behaviour**
  - **Marking of light switches**
- Other measures
  - **Organisation of energy saving weeks**
  - **Training of pupils in charge of energy saving in the classes**

# Marking of light switches



# Info at the class room door



# Posters for the school public



# Energy saving measures / Electricity

| <b>Energy-team and caretaker</b>   | <b>All pupils and teachers</b>   | <b>School administration</b>   |
|--|--|--|
| <p>Mark the light switches</p> <p>Make information sheets and wall newspapers</p> <p>Adjust Lights in corridors and on staircases</p> <p>Switch off devices which are not necessary (refrigerators, boilers)</p> <p>Remove redundant lamps</p> | <p>Switch on the light only if necessary (f.i. using only the lights on the wall-side of the room or above the blackboard)</p> <p>Switch of the lighting in longer breaks</p> <p>Stop using stand-by options in electric devices, such as video players and photocopiers</p> | <p>Purchase energy saving devices and lamps.</p> <p>Introduce new lighting system if necessary</p> |



# Energy saving measure / Heating

| <b>Energy-team and caretaker</b>   | <b>All pupils and teachers</b>   | <b>School administration</b>   |
|--|--|--|
| <p>Lower the temperature in the building</p> <p>Start lowering temperatures at night- as early as possible</p> <p>Lower the temperature during holidays</p> <p>Make the window draughtproof</p> <p>UfU</p> | <p>Air rooms by opening all windows briefly but widely</p> <p>Use the thermostat valves correctly</p> <p>Do not put anything in front of the radiators</p> <p>Close windows and doors after the lessons</p> <p>Keeping the doors to the stairs shut, otherwise the warm air will stream upwards</p> <p>Stop using hot water to wash your hands</p> | <p>Maintain the heating system</p> <p>Implement a modern control of the heating system</p> <p>Build a modern heating system, if the old one is inefficient</p> |

