



Energy-Saving Project Geislingen ZREU, Germany

Summary

The Resource saving project in Geislingen is part of the EnerinTown project supported by the IEE Programme of the European Commission. It was developed for 80 facilities in the City of Geislingen and is based on an interdisciplinary approach involving all groups of building occupants. The EMS (Energy Management System) builds on an innovative web-based tool for distant reading of electricity, heat, gas and water meters and provides data analyzing capabilities and automated generation of energy consumption reports.

The main benefits for the city are: additional financial resources / implementation of a professional energy management / practical lessons on the responsible use of energy and resources for users/pupils

No cost and low cost measures reduced the energy bill of public buildings in Geislingen during the first two years of the project by 340.000 €. These are re-invested mainly in energy efficiency measures and in consulting and training. In this way the project is self-financed by the savings.

End-user area

- New buildings
- Refurbishment of buildings
- Transport and mobility
- Financial instruments
- Industry
- Legal initiatives (regulations, directives, etc)
- Planning issues
- Sustainable communities
- User behaviour
- Education
- Other

Target Audience

- Citizens
- Households
- Property owners
- Schools and universities
- Decision makers
- Local and regional authorities
- Transport companies
- Utilities
- ESCOs
- Architects and engineers
- Financial institutions
- Other

Technical

- Energy efficiency
- Heating
- Cooling
- Appliances
- Lighting
- CHP
- District Heating
- Solar energy
- Biomass
- Wind
- Geothermal
- Hydro power
- Other

Context

Annual costs of the city of Geislingen for energy, water, waste water and waste disposal: approx. 1,700,000 €. The project was developed for 80 facilities in the City of Geislingen: Town halls, Administrative buildings, Fire – house, Schools, Kindergartens, Gyms, etc.

- Estimated saving potential: 10 – 15 %
- Baseline: average annual consumption of the previous three years 2001, 2002 and 2003 with temperature compensation
- Free financial resources (achieved through energy savings) are distributed between ZREU and the city of Geislingen and for the implementation of low cost energy saving measures



Objectives

Ecological aim: saving of energy and resources (water, waste water, municipal waste) and therefore a positive impact on the environment.

Educational benefits: building occupants contribute in practice and get acquainted with the positive effects of energy and resources saving.

Economic advantages: saving of financial resources; emerging free resources are used to implement further energy saving measures (mainly low cost measures - revolving fund).

Process

Realisation model

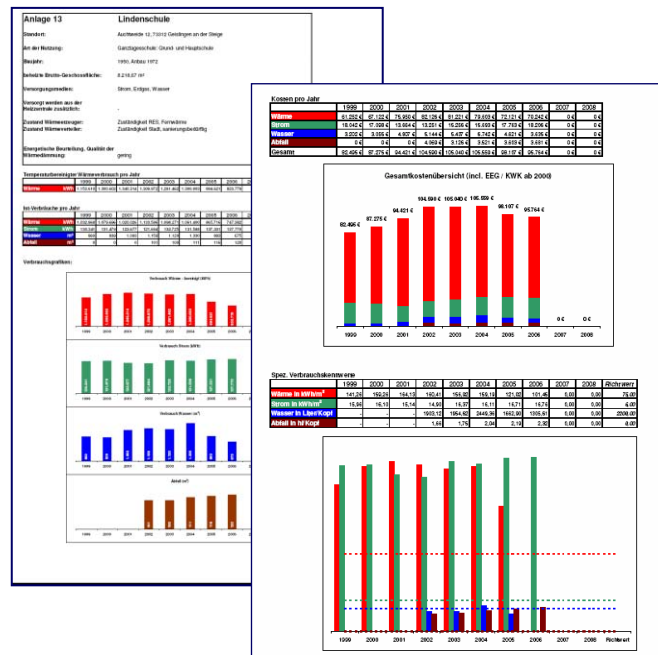
Formation of energy teams / election of energy managers for the supervision of room temperatures, airing, lighting, suggestions for improvement and co-ordination of on-site activities .

Activities

- On site inspections (Participants: building authority, caretaker, head of building (e.g. headmaster), pupil energy manager, ZREU)
- Object specific reports, recommendations ZREU catalogue for priority low-cost / now-cost measures
- Training of energy managers, care takers and pupil energy managers (Participants: building authority, caretakers, heads of buildings (e.g. headmasters), pupil energy managers, ZREU)
- User information (Materials for lessons, checklists, circulars, monthly energy report)
- Annual RSP competition (Best school, best project work, best caretaker)

Measures implemented

- Data Collection and Energy Management
- Heat, electricity and water meters for digital output
- Internet based electronic management system with automatic data collection
- Monitoring of consumption
- Fast reaction to failures in the technical equipment
- Compilation of characteristic values and benchmarking:
 - heat $\Rightarrow kWh/(m^2 \cdot a)$,
 - water $\Rightarrow m^3/(user \cdot a)$,
 - electricity $\Rightarrow kWh/(m^2 \cdot a)$,
 - waste $\Rightarrow m^3/(user \cdot a)$
- Annual energy reports with informative charts



Excerpt from the annual report for a school building, page 1 and 2



The order of implementation

- Measuring of room temperatures & information of building occupants and caretakers.
- Formulation of rules for room temperatures by the administration
- General energy saving behaviour (turn lights off, shut windows, turn thermostats down, 'The 7 lies about lighting' etc.)
- Gross problems with technical equipment (broken controls etc.)
- Electricity / artificial lighting intensity / pumps, ventilators, kitchen appliances
- In depth training of caretakers / 1 day workshop by an energy expert → fine tuning of controls

Financial resources and partners



The city of Geislingen is the initiator and beneficiary of the Energy Saving Project Geislingen. There are no financial resources necessary, as the project is self-financed by the savings.

The project is accompanied by ZREU – Zentrum für rationelle Energieanwendung und Umwelt GmbH, Regensburg. ZREU is responsible for the project management and the selection and implementation of new measures.

The internet based electronic energy management system (ECS = energy control system) was developed by KEVAG, a private ESCO.

Results

Savings:

2004/2005: about 140.000 Euro, or 8 % of total energy cost

2005/2006: about 200.000 Euro, or 12 % of total energy cost

Annual Contest October 2006 for the year 2004/2005

1. Prize School 1.000 €, pupils small presents, caretaker 100 €
Savings: 20,88 % = 17.022,11 €
2. Prize School 500 €, pupils small presents, caretaker 100 €
Savings: 14,87 % = 10.448,70 €
3. Prize School 250 €, pupils small presents, caretaker 100 €
Savings: 19,20 % = 23.842,73 €

Prizes for the best housekeeping: Two additional schools had savings of more than 15 % although project work was still slow. Therefore the caretakers earned all the merits.

Lindenschule	Savings: 19,69 % = 25.798,15 €
Helfenstein-Gymnasium	Savings: 15,27 % = 16.030,45 €

Benefits for the clients

- Saving on natural resources
- Emissions reduction and climate protection
- Additional financial resources
- Implementation of a professional energy management
- Practical lessons on the responsible use of energy and environment for users/pupils



Lessons learned and repeatability

The project shows the considerable potential for savings of resources and costs in public buildings. The tight budgets of municipalities often do not allow the investment in costly electronic heating control systems or improvement of the building envelope like insulation of outer walls or refurbishment of windows.

As there are no initial or additional costs for the consulting or for the implementation of technical measures the threshold for the administration is very low to engage in this kind of projects.

A crucial point for the success of the project in our experience is the active involvement of the administration and the politicians to carry through the first phase of change in user behaviour which often causes some strong feelings on the side of the building occupants. The annual contest with press coverage is a most important tool to improve the interest of the involved parties.

The reinvestment of the savings should be made as early as possible to earn the profits from the savings for as long as possible. The minimum project duration should be 5 years because the 3rd year is usually quite critical as the commitment slows down after the first successful 2 years.

The concept can be replicated nearly anywhere in Europe where energy cost plays a major role in public buildings. Adjustment to the local conditions would be required. A certain critical mass of buildings and energy cost is necessary to allow for the remuneration of consulting work out of the savings which is more or less similar for a lower number of buildings.

Contact for more information:

Project Web Site: http://www.enerintown.org/municipal_energy_management

Project Web Site: <http://www.zreu.de/Beratung%26Konzepte/Projekte.html>

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Printed reports or other literature available:

Title: Conference Proceedings ENERTECH 2007, Athens: Low cost / No cost measures for energy efficiency in public buildings, Konradl J., Caspari D., Zentrum für rationelle Energieanwendung und Umwelt GmbH (ZREU), Germany