

Energy management in schools – *Sun in schools*

RATHENOW *(Germany)*

GENERAL ASPECTS

The city of Rathenow is located in the eastern-central part of Germany, about 70 km away from Berlin. Rathenow is the capital of the district Havelland with about 150.000 citizens. The city itself has 30.000 inhabitants on a area of 100 km². Beautiful unspoilt landscapes surround the town. The river Havel and its channels and lakes cover the whole Havelland and the city itself.

Rathenow is in the process of strengthening and developing its reputation both as “town of optics” and as an economic centre in West Brandenburg.



CONTEXT

The city of Rathenow has been active in promoting energy efficiency measures for many years. In 1995 an Energy Development Strategy was established with the main areas

- Optimisation of the structure of local energy supply
- Utilization of renewable energies
- Rational use of energy in public buildings and public lighting

In 1996 the City Administration established the Rathenow Energy Agency for the implementation of an Energy management system which includes the development of a sustainable supply structure and the reduction of energy consumption as well as the use of RES-technologies in public facilities.

Description of the Rathenow Energy Agency

The Energy Agency was established with the support of the EC as an autonomous institution within the Department of Economy of the Rathenow City Administration. Since its establishment the Agency has achieved excellent results in energy saving in the public sector and the dissemination of energy technology information. After the

EC supported 3 year establishment phase at the end of 1998 the local government of Rathenow decided to continue the operation of the Energy Agency. The focus was put on the development of actions for the realization of energy saving projects in the public building sector. These actions spread in tariff related measures (Energy consumption monitoring,...) , technical measures (procurement guidance for the planning process, innovative lighting and lighting control system,...) and measures for awareness raising (campaign for the promotion of PV, Energy Management in Rathenow schools,...)

Description of the project “ Sun in Schools” as a part of the “ RATHENOW Energy Management Project in Schools”

Background



Following initial energy consumption analyses it became clear that schools and kindergartens in particular recorded high energy costs (up to 200 €/year per pupil) compared with other public buildings. On this basis and in accordance to the fact that the topic of energy efficiency is not the essential object in the teaching curriculum the project “Energy management in Rathenow schools” was set up. This project covers tariff related, organizational, technical as well as awareness raising measures for energy saving both as part of and in addition to the normal curriculum.

Targets

The aim of the project is to determine the energy saving potential of the school and to establish and implement concrete measures which ensure optimal room conditions and lead to a reduction in energy consumption. Priority concerns are to reduce consumption of electrical energy, heat and water through changes in behaviour in the school. This includes expanding both the economic as well as ecological viewpoints of careful energy consumption and the use of renewable energies to be used for the development of an energy saving consciousness.

Context and development of subordinated projects

The main project “ Energy management in Rathenow schools” as well as its part “Sun in schools” are based on the following principles:

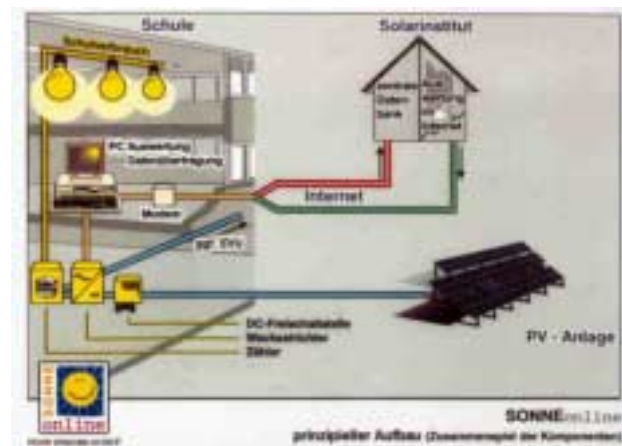
1. The topic must be integrated both as part of and in addition to the normal curriculum.
2. Pupils, teachers and technical staff must be integrated within the project work and their tasks and responsibilities must be clearly defined.

3. Energy saving projects in schools should contain practical investigations, laboratory tests as well as the development and implementation of demonstration models – the project work should be fun and interesting.
4. The school should not only be part of the project work, it should be also involved in financial aspects.
 - The school receives 80 % of the savings compared to the basis year as a refund. Of this, 30 % can be used as the school desires and the remaining 50 % is to be used for other energy saving measures and projects.
5. The project should achieve a sustainable effect on energy efficiency in school buildings and user behaviour of pupils and teachers. Therefore a 3 year contract between the Local Education Authority and the schools, which can be extended by agreement of the partners, is the base.

Description of the subordinated project “Sun in Schools”

The school receives a kit for a PV system (1 Kilowatt) with 9 solar modules. The construction of the system involves both teachers and pupils who have already been familiarised with the technical basics. This includes accompanying materials such as making literature or photovoltaic laboratory samples available. These materials are integrated in the physics curriculum. After setting up the PV kit it will be integrated into the school grid. The electricity produced is fed into the school grid which is visible on a meter accessible to all. As an annual amount approximately 800 Kilo Watt hours can be expected.

The special characteristic of the sun-online-project is the fact that consumption data is recorded daily by pupils using a PC and is transmitted directly to a solar institute. This means that a constant information exchange takes place via the internet to those pupils involved in the project.



Evaluation and Perspectives

All 9 Rathenow schools which has been involved in the project “Energy management in Rathenow schools” have shown considerable reductions in consumption. The achieved results after the first three-year project duration differ from 10 % - 15 % reduction in energy costs per school. This is a financial benefit of 35.000 €.

The compensations have been given by the major of the city to the students and teachers participated in this project at the end of each school year. These handing-over of checks have always been appreciated by the public and press.

The aims for the environment-friendly self-production of electricity have been successfully achieved through the *Sun in schools* project, meaning less conventional produced electricity is needed. With the help of this project the students practically get in touch with the topics environment and energy sources.

The school building as a consumer of energy is perfectly suitable for the integration of students in specific projects for saving energy and the implementation of renewable energies. Evaluations with students and teachers proved that their energy- and environmental awareness has changed through the creation and participation in this school project, also with regard to the consumption outside of the school.



By now, further schools in Rathenow are provided with PV- and solar technical devices, for pursuing projects like bicycle stands with light and fountains. Soon, we will also equip public Kindergartens with solar systems.

FOR FURTHER INFORMATION

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