

Case Study Großschönau

Common Description of the Demonstration objects

The community Großschönau is situated in the northern Waldviertel in the county Gmünd. Großschönau has 1.264 inhabitants in 13 smaller villages. Since the foundation of the association for tourism, village renewal and economic impulses in Großschönau in 1972 the community has become generally known as brand in the field of renewable energy sources and sustainability. Großschönau wants to give examples how rural communities can use their potential to make systematically steps for a better environment and a broader use of our traditional sources of energy. As one further step, Sonnenplatz Großschönau has become a partner in the Intelligent Metering project. 72 buildings from all over Europe get metered, 13 of them are located in Austria. In Großschönau all five public buildings are part of the project, so that the system of Intelligent Metering can be tested with a whole community. Aim is to save energy and running costs through behavioural change without large investment costs (i.e. trainings of the building operators). The identification of links between use of the buildings and their energy consumption is the main focus and innovation of the Intelligent Metering system.



The public buildings in Großschönau are:

- the Town Hall,
- the community centre,
- the Kindergarten,
- the elementary schools, and
- the gymnastic hall.

1. Town Hall (Gemeindeamt)

1.1. General description

The building has been set up in 1793 and was place of the elementary school until 1994. After the construction of the new elementary school the building has been renovated in 1995. The main part of the building had to be pulled down because of its bad condition. Today on the first floor the local, traditional music band (more than 50 members) has its training location. The ground floor is used for the administration and the offices of the mayor and his staff. Public toilets and rooms for a small shop are additional functions of the building.



1.2. Dates

Construction year:	1793
Renovation year:	1995
Size:	~ 450 m ²
Energy supply:	district heating
Building type:	detached

1.3. Usage

The office of the mayor is used from Monday to Friday. At the weekends the building is used by the local music band. During the week sometimes the building is used for music lessons, too. Within a week there are about 60 people using the building, with very different degrees of utilization.

2. Community Centre (Gemeindehaus)

2.1. General description

On the ground floor the local financial institute is situated with a conference room, a cash office, an entrance with ATM's, the safe and rest-rooms. Also located on the ground floor there is the local fire brigade with their garage for the vehicles.

Above the financial institute there are the rooms of the local general practitioner, a small museum and the quarter of the local, traditional dancing group.



2.2 Dates

Construction year:	1967
Renovation year:	~ 2000
Size:	~ 510 m ²
Energy supply:	district heating
Building type:	detached

2.3. Usage

The financial institute and the general practitioner are in the office from Monday to Friday. The museum, the dancing group and the fire brigade use the building mostly at the weekends. About 10 persons are using the building every day.

3. Kindergarten (NÖ Landeskindergarten)

3.1. General description

The Kindergarten was enlarged and renovated in 1995. Today it has two rooms for different groups of children, common rooms like a kitchen, a small gymnastic room, a playing ground and a cloak room. Outside the building there are various playground items installed for the kids.



3.2. Dates

Construction year:	1978
Renovation year:	1995
Size:	~ 390m ²
Energy supply:	district heating

Building type: detached

3.3. Usage

At the moment about 30 children attend the kindergarten in Großschönau. A team of 4 colleagues are looking after them. The Kindergarten is equipped to be in use until afternoon. At present only the time from 7.30 to 13.00 is in use.

4. Elementary School (Volksschule)

4.1. General description

Since 1575 there has been an elementary school in Großschönau. The place of the school changed a few times and is now situated at the Kreuzberg. The school has four classes, a craft room, the teacher's office, the head office, storage rooms, a cloak room, the room for the care-taker and rest-rooms in each floor. Additionally there are two rooms for the children where they can play during the breaks and an archive. The building was constructed in 1994 and has been planned to fulfil state-of-the-art requirements for safety and health of the kids (i.e. special chairs and desks ...).



4.2. Dates

Construction year:	1992
Opening year:	1994
Size:	~ 950 m ²
Energy supply:	district heating
Building type:	semi-detached

4.3. Usage

At present about 60 pupils are using the elementary school. 6 educators are teaching the children. In summertime the school is used four weeks for a summer camp.

5. Gymnastic Hall (Turnsaal)

5.1. General description

Parallel with the elementary school the gymnastic hall has been constructed in Großschönau. It contains two dressing rooms with rest rooms, a dressing room for teacher, and the gymnastic hall with its storage room for the sports equipment.



5.2. Dates

Construction year:	1992
Opening year:	1994
Size:	~ 380m ²
Energy supply:	district heating
Building type:	semi-detached

5.3. Usage

The gymnastic hall is used by the pupils of the elementary school, various associations of Großschönau, the alliance PAN as well as local kids and youth-groups. The degree of utilisation is varying a lot in dependence of season and weather.

Need assessment

1. Monitoring objectives

Basically Intelligent Metering will show that energy savings can be reached with small or no additional investment costs in public buildings. The saving potentials can be identified and tapped with the help of practical action guides. Those measures are available for poorer regions as well, because they will amortise after a few years. Behavioural change will help to save public costs and reduce environmental pollution.

2. Parameters to monitor

Electricity, water and heat get metered in all five buildings in Großschönau in the same manner. Installed are meters from Hydrometer. The own fibre optic net of Großschönau is used to transfer the data from the buildings to a server. The server reads the meter every 15 minutes, processes the data and sends it in the internal standard to the server in Esbensen. The server in Großschönau can be situated wherever a connection to the fibre optic net is possible.

3. Implementation needs

In 2004 a community owned fibre optic net was installed in Großschönau. For the metering of the data within the Intelligent Metering project the decision has been taken, that this net will be used for the data transfer from the buildings to the server in Großschönau. The installation of the meters has been carried out by the caretaker of the buildings themselves. To simplify the system and to optimize the costs all buildings got equipped with the same metering system. Our experience shows, that the installation of the Hydrometer hardware was rather easy and without major complications. Unfortunately the data transmission is not functioning properly all time. So it has become a necessity to check whether the transmission has been successful by hand.

4. Lessons learnt

We have seen that it is rather easy to implement Intelligent Metering in a smaller community like Großschönau, because the necessary number of key persons who have to be informed and convinced is a small one. When an opinion leader has been identified who accelerates the implementation of the project with his own conviction, the introduction of Intelligent Metering has high chances to be successful. Beneath the use of a simple and standardized metering hardware attention should be drawn on an easy usability and maintenance of the system. When a person has been found who will be informed about failed data transmission automatically and who has the competence to solve emerging problems, then the running of the system should be possible without problems. For the necessary centre an already existing server should be used to save maintenance and software costs.

System für Datenerhebung

1. Hardware



In Großschönau meters of the company Hydrometer are in use. Water and electricity are metered with impulse meters and the impulses were processed by a Hydroport. Heat is metered by a Hydroport Sharky 130. In each building all data comes to a HydroCenter. This HydroCenter can be read out remotely with a modem or a computer. To collect all data from the five buildings in Großschönau with one computer, the municipality has decided to use the fibre optic net to send the data to one single place. Therefore each HydroCenter is read out with a serial cable and the signals get transferred into Ethernet-suitable signals and sent to the server. On the server the software HydroNet is installed. This

software reads out all meters automatically every 15 minutes and exports the collected data to the common Intelligent Metering server in Denmark where the data gets processed and graphs get published online on www.intelmeter.com.



2. Communication (Data Transmission Protocols)

Measuring work with impulse meters. The signals get transferred some times until they reach the server via the fibre optic net. The server simulates a serial port which feigns that the HydroCenter is read out by a modem locally. The transport of the signal via the fibre optic net is therefore figuratively something like a 'cable extension'.

3. Data management (Data storage)

The software HydroNet archives the data automatically within the included database. To make it accessible for the Intelligent Metering project, the saved data is exported daily into our standardised csv-file and sent to Denmark.

4. Costs

In the run-up of the installation attention was drawn to minimize not only the investment costs but also the operating costs. The above described metering system with one manufacturer and no external networks the running costs are reduced to the marginal electricity needs. The installation of the hardware was done by community workers. The cost of hardware in each building was about € 2.553.



5. Lessons learnt

The community is contented with the system in use because it was easy to install, cost efficient in service and is easy to extend.

Monitoring Management

1. Procedures

The data is counted by the meters continuously. Every 15 minutes the actual count is read out by the meter. This gets done by the server automatically and the data gets stored in the database. The values for every 30 minutes are exported and daily send to the partner Esbensen in Denmark. The software Dynamat processes the data and publishes the graphs on the website. The collected data is available for all building users and specific behavioural patterns can be identified and checked on their energy efficiency.

2. Responsibilities

Within the chosen buildings meters are installed which could be read out every five minutes. But the half hourly collection is more sensible. A responsible person was defined who cares about the systems. He checks regularly if the data transmission was successful, because an automatically alarm system isn't implemented.

3. Lessons learnt

To guarantee a successful data transmission a server should be used, which has an appropriate maintenance, or an alarm system with automatically generated alerts should be coupled with the data management system. Another experience is that blackouts can easily lead to greater data losses when the server isn't running for a longer period of time, i.e. during a weekend.

Data Analysis

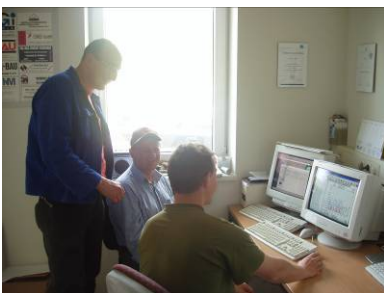
Through Intelligent Metering the effective consumption of energy is surveyed. It points out actions which are energy intensive. The users of the buildings recognize, where energy cuttings can be done without any restrictions. With the help of training sessions barriers can be identified which provide energy efficiency and the people get motivated to remove those barriers and use the upcoming potentials. Immediately with the installation of the system the caretakers can see if the heating system, the hot water or airing systems have false settings, which is normally unobservable. In Großschönau an abnormal energy consumption of the airing within the gymnastic hall has been detected. The airing

system was running in colder periods during the night although the gymnastic hall wasn't even in use. Generally can be stated, that the basic load can be reduced easier, because cost transparency can be communicated i.e. for running monitors, copiers or other office equipment.

Examples for energy reductions in Großschönau:

Switching off of modems, computer monitors and other office equipment after the office hours, installation of time-controlled light switches on places where the light was running frequently (i.e. public toilets), resetting of temperatures and times of the heating system in all five buildings, inspiration for a new thermal renovation of the community centre (Gemeindehaus), exchange of old home appliance devices (refrigerators, ...) because of their energy consumption, general increase of the awareness how energy is used/wasted and how this misuse leads to increased environmental pollution and running costs.

Training package



The building users were training and asked for their help to reduce the energy consumption according to the table stated below. In face-to-face sessions with responsible persons or in group sessions with whole groups of users all accessible users of the buildings were informed about Intelligent Metering, forms of energy and its costs itself, ways of reducing the energy consumption and personal effects of a higher energy efficiency. After a tour through the building immediate and long-term measures have been set up how the energy efficiency can be raised within the time after the trainings.

Training Timetable

Building	User	Date	Time	Trainer
All	Mayor	08.03.2005	19:00	HB
Elementary School, Gymnastic Hall	Head	15.06.2005	15:00	HB
Elementary School	4 th class	02.02.2006	10:00	MaB
Elementary School	3 rd class	20.02.2006	10:00	MaB
Elementary School	2 nd class	08.05.2006	10:00	MaB
Elementary School	1 st class	10.05.2006	10:00	MaB
Elementary School, Gymnastic Hall	Teacher	27.06.2006	13:30	HB
All	Cleaning Staff	29.06.2006	08:00	HB
All	Caretakers	25.04.2006	13:00	HB
Kindergarten	Carers	11.07.2006	09:00	HB
Town Hall	Community workers and office staff	22.08.2006	13:00	HB
Community Centre	Representatives of all user groups	25.09.2006	18:00	HB

HB Mag. Helmut Bruckner

MaB Maria Blauensteiner

Conclusions

Basically Intelligent Metering shows impressively, that cuttings in the field of energy and water in public buildings can be reached with marginal additional costs. With practical tips for the building occupants and the communication of the necessary knowledge about energy and energy efficiency the users are motivated to realise the actions discussed in the training sessions. Such actions are mostly connected with marginal costs and amortise after a short time.

Großschönau shows with its consistent measuring system that it is rather simple to reach reductions in every type of public building in the whole municipality. Also the community-wide use of Intelligent Metering saves the installation costs per building because of the better utilization of the centre with the server and the metering software. In some areas reductions of more than 30% were reached in the month after the training sessions compared to the month before the training sessions.