

ENERGY SAVINGS FROM INTELLIGENT METERING AND BEHAVIOURAL CHANGE: CASE STUDY

This case study discusses the use, the use of data of the remote control counters, the trainings, and the consequential energy savings in a local government of Lower Austria.

1. Development of building standards of Lower Austria over the years

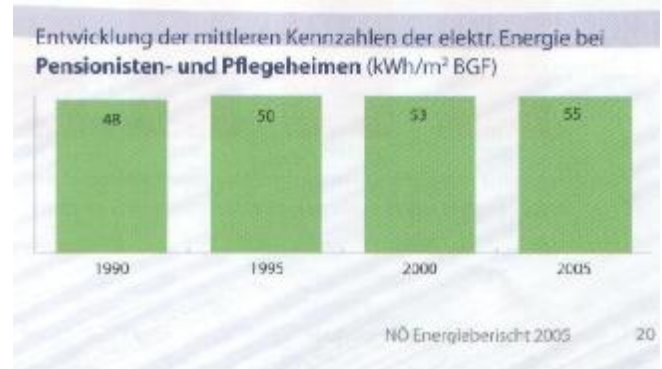
The European Union and all member states are committed to reduce the greenhouse gas emissions at 8 %. The aim of Austrian is to reduce these emissions at 13 % on the basis of the year 1990. Lower Austria is also committed to reduce these emissions in the same dimension. To reach this aim, Lower Austria has to carry out a lot of measures. These measures concern basically the reduction of the demand of energy and to reduce greenhouse gas emissions. These measures could be, for example energy accounting (since 1993), overall refurbishment public buildings and so on. Because of the project Intelligent Metering, it is possible to carry out trainings with building occupants and to evaluate the profits. This project is very interesting, as we include the following parameter in the evaluation: the categories of buildings, standards of construction, usage of buildings, building users and many more.



Analysis of the Geschäftsstelle für Energiewirtschaft, Government of Lower Austria

The statistic shows the ordinary energy consumption in 1990 of 170 kWh/m². In the year 2005 the energy consumption amounts approximately 105 kWh/m².a. Reasons for good key figures are refurbishments and new buildings, in the last years. The maximum value in the year 2005 amounts 130 kWh/m² and the minimum value in the year 2005

amounts 80 kWh/m². This value is very low for a nursing home. The aim is to decrease the energy consumption; the nursing homes should come up to an energy efficient building.



Analysis of the Geschäftsstelle für Energiewirtschaft, Government of Lower Austria

The energy consumption is because of the increasing technical equipment, like computers and so on. The nursing homes were refurbished the last few years, and they were adjusted to state of the art. This new equipment is high energy efficient, but the large number of equipment reduced the savings. Furthermore the energy consumption increased. These measures brought more comfort and more cosiness. The statistik shows an average energy consumption in the year 1990 of 48 kWh /m² a. In the year 2005 amounts the average energy consumption of 55 kWh/m² a. The maximum value amounts in the year 85 kWh/m²a, the minimum value amounts approximately 25 kWh/m²a, the value is very low. The aim is the reduce the energy consumption, that the nursing home get key figures, like the best one in lower Austria.

We also charge a key figure for water. We think that the key figures: water consumption per bed is necessary and important. The key figures "beds" show who many persons do live in the nursing home and if the nursing wastes energy.

1.1. Nursing and older people home Schrems Energy consumption in 2005

Heating	Q = 618.018kWh	117 kWh/m²
Electricity	Q = 331.946	63 kWh/m²a
Water	m = 3893 m³	48,6 m³/beds a

The key figures of the nursing and older people home in Schrems are higher then an average nursing home. Therefore it is possible to save

energy in all three categories (heating, electricity and water).

2. Basic data of the building:

The nursing home was built in 2000. People who live in this nursing home are in the Level 4 of nursing care that means that they are not able to leave alone and they are in need of care. Parts of building are used as bureau, management, buffet, kitchen, laundry and so on. The building has a lot of space to carry out different activities, like gymnastic and so on. The high space is not useful for the heating key figures.

The nursing home has 80 beds and 45 employees. There are two different wards.



Outdoor shot of nursing home Schrems
The heated gross floor area amounts
5.294 sqm.

2.1. Location

The nursing home is located on the outskirts of the town centre. The building is situated at a hill, which is not sheltered from wind. The city Schrems is located in the north of Lower Austria. Schrems is situated in a raw climate, where the temperature in night times, both winter and summer. The average heat degree days are 4347 kd (20/12).

The heat degree days are that days, where the temperature is under 12 °C. In Schrems there are 249 days per year (HT 12). On 249 days it is necessary to heat the building. In case of the nursing home, it is necessary to charge more heat degree days, because older people and in need of care people, need more heat than healthy ones. In nursing homes the temperature should be between 24°C till 26°C, dependent on the usage.

2.2. Habits of building users:

The nursing is open 24 hours a day. During the day, we staff take care of the inhabitants. To begin with hygiene, feeding, and to be in touch with the people, for example: playing games, handicrafts and so on. They are working in two shifts. During the night, there are only nurses to take care of people living there. Per wards, there has to be on person doing night duty.

Opening hour's kitchen:

Monday till Sunday 06.00 am – 06.30 pm

Bureau administration:

Monday till Friday 07.00 am – 03.00 pm

Nurses, Day shift:

Monday till Sunday 06.30 am – 06.30 pm

Nurses, Night shift:

Monday till Sunday 06.30 pm – 06.30 am

Opening hours, buffet:

Monday till Sunday 02.00 pm – 04:00 pm

2.2.1. Area determination

The building is only used as nursing home. There are no sub areas, which are usage or separate charge of energy.

2.2.2. Which things do we need for the implementation?

The nursing home Schrems has no central control system. Therefore there was no possibility to monitor the counters. There is only a system to handle the load management, to avoid load peaks.

It is possible to produce a graph with load peaks but not a monitoring of energy consumption. Therefore it was necessary to adopt the counters to the system EMC, to make a remote-control possible.

2.3. Implementation:

The energy agency Waldviertel analyses the nursing home Schrems:

- ✓ Adaptation of the existing counters (heating, electricity, water).
- ✓ Which counter for which area?
- ✓ an approximate determination of the possible energy savings
- ✓ appointment for the first training
- ✓ wiring of the counters
- ✓ Evaluation of an electrician, carrying out the installation
- ✓ specification of contact persons

After the first analyse, we create a tender for carrying out the adaptation of counters.

2.3.1. Heating counter

In this building we use a bellows-type gas flow meter. The adaptation was carried out by the electric utility. The tender includes the read relays and the installation.
Frequency: 1 Impulse = 1m³



natural gas counter with reed relays

2.3.2. Counter for electricity

The counter is a converter counter. The adjustment was realised through the energy utility. The offer of the energy utility contains the decoupling relays and the installation.

Frequency: 1 Impulse = 0,000333 kWh



Converter with decoupling relays

2.3.3. Counter for water

The counter was not suitable carrying out remote-control metering. The local waterworks create a tender, which includes the exchange of the counters and all costs. They install need counter with reed contacts.

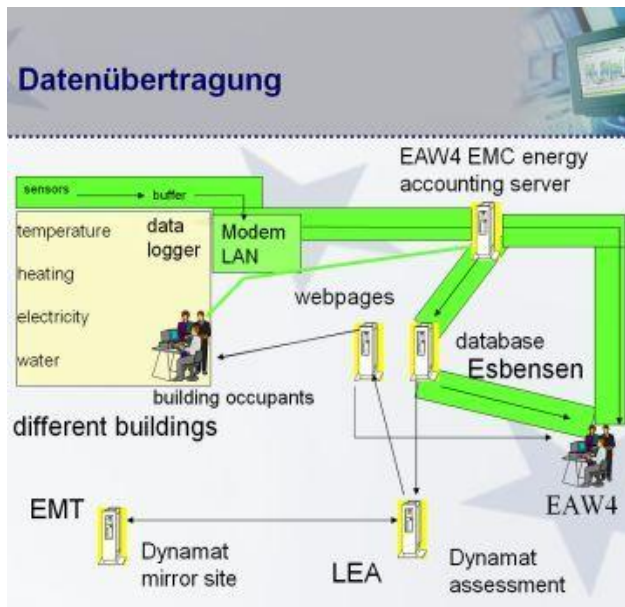
Frequency: 1 Impulse = 10 Liter.



Counter with reed contact

2.3.4. Monitoring System

The system is based on the monitoring of many different counters. The aim of the project is to monitor the data in half-hourly rates. More detailed monitoring make better analyses possible. It is easier to determine when and where energy is wasted. Because of technical reasons, the energy agency has the possibility to monitor the data in quarter-hourly rates. Therefore it is possible to see a detailed structure of consumption and behaviour of building users. The data are collected and analysed in the mathematical or graphical way. The energy agency Waldviertel creates an System for energy accounting called EMC, this programme works together with the Dynamat programme of Esbensen. We got a lot of data using those two programmes.



The transmission of the data from the counter to the data logger is carried out through a twice lead wire. For S0 impulses that length of the wire is limited with 10 meters. In case of lengths longer than 10 meters, you have to use an amplifier. We use, in case of longer wires the M-Bus System. That's the reason for a reliable System. The transmission of the data to the EMC Server, was realised with an Modem or LAN. From the EMC server, where the data are collected, the data are sent to the Esbensen Database. From this database, the data are processed, and you can have a look on the outcome on the homepage

www.intelmeter.com

On this website, it is possible to create a graphical analyse of the monitored data.

The advantages of this system are for example the wider selection of analyses, like

- Energy signature
- Heat degree correction
- Analyses of data comparison
- Budget
- And so on
-

The costs for the adjustments for the existing counters, including installation, material, working hours und VAT amounts 2455 €.

2.3.5. Lessons learnt

We install no sub counters, because of the costs. The employment of more counters would bring more details, and it would be possible to create more analyses. Therefore it could be possible to control which heating circuit uses how much energy. The housing technical servant, Mr. Franz Lotz notes all consumption data. We controlled this data. During the project the users recognize, that it is much better to analyse the data in a graphical

way, because many people visual persons. It is easier to handle with diagrams.

The minimum of monitored counters are heating, electricity and water. Only with the monitored consumption data and the graphical way of analysing, it is possible to control if the training was successful.

3. First training for housing technical servants and managing directors



After the adaptation and installation works, were data's of demand collected and analysed. In November 2005 took a training session for housing technical servants and managing directors place. The nursing home was represented by Herbert Höfenstock (managing director) and Franz Lotz (the housing technical servant).



Lecture of Riemer Roland
Participants at the first training

The aim of this training was to get to know the key person, the change experiences und to sensitize concerning the topic energy.

Because of the first training, was analyses carried out to show them at the training on the ground. This analysis was prepared with the energy accounting software EMC.

3.1. Heating

The graph below shows the demand on heating of an ordinary nursing home. The recurrent depressions are at nighttimes, where the usage is limited. This graph shows that the settings are all right. Depressions at weekends, like at bureaus, are not possible, unless in the administration parts of the building.

Very interesting is the heating energy consumption from Monday till Thursday, before the training took place. In this time, there was a peak at 01:00 am, the heating energy increased. Reason for this was a setting at the time control at the heating and ventilation system. Because of the training, the head of the nursing home, control the settings and carry out adjustments. That's why there was an immediately energy saving. Conclusion, only the known of training and a visit of an energy manager, makes manager worry about the settings and the energy consumption.

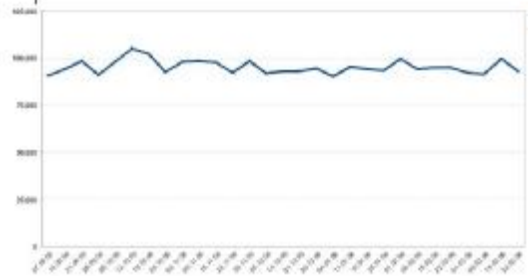
At weekends there is less energy consumption, because some parts of the buildings are not used and there is small depression at weekends

Analyse with quarter hourly resolution

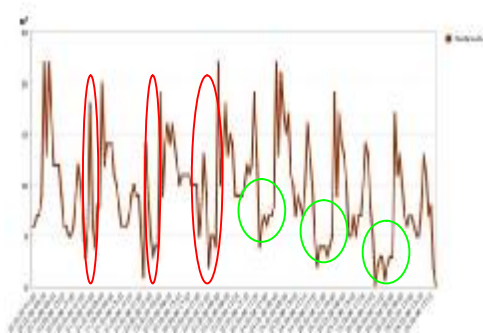
The graph above shows the demand on electricity of an ordinary nursing home. The energy demand increase at 06:30 am, because at this time the working start. In the kitchen the breakfast will be prepared; equipment will be switch on and so on. Furthermore the ventilation start working. The kitchen need to be heated and the used air need to be exchanged.

Also the heating boxes are used, in there a meals kept warm.

The energy demand decrease at approximately 04:30 pm till 05:30 pm. Then the equipment is on Stand-by modus.



The high decrease between Saturday and Sunday was a short power failure. This is not considered in our analyses.



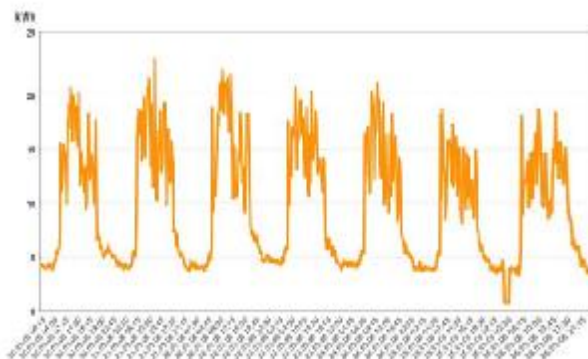
Analyses, with hourly resolution

a.



Analyse with weekly resolution

3.2. Electricity

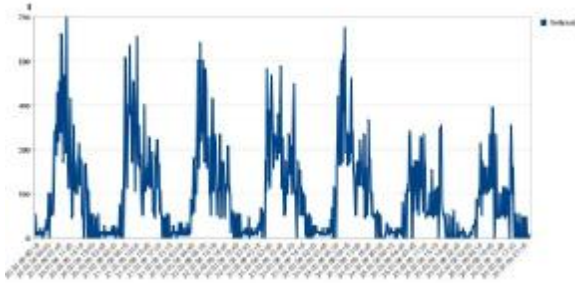


The graph above shows the same as the graph from point 4.1. The energy demand decrease short time before the training. This is another proof of the effect of an training.

At weekends there is less energy consumption, because some parts of the building are not used.

3.3. Water:

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The graph above shows the demand on water of an ordinary nursing home. The water consumption increases at 05:00 am. The staff in the kitchen start to prepare the breakfast and the staff and the people living in the nursing home start working and awake. A reduction at the water demand is at 06:45 pm. Furthermore there are decreases on Saturday and Sunday. The occupants have a bath schedule, and they do not have a bath on weekends.

Analyse water demand, weekly resolution

The analyse shows that there are no differences at the demand.

4. First training on-site:

The first training took place on 29th March, 2006. The invitation for the training was dispatched by mail.



10:00 am	Beginning
10:00 am till 11:00 am	Discussion with managing director, housing technical servant
11:00 am till 12:30 am	workshop with Mr. Lotz, and Roland Riemer) Workshop Training held by Verena Leidnix) with Mr. Höfenstock and the administration personnel, and on person of every ward
12:30 am till 01:30 pm	break
13:30 till 15:30	workshop with Mr. Lotz and Roland Riemer part 2
13:30 till 15:30	Workshop training held by Verena Leidnix with cleaning personnel

4.1. Matters of training

„Energy efficiency is no loss of comfort, but rather an intelligent usage of existing resources“

The first part of the training is a short discussion. We discuss the matter of project, the aims and the measures. Furthermore we discuss the program EMC (energy accounting system) and show some graph of the actual demand.

The second part of the training session is split. Roland Riemer controls the settings with the housing technical servant (settings of heating, ventilation, hot water generation).

Verena Leidnix carries out the workshop with the administration personnel. We will speak about measures for energy savings. We would like to point out: shaping of opinions and that only with little measures and behavioural changes, high energy savings could be reached. During the workshop this topic should be discussed:

- ý Water
- ý Lightning
- ý Ventilation
- ý Heating
- ý Kitchen in the office
- ý Cooking and so on

For all this measure, we create a poster. So the staff would be remembering every day.

- ý in the kitchen
- ý in the toilettes
- ý at the copier
- ý in the rooms
- ý at the elevator and so on.

Every collaborator and every visitor get a folder with the topics of the training and useful information for energy savings.

The first training took place on 29th March, 2006. Participants were managing director Mr. Herbert Höfenstock, technical housing servant Mr. Franz Lotz, as well as personnel of the wards and the cleaning personnel. The named persons are the key personnel.

1. The structure that should dominate in a local government looks as follows:

- ü The managing director is responsible for the energy costs, and he has to control that this costs are little as possible and the comfort for the staff is high.
- ü The housing technical servant should try to maintain the equipment and control the settings. He should come up to the requirement – mentioned above.
- ü The staff should use the energy as sparing as possible, they should not waste energy (not switch off the light, if they leave the room...).
- ü The cleaning persons are also key personnel.

The participants were very interested. The evaluate the satisfaction of the participants, we got 1 (1 best and 5 worst).The number of participants (16 persons) was really high for the first training. The matters of training were enforced as announced.

The axiom of our training was:

- ü when
- ü how much
- ü how long energy is used

According to this axiom, we carried out this training with the housing technical servant. We control the settings of the following things::

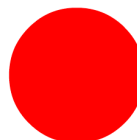
- ü Heating
- ü Temperatures of hot water and times of circulation
- ü times of ventilation
- ü times of usage, opening hours
- ü Temperatures
- ü lightning (inside and outside)
- ü setting of the solar power plant
- ü and so on

4.2. Workshop

The training was executed as Workshop and not as frontal instructions. We did not develop a presentation on PowerPoint, because the exercises were executed in collaboration between the participants and us. So it was possible for us to react on question. The results were noted on a flipchart.

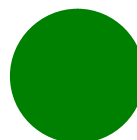
We create a simple system, that every building users and visitor could see that the management attach value to energy efficiency. The system consists of 2 point, on green point and one red point.

Wastrel



This point means that this setting wastes energy. This setting should be avoided.

Efficient



This point means that this setting is more efficient than the red one. Less resource was use

We have created posters which should assist to follow the instruction of the points. We have also prepared information posters. These posters should be placed at

highly frequented place, e.g. the kitchen, the copier, at the coffee machine and so on.

Everybody who comes into the building should get informed of Intelligent Metering and the measures.

In order that the building users disremember the measures for energy efficiency, did we design folder, with a lot of tips concerning energy and water. These tips could be used in the office and at home.



4.2.1. Aim of the workshop

The aim of the trainings is to get in contact with energy efficiency and measures to save energy. For us, it was very important to get to know these guidelines:

Energy efficiency does not mean losing of comfort, but rather to utilise the available resources wisely.

In the connection with energy efficiency, we also hear the statement: if I do not take the initiative, nobody would do. Therefore we use the axiom: one's own initiative actual commandment

Therefore everybody could begin at his working place to search for energy wastrel

Guaranteed everybody will find something to change at his working place.

Thus we show that the constantly control is very important. Key personnel got the access rights to the energy accounting system to see how much energy they save or if they waste energy. This is very important to secure that in one month the building users still think on energy efficiency.

The energy agency Waldviertel designed a circulation which show how to information should be transferred. This circulation should

not pause, but always circulate. Only this way we can guarantee that we get the best possible energy savings.

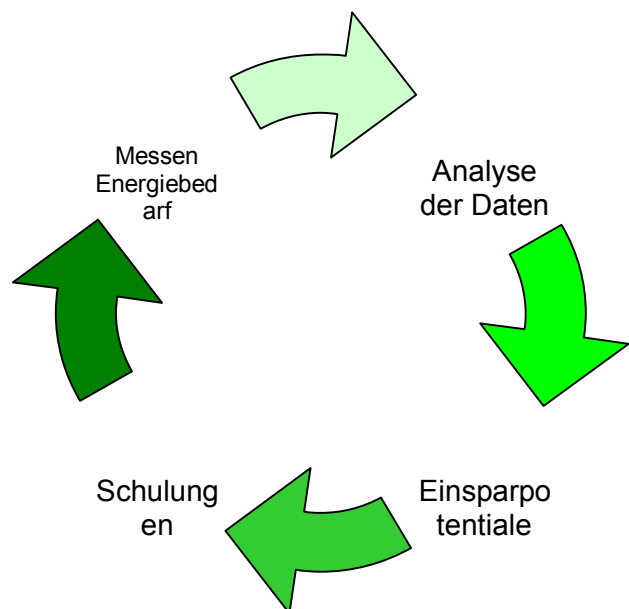
We transmitted a newsletter every month to the managing directors and heads of office. The newsletter deals with information about ventilation, heating, energy-savings lamp, usage of plants for cooling, and so on. The men's in charge should distribute the newsletter to the whole staff.

Small servings of information are better than a big surge of information, which gets in to oblivion.

Heating *	-43,77 %
Electricity	-16,26 %
Water	+0,24 %

* In the field of heating, it was not possible to evaluate an energy saving, because the training was at the end of the heating season. The evaluating with the energy signature was easier and more effective.

The moment of the training was still well chosen. During the transitional period, when there is less heating energy needed respectively only energy for the preparation of hot water, it is easy to control if the setting are ok. Because of this data and the heat degree correction, we decide to carry out a second training. This training will take place at the beginning of the heating season.



5. Second local training:



Invitation for the second local training, see below:

2. Trainings session Train-the-trainer Workshop

The energy agency Waldviertel offers – within the scope of the EU - project Intelligent Metering – a second training (with the main focus on heating). Person interested in participate such a training session, it does not matter if they participate the first one or not. Precognition is not necessary.

It is necessary to train the technical servant once more – especially at the beginning of heating season – to speak about outstanding question, the analyses and so on. Besides it is very important to control the settings of the heating.

In addition do we offer a train the trainer workshop for voluntaries, who are interested in energy efficiency and energy savings. In the future these persons are the speaking tubes between the staff and the energy agency. We design a manual with all topics which are necessary (details for heating, kitchen, water, ventilation etc.). These persons are energy representatives for this building. To the best advantage 2 person should accept this function.

If your are interested in carrying such trainings, contact us. If possible all trainings should take place at the day. To find an agreement on a suitable date please contact Ms. Verena Leidnix
mail: energieagentur@wvnet.at
Phone: 02842/9025-40871

The second training took place on 20th November, 2006 – with 6 attendees. The interest was signalised by an active discussion.

5.1. Matters of the training:

In anticipation of the training did we show a film “AL GORE – an inconvenient truth?” This film deals with climate change. Therefore the person got an insight of the actual situation. Moreover were a lot of article discussed, followed by a presentation. Roland Riemer has shown a brief summary of the analyses of all buildings participating. Afterwards we spoke about the building of the nursing home in Schrems in detail.

6. Specific data of the nursing home

During the first and second training we control



the technical settings, the interval of maintenance and the equipment.

6.1. Heating:

The heating is founded by two natural gas boilers:

- ✓ Boiler 1 P = 170 kW
- ✓ Boiler 2 P = 170 kW

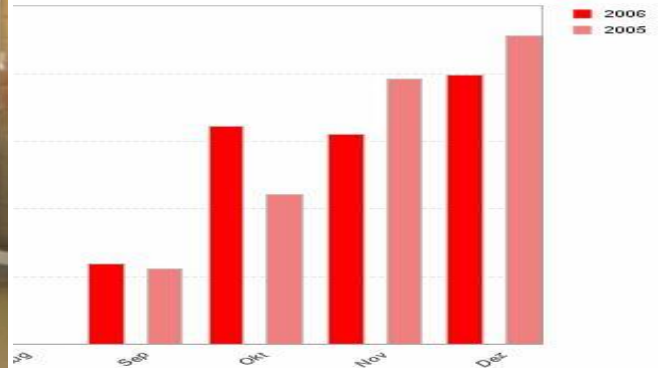
Both boiler are two level burners, therefore it is possible to regulate the load.



Ansicht Erdgaskessel LPPH Schrems

The boilers are used alternating. The system is designed really safe. If a boiler is defect, the other one start to work. Because of the two level burner systems, it is possible to regulate the load, and to hold the energy demand as low as possible. Until the training nobody cares about the boiler settings. The boilers were used in level 2, the firm which install the boiler has done this settings and nobody looks after that. Therefore the boilers always switch on and off. Every 3 minutes the boiler repeat, switch on and switch off. This makes a lot of losses. Furthermore, because of the high outside temperature, the supply temperature is very high. Reason for this was a wrong adapted heating curve. We did a lot of adjustment, to pass the curve at the basics of the building. Both measures realise high energy savings. Before the second training took place was the energy demand, after the heat degree correction higher than the year before. Because of this reason, we have a look on the heating system and the settings.

Because of the adjustment at the boiler settings there are high energy savings.



In collaboration with Mr. Lotz, we control the heating times and compare them with the usage times of the building. We did some corrections. It is very necessary to think of the interface between heating system and ventilation system. The systems have to collaborate, therefore it is important that losses are minimised.

6.2. Electricity:

The energy demand increase at approximately 06:30 am. Reasons for this, are at first the kitchen, the staff prepare the breakfast and the shift exchange. We find out, that the heating boxes are put into operation, to keep to meals warm. These boxes are not put out of order by the peak load system. Therefore there are increased load peak and because of the long time usage, there are higher losses. We agree, that these boxes are put into operation as late as possible, to avoid load peaks and increased losses.

We evaluate the settings of the ventilation, if they come up to the requirements of the nursing home. We found out that there is the need of other settings, both summer and winter times. Before the trainings took place, the ventilation was switch to the standard settings. This settings is adequate, there in winter and summer, there is an increase demand. The ventilation system has two levels. The first level represents the basic with normal usage. The second level is only necessary if there is an unusual usage. A increased change of air, comes up with an increased demand on electricity and an increased demand on heating energy. Therefore the right settings are really important. The adjustment was carried out by Mr. Lotz, housing technical servant. It is really important that the technical servant carry out the settings himself, then is sustainability guaranteed.

Settings carried out through third persons, who are not working there, are not sustainable. Learning by doing, is very important.

After the first training, the topic cooling was very interesting for the management and the staff. In the separate rooms for the occupants is a refrigerator. Every occupant is able to store his own food. Most of the occupants are handicapped or ill, so they are not able to handle the refrigerator or store any food. Therefore a fridge is not necessary. The staff was advised to switch off the fridges which were not used.

The preparation of the meals is local; therefore special freezers and fridges are needed. The cooling takes place in different boxes with different temperatures. Every box is supplied by a separate cooling aggregate. The waste heat is brought to an heat exchanger. The heat exchanger was polluted. Because of the cleaning the waste heat could be easier transmitted to the surrounding and the efficiency increased. The heat exchanger in the cooling boxes are out of ice and we realise a energy saving.

The Stand by of some equipment was metered, like the equipment in the training-rooms, like computers and modems. We charge the possible savings together with the management and the staff. The staff got a feeling for the amount of energy wasted through stand-by. Switching off the equipment in the training-room could save 1400 kWh per year or 190€ per year.

The topics elevator, coffee machines, dish washer and so on were discussed.

6.3. Water:

We did not do some change in the field of water. We only put on some red and green points, including the posters. A great saving could be the usage of the fountain for the toilets. The nursing could reduce the water bill (30%). The necessary installation was considered at the construction of the building. But there is one problem. The water in the fountain must have the quality of drinking water, otherwise the usage is forbidden

6.3.1. Hot water:

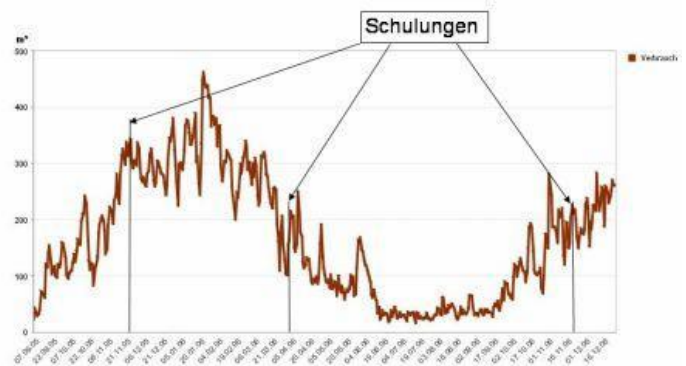
The preparation of hot water is founded by the both boilers and the solar power plant. The solar power plant is highly efficient (vacuum tube). Therefore is it possible to prepare the hot water already with low sun. The key figure per square meter of the plant surface amounts 497 kWh/m² a. This is a good figure and means that the power plant works good.

At the training day the temperature of hot water was set at 60°C. It is necessary to avoid the possibility of brewing; therefore the water temperature is reduced down to 45 °C. With a circulation pump the water distributed into the separate pipes. The running times of the pump are control with a time control. The hot water circulation makes a lot of losses. It is very important that the settings are right. Because the building is used 24 hours a day and 365 days a year, it is necessary that at every time and at every place hot water is available. An optimising is not possible. A reduction of the storage temperature (60 °C down to 55 °C) would bring a energy saving.

Summarised the system in the nursing home is in a good situation. The building caretakers (head of the nursing homes, the housing technical servant and the staff) take care to find new ways to save energy. The training actions were very successful.

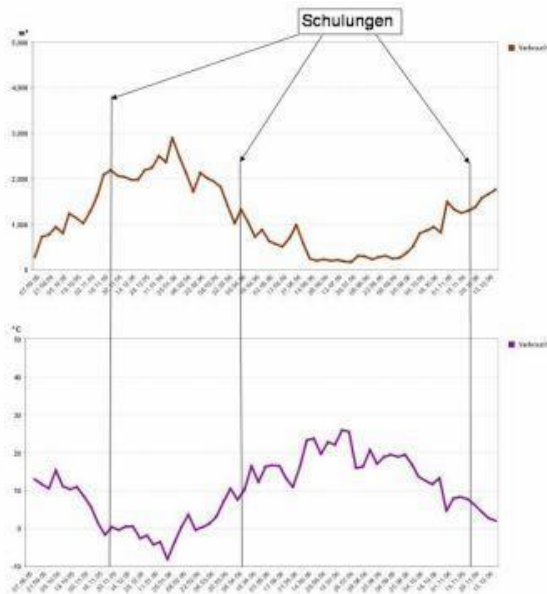
7. Saving after the training on 21.11.2005, 29.03.2006 and 20.11.2006

7.1. Analyses Heating:



Analyse of energy consumption after the trainings

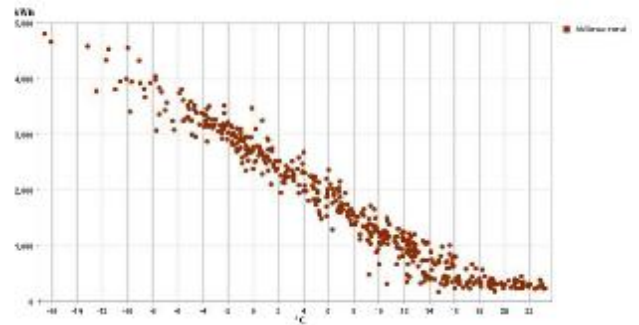
After the first training with the technical housing servant und the head of ward the energy demand reduced significant. After the other trainings the reduction was not as significant as after the first one.



A further analyse shows in connection with the outside temperature and in weekly resolution, that the energy demand after the training on 21st November, 2005, at constant outside temperature decrease. Reasons are according to the technical housing servant, die current and constant conversion of the measures learned at the training.

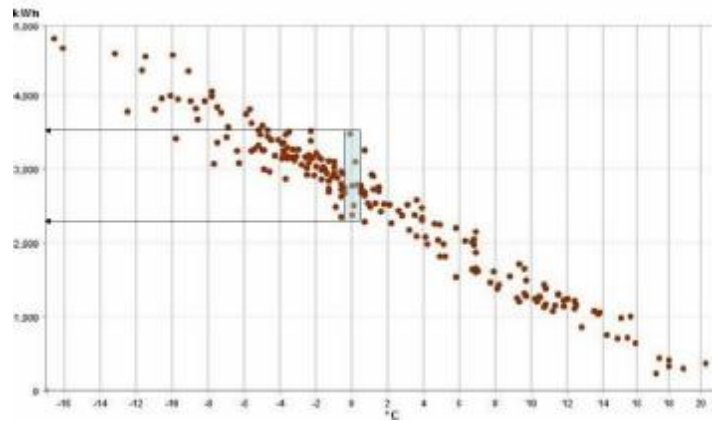
At the followed trainings, because of changes at settings, we got savings. It could be that the savings are influence by the outside temperature. bewiesen werden.

To proof that the savings are not only because of the increasing temperature, it is necessary to design a energy signature. The trainings were carried out in spring and in autoum (transitional times). There are unavoidable temperature differences. Aim is to leave the outside temperature aside. This analyse with energy signatures shows the heat energy demand in kWh at the specific temperatur. Therefore it is possible to show the demand indenpenden of time.



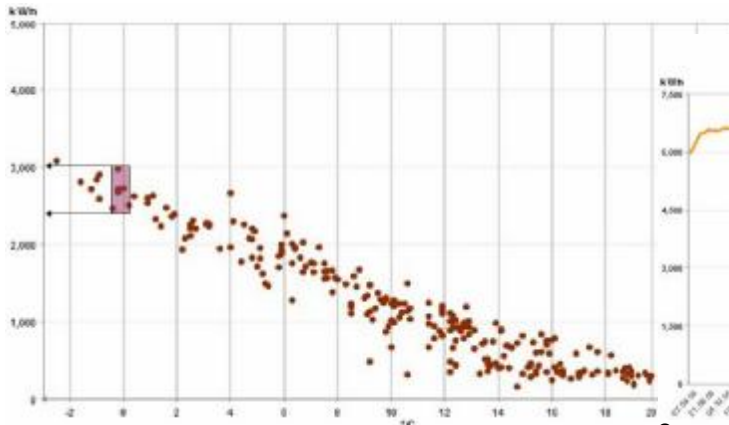
Analyse summarising the energy signature
07.09.2006 bis 28.12.2006

The graph above shows the summarising analyse of the nursing home Schrems. Each point shows the energy demand at a specific outside temperature. Because the usage of the building does not alternate, the demand is almost constant..



energy signature before the trainings took place.
07.09.2005 – 29.03.2006

Before the trainings took place on 29.03.2006 and 20.11.2006, the energy demand amounts at an ordinary outside temperature of 0°C between 2290 kWh and 3470 kWh.



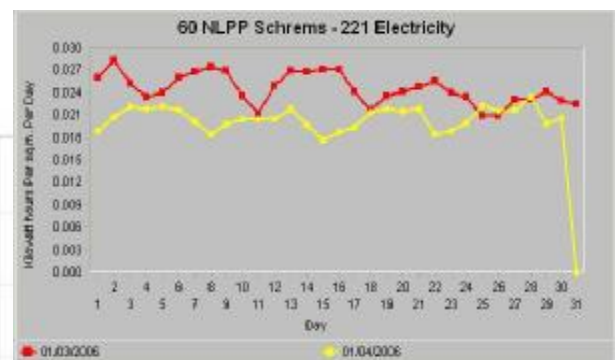
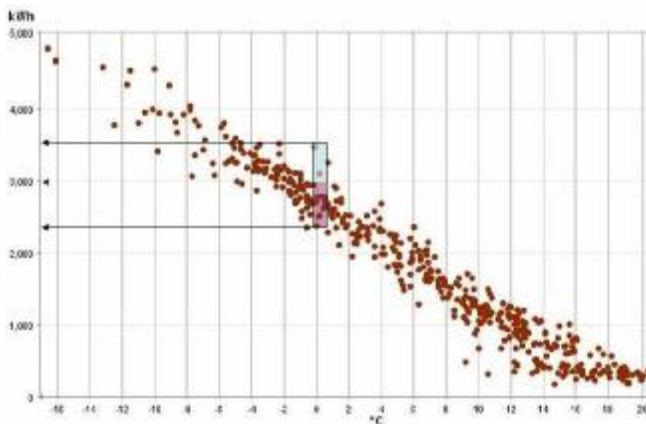
Energy signature after the trainings
07.09.2005 – 29.03.2006



Summarising analyse LPPH - Schrems

After the trainings on 29.03.2006 und 20.11.2006 the energy consumption amounts at an ordinary outside temperature of 0°C between 2460 kWh and 2970 kWh.

A comparison over the months March and April shows a significant energy saving.



Analyse: Dynamat
www.intelmeter.com

In the summary we can proof that the savings are not because of the higher outside temperatur, but because of our training sessions..

During the training (29.03.2006) we discuss the topics ventilation, cooling, Stand-by, lightning, computers and so on.

7.2. Analyse electricity:

With the technical housing servant we discuss the operating times of the ventilation system and the operating time of the heating system. We advice to maintain the cooling heat exchanger, and we charge the waste of energy in case of leaving technical equipment in stand-by mode.

The demand on electricity reduces before and after the second training. One reason is that the management advice to carry out some measure to optimise to system, according to the first training.

Since 07th of September, 2005, data were collected through the project Intelligent Metering. Therefore it is possible to compare a lot of data (before and after the trainings).



Analyse: Comparison, monthly resolution.

This graph shows that the energy saving is long-term since October 2005. It is not possible to compare September 2005 with September 2006, because the data collection start on 07th of the month.

7.3. Analyse of water:

In the field of water, we are not able to carry out any measures. We propose two measures:

- ü The use of water saving equipment at the taps, could be very helpful to save water in an easy way.
- ü The use of the water out of the fountain – if possible.



The analyse of the savings after the training sessions. There is a trend, that less water is used. We only use the red and green points. Energy savings with this term are only visible after a long time period.

8. Assessment of the training measures and energy:

At the example of nursing home, we are able to show, that training measures are necessary and effective, if all partner in the building are motivated and involved in this process. The local trainings are very well attended and the interest was signalled by an active discussion. That this project is successful, it is necessary that everybody works together and have the same opinion. The energy agency Waldviertel was very proud to carry out trainings in this building because we are always welcome.

This interest and the collaboration is responsible for the high of the energy savings.

8.1. energy demand Schrems Energiebedarf 2006

Heating	Q = 584.240 kWh	110 kWh/m ²
Electricity	Q = 314.761 kWh	59,5 kWh/m ² a
Water	m = 4.817 m ³	60 m ³ /beds a