

# TuDu! – Saving energy with a laugh!

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## Keywords

awareness, user behaviour, behavioural change, motivation of employees

## Abstract

A new, uncommon way of motivation for employees in industry enters the market: “TuDu” (german for “Just do it!”), a new training program which has employees laughing while targeting their intellect and raising awareness for more efficient energy consumption in their everyday work environment. And this is just the beginning of the way.

Experience showed that technical measures alone are not sufficient to reach the maximum potential for saving energy. Furthermore, it is crucial to raise awareness in employees about energy consumption and efficient energy use.

The energy experts together with a group of cabaret artists are building a bridge between economy and art. “TuDu” combines well known songs and important facts from energy-relevant topics such as efficiency, compressed air, lighting, standby into a show.

“TuDu” aims to raise and re-enforce awareness for efficient energy consumption in employees and motivate them to responsibly handle and preserve valuable energy: “TuDu” – Just do it, don’t rely on others ...

The workshop does not want to instruct, but – in a humorous way – show ways to improve handling valuable energy resources. The program can be tailored to each clients specific requirements and varies from meetings and workshops of the energy application in companies to training courses for managers and employees and attendant events.

After this first step a whole program gives assistance to the company over the time of one year primarily trying to commu-

nicate with the employees about energy efficiency and to help the leaders in the programme to be successful in their savings. So workshops are performed, newsletters for different topics are sent around and so on and by the ways savings occur by a change of peoples behaviour and by employees ideas brought to the company and the technical staff.

Concrete practical success stories show that substantial savings can be reached with the TuDu!-programme.

## The holistic concept of “TuDu”

The approach of ‘sattler energie consulting’ is the integration of energy efficiency, energy saving and raising awareness of their interaction, setting a basis for a change of behaviour in the consumers ‘sattler energie consulting’ presents well known facts using a holistic approach and concept, especially developed for the industry. The extensive experience of our consultants brings a wide knowledge and in depth know how of the topic. An important and unique aspect of the ‘TuDu! Gesamtenergiekonzept’ is the humorous way the topic is presented to not only raise awareness about simple ways to save energy, but also encourage positive engagement and long-time changes in our clients.

## INITIAL SITUATION AND TARGETS

### Initial situation

Companies generally try to reduce their energy demand and as such also reduce energy costs. Technicians have the job to optimise and reduce the energy demand within the business. However, employees often pay little attention to energy demands while performing their daily duties.

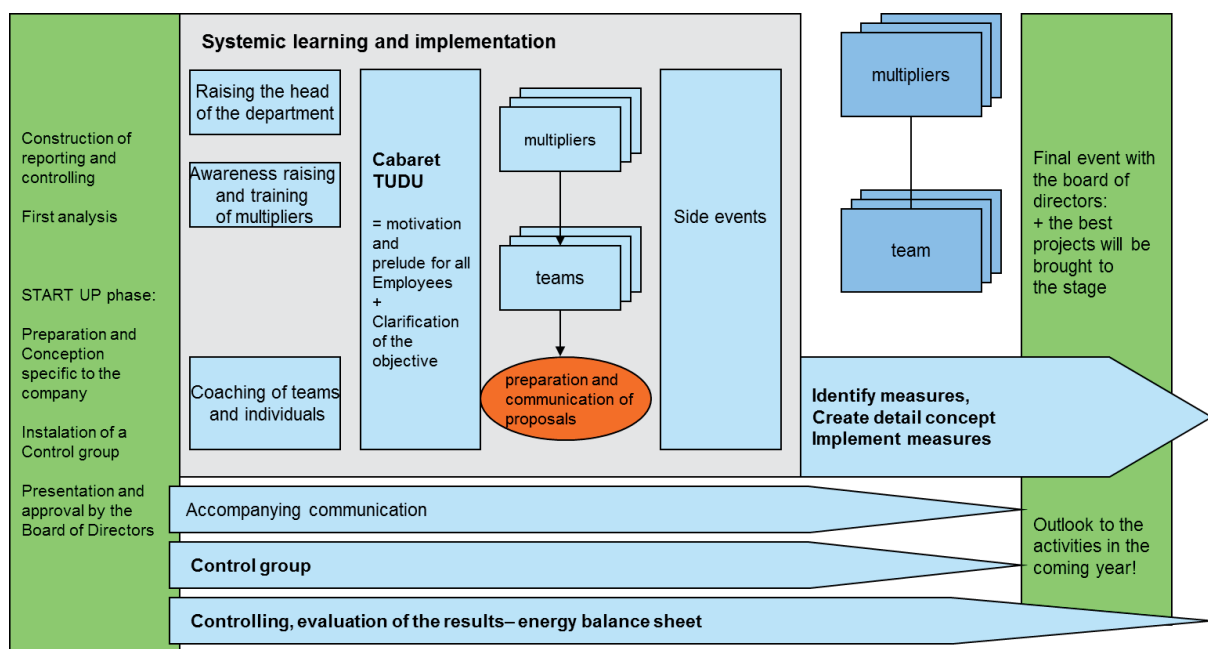


Figure 1. The holistic concept of 'sattler energie consulting'.

Energy demand and costs kept rising significantly despite energy saving measures having been put in place. This is often where external consultation can help to improve energy efficiency within the facilities.

#### Aims of the master plan

- To sustainably reduce energy consumption and -costs.
- To motivate the employees to actively participate in using energy more efficiently and bring in their suggestions.
- To work out in detail suggestions that are economically attractive.
- To develop a procedure of energy monitoring, controlling and reporting to verify the successful implementation of the project.

#### THE CONCEPT

The concept of "TuDu" is a holistic and sustainable approach to reduce energy consumption and costs. In contrast to the more conventional and technical concepts, "TuDu" uses systemic coaching to educate employees to actively save energy.

Systemic coaching is advice on questions of professional context with the aim of solutions by constructive/positive conversation. Coaching here is understood as a resource and solution-oriented consulting to the process: the client is an expert in his problems and solutions, the coach is an expert on the road to find the solutions. The coach helps the customer find individually appropriate solutions and purports itself no solutions. This is done by various systemic interventions (usually questioning techniques and metaphors, etc.). Systemic coaching is target-oriented and assessed on the basis of concrete and with the customer elaborated target criteria<sup>1</sup>.

The training courses are influenced on this basic attitude – interaction of involved participants – coaching sessions will be held only if necessary.

Energy experts of 'sattler energie consulting GmbH' together with the 'Seminarren GmbH', a group of cabaret artists, developed a unique program – the Seminar cabaret – to present the topic to the clients.

Figure 1 shows the holistic concept of 'sattler energie consulting' in a graphic overview. The details are discussed in more details later.

#### Concept of Controlling and the Development of a Reporting process

Depending on the needs and the context of the project within the company, a customised concept will be developed to establish and implement automatic energy controlling most efficiently:

- Evaluation of the initial situation requirements and goals
- Inspection of factory equipment, evaluation of the existing and potential counting system, and recording the technical and local framework
- Discussion of the findings and potential strategies
- Development of a measurement concept for data acquisition
- Development of a concept for reporting (data analysis and presentation)
- Proposal for implementation and further strategies

Parameters measured can be:

- Usage of electricity, gas, heat/cold and water; measured by performance output and/or energy consumption
- Temperatures
- Operating conditions (on/off as well as analog signals)

1. [http://de.wikipedia.org/wiki/Systemisches\\_Coaching](http://de.wikipedia.org/wiki/Systemisches_Coaching)

On the basis of the plan developed, 'sattler energy consulting GmbH' will give advice on the implementation of the energy controlling project.

#### First analysis

The 'klima:aktiv eeb-protocols', developed on behalf of the Austrian Energy Agency, form the basis for the contents delivered in the workshop and also the cabaret.

This expert tool allows an objective survey and assessment of existing facilities, as well as a first analysis of the existing potentials, partly based on hard facts and partly on soft facts. Furthermore, this evaluation will be a joint effort of the external consultants and in-house technicians.

Data collected will be analysed and a recommendation will be given with a pithy presentation, highlighting where there is need for action and the level of urgency by sector, as well as the expected results.

#### Start Up phase TuDu

The Start-Up phase initiates the accompanying and preparative steps for the project. These are the structural, organizational, and "human" factors in addition to the already initiated steps of building controlling & reporting, as well as the initial analysis of the technical approaches:

Detailed planning of the activities for the "human-related part" of the project

- create a detailed schedule
- accompanying measures/conditions and communication
- determine the governing body
- appoint the central contact person/project manager within the business
- calculate the budget for the accompanying measures
- appoint a team of experts for the evaluation of the project

A detailed proposal of the concept will then be submitted for approval to the responsible person/committee.

#### Workshops with department heads and multipliers

The "experience" of energy, but also the importance of energy efficiency in today's society as well as within the business environment is an important element of these workshops.

Experiments will be done in small groups to teach the 'value of energy'. For example, the participants will use an Ergometer to try and generate 1 kWh of electricity. This exercise will show the enormous effort needed to do this. The results and findings will be presented to colleagues and discussion will follow what this means for the business practises/operational practises (both would be fine I think).

Furthermore, it is crucial to the success of the project to provide extensive support and guidance for the participants to raise their awareness on the changes they can make to use energy more efficiently in their workspace.

The contribution each individual can make to the whole is highlighted and possible consequences of the actions of a "role model" or a "multiplier" are discussed.

Next, the topic of communication with staff and colleagues will be further explored. On the basis of the previous discussion it will be determined which steps are needed and also material and documents will be required to achieve the best possible results.

#### The TuDu-Cabaret

The "TuDu! Energie Seminar Cabaret" combines humorous sketches, famous songs and essential information to present important issues such as energy efficiency, office electronics, light, standby or thermal imaging adapted to the needs of the project/business.

The purpose of the cabaret is not to lecture, but to show in a light-hearted and engaging way weak points in dealing with valuable energy sources, but also draw attention to existing –

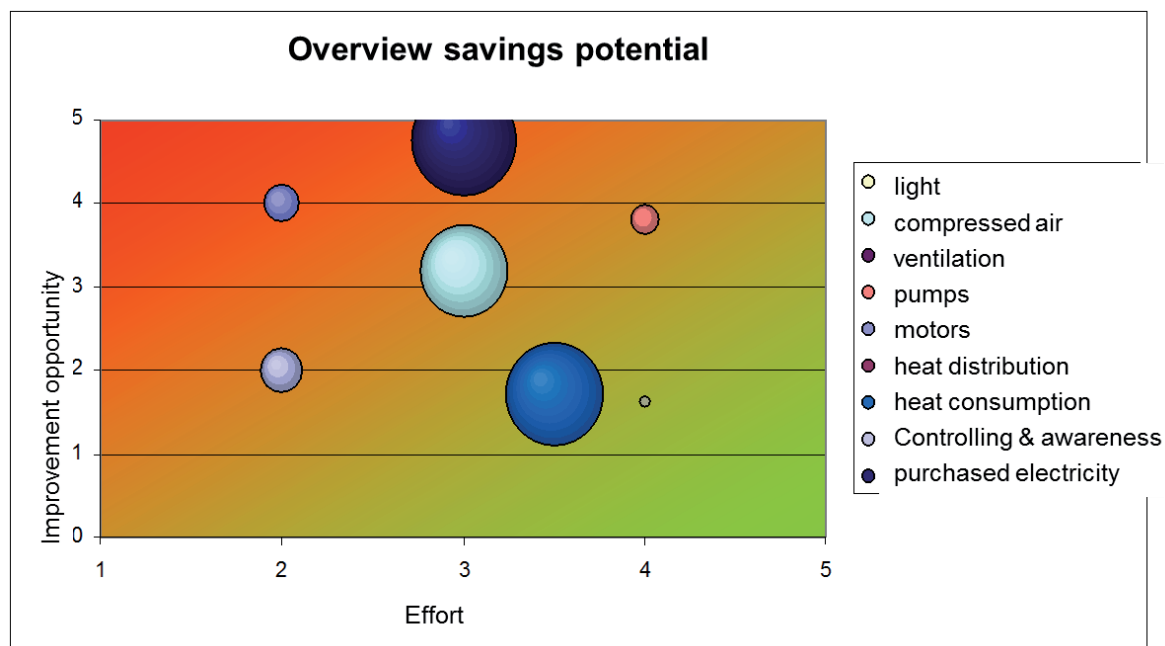


Figure 2: Appearance potentials and effort to realize the potential (Sattler, 2008).

but so far hidden – strengths within the business. The aim is to install a positive attitude towards the topic of energy and energy saving in the employees. Upon request, the program can be adjusted to suit the individual needs of the customers. These adjustments will then also be integrated in the training and motivational concept for the project.

The content of the cabaret will be put together on the basis of data from the first analysis and set goals of the project. It will present the objective and what measures need to be taken in its unique way. The contents of the cabaret will be discussed with and approved by the management first.

#### Events and celebrating success

These events aim to positively re-inforce and celebrate what has been achieved and thank the participants for their efforts. Furthermore, these events will help to guide the future direction of the project, to strengthen the motivation and further consolidate the awareness of the employees towards their energy consumption.

For such an event, the consultant together with the company can organise speakers (e.g. motivational speaker, energy experts, ...) or plan activities and give rewards for active participation (e.g. energy saving lamps for suggestions on how to minimise energy consumption within the workspace).

#### POSSIBLE ACCOMPANYING ACTIVITIES

As mentioned earlier, integration of a consultant is worth considering. Additional activities taken on by the energy consultants will depend on the services requested and also the amount of time and work the company would like to invest into the project.

#### Coaching

The aim of the coaching is to specifically support the multipliers and the key persons with their tasks in the project. The goal is to pass on information and motivation as efficiently as possible to the employees, who will in the end be the ones actively saving energy by implementing the measures put in place.

To have an idea of the accrued problems, here are two examples of one project:

One division had problems in finding measures. The context of coaching appeared that only measures have been found to a more efficient production but not increasing energy efficiency. Therefore in the context of the intern proposal system, this section had nothing to show.

At closer examination and consideration from a different angle many of these measures had also effects to energy efficiency and therefore can be submitted very well.

There was a similar picture in a further division. The context of coaching turned out that there was fear in proposed measures to the charge, why well-known measures are not already implemented. They want to maintain the appearance to have already done everything in this area. Through discussion of all possible variants, they came to the conclusion to do the "cards on the table".

#### Assistance for the management team

The task of the management team is to ensure the direction of the project as well as its progress. As such, the members have varied backgrounds to ensure all aspects of the company are

integrated if corrections have to be made in case of deviations from the original plan or objectives.

Other responsibilities of the management team are:

- to increase motivation of the participants
- to promote the internal communication
- to overcome internal organizational hurdles
- to point out potential difficulties
- to mobilize resources required in the short term
- to develop ideas to improve the quality of the proposals
- to investigate leads optimising the widespread impact

Energy consultants can help the management team by sharing their experiences from previous projects, help with problem solving or point out already known solutions, where available.

#### Support of assessment of the proposals

In the second step, the suggestions made by the staff and ideas of the energy consultants are to be assessed critically. This will be in large parts the task of the technical team, which is most familiar with the companies equipment. The energy consultant supports the technical team with their know-how on energy efficiency and experiences from earlier, similar projects done in other companies.

Tasks in this phase:

- Plausibility check, whether the measure can provide the described effect
- Identifying costs and benefits and determine the practical feasibility of the proposed measures in terms of energy technology and available company resources
- Discussion of possible problem areas and of facts still to be verified
- Agreement of further actions with allocation of tasks
- Summary of results (costs, benefits, feasibility)

#### Develop detailed concepts, create concept

Individual projects can be worked out in detail by the energy consultant to support employees.

The individual projects are then combined into an overall concept and reviewed to determine effects that may contradict each other or be mutually exclusive.

Tasks are:

- to work out details for the individual proposals
- to research the benefits of the technology
- to request quotes/offers
- to develop a plan how to implement those measures
- strategic prioritization of individual measures
- to verify the accepted parameters based on specific and defined measurements
- a detailed analysis of a control system, and determination of the possible additional potential within that system

- to compare all possible solutions for one problem
- to decide on further actions

#### Implementation monitoring

It is very beneficial to include the experience of the energy consultants in the implementation of measures, as otherwise – e.g. when hiring an external contractor with the implementation – the desired solution might not be achieved. Energy consultants can ensure that the measure is implemented in terms of maximum energy efficiency and savings are not made on critically important processes.

Often it is simply a case to deviate from known standard solutions and to think outside the box. Critical questioning of the process and the exact requirements will be the key for a new solution. This happens in the following way:

- Define the objectives and goals
- Question the actual demands
- Define the Specify and define the problem solving process
- Invitation to tender the necessary technology
- Precise definition of the key points
- Avoiding unnecessary security premiums by careful research
- Control of the implementation on actual function according to the specified requirements
- Verification of the result, with appropriate measuring technology

#### Evaluation of results

It is essential to evaluate the results of the program, especially after the first intensive phase and at the end of the program to verify the desired goals have been achieved. The collected data will be analysed and summarised in a report. These data can also be used to present examples of 'best practise' within the company.

#### BENEFIT

Studies have shown that through motivation of users, potential savings of 7–30 % are possible. In addition, savings through technical processes can reach the same magnitude. This suggests that with a holistic approach saving of 20–40 % are possible.

Furthermore, using the TuDu concept, employees have acquired a raised awareness and understanding of the topic, which is an important stepping stone towards a sustainable longterm solution.

### Best Practise Lenzing GmbH

#### COMPANY PROFILE

The "Lenzing Group" is an international company, with its headquarter in Upper Austria and production facilities in many major markets. Lenzing is market-, technology- and innovation-leader in special cellulose fibres and provides the global textile and non-wovens industry with cellulose fibres from wood, a natural raw material.

#### INITIAL SITUATION

The demand for electricity at the site of Lenzing originally was 618,000 MWh per year. The staff in the Department of Energy Supply and Energy Optimization has long been undertaking measures to reduce the energy demand and increase energy efficiency. Staff in production also has the opportunity to contribute to energy savings as they best know the production process. However, for changes to happen, the topic of energy consumption and savings has to become high priority for them.

#### MEASURES

184 suggestions to reduce energy consumption were submitted by staff members in conjunction with the project titled by the company "Energy Saving Year 2007". More than 700 workers attended the TuDu cabaret.

Implementation of the proposed measures lead to a reduction of the electricity consumption by ~3 % (correlating 18,000,000 kWh), successfully reaching the initial target of this project. Though 3 % might seem a small target, it needs to be taken into account that in large companies, this still can amount to enormous savings. In this specific case, the energy saved is approx. equal to energy consumed in 4,500 households in a year!

The representation and evaluation of typical savings suggestions and implemented measures include, for example:

- Number of proposals
- Total savings

Figure 3 shows the number of ideas and the implemented projects.

Since starting the project in 2007, 184 proposals have been introduced in various areas, of which 136 have been implemented to date. Total savings achieved through the 136 projects implemented amounts to 12,270,000 kWh. This amount consists of both, electricity and heat energy savings.

The data are listed in Figure 4.

As a sample project, the reduction of idle time on pumps will be explained briefly. Delivery times have been reduced by a change of control of the pump and thus €11,000 can be saved annually. Despite extensive renovation work, this project is realized, because it results in a favourable amortisations period of 2 years.

#### Power consumption in buildings

As a result of the project "Energy Saving Year 2007" the behaviour of employees in the reference project has improved noticeably. So much so, that a significant reduction of energy consumption in buildings can be measured (Figure 5).

#### COST EFFECTIVENESS

All projects with a amortisations period of less than five years have been released for implementation. For example, the optimization of cooling water pumps control or the reduction of consumption in the building sector through improved user behaviour.

The total expenditure for all measures amounted to €3,701,490 the entire costs amounted to €1,904,020. The average payback period is 2.15 years after the static amortisations calculation applied in the Lenzing AG.

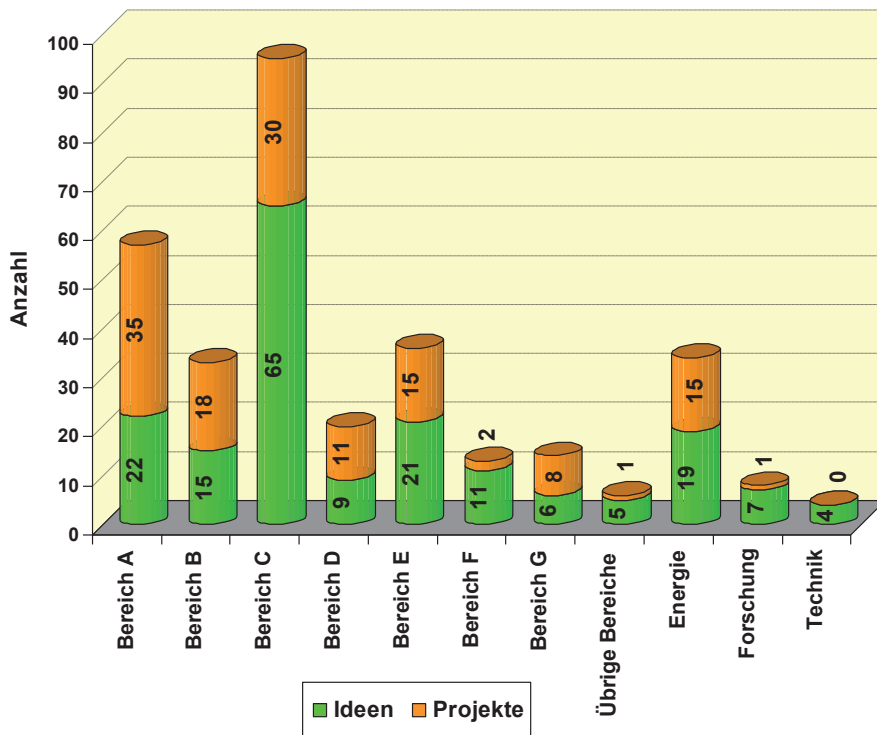


Figure 3: Number of ideas and projects by sectors (Sattler, 2008).

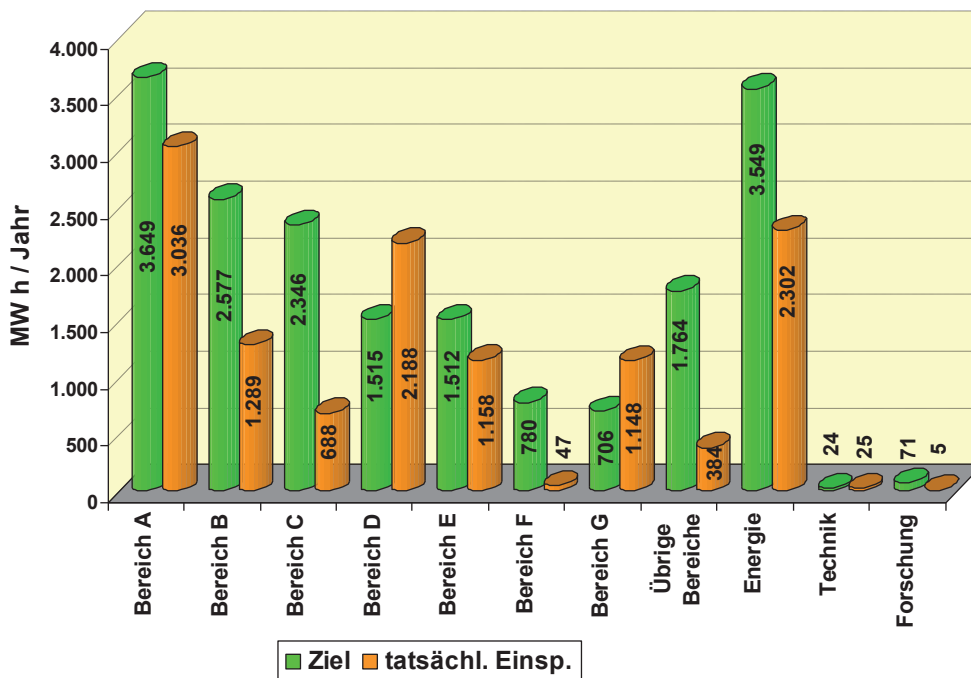


Figure 4: Targets and actual savings in electricity (Sattler, 2008).

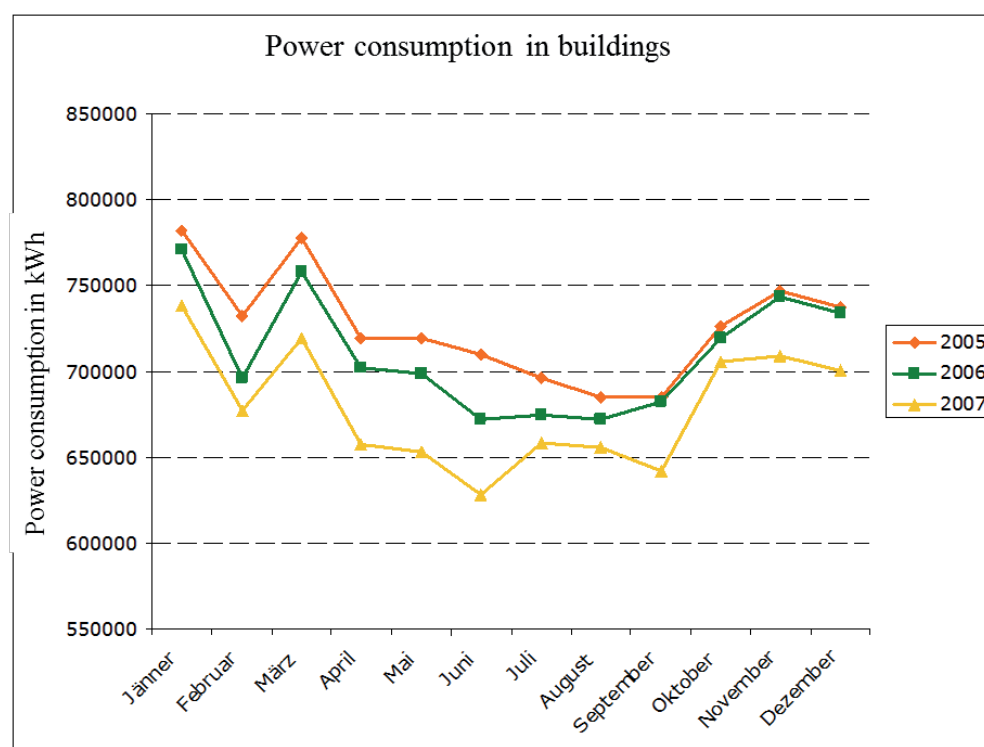


Figure 5: Development of electricity consumption in the building of the reference project (Sattler, 2008).

Table 1. Summary of costs and savings.

Energy savings	12,270,000 kWh/a
Cost savings	1,904,000 EUR
Cost reduction	4.41%
Single investment	3,701,490 EUR
Amortisations period	26 months

#### Total Costs of the holistic concept:

Sattler/Coaching: ~ 70,000 EUR

Internal technicians: ~ 1 man-year  
(½ project management – ½ f. evaluation of measures)

Cabaret: 700 persons × 2 h × 40 EUR

Other events: 200 persons × 2 h × 40 EUR

+1–3 h Effort of preparation of to each proposal/measure

**total: ~250,000 EUR**

Compared to traditional methods it's difficult to validate. We still haven't carried out a potential analysis in these pathways of an enterprise. All the recommended measures from the potential analysis have to be checked in detail which means about 5,000 EUR/measure. So the costs will be about 2–3 times more.

## Conclusion

The presented project of Lenzing was a great success:

- The Board fully supported the project. Board members were actively involved in the project and were present at the events. The strong support from the top level was a major fact in the success of this project.

- The person responsible for the technical aspect was a staff member of Lenzing and as such familiar with all the internal processes and equipment.
- A second person was tasked with communication and coordination of the project.
- A third person from the Technical Department was responsible for the review and implementation of the projects.

Interim bottleneck has revealed as the financial resources for the implementation of measures had to be driven from a special budget. It was surprising that so many measures could be found (the technique had already realized everything which was invaded them!).

Striking was that in those departments where the people could identify best with the theme and a suitably motivated and also expert "opinion leader" had the line, goals were achieved fastest or rather the most proposals were tabled and the greatest potentials were realized.

Other departments actually need "coaching" to the subject of the task ("we know many potential to increase the production efficiency, but no to energy efficiency"), although all got the same training courses and had received the same training materials. The technical background of all involved persons will be crucial, which entails a certain basic understanding for the subject.

In a current case in the health sector (non-profit organization) are these facts not in the way and the project runs much slower and less successfully.

- The Board supports the project less, accordingly there is resistance to “restrictions by energy efficiency measures”.
- The internal structures and resources for the project are very reduced, all resting on one person who has to complete the project without additional time budget.
- Multipliers were hard to find and even these only for individual areas. Doctors do not participate at all, they have other important tasks (“the others have to do that”).

These are the conclusions:

1. The most important fact is that the Board stands behind the project and shows this through correspondingly and appro-

priate guidelines and instructions issued so that no doubt can rise to the importance of the project.

2. Appropriate financial and human resources need to be allocated for the execution of the project.
3. There have to be found accordingly appropriate multipliers for the work with the staff and it's important to have attention on their motivation and information and to accompany them for the duration of the project.
4. To motivate all employees accordingly, which is easier for technical training translate's it's most important to explain the complex content to subject of energy efficiency at their level and in their language. For non-technicians the multipliers are an important part to make this translation work and to create appropriate presentations.