

INSTITUT FÜR FACILITY MANAGEMENT

energy \Rightarrow buildings \Rightarrow responsibility

Benefits of energy efficient buildings and energy
management

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Where and who is ZHAW*?

former. ZHW
Zürcher
Hochschule
Winterthur

former. HAP
Hochschule für
Angewandte
Psychologie

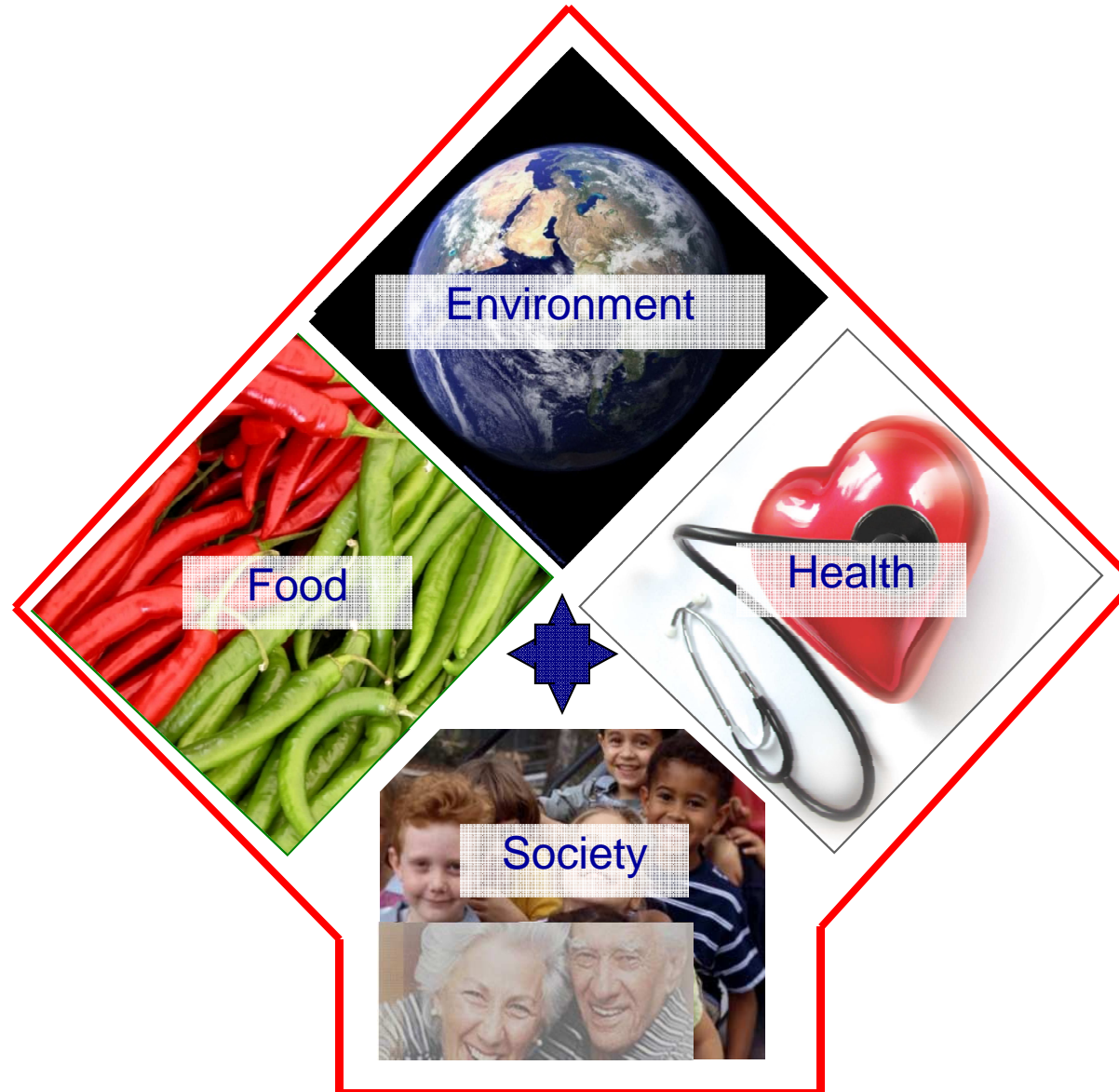
former. HSSAZ
Hochschule für
Soziale Arbeit
Zürich

former. HSW
Hochschule
Wädenswil



***founded September 2007**

Strategic fields Departement Life Sciences und FM



Disciplines of the university:

- Architektur, Construction engineering
- Health
- Applied linguistic
- Life Sciences and Facility Management
- Applied psychology
- Social work
- Engineering
- Management and Law

Institut of Facility Management

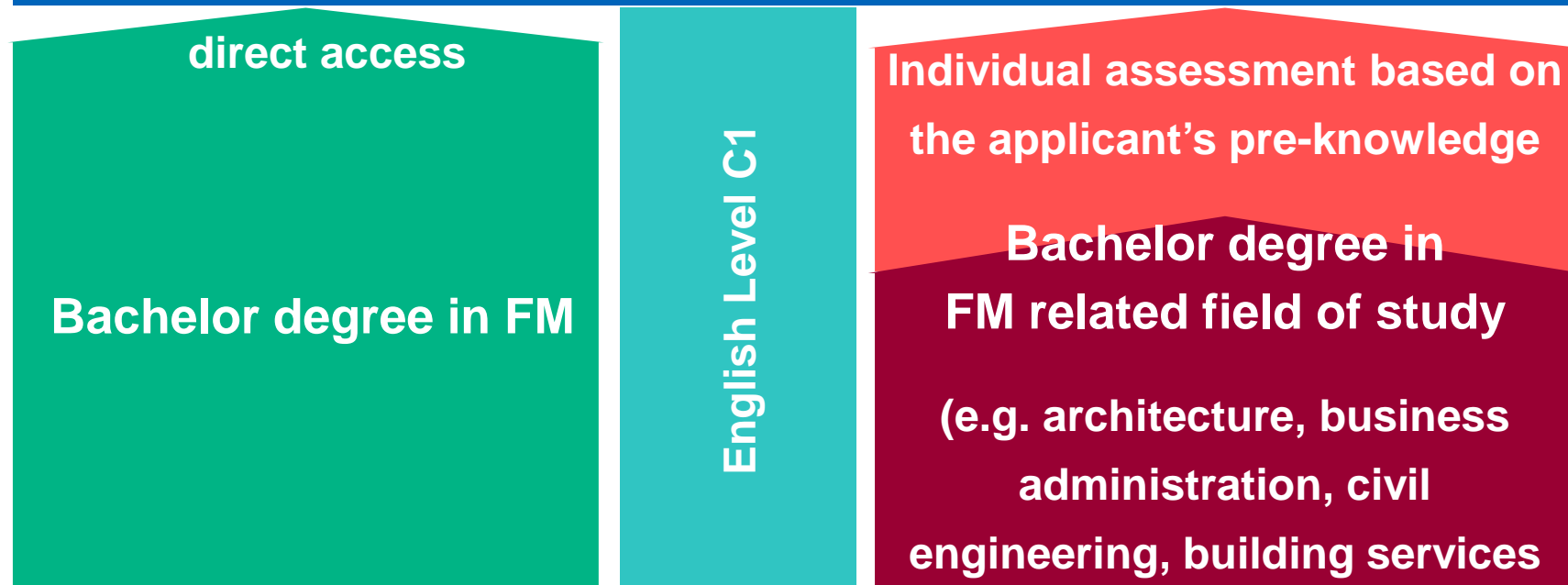
Employees end of 2011 persons (VZÄ)

Prof./Lecturer	22	(19)
Assistents	26	(16)
technical employees	3	(2)
Total	51	(37)
Increase 2011	11	(4)

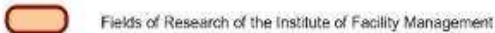
Master of Science in Facility Management

Admission Procedure: Requirements

Master of Science in FM

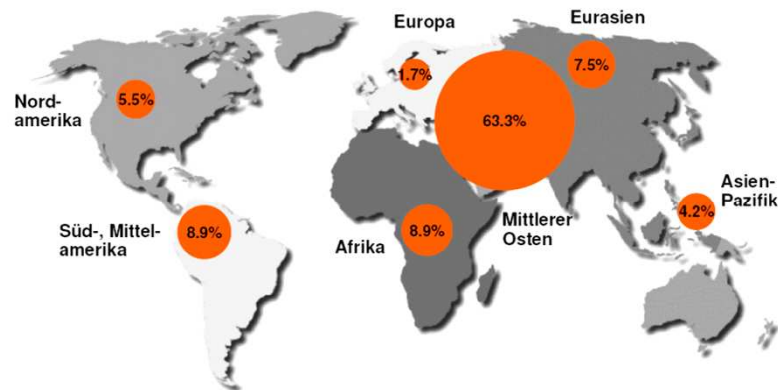






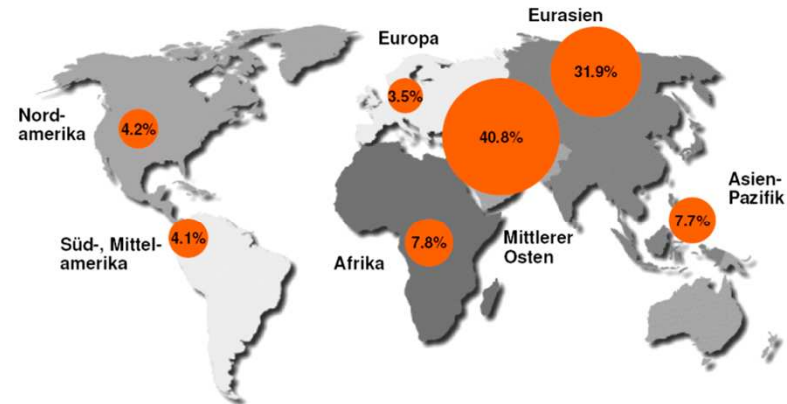
Consumer FM

Oilreserves



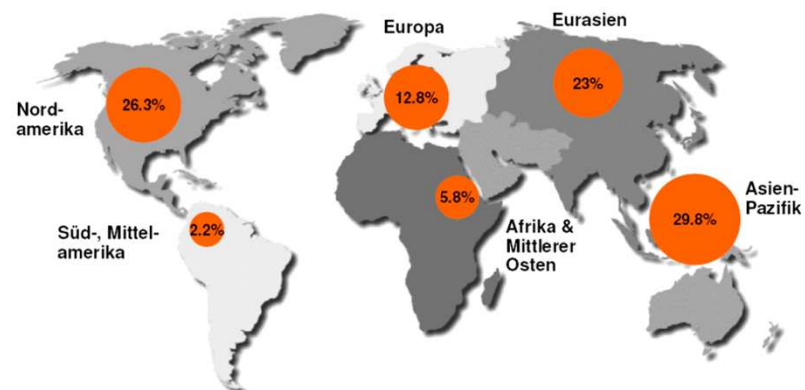
Quelle: BP Statistik 2004

Gasreserves



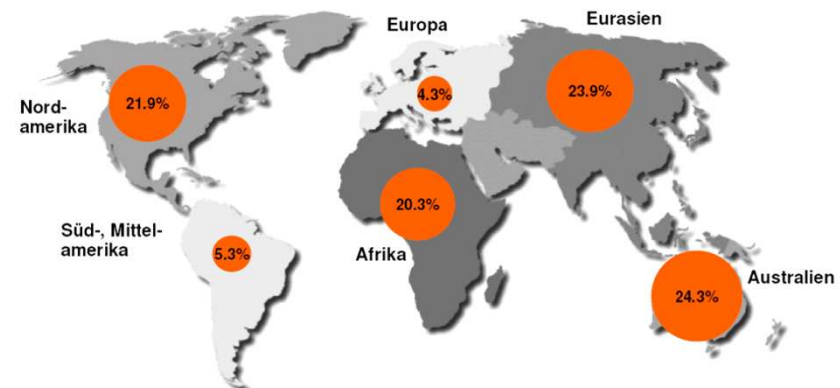
Quelle: BP Statistik 2004

Coalreserves

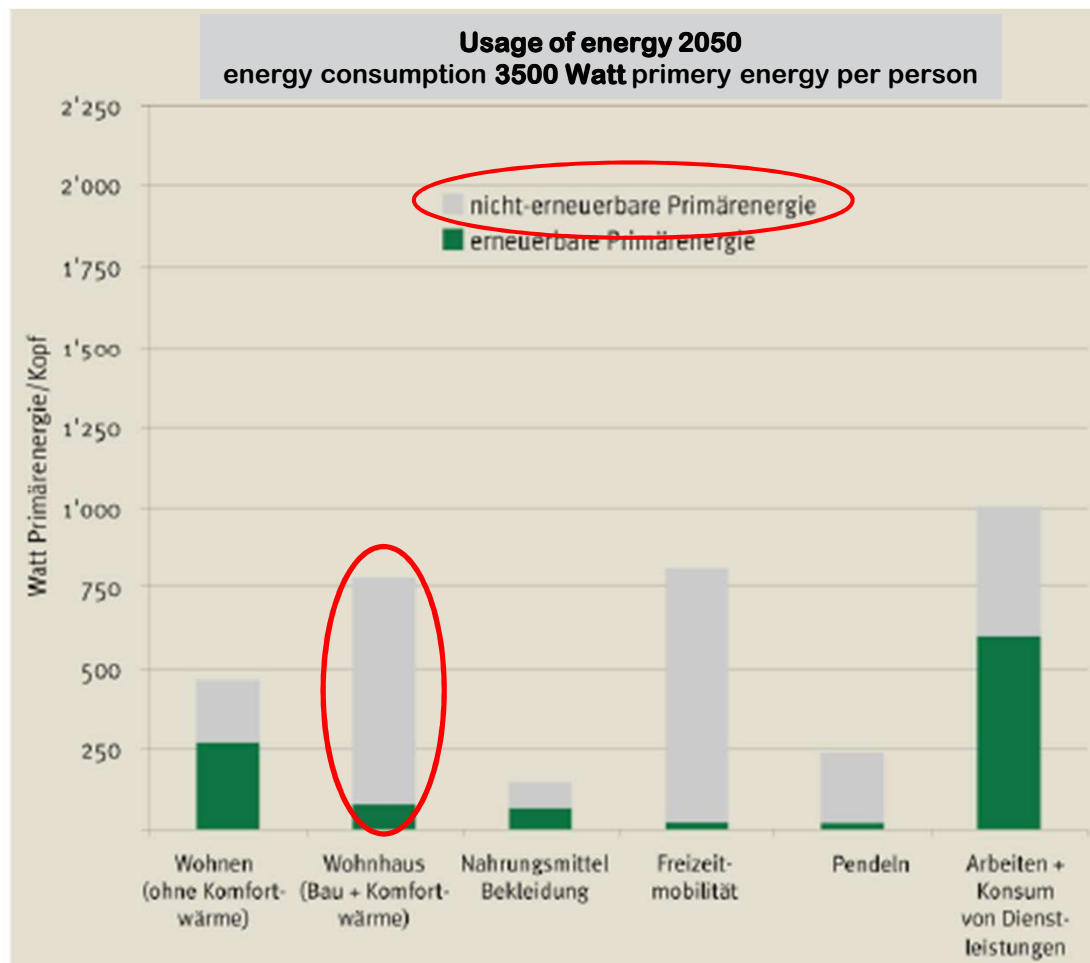


Quelle: BP Statistik 2004

Uraniumreserves



Quelle: OECD/NEA, 2005



Vision 2000 Watt-Society:

A power requirement of 2000 watts (1500 watts and 500 watts of renewable energy sources of fossil energy) for

- living, construction and thermal comfort
- food and clothing
- leisure mobility
- commuting to work
- work and consumption of services

* Ellipson, 2006

Measures for energy efficiency:

- regulations
- financial incentives and subsidies
 - CO₂ tax in the building sector
- renovation manager (Facility Manager!)
- increased market transparency and better information for the building sector
- education and training measures
 - Courses for building professionals, investors and property managers
- building energy certification
- renovation obligations

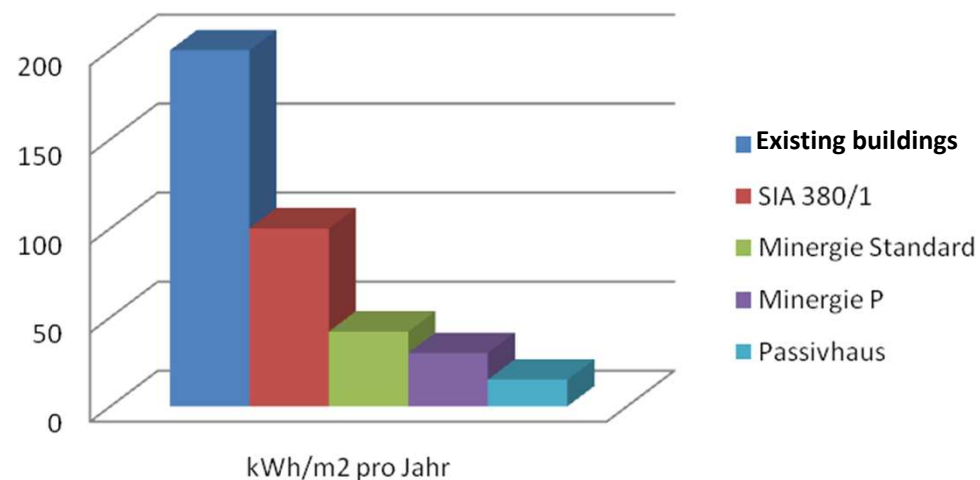
24.08.09 Bern

All 15,000 buildings energy performance certificates discounted by the cantons (GEAK) have been ordered **within three weeks**. The federal government has supported the introduction of the GEAK passes by lowering the price including expert report by grants to 200 instead of 1200 francs. The action of the government is now complete. *

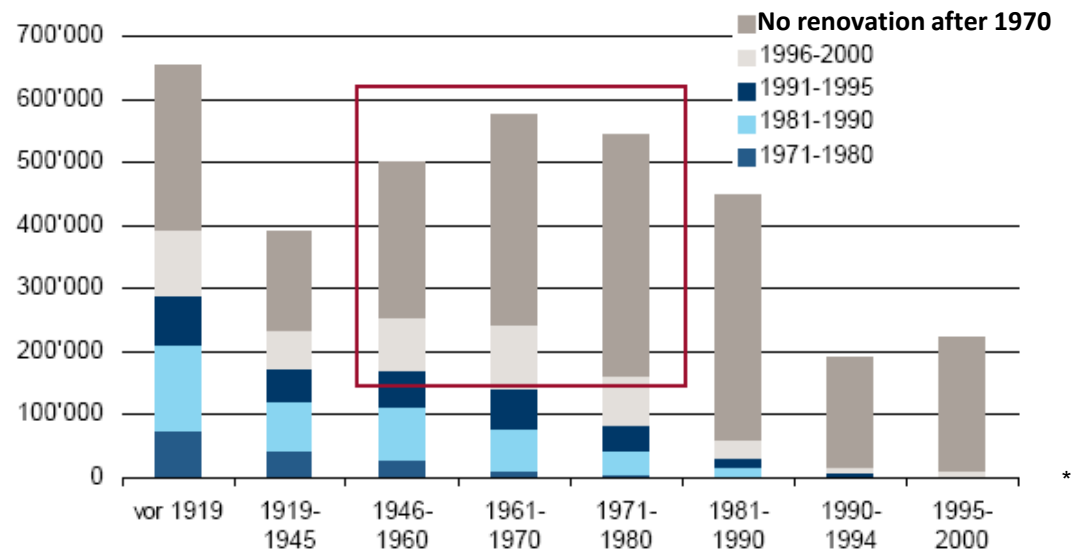
Efficient energy management:

- An energy-efficient building shell and good building services engineering are opportunities to save energy
- A huge potential exists in an energy-efficient management and use of property (facility management)
- The behavior of the user plays an important role

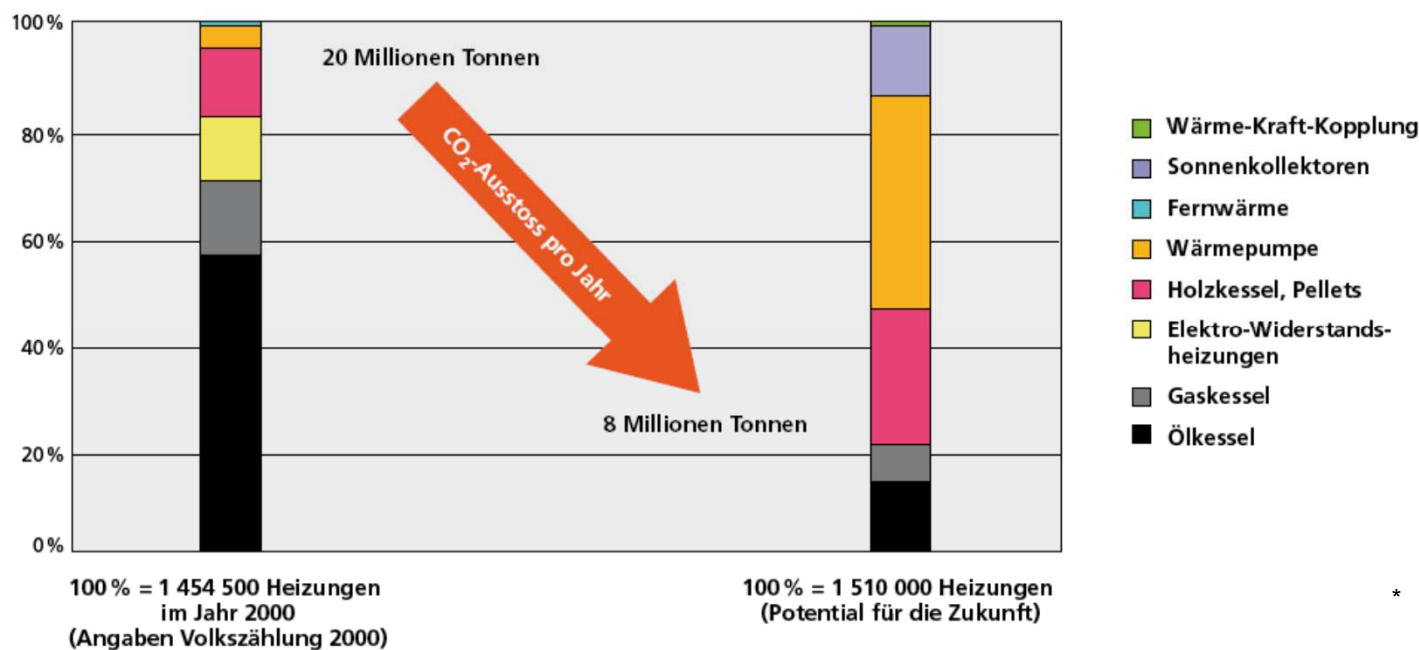
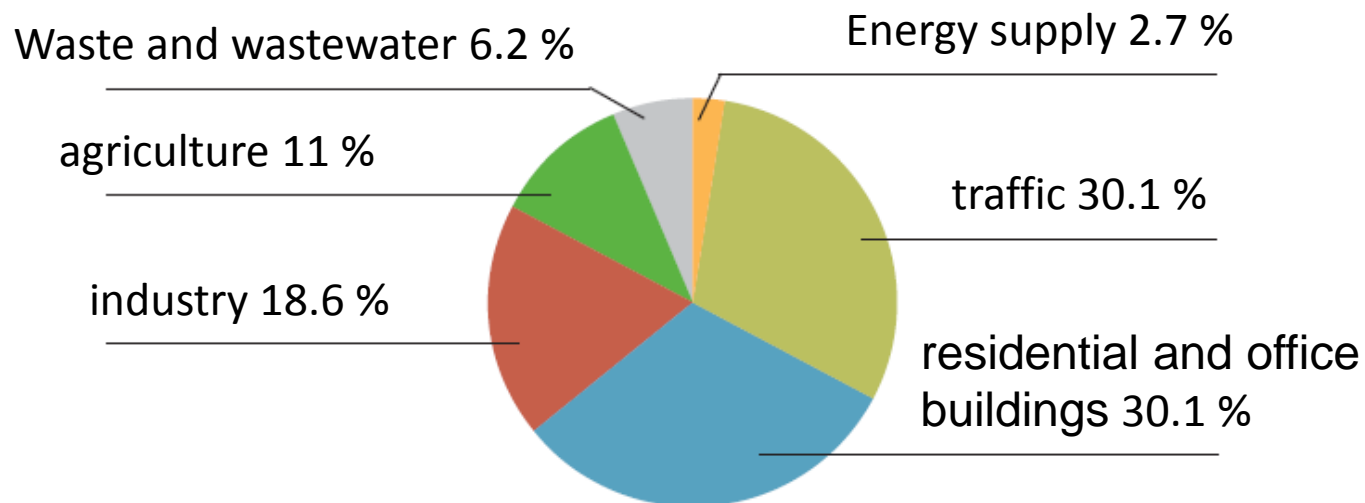
Energy demand due to different building standards 2008



Construction and renovation period of the Swiss housing stock

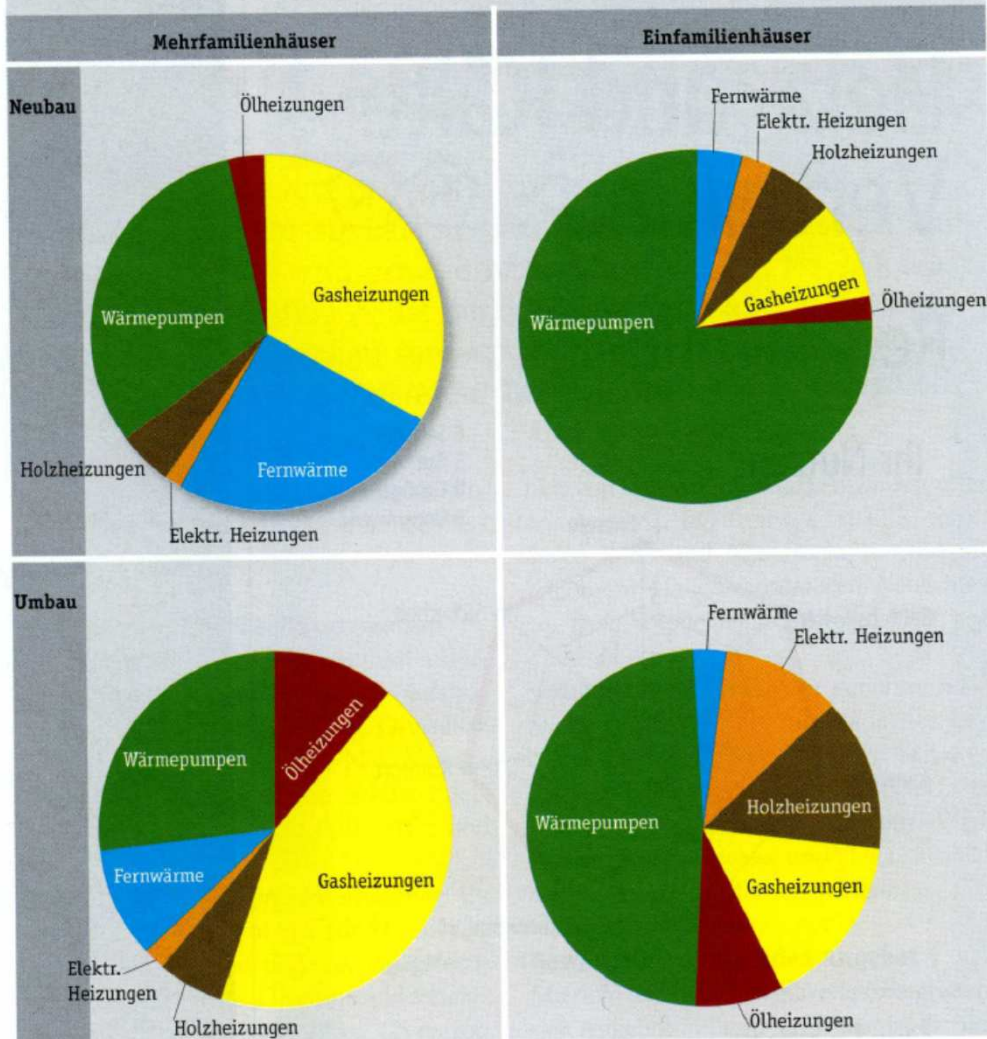


* Credit Suisse, 2008



* Bundesamt für Energie 2009

Wärmepumpen und Gasheizungen holen auf



Marktanteile verschiedener Heizsysteme im ersten Halbjahr 2008, gemessen an den Bauinvestitionen.
Quelle Baublatt Infodienst; Wüest & Partner

But,
far more than **half of**
the existing buildings
are equipped with an
oil or gas heater!

Reasons for the renovation backlog are:

- buildings that have **no need for renovation**.
- The **cantonal laws** that apply only to conversions and/or extensions.
- The **dilemma investor-/user**. Often the owner is not the user and is not interested in improvements in energy efficiency, as energy costs can be passed on to the tenants.
- The **condominium**. In the area of condominium ownership at least one party has a different opinion as the others. That leads to insufficient and heated discussion with the result that no renovation is done.

Roles owner / architect / planner:

- The initial situation is characterized by **uncertainty** on the part of the owner
- As with any consulting work, the agent (architect, planner, contractor) has to **build confidence**.
- Very often, the investments are high
- The quality of the presented concepts is for the owner often difficult to judge and it turns out only after the implementation.
- Actually, in practice, the owner himself should become an expert
- There is thus a dilemma. A good decision is the **involvement of a facility manager**, as he exclusively looks to the use phase and thus represents the owners point of view.

Building as an infrastructure :

- A city is dominated by buildings.
- Neglected buildings are despite a private matter a public concern
- Buildings are not only for earning money. Buildings are to be kept repaired infrastructure
- Regular maintenance is often less expensive than a "redevelopment" after many years
- The decisive factor is the usage.
- Ongoing maintenance and operating costs in the long run more important than capital costs

Facts:

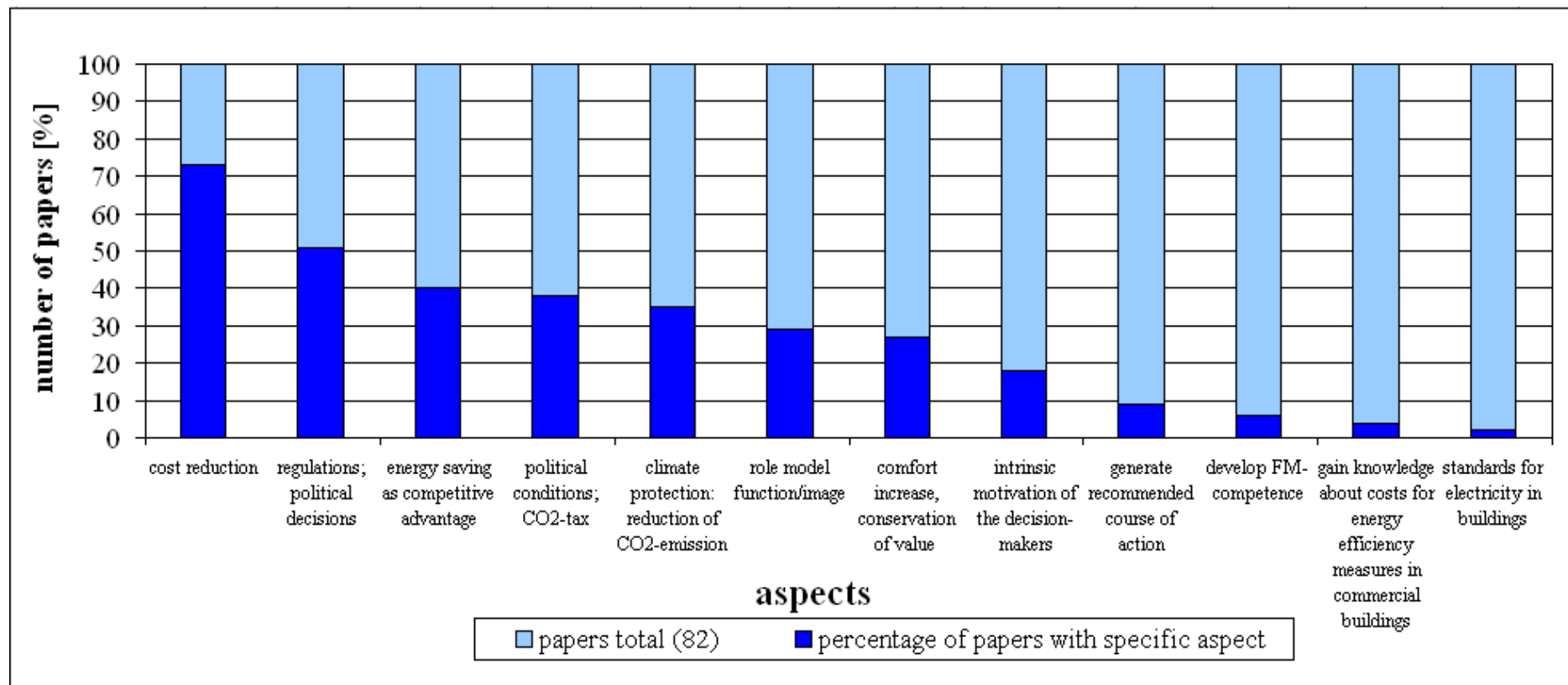
- **Most of the heat** used for space heating is still **generated by burning fossil fuels**.
- A simple **measure to reduce** this **consumption** is to **reduce the energy requirements**.
- **Energy management is** one of the **core businesses of facilities manager**.
- In recent years the consumption of energy and the **costs** involved **have become increasingly important**.

Literature search:

- The german language **literature** of the last ten years **was analysed**, **concentrating on** the following **important aspects**
 - **motivation**
 - **methods and measures**
 - **obstacles**
 - **experience**
 - **facility management**

Motivation:

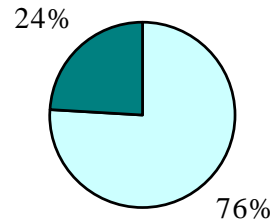
Most commonly-mentioned aspects for energy management



Motivation:

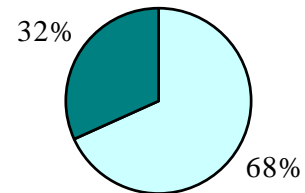
Mention of financial aspects

reports of SME, industry
(33)



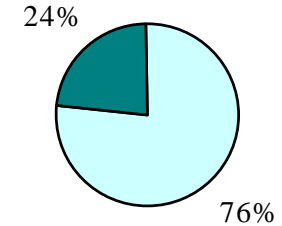
□ percentage of paper with this aspect
■ others

political papers
(22)



□ percentage of paper with this aspect
■ others

comprehensive papers
(59)

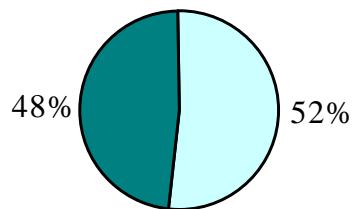


□ percentage of paper with this aspect
■ others

Motivation:

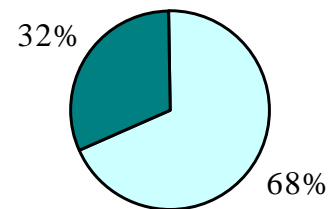
Legal regulations as a motivation for energy management

**reports of SME, industry
(33)**



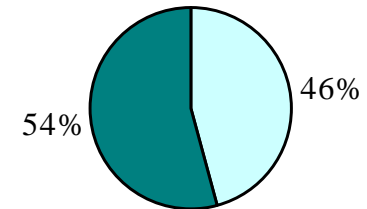
□ percentage of paper with this aspect
■ others

**political papers
(22)**



□ percentage of paper with this aspect
■ others

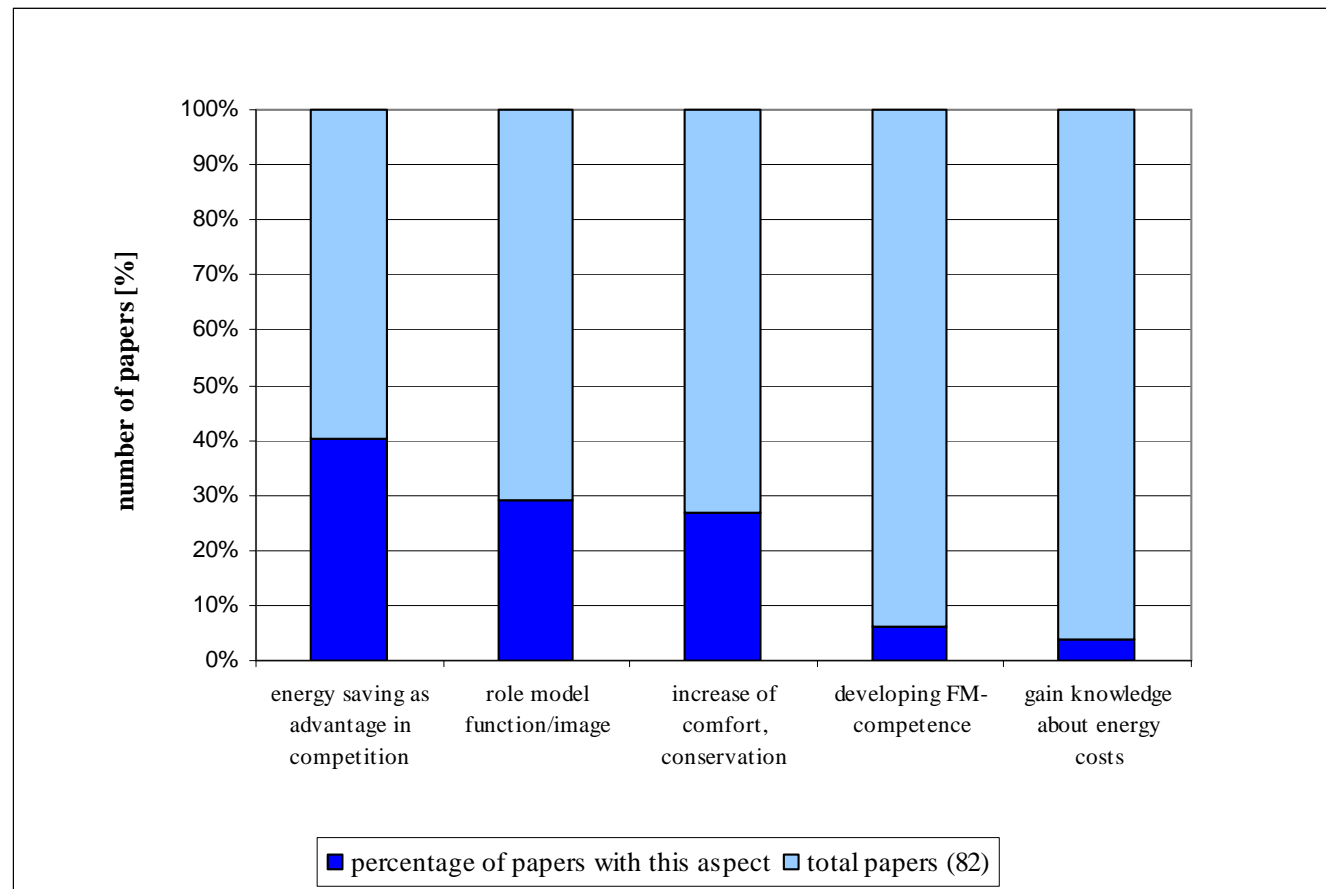
**comprehensive papers
(59)**



□ percentage of paper with this aspect
■ others

Motivation:

Entrepreneurial aspects as motivation



Methods and measures:

- First step is an **analysis to determine** the areas to be addressed and the **measures that are feasible under the current financial and structural conditions.**
- It may comprise an analysis and evaluation of the existing documents on energy data, such as energy supply contracts, energy invoices and data regarding energy consumers.
- An inspection by an external consultant is also advisable.

Methods and measures:

- Common technical measures are waste heat utilisation, heat recovery, control adjustment, thermal insulation of buildings, replacement of old installations and use of renewable energy.
- Beside these technical measures, it is equally important to carry out organisational measures.
- Energy management needs to be identified as part of facility management. This is usually not the case, especially if no facility management exists in a company.

Methods and measures:

- One person or department must be explicitly responsible for energy management and should have the necessary decision-making authority.
- Nearly one-third (27%) of surveyed papers indicate that a mission or a goal to increase energy efficiency or energy saving should to be formulated.
- This is a key part of the energy management strategy and will form the basis for decision on further measures.

Methods and measures:

- An energy saving vision should lead users in the company to become aware of their consumer behaviour and reduce consumption.
- Users should therefore be involved in producing motivation and ideas, because energy saving measures, which require behavioural changes, must be broadly accepted.
- One good way of achieving improvements is a seminar for all employees.

Methods and measures:

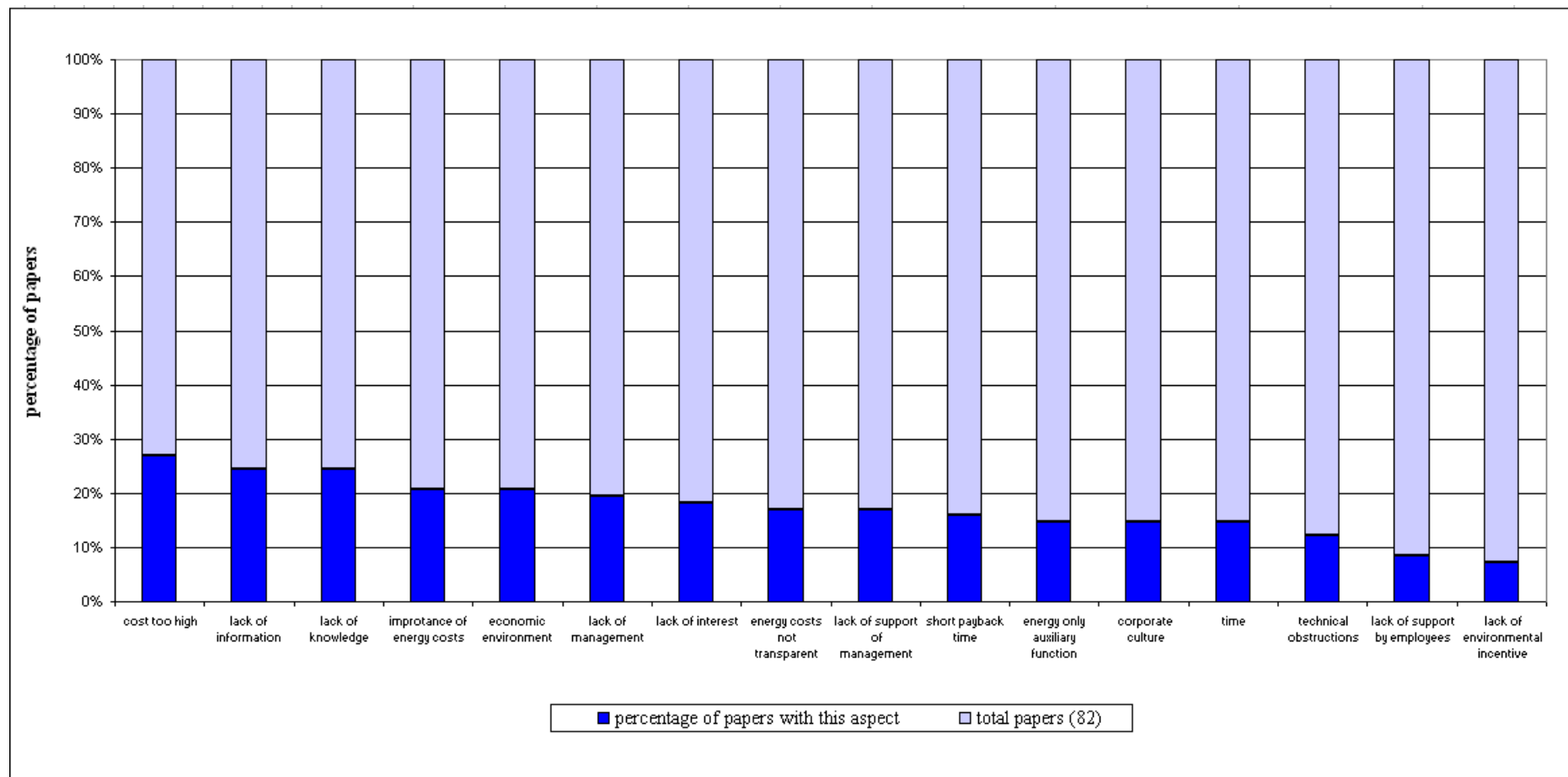
- Immediate measures are usually the most cost-effective ones.
- They are based on behavioural change and adapting equipment and the operating hours of installations.
- They are very obvious and feasible without major financial or staffing expenses.

Methods and measures:

- The monitoring of measurements is the second major task.
- Controlling energy consumption and monitoring energy costs allows those responsible to determine the effectiveness of measures implemented and to propose necessary improvements.
- Costs and consumption controls should be noted at least once a year and monitored over a longer period.

Obstacles:

Most commonly-mentioned obstacles for energy management



Obstacles:

- For many business the most frequent, and therefore the main obstacle appears to be the high cost of proposed measures.
- Even the initial analysis, which is usually the first step, may involve considerable expenditure.
- The estimated savings as a result of potentially efficient energy management are not high enough to overcome resistance to spending money.

Obstacles:

- Lack of information about opportunities for better energy efficiency, together with a lack of knowledge on the part of the main persons involved, are key reasons why potential savings are not exploited.
- Often, an energy consultant would be necessary to fill in the gaps in knowledge. But as the costs of hiring an energy consultant are only one of the first components in a whole package of expensive measures, companies are reluctant to make this commitment.

Obstacles:

- Due to the fact that energy costs are low compared to total operating costs, there does not seem a need to take measures in this area
- Together with the main obstacle, the fear of high costs, this factor may ensure that energy management is hardly considered at all, and efforts to initiate a more detailed investigation will not be made.

Obstacles:

- The cost of investment in this sector must show either a financial effect or a substantial payback, or at least make a positive impact on the core business.
- Massive price cuts for the purchase of electricity are not beneficial for energy-efficiency measures. Low energy prices provide little justification for investment, because the payback period is delayed.

Obstacles:

- Measures to increase energy efficiency can only be taken and implemented sustainably if management recognises and supports energy management.
- If directors have little or no interest in the subject, the result is a disincentive for such projects, because sometimes measures need to be enforced despite the doubts of employees and persons in managerial positions.

Obstacles:

- Energy is often a vital need for industry and SMEs, but they see the provision of energy as more important than its efficiency.
- For this reason, and because of fears that savings could affect the quality of products and processes, projects to ensure more energy efficiency are not carried out.
- Energy management is often a secondary management function with low significance compared to other daily business concerns.

Experience:

- More than one third of the examined papers state that with active energy management on a long-term basis advantages and further savings are to be expected.
- With exchange of experiences in groups and a common approach in newly forged networks positive experiences were learned.
- Doing energy management within a network is much faster and leads to more success.
- Through the formation of groups and comparison with the different groups as a competition encourages more energy efficiency.

Experience:

- Very often a benchmarking is missing. The reason for that is high diversity of companies even within the same business.
- The involvement of users is necessary.
- One is intensive information provision involving workshops and interviews, and another is the active participation of users in an energy management programme.

Facility management:

- Where facility management is mentioned, the benefits of the professionals involved in the company's management are clearly highlighted.
- This underscores the fact that facility management as a separate function has not yet been sufficiently established and is still inadequately positioned.
- The potential is there, but there is a lack of awareness that well-trained, competent professionals can carry out the work of facility management – and energy management as a vital part of their job – efficiently and to the economic advantage of the company.

Conclusions:

- The demand for facility managers that have the expertise necessary ability to make the right decisions in matters of energy management is definitely there.
- One important obstacle is that managers are not generally encouraged to be sensitive to environmental and energy concerns.
- In every case where their awareness has been raised and measures taken, energy management has been a success story.

Conclusions:

- Facility management is the discipline that can best be recommended to provide the energy management professionals required, but unfortunately facility managers are not prominent in the organizational structure of most companies.
- wherever a facility manager is given clear responsibility for energy saving, success generally follows.
- the infrastructure of a company used by everyone (facilities, which make everything else possible) often goes almost completely unnoticed.

Conclusions:

- Broadly based training for facility managers in both technical and business knowledge and management must form the basis for a campaign designed to sensitise business to the need for energy management.
- The most efficient and effective influence will be generated when the facility manager is also in a position where facility-related expertise and the corresponding responsibility are 'bundled' in his position.
- Where strategic decisions with changes for the facilities are about to be taken, the facility manager must be in the team from the beginning.

Conclusions:

- If active energy management as a core competence of facility managers becomes a standard in companies, and is anchored in them through the necessary delegation of responsibility, this will open up energy-saving and cost-reduction potentials that are comparable with the results achieved by other company divisions.