METHODS AND EXPERIENCE IN IMPROVING COMPETITIVENESS THROUGH COST REDUCTIONS RESULTING FROM THE RESTRUCTURING OF INTERNAL PROCESSES, QUALITY MANAGEMENT AND OTHER METHODS IN DISTRIBUTION NETWORKS

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SUMMARY

The transition from a monopoly to a competitive situation results in a fall in revenues generated by German energy utilities.

Cost-cutting programs are being designed to enhance the competitiveness of utilities.
A set of coordinated initiatives is needed to achieve these cost reductions. This paper describes such initiatives as Benchmarking activities, rethinking processes, management by objectives, budgeting and capital expenditure Controlling, TQM and organisational changes, and gives examples of their implementation. Only a complete package of such initiatives ensures the involvement of all levels of a company and their successful implementation.

1 BACKGROUND

The New Energy Sector Act approved by the German Parliament on 28 November 1997 and published in the Federal Law Gazette on 24 April 1998 opened the German electricity market to competition. Today, the impact of competition is being increasingly felt. Large customers are the first to seize the new opportunities by demanding better Reliability from electricity suppliers which may be located far from them. The price of electrical energy is no longer determined by electricity suppliers but by the market. Each energy utility therefore must brace itself to achieve sustainable business success in spite of considerable declining energy prices in the market. This can only be achieved by drastic cost-cutting programs. The cost of the electricity consist of three components: generation costs, distribution costs and other costs. For the time being, competition mainly concerns generation costs. In this respect, it is imperative to achieve the highest possible savings with regard to the other costs.

Distribution costs, i.e. the costs accruing for the transmission and distribution networks, seem to be of secondary importance when it comes to competitiveness. This is understandable, given the fact that networks have retained their monopoly position and are only required to ensure non-discriminating access for all interested parties under conditions of equal cost-sharing. However, reality appears different. Monopoly sectors will come under increased seutiny by the regulators. This will stabilize third party access charges and reduce prices. An energy utility whose network costs exceed the regulated price will no longer be able to cover its costs. Its competitiveness will, thus, be considerably reduced. To remain competitive, each energy supplier will make efforts to keep the energy price for its customers as low as possible. This alone makes it necessary to avoid unnecessary network costs.

As experience made in the deregulated Scandinavian markets shows, a drastic decline in electricity prices is to be expected. Efficient cost reduction management must be implemented to ensure that the utility will continue to make a profit despite declining sales. Efficient cost reduction management means to make use of cost-cutting opportunities in each and every area. Implementation of cost-cutting programs in the transmission and distribution networks is a must for all electric utilities which want to remain successful.

The following sections describe how Bewag, the leading energy utility in Berlin, rises to the challenges of cost reduction management in its distribution networks.

2 TOOLS TO ENHANCE PROFITABILITY

Given their past monopoly position, energy utilities had no reason to worry about the profitability of their business. Their efforts were primarily focused on supply reliability. The resulting technically-oriented approach led to high reliability and surplus capacities, both in the generation and in the network area. Installation of new technical equipment was mainly aimed at ensuring high reliability under any circumstance, even if it was unlikely it would ever be needed. Cost-benefit analyses were of secondary importance. Industry standards were often seen as not good enough. Each utility developed its own safety philosophy and safety requirements.

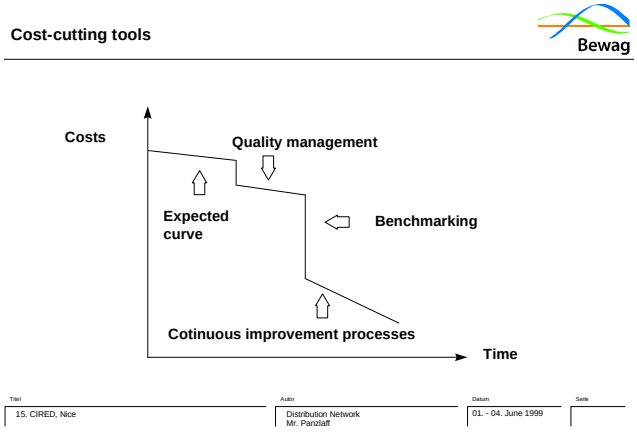
As a rule, utilities can rely on comfortable capacity reserves when faced with the future. What is really necessary? What is the cost-benefit ratio? On the other hand, the competition-oriented approach embraced by utilities must focus on the customers, their demands for low-priced

energy, for supply reliability and for the extra of services free of charge.

Rethinking the way a utility does business is the most powerful tool to enhance economic efficiency (picture 1).

This rethinking must be translated into concrete measures. With this aim in mind, Bewag has applied the following tools:

- Benchmarking activities
- Management by objectives
- Capital expenditure and cost Controlling
- Introduction of systems aimed at involving all employees in initiatives to improve the company's performance such as CIP (continuous improvement processes) and TQM (Total Quality Management)
- Changes in the organisational structure (introduction of center-based structures)



Picture 1

The tools mentioned here are well known. However, it is important to note that one method alone will not lead to success. Only a package of interrelated measures will ensure the necessary support for change through enhancing motivation and providing leadership. The following chapters describe how these methods have been applied at Bewag.

3 INITIATION AND IMPLEMENTATION OF RETHINKING PROCESSES

You cannot hardly find a German utility which did not start a rethinking process in the early 90`. The earlier and the more consistently these processes were introduced, the easier it was to bring about the necessary changes. The difficulty was to convince the whole company - from the top to the bottom - of the necessary and sometimes painful changes and to involve the trade unions and works councils in this process. At first, this process met with the resistance of managers at different levels since it often meant questioning existing values, tested methods and experience gathered over decades. A new way of thinking cannot simply be ordered from the top. It requires a process which takes months at each management level. It will unavoidably lead to the replacement of those managers who do not have the strength, the will or the ability to develop and implement new ideas.

A closed market means a new way of thinking and the initiation of far-reaching changes in Bewag's distribution network. Based on an analysis of the situation, the future responsibility of the distribution network for the overall performance of the company was determined. With this in mind, a list of nearly 50 different items was investigated. To start the ball rolling, specific work orders were issued.

The starting point of the ensuing brain storming exercise was that all existing practices could be put into question. The only restriction was to put forward only ideas that concerned the distribution network and could be implemented.

After some initial scepticism, the new concepts were enthusiastically received and consistently implemented. This resulted in a new assessment of the maximum use of operating equipment, transformers and cables in cheaper cable route profiles, the procurement of simpler and cheaper equipment in line with industrial standards and a simplification of operation processes. Recognition that the old and expensive way of working was not in line with technological developments often led to a reduction in costs. It was decided for example to do without the expensive bedding of plastic-insulated cables in stone-free soil, a practice which dates back to a time when lead- or aluminium-covered cables were used. In line with present knowledge, it was also decided to give up the precautionary measure of using only multiple sheath medium-voltage cables (water/tree issue).

The introduction of a standard transformer with open cooling and no additional protection such as Buchholz or thermal protectors resulted in considerable savings. A change in assessment of the loading of distribution transformers enabled a release of several hundred transformers. This brainstorming exercise resulted in significant savings amounting to millions of deutschmarks.

4 BENCHMARKING ACTIVITIES

Like other companies, utilities are convinced that their way of working is correct. However, such an approach makes companies blind to possible improvements. Internal comparisons between different departments provide an inappropriate tool to overcome this situation. Only a comparison with other independent companies operating in the same or in a different sectors at a national or, indeed, international level, will help identify an existing scope for improvement.

Bewag started its first Benchmarking activity by comparing its distribution network with four other German utilities in 1995. Initially, these activities met with a sceptical response within the organisation. Internal departments were convinced that their way of working was correct. Due to the regional organisational structure of the distribution network in Berlin, there had been previous internal comparisons of different Bewag units. However, this first external Benchmarking project rapidly developed dynamics of its own. It revealed surprising differences in costs. Soon, it became an accepted tool to improve existing processes and to cut costs.

None of the companies involved had any previous experience with Benchmarking processes and no consultants were involved. All necessary measures had to be carried out by the companies involved. It was agreed to study thirteen core processes of electricity distribution which covered most of the range of activities carried out by distribution networks. In each case, the comparison involved personnel expenses, costs of material, costs of external services, total costs and the duration of the specific process. The processes investigated were connection of a low-voltage customer, connection of a medium-voltage customer, trouble-shooting in low-voltage and medium-voltage networks, road construction or erection and connection of a secondary substation. Each utility determined its own cost by means of a model process jointly defined in advance. The working group concentrated its activities on the development of clearly defined process models.

This approach to Benchmarking had the advantage that it brought the responsible personnel of all utilities in direct contact with each other. This made it easier to find the causes for differences in costs and to quickly initiate improvements.

The disadvantage was that all the statements made referred only to the pre-defined model process. This is not enough information for staff justifications or overhead cost justifications.

This Benchmarking project resulted in annual cost reductions of over DM 10 million for Bewag's distribution network alone. The other utilities achieved similar results.
No company was able to be the best in each and every aspect. Each could learn something from the others.

All the utilities involved in this Benchmarking project compete today in the market place. Nevertheless, the people who had been responsible for this project in the individual companies have remained in contact. It cannot be excluded that a second initiative will be launched on the basis of the experience gathered. This proves clearly that there are no losers in Benchmarking. All participants have something to gain and will strengthen their position in the national and international markets.

In 1996, Bewag participated in a Benchmarking project focusing on distribution. Initiated by a consultanty with the support of VWEW (Verlags- und Wirtschaftsgesellschaft der Elektrizitätswerke m.b.H), this Benchmarking project involved 23 German companies. The project in Germany was modeled along the lines of two previous Benchmarking initiatives carried out in the Netherlands. Two different ratios were defined: customer installations per full-time employee for customer-oriented processes and the number of transactions per full-time employee for technical processes. The productivity of the individual processes compared differed by several hundred per cent between the companies investigated. The presentation of the results allowed the participants to draw particular conclusions as to the efficiency of their staffing policies. Given the anonymous nature of this project, it was however difficult to find out more about best practices. As a result of up-coming competition, some companies had also refused to provide certain data.

For Bewag, this Benchmarking activity proved very interesting. It expanded the focus resulting from the first project and provided supplementary information with regard to the productivity of Bewag's personnel. These findings are important when it comes to defining the number of people needed in the new centers to be established.

However, Benchmarking projects are but a first step to new findings and cost reductions. In order to benefit from such initiatives, it is equally important to translate these findings rapidly into practice. In the course of the Benchmarking project, employees realised the necessity to change their previous way of working and to accept new and better process structures. This proved helpful in the implementation of the necessary changes.

All Benchmarking activity have one disadvantage in that they paint a picture of a specific moment in time. What is best practice today, can easily be nothing more than an average performance tomorrow. This is the reason why Benchmarking activities must be institutionalised. They must become a permanent process. The distribution network of Bewag sees these comparisons with other German utilities only as a first step. The preparation of Benchmarking activities with international utilities is already underway.

5 MANAGEMENT BY OBJECTIVES

The development of ideas is just one side of the coin. It is equally important to implement them. In order to turn ideas into success, it is necessary to develop them into objectives and to design control and support measures for the achievement of these objectives.

The management by objectives concept was introduced in the distribution network as well as in other organisational

units of Bewag four years ago. At the beginning of each business year, executives set themselves specific goals for the coming 12 months. Several feedback discussions are held in the course of the year. At the end of each year, the achievement of these aims is assessed. Intensive efforts are made to reach these objectives because they are instrumental in determining the variable pay of executives. The point is to set demanding aims which can nevertheless be fulfilled. The concept is not only a top-down imposition of goals, but objectives can either be proposed bottom-up or top-down. All sorts of objectives can be agreed, provided that they are quantifiable. The following are a few examples of goals set in the past:

- to reduce the number of staff needed by *X*%
- to reduce the capital expenditures needed by *Y* %
- to increase the average loading of the distribution transformers by *Z* %
- to reduce the time of handling customer requests to maximum of *N* days.

In the course of the planned restructuring and the introduction of center-based structures it is envisioned to agree on certain binding economic indicators with the newly established centers. The solution preferred at the moment is to define an EBITDA (Earnings Before Interest, Tax, Depreciation and Amortisation) for each individual center.

6 CONTROLLING OF CAPITAL EXPENDITURES AND OTHER COSTS

Each company has to plan not only its revenues but also its capital expenses and other costs in order to ensure its liquidity and business success. While this has always been the case, there is now more pressure on the cost side, on capital expenditures and other costs due to declining revenues. This requires scrutinizing each item to be budgeted for potential cost reductions and to continuously monitor the budget during the business year.

Bewag's capital expenditure program had reached sky-high proportions due to the former insular position of West Berlin with the resultant need for higher supply reliability and due to the necessary modernisation of the network in the Eastern part of the city following reunification. In the run-up to liberalization of the energy market, the capital expenditure program of the distribution network had to be stripped to a fraction of its original size to cover just what was absolutely necessary. A success story was the Potsdamer Platz project where a capacity of 40 MW was expected for a small and densely built area. Instead of building a completely equipped new substation with a costly 110-kV feed-in, as we would have done in the past, substations situated at the periphery were used for the supply of this area. This required some network restructuring and a load transfer to substations situated further out. The decision was made using load and efficiency studies. For the first time, priority was given to tap all existing reserves rather than creating new surplus capacities.

A permanent investigation committee on capital expenditures was established with the goal to implement this new way of thinking throughout the six decentralized network sections forming the distribution network. This committee provides a platform for the individual network regions to mutually control the necessity and efficiency of each individual capital expenditure project, to identify possible cost reductions or to find substitute solutions which allow for a reduction or total deletion of the capital expenditure project. At the beginning almost all projects submitted had to be sent back for lack of clarity. Today, all projects submitted stand up to close examination. As a result, the capital expenditures of the distribution network declined by over 50%.

7 THE TQM CONCEPT

Total Quality Management is a management concept based on the involvement of all employees in an organisation. Its aim is to put quality at the centre of all efforts and to ensure long-term business success by satisfying customers. Successful TQM leads to an examination of all quality components and finally to certification according to DIN EN ISO 9002. Although such certification is a desirable global objective, the way leading to it is more important. What has to be avoided at all cost is a pointless flood of regulatory papers which enhances the administrative burden and paralyses the intellectual capacity of the individual. For the distribution network of Bewag, TQM (pciture 2) stands for the following:

T = Total
- involvement of all employees
- involvement of customers
- involvement of suppliers

Q = Quality
- quality of work
- quality of processes
- quality of the organisation

M = Management
- management quality (setting a positive example)
- promoting the ability to learn and to work in a team

Currently, the focus is on exploiting the nuggets of gold in the minds of the employees. Who else than the employees who do the day-to-day work can identify the obstacles preventing top performance or top quality. When involved in these rethinking processes, the employees will better understand the necessity of a new approach and will contribute to achieving the quality required for a sustainable business success. This kind of TQM aims at supporting the central corporate objectives, i.e.

- consistent customer orientation. This means to gear all activities of employees towards the justified requirements and expectations of external and internal customers,
- long-term quality orientation. This means a critical analysis of all methods and processes by continuously questioning their usefulness and permanently implementing improvements .

The more the employees are involved, the easier it is for the management to do without measures ordered from the top.

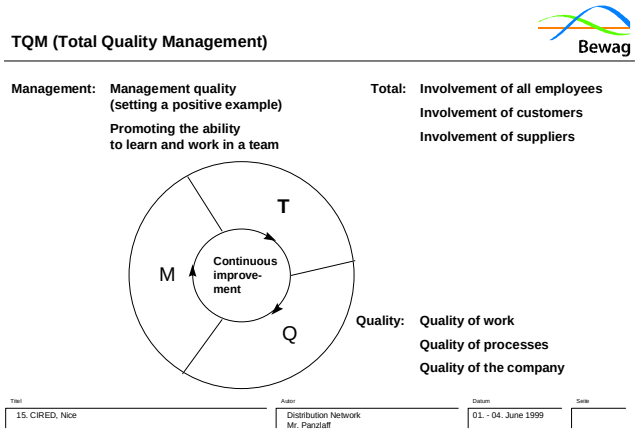
During the practical implementation of this TQM concept, a large number of employees declared their readiness to become so-called „Q messengers“, i.e. to spread the quality idea and to support other employees in developing and presenting new ideas and in translating them into practice. Naturally, employees benefit directly from these improvements by bonuses connected to the business success of the company.

A second initiative aimed at the continuous improvement of existing processes (the so-called CIP initiative) serves the same purpose. It is based on the same principles as TQM, but uses a different organisational approach: there are fixed CIP groups which work as a team in the search for improvements and provide support in translating respective proposals into practice.

Mid-1997 marked the start of the introduction of these ideas. The distribution network alone is pursuing nearly 100 proposals. The resulting cost reductions should be sufficient to meet the target for the 1997/98 business year of identifying potential cost reductions of at least DM 600,000. In addition, there were many important recommendations on how to define the value of customer satisfaction or how to simplify processes, which cannot be quantified in terms of money saved. However, what is most important is the employees' awareness that they can play an active part in these processes of change. The following are a few examples of TQM proposals:

- introduction of plastic tapes to mark cables
- improvement of waste disposal in the network area
- additional expenses incurred in connection with damages are no longer entered into the books (cutting out administrative expenses which would exced the revenues collected)
- introduction of a simplified and cheaper truck for distribution transformers
- access to data bases of suppliers
- fullfilling of an order only upon receipt of payment from the customer

The application of the above concept is still new to Bewag. Though the first successes are encouraging, a lot of support will be needed to firmly institutionalise these methods within the company.



Picture 2

8 ADAPTATION OF THE ORGANISATIONAL STRUCTURE

Many German utilities are changing their organisational structures. Some establish legally independent companies, e.g. for generation, networks, engineering services, while others restructure themselves by establishing individual centers which are made responsible for their respective performance. The reasons for these organisational changes are on the one hand the Unbundling requirement, i.e. the separation of the costs of generation, transmission and distribution. On the other hand, it is a must for utilities to restructure themselves in line with the requirements of the markets and customers in the new competitive environment. Furthermore, the restructuring aims at creating incentives for shrewd business sense based on a clear-cut cost and revenue orientation. The aim is to clearly show the contribution made by individual functions to the overall performance of the company. The strong vertical integration of functions leading to many interfaces in a transaction is to be abolished in favor of more flexibility and customer orientation.

Bewag has decided to establish a center-based structure. The necessary organisational basis is to be prepared and approved by the end of 1998. It is envisioned to implement the new structures in the first half of 1999. The center-based organisational structure of Bewag will ensure a new orientation towards customers, markets and competition by:

- reflecting the different dynamics of markets and competition with their respective risks and return requirements in the individual divisions (centers).
- making performance-oriented divisions better manageable as profit or service centers with personal responsibility.
- coordinating the individual specific centers through internal market mechanisms of Bewag.

- creating entrepreneurial freedom at all levels to enable the development of the necessary shrewd business sense.
- managing the centers on the basis of operative and quantifiable indicators such as budgets, operating result and EBITDA.

In addition, the center structure project will identify and implement cost reductions. The vertical deconcentration and horizontal concentration of business transactions carried out by centers will lead to synergies resulting in significant personnel reductions. It is important to include the overhead areas in these considerations. Future staffing policies must be determined on the basis of Benchmarking results.
The network department of Bewag will bring all network activities under one umbrella. It will lead to synergies between network planning, network management, commercial and management functions.

9 CONCLUSIONS

There is no ideal way to competitiveness. The key to success lies in personal responsibility for the performance of all organisational units including the distribution network and the involvement of all employees in cost-cutting efforts. In order to make full use of the resources available, utilities need an overall concept using different tools to tackle these tasks. The methods described are not new. A total management approach is also nothing new. Thus, the present paper describes some exemplary ways of how to translate existing know-how into practice to the benefit of the company. The success of a utility strongly depends on the efficiency of this transformation process. The smaller a utility is and the less its possibilities of diversification are, the more important it is to implement the above processes in an efficient way. Though a relatively small company in the German utility sector, Bewag is hopeful that it has embarked on the right way leading to cost reductions, and thus to enhanced competitiveness.