

2. Case Studies

**Measures implemented
in the PREMA programme
in Wolfenbuettel**

Less returns of dough due to improved organisational structures

Altstadt Bäckerei Richter, Germany

IN BRIEF

The wide range of products offered by the bakery (83 staff members, 10 branch shops) also includes a guaranteed delivery of fresh rolls during the whole day. To this end, the dough prepared and portioned in the central bakery are baked in the branch shops several times per day. In order to ensure that fresh rolls can be offered until closing time, a sufficient number of dough portions has to be available in the branch shops. After closing time, the unused dough portions are returned to the bakery, where they can be used to a certain (low) degree for the production of new dough. The remaining dough portions turn into waste and have to be disposed. Due to PREMA, the planning of dough requirements was improved: Experience as well as the consumption during the last few business days are now taken into consideration to a higher degree. If required, orders given by the branch shops for the following day can furthermore be modified by either the branch manager or the master. The fact that the staff members were informed about the value of the returns and the significance of exact planning of the orders contributed to a reduction of returns by approx. 30-40%.

THE PROBLEM AND ITS CAUSES

Prior to the participation in the PREMA programme, the number of returns was not an issue; they were considered unavoidable if the availability of fresh rolls in all branch shops has to be guaranteed until closing time. A detailed analysis of the causes for the returns led to the following results: imprecise planning, unsettled responsibilities, shop assistants rely on the branch management and do not participate in the planning of orders, wrong deliveries to individual branch shops. Since all of these causes can rather easily be redressed through organisational measures, it was realised that the number of returns definitely can be reduced without affecting customer service.

THE INFLUENCE OF THE PREMA MODULE “ENVIRONMENT-ORIENTED COST MANAGEMENT“ (EoCM)

The branch manager and a master of the bakery participated in the programme “Profitable Environmental Management” (PREMA) in Wolfenbuettel. In the framework of the EoCM module, they calculated the entire NPO costs caused by the returns of dough and realised that the costs of the returns were much higher than assumed. Following the analysis of causes, they therefore developed and implemented measures aimed at reducing the returns. The availability of fresh rolls until closing time is still ensured.



ACTIONS TAKEN WITHIN THE COMPANY

- Staff members were informed about the value of returned dough and the significance of exact planning of orders for the following day.
- Staff members of the branch shops were encouraged to contribute their experience regarding consumption patterns and the actual sales data during the previous days when placing orders.
- Management introduced the possibility to modify orders placed by the branch shops.

ENVIRONMENTAL RESULTS

Due to improved planning of orders, returns of dough could be reduced by approx. 30-40%. Thus, 3 to 5% less dough has to be produced, which leads to a reduced consumption of the input materials flour, energy and water. Furthermore, the – payable - disposal of excess dough could be reduced.

ECONOMIC RESULTS

Investment costs	none	costs for information of staff members are insignificant
Additional running costs	none	
Annual net savings	7,800 Euro	due to reduction of dough production and to a high degree due to reduced input of labour
Pay-back period	immediate	

ORGANISATIONAL IMPROVEMENTS

Due to the intensive discussion of the topic “returns of dough”, the awareness of staff members changed, so that they accepted and cooperated in the improved and more detailed planning of orders.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontry-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

ALTSTADT BÄCKEREI RICHTER

Carsten Richter
Dr. Heinrich-Jasper-Str. 65
38304 Wolfenbüttel
Tel.: +49 (5331) 883-112
Fax: +49 (5331) 883-115
Email: Richters-Altstadtbaeckerei@
t-online.de

Reduction of plastic waste and labour input through the use of reusable velcro polythene sheets

Altstadt Bäckerei Richter, Germany

IN BRIEF

For the pre-fermentation of roll dough, the bakery (83 staff members, 10 branch shops) used to cover 5 baking trays out of a huge pile with polythene sheets, which were subsequently disposed of as waste. Due to the participation in the PREMA programme, management resolved to reduce waste and waste disposal costs. This led to a replacement of the polythene sheets by reusable velcro polythene sheets which cover the whole tray container. This measure not only reduced waste, but also brought about a significant reduction of labour input.

THE PROBLEM AND ITS CAUSES

For the pre-fermentation of roll dough, 5 baking trays at a time were placed on a table and covered with a plastic sheet. This caused both a high consumption of one-way plastic sheets and a relatively high input of labour.

THE APPLICATION OF THE GOOD HOUSEKEEPING GUIDE

The PREMA trainers, the manager and a master baker participated in the company visit during the Good Housekeeping (GHK) training of the PREMA programme. By means of the checklist on “waste” of the GHK Guide, they checked the possibility of using returnable packaging material, and with the checklist on “storage and transport” they examined the use of containers on wheels for the transport of baking trays.



ACTIONS TAKEN WITHIN THE COMPANY

- Purchase of containers on wheels with reusable velcro polythene sheets, which are fastened to the sides of the container bearing the baking trays.

before:

dough on tray which are covered with plastic sheets → each tray had to be carried individually into the branch shop

afterwards:

container on wheels with velcro sheets into which the filled trays (left photo) are placed without plastic sheets → container is rolled into the branch shop



ENVIRONMENTAL BENEFITS

By replacing plastic sheets by velcro polythene sheets, the consumption of one-way plastic sheets could be reduced by approx. 40%.

ECONOMIC RESULTS

The economic evaluation depends on how the purchase of 15 containers on wheels is included in the calculations. The containers cost Euro each, including the velcro polythene sheets. Though these containers were purchased as a result of the PREMA training, they are not only used for pre-fermentation and the transport of roll dough, but also for the transport of the products. Therefore only a certain percentage of the purchase costs is to be included in the calculation of investment costs for the velcro polythene sheets.

	Option 1: The purchase costs for the containers are not taken into consideration	Option 2 The purchase costs for one container is taken into consideration	Option 3 The purchase costs for all containers are taken into consideration	
investment costs	none	350 Euro	5,250 Euro	For the purchase of containers
additional running costs	none	none	none	
annual net savings	5,600-7,500 Euro	5,600-7,500 Euro	5,600-7,500 Euro	Labour input reduced by 1.5 - 2 hours / day (previous costs for one-way plastic sheets (6 cent / piece) neglected)
pay-back period	immediate	< 1 month	8 -11 months	

ORGANISATIONAL IMPROVEMENTS

Since the velcro sheets are fastened directly to the container, it is no longer necessary to cover each pile of 5 trays separately. Thus, the labour input is reduced significantly. An additional reduction of the work load results from the easier transport of dough into the branch shops: The container with the trays is simply rolled into the shop; it is no longer necessary to carry individual trays. The reduction of work load also contributed to the fact that the staff members support the implementation of further measures of improvement (e.g. with regard to waste).

IMPROVEMENTS IN WORKPLACE SAFETY AND HEALTH PROTECTION

By using velcro polythene sheets fastened to the container and transporting the dough and other products in closed containers, the products are less exposed to contact with people and the environment. Thus, food hygiene is increased. Since less flour and other substances are released due to the new way of coverage and transport, cleanliness in the bakery is further increased.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U) – Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

ALTSTADT BÄCKEREI RICHTER

Carsten Richter
Dr. Heinrich-Jasper-Str. 65
38304 Wolfenbuettel
Tel.: +49 (5331) 883-112
Fax: +49 (5331) 883-115
Email: Richters-Altstadtbaeckerei@t-online.de

Energy savings through checking the compressed air system, maintaining compressors and shutting down of unused tubes

Altstadt Bäckerei Richter, Germany

IN BRIEF

The bakery with 83 employees sells its products in several branch shops. In the production, compressed air is required, e.g. for transporting the flour from the silos to the leaven machine, and for operating the icing machine and bread slicer. Energy requirements could be reduced by shutting down superfluous compressed air tubes, maintaining the compressors and checking the compressed air system for leakages. The working life of the compressors also is increased through maintenance.

THE PROBLEM AND ITS CAUSES

The generation of compressed air demands a lot of energy. Thus, the annual costs amount to EUR 250 for a system with an opening of 1 mm in diameter, a pressure of 6 bar, 8,000 working hours and a price of EUR 0.10 per kWh. Therefore the tubes should always be carefully checked for leakages, and unused parts of the tube system should be shut down, so that the compressed air goes only through those parts of the tube system which are required for the production process. The baking department has been used for 36 years, and has repeatedly been altered and extended. During these renovations, the compressed air system was branched out again and again, but only parts of the system are actually required today. Neither the employees nor the management of the bakery had been aware of the significance of the costs related to the compressed air system.

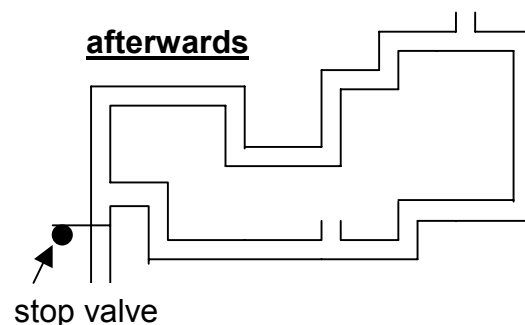
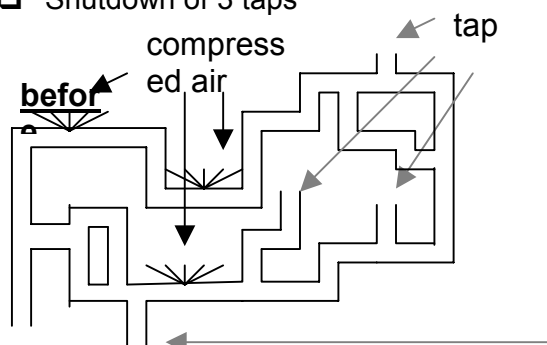
THE APPLICATION OF THE GOOD HOUSEKEEPING GUIDE

During the Good Housekeeping training in the framework of the "Profitable Environmental Management" (PREMA) programme in Wolfenbuettel, the PREMA trainers, the manager and a master baker, as well as a participant from another company took part in a company visit to the bakery. The checklist on energy contained in the Good Housekeeping Guide provided important hints regarding compressed air systems.



ACTIONS TAKEN WITHIN THE COMPANY

- Check of the compressed air system with regard to leakages
- Maintenance of compressors
- Shutdown of ca. 25 m of unused tubes
- Installation of stop valves to shut down parts of the compressed air system if not required for a certain operation
- Shutdown of 3 taps



ENVIRONMENTAL BENEFITS

Potential causes for losses of compressed air were eliminated by shutting down some 25 m of unused tubes and removing three taps, some of which were leaking. With the installation of stop valves it is now possible to supply compressed air only to those tubes which are actually required; the compressed air no longer has to pass through the whole system. By maintaining both the compressors and the used part of the tube system, the compressor load is decreased, and energy consumption is reduced by one third. Furthermore, the working life of the compressed is significantly increased.

ECONOMIC RESULTS

Investment costs	1,000 Euros	For shutting down unused tubes, maintaining the compressed air system and compressors (spares and working hours)
Additional running costs	none	
Annual net savings	Reduction of energy consumption for the generation of compressed air by 1/3 Increased working life of compressors	The savings can hardly be quantified, as the company only knows the overall energy consumption, but not the percentage required for the generation of compressed air
Payback period		Since the annual savings cannot be quantified, the payback period cannot be calculated.

ORGANISATIONAL IMPROVEMENTS

As working hours of the compressor had been successfully reduced, the employees became aware of the amount of energy required for the generation of compressor air. They also understood the importance of switching off the compressed air system and of regularly checking the system for leakages.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

ALTSTADT BÄCKEREI RICHTER

Carsten Richter
Dr. Heinrich-Jasper-Str. 65
38304 Wolfenbüttel
Tel.: +49 (5331) 883-112
Fax: +49 (5331) 883-115
Email: Richters-Altstadtbaeckerei@t-
online.de

Less inputs and workload through a new system for spray fats

Altstadt Bäckerei Richter, Germany

IN BRIEF

In the bakery (83 employees, 10 branch shops), food fats are used for greasing the bread baking tins and oiling the machines. To this end, small containers were filled with spray fats from a fixed barrel; the small containers were then transported to the respective working areas. This procedure caused fat losses and grease marks on walls and floor. By investing in a new system for spray fats, which consists of returnable spray fat barrels on wheels, not only precious working time is saved, but also the use of spray fats is reduced and hygiene in the baking department is significantly improved.

THE PROBLEM AND ITS CAUSES

In order to use spray fats in the respective working areas, the employees had to pump the required quantities from a large, fixed barrel into smaller containers. This was relatively time-consuming, and since the hand pump did not allow for exact dosage, fat was lost in considerable quantities and polluted walls and floor.

THE APPLICATION OF THE GOOD HOUSEKEEPING GUIDE

In the framework of the "Profitable Environmental Management" (PREMA) programme in Wolfenbuettel, the bakery manager and a master baker, as well as the PREMA trainers and a participant from another company took part in a company visit to the bakery. Inspired by the checklist on the use of raw materials and auxiliaries contained in the Good Housekeeping Guide, they decided to initiate improvements related to the handling of the spray fats.



ACTION TAKEN IN THE COMPANY

Purchase of a new system for spray fats: it consists of small returnable barrels to which spray caps are fastened; these guarantee an improved dosage of the spray fats



Old system:
the pumping caused
grease marks on the
wall

New system:
clean and
transportable



ENVIRONMENTAL BENEFITS

Through the new system for spray fats, raw material losses during distribution are reduced. Due to the reduced pressure of the spray caps, the dosage of the spray fats could be improved, thus consumption was reduced by approx. 10%.

ECONOMIC RESULTS

Investment costs	814 Euros	for the purchase and installation of the new system
Additional running costs	none	
Annual net savings	350 Euros consumption of spray fats reduced by 10%	saved working time since pumping is no longer required (30 min./ week) due to improved dosage of the spray fats
Payback period	< 1 year	

ORGANISATIONAL IMPROVEMENTS

The new spray fat system made the employees' tasks easier, since it consists of small barrels which can directly be used in the working area. Thus, it is no longer necessary to pump the fats from a large into small containers.

IMPROVEMENTS IN WORKPLACE SAFETY AND HEALTH PROTECTION

By dosing the spray fats more exactly and reducing its consumption, the hygienic conditions in the baking department have improved. Both spot marks on the wall and floor, and the pumping of fats from one container to another are things of the past.

WEITERE INFORMATIONEN:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

ALTSTADT BÄCKEREI RICHTER

Carsten Richter
Dr. Heinrich-Jasper-Str. 65
38304 Wolfenbüttel
Tel.: +49 (5331) 883-112
Fax: +49 (5331) 883-115
Email: Richters-Altstadtbaeckerei@t-online.de

Reduction of mistakes in the production process through intensified supervision of trainees

Holzhof Börßum GmbH, Germany

IN BRIEF

The main activity of the carpentry (9 staff members) is the planning and production of custom-made wooden furniture, window frames and doors, as well as works related to the preservation of historic buildings. Especially the trainees often made mistakes in processing the timber (e.g. knothole in visible spots); these went through the entire production process and subsequently had to be remedied at considerable extra cost and time. Due to intensified training and supervision of the trainees, mistakes are now noticed much earlier and can be remedied at relatively low costs in an early production step. This measure was combined with an information of all staff members about the value and costs of timber and cuttings.

THE PROBLEM AND ITS CAUSES

Since many of the carpentry's activities are still new to the trainees, it is easy for them to make mistakes. In this carpentry, the trainees' work ends up in the final product; therefore even minor deviations from the standard can have considerable effects. This had so far been accepted, as the employees were not aware of the high costs involved in reworking and the elevated amount of cuttings resulting from mistakes.

THE INFLUENCE OF THE INTRODUCTORY WORKSHOP

During the introductory training in the framework of the programme "Profitable Environmental Management" (PREMA) in Wolfenbuettel, the carpentry elaborated a material flowchart and analysed the company's strengths and weaknesses. Participants discussed the problem of mistakes in processing the timber which go through the entire production process if they are not recognised at an early stage, causing unnecessary costs and consumption of material. The manager used this as an opportunity to adopt measures for an early detection of mistakes.

ACTIONS TAKEN WITHIN THE COMPANY

- Staff meeting to inform all staff members about the value of the timber and cuttings, as well as the costs of correcting mistakes
- Individual informal talks with employees regarding the value of timber and cuttings
- Intensified training and supervision of the trainees, including inspection of their work
- For each job, staff members choose those boards which cause least cuttings.



before:

The trainees' work was not supervised to such an extent that production mistakes could be prevented, thus they went through the entire production process.

afterwards:

intensified supervision so that mistakes are detected and remedied at an early stage.

ENVIRONMENTAL BENEFITS

Due to an intensified training and supervision of the trainees, mistakes do no longer go through the entire production process, but are detected and corrected at an early stage; thus, less timber is required for reworking. As the boards to be processed are chosen more carefully, cuttings could be reduced.

ECONOMIC RESULTS

Investment costs	none	
Additional running costs	2,730 Euro	for intensified supervision of the trainees (1 1/4 hours/week)
Annual net savings	6,552 Euro	through savings in timber purchase and reduced costs for remedying mistakes (3 hours/week)
Pay-back period	immediate	

ORGANISATIONAL IMPROVEMENTS

The information on the value of timber and the NPO costs of cuttings, as well as an improved supervision of the trainees increased the employees' awareness regarding mistakes, as well as their knowledge of the value of the raw material timber and the processed (intermediary) products.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private Sector
of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 oder -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

HOLZHOF BOERSSUM GMBH

Heidi Merl
Backhausweg 14
38312 Börßum
Tel.: +49 (5334) 7024
Fax: +49 (5334) 7515
Email: info@holzhof.net

Reduction of costs, waste and delivery periods through optimised purchase of cut to size plastic material

IMWAB GmbH, Germany

IN BRIEF

IMWAB, a company with 13 employees, works in the fields of testing machine construction, automation systems, construction of special machines as well as jigs and fixtures. For the construction of these machines, the company needs plastic boards which previously had been bought from various suppliers who cut them to size already. As a result of the PREMA programme, the company restructured its purchasing procedures. They decided to purchase from a single supplier and due to the increased quantities bought from this supplier, they could negotiate a lower purchase price and reduce delivery periods. Since the supplier now keeps the required plastic boards on stock for IMWAB, there is a buffer so that the material can be delivered immediately if there are any short-term orders. Since both companies agreed on an optimised cutting plan, the individual boards can be used more efficiently, thus reducing cutting waste. The remaining small cuttings are no longer disposed of by the supplier, but are stored at IMWAB and used for smaller tasks.

THE PROBLEM AND ITS CAUSES

As IMWAB does not have a cutting machine of its own, the plastic boards had always been cut to size by the supplier. The boards were tailored to each individual order, sometimes causing a high amount of waste which was disposed of by the supplier. Since IMWAB paid for the entire board, the supplier had no reason to complain about the high percentage of waste. The IMWAB management, on the other hand, did not actually realise the high amount of material waste and its value, as it was generated outside their own company.

THE INFLUENCE OF THE “ENVIRONMENT-ORIENTED COST MANAGEMENT” MODULES (EoCM)

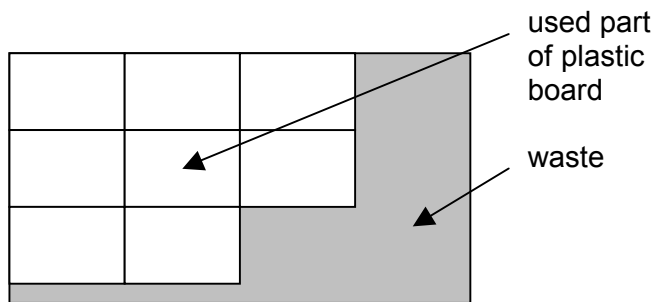
The senior partner of IMWAB participated in the “Profitable Environmental Management” programme (PREMA) in the City of Wolfenbuettel. Through the EoCM module and the calculation of costs caused by non-product output he became aware of the actual costs of plastic waste and initiated measures in this field.



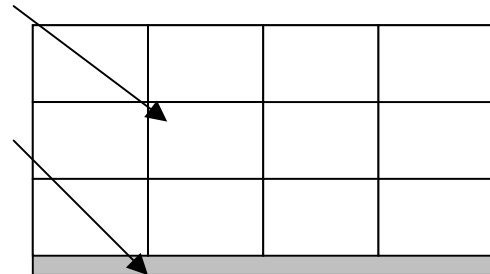
ACTIONS TAKEN WITHIN THE COMPANY

- IMWAB buys all plastic material from one single supplier.
- IMWAB agrees with the supplier to have a buffer of uncut plastic boards on stock, so that deliveries can be made at short notice, if required.
- The cutting of plastic boards is redesigned: with the help of a CAD programme, the supplier cuts the boards completely, even if not all the parts are immediately needed.
- Parts that are not immediately required are stored at the supplier's and delivered to IMWAB when needed for the next order.
- The cuttings are stored at IMWAB where they are used for smaller tasks.

before:
required measures cut to size from
one board for each order →
remaining plastic is disposed



afterwards:
plastic board is cut to size
completely → pieces not required
for the order in question are stored



ENVIRONMENTAL BENEFITS

Due to the optimised cutting system, the raw material is used more efficiently, reducing waste material by approx. 5% each.

ECONOMIC RESULTS

investment costs	none	
additional running costs	none	
annual net savings	5,100 Euros	through reduction of material waste and reduction of purchase price by 5% each
pay-back period	immediate	

ORGANISATIONAL IMPROVEMENTS

By purchasing all material from a single supplier, optimising the cutting system and establishing a material buffer with the supplier, short-term deliveries are guaranteed and cut to size material is readily available. Due to the exact cost calculation, management and employees realised that savings in raw material use can lead to a reduction of production costs and negative environmental impact.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

IMWAB GMBH

Stephan Blechinger
Adersheimer Straße 64
38304 Wolfenbuettel
Tel.: +49 (5331) 992992
Fax: +49 (5331) 992993
Email: info@imwab.de



PREMA IMPLEMENTATION IN AN INSULATION COMPANY

Dollenberg
Isolierungen
GmbH

Case Study No. 7

Increased efficiency and reduced fuel consumption through modified organisational structure

Dollenberg Isolierungen GmbH, Germany

IN BRIEF

The company with some 30 employees produces insulations protecting form heat, cold, sound and fire. They also produce sheet metal channels into which the insulating material is directly installed on the construction sites. As a result of the increased regional traffic following the opening of the border and subsequent unification of FRG and GDR, the company's vehicles were stuck in a traffic jam for approx. one hour each morning on their way to the construction sites. By loading the vehicles with the required materials and written working instruction the evening before, the employees now reach their respective place of work ahead of the peak hour, thus saving precious working time and reducing fuel consumption by ca. 20%.

THE PROBLEM AND ITS CAUSES

Previously, the operations for the day had been planned in the mornings. Thus, the drivers left late and were regularly caught up in traffic jams caused by commuters. This situation had been considered inevitable.

THE INFLUENCE OF THE INTRODUCTORY TRAINING

The company participated in the "Profitable Environmental Management" (PREMA) programme in Wolfenbuettel, Germany. During the introductory training, participants examined strengths and potentials for improvement in their companies. One of the working groups analysed the causes of the problem "increased fuel consumption caused by traffic jams in the mornings" and elaborated corrective measures. This made the manager reconsider the internal working routines.

ACTIONS TAKEN IN THE COMPANY

- Presentation of the problem in a staff meeting, explanation of the reasons for organisational changes
- Loading of the company vehicles with materials and working instructions in the evening; thus the vehicles can leave for the construction sites as soon as the employees have arrived in the morning

Problem:

- ⑦ o'clock: loading
- ⑧ o'clock: departure
- (traffic jam)
- ⑨ o'clock: arrival at construction site

Solution:

- evening: loading
- ⑦ o'clock: departure
- _____ (empty roads)
- 7:30 o'clock: arrival at construction site

ENVIRONMENTAL BENEFITS

Since traffic jams are avoided, the fuel consumption as well as the emissions caused by the vehicles are reduced by 20-25%.

ECONOMIC RESULTS

Investment costs	none	
Additional running costs	none	
Annual net savings	36,000 Euros 2,400 Euros	through reduction of travel time by ca. 1/2 hour per day and additional working time on the construction sites through reduction of fuel consumption by ca. 20-25%
Payback period	immediate	

ORGANISATIONAL IMPROVEMENTS

Since the vehicles are loaded with working instructions and materials in the evening, the employees already know their tasks for the following day. Thus, when leaving the head office the following morning, they have a clear structure of what has to be done. This modification significantly contributed to increasing staff motivation.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

DOLLENBERG ISOLIERUNGEN GMBH

Jörg Dollenberg
Drohnenberg 10
38302 Wolfenbüttel
Tel.: +49 (5331) 7914
Fax: +49 (5331) 32594
Email: info@dollenberg-isolierungen.de

Reduction of container scrap metal through rigorous reuse of sheet metal pieces

Dollenberg Isolierungen GmbH, Germany

IN BRIEF

This enterprise with a staff of 30 fabricates insulation against heat, cold, sound and fire, mounting them into the buildings directly at construction sites. The enterprise also produces sheet metal air ducts for the mounting of heat-insulating jackets generating scrap metal. Generally, this scrap metal is produced on the construction site and used to be disposed of in a container without looking into possible reuse. Die analysis of the amount of scrap metal showed that it was far beyond the estimated quantity of scrap metal and that many pieces of the sheet metal could be used in other production steps. By systematically checking the amount of scrap metal, informing the staff about its value, prohibiting the disposal of large metal sheets and ordering and systematising their storage, it was possible to reduce the amount of scrap metal considerably.

THE PROBLEM AND ITS CAUSES

The scrap metal that is usually produced on the construction site is disposed of in the container that stands directly next to the car park of the fleet of vehicles. The staff disposed of the residual metal parts without thinking about their value and a possible reuse.

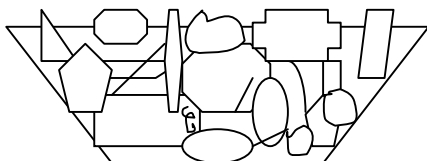
RESULT OF THE INTRODUCTORY TRAINING

The managing director of Dollenberg took part in the programme "Profitable Environmental Management" (PREMA) in Wolfenbuettel. During the introductory training the participants were made familiar with the flow charts of production processes and the idea of non-product output. Setting up a flow chart of the production process in his own enterprise the managing director was prompted to look into his non-product output, above all scrap metal.

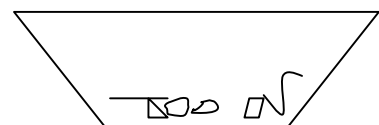
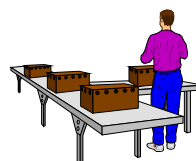
ACTIONS TAKEN WITHIN THE COMPANY

- Checking the scrap metal in the container
- Ordering and systematising the storage to make it easier to find large reusable sheet metal parts
- Informing the staff on what to do with the metal sheets, prohibiting the disposal of reusable sheet metal parts, posting information notes on the container

before:
container with large
pieces of scrap metal



afterwards:
large metal sheets are stored
separately and are reused, reducing
the amount of scrap metal



ENVIRONMENTAL BENEFITS

The amount of scrap metal was reduced by 80% through the rigorous reuse of small pieces for production; with this the enterprise was able to save a considerable amount of raw material and resources, producing less waste.

ECONOMIC RESULTS

Investment costs	none	
Additional running costs	none	
Annual net savings	6,000 euros	buying fewer new metal sheets because of the reuse of 80% of the residual parts
Payback period	immediately	

ORGANISATIONAL IMPROVEMENTS

Looking into the idea of "non-product output" the managing director recognised that many things can be improved of which he had not thought before. He had wrongly assumed, for example, that there was no saving potential or room for improvement with regard to waste.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Germany
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

DOLLENBERG ISOLIERUNGEN GMBH

Jörg Dollenberg
Drohnenberg 10
38302 Wolfenbüttel
Germany
Tel.: +49 (5331) 7914
Fax: +49 (5331) 32594
Email: info@dollenberg-isolierungen.de

Reduction of timber waste through systematic storage

Nanko - Die Möbeltreppe GmbH, Germany

IN BRIEF

“Nanko - Die Möbeltreppe” is a carpentry with 25 employees which produces both system-built and individual stairs from massive timber. Hitherto, any pieces of wood which remained in cutting operations and were not immediately used, had directly been disposed of without checking whether they could be used at a later time. By establishing a storage system, i.e. division of the stores and sorting of remainders according to size, even small pieces can now easily be found and used systematically, e.g. for rungs. This has resulted not only in a more efficient use of the raw material timber, but also in cost reductions.

THE PROBLEM AND ITS CAUSES

When cutting timber, it was very convenient for the employees to directly dispose of any remainders. They did not think of its value and potential re-use, e.g. for the production of rungs. Even if staff members occasionally did store smaller pieces, these were not used any more, as the stores were not organised and especially smaller pieces of timber could hardly be found. Thus, the employees found it too complicated to search the stores for suitable pieces of timber.

THE INFLUENCE OF THE TRAINING MODULE “ENVIRONMENT-ORIENTED COST MANAGEMENT“ (EoCM)

In the framework of the “Profitable Environmental Management” (PREMA) programme in Wolfenbuettel, both the manager and the commercial director of the company participated in the “Environment-oriented Cost Management” (EoCM) module. In this training, they calculated the costs for the NPO “cutting waste” and found out that the costs for this unused timber were unexpectedly high. Thus, they developed measures to reduce these costs.



ACTIONS TAKEN WITHIN THE COMPANY

Information and training of the employees with regard to the value and efficient use of timber as well as the significance of an organised store for a systematic reuse of timber pieces

Organisation and extension of the store rooms

Sorting of remaining timber pieces according to size



before:
cutting waste is directly disposed of

afterwards:
cutting waste is systematically stored and reused



ENVIRONMENTAL BENEFITS

By introducing a storage system timber pieces, which had formerly been directly disposed, are now stored and reused when needed. Thus, the purchased timber is used more efficiently and cutting waste is reduced. This cutting waste had formerly been resold as firewood or for handicrafts at a small profit.

ECONOMIC RESULTS

Investment costs	1,000 Euros	for the organisation of the stores and sorting of timber pieces according to sizes
Additional running costs	none	
Annual net savings	12,000 Euros	through the reduction of raw material costs by 2% due to optimised use of the timber
Pay-back period	1 month	

ORGANISATIONAL IMPROVEMENTS

Since the new storage system has been introduced, the employees can move safely in the stores and find what they are looking for. Previously timber pieces, which had been transferred to the stores, were kept for years, thus blocking storage capacities. The new system is transparent and can be used efficiently. The information about the value of the timber made employees aware of the significance of the raw material and its costs.

IMPROVEMENTS IN WORKPLACE SAFETY AND HEALTH PROTECTION

By organising and systemising the store, the risk of accidents has been reduced.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

NANKO - DIE MÖBELTREPPE GMBH

Uwe Nanko
Goslarsche Straße 22
38304 Wolfenbüttel
Tel.: +49 (5331) 9595-0
Fax: +49 (5331) 9595-95
Email: dieMoebelTreppe@t-online.de

Reduction of waste wood by optimising cutting through defined cut size

Nanko - Die Möbeltreppe GmbH, Germany

IN BRIEF

The carpentry Nanko - Die Möbeltreppe with a staff of 25 manufactures solid wood staircases in system construction and individual styles. The cutting of timber for the staircases used to be customer-specific. Since the orders differ significantly, an optimal use of the timber was not possible and a lot of wood scraps were generated during cutting. By defining the cut size of the timber with different lengths and widths, storing the pre-cut pieces until use, it has been possible to achieve an optimal cut, reducing waste wood and as a result costs.

THE PROBLEM AND ITS CAUSES

The customer-specific cutting of timber had the result that, depending on the required size of the pieces, the wood was not used entirely, generating a rather high amount of waste wood during cutting. Even though defining the cut size and storing the pre-cut pieces is obvious for the manufacturing of system construction staircases with standard elements (steps and pickets), this measure was never taken into consideration as neither the managing director nor the staff were aware of the value of the cut remainders.

IMPACT OF THE MODULE “ENVIRONMENT-ORIENTED COST MANAGEMENT” (EoCM)

The managing director of Nanko - Die Möbeltreppe took part in the programme “Profitable Environmental Management” (PREMA) in Wolfenbüttel. In the course of the module “Environmentally-oriented cost management” (EoCM) he calculated the costs for the non-product output of his waste wood. The high costs prompted him to develop and implement improvements.



ACTIONS TAKEN WITHIN THE CARPENTRY SHOP

Information and training of the staff with regard to the value of the wood and the costs that are caused by waste wood

Defining cut size for standard elements (steps and pickets) that are stored after cutting



before:

only customer-specific production

afterwards:

production of standard elements and well-organised storage (in relation to cut size)

ENVIRONMENTAL BENEFITS

By defining cut size standards and avoiding a mere customer-specific cutting, it was possible to accomplish an optimal cut, reducing cut remainders by 4 to 5%. This saves the natural resource timber. Less waste wood is sold for do-it-yourselfers or as firewood at low price.

ECONOMIC RESULTS

Investment costs	1,000 euros	for extension of storage space
Additional running costs	none	
Annual net savings	15,000-30,000 euros	reduction of raw material costs by 4-5% (through better utilisation of wood and fewer cut remainders)
Payback period	< 1 month	

ORGANISATIONAL IMPROVEMENTS

Information on the value of timber and its improved utilisation with defined cut size increased the awareness of the staff about the importance of wood as a raw material and its costs.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Germany
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

NANKO - DIE MÖBELTREPPE GMBH

Uwe Nanko
Goslarsche Straße 22
38304 Wolfenbüttel
Germany
Tel.: +49 (5331) 9595-0
Fax: +49 (5331) 9595-95
Email: dieMoebelTreppe@t-online.de

Less cutting waste through improved cutting strategy

Nanko - Die Möbeltreppe GmbH, Germany

DER FALL

“Nanko - Die Möbeltreppe” is a carpentry with 25 employees which produces both system-built and individual stairs from massive timber. In the company, the purchased timber used to be cut to roughly the size of steps. If there were any faulty spots, like e.g. knotholes, in the piece of timber, these were simply cut out. Thus, the piece of timber often became too short and had to be disposed of. With a modified cutting strategy, the cut simply goes through the faulty spot, so that the board still has the required length. Since slanting steps are always required, faulty spots can still be removed in the final cut. By using the timber despite the flaws, cutting waste could be reduced.

THE PROBLEM AND ITS CAUSES

Previously, nobody had thought of the final shape of a board during the rough cutting. Therefore any faults were generously cut out so that the resulting smaller boards often could not be used any more. When the cut is made right through the flaw, there are imperfections on both parts, but since many steps have to be slanting, these imperfections can be removed in the final cut. Neither the employees nor the management had thought of this possibility, since they had not been aware of the costs related to cutting waste.

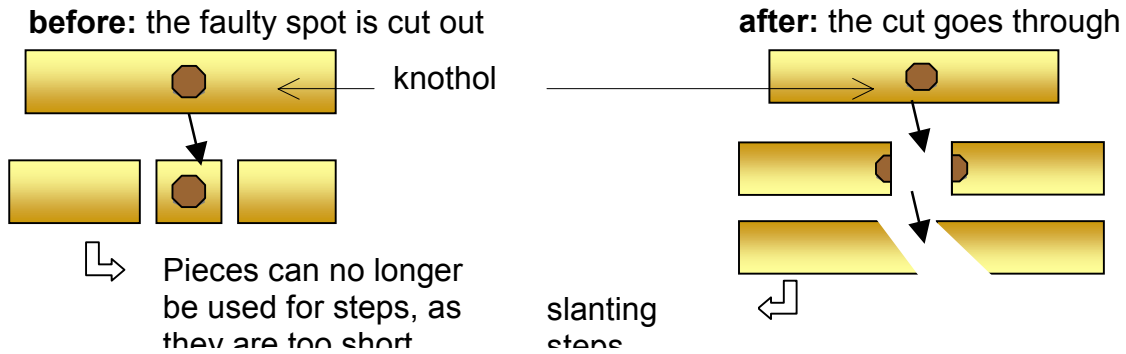
THE INFLUENCE OF THE TRAINING MODULE “ENVIRONMENT-ORIENTED COST MANAGEMENT” (EoCM)

In the framework of the “Profitable Environmental Management” (PREMA) programme in Wolfenbuettel, the manager and the commercial director of the company participated in the „Environmental Cost Management (EoCM) module. By calculating the costs for the NPO “cutting waste”, they realised that they had considerably underestimated these costs. Following an analysis of the causes, they developed measures aimed at reducing their cutting waste.



ACTIONS TAKEN WITHIN THE COMPANY

Information and training of the employees with regard to the value and efficient use of timber
Introduction of a new cutting strategy for faulty boards: the flaws are no longer cut out, but the cut goes right through them so that the surfaces above and underneath can still be used



ENVIRONMENTAL BENEFITS

The more efficient use of faulty boards results in a reduced amount of timber waste; the consumption of timber is thereby reduced by 1-2%. The amount of cutting waste, which has been sold as firewood or for handicrafts at a small profit, likewise is reduced.

ECONOMIC RESULTS

Investment costs	none	
Additional running costs	none	
Annual net savings	3,000 – 6,000 Euros	through reduction of raw material costs by 1-2% (more efficient use of the timber)
Payback period	immediate	

ORGANISATIONAL IMPROVEMENTS

The information on the value and improved use of the timber has increased the employees' awareness of the significance of this raw material and its costs.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)
 Petra Kontny-Eimer
 Tulpenfeld 2
 D-53113 Bonn
 Tel.: +49 (228) 60471-12 or -23
 Fax: +49 (228) 985 7018
 Email: gtzp3u@aol.com

NANKO - DIE MÖBELTREPPE GMBH

Uwe Nanko
 Goslarsche Straße 22
 38304 Wolfenbüttel
 Tel.: +49 (5331) 9595-0
 Fax: +49 (5331) 9595-95
 Email: dieMoebelTreppe@t-online.de

Reduction of varnish consumption through introduction of a new varnishing technique

Nanko - Die Möbeltreppe GmbH, Germany

IN BRIEF

The carpentry Nanko - Die Möbeltreppe with a staff of 25 manufactures solid wood staircases in system construction and individual styles. It uses different varnishes for surface treatment. It was possible to reduce the consumption of varnishes by 20% through the introduction of low mist varnishing equipment. The new method consists of a new spray gun and a new pumping system. The varnishing technique was also modified: the banister pickets are no longer sprayed but dipped into a varnish bath. In addition to these measures the management talked to the workforce about varnishing techniques, cleaning intervals as well as orderliness and cleanliness.

THE PROBLEM AND ITS CAUSES

The old varnishing method wasted a lot of varnish, in particular by overspray, i.e., diffuse varnish that is lost during spraying. In order to apply as much varnish as possible onto the timber, it is necessary to achieve the finest possible mist (e.g., this can be achieved with low pressure). The quantity of varnish that is needed is determined by the size of the pieces of wood: the most efficient way is to varnish large pieces as relatively little varnish is sprayed beside the piece if it has a large surface. In their efforts to reduce varnish consumption or overspray the enterprise had to think about quality as well since it is essential for later processing that the entire piece is covered with varnish.

APPLICATION OF THE GOOD HOUSEKEEPING GUIDE

The carpentry Nanko took part in the programme “Profitable Environmental Management” (PREMA) in Wolfenbüttel. During the “Good Housekeeping” (GHK) training the carpentry shop was visited against the background of the “Good Housekeeping Guide” with the support of the workshop trainer. In addition to the calculation of the “non-product output: overspray” the Materials Checklist was taken into particular consideration for the analysis of optimisation potentials.



ACTIONS TAKEN WITHIN THE CARPENTRY SHOP

- Introduction of low mist varnishing equipment using low pressure (consisting of a new spray gun and a new pumping system)
- Modification of the finishing process: banister pickets are no longer sprayed but dipped into a varnish bath
- Information of staff about efficient vanishing techniques, cleaning intervals, orderliness and cleanliness
- Estimate of varnish consumption



old finishing process

new low mist varnishing system, that works with low pressure



ENVIRONMENTAL BENEFITS

The new varnishing method makes it possible to produce a fine mist of varnish with low pressure: this reduces energy consumption and helps to finish the surface efficiently maintaining the previous level of quality. The new varnishing method and dipping the banister pickets into a varnish bath reduces overspray and the resulting varnish emissions by 40%. In addition, fewer filters to collect oversprayed varnish need to be disposed of. The need for cleaning as well as water consumption for the cleaning of the varnishing cabin could be reduced.

ECONOMIC BENEFITS

Investment costs	4,000 euros	for the purchase of a new spray gun and a new varnishing pumping system
Additional running costs	none	
Annual savings	11,000 euros	through reduction of overspray by 40%
Payback period	4.36 months	

ORGANISATIONAL BENEFITS

In particular the reduction of varnish emissions at the workplace made the staff approve of the changes. This is a good starting point for their support of future measures.

OCCUPATIONAL HEALTH & SAFETY IMPROVEMENTS

Less varnish consumption and in particular lower varnish emissions have reduced significantly the MAK (maximum workplace concentration) pollution at the workplace, protecting the health of the workforce.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Germany
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

NANKO - DIE MÖBELTREPPE GMBH

Uwe Nanko
Goslarsche Straße 22
38304 Wolfenbüttel
Germany
Tel.: +49 (5331) 9595-0
Fax: +49 (5331) 9595-95
Email: dieMoebelTreppe@t-online.de

Less timber waste through alterations in timber purchase

Nanko - Die Möbeltreppe GmbH, Germany

IN BRIEF

Nanko - Die Möbeltreppe is a carpentry with 25 employees which produces both system-built and individual stairs from massive timber. Hitherto, the timber was bought from the sawmill as stock lumber (i.e. with the bark); it was then cut to the required lengths in the company. This caused large amounts of cutting waste which could not be used any further. By purchasing square-edged sawn timber (pre-sawn planks without bark) and informing the employees about the value and efficient use of the timber, the amount of timber waste in the carpentry could be reduced. The purchasing price of the square-edged sawn timber is somewhat higher than that of stock lumber, but taking into account the labour involved in cutting up the stock lumber and the high amount of cutting waste, it is still profitable to purchase the pre-sawn planks. When purchasing timber now, the company also takes into consideration the quality required for the piece in question, as e.g. invisible parts do not need to be of the same quality as visible parts. Thus, all quality levels of timber can be used.

THE PROBLEM AND ITS CAUSES

When the company purchased stock lumber, a high percentage of the timber had to be cut off, since the bark could not be used for the production of stairs. This waste parts, however, had been paid for as well, since the price is calculated per square metre. Now that the carpentry buys square-edged sawn timber, these useless parts have already been removed and are not paid for. Thus it pays to buy square-edged sawn timber, even if the price per square metre is higher. Due to a lack of knowledge, low-quality timber had previously been disposed of, although it could have been used for parts with lower quality requirements (invisible parts).

THE INFLUENCE OF THE TRAINING MODULE “ENVIRONMENT-ORIENTED COST MANAGEMENT” (EoCM)

The company's manager and the commercial director participated in the “Profitable Environmental Management” (PREMA) programme in Wolfenbuettel, Germany. Part of this programme was the module “Environment-oriented Cost Management” (EoCM). By calculating the costs for the NPO “timber waste”, they realised that they had significantly underestimated the costs related to the unused timber. Having analysed the causes for the amount of timber waste, they developed measures aimed at reducing it.

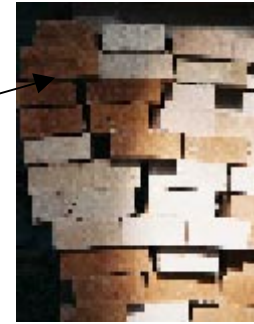


ACTIONS TAKEN IN THE COMPANY

Development of a data base on the basis of practical tests in cooperation with the supplier. They tested which kind of timber in which quality could be used most efficiently and cost-effectively for which component. (Visible parts e.g. always have to be of high quality.)
Information and training of employees regarding the value and efficient use of the timber.
Purchase of timber in adequate quality for each component (e.g. square-edged sawn timber instead of stock lumber)



before:
stock



afterwards:
square-
edged sawn

ENVIRONMENTAL BENEFITS

Since an adequate quality level is used in accordance with the quality requirements for the final product, the timber can be used more efficiently: By generating less timber waste, the use of this natural resource is reduced. The timber waste is no longer re-sold at low prices as firewood or for handicrafts.

WIRTSCHAFTLICHE ERGEBNISSE

Investment costs	400 Euros	for the development of an exact data base matching timber quality and components (2 employees during half a day)
Additional running costs	none	
Annual net savings	24,000 – 30,000 Euros	by reducing raw material costs by 4 to 5% due to optimised use of timber
Payback period	immediate	

ORGANISATIONAL IMPROVEMENTS

By informing the employees about the value and efficient use of the timber, they became more aware of the significance of the raw material and its costs. As the employees do not longer have to cut up the stock lumber, they have saved working time which can be used for other important tasks.

WEITERE INFORMATIONEN:

GTZ-P3U

Pilot Programme for the Promotion of Environmental Management in the Private Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
E-mail: gtzp3u@aol.com

NANKO - DIE MÖBELTREPPE GMBH

Uwe Nanko
Goslarsche Straße 22
38304 Wolfenbüttel
Tel.: +49 (5331) 9595-0
Fax: +49 (5331) 9595-95
E-mail: dieMoebelTreppe@t-online.de

Reduction of fuel consumption through training of bus drivers

Travel Agency Schmidt (plc), Germany

IN BRIEF

The travel agency with 65 employees has not only a licence to trade in travels of all kinds, but also owns a fleet of buses which are used both for classic coach tours and as public service buses in local traffic. Since fuel consumption to a high degree depends on the individual way of driving, the drivers were trained to drive fuel-efficiently. This led to a reduction of the average fuel consumption by 5%.

THE PROBLEM AND ITS CAUSES

Each of the drivers of the public service buses daily drives the same route with the same bus. Due to the individual way of driving practised by the drivers, the fuel consumptions varied significantly. Thus, driving in a low gear and with high revolutions e.g. causes elevated fuel consumption levels. Theoretically, the drivers were aware of this fact, practically, however, they did not drive fuel-efficiently as they were not aware of the fuel costs.

THE APPLICATION OF THE GOOD HOUSEKEEPING GUIDE

The authorised signatory of the travel agency participated in the "Profitable Environmental Management" (PREMA) programme in Wolfenbuettel. During the Good Housekeeping (GHK) training, participants and PREMA trainers carried out a company visit to the travel agency. Here, they applied the Good Housekeeping Guide and paid special attention to the checklist regarding energy.

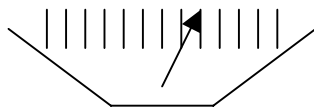


ACTIONS TAKEN WITHIN THE COMPANY

- Training of the drivers working on public service buses: each driver was trained by a driving instructor on "his" own route in order to focus on the specific characteristics of this route and the individual way of driving practised by the driver in question.
- Monthly monitoring of the fuel consumption per bus
- Conversations with drivers who deviate from the average consumptions

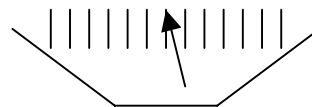
before:

31 l / 100 km



afterwards:

29 l / 100 km



ENVIRONMENTAL BENEFITS

As a result of the drivers training, the average fuel consumption – and thus emissions – were reduced by 5%.

ECONOMIC RESULTS

Investment costs	2,500 Euros	costs for the drivers training and loss of working hours
Additional running costs	none	
Annual net savings	3,600 Euros	due to the reduction of fuel consumption by 5%
Pay-back period	8.3 months	

ORGANISATIONAL IMPROVEMENTS

As a results of the training and the subsequent reduction of fuel consumptions, the drivers became aware of the enormous influence the way of driving has on fuel consumption. This increased the motivation and self-esteem of the drivers on public service buses.

FOR FURTHER INFORMATION:

GTZ-P3U

Pilot Programme for the Promotion of
Environmental Management in the Private
Sector of Developing Countries (P3U)
Petra Kontny-Eimer
Tulpenfeld 2
D-53113 Bonn
Tel.: +49 (228) 60471-12 or -23
Fax: +49 (228) 985 7018
Email: gtzp3u@aol.com

REISEBÜRO SCHMIDT GMBH

Hendrik Schmidt-Mühlen
Stadtmarkt 17
38300 Wolfenbüttel
Tel.: +49 (5331) 884-103
Fax: +49 (5331) 884-111
Email: hschmidt-muehlen@der-schmidt.de