

Your Impulse for
the Future!



LeEN[®] 
Learning Energy Efficiency Networks



Come together, learn together, profit together!



What is a LEEN-Network?

Increasing energy costs, resources austerity and climate change call for the readiness to change. Innovative companies take this as a chance to increase energy efficiency and, at the same time, improve their own competitive position.

LEEN, which stands for Learning Energy Efficiency Network, supports all this. By learning from each other a multitude of companies cooperate in order to save energy in the most cost effective way. On this behalf, starting points of the cooperation within the network are efficiency improvements with respect to cross-cutting technologies (e.g. compressed air systems, combined heat and power systems, electrical drives).

Round about 4,000 profitable measures have been identified (average Internal Rate of Return, IRR: approx. 35%; average Payback Period: approx. 3 years) in 30 evaluated networks in Germany. The results showed that companies cooperating in networks increase their efficiency twice as fast compared to the German industrial average.

Companies in motion

An innovative process like that requires a management within the participating companies that involves the people in these companies. It should motivate the employees to leave the beaten tracks, giving them the possibility to bring forth their own ideas and to create solutions.

For that purpose five significant signals have to be set:

- postulating energy efficiency as business objective
- involving the management
- verbalizing accomplishable, binding objectives and measuring energy consumptions
- determining decision routines and implementing measures
- monitoring the success

Case study

Exchange of 250 lamps within production
 Investment: 11.500 €
 Energy savings: 48 % (= 7.100 €/a)
 Payback: 1,6 years

Modernization of a compressed air system
 Investment: 70.000 €
 Energy savings: 9 % (= 60.500 €/a)
 Payback: 1,2 years

Modernization of the heat recovery system
 Investment: 42.000 €
 Energy savings: 58.600 €/a
 Payback: 0,9 years

Heat recovery concerning a compressed air system
 Investment: 45.500 €
 Energy savings: 46.600 €/a
 Payback: 1 year

Those who know what science can accomplish!



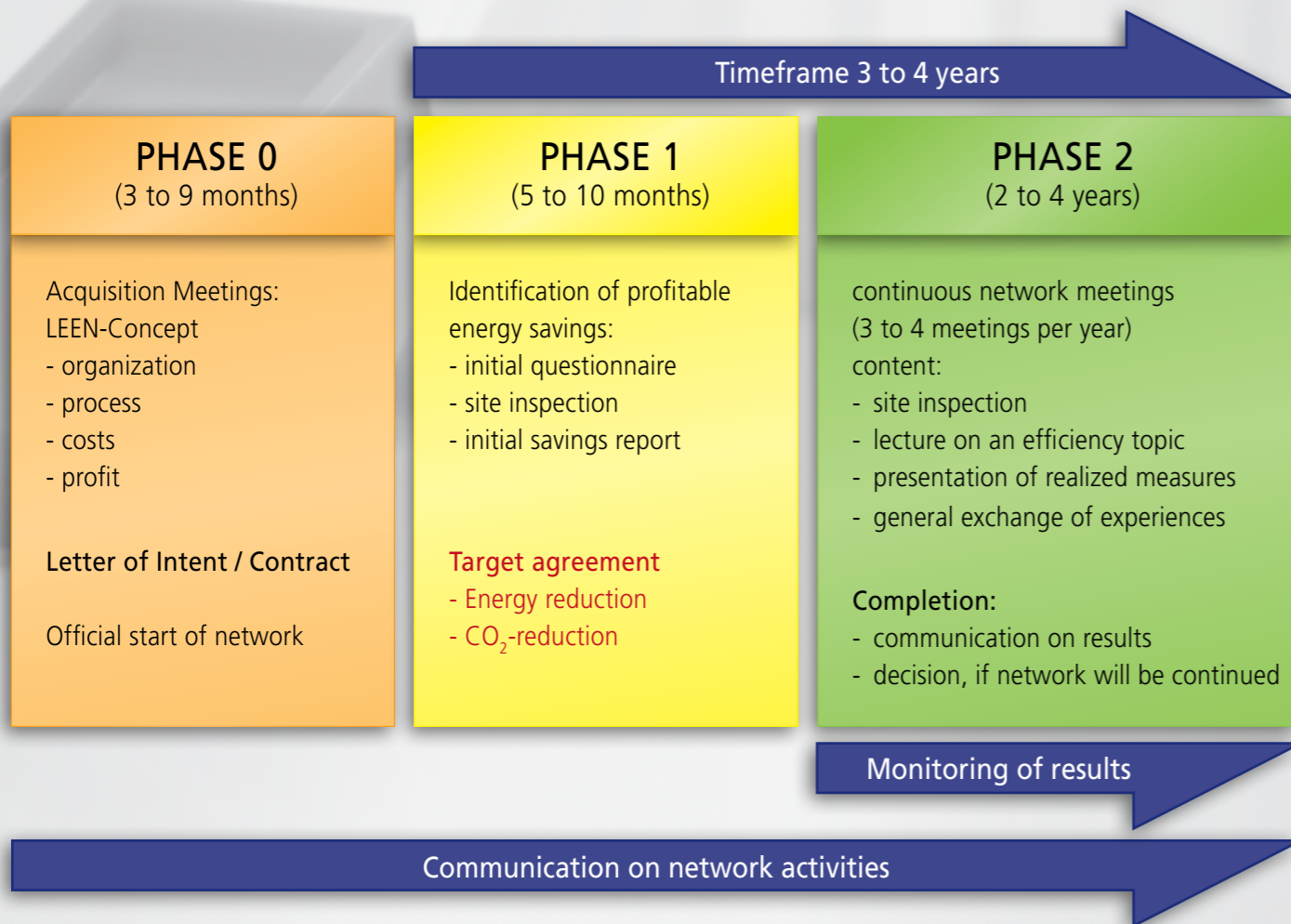
Who is LEEN Ltd.?

LEEN Ltd. has been founded in cooperation between IREES Ltd., Energy Baden-Württemberg Sales Ltd. and Fraunhofer Society e.V.. We develop and distribute the LEEN-Management system. Therefore we offer the means and know-how for energy efficiency networks on a global scale.

Our major tasks:

- Implementation of pilot networks on behalf of the customer (network host)
 - Support with respect to acquisition
 - Management of the entire process during the lifespan of the network
 - Organization of experts for papers and presentations
 - Carrying out initial consultancies and monitoring
- New and further development of the LEEN-Management system
- Accompanying the certification process within the framework of DIN EN ISO 50001
- Certified further and vocational training of moderator and consultant engineer for the energy efficiency networks
- Training with respect to electronic investment calculators (LEEN-Tools) of the cross-cutting technologies

LEEN-Networks: How does it work?



LEEN at a



The LEEN-Management system regulates the build-up and permanent participation within the efficiency networks which include 10 to 15 companies. Every one of these companies should be able to manifest annual energy costs of at least 200,000 € in order to guarantee that cooperation in the networks proves profitable.

The network host (organization), the moderator (organization and management of the network meetings) as well as the consultant engineer (initial consultation, monitoring) play important roles thereof.

Acquisition phase (Phase 0)

The future network host (e.g. Industrial Chamber of Commerce, community, energy suppliers) wins companies to participate in and join the network. This can be managed by information events or by individual contact. On this behalf it proves to be successful to build upon and to include existing structures (e.g. environmental working groups).

Initial consultancy phase (Phase 1)

A LEEN-certified power consultant engineer identifies the existing possible savings in the companies. After the companies have completed a data collection sheet concerning their energy situation (consumption, devices) the consultant engineer carries out site inspections in all companies which will serve as basis for the initial consultancy report. Subsequently a mutual energy efficiency and CO₂ reduction objective will be defined for the network with all cooperating companies involved.

Network phase (Phase 2)

The network phase starts at the same time as the initial consultancy phase in order to establish the contact between the cooperating companies. The meetings each take place at one of the companies participating. A LEEN-certified moderator chairs the meeting. After a site inspection with information on the energetic situation there will be expert papers and presentations and exchange of information between the participants. For instance, network participants report on implemented measures and lessons-learned which serve as good examples for the other participants. This information exchange is a central success factor.

An official success monitoring will take place once a year. The results of which will be documented by the consultant engineer in an official report thereof. These reports also serve for following-up the network's objectives.

Along with supporting the network the host also takes care on communicating all information in the most favorable way to the public in order to do successful image work by authentic and credible climatic protection of the network. At the end of the lifespan the companies decide on any continuation of the network.

Who does what?

Optimal organization obligatory!



The parties involved

We, the LEEN Ltd., take care on the certified further and vocational education of moderators and consultants engineers within the framework of energy efficiency networks. In addition we also attend to the LEEN-Management system by developing and improving electronic investment calculators as well as by supplying materials and teaching aids with respect to foundation, organization and implementation of networks according to the LEEN-Standard. By means of this we ensure the quality and the success of the networks. Supplementary for our network host we take care on supporting the entire networking process as a service.

Network host / Initiator

The network host operates as contracting party and project manager of the participating companies, of the consultant engineer and the moderator with overall responsibility; usually energy suppliers or public institutions such as communities or Industrial Chambers of Commerce. The host recruits the network's participants and manages schedules, budgets, invoicing and controlling. He assigns external stakeholders such as the consultant engineer and the moderator; and he takes care on public relation activities with respect to communicating the project to the public.

Moderator

The moderator chairs the network meetings, including preparation and follow-up thereof, informs the companies and supports the consultant engineer with respect to monitoring. A moderator has successfully participated in the LEEN-Training and already brings forth profound experiences with respect to moderation and facilitating. He serves as main contact for the companies and enhances the dialogue to exchange experiences between the network's participants.

Consultant Engineer

The consultant engineer carries out the initial consultancy as well as the monitoring. He supports the moderator in finding experts for papers and presentations and serves as technical contact. A consultant engineer in a network has to have completed the LEEN-Training successfully. In addition to this, profound experiences with respect to power engineering consultancy in the industrial area are mandatory. The consultant engineer contemplates the operational flows of energy holistically and stipulates technically and operationally evaluated optimization measures. From this derive any feasible corporate savings potentials. The mutually agreed upon objective recommendation with respect to energy efficiency and CO₂ reduction of the network will be derived thereof.

Promote your

business partners!

Acquisition phase

Acquisition refers to the period prior to the kick-off event of the network. The initiator establishes the network and recruits the adequate participants on this behalf. By organizing information events, individual contacts and by using existing structures companies are being contacted and involved. An objective thereof is to receive a letter of intent or even better – a signed contract for participation in the network. Usually the initiator later on becomes the host. If this isn't the case the relevant host should be introduced to the participants as soon as possible, ideally having won their trust already.

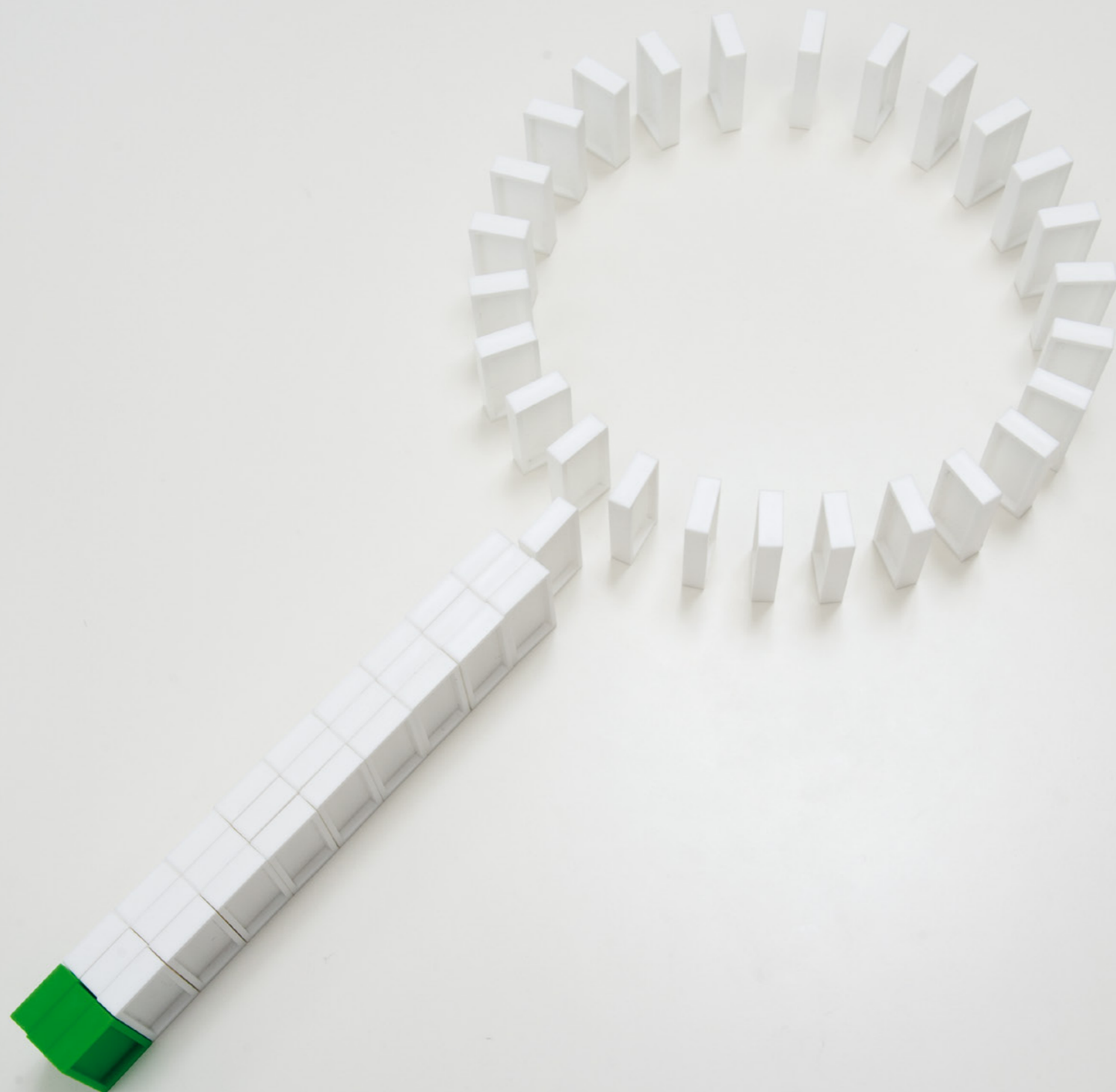
The prospect of operational profit is a decisive factor for the companies involved. Above all a common denominator for participation in the network has to be found where the selection of participants is concerned. Therefore the following frame conditions have to be taken into consideration:

- Annual operational energy costs of at least 200,000 € (usually starting from approximately 50 employees and an annual turnover of 5 million €); where several locations or sites are concerned this shall apply for the participating location.
- No too large enterprises with energy costs of more than 20 million €
- Regional locations, maximum distance 150 km, simplify personal meetings and informal contacts
- Significant part of energy demand generated by cross-cutting technologies; e.g. by compressed air systems, cooling systems, heat recovery systems etc. This intersection is important for generating a common interest in exchanging experiences.

Acquisition usually starts with an information event during which all interested parties receive the project's description and the letter of intent, giving them the opportunity to directly express their interest and desire for participation. Companies not able to decide immediately should be granted further consultancy. This will take place by means of individual contact and designation.

Tips for acquisition

- Use existing networking structures
- Personal company visits and contacts often lead to success, yet prove to be cost intensive
- Acquisition phase at maximum 6 months, otherwise early decision makers might bail out
- Directly clarifying possible conflicts of interests where companies of the same industry sector are concerned
- Use the profound experiences of LEEN Ltd.



Getting a thorough

overview



Where do we start? Where do we want to go?

Successful networking tasks are based on the initial consultancy's quality as a central foundation. It is divided into several steps and will be executed by the consultant engineer.

- Step 1: Data collection
- Step 2: Site inspection
- Step 3: Elaboration of the initial consultancy report and presentation to the board of directors
- Step 4: Definition of objectives within the network

Data collection

The data collection form retrieves general business and energy data as well as machine or facility data. Companies tend to underestimate the time necessary for filling-in the form. Serving as important foundation of the initial consultancy, however, the form should be dealt with in due diligence, if necessary in cooperation with the consultant engineer. Based on the retrieved data both the consultant and the company establish the procedures and checklists for the site inspection.

> Tips for the collection of data

Filling-in the data collection form in due diligence is foundation for the site inspection and therefore mandatory for efficient consultancy. The prospect of implementing an energy management system (e.g. according to DIN EN ISO 50001) might be motivation thereof due to the fact that for that purpose a collection of data is mandatory anyway.

Site inspection

The consultant aligns with the energy responsible of the company beforehand in order to complete data gaps in the form and to stipulate the precise routine of the day thereof. The checklist's primary purpose is to make sure that all experts necessary for the individual technical areas are available during the site inspection. In addition to that the company's energy responsible should accompany the entire site inspection. During tour individual measures will be identified. Most naturally, upon the site inspection all safety regulations shall be followed.

Analyzing, evaluating,

getting to the point



Initial consultancy: Reporting and defining objectives

Using the LEEN-Tools the consultant engineer establishes the extensive initial consultancy report. The following materials ensure a constantly high quality level:

- Data collection form
- Technical calculation tools
- Measure overview
- Sample report and minimum requirements with respect to the initial consultancy report

Reference dimensions with respect to timing of an initial consultancy for the consultant engineer (ce) as well as for the company (c)			
Company size (jährliche Energiekosten)	data collection	site inspection	reporting
Small business (< 300.000 €/a)	1 days (ce) 3 – 5 days (c)	1 – 2 days (ce) 1 – 2 days (c)	5 – 7 days (ce) 1 day (c)
Medium-sized business (< 1.000.000 €/a)	1,5 days (ce) 5 – 15 days (c)	2 – 4 days (ce) 1,5 – 3 days (c)	8 – 10 days (ce) 1,5 day (c)
Big businesses (< 5.000.000 €/a)	2,5 days (ce) 10 – 30 days (c)	4 – 6 days (ce) 2,5 – 5 days (c)	10 – 15 days (ce) 2 day (c)
Large-scale businesses (>10.000.000 €/a)	timeframe has to be agreed upon individually		

An initial consultancy report according to LEEN implies a certain amount of mandatory itemizations which ensure conformity with respect to DIN EN ISO 50001. The expenditure of time necessary for the consultancy depends on the size and complexity of the company involved. For a medium sized business with approximately 20 identified measures and a consultancy complexity of 10 days there should be considered about half a day.

In a draft version the report will be forwarded to the company in order to be commented so that consultants as well as the companies themselves have the identical ideas and opinions on the potentials identified. Central element of the report is the so-called measure overview displaying all identified measures and their substantial key data (energy savings, CO₂-reduction, profitability). The completed report will be presented to the company's management by the consultant engineer and shall be signed by all parties as a sign of commitment.

Defining objectives

The initial consultancy phase within the network terminates with the common agreement of one energy efficiency objective and one CO₂-reduction objective each. This shall be agreed upon and stipulated between the participants, the moderator as well as the consultant engineer thereof. The common objective is voluntarily and has a motivating function, e.g. as orientation for employees or as criterion with respect to the management. It may also be used for external communication and public relation of the network. Fundamental orientation for the suggested network objective is the sum of the absolute savings potentials of all companies involved divided by the absolute energy consumption of these participants.



Initial primers for impulses



Network meetings

Along with the initial consultancy the network meetings are a central element of the Learning Energy Efficiency Networks. They take place on a regular basis – usually every 3 to 4 months – at one of the participating companies.

The first meeting which is usually attended by companies having huge expectations ranges as the official starting point of the network. The network team's task is now to convey to the companies right from the very start the structured course of networking.

The first network meeting has to

- elicit the companies' expectations
- determine the rules for participation within the network (punctuality, no external interference, confidentiality etc.)
- create the organizational basics with respect to the network's course of actions (scheduling of the subsequent 12 months filled with initial consultancy and network meetings)
- determine the topics of the next meetings in accordance with the companies

The subsequent network meetings will be granted

- a site inspection through the hosting company so that the participants can have an overview on the energetic situation thereof
- expert papers and presentation of external keynote speakers
- exchange of experiences with respect to measures implemented
- an annual presentation of the results of the monitoring



Internal and external image, aftermath



Public relations

To what extent results may or should be communicated to the public depends on the participating companies. By means of press conferences, presentations and also via the internet the work may be made public in order to create positive image enhancing synergies.

Monitoring

Monitoring addresses the process control in order to monitor objectives and, if necessary, to modify them. LEEN-Monitoring complies with DIN EN ISO 50001.

Bottom-up-Monitoring – Implementation effects with respect to energy efficiency measures

Bottom-up-Monitoring efficaciously lists all measures effective in the year of analyses of one company. The total of the measures effective thus equals the savings of the relevant year. Hereby the energy efficiency increase as well as the CO₂-reduction of the company will be calculated.

Top-down-Monitoring – Formation of parameters

Top-down-Monitoring is based on the time-related alteration of energy consumption parameters between the basic year and the year of the analysis. The annual energy parameter (e.g. in MWh per ton) results as quotient out of the total energy consumption as well as of the production. The Top-down-Approach is based on specific energy consumption values of the entire operation process. It implies all energy-relevant alterations notwithstanding their origin or cause.

LEEN-Monitoring

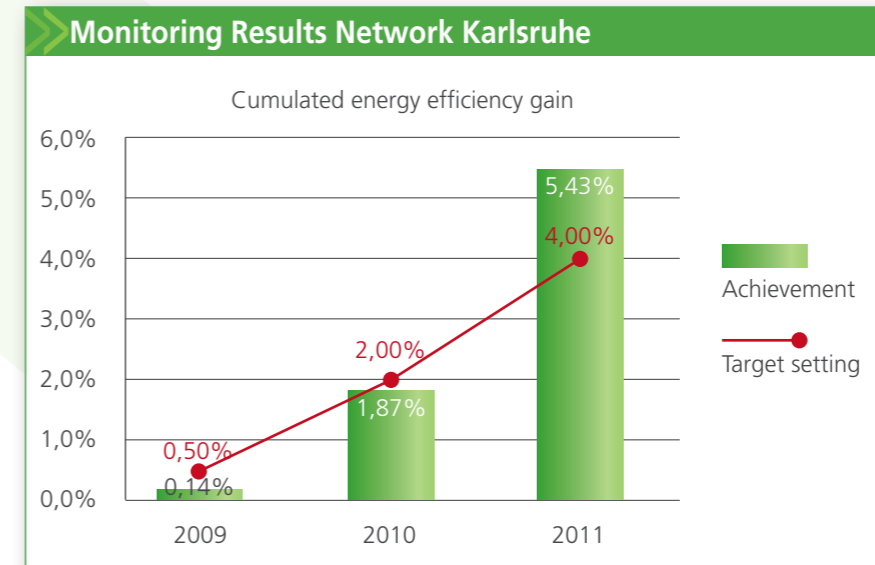
Generally both approaches will lead to different results, especially upon major alterations in production. For the purpose of monitoring the attainment of the network objective the Bottom-Up Monitoring is applied because this approach in an indicator for active commitment with respect to energy efficiency improvements. The Top-Down-Values show whether or not the energy consumption ranges within the set parameters.

Prepared figures and prepared for the future



Course and content of the monitoring

- Entering the energy consumption data as well as the production data into the monitoring tool by means of the company
- Entering all implemented measures into the monitoring tool by means of the company including those not mentioned in the initial consultation report
- Bottom-up-Approach: Calculation of the energy savings with respect to primary respectively final energy (efficiency increase) and reduction of the CO₂ emissions based on the implemented measures
- Top-down-Approach: Formation of energy parameters
- Plausibility validation of the determined results by the consultant engineer
- Establishing the monitoring report according to LEEN-regulations by the consultant engineer
- Establishing a network report including an evaluation of the objectives achievement by the consultant engineer in cooperation with the facilitator



Conclusion or installment

The network's final monitoring report concludes the determined network period and indicates if the objectives have been achieved. The companies then decide if and how they are willing to get on with the network. Since energy efficiency is an ongoing task, there already are networks in Germany that are continually in progress for years successfully for that matter.



Experience as best example /

Facts and Figures

Profitability of network participation For a company

Plastics processing industry businesses
(energy consumption 14 GWh/a)

Cumulative savings over 3 years:	165,000 €
Investment:	65,000 €
Participation costs network (directly):	25,000 €
Labor input network:	25,000 €
Profit after 3 years:	50,000 €
Expected annual profit after 3 years:	55,000 €
Payback period:	25 months

Average profitability of Implemented measures

Network with 10 companies

Energy costs savings:	1.6 m €/a
Investment:	2.7 m €
Payback period:	1.7 years
Internal rate of return (IRR):	59%
Net present value (NPV):	7.1 m €

Individual measure of Ninkaplast Ltd.
Illumination: LED instead of mercury vapor lamp

Operating figures of the investment

Savings	300 MWh/a
CO ₂ -reduction	152 t/a
Imputed interest rate	0%
Investments	42,000 €
Machine life	8 a
Energy costs reduction	45,800 €/a
Internal rate of return (IRR)	109 %
Net present value (NPV)	202,300 €
Payback (static)	0,92 a

Medium-sized businesses – maximum success!
Ninkaplast Ltd. (ninka) is a medium-sized company with 80 years of experience in plastics processing and molding. In partnership with the customers ninka develops, produces, refines and mounts as well simple parts as also complex systems and supplies renowned furniture, household & technology, media & communications, transportation & logistics as well as medicine & environment-related companies.

Helmut Giesdorf & Co. Ltd. – LEEN OWL II

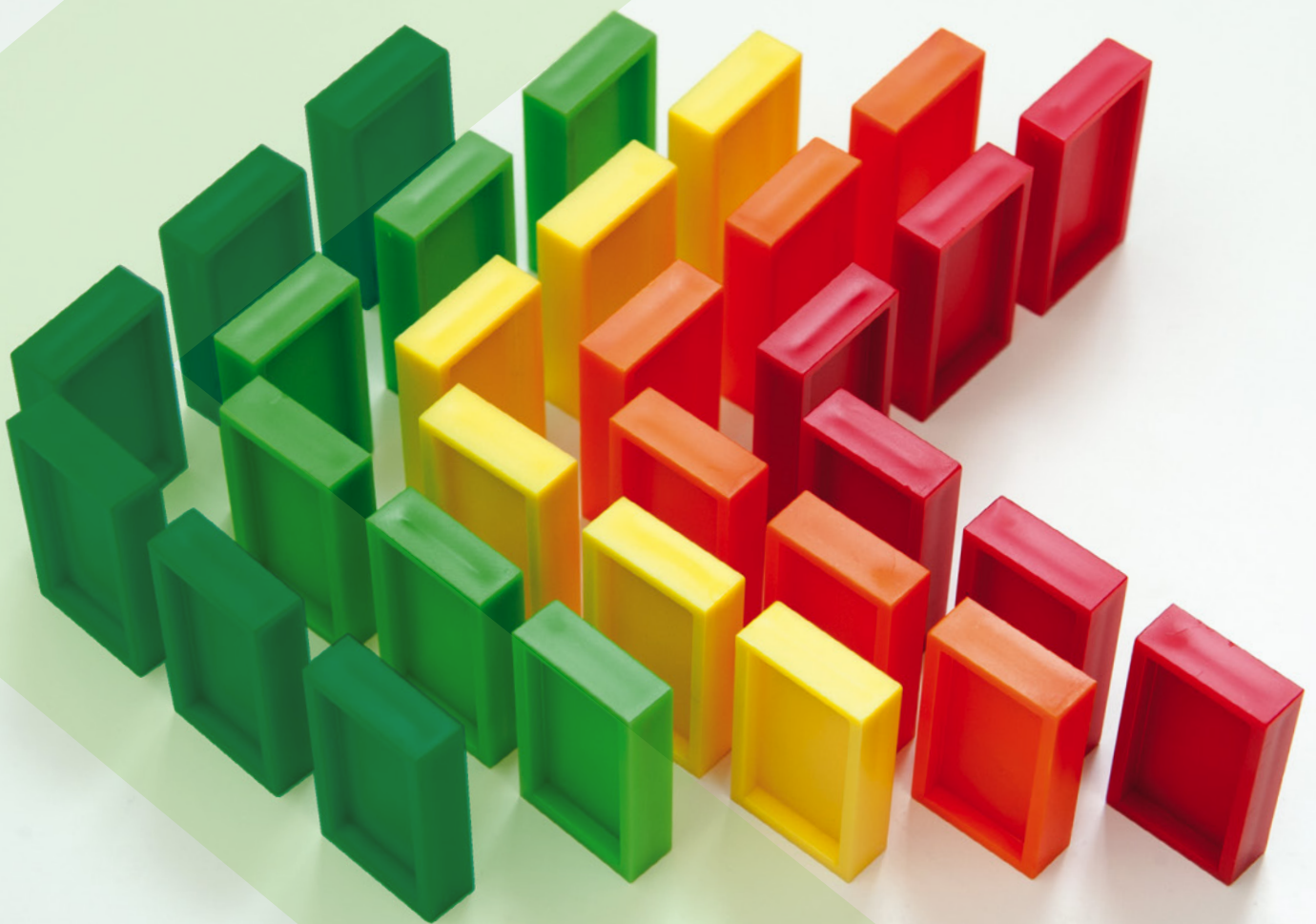
Operating figures of the investment

Savings	454 MWh/a
CO ₂ -reduction	164 t/a
Imputed interest rate	10%
Investment	87,000 €
Machine life	10 a
Energy costs reduction	45,000 €/a
Internal rate of return (IRR)	50 %
Net present value (NPV)	185,000 €
Payback (static)	2.00 a

Issued: 2013

Investments pay off!
Three years ago, *Helmut Giesdorf & Co. Ltd.* has carried out 5 measures with respect to efficiency since the project started. The investment of approx. 87,000 € have effected savings of round about 45,000 € per year. In total approx. 289 MWh power and about 43 MWh long-distance heating will be reduced. The company's CO₂-emissions have been decreased at 164.6 tons per year (this equals the CO₂-emissions of 58 average dwellings).

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