

Efficient. Pioneering. Cost effective.

ETANOMICS – Your competent partner  
for integrated energy concepts.





For SMEs. For the industry. For service providers.  
**ETANOMICS turns energy efficiency  
 into your competitive edge.**

**Integrated energy concepts for the industry.**

Rising energy costs are a factor that will be a force to reckon with in the next few years. These will be joined by more stringent legislation that will grant tax capping only to those production companies that have introduced an energy management system. It is therefore vital that companies tap into the two largest energy resources available today: maximised energy efficiency and optimised cost structures. To this end, Etanomics Service GmbH develops and realises integrated energy concepts for the industry and service providers, e.g. in catering.

How you can benefit from our know-how:

- enhanced energy efficiency
- energy consumption reduced by at least 10%
- energy controlling, cost cuts, and reduced pollution levels
- planning reliability through compliance with legal provisions
- competitive strength safeguarded over the long term
- process management from planning to realisation
- extensive experience, also on expansive premises

**Invest in systems fit for the future.**

Energy efficiency does not lend itself to island solutions. The objective must always be to provide a solution that can stand the test of time. True to this policy, Etanomics offers a portfolio of integrated, sustainable energy concepts. In our role as a long term partner, we support and advise our customers over the entire project lifetime. Together we develop and implement the energy concepts, analyse the required targets, and continuously realign the project's progress to the market.

This involves:

- strategic planning for the implementation
- energy controlling
- analyses of measures and processes
- inline analyses and optimisations

**Energy efficiency pays off:  
 also in the form of state subsidies.**

The state subsidises energy intensive industries by granting them electricity and energy tax allowances and adjusting offsets in the promotion of renewable electricity (EEG rates of remuneration). To be granted tax capping, i.e. electricity and energy tax allowances, a company must increase its energy efficiency by 1.3% pa. This requires a certificated ISO 50001 energy management system or EMAS system that verifies energy efficiency and entitlement to subsidies under the renewable energy regulations.

→ **Plan for cost effectiveness, and act for society and the environment: by investing in energy efficiency, companies can achieve energy savings in excess of 15%. This cuts costs – and emissions.**



Consult. Plan. Realise.  
**ETANOMICS** energy concepts  
 provide integrated solutions.

**Invest in end to end solutions that are worth your while.**

When developing pioneering energy concepts, Etanomics treats consultation, planning, and realisation as an inseparable whole. In practice, this means that Etanomics always provides end to end solutions from the one source. These include the analysis, the concept, the realisation, and – particularly important – the monitoring and evaluation of all measures taken.

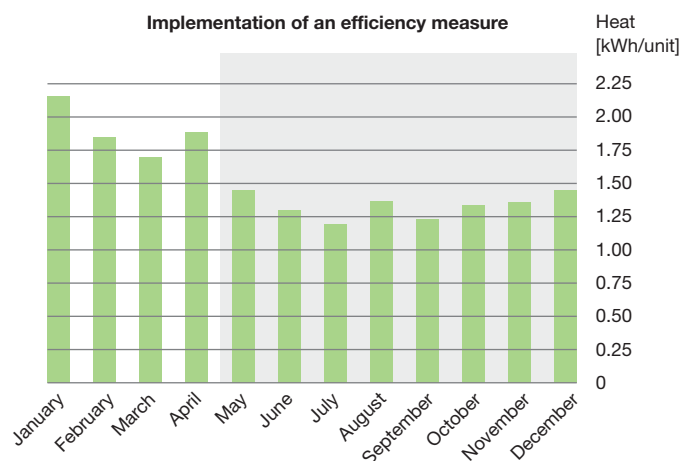
Our procedure:

- to define customer requirements
- to analyse the actual situation
- to define potential/measures, broken down into immediately realisable, medium term, and long term activities
- to raise the awareness of employees
- to quantify and implement results

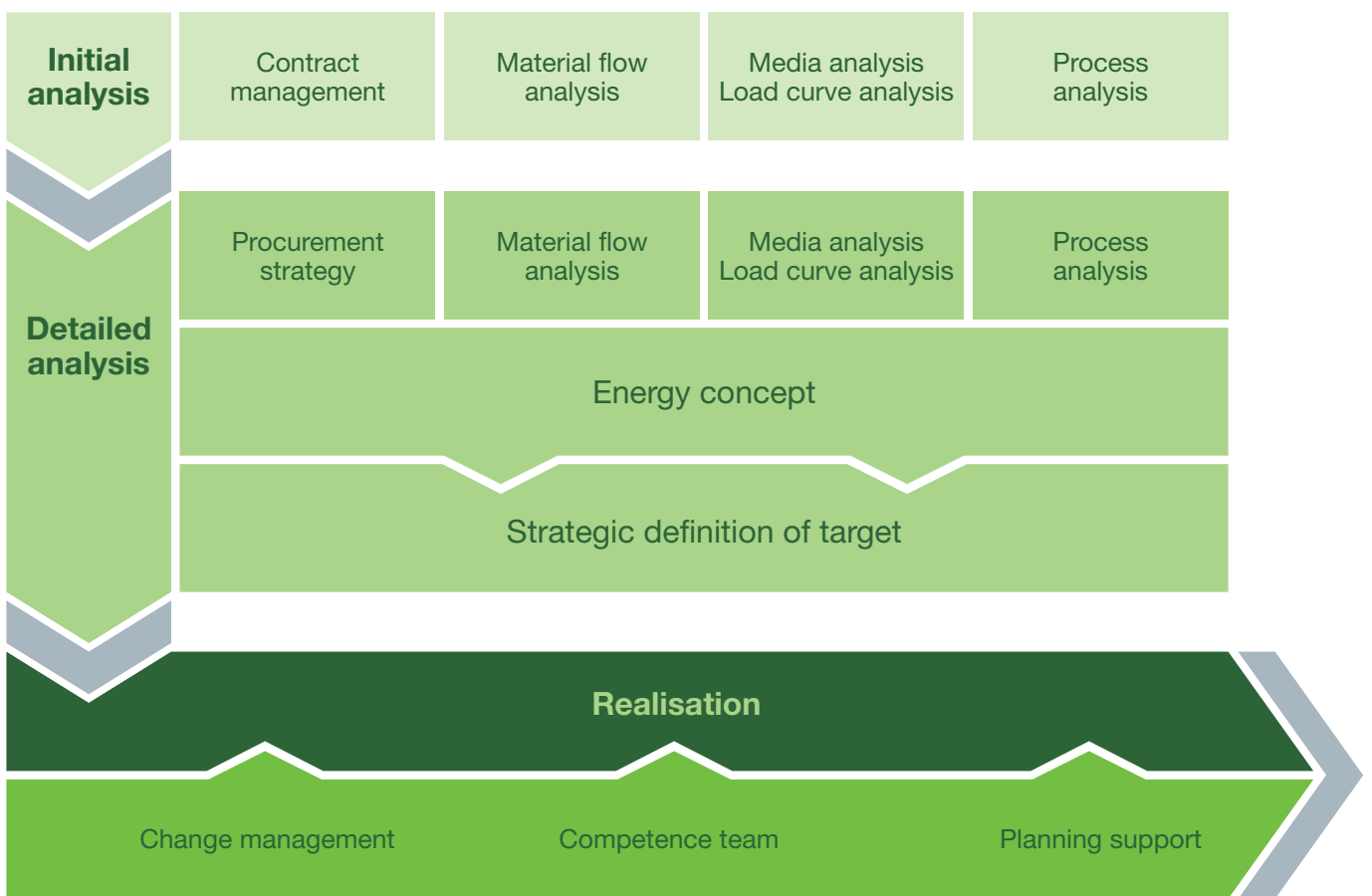
**Decide for solutions that will bring your whole company that decisive step ahead.**

Etanomics analyses the entire company with all of its energy consumers. The energy concept based on this includes all aspects from the details to the peripheral, from the individual production processes to the entire location. Our solutions not only target the company itself, but also include adjoining consumers, the infrastructure, organisations, and energy markets in the analyses. This gives rise to an integrated, measurable energy concept. Procurement strategies and energy efficiency then extend beyond the company's location, e.g. into the entire corporate group, a community, or an industrial state.

→ **Step by step – implementing each measure helps to turn a concept into a long term partnership.**



These example energy performance indicators for a washing process make it clear: the success of an energy efficiency measure in May can be measured immediately.



At a glance: the flow chart of Etanomics methodology.

Think over. Think along. Think ahead.  
**ETANOMICS** develops energy  
 concepts for the future.

**Initial concept:**  
 geared to success from the outset.

Each and every concept starts with the quantification, description, and analysis of the actual situation. At the same time, a material flow analysis provides the basis for all measures. This represents the energy relations over the whole value chain – as structured and quantified values. It therefore reveals the dependencies between energy purchases, energy generation, and the product.

**Detailed concept:**  
 recording all possibilities.

The bases determined in the initial concept undergo a detailed analysis that brings them together in a realisation concept. This integrates process and potential analyses; the energy and development study; the setup of a combined energy system; and the evaluation of the findings.

**Realisation:**  
 together with the customers and  
 experienced partners.

After the planning phase, we steer the realisation process together with experienced partners in our network – always in agreement with the users and our customers' partners. Scheduling, the implementation strategy, and project management remain transparent at all times.

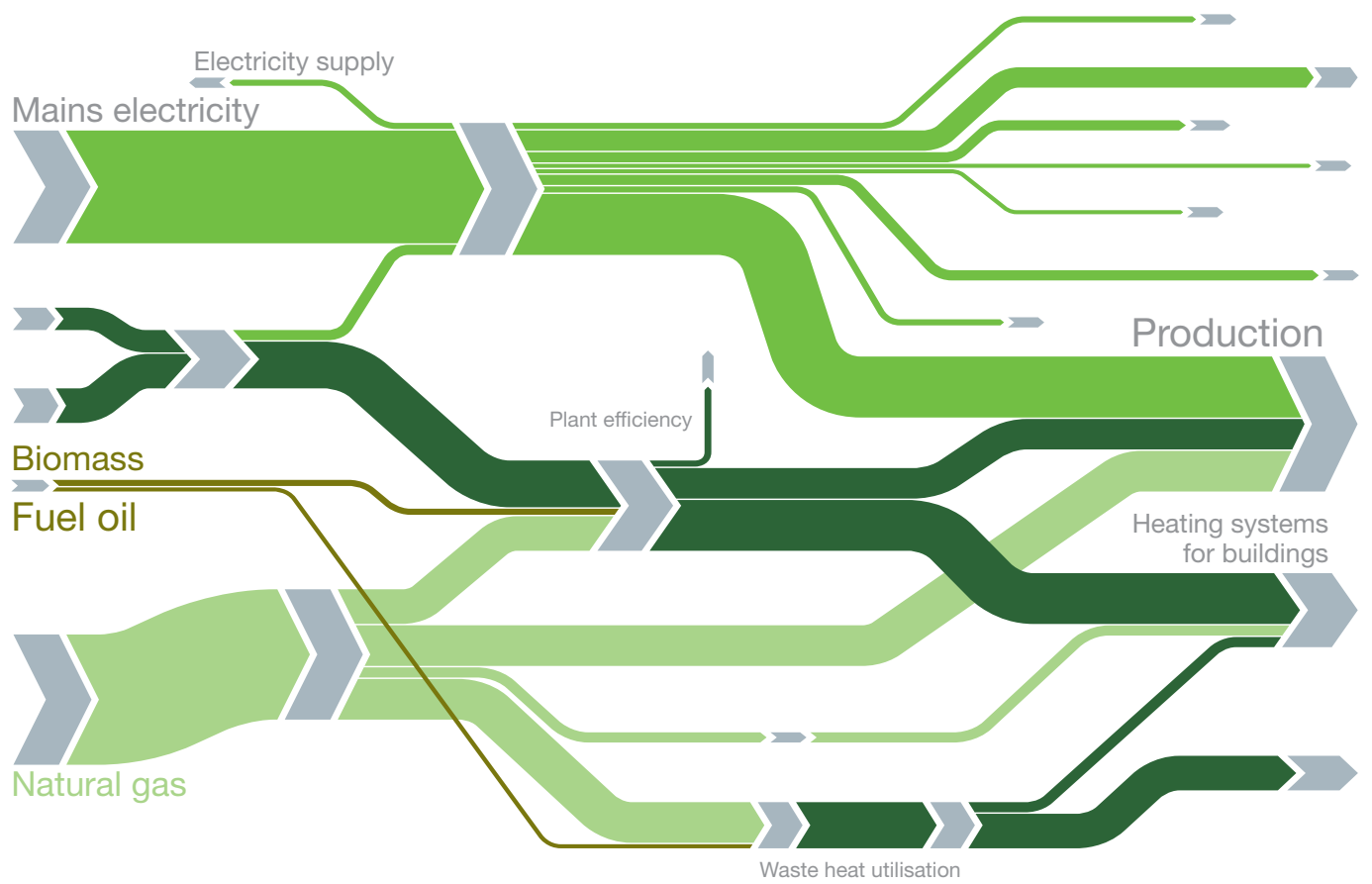
**Evaluation:**  
 it is important that genuine added value  
 has ultimately been created.

From the initial concept to the implementation of measures to the evaluation, you receive Etanomics energy concepts from the one source – and this without interfaces anywhere along the line. All of the defined targets are geared to sustainability – for reduced energy costs, lower pollution levels, and improved utilisation of resources. And, aided by its own methodology, Etanomics is also in a position to conduct flexible and extensive analyses on the interactions between the various targets.

The targets at a glance:

- financial targets: lifecycle analysis (LCA), return on investment (ROI), total cost of ownership, cash flow analyses
- energy and efficiency: reduction potential, substitution potential, reduction of CO<sub>2</sub> emissions
- organisation: process reliability, modifications to setup and process planning
- customer prospects: carbon footprint for image enhancement, stakeholder interests

→ We are not satisfied with the energy efficiency of a company until all areas benefit from the measures on a sustainable basis.



The material flow schematic illustrates where most energy is used and where the highest costs and emissions arise.



Analyse. Verify. Optimise.

## The material flow analysis as the basis for every ETANOMICS energy concept.

### View your corporate processes from a completely different perspective.

Our cooperation starts every time with the systematic compilation and depiction of the energy and material flows. A detailed material flow analysis therefore provides us with a basis for every energy concept and for understanding the separate processes and sequences involved in the overall system. The load curve analysis then extends this knowledge with statistical methods and measurements.

The target of this analysis is the structured definition of measures and processes serving to reduce the energy requirements and hence costs and emissions.

Findings of the material flow analysis:

- requirements split/requirements analysis
- performance indicators
- cost structure/savings potential
- corporate carbon footprint
- optimisation of management processes
- analysis of production processes

Definite measures:

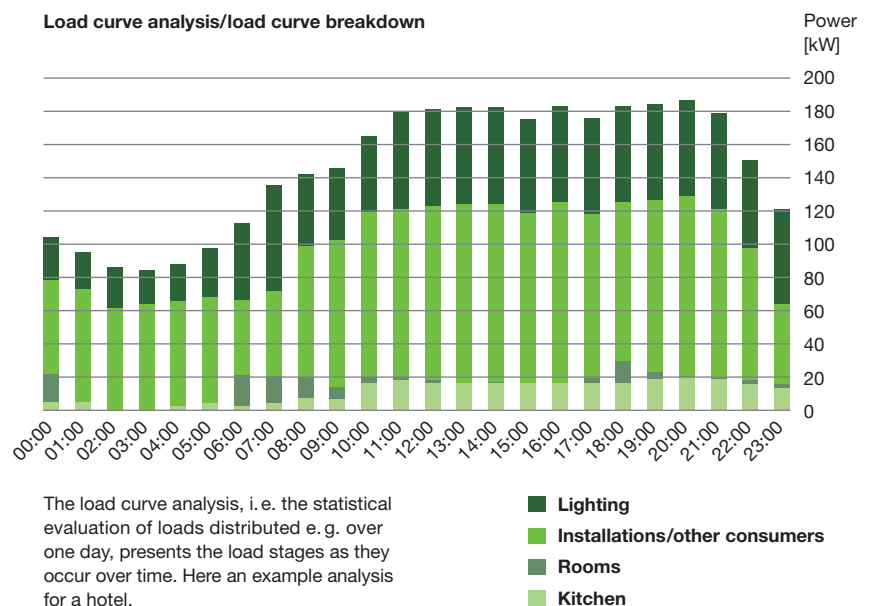
- energy procurement/energy marketing
- processing technology/plant operations
- combined energy system/plant hydraulics
- needs based cost analysis on operating resources

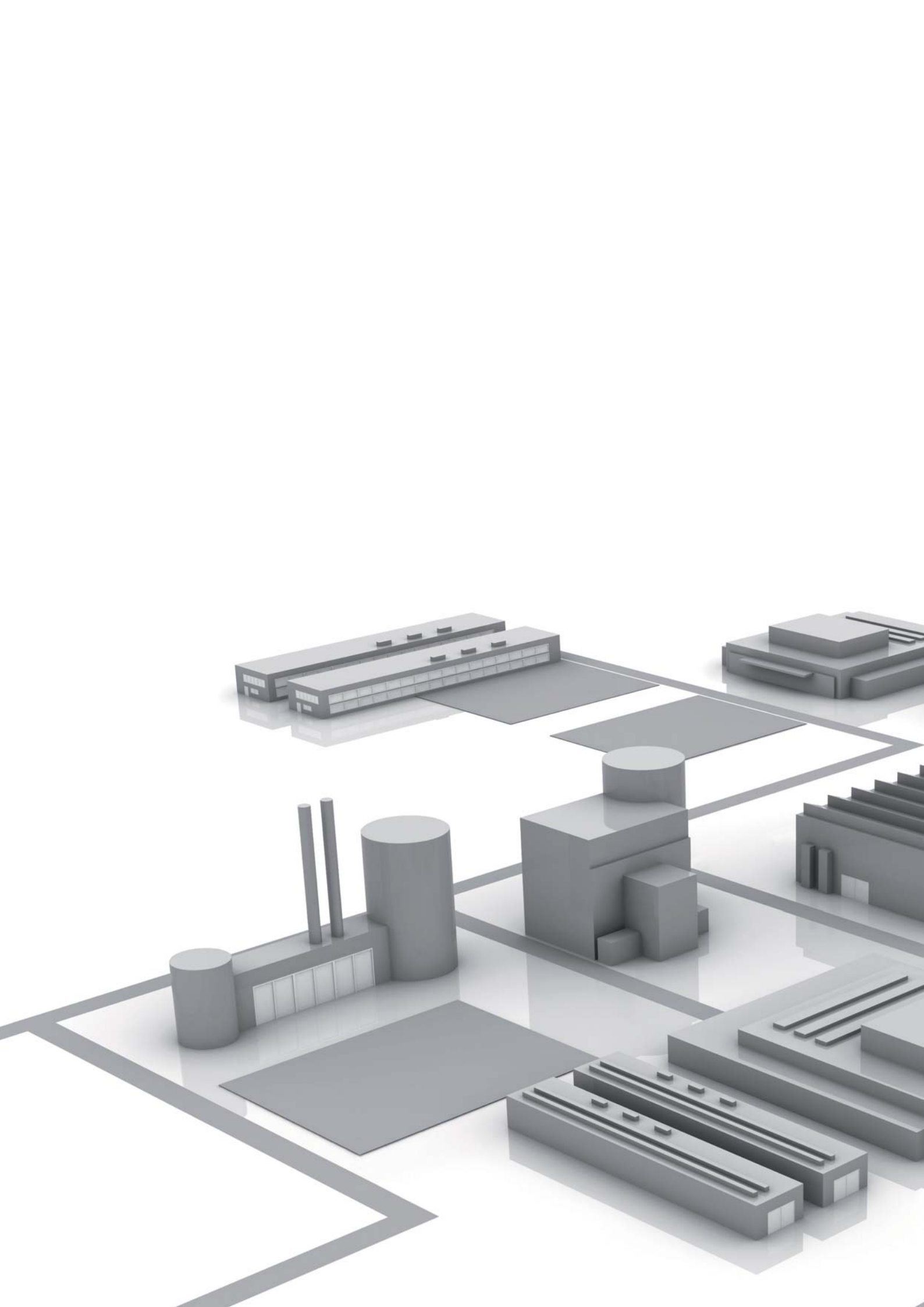
### The potential analysis makes energy concepts plannable.

The next step involves the so called potential analysis. This examines the potential a company or location has to offer for an energy concept geared to the future. At the same time, it defines the areas in need of investment as well as the existing potential that can be utilised without financial expenditure.

→ The material flow analysis can, for instance, depict energy flows, emissions, or value creation completely in accordance with individual requirements. This depiction can extend into single production processes.

Load curve analysis/load curve breakdown





Transparent. Exemplary. Trendsetting.  
The facts and figures for an example  
ETANOMICS energy concept.

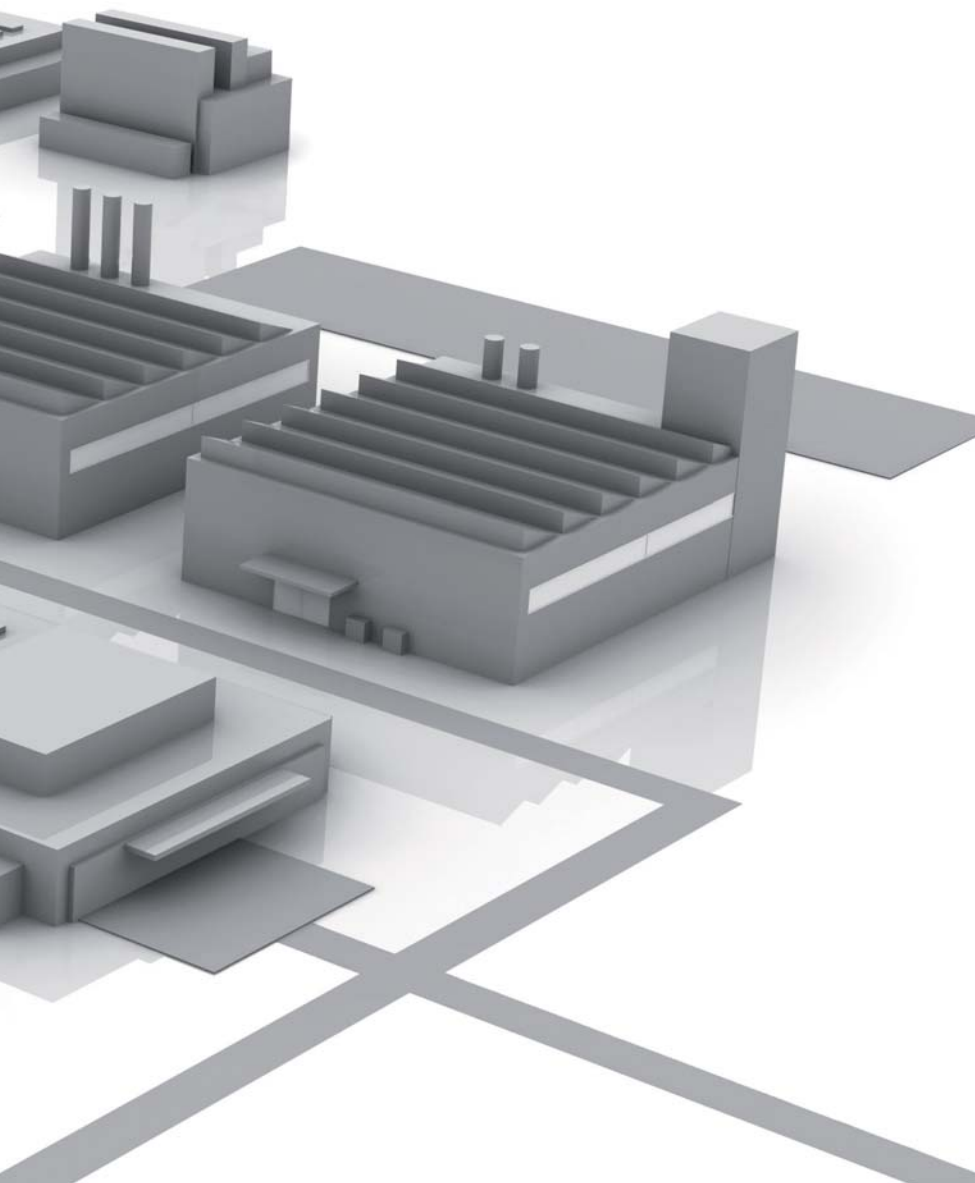
**Take a virtual trip to the world of energy efficiency.**

All Etanomics energy concepts focus on linking the functions of each technical solution. At all events, the components and systems are nonproprietary, with priority given to systems

already available. Our customers therefore receive integrated, energy efficient technical concepts of optimised cost effectiveness for buildings and plant.

The following presents an example of how the measures are calculated and interact with each other. Not all measures are shown here, but only the most important ones that have been implemented. Yet one thing does become clear: thanks to the high savings, the return on investment needs only about five and a half years.

→ **The example presented here is representative of an industrial production company including its administration. Our energy concepts, however, can be applied to every other company.**



#### Total requirements

Electricity:	32,000 MWh
Natural gas:	28,000 MWh
Fuel oil:	240 MWh
Water:	78,000 m <sup>3</sup>

#### Total/savings

Secondary fossil energy:	42,000 MWh
Water:	25,000 m <sup>3</sup>
Emissions:	31,000 t
Savings:	approx € 1,260,000

**Energy costs - 20 %**

**Emissions - 20 % CO<sub>2</sub>**

## A combined energy system from the logistics to the administration

The continuous improvements to processes, plant regulation, and the entire system could reduce the total power consumption of the energy centre by 3.7 MW – and that despite additional consumers. In this example, combined heat and power (CHP) units generate 926 kW of electric power. These CHPs are fuelled with biomass, so the electricity they generate is subsidised at the EEG rates. Also, the biogas is produced in a plant in the direct vicinity, safeguarding a regional creation of value. At 76 %, the proportion of biomass in this plant lies far above the base load of conventional industrial installations.

Heat quantity:	19,400 MWh
Emissions:	1670 t
Investment:	€ 2.05 m
Heat price:	5.4 ct/kWh
Return on investment:	2.3 years

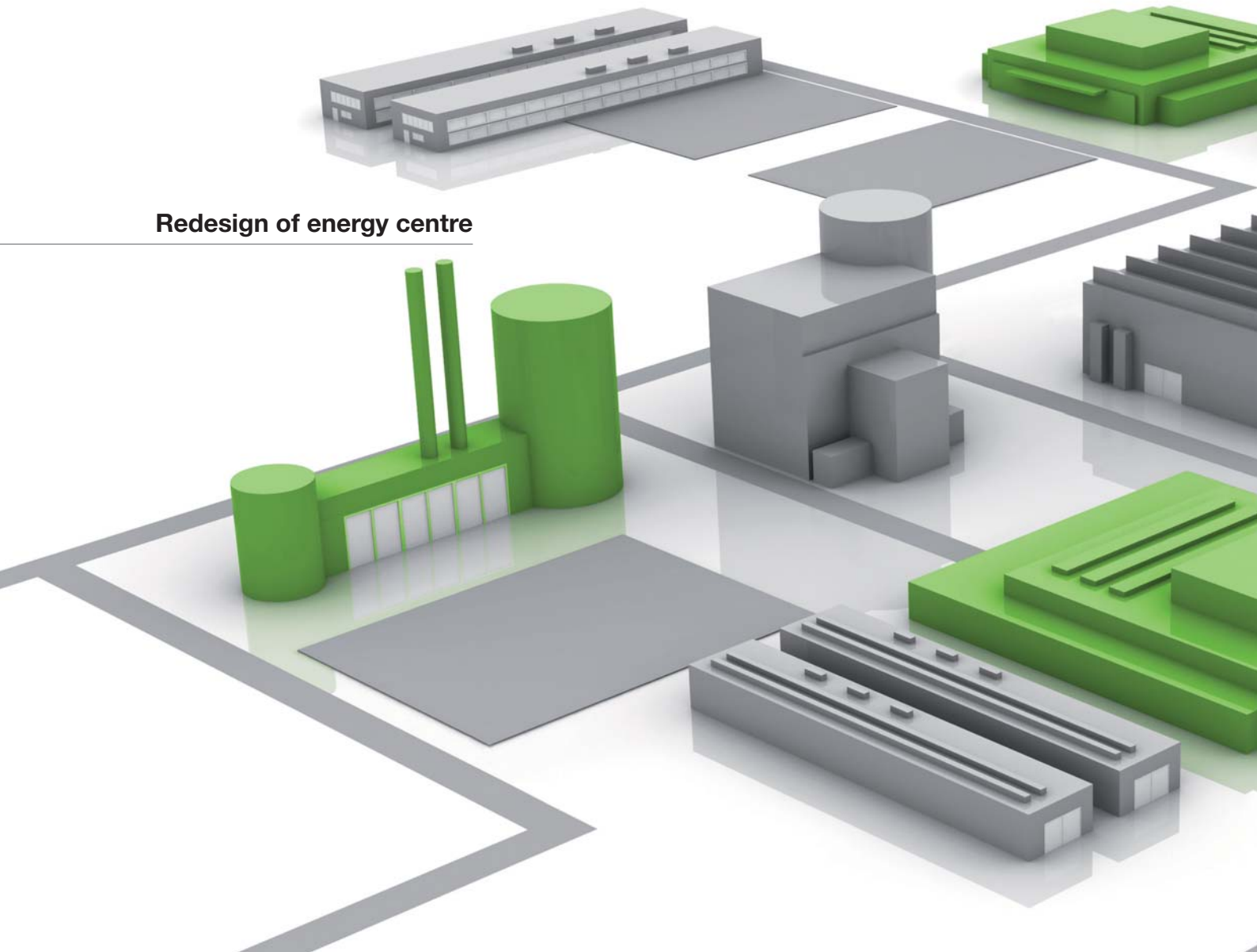
## Cooling requirements as a reference value

Central heat recovery utilises the waste heat from production processes, computer centres, and compressed air generation. A refrigerator supplies production, computer centres, and other facilities with cooling water. The installation's hot side is fed into the return line to the combined energy system, for considerable reductions to the heat quantity generated by the energy centre. This configuration of the installation as part of the combined energy system helps to determine the costs of each medium for each of the overall system's operating modes. The results are minimised total costs that energy controlling can also optimise and bill on a consumption basis.

Heat quantity:	5,500 MWh
Emissions:	- 1,270 t
Investment:	€ 2.7 m
Cost savings:	€ 292,000
Return on investment:	9.3 years
Compressed air costs:	1.6 ct/m <sup>3</sup> (STP)
Cooling energy costs:	3.5 – 7 ct/kWh
Cooling power:	940 kW
Heat output:	1,200 kW

## Central heat recovery

## Redesign of energy centre



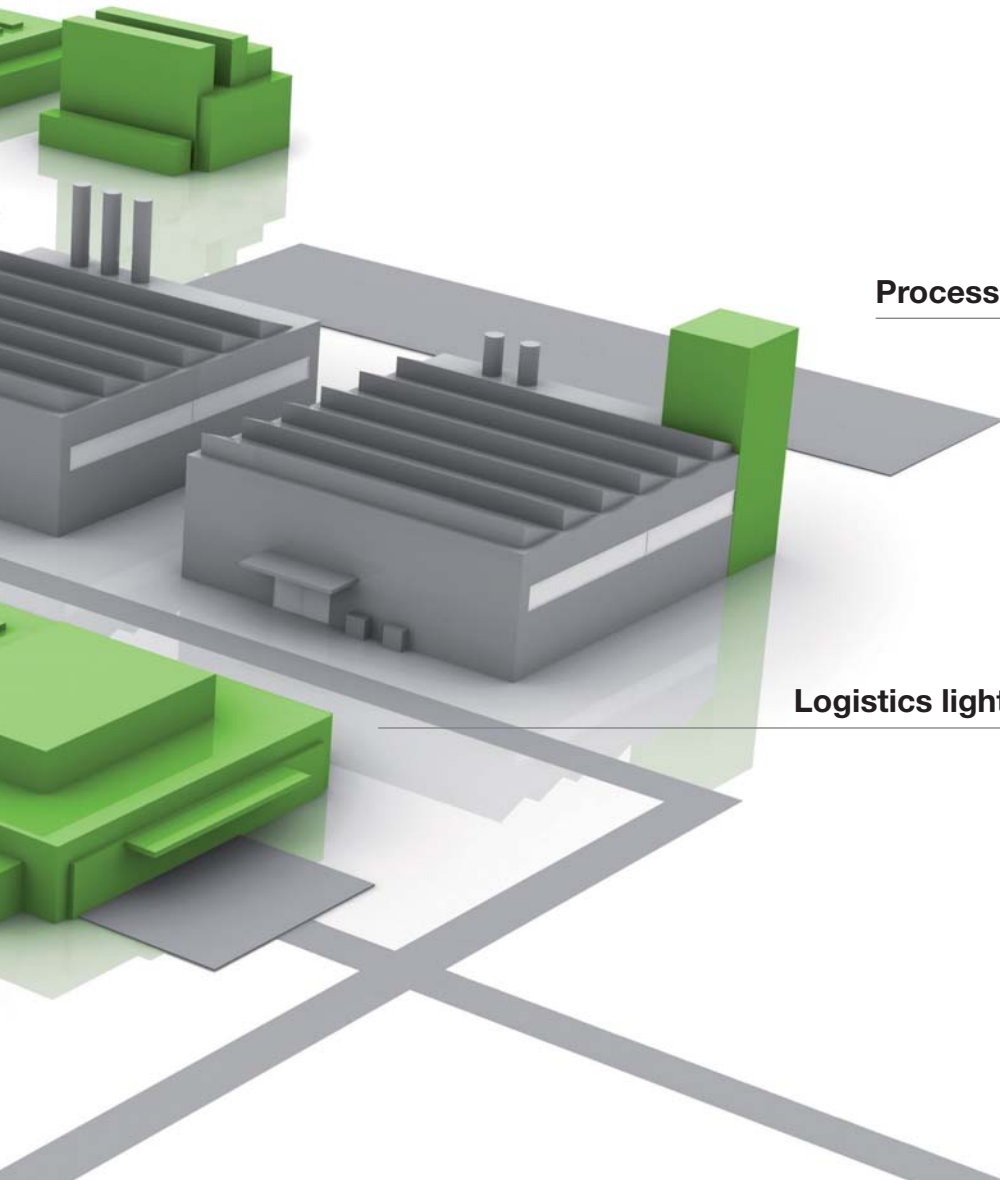
## Process optimisation

Also processes and installations present an enormous potential for savings. In initial studies, measurements and production variables are analysed to return meaningful performance indicators that compare these production variables with energy consumptions. The findings: the energy requirements fluctuate by up to 20 % for the same process. For this reason, measures for enhancing energy efficiency extend to individual employees, the analysis of processes, and plant maintenance. By consulting these constant reports on performance indicators, every employee can follow the development of his present energy efficiency. Also, a comprehensive energy management system publishes all of the required details on a dashboard – down to the process and machine level.

Electricity consumption:	151,000 kWh
Emissions:	93 t
Electricity costs:	€ 22,700
Investment:	€ 1,200
Savings potential:	€ 3,580 (> 15 %)
Return on investment:	< 1 year

## Process optimisation

## Logistics lighting concept



### Calculate using figures obtained from practice – for significant cuts in your operating costs.

Plans and targets are one thing – definite results for years to come another. For this reason, we never rely on theoretically feasible tables of figures, but utilise sound values that

can also be put into practice. Besides energy efficiency and cost effectiveness, the focus is also on future and investment security. Energy performance indicators (EPIS) serve to monitor exactly the efficiency of processes and measures. These provide an important basis for identifying further optimisation potential.

→ We think and act not in zones, but in integrated systems. As a consequence, we analyse and evaluate every object according to its present and planned use.

## Targeted and intelligent lighting

The realisation of a needs based lighting concept incorporated a balance of factors represented by cost effectiveness, employee awareness, and automation. The realised concept illuminates the loading areas for logistics and incoming goods depending on the level of daylight and allows direct intervention by employees. This helps to save 47,500 kWh pa of electricity, 29 t of CO<sub>2</sub>, and about € 8,500. The (static) amortisation period for this measure is therefore 7.8 years.

Investment:	€ 68,000
Electricity savings:	47,500 kWh
Load reduction:	31 kW
Cost savings:	€ 8,680
Return on investment:	7.8 years
Emissions:	- 29 t



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