



# SIMAIN Energy Optimization – for industry and infrastructure

using valuable energy more efficiently!

Industrial Technologies

**SIEMENS**





## A holistic approach to cut energy costs sustainably.

### Energy efficiency is a decisive factor for the success of your business.

Reducing energy costs successfully and sustainably is an issue of growing importance, a key part of ensuring cost-effective optimized operations in an industrial plant. Increasing energy prices and tightened laws for greenhouse gas emission force to review the energy consumption of your company. The profitability of your business is also influenced in a major way by the efficiency and reliability of the supply of energy.

### The key to success: Comprehensive Energy Management

We have seen from many of our projects, covering a range of industry sectors, that technology-related measures alone are simply not sufficient to achieve sustained increases in energy efficiency. More often than not, changes must be made to the operational processes, the organization and even the management processes.

This means that the energy efficiency of a company can only be optimized consistently and continuously by including professional energy management of the technical and operational practices in the daily running of the business.

### What's behind Energy Optimization?

Siemens Industrial Technologies – the technical services provider of Siemens for industry and infrastructure – has developed SIMAIN® as a portfolio of services for the operations phase which targets the individual requirements and business objectives of our customers. Energy Optimization is the service package devoted exclusively to increase the energy efficiency of your production facility and to achieve a lasting reduction of your costs.

Energy Optimization by Siemens Industrial Technologies takes a detailed look at the complete energy balance of your company, including all energy forms (compressed air, vacuum, heat, etc.) in conjunction with the primary energy sources involved (petroleum, natural gas, water, etc.).

What is more, Energy Optimization takes national regulations and government subsidies into account, thus ensuring the highest possible impact on profitability.



# The Energy Optimization process – a holistic and sustainable method to improve energy efficiency.

Understanding your production processes is essential to making Energy Optimization a success.

Close cooperation with you and our specialists as partners is therefore an integral part of every Energy Optimization project.

In four phases, Energy Optimization optimizes the use of electricity and other forms of energy including gas, heat, steam, compressed air, or natural gas.

A comprehensive analysis enables Energy Optimization to integrate auxiliary processes, such as the generation and use of process heat, steam or cold, into the optimization concept. This, in turn, helps you to use these resources more efficiently throughout your production facility.

Phases	Awareness	Analysis	Feasibility	Implementation & Sustainability
<b>Demand</b>	identification of optimization potential	technical analysis for estimation of energy saving potential	risk analysis, concept development & Return on Invest (ROI)	Continuous Improvement Process (CIP)
<b>Benefit</b>	quick support for internal decisions and industry specific benchmark	first overview of energy efficiency measures	implementation concept with Return on Invest (ROI) calculation	professional project management by Siemens and CIP
<b>Energy Optimization</b>	Energy Health Check	Energy Optimization Services, Energy Optimization of Drive Systems		

Energy Optimization is our services package tailored to achieve sustained increases in energy efficiency. We use a specially developed methodology in the awareness phase to assess all energy relevant aspects of your operational practices.





# Energy Health Check

The assessment of the energy awareness and potential savings in your plant using a computer-based interview focused on energy related processes.

## Take a close look at your energy related processes – with the “Energy Health Check”

The “Energy Health Check” comprises a computer-based interview. All energy-relevant processes, systems and procedures from operations, from the organization and from management are assessed in a systematic way. The objective of this interview is to do a comparative analysis of these processes, practices and procedures in order to

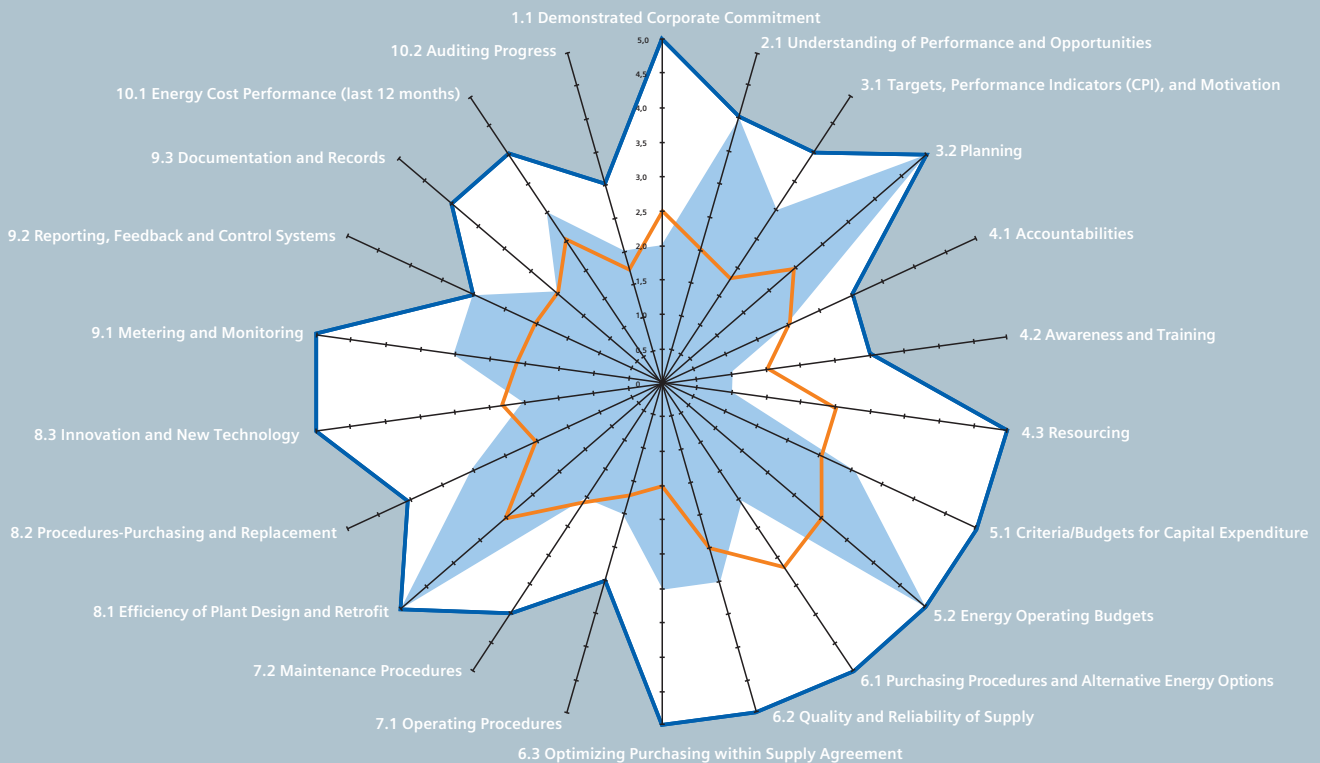
- identify promising opportunities to sustainably increase the energy efficiency,
- detect savings potential,
- recommend actions for improvement that will ensure that the potential savings and the increase in energy efficiency are achieved,
- generate an industry specific benchmark.





## How the “Energy Health Check” works

- The “Energy Health Check” analyses and evaluates the energy efficiency based on the operational processes using the data collected a 2 hour computer-based interview.
- The software used was specially developed to carry out this type of analysis.
- The interview is conducted by one of our certified auditors together with several representatives from different areas of your company (e.g. senior management, plant management, facilities and/or environmental managers, chief financial officer, maintenance or energy managers).
- Your organization’s energy management practices are assessed in 10 key areas that break down into a total of 22 elements (see graph) with questions requiring simple ‘yes’ or ‘no’ replies as well as built in plausibility checks.
- Your replies will be evaluated by the program. The overall and area-specific evaluations for your company will be shown on the scale of one to five.
- To complete the picture the tool provides an international benchmark service to show you how your company compares with others in your industry sector.

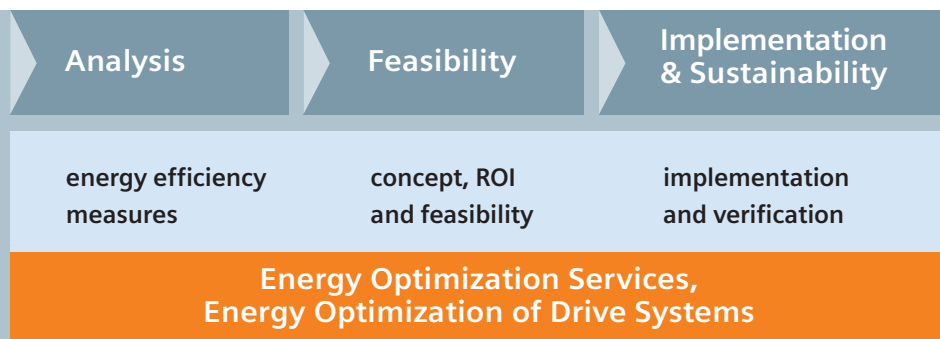


## The results of the “Energy Health Check” in the final report:

- The overall performance in terms of energy efficiency of your company as well as the level of development for each of the 22 categories.
  - Your results will be compared with different industries, sectors and companies by means of a database including more than 2000 companies.
  - Specific recommended actions that will lead to increases in your company’s energy efficiency.
  - Generation of monetary savings.
- A recommendable further step would be the “Energy Optimization Services” which takes all forms of energy into consideration in order to do a detailed analysis of your plant.

# Energy Optimization Services

Using energy more efficiently with Energy Optimization Services – higher productivity, higher earnings!



## Analysis-Phase

### Detection of energy efficiency potential, development of possible measures

This phase is a technical analysis on-site that serves to identify the first energy efficiency measures and to assess the general condition of the plant in terms of energy efficiency. All energy forms, the energy supply and distribution, the energy data collection and archiving and the output (e.g. waste heat) will be analyzed and assessed.

The results are:

- Overview of energy efficiency measures and optimization potential.
- First estimation of the potential energy savings and the necessary invest for each energy efficiency measure.
- A short report summarizing the outcome of this analysis.

## Feasibility-Phase

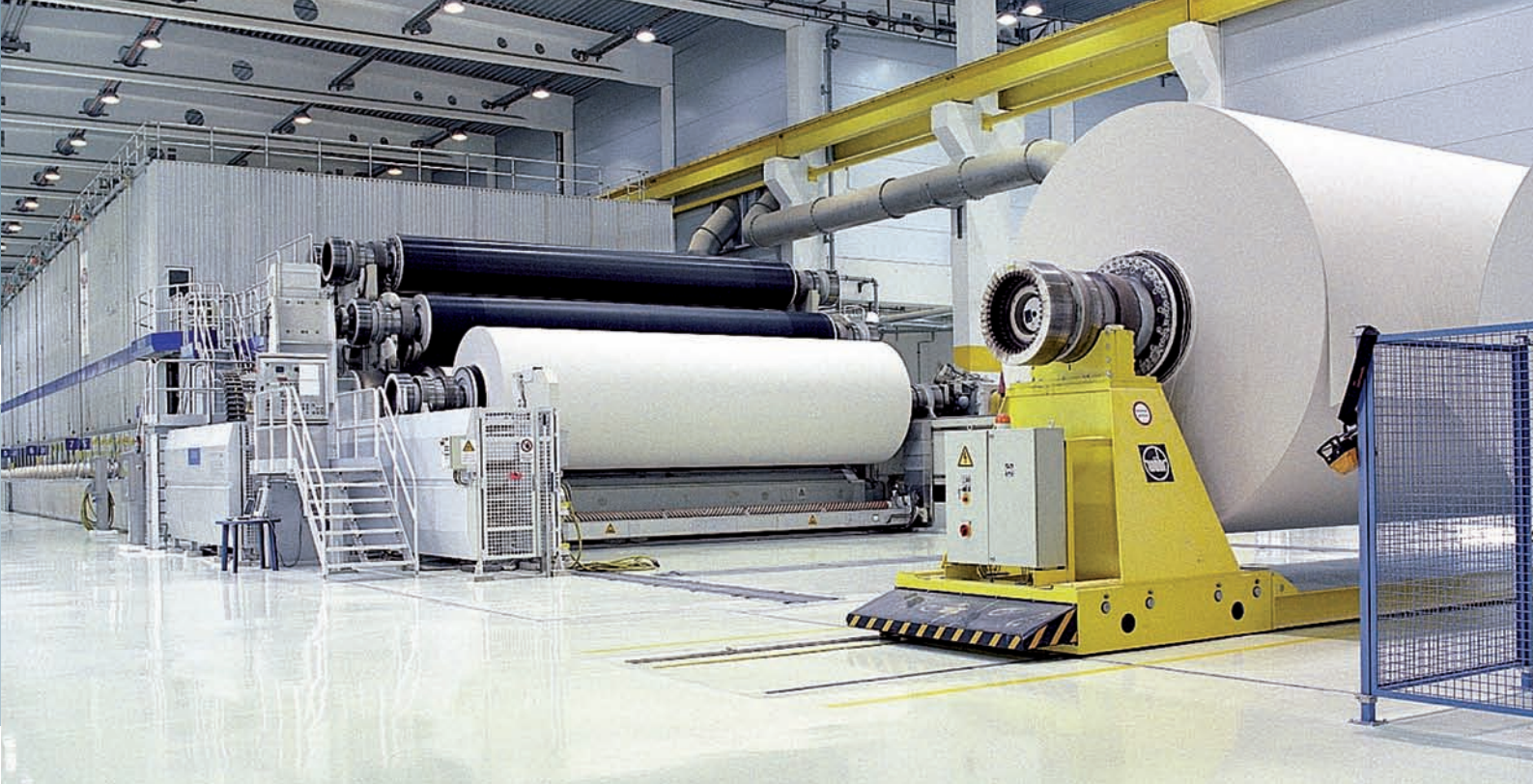
### Selection of measures, measure list preparation

Now the measures identified during the Analysis-Phase will be prioritized by the customer. For those measures selected a detailed implementation concept will be developed. Furthermore each measure will be assessed in terms of technical and economical feasibility.

For the economical feasibility detailed calculations and measurements will be conducted to determine the actual energy saving, and binding offers from Siemens and selected suppliers will be solicited in order to determine the actual investment. For the technical feasibility close coordination with suppliers and the customer's maintenance and production department is necessary.

The results are:

- Detailed technical and economical feasibility study.
- Overview of yearly energy savings.
- Implementation concept.



## Implementation-Phase

### Implementation of measures

The last step includes the implementation of the selected measures and the modernization of the facility. In this phase Siemens can provide the modernization with its own products and professional project management for external suppliers.

The results are:

- Transformation of potential savings into cost reduction.
- Reduced energy bill and production costs.
- Reduction of greenhouse gas emissions (environment-friendly production).
- Increased awareness and transparency
- Subsidies (if applicable).



Although during the Energy Optimization Services the drive systems will be considered as well, you can order the analysis of the drive systems separately.

Energy Optimization of Drive Systems is a service package specially customized to drive systems.

# Energy Optimization of Drive Systems

Our service package for reducing your energy costs.

## The challenge

Electrical energy is one of the most important production and cost factors. More than two-thirds of electric power in industry is consumed by drive systems. Independent studies show that approximately 30% of all electrical drives can be run more efficiently, enabling energy savings of up to 50% under optimal operating conditions. Machines with a comparatively high savings potential include pumps, fans, compressors, conveyors, blending and grinding mills, and extruders.

## Our solution – Energy Optimization of Drive Systems

Two conditions must be fulfilled for the optimization of your drive systems to be worthwhile. They are:

- 1.) Specialists must possess optimization expertise with regard to the evaluation of savings potential, the selection of drive systems for your company, and the formulation and technical implementation of economical optimization measures.
- 2.) High-quality and highly-efficient electrical components must be used, including low-consumption motors and frequency converters.

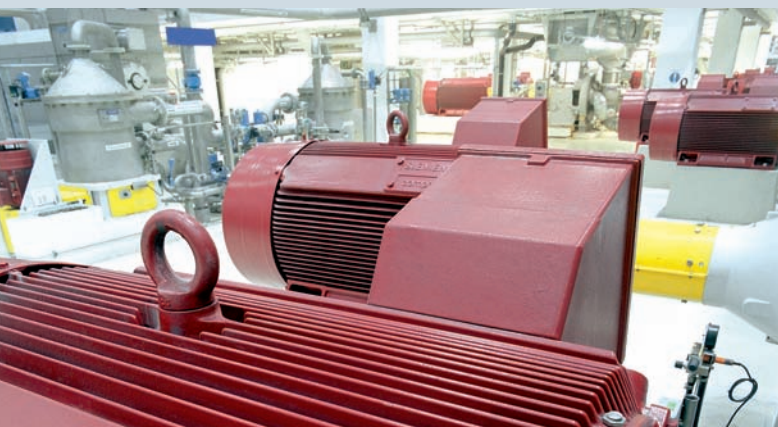
We meet both requirements – by using motors and frequency converters from Siemens and by making available the optimization expertise of a world-class provider of technical services.

Optimization of energy consumption takes place in three phases:

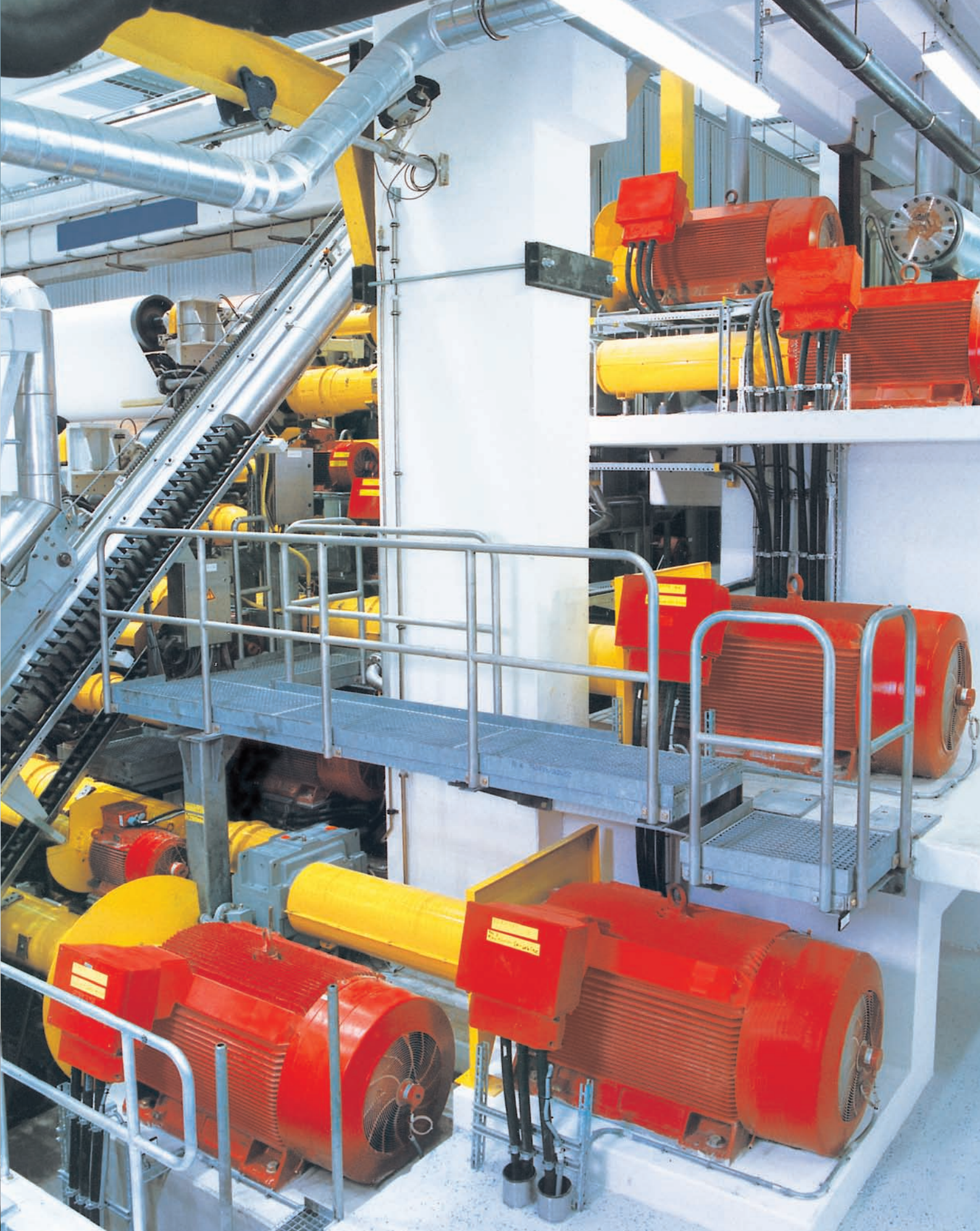
- Phase 1: Estimate of potential for stochastic estimation of the theoretical energy-saving potential by means of checklists.
- Phase 2: Energy analysis verifying the estimation of potential that is determining the precise energy cost savings.
- Phase 3: Technical and organizational implementation of the measures for optimizing selected drives based on result-dependent contracts.

## Good reasons for Energy Optimization of Drive Systems

- Identification of inefficient drive systems.
- Short amortization period.
- Free stochastic estimate of potential.
- Significant and sustained reduction of power consumption, energy costs, and environmental impact.
- Investment security through performance-based contract for technical implementation.
- Costs for the analysis applied against the implementation contract with Siemens.
- No charge for the analysis if no significant savings potential can be identified.









## Energy Optimization – no “hit and run”

A successful energy management approach is never based on cosmetic improvements and the quick implementation of substandard components and equipment to provide short-term gains. The risks of enormous follow-up costs are just too high.

Instead, Energy Optimization from Siemens Industrial Technologies takes a detailed look at the technical and economic aspects of your entire process. This enables us to develop a step-by-step concept to improve energy efficiency in line with your business needs – and then to implement it.

By taking your processes and technical facilities, national regulations, fluctuating energy prices and different energy suppliers into account, our Energy Optimization delivers significant benefits, including:

- Obvious and sustained reduction of your energy costs.
- Holistic approach: Consideration of all energy related processes and forms of energy: heat, compressed air, steam, maintenance, operations, monitoring, GHG-emissions, management-awareness, subsidies, etc.
- Extensive transparency with regard to energy needs, consumption, and costs.
- Continuous Improvement Process: Each phase adds value. After each phase the customer decides whether to continue.
- Worldwide support and know-how of a global powerhouse in engineering: presence in more than 190 countries with a worldwide network of highly trained energy specialists.
- Avoidance of financial penalties by conforming to national regulations.
- Access to government subsidies.
- Short-term ROI through concentration on improvement measures that really pay off.
- Better image for your enterprise thanks to high energy efficiency.
- Optimal resource utilization through concentration on your core capabilities and cooperation with a reliable, independent provider of technical services.
- Performance based agreement is possible.

■ **Improvement of your productivity, increase of your profits!**

**We care – that’s our promise !**



Energy Optimization is just one service package in our SIMAIN portfolio. Within the scope of our productline Asset Performance Management we supply in subjects as Maintenance Improvement and Integral Plant Maintenance.

SIMAIN BUSINESS BASED MAINTENANCE		SIMAIN ENERGY SERVICES
Maintenance Improvement	Integral Plant Maintenance	Energy Optimization
Maintenance Health Check	Maintenance Operations	Energy Health Check
Maintenance Business Review	Motor-Management-Program	Energy Optimization Services
Maintenance Improvement Program		Energy Optimization of Drive Systems

## More Information

Siemens AG  
Industry Sector  
Industry Solutions Division  
Industrial Technologies  
I IS IN  
P.O. Box 3220  
D-91058 Erlangen, Germany

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

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