

# SPECTRUM

THE IE GROUP MAGAZINE



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## Sustainability

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Sustainable industrial buildings are one thing above all else: efficient. IE shows how economic efficiency and sustainability go hand in hand. And why solar collectors on the roof are not always the best solution.



The specialist for industrial buildings.





## The sustainability formula for industrial buildings: 360° instead of 08/15

Sustainable or profit-oriented: In political discussions, it is often assumed that there is a natural contradiction between these two characteristics. From a business perspective, however, it is very simple: a company that is not economically viable cannot be sustainable - because it will not exist for long.

At IE, we really like the phrase “sustainable and economical.” It is not despite, but precisely because a company acts sustainably that it is economically successful. In the case of industrial buildings, it is obvious that a long-term perspective is not only sensible, but absolutely necessary. After all, the investment should pay off over many years. That is why we take a holistic view of industrial construction: it is not the construction costs alone that determine whether an architectural solution makes sense, but how it affects long-term operating costs, the environment, and the attractiveness of the workplace.

The practical examples presented in this Spectrum highlight various aspects of the economic, ecological, and social sustainability of industrial buildings. Two factors are key to their success: a 360° view of the company's specific situation and smart ideas that combine construction and operations planning.

A run-of-the-mill industrial building is the opposite of sustainability. This is evident from our experience with many existing buildings, where we are called upon to remedy deficiencies after a few years. But then, in most cases, only compromise solutions are possible, which can never develop the same potential as an industrial building that is designed to be sustainable from the start. This extra analysis and holistic planning at the beginning of a project always pays off – year after year.

Thomas Rieger, Managing Director IE Technology Zurich  
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# Sustainable through and through instead of just greenwashing

*Sustainable industrial construction involves much more than just a green roof with solar panels. It's about the bigger picture: long-term competitive advantages instead of short-term cost savings, consistent resource conservation instead of green cosmetics, and a performance-enhancing work environment instead of architectural dreariness. Ecological, social, and economic benefits do not have to be contradictory: with efficient processes, all three goals can be reconciled.*

The long-term perspective is at the heart of the concept of sustainability. Instead of narrowing the focus to the construction phase, sustainability broadens the perspective to encompass the entire life cycle. Truly sustainable factories must therefore provide answers to the key challenges facing industry, otherwise their lifespan will be limited: the increasing demand for individualized products and customized solutions; rising energy costs; and increasingly unpredictable economic cycles, which make long-term production planning extremely difficult. The concept of sustainability is based on the idea that the environment is not just a resource to be exploited, but a system that must be respected and preserved.

„For us, the definition is quite simple: industrial construction is sustainable if it pays off for the company in the long

term. We are not interested in shining with short-term pseudo-successes, but in securing long-term competitive advantages and bringing them into line with ecological and social goals," says Thomas Rieger, Managing Director of IE. "We therefore do not see sustainability as a special discipline, but rather an integral part of our planning methodology. This means that we take into account all the costs that a building incurs over its entire life cycle: from project development to its demolition."

The high operating costs incurred by manufacturing companies mean that they carry more weight than construction costs.

On average, operating costs over a ten-year period add up to at least the same amount as construction costs. Anyone who neglects this in their planning will pay a very high price in the long run. "Sustainable industrial construction must achieve one thing above all else: efficient processes within its walls. Everything else is greenwashing," says Thomas Rieger. "If this core element is not right, then energy, labor, and resources are wasted day after day. Solar panels on the roof may make sense, but if the processes inside the building are inefficient, a photovoltaic system can never compensate for that."

By combining operations and construction planning, architectural, process, and building services expertise under the roof of the IE Group, the industrial construction

⇒ *„The most important factor for sustainable industrial buildings is efficient processes that are optimally supported by the building.“*

Percy Limacher, Managing Director IE Plast Zurich

# SUSTAINABLY ECONOMICAL



specialist can bring together all the key factors that influence the sustainability of an industrial building. In addition to optimizing processes, the following points, among others, play a decisive role in IE's sustainability concept:

## Scalability

The factory must be able to grow and contract in terms of technology, space, and personnel in line with production cycles. Only an industrial building that can adapt flexibly to changing requirements is sustainable. Otherwise, it will have to be replaced prematurely - a waste of resources in both ecological and economic terms.

IE therefore designs the buildings to be scalable and, at the same time, develops a master plan for the further development of the entire factory site.

## Space efficiency

The equation is simple: the smaller the area required for a factory, the lower the construction and energy costs, and the better the ecological balance. IE ensures the best possible use of space through meticulous planning based on all goods and people flows.

## Low emissions

The factory of tomorrow will be built from materials with the lowest possible gray energy content. It will have energy-active floor and wall elements and use ground-water and geothermal systems, photovoltaic systems, and hybrid collectors to generate energy. IE makes clear statements about the costs over the depreciation period as well as the time to return on investment.

These facts provide customers with a sound basis for deciding how much they want to invest in alternative energies and emission reduction. These facts provide customers with a sound basis for deciding how much they want to invest in alternative energies and reducing emissions.

## The quality of the workplace

The architecture of industrial buildings is a decisive factor in employee satisfaction with their workplace and productivity: daylight, an open view to the outdoors, natural ventilation, pollutant-free building materials, and sufficient space for social rooms create the basis for this. In view of the growing competition for increasingly scarce skilled workers, this social sustainability aspect is a success factor that should not be underestimated.



OPERATING COSTS TURNED DOWN TO A MINIMUM

## Space requirements reduced by a third, energy consumption by half

*A production and assembly plant for off-road vehicles was struggling with an extremely fragmented company site. IE was commissioned to optimize the buildings and the site in such a way that operational processes would become significantly more efficient.*

The site, which has grown organically over decades, extends on both sides of a public thoroughfare that had to be crossed for a large part of the internal flow of goods - several times during a complete production cycle.

The results of IE's analysis and planning came as a big surprise to the client: 32 percent of the originally used floor space was dispensable – that's around 15,000 square meters! Most of the functions of the small-scale building structures in the area south of the street could be integ-

rated into a new building on the other side of the street, which makes full use of the permissible building height. This concentration of functions significantly streamlined the entire flow of goods.

A conveyor shaft under the public road connects the processing center remaining on the southern site with the new building, eliminating the need for time-consuming material transport across the road.

The environment benefits not only from the significantly reduced land consumption, but also from much lower emissions: energy savings are around 50 percent - with the same production capacity. This is due to the new building, which is state-of-the-art in terms of construction and building technology, more efficient processes throughout the company, and a significantly smaller building volume.

⇒ *„Simplifying processes, defragmenting complex structures: a win-win for the environment and business.“*

Thomas Rieger, Managing Director IE Technology Zurich

WOOD INSTEAD OF STEEL, RECYCLING INSTEAD OF BURNING

# Gray energy is turning green - and affordable

A food manufacturer from Switzerland tasked IE with constructing a new building that would be exemplary from an ecological perspective, but without significantly exceeding the budget for a conventional industrial building. In addition to energy recovery and process optimization, IE focused primarily on avoiding gray energy, i.e., the energy consumed during the construction process itself.

Steel support structures are usually used for storage and packaging halls in the hygiene-sensitive food industry. IE proposed a more ecological alternative: wood. Thanks to its extensive experience with processes in the food industry and in-depth knowledge of hygiene requirements, IE was able to convince the client.

## Wood: ecological, practical, cost-effective

The better arguments clearly lay with wood: On the one hand, the use of wood was significantly cheaper, as steel prices were reaching new highs at the time. On the other hand, the environment benefits considerably: the energy required to produce wooden beams is many times lower than that required for steel.

⇒ *„Mental blocks often prevent sustainable solutions. Are wooden support structures unsuitable for sensitive production facilities? That used to be the case. Today we know that they actually offer impressive advantages.“*

Rainer Pirkelmann, Managing Director IE Food Zurich

And since it is a renewable raw material, wood is CO<sub>2</sub>-neutral. In addition, timber structures also offer the highest level of fire and thermal protection: wood naturally conducts heat and cold significantly less than other building materials. As a result, IE's timber construction easily exceeded the legal requirements, even in standard construction.

## Excavated material for agriculture saves CO<sub>2</sub> and costs

IE further reduced the gray energy through the sustainable handling of the excavated material: the excavators moved around 9,000 m<sup>3</sup> of black earth to prepare the construction site. This peat material usually ends up in incinerators. IE found another way: the peat was mixed with mineral material on site and used to level the adjacent agricultural land for leveling. This measure enhanced the value of the neighboring agricultural land. It saved the client disposal costs of CHF 1.2 million and the environment 1,800 truck trips, as well as the CO<sub>2</sub> emissions from burning the peat.

With clever ideas, IE exceeded the client's expectations: lower construction and operating costs are combined with reduced resource consumption and significant CO<sub>2</sub> savings in this project, resulting in a truly sustainable industrial building.



THE UNDERESTIMATED CATALYST FOR PRODUCTIVITY

# Architecture ensures flashes of inspiration and feelings of happiness

*An IE project for a manufacturer of special-purpose vehicles demonstrates the positive effect of architecture on the working atmosphere and productivity. The company's buildings were outdated, dark, poorly ventilated, and not logically connected to each other. Development and production were almost hermetically separated from each other - in buildings at opposite ends of the company premises.*

On inquiry, the company confirmed that there was not only a physical distance between development and production, but also a pronounced silo mentality: each department preferred to keep to itself. This was an untenable situation in a company with a well above-average vertical range of manufacture that is completely dependent on its own innovations.

When commissioning IE, the company's initial focus was on optimizing internal processes. However, IE drew attention to the unique opportunity to simultaneously improve employee motivation and collaboration - with the help of a compelling architectural solution. Studies show that the majority of innovations in companies come about informally – not in specially convened meetings, but in more chance encounters in the workplace or in the break room.

## **Architecture enhances interaction**

IE took these findings into account and designed a building that combines production and development under one roof. The route system was deliberately designed so that employees from both departments would have to meet and communication would get underway. IE deliberately placed the assembly hall for gearboxes at the center of the new building and made it visible from three sides through glazing. It was precisely this interface between



production and development that became the eye-catcher and communicative center of the entire company.

## **Architecture improves working atmosphere**

Just a few years later, the company confirmed that collaboration between development and production had improved significantly. And not only that: job satisfaction had risen noticeably in both departments. One of the main reasons for this was the attractive new building. Thanks to its optimal orientation towards the sun, floor-to-ceiling glazing, and a narrow building structure, it is flooded with daylight and yet sufficiently shaded. This not only saves energy, but also contributes significantly to well-being in the workplace. And all this with construction costs that hardly differed from those of a conventional industrial building. The success is clear to see: the new building has made the location the most productive of the globally active industrial group.

⇒ *„Communication is the driving force behind innovation – and thus becomes a decisive design factor for modern industrial construction.“*

Alberto D'Acquisto, Architekt and LEED AP



COMBINED HEAT AND POWER PLANT PAYS FOR ITSELF AFTER ONLY 1.5 YEARS

## Gold standard energy efficiency

*A holistic view of all processes makes a big difference in the construction of a new building for a pet food manufacturer. In order to achieve the customer's high sustainability goals, IE based its design on the internationally recognized LEED Gold energy label and its comprehensive catalog of criteria for energy efficiency and sustainability. An IE team specially trained and licensed for this purpose is available to implement the LEED standards.*

The biggest challenge for the company, with its energy-intensive extrusion process, was how to use energy as efficiently as possible.

A comprehensive analysis of the total energy requirements provided the answer. It was advantageous that IE was already responsible for all operational planning and therefore had a detailed overview of all processes. This meant that from the outset, consideration was given to using the waste heat from production to heat the office and social areas.

### **Ideal conditions for a combined heat and power plant**

The result of the analysis: the amount of electricity and heat (in the form of steam) required for production were roughly equal. This is an ideal condition for combined heat and power generation. IE therefore designed a combined heat and power plant that covers virtually the entire demand for electricity and heat. With an efficiency of up to 97 percent, the power plant significantly exceeds the average for public electricity generation and therefore considerably reduces CO<sub>2</sub> emissions.

⇒ *„If you want to save energy on a large scale, you need savvy - and a complete overview of all operations processes.“*

Tobias Rosenbaum, Managing Director IE Food Munich

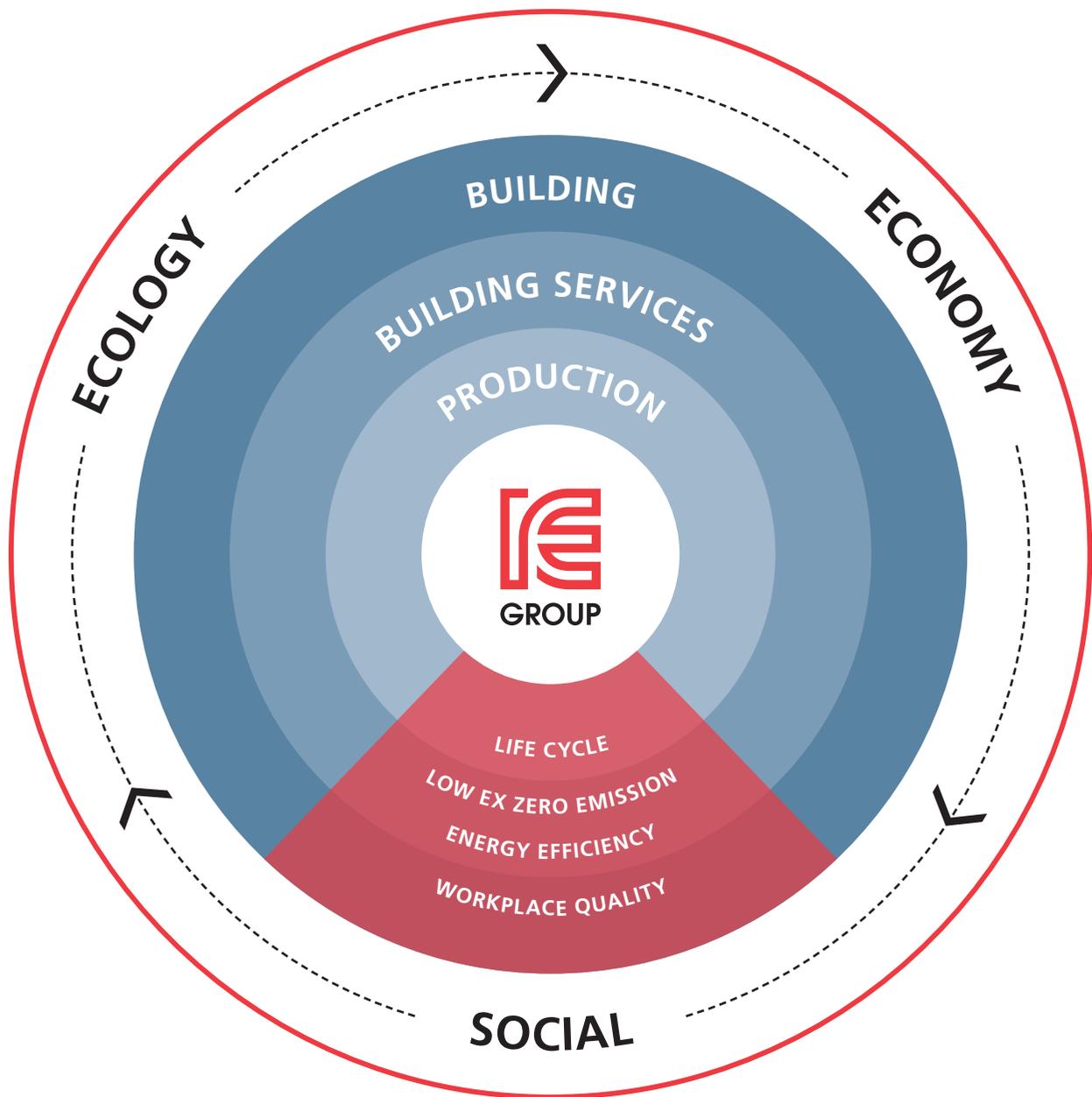
The same applies to energy costs: thanks to the high efficiency of the power plant, the company saves large sums of money every year. The investment in the combined heat and power plant therefore paid for itself after only one and a half years!

A variety of other individual measures, such as LED lighting throughout the facility and the use of materials from the region, ensured an all-around sustainable new building on a greenfield site. This result was confirmed by the pre-assessment according to the LEED Gold standard.

# Our added value: industry experience plus expertise in sustainable planning and construction

During your first meeting with IE, you will quickly realize that you are dealing with a partner who not only understands your everyday concerns, but also finds new solutions tailored to your specific situation. Sitting at the table with you are not only experts in sustainability, but also specialists in operations and construction planning with extensive industry experience. This enables us to

quickly familiarize ourselves with your workflows and production processes and to implement the solutions we develop with you in terms of construction. The result: an industrial building that optimally supports your production processes and thus masters the triad of economic, ecological, and social goals.






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## Our special services sustainability

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### SUSTAINABILITY CONCEPTS

- ✓ Integral Planning
- ✓ PProcess efficiency
- ✓ Consideration of life cycle
- ✓ Resource efficiency
- ✓ Use of daylight
- ✓ Low Ex Zero Emission

### ENERGY CONCEPTS

- ✓ Self-sufficiency concepts
- ✓ Anergy-exergy concepts
- ✓ Energy efficiency
- ✓ Multiple use of process energy
- ✓ Energy contracting

### BUILDING CERTIFICATIONS

- ✓ Feasibility Assessments
- ✓ LEED, DGNB, SNBS, Minergie
- ✓ Planning, consulting
- ✓ Certifications

### ENERGY CHECK UP

- ✓ Analysis of material and energy flow
- ✓ Catalog of measures
- ✓ Potential assessment
- ✓ Use of renewable energies
- ✓ Sensitivity to energy sources

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### STRATEGIC PLANNING

- ✓ Energy master plan
- ✓ Area networks
- ✓ Mobility concepts
- ✓ Convertible building concepts

### CONSTRUCTION PLANNING

- ✓ System separation of trades
- ✓ Life cycle assessment of building materials
- ✓ Emission-free building materials
- ✓ Scalability of building concepts
- ✓ Flexible building structures

### CONSTRUCTION EXECUTION

- ✓ Selection of local companies
- ✓ Standard-compliant execution
- ✓ Construction during ongoing operations
- ✓ Conversion, new construction, extensions
- ✓ Guarantees for costs, deadlines, quality, and function

### PROJECT MANAGEMENT

- ✓ General planning
  - ✓ Overall coordination of buildings, infrastructure, and facilities
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Our sustainability experts leave nothing to chance. That's why we pay attention to even seemingly minor details in energy supply, the materials used, and material flow. We never lose sight of the bigger picture

Our sustainability experts are involved in the process from planning to implementation of industrial construction. This enables us to create fully sustainable industrial buildings that operate efficiently.



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## Contacts

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