02.2023

BILFINGER now!

we care

From roadmap to implementation: what to look out for

we can

Insulation: the biggest quick win

we create

ENERGY AND CARBON EFFICIENCY

Immediately available with an immediate impact

BILFINGER

ENERGY AND CARBON EFFICIENCY

"IMMEDIATELY AVAILABLE WITH AN IMMEDIATE IMPACT"

Among the most important levers for increasing the sustainability of industrial plants are measures to improve energy and carbon efficiency. What approaches have proven successful? What measures in particular are currently being taken? Oksana Roman, Global Development Director at Bilfinger, talks about some recent developments.

What is meant by energy and carbon efficiency? And what significance does it have for increasing the sustainability of industrial plants?

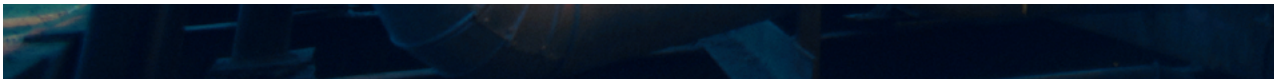
Energy and carbon efficiency measures are aimed at producing the same or higher output by consuming less energy and, therefore, emitting less CO_2. Given a changing climate and the need for sustainable transformation, such measures have, of course, become considerably more important. This has also led to multiple technological developments in recent years that open up new potential for saving energy and reducing CO_2 emissions.

What is the best approach to ensure that the measures have the greatest possible impact?

First of all, it is important to be conscious of energy flows and their significance for the performance of your plant. The first step should always be an inventory and analysis of the current situation. Operating conditions, site and related infrastructure specifics and the determination of critical process parameters should be taken into account. Energy efficiency audits and insulation scans should be also part of any such analysis. They form the starting point for thinking about improvement potential in the next step. These improvements can be realized through small or large changes.

What measures are currently being implemented most frequently in industrial plants?

The selection of measures is, of course, highly dependent on the plant. Is it a brewery, specialty chemicals plant or a cement plant. This is why the analysis phase is so important. The focus is rarely on individual measures, but rather on a package of several measures that need to be implemented simultaneously and in a coordinated manner. There is currently a strong focus, however, on the digitalization of processes with the goal of increasing connectivity between physical plants as well on transparency and the increasing electrification of plants and operations. A significant number of industrial companies are also currently modernizing their heat exchangers, dryers, pumps or other equipment and replacing fuel-operated boilers with heat pumps or updating the entire thermal insulation. If these measures are



> With our comprehensive range of services and our many years of expertise, we can significantly increase our customers' energy and carbon efficiency – and thus make an important contribution to achieving their sustainability goals."
>
> THOMAS SCHULZ,
> GROUP CEO BILFINGER SE

intelligently combined, the total savings potential is enormous – and it can be achieved faster and with a lower level of capital expenditure. Efficiency measures are the quick wins. They are immediately available and have an immediate impact.

How can we avoid taking measures today that will be obsolete tomorrow? And how can we avoid a lock-in?

This can only be achieved with a comprehensive approach that takes into account not only the current situation but also future developments. At Bilfinger, we have developed a net zero roadmap solution for this purpose. It considers the special features of industrial sites and processes as well as local and regional infrastructure development, looks at technological options, includes regulatory projects and, of course, also integrates economic aspects. The net zero roadmap can be used for internal decision-making or external reporting purposes and it serves as a comprehensive blueprint for those immediate and future measures to increase the energy and carbon efficiency of plants. Of course, Bilfinger also provides support for the implementation of all these measures.

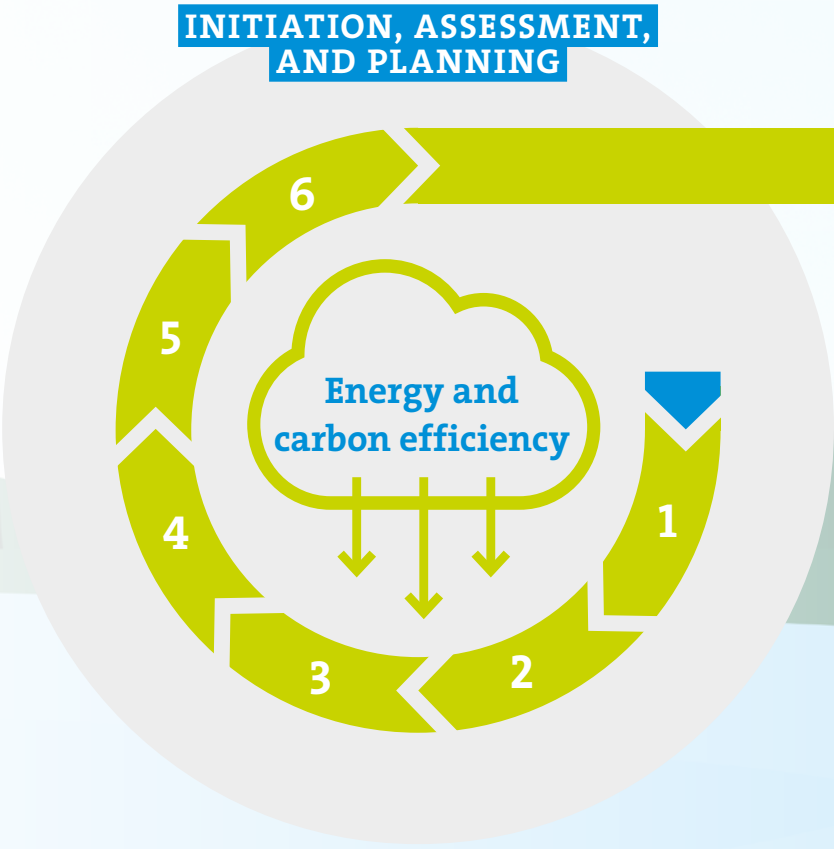
Contact in case of questions:

Oksana Roman
Global Development Director
Bilfinger SE
+31 652 694 109
oksana.roman@bilfinger.com

NET ZERO ROADMAP

Bilfinger's approach to energy and carbon efficiency

Energy and carbon efficiency measures can significantly improve the sustainability performance of industrial plants. To take full advantage of their potential, a structured and systematic approach is essential. The energy and carbon efficiency approach applied by Bilfinger consists of three phases: the development of a net zero roadmap, the design of measures and their implementation (build). This approach, which has been tried and tested in a large number of projects, is suitable for individual industrial plants as well as for operators with a large number of sites.



1
PROCESS ANALYSIS
- Process flow diagram
- Critical process parameters
- Best available techniques
- Alternatives and variants

2
BASE CASE ANALYSIS
- Energy scan
- Site visit
- Emission registration
- Expert judgement

3
ENVIRONMENTAL ANALYSIS
- Context outline
- Stakeholders
- Regional vision / initiatives / potential
- Laws and regulation

4
ENERGY / CO_2 SAVINGS POTENTIAL
- Process optimization
- Renewable energy
- New energy technologies
- Eco-design – circularity

5
RISKS, OPPORTUNITIES & COSTS
- Lock-in
- Availability / continuity
- Market developments (CO_2 price / Grants)
- CAPEX / OPEX

6
NET ZERO ROADMAP
- Scenario routes
- Measures timeline
- Permissions
- Application

we care

> The best way for plant operators to reduce energy consumption is to make plants more energy efficient. Bilfinger provides support throughout the entire process – from analysis and development to implementation."
>
> JÜRGEN LIEDL, EXECUTIVE PRESIDENT, BILFINGER ENGINEERING & MAINTENANCE EUROPE

OPTIMIZATION AND MODIFICATION

NET ZERO ROADMAP

Design & Build

(various types of project deliveries)

Operate & Maintain

(energy-related add-on services)

CUSTOMIZABLE TOOLBOX › FOCUSED ON SUSTAINABLE IMPROVEMENTS

INSULATION

THE BIGGEST QUICK WIN

Laws and regulations are currently being enacted to increase energy efficiency all over the world. In the Netherlands, a new law requiring energy-intensive companies to prove that they have energy efficient plants has been in effect since January 1, 2023. This includes the legal obligation to conduct regular energy audits and monitor the effectiveness of their insulation.

There is a simple reason why an insulation inspection has become a legal requirement: Insulation is a proven, cost-efficient measure that can significantly increase energy efficiency. It is also relatively easy to identify weaknesses in existing insulation with the help of thermal imaging cameras. With ISO Scan and TIPCHECK (Technical Insulation Performance Check), recognized procedures have become established on the market. These procedures systematically reveal where heat or cold is escaping due to missing, faulty or improperly installed insulation.

The next step is a little bit more challenging: Which insulation generates the greatest impact and is the most economical? To help the process industry answer this question, Bilfinger has developed a comprehensive portfolio of services – from standard insulation to customized industry solutions. With its unique combination of engineering and consulting expertise, Bilfinger also helps its customers meet increasingly strict regulatory requirements.

"Due to new legal requirements, we believe our clients will have an increased focus on the quality of their insulation this year, and will want to ensure insulation meets the highest standards in order to reduce energy consumption. At Bilfinger BeNe we have the capability to perform the insulation scan, identify heat and therefore energy loss with a thermal imaging camera and install high quality insulation for our customers."

Rob Engelaar, COO Bilfinger Netherlands

"Especially when it comes to insulation, a comprehensive overview and and a comprehensive range of services from a single source are important. With TIPCHECK, we have an efficient audit tool at Bilfinger that is the easiest and the fastest way to assess the quality of thermal insulation. Our colleagues determine the thermal loss of the existing thermal insulation while at the same time offering a solution to improve its quality, which translates into an improvement in energy efficiency for the entire system."

Cezary Krzyszewski, Commercial Director, Multiserwis, Poland

"With PrefApp, our most recent innovation, insulation isometrics are measured and drawn digitally. Working with 3D images and our PrefApp we are able to produce insulation sheet work for several thousand isometrics in a very short time. Another advantage is that we can produce the cladding before the releases of the piping on site."
Pascal Vermeulen, Commercial Manager Bilfinger BeNe

"Our insulation solutions for onshore and offshore plants not only increase energy efficiency, but also reduce CUI effects, among other things. That's why we almost exclusively develop and install solutions tailored to the specific conditions of the plants. We believe there is tremendous value in being able to apply our core competences to new sustainable market segments."
Leif Helge Eriksen, Director Business Development & KAM, Bilfinger Nordics AS

"As a premium member of the European Industrial Insulation Foundation, we at Bilfinger are helping to shape first-class insulation services in Europe and are well informed about the kinds of technologies and innovations that are available. Our customers benefit greatly from theexpertise of our TIPCHECK engineers and insulation experts."
Sven Ewert, Branch Manager Insulation, Bilfinger Industrial Services Schweiz

"We use a number of innovative insulation technologies. To mention just one example, we are increasingly using drones for inspections and for thermal imaging to scan areas that are difficult to access. This allows us to identify hidden potential savings."
Ronnie Ridgdell, ISP Operations Manager North America

Contact in case of questions:

Pascal Vermeulen
Commercial Manager
Bilfinger BeNe
+ 32 476252768
pascal.vermeulen@bilfinger.com

we care

FOOD AND BEVERAGE INDUSTRY

SUSTAINABILITY AS A TOP PRIORITY

The food and beverage industry in Central and Eastern Europe is undergoing a profound transformation: In addition to digitalization, sustainability criteria in particular are changing the requirements for future-oriented plants in the industry. Interest in sustainable technologies will continue to grow rapidly in the coming years, says Maja Vrcelj, Food and Beverage Market Leader Central & Eastern Europe at Bilfinger Tebodin.

How will the food and beverage industry in Central and Eastern Europe develop in the years ahead? What are the challenges?

The prospects for the food and beverage industry in Central and Eastern Europe are very promising. Geopolitical changes and the increasing shortening of supply chains in Europe are also contributing factors. The strongest growth in food and beverage output in Central and Eastern Europe was recorded in Poland, as a regional leader in market size and number of investment sites, along with Romania and Hungary. It is clear that sustainability has become a top priority – not only in greenfield projects but especially in brownfield projects, which currently dominate the market.

What are the consequences of this development?

Nearly all manufacturers in the industry are intensively addressing the question of how to make net zero operation of their plants possible. Investments are increasingly being judged by the extent to which they contribute to decarbonization. We see that energy transition and energy efficiency projects are picking up momentum – we just recently finished an energy assessment and master planning project for a leading international beverage producer, and we have several similar projects in the pipeline. Solutions for thermal insulation, optimization of waste heat utilization and innovative ideas for energy conservation are attracting a great deal of interest.

Does this require extensive changes to the design of industrial plants?
Each project is different and its complexity is derived from goals and ambitions set by the client. In some cases, it requires considerable interventions in existing structures and processes, but also makes it possible to put innovative technologies such as deep processing to use. Sustainability initiatives are no longer just a buzzword, but a major area of capital spend. The food and beverage industry is also required to switch to sustainable packaging, which poses considerable challenges compared to other industries due to the strict hygiene regulations. The industry's already high interest in sustainable technologies will therefore increase further in the coming years.

How does Bilfinger Tebodin support these initiatives? Which manufacturers does Bilfinger Tebodin work with?
Bilfinger Tebodin provides support throughout the entire life cycle of a plant: from initial business idea with consulting and project management through engineering and construction management as well as commissioning and start-up of the plant. With our multidisciplinary teams and our extensive expertise in the food and beverage industry, we are able to plan and execute highly efficient industrial plants as well as their modifications and improvements. Our key clients on the market are international food, beverage and agro industrial manufacturers who we support in multiple countries in the region as well as worldwide.

Contact in case of questions:

Maja Vrcelj
Food and Beverage
Market Leader Central and Eastern Europe
Bilfinger Tebodin d.o.o.
+381 63314105
maja.vrcelj@bilfinger.com

FROM THE ROADMAP TO IMPLEMENTATION

"THE COMPREHENSIVE VIEW IS KEY"

More and more operators of industrial plants are setting climate neutrality targets. When it comes to creating a roadmap for their activities, however, they often rely on third-party support. Jordi Koes and Melanie Noorlander from Bilfinger Tebodin explain what is important when developing and implementing a net zero roadmap – and where the stumbling blocks lie.

What are the key factors for developing a successful net zero roadmap?

JORDI KOES: First of all, it is important that the roadmap is broken down into clear process steps. There must be phases of analysis, idea collection and evaluation, development, planning and implementation. Because the path to climate neutrality involves a large number of measures and far-reaching changes, the roadmap needs to reduce the degree of complexity while still covering all the aspects that need to be considered.

What aspects, for example?

MELANIE NOORLANDER: They include stakeholder expectations, production and site specifics, current energy supply, the scope and nature of emissions and, of course, existing organizational structures. Regulatory requirements, market trends and many other external factors must also be taken into account. It is therefore necessary to analyze and evaluate these very carefully before embarking on development of the measures.

How long do the individual phases of a net zero roadmap take?

JORDI KOES: The duration depends heavily on the situation and the expectations of the company. As a general rule, however, we have found in our projects that the roadmap development phase – at Bilfinger we divide this into process analysis, base case analysis, environmental analysis, energy / CO_2 saving potentials and risk as well as opportunities and costs – takes about four months.

What should the outcome of the roadmap development phase be?

MELANIE NOORLANDER: Once the roadmap has been developed, it should be clear how the defined climate neutrality target can be achieved. There are usually several alternatives. However, the core document is an overview of measures, prioritized by type, cost per ton of CO_2 reduction and ease of implementation. This overview shows which measures have which impact, in which timeframe and what investment is required. The CAPEX amounts should be calculated as accurately as possible, of course.

How do you ensure that this calculation is as accurate as possible?

JORDI KOES: One of the biggest advantages we have here at Bilfinger is the outstanding knowledge of a wide range of technologies and industries thanks to our broad positioning. Since we provide comprehensive support to operators of industrial plants from planning through to construction and maintenance, we can take a comprehensive view. This helps enormously in assessing and calculating investments and their subsequent effects. And because we assist not only with development of the roadmap, but also with the engineering and implementation the measures, our investment calculations are accurate for each specific phase of the project.

BUSINESS CASE

Client:
international food group
Scope:
Development and implementation of energy and carbon efficiency measures at 13 sites worldwide
Services:
Bilfinger Tebodin: Feasibility, consulting, conceptual & basic engineering
Bilfinger Life Science: Implementation
CAPEX:
€6-€9 million per site

What is the best way to proceed in the design and build phase? Which steps should be taken first, which later?
MELANIE NOORLANDER: We always recommend starting with the measures that can be implemented most quickly. This is because it is important for the progress of the project to achieve early successes. These are typically measures that reduce energy demand, for example by increasing energy efficiency. Subsequent measures focus on a gradual switch to renewable energy. The last category comprises measures that are usually associated with more far-reaching changes. These generally involve reorganizing production processes and changing fundamental structures and procedures.

> One of the biggest advantages we have here at Bilfinger is the outstanding knowledge of a wide range of technologies and industries thanks to our broad positioning."
>
> JORDI KOES, BUSINESS MANAGER INDUSTRIAL SUSTAINABILITY

Contact in case of questions:

Jordi Koes
Business Manager Industrial Sustainability
Bilfinger Tebodin
+31 651179253
jordi.koes@bilfinger.com

Melanie Noorlander
Manager Engineering Process & Energy
Bilfinger Tebodin
+31 626434718
melanie.noorlander@bilfinger.com

YOUR OPINION MATTERS TO US!

You are reading the latest issue of Bilfinger now! How do you like it? What topics would you like to learn more about? Feel free to send us your opinions and ideas:

now@bilfinger.com

www.bilfinger.com

IMPRESSUM PUBLISHER (V. i. S. d. P.) Bilfinger SE, Oskar-Meixner-Strasse 1, 68163 Mannheim, now@bilfinger.com
EDITORIAL RESPONSIBILITY Sarah Tomasso, Head of Internal Communications **CONCEPT AND REALIZATION** COMMPARK GmbH **LAYOUT** ServiceDesign GmbH