

**SIEMENS**

*Ingenuity for life*

# Building Efficiency as a Service

A managed service solution by  
Siemens Building Performance & Sustainability

[siemens.com/perfect-places/building-performance](https://www.siemens.com/perfect-places/building-performance)

## Using OPEX efficiency to overcome CAPEX constraints

With corporate real estate typically being the second largest expense on many organizations' income statements<sup>1)</sup>, buildings have become an important, yet often overlooked financial lever for many organizations.

From reputational gains to higher productivity and lower compliance risks, improved building performance brings well documented direct and indirect financial benefits for businesses. High-performing buildings are cheaper to run and maintain, and have longer infrastructure refresh cycles. This means that OPEX are lower, and CAPEX can be re-allocated away from real estate upkeep and toward core business activities – an attractive proposition for any corporation.

For many organizations, however, a major barrier to realizing the full potential of building performance is that it is viewed as a support activity, rather than core to the business. As a result, building efficiency improvements are rarely prioritized during budgeting, and many of the skills required to drive them are no longer kept in-house.

Building Efficiency as a Service (BEaaS) from Siemens enables organizations to create the perfect place for their business. This service model helps them acquire the skills, technology and analytics capability they need to get the most out of their buildings, without bearing crippling upfront costs – in fact, under the right circumstances, the services can even be completely cost-neutral, with no impact on the balance sheet.

Over **80** percent of US commercial buildings were built before any green building standards were launched in the country.<sup>2)</sup>

### Key takeaway:

BEaaS enables organizations to implement essential building performance improvements at scale with no CAPEX.

## The building performance imperative

The C-suite's ability to support their organization's strategic goals is increasingly linked to how well they understand and manage the impact that building performance has on the whole business. The majority of US and European buildings were built before any of the modern efficiency standards were

in place, and between 75 and 90 percent of the European building stock will still be in use in 2050<sup>3)</sup>. As a result, the majority of organizations likely operate from poorly performing premises that are draining financial, human and environmental resources (Fig. 1).

1) IBM Global Business Services, Creating A Smarter Planet One Building At A Time and Federal R&D Agenda for Net-Zero Energy, High Performance Green Buildings

2) <https://www.eia.gov/consumption/commercial/data/2012/bc/cfm/b8.php>

3) <https://ec.europa.eu/energy/sites/ener/files/documents/Final%20Report%20EEFIG%20v%209.1%2024022015%20clean%20FINAL%20sent.pdf>

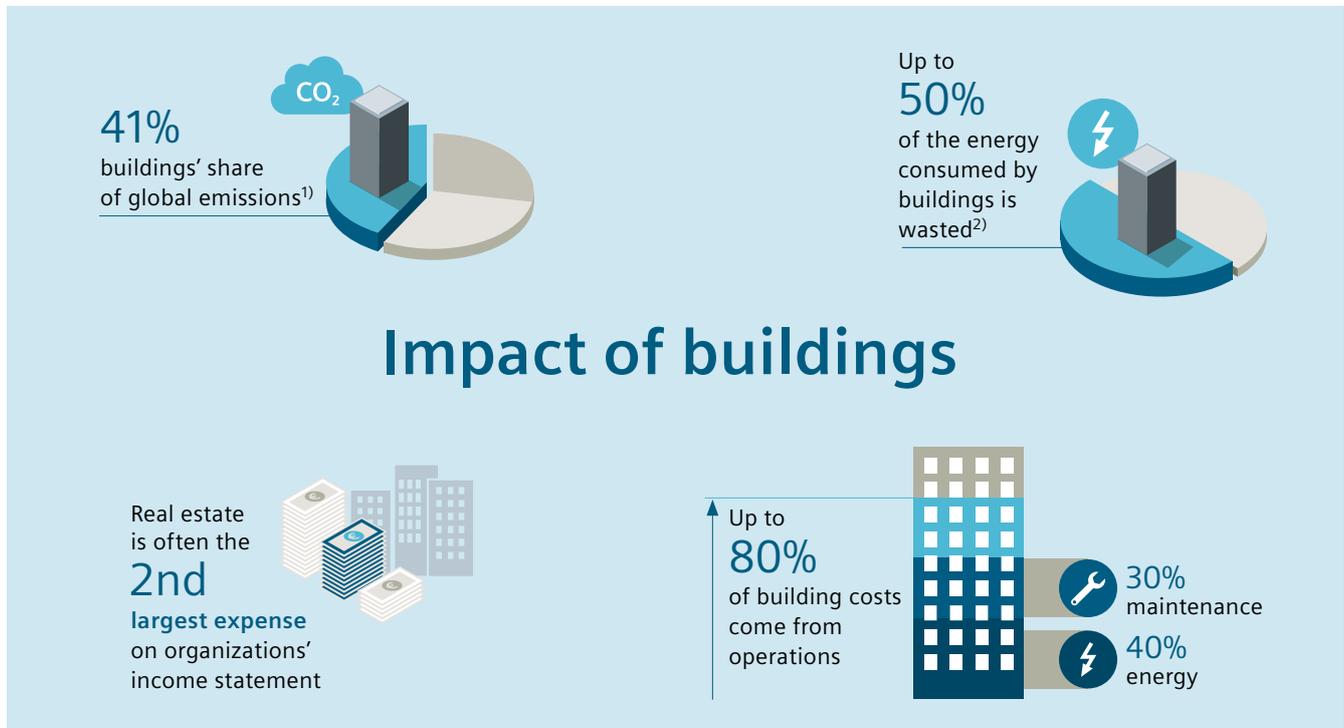


Fig. 1

A building's total cost of ownership is, for the main part, linked to operations: 40 percent of these costs come from energy, and up to half of the energy used by buildings is wasted. But poor building performance isn't just responsible for unnecessarily high energy bills or an unattractive carbon footprint for investors (41 percent of global emissions come from buildings).

When building performance isn't optimized and monitored as it should be, OPEX and CAPEX creep up, driven by unscheduled maintenance activities and equipment replacement required to just keep the infrastructure running. Inefficient buildings have also been linked to poor health and low productivity.

Poor building performance also raises the risk of non-compliance with energy efficiency regulations, green building standards and climate laws – as well as the costs of putting this right.

**500** new climate laws passed in **66** of the world's largest emitting countries since the Paris 2015 agreement.<sup>3)</sup>

**Key takeaway:**

BEaaS provides a systematic, OPEX-based way to improve building performance, ensure compliance, and manage risks.

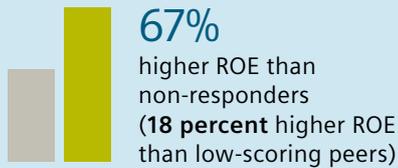
1) <https://www.usgbc.org/articles/green-building-facts>

2) <http://breakingenergy.com/2011/07/26/the-top-ten-ways-we-waste-energy-and-water-in-buildings/>

3) [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/360596/hmg\\_paris\\_2015.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360596/hmg_paris_2015.pdf)

## S&P 500 companies' performance based on sustainability

### Generate superior profitability



### Enjoy more stability



### Grow dividends to shareholders



“The S&P 500 companies that have built sustainability into their core strategies are outperforming those that haven’t according to a 2014 report by CDP<sup>1)2)</sup>.”

### Key takeaway:

BEaaS lowers OPEX, improves CAPEX efficiency, and outsources risks.

## What good building performance looks like

By contrast, high-performing buildings can increase employee productivity by up to 15 percent, and see their value increase to a potential 23 percent above non-optimized buildings<sup>3)</sup>. Considering buildings are among most organizations’ top three assets in terms of value/liabilities, all this can positively impact an organization’s reputation with potential investors, employees, and customers.

When revenues, productivity, and investor confidence all go up, it becomes easier to generate or source the necessary cash to invest in core business activities, and to innovate business models. The future becomes brighter (side bar: S&P 500 companies’ performance based on their sustainability strategy).

## When a building performs the way it should...

- funds go to mission critical activities only,
- your business is reliable and more resilient to risks,
- public perception improves and customers take notice,
- sustainability objectives are met or exceeded,
- employees are comfortable and more productive,
- your competitors are forced to play catch-up.

**Achieving these results is only possible through advanced technologies, experts, and the right data.**

## Overcoming building efficiency delivery barriers

Organizations, of course, need to put in place a comprehensive program to baseline their building portfolio’s performance levels, prioritize improvements that will deliver the highest savings, implement these measures, then monitor the outcomes over time. But internal competition for resources and budgets means that these pro-

grams don’t always shape up as they should. This is in part due to the typical delivery and financing models available, which don’t provide enough flexibility to many organizations.

1) CDP North America

2) <http://plannedcities.com/economic-value-of-sustainability-green-premium-and-brown-discount/>

3) [http://www.worldgbc.org/files/1513/6608/0674/Business\\_Case\\_For\\_Green\\_Building\\_Report\\_WEB\\_2013-04-11.pdf](http://www.worldgbc.org/files/1513/6608/0674/Business_Case_For_Green_Building_Report_WEB_2013-04-11.pdf)

## What is Building Efficiency as a Service?

BEaaS is based on a Managed Service Agreement. This service model drives reductions in buildings' energy use and operating costs without the need for additional capital. It also gives Siemens a mandate to identify and implement strategies to achieve pre-agreed savings goals over the term of the contract.

Customers' obligation to pay for the improvements is limited to the extent that the cost reductions have been achieved. Payments are based on these savings. If there are no savings, Siemens pays for the difference.

Within the scope of BEaaS, Siemens will provide a preliminary review of the facilities, focusing on both demand-side facility upgrades and improvements, and the potential for supply-side cost reduction. Based on this analysis, Siemens will prepare

a preliminary financial model showing the impact of the improvements on the client's operating results.

The next step is a Project Development Agreement (see side bar) where Siemens designs a solution that meets pre-agreed financial parameters.

Siemens takes full responsibility for the risks and costs of implementing measures to meet the contractual performance targets. This includes the repair, replacement and insurance of technical equipment.

Siemens will analyze the systems' performance and energy use with Navigator, its cloud-based suite of building performance applications (Fig. 2). This enables Siemens to verify performance and take action to ensure that the program is on track against the pre-agreed targets.

### At a glance – the project development plan

The project development plan is a crucial part of building efficiency improvement programs. Our experts first perform a building performance assessment, which consists of reviewing and analyzing energy data, system drawings, etc., and of conducting interviews and site audits and evaluations.

They then compile a report, in two steps with intermediate reviews with the client. It includes a description of the current situation, the proposed measures with expected savings, and overview of the savings guarantees, and the strategy for measurement and verification.

## Navigator – the cloud-based energy and sustainability platform

Turning data into results across your entire building portfolio

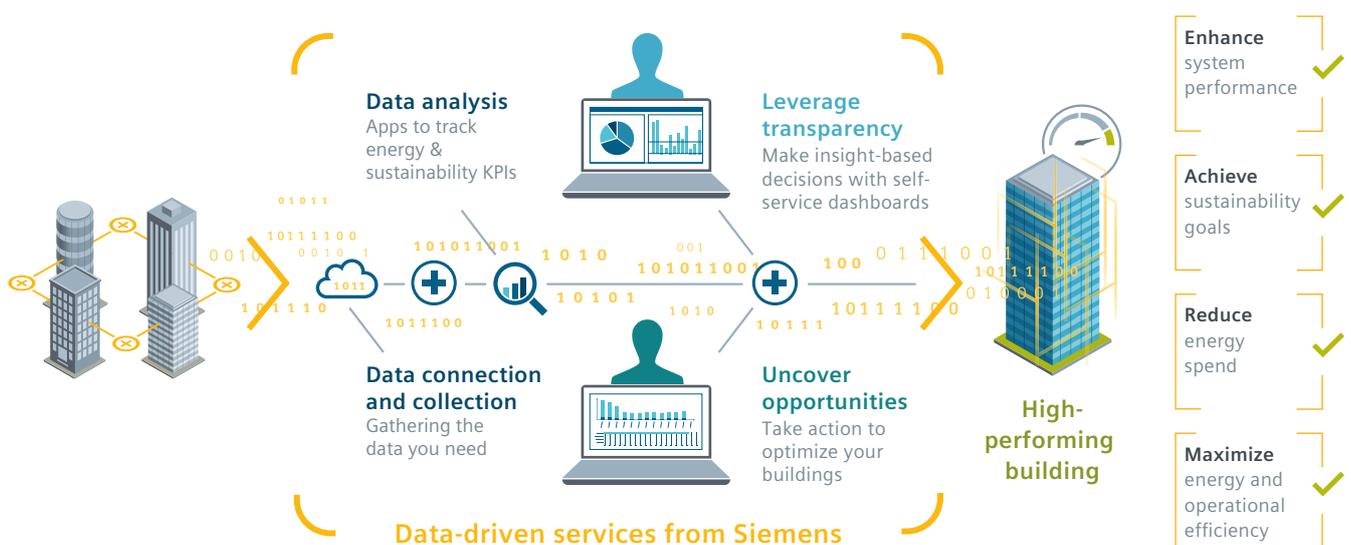


Fig. 2

### Case study highlight

#### NKC, Gothenburg, Sweden manufacturing<sup>1)</sup>

Managed Service Agreement with shared savings led to a direct positive cash flow contribution.

- Identification and implementation of energy efficiency improvement measures
- Modernization of ventilation system
- Building Performance Monitoring and Optimization Services
- Installation of a Desigo building automation and energy management system

## Finding the right delivery model

BEaaS has positively contributed to many organizations' economic efficiency, sustainable growth, and financial stability (see page 11: case study, Creating the future of sustainable dairy production.).

A key impact of BEaaS on organizations' performance is that it enables the reduction of maintenance costs, and mitigates their risks on site, such

as downtime, production stops or exposure to energy market volatility for example.

Different finance and delivery models are available today to help organizations implement the building performance improvements they need. It is crucial to tailor-make a solution to fit the needs of a customer's unique set of circumstances.

Greater savings through holistic view



Minimized risk for project and execution



No budget needed



Faster in achieving sustainability goals



Minimized risk for finance or performance



Cash flow neutral



1) Download the flyer: <http://www.siemens.com/download?A6V10908749>

## Contract structure

The Project Development Agreement is followed by a Managed Service Agreement. Only one Managed Service Agreement (BEaaS) is needed between Siemens and the client. The BEaaS is a lean document focusing on Siemens’

main obligation to reduce energy consumption. The financing is organized in the background – clients have just one partner during the contract term (Fig. 3).

## Key considerations

The right building performance partner will integrate the organization’s strategic goals into the overall efficiency improvement program. Organizations however should not lose sight of the fact that building performance is also measured in terms of costs and risks.

A key consideration, therefore, when selecting a partner, is its ability to offer a building performance delivery model that will efficiently drive maintenance costs down, while decreasing and mitigating the organization’s risks at site level, for example by reducing downtime, production stops, etc.

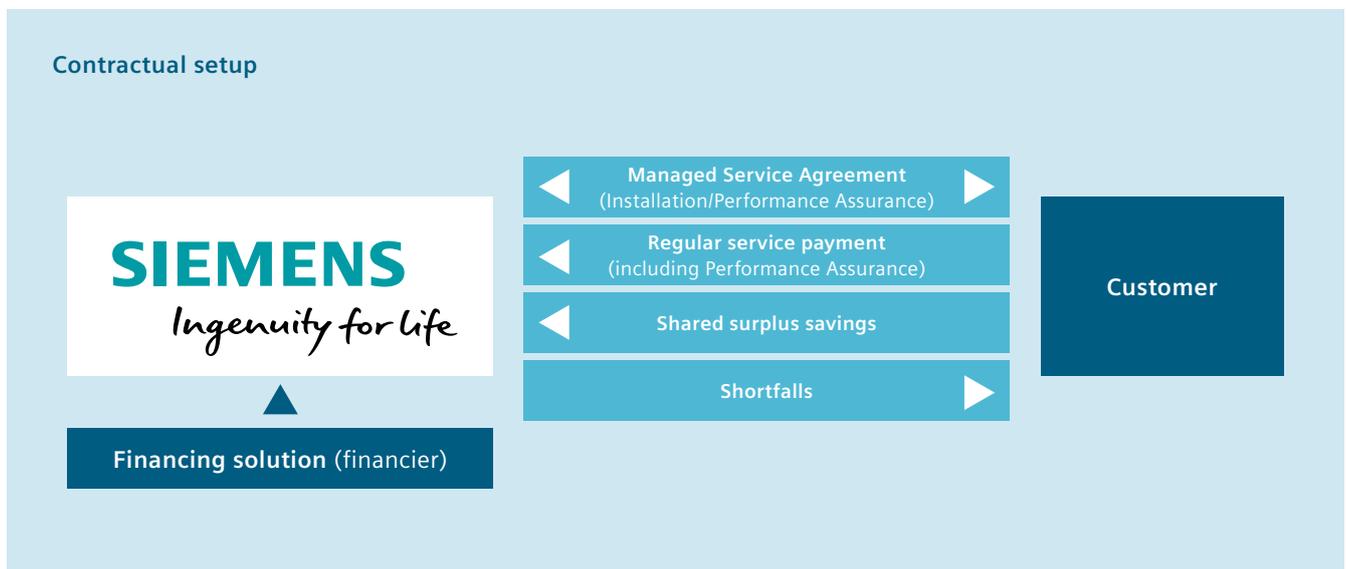


Fig. 3

### Payment characteristics and service charge

All payments in a BEaaS are based on a percentage of the savings. All payments are predictable and therefore easy to budget for. Based on the individually agreed terms and conditions positive cash flows are possible. The savings are measured and verified each year (see Fig. 4).

In case of underperformance, Siemens compensates for the difference at the end of a saving period. The contract also encourages both parties to save more costs than guaranteed.

With BEaaS, Siemens bears the technical, service and financial risk, but any surplus savings are shared equally. Siemens is allowed to bring in additional measures to safeguard the savings without additional costs to the customer, and after prior agreement.

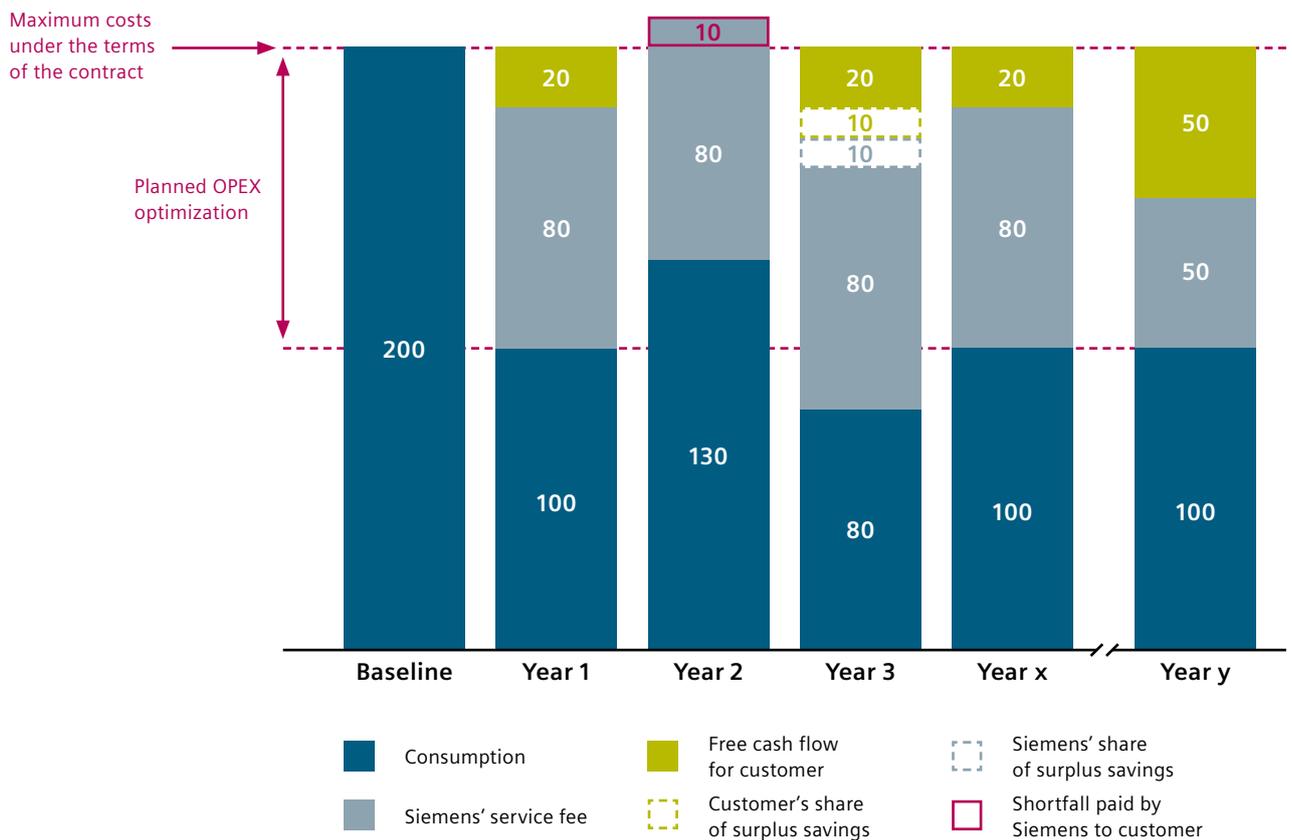


Fig. 4

In this example, the BEaaS contract runs from year 1 to year x. The value of the services delivered, expressed here as potential yearly savings, is 100. Out of this, 80 will go to Siemens for its yearly service fee, and 20 represent the customer's potential net savings. Any savings above the initially identified potential savings value will be equally shared between Siemens and the customer.

**Baseline:**

This represents the actuals (energy consumption, costs, etc.) before the start of the BEaaS contract. It serves to determine the maximum costs the customer will incur under a BEaaS contract. Here it is set at 200. Costs will never go above this baseline for the duration of the contract.

**Year 1:**

In this example, the consumption was reduced by 100<sup>1)</sup>. After the yearly contractual service fee of 80 is paid to Siemens, the customer receives a positive cash contribution of 20.

**Year 2:**

In this case, the consumption was reduced to 130. But after the Siemens service fee of 80 is taken into account, the total costs amount to 210. This is 10 above the agreed maximum costs as per the contract. Siemens will compensate the customer for the shortfall (10) at the end of the saving period.

**Year 3:**

**WIN-WIN:** The nature of a BEaaS contract encourages both parties to save more than initially planned. In this case, the total savings amount to 40, 20 above the planned savings. This surplus saving is shared equally between the customer and Siemens. The customer's total positive cash contribution for the period is therefore 30.

**Year x:**

This marks the last year of the contract. After the contract ends, the customer will no longer pay the Siemens service fee, but will also no longer benefit from the ongoing efficiency improvements delivered as part of the initial service contract. This is a good time to review what has been achieved, and discuss, as partners, how to proceed to drive ongoing optimization.

**Year y:**

Possible scenario after initial service contract ends – after the contract ends, Siemens would recommend that customers continue the strategic and tactical optimization, so as to maintain the savings and efficiencies gained through the initial BEaaS service delivery model. This could be achieved by entering a new BEaaS phase.

**Key takeaway:**

With BEaaS from Siemens, organizations will never exceed their baseline consumption during the term of the contract (based on comparable weather and usage conditions as in the baseline year).

**Case study highlight**

**Global automotive manufacturer, Germany**

Managed Service Agreement delivers:

- Energy savings of over €4 million per year across 4 plants
- Guaranteed savings of 5,384 kW of electrical power
- Off-balance treatment in this case

Building performance improvements:

- Optimization of 253 air handling units only 3 of which could be inspected
- Siemens experts transferred the findings from 3 ventilation systems to the other 250 systems
- Connection and upgrade of the building management system including associated services

1) Based on comparable weather and usage conditions

## Key benefits of BEaaS



### **OPEX reductions pay for CAPEX upgrades:**

By entering into a BEaaS agreement, companies can benefit from improvements and upgrades of their facilities without upfront investments – this frees up capital for other strategic investments.



### **No savings, no payments:**

With BEaaS, payments are conditional on the savings delivered by the service. The service costs will never exceed the savings. Additionally, a positive cash flow contribution is possible. Above-target savings are shared equally between the parties.



### **Outsource the risk with full service:**

Siemens bears the building performance risks. BEaaS can include multiple service levels, including full repair and replacement of equipment.



### **No transfer of ownership:**

Off-balance sheet treatment is possible<sup>1)</sup>. As the service's goal is to generate savings, Siemens can substitute and bring in any additional improvement measures it sees fit to safeguard or enhance savings, after prior agreement from the customer.



### **Meeting energy efficiency, sustainability and environmental goals:**

Consumption, emissions, and costs can be reduced by implementing new, more efficient equipment. As part of the service, Siemens looks at optimizing energy and carbon efficiency for both the supply and demand sides.



### **Improved transparency:**

The facilities' systems and energy usage are continually monitored in real-time by experts at the Siemens Digital Service Centers.



### **One contractual partner:**

Siemens acts as general contractor, service provider and even organizes the financial solution in the background.

<sup>1)</sup> Siemens does not consult or advise customers on the effect on the balance sheet nor does Siemens give any financial advice. The determination of the contract is the sole responsibility of the customer. We therefore strongly recommend that customers verify the determination of the contract with their financial auditors

## Case study: Creating the future of sustainable dairy production.

This major dairy company, headquartered in Northern Europe, trusted Siemens to further its vision to “create the future of dairy to bring health and inspiration to the world, naturally”. As one of the four largest milk suppliers in the world, it operates in 38 countries, 17 of which also have manufacturing facilities. Its strong sustainability commitment means that the company has so far reduced its total climate impact by 16 percent compared to the 2005 level – despite a significant increase in production.

The client’s sustainability strategy includes targets to reduce greenhouse gas emissions from processing, transport, and packaging by 25 percent, and energy and water consumption by 3 percent annually – all by 2020. Also, by then, half of the energy used

must come from renewable sources.

To reach these goals, the group turned to Siemens, which had already provided ISO 50001 advisory services at another facility in Germany, by offering a cost-neutral way of modernizing the technical building infrastructure.

A pilot project at a milk processing facility in Sweden was delivered through the BEaaS model, with a 60-month contract term. The contract includes guaranteed annual cost savings of 30 percent per year, delivered through facility improvement measures (FIMs), such as HVAC upgrades and the installation and operational optimization services. Siemens delivers the FIMs for the guaranteed energy reduction as a service.

### When the right building data...

Siemens undertook energy audits at all dairy facilities to establish a baseline. This enabled benchmarking and identifying opportunities for improvements. Data was taken from the various technical systems and from historic energy consumption data.

### ...is properly applied...

The technical infrastructure upgrades at the Swedish dairy facility included: New air handling units, the installation of heat recovery and new lighting, and the partial conversion of steam production. In parallel, working times and setpoints were optimized, and remote monitoring was set up via Navigator – the cloud-based energy and sustainability platform, connected to a Siemens Digital Service Center.

### ...we help create perfect places.

- Guaranteed annual energy savings of 30 percent
- Reduced risks associated with technical infrastructure
- CO<sub>2</sub> reduction of 26 percent
- Contract duration of less than 5 years.

People spend about 90 percent of their time indoors.

Improve the places where they spend their lives and you improve their lives.

With our people and technology, our products and services, our aim is to create perfect places.

For every stage of life.

When building technology creates perfect places – that's Ingenuity for life.

**#CreatingPerfectPlaces**  
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