

Data utilization service for
the manufacturing floor i-BELT
Examples of application

OMRON

Keys to Achieving both Decarbonization and Productivity Improvements Seen from Actual Examples



Achieving both Decarbonization and Sustainable Business Growth

What is carbon neutrality?

Carbon neutrality refers to subtracting the amount of greenhouse gases such as carbon dioxide absorbed by forests and other resources from the amount of those gases that has been emitted, to achieve a virtual total of zero.

International expansion of carbon neutrality

In recent years, various types of weather disasters have been occurring around the world, so the reduction of greenhouse gases, which are one of their causes, is becoming a global concern. In order to resolve these issues, with the aim of reducing emissions, the Paris Agreement included discussions on international arrangements for reducing greenhouse gas emissions, to strive to achieve carbon neutrality in the second half of this century. Individual countries have set ambitious targets for the year 2050, and movements aimed at achieving carbon neutrality are expanding internationally.

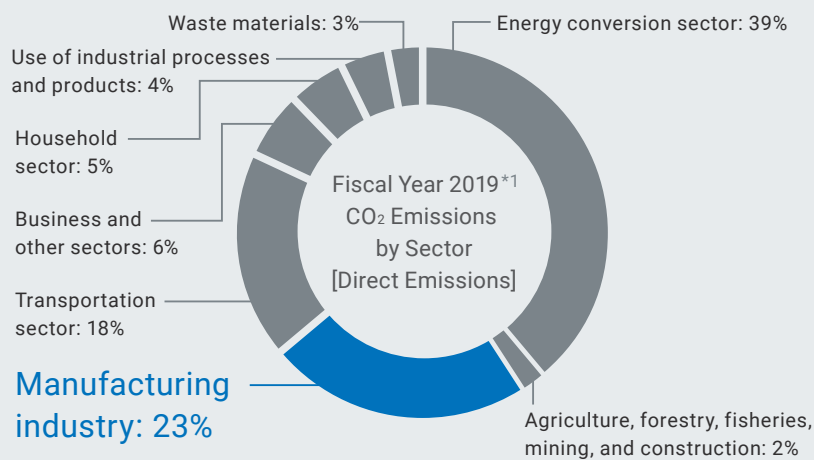
Significance of efforts toward carbon neutrality in the manufacturing industry

According to a survey conducted by the National Institute for Environmental Studies, the manufacturing industry accounts for 23% of global energy-related CO₂ emissions^{*1}.

This is an extremely large proportion, so it is clear that efforts toward carbon neutrality by the manufacturing industry will contribute tremendously to the reduction of CO₂ emissions.

Since factories consume enormous amounts of energy, with particularly large volumes of CO₂ emitted from power consumption and industrial waste materials, they are being required to make improvements for their reduction.

In order to achieve the considerably difficult goal of carbon neutrality by 2050, it will be necessary for progress to be made by initiatives in all sectors and industries. Within them, it is considered essential to combine measures that align with the business conditions of corporations, from among the three types of measures consisting of energy conservation, renewable energy, and electrification. With the goal of creating a sustainable economic society in which future generations can live in comfort and security, we must work from now towards the realization of a carbon-neutral, decarbonized society.



*1. Prepared based on data from the Greenhouse Gas Inventory Office of the National Institute for Environmental Studies

Energy conversion sector	Transportation sector	Manufacturing and buildings
Expansion of renewable energy	Use of renewable energy through the electrification of automobiles	Thorough energy conservation and use of renewable energy

Issues for Manufacturing Industry “Decarbonization” and the Key to Reform

As a priority initiative for the manufacturing industry, we propose reform into a manufacturing structure that achieves both decarbonization and sustainable business growth and is not affected by the energy environment.

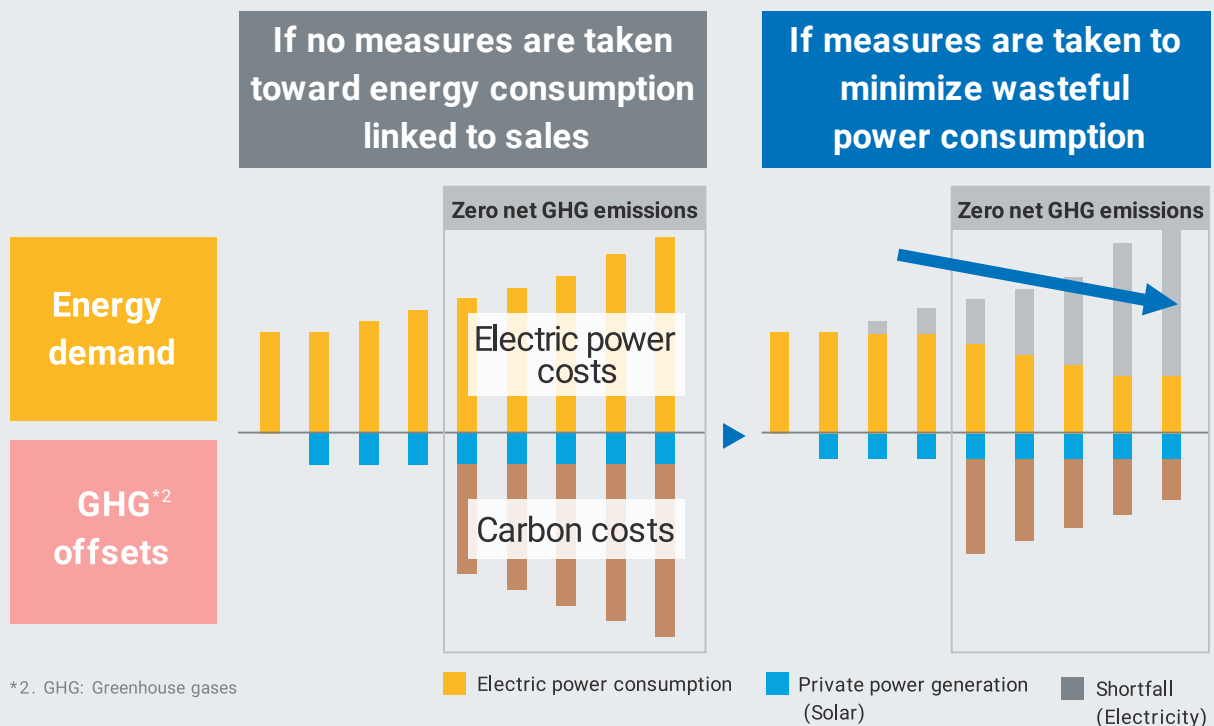
Challenges being faced

Although energy consumption is linked to sales, energy costs are opaque due to factors such as soaring electricity prices and imminent border carbon taxes. Therefore, a situation in which cost burdens could possibly affect the competitiveness of corporations is rapidly approaching. In other words, it has become essential that we achieve both decarbonization and sustainable business growth, and reform our manufacturing structures so that we are not affected by the energy environment.

First of all, minimize wasteful power consumption which does not create value

To achieve decarbonization, it is necessary to utilize renewable energy and pay the burden of carbon costs according to the increasing energy demand. First of all, we must thoroughly reduce the energy demand that increases as the sales increase. We also believe that it is necessary to minimize the carbon costs by methods such as utilizing renewable energy.

In other words, could the key be to first eliminate waste through the “minimization of cost burdens which do not create value.”



Increasing Energy Productivity with i-BELT to Achieve Both Environmental and Business Targets

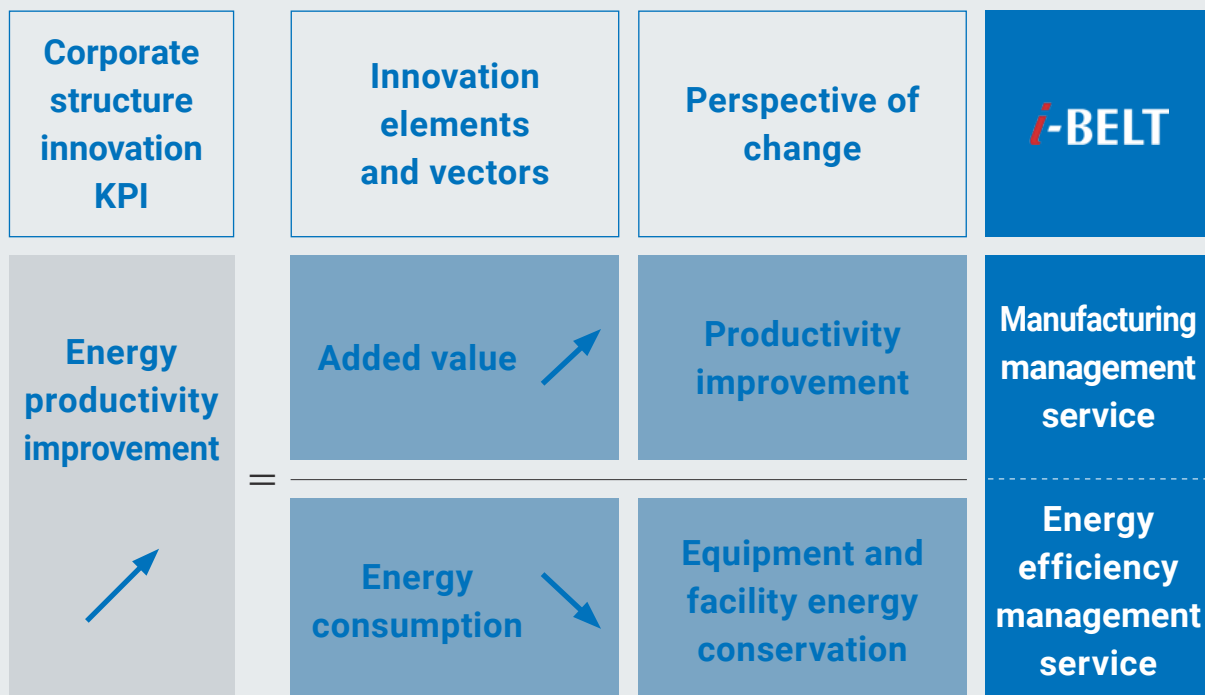
The key point is the index of “energy productivity.”

We believe that improving this index is the key to achieving both decarbonization and business growth. It is calculated by an equation with the denominator and numerator as shown below.

The “improvement of energy productivity” means not only initiatives for energy conservation, but also the simultaneous achievement of increased production per unit of time.

The application of site data will be an important point for using energy efficiently and drastically reducing energy consumption.

OMRON's i-BELT service provides manufacturing management services to support productivity improvement, and energy management services to support energy conservation. We work on both productivity and energy consumption to help customers improve the energy productivity at their manufacturing sites.





Example of Initiatives toward Decarbonization

OMRON Ayabe Factory

Example products



The OMRON Ayabe Factory is a major factory for sensors. It is a factory that performs the small-lot production of a large number of models, with the various products produced ranging from small photomicrosensors with sizes of several centimeters, to large inspection equipment on the scale of several meters.

Energy conservation issues

Breaking down the barriers between organizations and departments which are created by differences in the roles of supply and demand.

The priority for energy supply is “stability,” but for demand it is “quality and productivity.”

Since supply on the factory side and demand on the manufacturing site side have different missions, if we have a situation where the relationship between these two parties is not clear, then even if efforts are made there will be concerns about the impact on productivity and quality, and there will not be much progress achieved.

However, on the other hand, we believe that if we make the relationship between the two parties visible and have more active communication, then we will be able to reduce energy consumption while also securing and improving productivity and quality.

Mission

Stable supply of energy



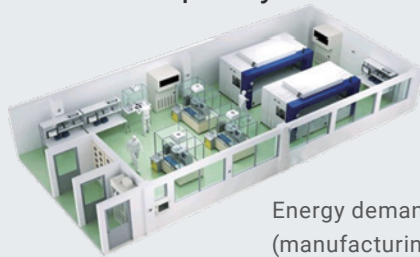
Energy supply side (factory facilities)



Organizational barrier

Mission

Ensuring productivity and quality

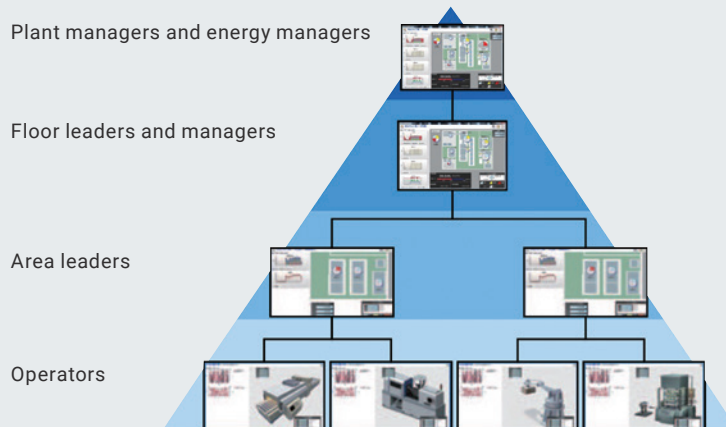


Energy demand side (manufacturing site)

Creating Active Communication

Continuous centralized monitoring of environmental and production information to work toward improvements, and discussions based on real data to improve awareness in the workplace

Communication activation through a hierarchical display



We have made it possible to display the information per level, depending on the viewer. Additionally, more active communication is encouraged to promote the recognition of changes at work sites which are “different from the usual conditions,” that cannot be seen by just introducing sensing and visualization alone, so that this leads to improvements.

Communication tool for promoting recognition at work sites



“Environmental ANDON” visualization system (PAT: Patent No. 4377353 (JP))

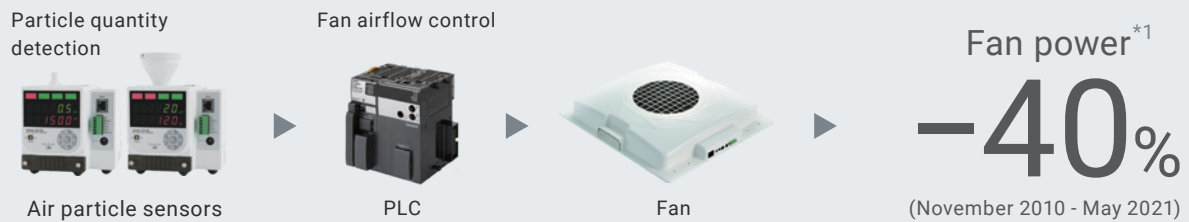
We created a situation where we can centrally monitor various production information, which includes not only the amount of electric power, but also the production volume and the manufacturing workplace environment information including temperature, humidity, and particle counts, as indexes related to quality. The “continuous monitoring” makes it possible to detect environmental fluctuations and anomalies, and to investigate the causes and implement countermeasures on the spot.

Initiative Content Example 2

Accelerating Energy Control at Manufacturing Sites

Reduce power consumption without reducing cleanliness and achieve both quality improvement and energy conservation on clean units

Realizing energy just-in-time with automatic control

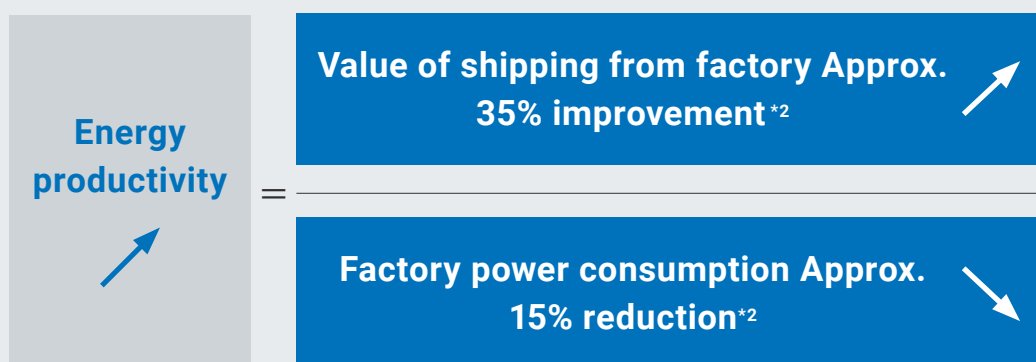


*1. Both 24H strong operation and energy-saving operation are within the particle standard value

With continuous sensing of particle quantities for real-time feedback control of fan filter unit airflow, the amount of electricity consumed was reduced without reducing the cleanliness, resulting in a 40% reduction in the power used by the fan filter unit. By making the quantity of particles visible at all times, it became easier to investigate the causes of any foreign matter generation, and there was progress made in workplace improvements such as cleaning and measures against sources of dust, so the quality of the workplace environment has also improved.

The Ayabe Factory is continuing to implement various other initiatives in addition to these.

Achievements at the Ayabe Factory



*2. Calculated from results over the 10-year period from 2010 to 2021 (internal research)

Note: Do not use this document to operate the Unit.

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