

Energy-saving



Visualization of Loss Reduces Energy Consumption by 4%

Company “A” wanted to reduce energy consumption. The company visualized the energy loss linked to the operating status of each equipment, and succeeded in reducing energy consumption of its production line by 4%.
What was the secret to its success?

See inside
for details!



Customer's Concern

Company "A" wanted to reduce energy consumption, but didn't know where to start because they didn't collect energy data from each equipment. The company was also unable to determine the cause of energy losses because energy data wasn't linked with the equipment operating status.



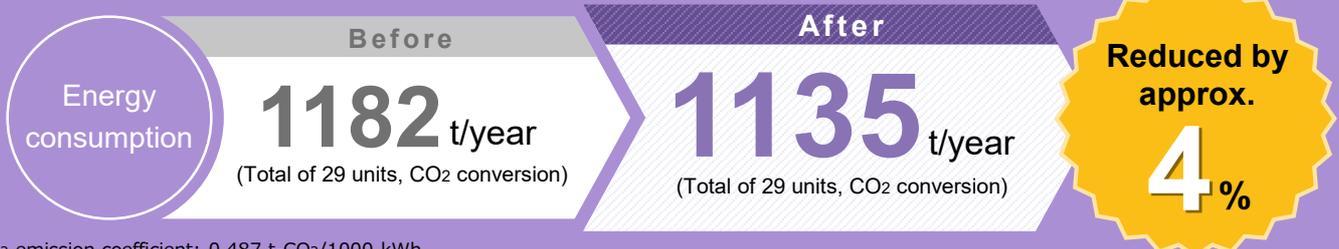
We don't know where to begin our energy-saving efforts.

We are unable to identify the energy loss and the reason behind it.

It seems we even use energy when the equipment is stopped...

What has improved

By linking and visualizing energy consumption and the operating status of each equipment, the customer is now able to discover slight changes or losses in energy consumption. For example, the customer was able to discover energy loss of equipment in standby mode, and by implementing measures such as reducing standby time and switching it off appropriately, energy consumption was reduced by approximately 4%.



*CO₂ emission coefficient: 0.487 t-CO₂/1000 kWh
(2013, value published by the Federation of Electric Power Companies of Japan when 2 nuclear power plants were operational.)

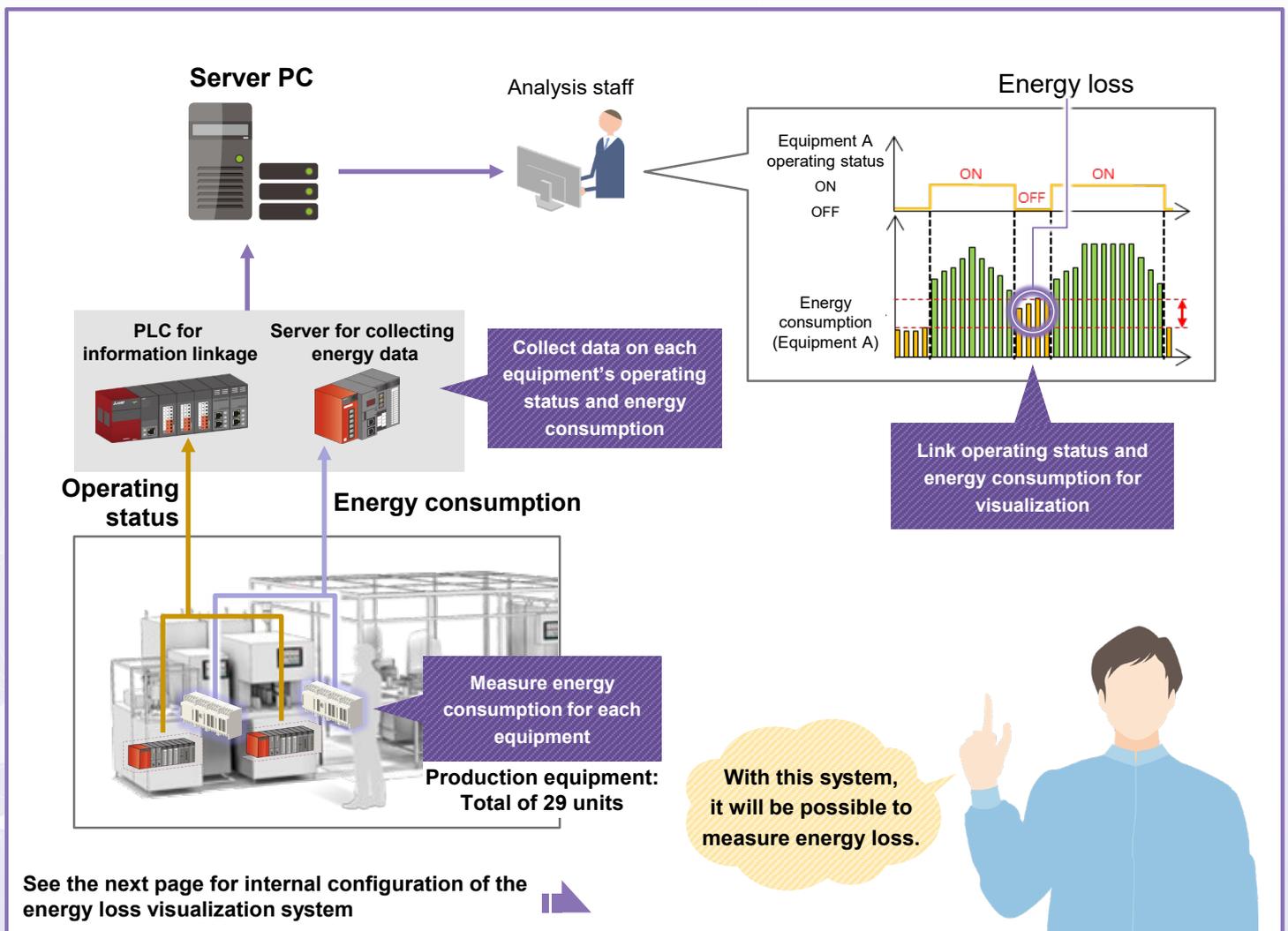


Point 1

By visualizing energy consumption of each equipment, the customer is now able to accurately identify slight changes or losses in energy consumption.

Point 2

By linking operating status of each equipment to the visualized data, energy loss of equipment in standby mode can be identified, which makes it possible to consider improvement measures.



Return on investment (ROI)

Cost

Approx.
9 ~ 12.5 million yen
/line (including system configuration)

Construction period

Approx. **1** year
(including conceptual period)

Payout period

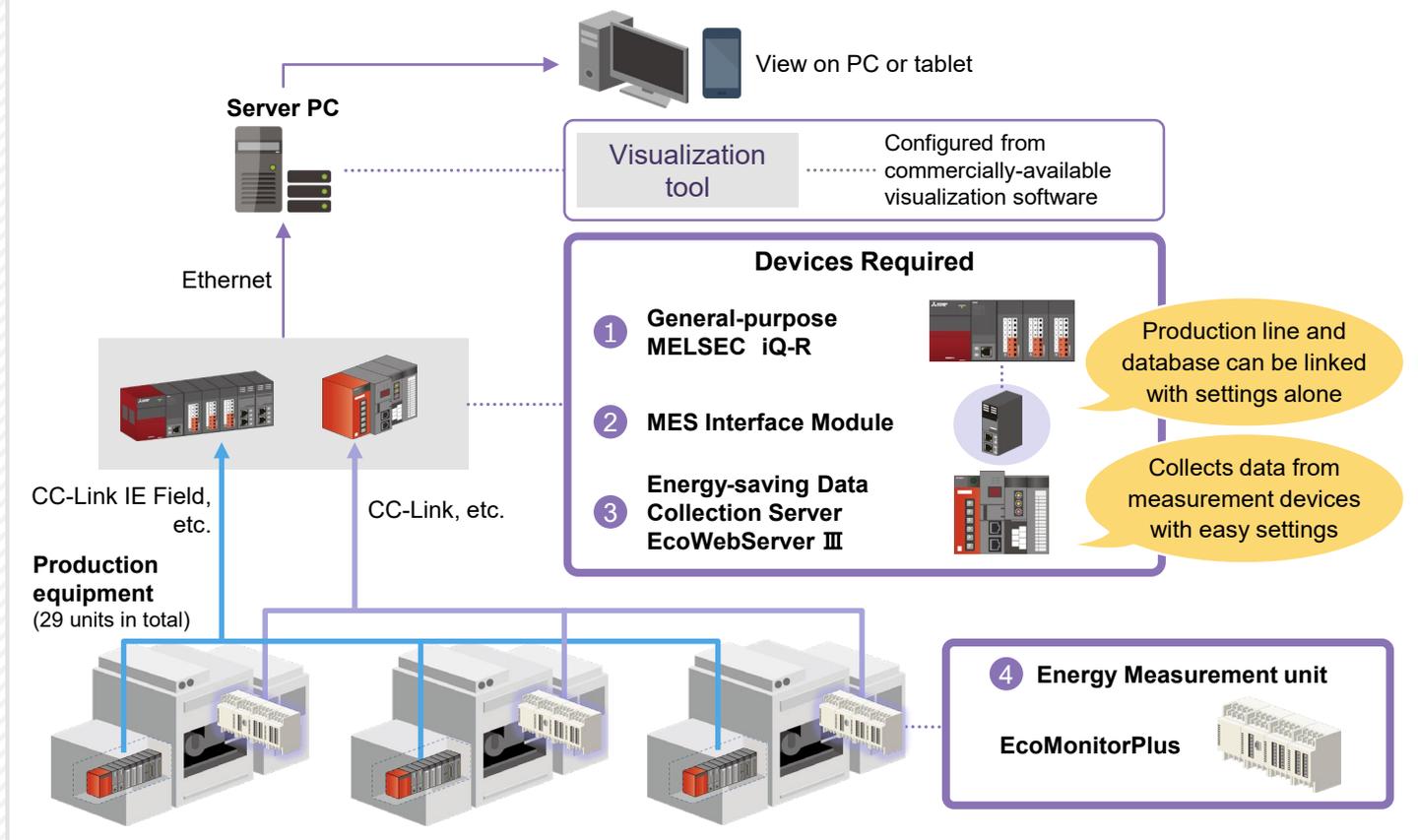
Approx. **5** years

*Interpretation of payout period

In this example, the energy consumption reduction effect was shown through CO2 conversion in accordance with Tokyo Global Climate Change Countermeasure Guidelines, and this equates to a reduction of approx. 94 MWh of electricity and 2.7 kL of fuel consumption. If we assume electricity costs 19.8 yen/1 kWh and fuel costs 80 yen/L, the annual cost reduction for electricity would be 94 MWh × 19.8 yen/1 kWh = 1,861,000 yen, while the annual cost reduction for fuel would be 2.7 kL × 80 yen/L = 216,000 yen. The total of these two amounts would give the annual reduction in energy costs, i.e. 1,861,000 yen + 216,000 yen = 2,077,000 yen, therefore if the system building cost was 10 million yen, the payout period would be 10 million yen ÷ 2,077,000 yen = approx. 5 years.

Overview of the Energy Loss Visualization System

The system introduced in this example is configured from general-purpose PLC **MELSEC iQ-R**, an **MES Interface Module**, and **EcoWebServerIII**. It helps the customer to identify energy loss through visualization by linking equipment operating status and energy consumption.



Equipment Configuration (example)

Please separately prepare cables for connection to devices other than the major devices listed below.

Type	Model	Overview	Standard price (yen)
1 General-purpose PLC MELSEC iQ-R			
PLC CPU	R08CPU	Program capacity: 80 ks (320 KB)	220,000
Base Module	R35B	5 slots	21,000
Power Supply Module	R61P	Input: 100 to 240V AC Output: 5V 6.5A DC	20,000
CC-Link IE Field Module	RJ71GF11-T2	A network module to receive operating status from control PLC within equipment *Whether or not this module is required mainly depends on the control device of the target equipment.	50,000
2 MES Interface Module			
MES Interface Module	RD81MES96N	A module to automatically register production line information into the database with parameter settings alone	230,000
3 Energy-saving Data Collection Server			
EcoWebServerIII	MES3-255C	CC-Link communication product	470,000
4 Energy Measurement Unit EcoMonitorPlus (require one set for each piece of equipment)			
Base Module	EMU4-BM1-MB	Economic product	35,000
Expansion Module	EMU4-A2	For power measurement	37,000
CC-Link Communication Module	EMU4-CM-C	Max. connectable units: 42 when configured of this device only	36,000

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⚠ Safety precautions

To use the products listed in this publication properly, be sure to read the relevant manuals before use.