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FACTORY AUTOMATION

Customer Reference

Energy savings achieved through power monitoring at tire plant

The Yokohama Rubber Company's Onomichi Plant is saving energy using Mitsubishi Electric's data collection server EcoWebServer III, and the support application EcoAdviser. EcoWebServer III identifies energy losses, including by highlighting wasteful or unnecessary equipment operation, while EcoAdviser highlights energy conservation options to on-site workers.

Key points

- **EcoWebServer III identifies wasteful electric power consumption**
- **EcoAdviser Utilization Support Service enables efficient startup**
- **The company promotes its 'Environment Month' by using the EcoAdviser screen to disseminate information**

The Yokohama Rubber Company manufactures and sells automotive tires and other products. As a global company, it has 15 plants in Japan plus 21 more worldwide.
Its plant in Onomichi City, Hiroshima Prefecture, specializes in the production of large tires for construction and industrial vehicles that operate in mines, ports, and other demanding environments. In use, these tires work hard and must be able to withstand extremely large loads. They are made to a sophisticated design that includes reinforcing and other appropriate features.
Not surprisingly, the manufacturing process is complex and there is an on-going need to develop ever-larger and more capable tires. Therefore, the plant has to rise to the challenge of constantly producing new tire designs that are bigger, more reliable and more robust.

The tire manufacturing process requires a large amount of energy, especially in the scouring process for mixing raw materials. In response to the drive for carbon neutral manufacturing, Yokohama Rubber is working on energy conservation initiatives with the initial goal of reducing its greenhouse gas emissions by 28%, compared to 2019, by 2030. Longer term it plans to achieve net zero CO2 emissions (carbon neutral) by 2050.
The company has already reduced the use of electricity through the introduction of modern inverters while other energy-saving measures have resulted in other significant reductions in fuel costs. Now senior managers at the Onomichi Plant, have asked the Engineering and Maintenance Section, which is in charge of equipment management, to lead a new energy-reduction program. The new Mitsubishi Electric EcoWebServer III and EcoAdviser solutions will enable the plant's engineers to monitor power consumption in detail and interpret the data quickly and accurately.

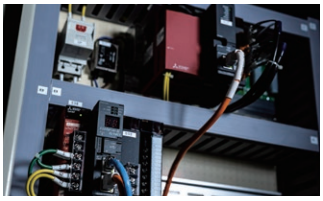
Safety: a key customer requirement

Aiming to create a world-class energy saving program, engineers from the Onomichi Plant were very keen to visit Mitsubishi Electric's Fukuyama Works. This is not only where the energy-saving support equipment is made, the works also showcases energy conservation techniques in its own operations. In fact, it is so successful at this that Mitsubishi Electric has designated it as a model factory for energy initiatives.

Kazuyoshi Yanagisawa, Manager of Onomichi's Engineering and Maintenance Section, was immediately impressed by measures he saw at the Fukuyama Works, commenting: "While their products are different from ours, I realized at once that the factory's energy efficiency is superb, thanks to the monitoring and analysis systems they have developed, based on EcoWebServer III and EcoAdvisor."

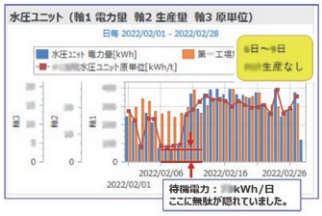
Kazuyoshi Yanagisawa, Manager, Engineering and Maintenance Section, Onomichi Plant, The Yokohama Rubber Company.

Based on their tour of the Fukuyama Works, Onomichi's Engineering and Maintenance Section developed an energy-saving data collection system based on EcoWebServer III. This collects energy information from around the factory and displays it on a PC connected to the site's existing internal computer network.



EcoWebServer III installed on-site (bottom of photo). Above is a PLC for collecting data from measuring instruments.

This new system means power consumption can be visualized in near real time, making it possible to plan effective energy-saving measures and to detect machine errors almost as soon as they happen.
Takeshi Matsushita of the Engineering and Maintenance Section reviews the benefits of the new system, "We quickly discovered via EcoWebServer III that power consumption was fairly constant throughout the day. Surprisingly, it did not drop much during periods of low production. This was because the main water pump was operating all the time, even when a pressurized supply was not required. This was a quick fix with an immediate payback in terms of significant energy savings."
It was also realized that power consumption was not dropping significantly during the night when production was also lower. After consulting with the appropriate personnel, new procedures were developed ensuring compressors were turned down or off when not needed. This simple initiative led to further energy savings both at night and during the day when major production equipment was not in use.



Example of identifying areas for improvements in energy conservation

Daily power trends were checked using EcoAdviser. Days were found when the equipment was not running but was still consuming power. On days when the equipment was not scheduled to be in operation, the unit was turned off and a plan was made to reduce standby power to zero, cutting unnecessary energy consumption.

"We want to promote visualization in a way that people can understand at a glance."

To enhance the energy-saving effects of EcoWebServer III, Yokohama Rubber has also installed EcoAdviser at the Onomichi Plant. EcoAdviser is an energy-saving support application that graphically visualizes energy information collected by EcoWebServer III in an easy-to-understand manner that can be seen by all personnel.

Kazuyoshi Yanagisawa explained again, "It is only natural that we energy managers want to see and understand fully-detailed energy information. However, it is the operators on-site who actually use the energy. We realized that in order to increase on-site motivation for energy conservation, clear simple graphics display via EcoAdviser would be an ideal solution."

However, he says they were a little apprehensive before the introduction of the system. Takeshi Matsushita recalls, "When I saw EcoAdviser at Fukuyama Works, I thought, 'this is easy to understand,' but at the same time I was worried about whether I would be able to create such a screen myself. But with Mitsubishi Electric's support, installation and startup was quick and easy."

Takeshi Matsushita, Engineering and Maintenance Section, Onomichi Plant, The Yokohama Rubber Company.

The company also adopted the EcoAdvisor Utilization Support Service provided by Fukuyama Works. This includes screen creation training and basic screen creation services to get the system up and running quickly. The training has been effective, and now the staff members are able to create new screens on their own.

Boosting 'Environment Month' Activities

Yokohama Rubber designates June every year as 'Environment Month', when each department at the plant competes in energy-saving activities. The EcoWebServer III and EcoAdviser played a major role in the most recent Environment Month. "Previously we could only describe the results rather than quantify them," says Takeshi Matsushita. "However, EcoWebServer III and EcoAdviser have made it possible to visualize the effects of actions such as turning off wasteful lighting in a way that can be understood by everyone. Showing the actual power saving figures really motivates each department."

In addition to Environment Month, the Engineering and Maintenance Section now uses the figures to disseminate information to all personnel via a regular in-house e-newsletter entitled Energy Conservation Communication. By copying the EcoAdviser screen into the newsletter, specific information can be given in an easy-to-understand way.

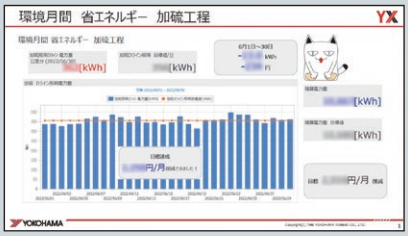
◇ E-Newsletter (Example) ◇

=== Energy Conservation Communication Vol.6 ===

Dear everyone at the Onomichi Plant,

Thank you for your daily energy-saving activities.
A week has passed since the beginning of Environment Month.

If each worker knows the location of the light switches and turns off the lights when leaving the work area, we believe our targets will surely be achieved.
Let's all take the opportunity of Environment Month to achieve our targets while making this a regular habit for everyone.



(EcoAdviser dashboard screen attached to email)

To increase awareness of energy saving activities an in-house e-newsletter is sent to all personnel.

Going global

The Onomichi Plant's Engineering and Maintenance Section efforts were so successful that they were asked to make a presentation at a meeting of senior managers from across the Yokohama Rubber Group.

Kazuyoshi Yanagisawa recalls, "The graphical visualizations generated by EcoAdvisor attracted particular interest. At most Group plants visualization is currently done on an electric power system basis. But we have shown that by breaking this down into individual processes, functions and departments, it is possible to create visualizations that are more relevant to individual people, which they find far more motivating than plant-wide figures."

Not content to rest of their laurels, Onomichi is now considering integrating management of energy sources other than electric power, such as boilers, steam, and cooling water, into the EcoWebServer III/EcoAdviser system.

The Yokohama Rubber Co., Ltd.

YOKOHAMA

Founded: 1917.
Business: Manufacture and sale of various types of tires for passenger cars, trucks and buses, construction vehicles, industrial vehicles, agricultural and forestry machinery, and other automotive products. Other products include the manufacture of conveyor belts, bridge and civil engineering materials, and aviation components as well as the manufacture of sporting goods, information processing services, etc.
Onomichi Plant: Began production in 1974 and currently produces mainly tires for construction and industrial vehicles.
URL: https://www.y-yokohama.com/

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