

Thermal storage

Osumi Factory of Zennoh Kagoshima Chicken Foods Corporation

At Osumi Factory, chickens that are raised at 44 contract farms in Soo-shi, Kagoshima where the factory is located and neighboring Shibushi-shi are processed and shipped out as general broiler meat. Under strict sanitary supervision, more than 30,000 chickens are processed. With an integrated system from chicken breeding to processing, the company pursues "safe and worry-free chicken products."



Location: 4980 Osumi-cho Nakanouchi, Soo-shi, Kagoshima
 Site area: 28,108 m²
 Total floor area: 3,769.7 m² (factory building)
http://www.karen-ja.or.jp/group/04_chicken_foods.html

Effective heating of a large amount of feed-water

Elimination of the dependence on steam boilers and reduction of environmental loads, which were achieved by the introduction of heat pump water heaters

Challenges before introduction

Heating by high energy-consuming steam boilers

For processing of fresh chickens, it is needed to soak them in hot water and depilate them. In this process called "scalding," a large amount of hot water is always needed. As the factory has become a Type 2 Designated Energy Management Factory, the reduction of fuel oil used by the steam boilers that supply hot water for scalding and their CO₂ emissions has become a big problem.

Positive effects after introduction

CO₂ emissions decreased to one-third of the original emissions and energy cost decreased by 88%.

To replace the conventional steam boilers, heat pump water heaters were installed and a system to heat feed-water was introduced. As a result, CO₂ emissions are expected to be reduced by 65% and energy cost by as much as 88%. Moreover, startup of the steam boilers has become faster and labor hours have been shortened.

Customer's voice



Mr. Toyomi Mizoguchi
 Deputy Manager
 Manufacturing Business Department at Osumi
 Factory
 Zennoh Kagoshima Chicken Foods
 Corporation

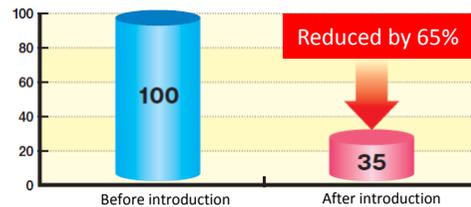
With the extension of the factory, the number of chickens to be processed per day is slated to increase up to about 55,000 from about 32,000 at present. In expectation of such future of the factory, we plan to further streamline equipment for the improvement of the efficiency. The factory is already scheduled to start full-scale operation in 2012, and we also promote the introduction of ice thermal storage air conditioners. Aiming at further reducing energy cost and CO₂ emissions, we will consider the introduction of new equipment.



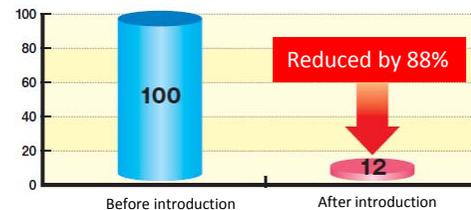
Mr. Teruo Matsukubo
 Assistant Manager of Safety and Health Division
 Manufacturing Business Department at Osumi
 Factory
 Zennoh Kagoshima Chicken Foods Corporation

Unlike steam boilers, heat pumps are easy to operate. Since we just turn the knobs, they can be used by anyone. Furthermore, heat pumps are smaller than we expected. They save not only energy but also installation space. In addition to the effect of reducing environmental loads and costs, heat pumps have other advantages such as low noise and high maintainability.

Comparison of CO₂ emissions



Comparison of energy cost



[Calculation conditions]
 > CO₂ emissions intensity
 ● Electricity : 0.555 kg-CO₂/kWh (*1) ● Type A fuel oil: 2.71 kg-CO₂/ℓ (*2)
 (*1) Actual values of Kyushu Electric Power Company for FY2006
 (*2) Act on Promotion of Global Warming Countermeasures

Points of new system

Heating feed-water by heat pump heaters Drastic reduction of CO₂ emissions and cost

For production of chicken products, it is necessary to soak chickens in hot water and depilate them. In this process called "scalding," chickens are soaked in turn in a water tank filled with about 7m³ of hot water of about 60°C. Whenever a chicken is soaked, about 1ℓ of hot water is absorbed into feathers, scalding always needs water supply, and huge heating loads are caused. It was a challenge to reduce the amount of fuel oil consumed by two steam boilers for water heating.

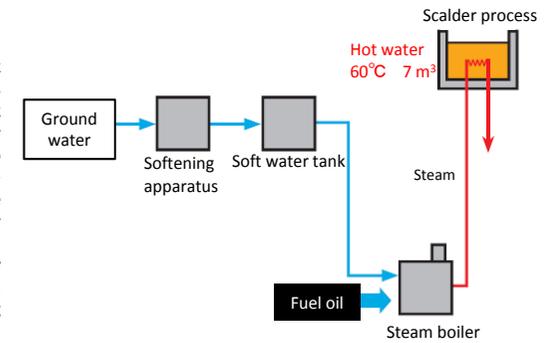
The amount of fuel oil consumed is significantly reduced by producing hot water of 65°C with heat pump water heater, storing the hot water in a 10 m³ hot water tank during nighttime, and supplying the hot water to the steam boilers. CO₂ emissions are expected to be reduced by 65% and cost by as much as 88%. In addition, as a result of storing hot water during nighttime, it has become possible to delay the start of the boiler operation early in the morning for 30 minutes, leading to reduced workloads for employees.

As the Osumi Factory has become a Type 2 Designated Energy Management Factory, we have put our efforts in to the reduction of fuel oil consumptions and CO₂ emissions. The company has been planning to expand the capacity of the factory. As more environmental measures and further energy conservation are required, the company plans to continue the introduction of heat pump equipment and thermal storage systems.

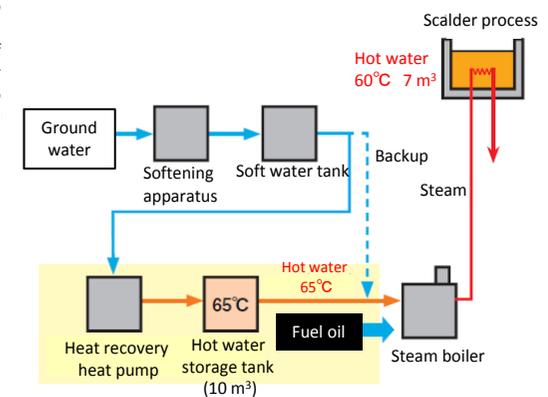


↑ Broilers delivered from farmers are butchered on the same day.

Outline of system before introduction



Outline of system after introduction



Outline of equipment

- Time of introduction: December 2008 (renewal)
- Pieces of equipment introduced:
 - Air source heat pump water heater (Eco Cute) x 1 unit 85 kW (65°C)
 - Hot water storage tank 10 m³



↑ Air source heat pump water heater (left) and hot water storage tank (right)