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### **Decarbonization solution by using renewable electricity**

Tatsuya Takamatsu  
SINANEN CO.,LTD

This paper explained how to procure electricity from renewable energy for decarbonization. The first issue that companies should consider in order to achieve decarbonization is whether or not they will invest themselves and strive to improve the ratio of renewable energy. If you are not willing to invest, you can solve it by consulting a power retailer and using the environmental value of the existing power plant. If you are willing to invest (additionality), I think the three methods described in this paper will be very informative. Particularly with regard to the Corporate PPA, although it is the most noticeable method, the understanding has not progressed, so I would be grateful if you could understand how to operate it in this paper.

### **Initiatives for low-carbonization in Kanto Mill(Katsuta)**

Kai Matsubara  
Kanto Mill (Katsuta) , Hokuetsu Corporation

In Hokuetsu Corporation Kanto Mill (Katsuta site), the No.2 biomass boiler (2B) and No.2 steam turbine generator (2T/G) generate steam and electric power for the whole facilities, and the surplus electricity is supplied outside for sale. This boiler mainly uses wood chip derived from construction waste, coal, and paper sludge and waste plastic generated inside the mill. On calorie basis, about 90% of the fuel is wood chip and paper sludge, about 1% is waste plastic, and the rest of around 10% is coal.

Our company set a goal in 2021, that it will achieve virtually zero of carbon dioxide emission by 2050. For this goal, we have already started efforts to reduce coal used for fuel in 2020. In this report we introduce the examples of coal reduction so far and future policies.

### **Fuel conversion of lime kiln**

Shigeyuki Ido  
Kani Mill, Daio Paper Corporation

Daio Paper Group has declared that we will aim for carbon neutrality in 2050 toward the realization of carbon-free society. In order to reduce CO<sub>2</sub> emissions at Kani Mill, the fuel for lime kiln, which is one of the main source of CO<sub>2</sub> emissions, was converted from heavy oil to city gas.

By converting fuel, CO<sub>2</sub> emissions will be reduced by 11,173t in 2022. This is 8.9% of CO<sub>2</sub> emissions of Kani Mill.

In the future, further reductions in emissions can be expected to be achieved by reducing emission intensity on the supply side.

### **Activities for Energy Saving in Ishinomaki Mill**

Satoru Suzuki  
Ishinomaki Mill, Nippon Paper Industries Co., Ltd.

The Nippon Paper Group is working to reduce GHG emissions through three key initiatives: shifting to alternative fuels, promoting energy saving in production and logistics processes and absorbing and fixing CO<sub>2</sub> through the appropriate management of company-owned forests.

We will introduce four improvement cases at Ishinomaki mill.

「Efficiency increase by a 7B black liquid heater of the indirect system」

「Improvement of practical use of 8B SAH」

「Increase of RPF by control improvement of 1B GAH」

「Load stabilization of a 8B by improvement of 6T control」

## **Control System to Optimize Cooling Tower Type Condenser Cooling Water System**

Toshiaki Shimizu  
Chubuplant Service CO.,LTD.

Cooling tower type condenser cooling systems are greatly influenced by atmospheric conditions. Moreover, since they are designed for the hot and humid summertime, excessive cooling for most of the year results in a large waste of power. To solve this problem, this system optimally controls the rotation number of the auxiliary machines of the condenser cooling water system: the cooling tower fan and the circulating water pump, thereby reducing the station service power of the power generation equipment and increasing the amount of electricity selling. Specifically, the total power of the cooling tower fan and the circulating water pump is minimized by controlling both the cooling air volume of the cooling tower fan and the cooling water flow rate of the circulating water pump to prevent overcooling of the cooling water and at the same time, the degree of vacuum of the condenser is controlled to a constant level.

In an in-house power generation facility that had introduced this system, the power reduction amount was 1,337 MWh / year (crude oil equivalent 337 kL / year), and the reduction rate was 52.2%, which means the amount of power was reduced to less than half. In addition, the condenser vacuum value had been controlled to be mostly constant throughout the year, contributing to the improvement of turbine efficiency.

## **New way of applying stabilized halogen application in paper mill**

Takayuki Fujii , Akira Yamakawa  
KATAYAMA CHEMICAL,Inc.\*<sup>1</sup> and KATAYAMA NALCO,Inc.

From the standpoint of environmental concern such as preservation of forest resource and waste disposal, importance of the reuse of waste paper is increasing. As the utilization rate of waste paper increases, the strength of the paper decreases due to the reduction of fibrils on the surface of the fiber and the increase of short fibers as the paper is recycled over and over. In addition, there is a growing demand for the reuse of low grade waste paper that has not been used in the past. Besides, the trend toward closed systems in consideration of the environment has led to problems such as pitch trouble and reduced effectiveness of internal chemicals due to deterioration of process water quality. Manufacturing process of waste paper pulp are disintegration of waste paper, dust removal, deinking and bleaching. Those waste paper pulp is used in the preparation process to add internal additives and to adjust the pulp density, then it goes through the paper making process to be completed as paper. There are several problem in each process such as difficulty in disintegration and deinking, pitch trouble and increasing paper strength agent usage due to decreased paper strength. In order to solve these problems, we focused on stabilized halogen and conducted several studies. We have products that produce stabilized halogens, and we have verified its effects other than biocide, such as accelerated disintegrating, improved deinking, suppression of pitch trouble, and enhanced paper strength.

## **The latest trends in technologies of heat transfer improvement -Kurita Dropwise Technology-**

Ippei Tanaka, Mitsuru Komatsu  
Kurita Water Industries Ltd,

Kurita Dropwise Technology has been installed to over 100 factories, mainly in Japan and South east Asia. From these references, the improvement of steam consumption by 3~20 % and other new values were also confirmed, such as the improvement of the paper machine speed, the cut of maintenance operation, the decrease of loss products, the time saving of pre-heating and so on.

In recent years, this technology has been installed not only to paper factory but also other factories, and great effects were confirmed in each factories, such as a condenser of power boilers, a corrugator in cardboard factories, a cooking instrument in chemical factories, and so on.

We have had trials for applying to new facilities, such as a turbine condenser in power boilers, an 1E can and condensers in black liquor evaporators, a steam dry process in pulp sheet machines, and so on. Kurita believes that we can contribute to create the new value for society and companies, by installing this technology and maximize heat transfer efficiencies of more factories.

## **Contributes to power saving (CO<sub>2</sub> emissions reduction) and maintenance cost cut with HFD System (Hyper Flat Drive System)**

Takemasa Yoshimi

Power Transmission Belt Design Group Engineering Department Industrial Products Division, BANDO CHEMICAL INDUSTRIES,LTD.\*<sup>1</sup>

We are a comprehensive belt manufacturer with a history of over 100 years and have been researching and developing products that efficiently transmit energy even before the adoption of the SDGs.

Years of developing high efficiently products, Bando's "Hyper Flat Drive System (HFD system)" is here now to announce proudly winning the Energy Conservation Award in 2013 and 2019 (sponsored by the Energy Conservation Center of JAPAN; as well as by the Ministry of Economy, Trade and Industry of JAPAN). Below you will find Bando HFD system features and benefits, along with how HFD contributes to the next green environmental society.

The features of Hyper Flat Drive system are as follows.

1. Compared to V belt, BANDO flat belt of HFD system leads highly effective energy savings due to the belt's hyper flexibility features to the pulley
2. Thanks to the the unique technology of the pulley and auto-tensioner combined device, maintenance-free and longer life are possible by the meandering prevention control and tension control.
3. The range of application covers large capacities from 2.2kW - 22kW to 30kW - 75kW for commercial and industrial HVAC (heating, ventilation, air conditioning) applications.
4. Adjusting the tension of V-belt and attaching and detaching the belt, it is necessary to work with a large number of workers, and there is always a risk of a injuries caught between V-belt and V-pulley. The HFD system does not require tension adjustment, and the flat belt can be attached / detached safely and easily.