“Technological improvement for Paper mill “Ligatne” Ltd.”

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Keywords **– Recycled, efficiency, economical, woodchip, storage**

I. Introduction

Paper mill “Ligatne” being the oldest industrial enterprise in Latvia, has had to overcome a lot of obstacles in its long history, like loss of all equipment during WWI. Despite that, it is looking for a ways to become more energy efficient. Data of production, water and fuel consumption were analyzed. The latter was chosen to have higher potential, consequently, possible improvements for boiler house were looked into. Construction of wood chip storage area with shelter was analyzed to have potential to reduce moisture level of wood chips from 50% to 40%, reducing fuel consumption by 13.6%. Laboratory measurements of wood chips gave an average moisture level of 51%, justifying the need for reduction. The total project cost estimate to build 800 m^2 concrete platform with shelter proposed was found to be 74 thousand LVL. With a discount factor of 7.94%, discounted payback time is 1 to 2 years.

II. Production scheme

Production processes were looked into to understand links connecting different parts of production scheme. Main flows can be seen in Fig.1. – Fresh water, paper, waste water and heat. Additionally, it must be noted, that water production involves wide use of electrically powered machines for paper production, water transport, ventilation, lights and office. Most emissions come from heat and paper production.

III. DATA ANALYSIS

Available data of production, water consumption and wood chip consumption for steam production were analyzed for year 2011 and 2012. Analysis of production processes and best available technologies (BATs) in manufacturing recycled paper were carried out.

IV. Methodology

Production scheme was used to find crucial points of interest, where possible improvements could be done. Production and consumption data were used to analyze if crucial points can be evaluated. Available data were compared with indicators given from BATs. Economical analysis were carried out for possible improvement to calculate discounted payback time, indicators (NPV, IRR and PI) and sensitivity analysis.

V. Results

Both water and fuel consumption was greater per ton of produced paper compared to BATs [1]. Option to build storage area for wood chips was chosen as superior because of abundance of fresh water and high level of moisture in wood chips. Results from economical analysis justified choice of improvement with short payback time, low sensitivity for change of capital investment and high sensitivity for change of wood chip price, but since the existing trend for price of woodchips is to increase, high sensitivity for latter is

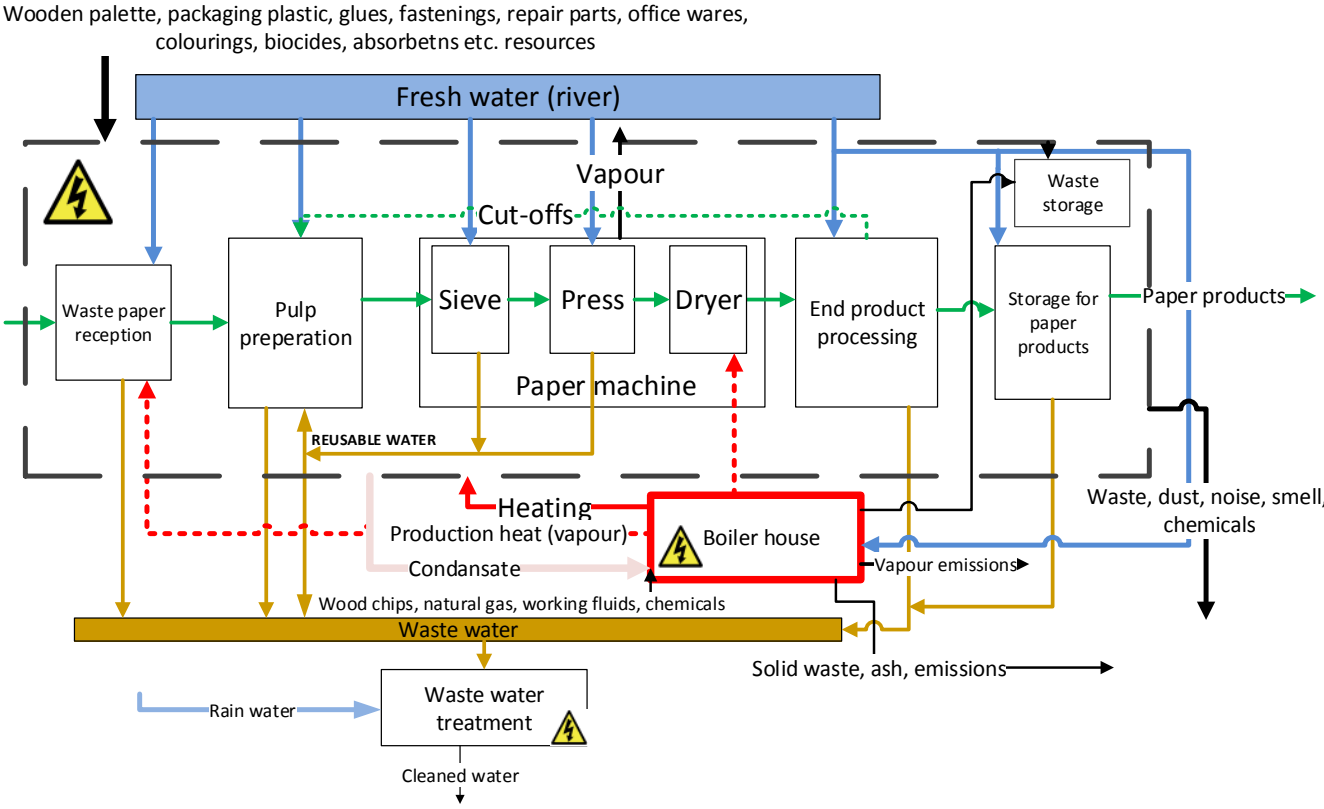

Fig. 1. Production scheme for paper mill “Ligatne”

favorable.

VI. V. References

[1] About best available technologies: http://www.vpvb.gov.lv/data/files/ippc/bat/LCelulozePapiraRupn.pdf [05.05.2013]