

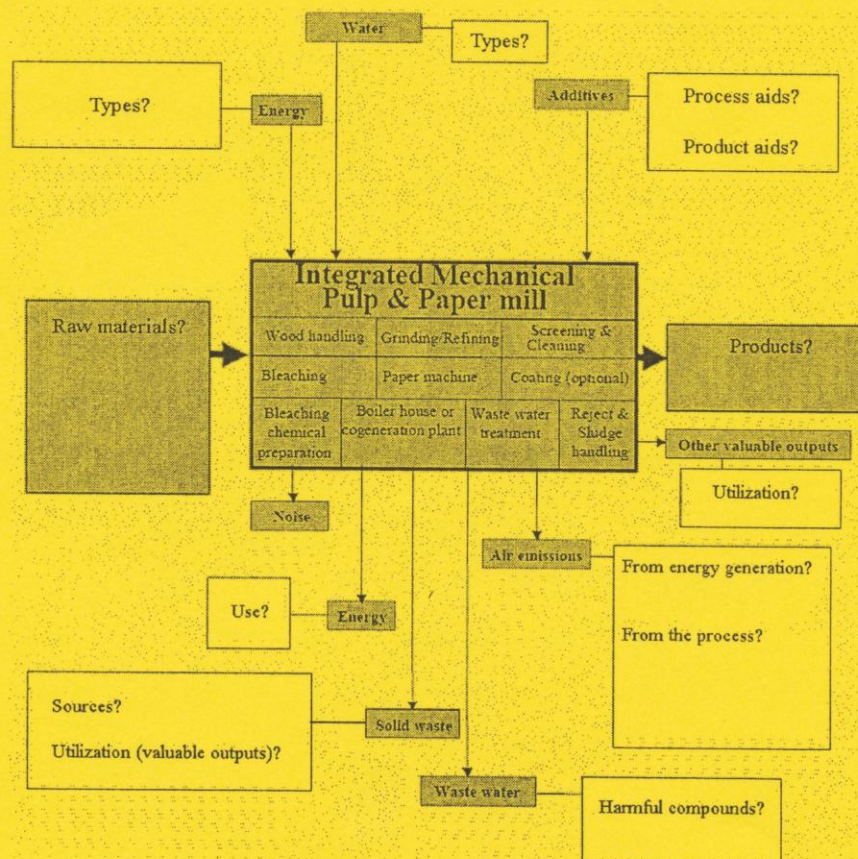


Aalto University School of Chemical Technology
Environmental Technology in the Pulp and Paper Industry (4 cr)
Prof. Olli Dahl

Exam 5.1.2012

Compulsory questions (1 - 2)

1. Briefly explain the following words, abbreviations, principles or their environmental significance. 5p. (a 1p)
 - a. BREF
 - b. Fly ash
 - c. Bottom ash
 - d. Toxicity
 - e. Green liquor dregs
2. Discuss the inputs and outputs shown in the figure. Describe the origin of the various **environmental loads associated with the process** and the types of in-process decisions, abatement and treatment **methods to reduce** environmental loads. 5p.





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Answer three (3) questions from questions 3 – 6. (5p each)

3. Discuss the concept of BAT in environmental permitting processes.
4. Briefly introduce the quality and quantity of air emissions from chemical pulp production and their main treatment methods.
5. Discuss the differences and factors affecting effluent composition from various chemical pulp bleaching sequences. Which options are there for different processing possibilities?
6. Internal and external treatment methods and further uses of solid phase side streams from the pulp and paper industry.