

**EKONO Inc.
STRATEGIC STUDY**

Study Abstract

**ENVIRONMENTAL PERFORMANCE,
REGULATIONS AND TECHNOLOGIES
IN THE PULP AND PAPER INDUSTRY**

2010

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Study Abstract

1. GENERAL

For the past seventeen years, EKONO Inc. has issued an annual publication entitled "*Environmental Performance, Regulations and Technologies in the Pulp and Paper Industry.*" The objective of the report is to provide information on current environmental performance data and issues as well as technologies available to meet current and expected future requirements. The highlights of the 2010 issue are:

- Environmental performance in the pulp and paper industry. EKONO's data base includes information from about 700 pulp and paper mills, mainly from North America, South America and Europe.
- Presentation of the permit limits in different environmental regulatory regions, states and provinces for different types of pulp and paper mills. Mill specific permits are illustrated with bar charts.
- Status of environmental certification and environmental labeling in the pulp and paper industry
- CO₂ emission data for the year 2009 from about 475 pulp and paper mills in Europe,, North America, and South America.

The focus of our study is with the North American, South American and European pulp and paper industries.

2. ENVIRONMENTAL PERFORMANCE

Actual air emission and effluent discharge data from 2009 are analyzed and presented in the report for nine different mill categories. The analyses include graphical and numerical presentations of emission data from more than 700 pulp and paper mills in North America and Europe. The data presented in the report are taken from EKONO's database, which is updated annually based on publicly available data sources and on a review of environmental reports to the authorities and corporate annual environmental reports.

Samples of the performance data are given in Figure 1 and Figure 2. The report includes some 200 different benchmarking charts.

3. PERMIT LIMITS IN SAMPLE PULP AND PAPER MILLS

Regulatory regions (countries, states, provinces) have general permit limits, which are presented in the document. However, in many cases the local authorities can apply mill specific limits that differ from the country/state/province general levels as long as these are not exceeded. Examples of mill specific limits are shown on benchmarking charts for different type of pulp and paper mills in North America, South America, and Europe.

Figure 3 illustrates the presentation of the mill specific permit limits.

4. ENVIRONMENTAL MANAGEMENT STANDARDS AND ENVIRONMENTAL LABELING

The European Union EMAS environmental management system is updated and sample mills with EMAS certification are listed. Many pulp and paper companies are revisiting the environmental labeling concept. The relationship of various labeling schemes with different environmental management systems is discussed in the report. The environmental labeling systems, including the European Union Flower, Nordic Swan and the Canadian EcoLogo are described. The status of ecolabel registration of pulp and paper companies is reviewed in the study.

5. CO₂ EMISSIONS

Benchmarking charts are provided for comparison of CO₂ emissions for different types of mills in different areas on the same basis. The direct CO₂ emissions from burning fossil fuels in boilers, lime kiln and dryers are included. The EKONO database includes CO₂ emission data for about 475 pulp and paper mills. The total annual production for these 475 mills is about 152 million tons of pulp and paper.

Figure 4 shows the CO₂ emissions from sample bleached market kraft mills.

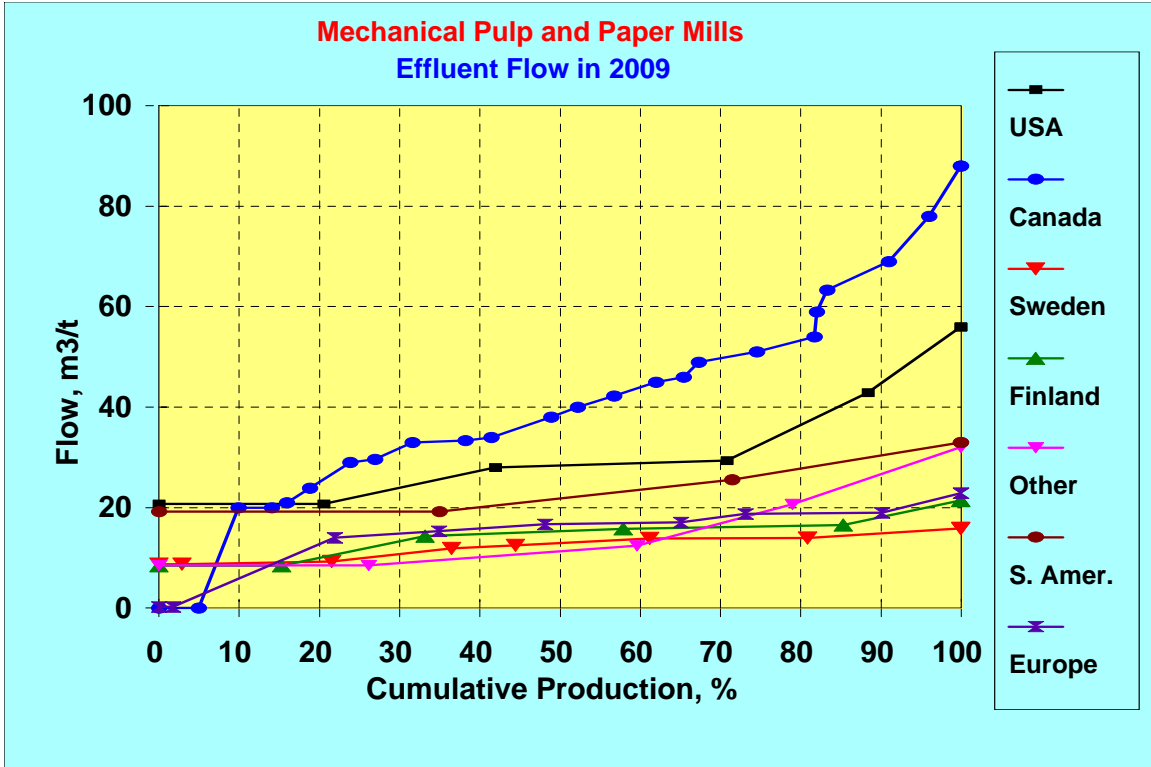


Figure 1 Effluent Flow from Mechanical Pulp and Paper Mills

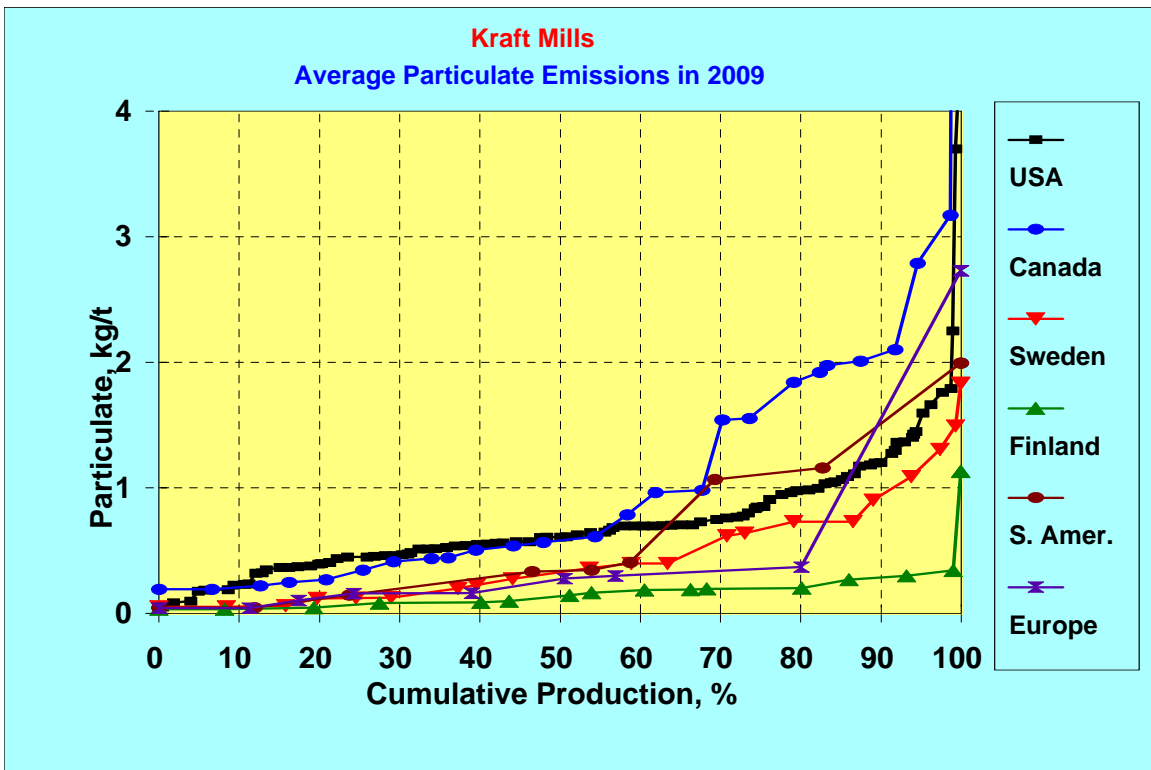


Figure 2 Particulate Emissions from Kraft Mills

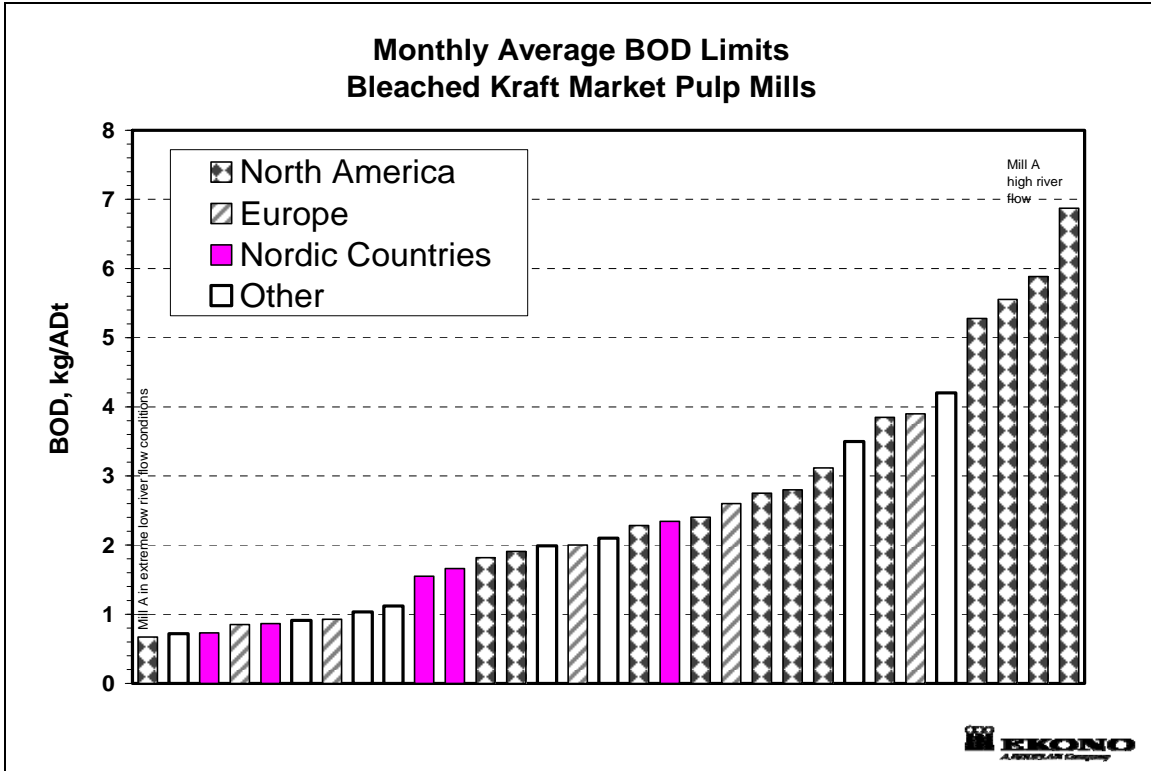


Figure 3 BOD Limits in Sample Bleached Kraft Market Pulp Mills

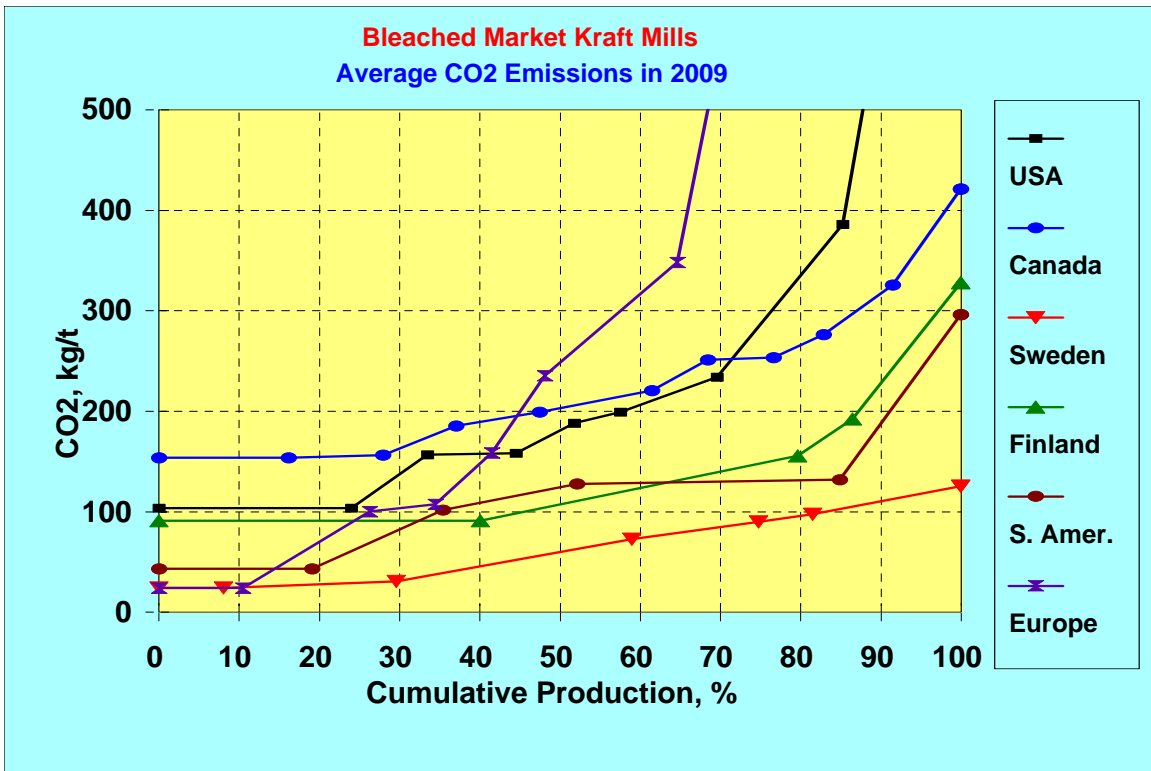


Figure 4 CO₂ Emissions from Fossil Fuels in Bleached Market Kraft Mills