

Steps to increase profits through operations improvement—Part I

This is part of a continuing series of financial articles from JP Management Consulting (a subsidiary of Jaakko Pöyry Consulting) and TAPPI examining the industry's financial performance and steps underway to improve that performance.

As previously discussed in this series, the pulp and paper industry has not created value for its investors over the last 10 years. In this commodity-oriented business facing global competitive pressure, minimization of manufacturing costs is very important. Cost analysis and benchmarking are critical tools to understand the industry environment and establish targets.

Operational improvement is needed in many cases to meet cost targets. This article will describe a three-phased Operations Improvement Program (OIP), proven to effectively cut costs and improve efficiency. Phase I, the subject of this article, is focused on establishing a vision for business potential. This is accomplished by benchmarking the asset quality and operating performance of the mill against competitors and industry leaders. Using this analysis, along with expert opinions and design specifications, the mill's total performance potential is identified and a gap analysis is conducted to establish targets.

In Phase II, a detailed performance improvement plan is developed, while Phase III is the implementation and follow-up of the achieved results.

ASSET QUALITY

The cornerstone for the attainment of sustainable operational improvement is the development of realistic, but stretched targets. Since the achievable performance of a mill is partly dependent on the quality of the manufacturing facilities available, the assessment starts with benchmarking of the asset quality.

The asset quality of a production line is basically its technological capabilities. Asset quality is a function of the original mill and equipment design, its age, and rebuild investments made over time. Asset quality influences product quality as well as manufacturing and capital costs of production, both directly and through operating performance. It also determines the limits for many operational parameters, such as labor productivity, furnish and energy needs.

The parameters included in the evaluation of asset quality for a paper mill vary depending upon the product the paper machine is making, but some general parameters are: trim width, production capacity, PM design speed, PM technical age, and technical standard (stock preparation, headbox, forming method, press section). These parameters are benchmarked against an appropriate competitor universe.

As an example, **Figure 1** shows a plot of a specific machine against global producers of coated groundwood in terms of PM capacity and technical age.

Similar graphs can be prepared for design speed vs. trim width. These graphs are useful to visualize the asset quality of the paper machine compared to industry competitors.

OPERATING PERFORMANCE

A high operating level is one of the key success factors of any mill. Operating performance is strongly influenced by management, operating and maintenance practices and the skill level and motivation of the work force.

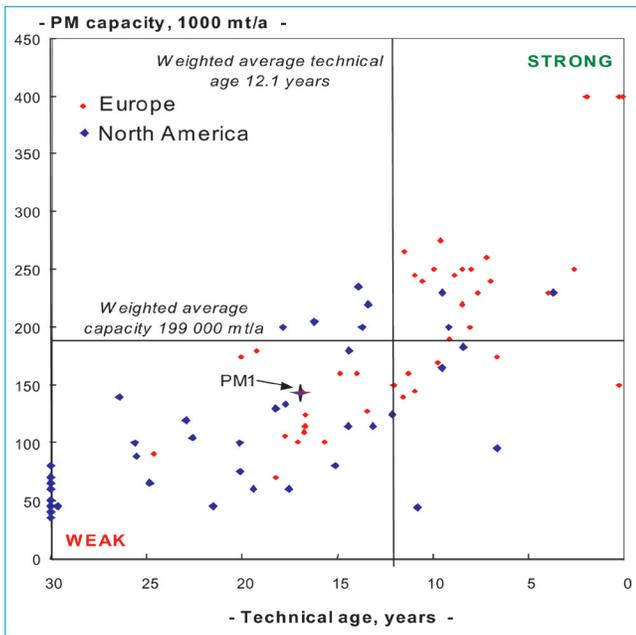
In many cases the achieved level of operating performance may not have the most decisive impact on the financial performance of a mill during a given year. Sales performance or exchange rate fluctuations, for example, may have a more pronounced effect. Nevertheless, the general interest in benchmarking of operating performance has increased in recent years for three reasons:

First, improving operating performance can immediately result in an improved competitive position and increased profits.

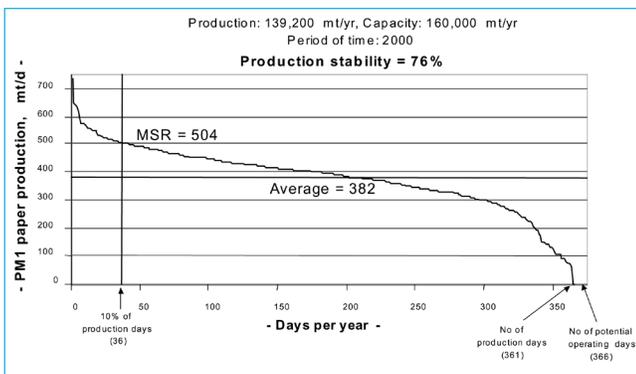
Second, in many cases an improvement in the operating performance level requires little or no investments and is the quickest way to raise output and profit without significant capital spending.

Third, among the main drivers influencing the financial success of a mill, operating performance is one of the few components mill management can control.

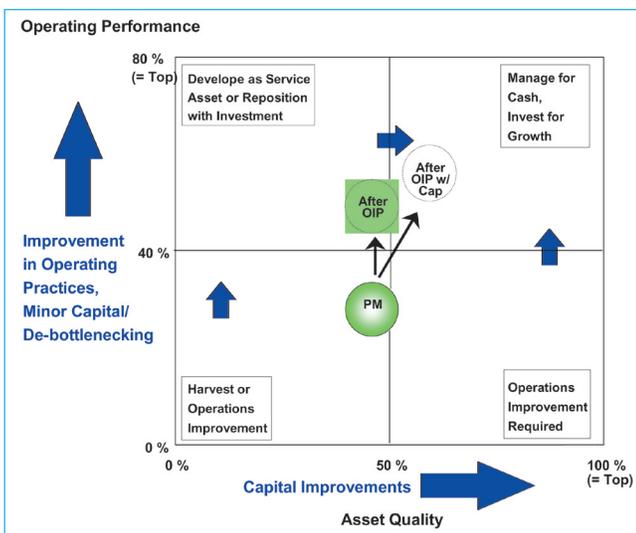
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1. PM capacity vs. technical age for global producers of coated groundwood



2. Production stability curve



3. Asset analysis chart

The factors included in the operating performance benchmarking assessment for a paper mill also vary depending upon the kind of product the paper machine is making. Some typical parameters are: production stability, efficiencies (total, time, material, and speed), furnish composition (BSKP content, filler weight, coat weight, etc.), utility usage (heat, power, water) personnel productivity, maintenance costs.

To measure production stability, which can be very enlightening, a duration curve is created from actual daily production data during a period of one year by sorting the data in descending order, as shown in **Figure 2**.

The flatness of the curve indicates the stability of production. Production stability can be expressed numerically as the ratio of average production divided by the maximum sustainable rate (MSR). This indicator is a product of the combined effect of the level of operating skills and the standard of maintenance. A comparison of the production stability percentage of a subject mill to similar mills can provide an indicator of the average daily production level that should be achievable.

A poor stability profile could indicate a large amount of downtime or large variations in production rate. Downtime could be due to market, maintenance or operational problems, or most likely a combination of all three. Production rate fluctuations could indicate problems with support processes, or product rationalization.

To dive deeper, mill efficiencies should be analyzed and benchmarked using strict definitions in order to ensure credible comparisons. Three efficiencies typically benchmarked are:

1. PM time efficiency is the ratio of a paper machine's uptime vis-à-vis its potential operating time.
2. Material efficiency is the share of production that is saleable relative to the actual gross paper machine production on reel.
3. PM speed efficiency compares the actual weighted average paper machine speed to the product-weighted average maximum speed.

ASSET/PERFORMANCE POSITIONING

Once all the information has been analyzed, the mill is compared against the industry top and bottom performers and given a rank position in each of the parameter analyzed and a score for asset quality and operational performance is calculated.

Comparing the operating performance to asset quality, as shown in **Figure 3**, can provide a simple, yet very powerful assessment of an asset's needs in terms of capital and/or performance improvement.

In this example, the subject machine has a performance gap relative to its asset quality. This suggests a path forward based on operational improvement, as the mill's performance has not earned the "right for more capital." However, closing this gap could position the asset for future capital investment. **TJ**