

CASE STUDY

How EDGE Transformed a Containerboard Mill's Profitability A Zero-Capital Optimization Success Story

In early 2024, a North American containerboard company found itself in a position unfortunately familiar to mills across the industry. Years of tight margins had eroded their ability to reinvest in capital equipment and maintenance, leading to reliability issues that began to impact production.

The fluctuating prices of virgin fiber and old corrugated containers (OCC) had driven production costs high enough that the profitability of certain customers and contracts was unclear. While improvement opportunities existed for the mill, the challenge was determining where to begin and what to prioritize.

THE COMPETITIVE EDGE

To help the company through this difficult transition, ResourceWise and partner F3 Analytics introduced their new service, EDGE (Enterprise Decision Guidance and Execution).

EDGE is a decision support and analysis service driven by unique optimization and simulation technology tailored specifically for the pulp and paper sector. It enables customers to make informed choices and confidently navigate complex challenges.

EDGE BY RESOURCEWISE AND F3 ANALYTICS

EDGE helps pulp and paper companies make data-driven decisions that enhance performance and profitability by:

- Providing industry-specific insights tailored to your specific needs
- Creating detailed models of your operations based on real data
- Identifying opportunities to reduce costs and improve operations without added investment
- Supporting faster decision-making with actionable recommendations in days
- Delivering a methodology and toolbox for continuous use across your business

EDGE is purpose-built for the pulp and paper industry, ensuring that customers benefit from domain expertise and specialized knowledge. Unlike generic optimization and consulting services, EDGE addresses the nuances, challenges, and opportunities unique to the industry, delivering more accurate analysis and recommendations that align with the specific needs and goals of pulp and paper companies.

The EDGE modeling system builds a representation of your business from fundamental engineering parameters, with data collection streamlined by our FisherSolve database.

Each analysis treats the production system as a whole, simultaneously optimizing across the typically siloed operational areas of the powerhouse, pulping, and papermaking, while maximizing EBIT based on true marginal economics rather than assumed average costs.

EDGE is not just a one-time product but offers a methodology and toolbox for continuous use across the enterprise. Once past the initial setup phase, even complex issues can be thoroughly addressed on a scale of days instead of weeks or months.

Its range of analytical tools, data visualization capabilities, and reporting features support regular assessments, so customers can be

TARGET USE CASES

- **Strategy:** Capital investment, M&A, and integration, as well as building, closing, and divesting facilities
- **Operations:** Zero-capital operational improvement and debottlenecking
- **Planning:** Annual planning, business risk and interruption, and economic volatility

confident their plans are always current with evolving market conditions.

EDGE customers typically achieve millions of dollars in annual savings by operating existing assets differently, often without significant capital expenditure.

OPTIMIZING PROFITABILITY AND PERFORMANCE

Within approximately three months of receiving the necessary data, ResourceWise and F3 stood up a parameterized EDGE model of the containerboard company's 2023 operations that fully replicated their historical outcomes with remarkable accuracy—within pennies of EBITDA and ounces of fiber. It also matched all measured mechanical, operational, and physical data in between. Scenarios were then compared against this base case to address two key areas.

First were “zero-capital opportunities,” seeking to identify how the existing asset base might have been operated differently to achieve higher profits without requiring additional capital investment.

These possibility decision levers included:

- Boiler fuel mixing
- Steam turbine generation and extraction profiles
- Furnish mix ratio of virgin to recycled fibers
- Distribution of production across PMs

The second focus was analyzing the returns from maintenance improvement investment in the powerhouse. A suite of repairs and improvements designed to reduce upsets, including reliability upgrades to the hog fuel delivery system, were under consideration.

The question was how greater mill stability would impact the bottom line and whether this would enable increased paper machine uptime that could be used to sell additional product.

PILOT OUTCOMES

EDGE identified several million dollars in zero-capital improvement opportunities. In the powerhouse, operating the boilers and turbine to minimize fossil fuel use and maximize power generation would have deferred nearly \$1 million in purchased energy. Shifting the furnish mix toward OCC and reducing virgin fiber use saved an additional \$250,000. Thanks to EDGE's comprehensive marginal analysis, the company was able to pinpoint the exact cost per ton at which virgin fiber and OCC become uneconomic.

EDGE was additionally able to identify nearly 50,000 tons of product that had been sold at an operating loss due to the high incremental cost of virgin fiber. While this product appeared profitable when analyzed on an average-cost basis, it was revealed to be contribution-negative when examined on the true economic margin. Declining these orders was an opportunity worth up to \$5 million—or more, if those orders could be replaced at a higher price point.

Due to the mill's production level having led them to climb the fiber cost curves to the point of unprofitability already, the prospect of investing in powerhouse reliability to increase paper machine uptime had minimal incremental value beyond deferring fossil fuel purchases.

\$1 Million

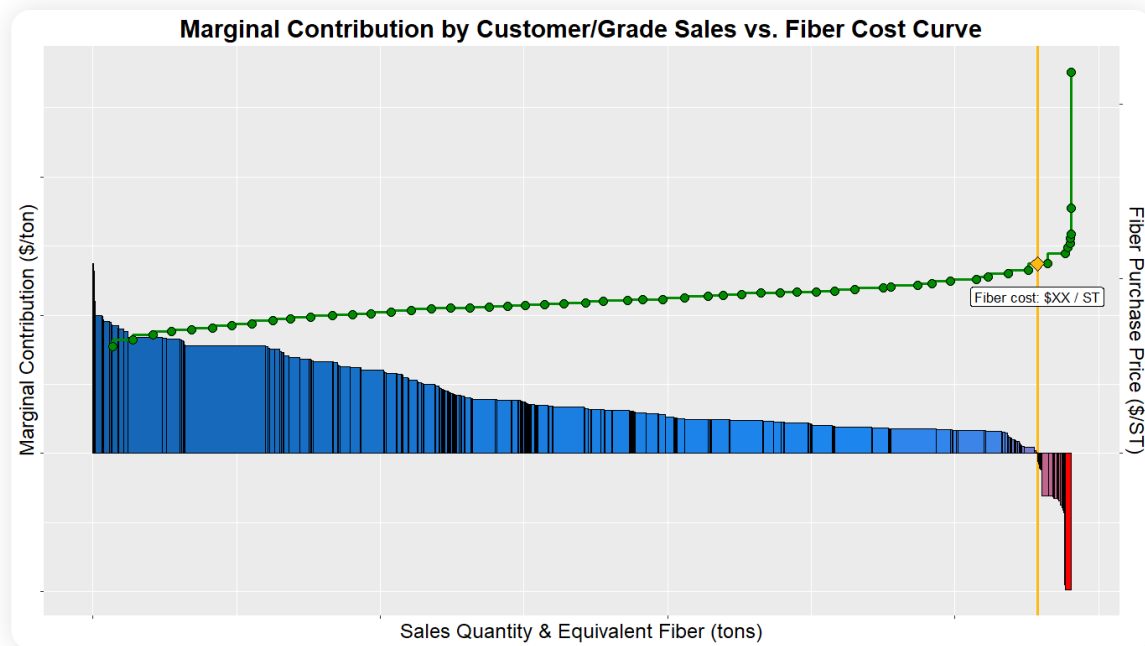
Deferred in Purchased Energy by Maximizing Power Generation and Minimizing Fossil Fuel Use in the Powerhouse

\$250,000

Savings by Shifting Furnish Mix Toward OCC and Reducing Virgin Fiber Use

\$5 Million

Opportunity from Identifying Nearly 50,000 Tons of Product Sold at an Operating Loss Based on True Economic Margin



LOOKING TO THE FUTURE

Retrospective analysis is useful, but real value comes from improving future decision-making in real time.

As a final phase of the pilot, EDGE was used to perform a forward-looking marginal contribution analysis against a projected 2024 sales slate using updated fiber cost curves and other input pricing. This exercise revealed a potential \$2 million in sales rationalization opportunity and highlighted a significantly different mix of products and customers compared to the 2023 analysis.

It is crucial that tools like EDGE be used and updated regularly so customers can adapt quickly and comprehensively to changes in raw material prices, energy costs, and market demand. By using real-time optimization recommendations, companies can proactively avoid costly mistakes and improve outcomes, driving profitability and operation excellence.

Scope of EDGE

PHYSICAL OPERATIONS

- End-to-end view from fiber and fuels to delivered product
- Energy systems: fuels, boilers, and turbines
- Multiple mills, business units, and sales regions
- Highly detailed modeling on relevant aspects for analysis

ECONOMICS AND FINANCE

- Purchase and sales details: location, quantity, supplier/customer, price, and tiers/cost curves
- Configurable and detailed financial

Speak to an expert to learn how EDGE can help you optimize your operations, reduce costs, and unlock new revenue opportunities tailored to your business needs.

resourcewise.com/about/contact-us

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We help our customers make better decisions by providing accurate data and analytics, which we supplement with strategic consulting. Because our markets are energy-intensive, we use our data and expertise to help our customers identify and navigate decarbonization pathways and industry-related regulatory requirements.