

## Beyond Local Economics: Improving Competitiveness through Marketwide Supply Optimization

The building materials industry is experiencing an unprecedented retrenchment. While economists debate the details of the recessionary environment, manufacturers face challenging daily decisions regarding pricing, capacity, production levels, cost targets, and investment. At L.E.K., we have found that within each of these areas, there lies opportunity. For example, most suppliers make production and utilization decisions based on the lowest cost of supply or the lowest delivered cost to a market. Often, this is the right decision. However, these methods may be suboptimal if they do not consider the possibility of a highly efficient system-wide solution.

In analyzing the cross section of commercial facts and operational capabilities, we find further opportunity for substantial value creation and profitability. This requires a deep understanding of the prevailing market and competitive forces, as well as an outlook for the future

*Beyond Local Economics: Improving Competitiveness through Marketwide Supply Optimization* was written by **Robert Rourke**, Vice President and Head of L.E.K.'s Building & Construction Practice, and **Aaron Smith**, Vice President in L.E.K. Consulting's San Francisco office. Please contact L.E.K. at [industrial@lek.com](mailto:industrial@lek.com) for additional information.

evolution of both factors. It is only with this complete understanding that producers can make optimal decisions regarding pricing, production volumes, capacity expansion, and target cost reductions across their asset base. If a company cannot answer, with confidence, the following questions, there is a good chance it is leaving millions of dollars on the table when making commercial and strategic decisions:

1. What is the available capacity (including competitors'), by plant, that is relevant to a given market, and what is the landed cost of that capacity?
2. At what price increase would competitors rationally shift supply from other markets into this market?
3. At what price decrease would competitors rationally shift supply into other markets from this market?
4. Where is my position in the supply curve and how vulnerable/secure am I to changes in competitors' capacity or changes in market demand?
5. At what target cost of production can I improve my competitiveness?
6. How do I find the optimal solution across my plants/assets – as opposed to just a single plant?

### Commercial Factors Aren't Enough: Traditional Approaches to Managing Pricing and Supply

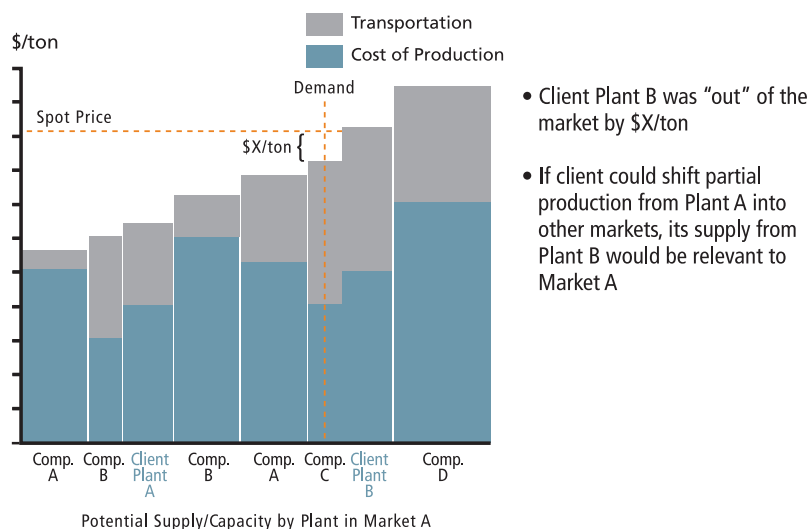
Building material companies commonly make pricing decisions based on the fundamentals of local market dynamics. Knowledge of competitors and customers forms the basis for how they approach each market – typically pricing just under their estimate of the competition's price. These estimates are based on numerous assumptions about competitors' costs of manufacture, utilization levels, and transportation costs. Some companies are more rigorous in decision making, such as those who build and analyze supply curves for local markets and new contracts. However, few expand their analysis beyond a specific geographic market.

This results in supply decisions that are optimal within local markets, but can be suboptimal across regions addressable by the company. Supply decisions made at the local level too frequently fail to consider the effect of the decision across a system of assets, thus neglecting to consider how the decision may impact the actions of competitors.

## Case Study: A Superior Total Network Solution

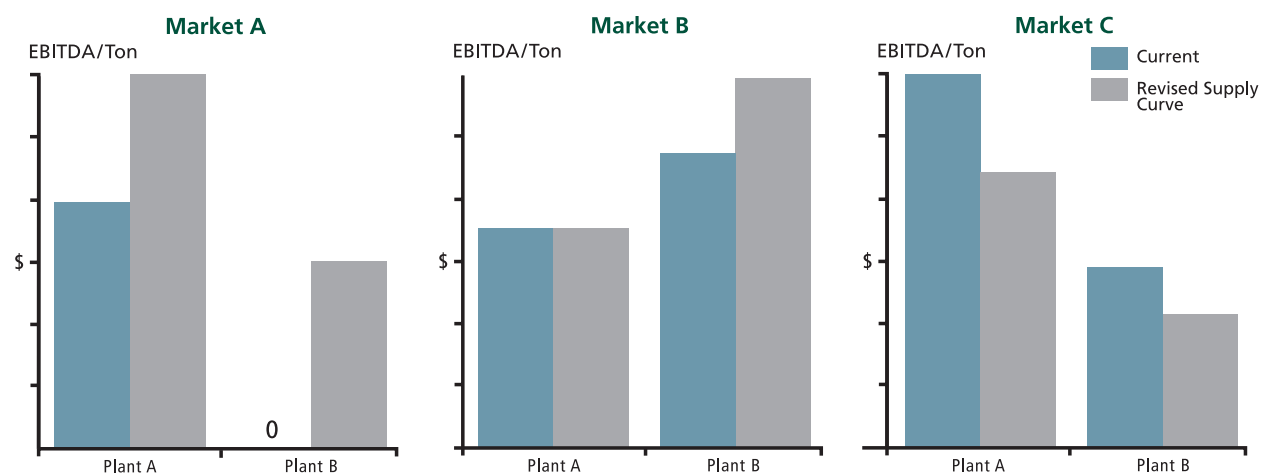
Supply Optimization is akin to playing a game of chess. Rather than focusing on the next move to win, one must consider how each will affect subsequent moves – yours and your opponent's. For example, while working with a client serving the industrial materials market, L.E.K. analyzed several underperforming plants that were pursuing the logical strategy of serving their most profitable markets. Their plants had high fixed cost and pricing was set to drive volume. Not surprisingly, their competitors were pursuing the same strategy, so pricing was held to very low levels, with some of the plants failing to generate adequate returns. To further complicate the issue, the client also had several plants focused on the same geographic markets due to proximity, which furthered the imbalance between supply and demand. As a result, the client considered shutting down the highest-cost plants in the region. Surprisingly, when we took a more holistic view of their supply position, we saw that there were other markets that could be profitably served, though at lower margins. When we "looked ahead" at the competitor reaction to a shift in our client's volumes, we saw there would be little price degradation in the target markets the client would move into and significant price appreciation in the markets they were currently serving. As a result, prices were quoted to shift volumes, competitors reacted as expected, a little money was lost in the new markets, but a lot of money was made in the existing markets.

"Market A" Delivered Cost Supply Curve



Those companies that do make decisions based on the broader demand and supply factors across their network of plants and customers, and are aware of the plausible response by their competitors, develop a sustainable competitive advantage.

Ultimately, a company may be better off choosing the suboptimal move for a plant if it results in, or enables, the optimal solution across its network of assets. If it optimizes only at a local level, it may miss the opportunity to benefit from a superior total network solution.



- By shifting some production away from Market A, the slope of the supply curve steepened, making Plant A more profitable in Market A and making Plant B profitable and relevant to Market A.
- Plant B was, as a result, more profitable in total across markets, and its improvement in profitability exceeded the small change in Plant A's profitability to Market A.

## The Solution: Supply Optimization

One solution for critical strategic decision making is what L.E.K. calls Supply Optimization – one part supply analysis and one part game theory. It is an invaluable tool to maximize a company's return on capital employed, improve its competitive position, and encourage rational competitive behavior within the industry. It is an innovative approach to making comprehensive supply decisions from pricing and volume decisions, to considerations on capacity or new sources of supply and reserves and even cost target setting. This approach requires detailed internal, market and competitive data; sophisticated tools for processing the data; careful assessment of likely competitor response; and consideration for the wide-ranging impact that may result from implementing the recommended decisions. The potential upside far outweighs the effort involved in taking this holistic approach. Effective Supply Optimization can significantly reduce supply costs, strengthen pricing power and competitive position, and have a profound impact on profitability.

## Making the Transition to Supply Optimization

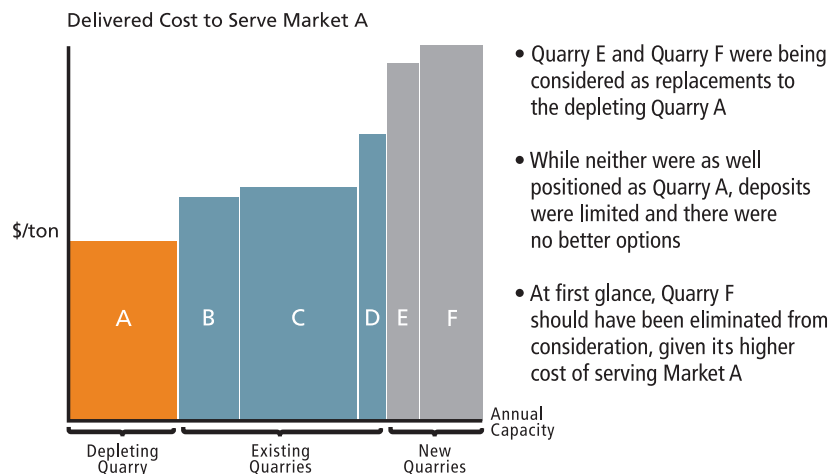
The process of utilizing Supply Optimization includes five steps:

1. Gathering market intelligence
2. Building a supply optimization tool
3. Interpreting the results
4. Determining the best course of action
5. Implementing the recommendations

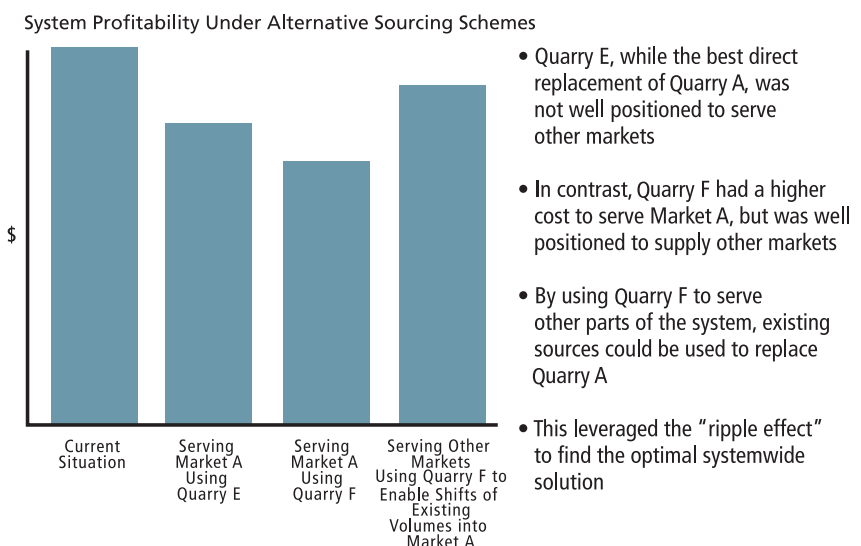
### Case Study: The “Ripple Effect” of New Reserves

L.E.K. adopted this approach during recent work with a client who was facing significant quarry reserve depletion. Several new sources had been identified and valued based on their cost to supply the markets served by the depleting quarries. Utilizing supply optimization, we identified highly valuable sources that had been originally discounted based on their inability to directly replace the depleting quarries. However, they were able to indirectly replace the depleting quarries by shifting the supply across the network of quarries. While many of the existing quarries served less profitable markets, the system-wide benefit was higher than acquiring a direct replacement for the depleting quarry. The result was a much broader and higher value set of options which filled their reserve gap.

#### Quarry A's reserves were depleting and several quarries were being considered to fill the supply gap



#### Quarry F was an inferior alternative as a *direct* replacement of Quarry A; however, it was better able to serve other currently served markets and created a better system-level solution than Quarry E.



Step 1 includes gathering the required market intelligence, and starts with the same deep knowledge of local markets used in traditional approaches to managing supply. In general, it goes deeper and requires the following: estimating the level of consumption, pricing and other demand-side factors; detailing the companies able to serve each local market including volumes, capacities, and their costs of placing product into each market; and assessing a company's own cost positions, contractual obligations, and other strategic initiatives that may impact its approach to each local market.

Step 2 focuses on creating a custom Supply Optimization tool that utilizes sophisticated modeling techniques – akin to simultaneous linear programs – and software able to link the enormous number of potential decisions with the market intelligence collected in the first step. It must simultaneously “solve” each market by correctly predicting each competitor's

actions to determine the optimal course of action. It does this by determining the most rational (i.e., profit-maximizing) course of action, then plays it through the action/reaction between a company and its competitors in each market. This action/reaction is played out until there are no more “moves” available where profitability can be increased.

Steps 3 and 4 involve running the “what if” scenarios and building consensus among management that the right course has been identified. Ideally, this involves debate around the recommendations to uncover and fully understand the key drivers of each recommendation. When done correctly, management will have confidence in the actions to be taken and the rationale for each, thus setting the stage for Step 5: implementing the recommendations.

## Conclusion

Especially in disruptive economic times, companies should not abandon the traditional goals of low-cost supply and market-based pricing. Rather, we encourage companies to utilize this complementary Supply Optimization tool to unlock optimal decisions from a more holistic perspective. Doing so will have a profound impact on short-term and long-term profitability, resource allocation decisions, and competitive position. Take action now – in the face of unprecedented market conditions – to survive the storm by capitalizing on the market volatility and the potential shortsighted nature of your competitors' decisions.

**L.E.K. Consulting is a global management consulting firm that uses deep industry expertise and analytical rigor to help clients solve their most critical business problems. Founded more than 25 years ago, L.E.K. employs more than 900 professionals in 20 offices across Europe, the Americas and Asia-Pacific. L.E.K. advises and supports global companies that are leaders in their industries – including the largest private and public sector organizations, private equity firms and emerging entrepreneurial businesses. L.E.K. helps business leaders consistently make better decisions, deliver improved business performance and create greater shareholder returns. For more information, go to [www.lek.com](http://www.lek.com).**

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