

Technology is not enough

In cleantech due diligence,
operations are a crucial (and
often overlooked) element

*PwC's PRTM
Management Consulting*

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Cleantech companies have become a favored target for strategic buyers, private equity players, and venture capital firms, as the recent flurry of mergers and acquisitions (M&A) and investment activity demonstrates. All too often, however, suitors conducting due diligence focus on the company's technology and market strategies, while overlooking its operational capabilities.

Cleantech companies are particularly susceptible to scalability issues because they often begin as niche R&D firms, with a relatively unstructured research and development (R&D) culture and executives who are technically astute but have little operational or manufacturing experience. The shift from developing pilot technology to high-volume manufacturing, therefore, often brings with it a host of vulnerabilities—among them, supply chain problems and substandard product quality—which can doom a firm and cause significant liabilities for new owners or investors.

To succeed in the **cleantech market**, potential acquirers and investors should deploy a comprehensive due diligence process that includes not only market and technical aspects, but also a deep assessment of operational capabilities. The due diligence model should cover three key elements:

New product development

Cleantech companies must have a disciplined approach for translating customer needs into **new products** with standard designs that optimize functionality and quality. This requires a holistic design process incorporating feedback from manufacturing engineers and service components of the company. In addition, the process for new product development should include clear gates for review.

Manufacturing and quality

Many cleantech components, particularly in the solar industry, are designed for life cycles of 20 to 25 years. Accordingly, products must go through comprehensive qualification procedures, including highly accelerated lifetesting (HALT), to ensure their safety and reliability over that extended period. Many startups lack the engineering resources needed to establish a framework for this process. Successful companies understand the importance of such a framework and implement dedicated teams to test the reliability of specific parts and systems.

Supply chain

Operational excellence in manufacturing requires a coherent supply chain that incorporates planning, sourcing, execution, delivery, and returns. Companies must properly assess the risks of disruptions in continuity and substantial swings in the price of major commodity categories. They should also understand the optimal strategies for managing inventory, materials, and working capital. Finally, the organization's **supply chain strategy** should be assessed, including the selection, qualification, risk profile, and readiness of its supply base, along with the supply chain strategy of any contract manufacturing partners.

A producer of thin film solar modules is good example of manufacturing excellence. The company is relentlessly focused on execution. Those efforts have generated a clear and compelling cost advantage: the company's module manufacturing cost is roughly \$0.75 per watt, while other thin-film solar companies are currently at \$1 or more per watt. This cost advantage has made the company the gold standard in the cleantech industry—a company that understands the importance of executing current solutions, rather than innovating new ones.

As the cleantech industry braces for rapid growth—and a corresponding increase in M&A activity—we believe that companies focused on engineering and R&D will ultimately lose out to those focused on manufacturing and operations. Technology is not enough. Cleantech companies must understand that success in the long term depends less on technical expertise than on how that expertise is executed. For potential acquirers and investors, the due diligence process should reflect these priorities.

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