



LIFE BEYOND MIT

A five-time MIT alumnus reflects on his transition from academia to industry — and what it’s like to leave a tenured EECS professorship to become a high-tech entrepreneur.

Martin F. Schlecht,
former EECS professor,
at SynQor headquarters

By Kathryn O’Neill | Connector Contributor

As CEO of SynQor, Martin F. Schlecht oversees one of the world’s leading suppliers of power electronic products. Yet the MIT alumnus might easily have spent his entire career in MIT’s Department of Electrical Engineering and Computer Science (EECS).

Schlecht earned five degrees (SBEE, SBME, SMEE, EE, and ScD) from the Institute and then spent 15 years on the EECS faculty. What prompted the full professor to leave and start a company? “I wanted to do something new,” Schlecht says. “Having spent all my time in academia — I was 43 years old — I decided I wanted to learn something about business.”

Schlecht also saw an opportunity: a market need for more efficient DC-to-DC converters to meet the rising demand for logic circuits that operated on lower and lower voltages, a key component in telecom and datacom equipment, as well as elsewhere.

Schlecht envisioned a way to significantly improve the efficiency of such converters using synchronous rectification — a process that converts AC to DC in synchrony with changes in the polarity of the power circuit waveforms — in a particular manner. (While DC-to-DC converters begin with DC input, they use power switches to provide AC waveforms to the isolation transformer. For that reason, the secondary-side AC waveforms need to be rectified or converted back to DC to power such components as logic circuits.)

In the 1990s, most DC-to-DC converters were only about 80 percent efficient; they lost the rest of the energy to heat. By solving some of the technical challenges involved in building DC-to-DC converters using synchronous rectifiers, SynQor was able to produce converters that were 90 percent efficient and therefore didn’t need heat sinks or the special construction techniques that provided thermal connection from the power circuit components to those heat sinks. As a result, the company’s converters were smaller, lighter, and easier to fabricate while also providing a higher level of quality and reliability than what was then standard in the industry, Schlecht explains.

“Synchronous rectification was a known idea in a general sense, but it wasn’t adopted in the industry because it was very complex to implement, particularly in isolated converters,” Schlecht says. “What I was able to see — through my connections at MIT — was that there was a fast change in the need for higher efficiency as the voltages needed to power logic circuitry quickly dropped from the 5-volt standard to values below 1 volt.” At that time, he adds, he began to focus on developing power circuit topologies and architectures that were best suited to address the complexities of implementing synchronous rectifiers.

“During Marty’s work with me in his doctoral program, our research group was working at the cutting edge of high-frequency power electronics technology,” recalls John Kassakian, professor of electrical engineering in EECS.

"It was Marty's creativity and engineering skill that was largely responsible for our achieving what, at the time, was a record power-conversion density. I take pride in his having leveraged that work into a very successful, U.S.-based, power supply company."

Schlecht launched SynQor in 1998 to provide his novel DC-DC converter technology, and he has since guided the company's continual growth and diversification. Today, SynQor supplies thousands of products — not only DC-DC converters but also AC-DC power supplies, inverters, uninterruptible power supplies, and filters — to industries ranging from telecom to aerospace and from health care to the military.

Fortunately for Schlecht, MIT made it easy for him to take the first step toward entrepreneurship: he received a two-year leave of absence to start his company. "That was a safety net," Schlecht says. "The real challenge was when the two years were up. Leaving MIT then was a tough decision."

However, the telecom industry was booming in the late '90s, and SynQor had a technological edge. So at first the risk seemed quite manageable, Schlecht says: "Everyone thought the sky was the limit."

The fledgling company was put to the test just about six months after Schlecht left MIT, when the telecom bubble burst. The industry's collapse was "some 10 times bigger than the

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better-known dot-com crash" of the early 2000s, according to *The Economist*. "The next five to six years were tough for everybody in our industry," Schlecht recalls. Big companies struggled, and many startups went out of business.

Schlecht met these early challenges with the same problem-solving approach he'd grown familiar with at MIT: "I was able to bring my MIT education and cultural philosophy to bear to analyze the situation, and eventually help us grow."

Recognizing that technological advantages don't last forever — "Your competitors will eventually discover what you're doing, and all existing players will have comparable products" — Schlecht credits SynQor's survival in part to its business strategy and problem-solving culture.

These factors led SynQor to what Schlecht views as the company's key competitive advantage today: lean, responsive

manufacturing. "After the bubble burst, we placed a lot of emphasis on offering not just technology but high quality, reliability, and manufacturing responsiveness," he says. "I am very proud of our technology. But in retrospect, I'm more proud of what we've accomplished with our manufacturing capability."

All the company's products (more than 1 million converters per year) are manufactured at SynQor's headquarters in Boxborough, Mass., about 30 miles northwest of MIT. That enables the business to respond nimbly to demand and to provide a significant measure of quality control. "By manufacturing here instead of letting someone do it halfway around the world, we are able to see issues that cause problems," Schlecht says. "We are able to make continual improvements, and we have."

Manufacturing in the United States also gives SynQor a competitive edge, he says: "It's a wonderful example of how an American company can compete with an offshore manufacturer. It's not by just trying to reduce costs. It's by also providing features that make it worthwhile for the customer to pay a little extra money."

What advice does Schlecht have for others who would like to start a company?

"Be able to recognize a problem and be able to solve a problem. Those are important skills to learn," he says. "Be flexible and willing to change your mind in light of new facts. Know your priorities and focus on them." But most important of all, he adds: "Be competitive. You must be driven to win."

For Schlecht, founding a company wasn't just about the startup phase. It was about growing a sustainable business and making the field of power electronics more efficient. "To younger people looking for a way to save the world, I would say that sometimes the answer is very simple: just develop a technology that's more efficient than what's out there and move that technology into the marketplace sooner than it would otherwise have gotten there. The energy you save the world by this effort can be substantial," Schlecht says.

Almost 20 years have passed since the SynQor's launch, and Schlecht's time at MIT is long behind him. However, he has had the chance to watch his daughter go through the Institute — Lisa Schlecht is a 2010 mechanical engineering graduate who also received two master's degrees from MIT, in mechanical engineering and in technology and policy. (Schlecht's son, Derek, received a bachelor's degree in mechanical engineering from Syracuse University in 2013 and is pursuing a master's degree at North Carolina State University.) At SynQor, Schlecht has begun to focus on ensuring that the business will continue to thrive well past his own tenure at the helm.

Looking back now, Schlecht said he considers it a privilege to have had two such interesting careers. "I really enjoyed my time at MIT. I enjoyed the things I learned. I enjoyed all the people I met, whether students, faculty, or staff," he says. "I'm very glad to have had completely different professional life experiences. It's been fun on both sides." 