

# PHOTONICS BLOG SERIES - INSTALLMENT 1

## Consolidation Heats Up the Photonics Industry

By: Brent Costello



For the past five years at least we have watched the rapid consolidation of the photonics industry. Yet we believe the consolidation of this huge, fast-growing, and highly fragmented international industry is really still in its early stages. There remain thousands of companies around the world ripe for sale or mergers with other companies that we believe can keep the M&A momentum churning for many years to come.

In this report, we'll go over the reasons for this, but before we begin, let's try to answer the question: What exactly is "phototonics?"

### **What is photonics?**

According to SPIE, the international society for optics and photonics, photonics is "the science and application of light; it is the technology of generating, controlling, and detecting light. Thousands of entities use optics and photonics technology every day."

Indeed, "photonics components are everywhere," McKinsey notes in a January industry report. "They enable military night vision systems and the smartphones that consumers use; the streetlights in many major cities have photonics components, as do the photovoltaic cells in the cities' solar-heated buildings; state-of-the-art manufacturing plants use photonic lasers for marking and cutting; and automobile manufacturers take advantage of photonics in their advanced driver assistance systems (ADAS)."

Industries that utilize photonics components range from smartphones and televisions to 3D printing to defense to healthcare and life sciences. Core components include LED and laser chips, optical glass, detectors and image sensors, lenses, prisms and optical fibers.

According to McKinsey, the global photonics market today totals about \$1.4 trillion, but is expected to grow to nearly \$2 trillion by 2025. It attributes that phenomenal growth to "several megatrends, including increased automation and the explosion in digitalization and cloud computing. With the market headed for a sustained period of double-digit growth, the next few years will be pivotal for large component players."

# Consolidation Heats Up the Photonics Industry

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## A fragmented industry

While the industry is large and has a broad international footprint, it remains highly fragmented, despite the large amount of consolidation over the past several years. According to [SPIE's most recent Optics & Photonics Industry Report \(2022 Fall Update\)](#), there are 4,842 companies in the core photonics market. That's up 78% just in the past 10 years.

The majority of these firms are considered to be small and medium size entities (SMEs), meaning those with revenues of less than \$50 million and fewer than 250 employees. Moreover, more than 70% of those have annual revenues of less than \$10 million, generating in aggregate less than 3% of global photonics revenue. Needless to say, the largest companies generate most of the revenue; just 2% of all photonics companies generate almost three quarters of total industry revenue, SPIE says. Among those are household names such as Corning, Nikon and Carl Zeiss.

SMEs in the photonics industry face a number of problems including: 1) supply chain pressures, 2) a shortage of qualified workers and 3) insufficient capital. In the next installment of this report, we'll discuss how these problems lead to consolidation of companies in the photonics industry.

## PHOTONICS BLOG SERIES - INSTALLMENT 2

### Consolidation Drivers in the Photonics Industry

#### Supply chain pressures

As we all know, global supply chains in just about every industry were severely impacted by the COVID pandemic. Our first installment on this topic can be read [here](#). We continue discussing consolidation drivers in the photonics industry in this second installment. Reliance on foreign supply sources and the prevalence of just-in-time supply chains had significant negative impacts on photonics companies. Although those COVID-related supply chain issues have abated somewhat, other supply chain issues are likely to put SMEs at a disadvantage to the larger photonics companies, which have more resources at their disposal to deal with these bottlenecks.

In Europe, for example, where about a quarter of photonics companies are based, the war in Ukraine has exposed and exacerbated the "overreliance on overseas supply chains," according to a recent report from Photonics21. "More than 80% of European photonics companies say they are experiencing major supply chain issues," Optica reported. "The vulnerability of the European photonics supply chain may lead to serious knock-on impacts on key European industrial sectors," including healthcare, manufacturing, defense and security, telecommunications and automotive.

Larger photonics companies are better able to overcome these supply chain issues and find new sources of necessary materials.

# Consolidation Drivers in the Photonics Industry

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## Worker shortage

An even more serious problem may be the shortage of workers. After all, “photonics won’t work without a workforce,” as a recent issue of Photonics Spectra put it.

“The biggest challenge is about people,” Thilo von Freyhold, a vice president at Jenoptik, told Electro Optics, an industry information website. “We need more people working in photonics, in R&D, manufacturing and packaging of photonics devices.”

“The [labor] shortage is impacting our growth and innovation,” Alexis Vogt, professor of optical systems technology at Monroe Community College (MCC) in Rochester, New York, told SPIE. “Without enough technicians, we are stifling productivity and limiting the degree to which the industry can support the research that our optics engineers are being counted on to conduct.”

Larger companies have the advantage in attracting more workers. They usually can pay higher salaries and afford more generous benefits. Many are also actively implementing various recruitment and training tactics. For example, one industry leader has a program that will pay workers' tuition at Vogt's program at Monroe Community College. Corning has a technician pipeline program. Edmund Optics, a leading global optical solutions provider since 1942, has an educational outreach program called Edmund Scientific that engages students at a very early age. Programs like these are often beyond the reach of smaller photonics companies.

AmeriCOM, the American Center for Optics Manufacturing, wants to “increase the capacity and quality of skilled optics technicians by a factor of 16 — from less than 50 per year to more than 800 per year by 2025,” according to its website.

## Insufficient capital

Another big problem is money. Many small photonics companies are not sufficiently capitalized to meet the challenging manufacturing environment that lies ahead, leading to a world of “haves” and “have nots.”

One photonics industry executive aptly described the situation as follow:

“Despite the high value and potential return on investment [state of the art optical] technologies can bring, they still require a significant capital outlay. Companies eager to begin incorporating these technologies into their manufacturing process and gain new expertise are faced with a chicken-and-egg scenario: While you need the work to warrant the machine purchase, you also need the machine and know-how to win the work. Thus, the industry has been divided into those who have these types of technologies in their toolbox and have the means to expand the breadth and depth of their offerings, and those who do not and thus cannot compete as aggressively for market share.”

Larger, better capitalized companies have the resources needed to meet this challenge.

In the third and final installment of this report, we'll look at the risks small photonics companies run by remaining in business versus selling to an investor or larger strategic buyer.

## PHOTONICS BLOG SERIES - INSTALLMENT 3

# What is the Risk to Companies that get Left Behind in the Photonics Industry Consolidation?

In the first two parts of this series we explored the reasons behind the rapid consolidation of the photonics industry. In this final segment we examine the risks photonics companies run by not seriously considering exiting now when buyers are able and willing to pay premium prices and valuations.

Undercapitalized firms in a consolidating industry become progressively uncompetitive and could eventually be excluded altogether from industry consolidation or be forced to sell at less than desirable prices.

As M&A advisors, we see literally billions of dollars of hard-earned owner equity at significant risk of vaporizing if owners don't consider all of their options and devise a plan when they are faced with a consolidating industry scenario.

Owners should ask themselves this question: Is there a realistic organic growth plan that will ensure my place in the competitive landscape going forward? If not, then it is time for some deep and honest reflection. Even if you are successful in growing the top line, but your margins drop to keep things spinning, you are losing substantial equity over time – perhaps millions – and with it the financial wherewithal to manage your way out of an increasingly difficult situation.

The good news is that well-funded buyers stand ready to invest in photonics companies. Strategic buyers and private equity funds have ample capital available to them and have accelerated their acquisitions of photonics companies at historically high valuations. Frequently, acquisitions offer a better overall equity outcome than the “grow and sell later” strategy.

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