# OIDA Photonics Market Report
Free Highlights Version

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2013 Market wrap-up for selected U.S. companies. The figure shows the revenues of leading companies supplying optoelectronics components and headquartered in North America. The sum of the revenues is nearly $22 billion, but includes some non-photonics and non-component revenues. These companies, while relatively few compared to the hundreds of companies overall, nonetheless represent nearly 90% of North American revenues.

It can be seen that there is a general upward trend in revenues, but with some seasonal behavior: each year starts off with a slower quarter and builds momentum through the year, although 2013 was an exception, in part due to the performance of First Solar.
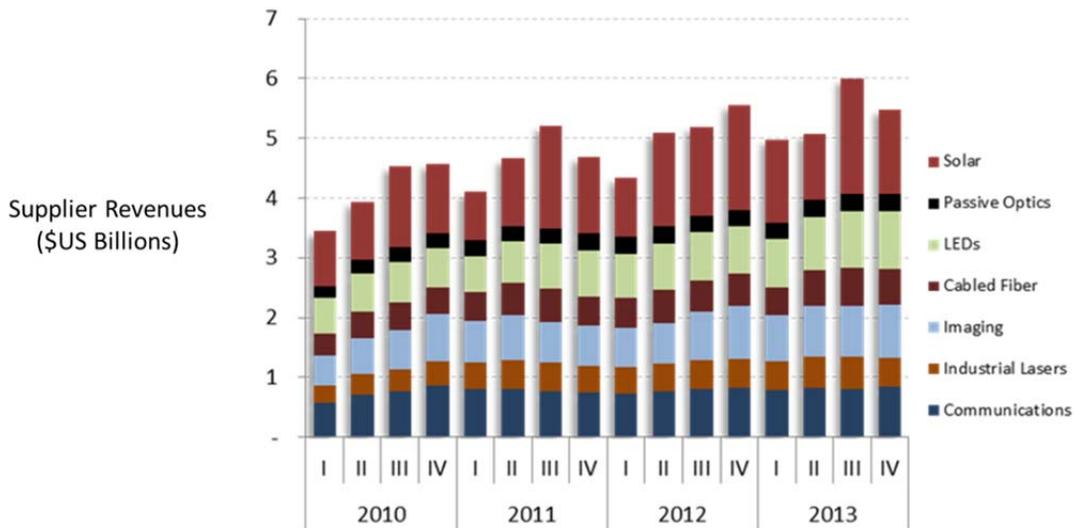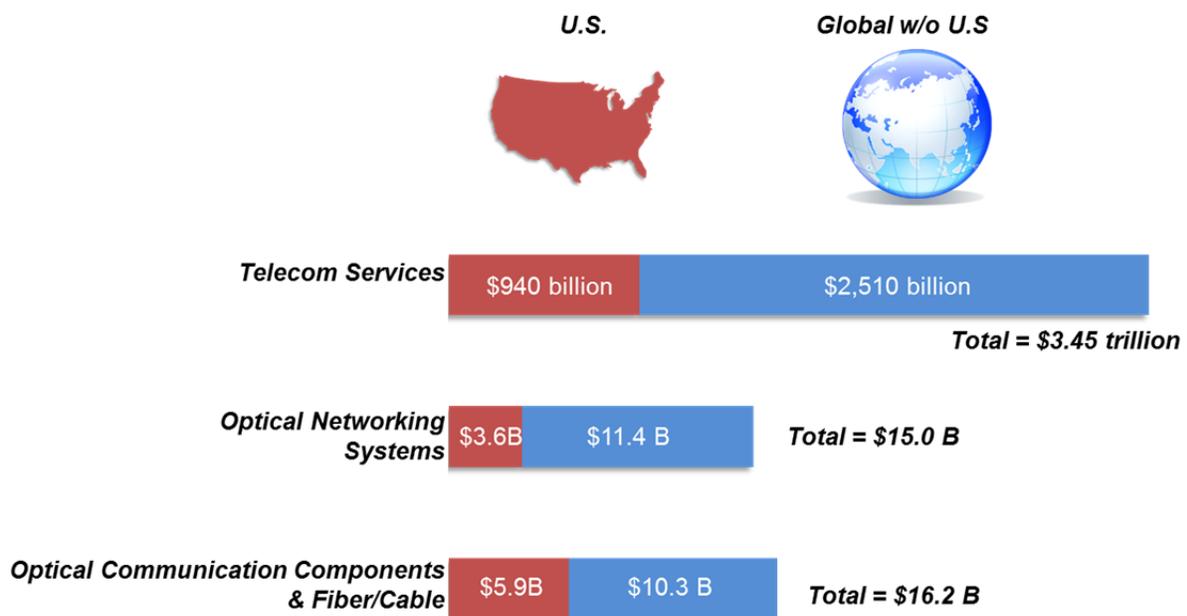

Source: OIDA (2014)

Among these selected companies, excluding solar, 2013 ended about 9% over 2012. The communications companies ended the year up 4.3%.

Looking ahead, we should expect moderate but healthy global growth in photonics, about 5-10%, as well as for U.S. suppliers. Many economists anticipate that 2015 may be the year that the global economy is fully out of the recession, with the major regional economies feeding each other's growth. Fortunately, U.S. optoelectronics suppliers are faring much better than the economy as a whole.

The global optical communications ecosystem. The global photonics ecosystem is too large to characterize as a monolithic industry or market. Instead, we look at vertical markets. The figure below highlights features of the supply chain for optical communications. At the top is shown the market for telecom services at $3.5 trillion annually. That segment is only the most direct use of the technology, but not the only one; enterprise networking also depends on the technology, not to mention the large part of our present-day information economy. Also shown are the markets for optical networking equipment and for the components, including optical fiber and cable (the bars are not shown to scale). The U.S. share is shown in each case.

U.S.   **Global w/o U.S**

| Telecom Services | $940 billion | $2,510 billion |

Total = $3.45 trillion

| Optical Networking Systems | $3.6B | $11.4 B | Total = $15.0 B |

| Optical Communication Components & Fiber/Cable | $5.9B | $10.3 B | Total = $16.2 B |

Sources: TIA's 2013 *ICT Market Review and Forecast,* Ovum, CRU Group. All values are for 2012.

It is important to note that countries have multiple interests, particularly to assure the strength of their own telecom infrastructure, as well as to nurture their domestic technology suppliers. Complicating this is the global nature of this industry today: U.S. end-users buy equipment from both domestic and foreign-based vendors, and U.S.-based equipment vendors sell to a global market of customers.

The data center hardware market. Much of the attention in optical communications is currently in data centers. The chart below is selected from a previous issue of the OIDA Market Update, featuring OIDA's Data Center Workshop.

Source: Karen Liu (Ovum), at the OIDA workshop Future Needs of Scale-Out Data Centers (March 2013).
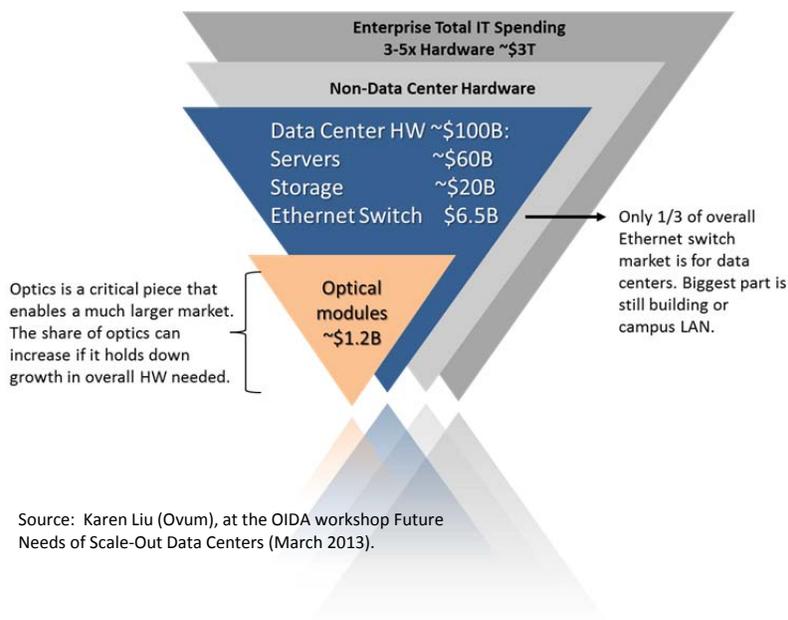
Ovum made this estimate of the relevant data center market, itself a part of the larger IT ecosystem. Data center hardware may account for about $100 billion in annual sales. Of that, about $60 billion is for servers, $20 billion is for storage, and $6.5 billion is for Ethernet switches.

Of this, about $1.2 billion of the optical module sales are for data centers, or about 1.2% of the total. Customers are seeking to improve the performance of the optics while keeping prices and power consumption low, so the share of the cost of the optics could increase if it brought bigger improvements in the overall data center cost.

However, most data centers have conventional designs, using optical transceivers with standard form factors. One estimate by Emerson Network Power places the number of data centers worldwide over 500,000, with an average area of about 560 square feet. Whatever the number, only a few very large data centers use advanced "scale-out" designs and seek non-standard optical products. The March workshop and report investigated the market opportunity for products addressing a new niche, using more relaxed specifications than conventional products.

The question is whether it is favorable for the industry to pursue new products, particularly if the major customers (such as Google and Facebook) don't agree themselves on the specifications, forcing suppliers to modify products for each of them.

The passive optics market. OIDA recently updated its estimates of the passive optics market. This includes the lenses, mirrors, prisms, crystals, fibers, wafers, and so forth that go into optical systems. We don't count window glass, but we include almost everything else.
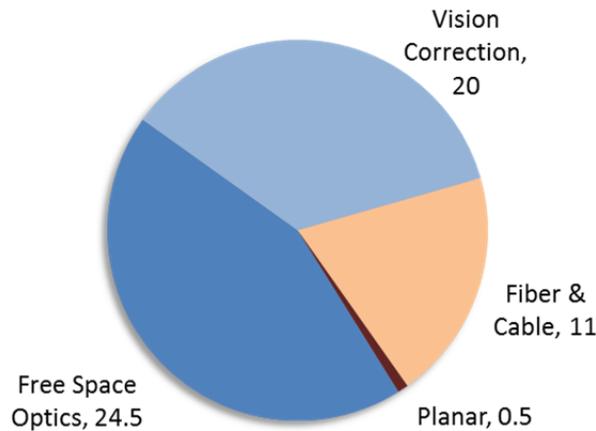
The total market is about $56 billion. Free space optics is the largest and most familiar form of passive optics products, amounting to about $24.5 billion in annual sales. Much of this is for lens and camera modules that go into several billion consumer products. Vision correction includes eyeglass lenses, contact lenses, and intraocular lenses. That segment has some new attention with the appearance of Google Glass and several other displays using heads-up displays and wearable computing. Optical fiber, cabled fiber, and associated technology count for about $11 billion in sales. Planar optics is used for such things as arrayed waveguide gratings, wafer-scale optics for image sensors, and photonic integrated circuits. The planar manufacturing platform is seen as a low-cost solution for many applications, but has only a small share of the optics market today.

Look for these upcoming OIDA events and presentations:

Early Dec	Orlando	Florida Photonics Cluster meeting
3-4 Nov	Washington DC	21st OIDA Annual Forum
TBD	TBD	Photonic Integration Workshop
12-13 June	San Jose	100G Roadmapping Workshop (at CLEO)
27 May	Montreal	Photons Canada meeting (at Photonics
Early April	TBD	MI-Light meeting
12 March	San Francisco	OFC Exhibitor Breakfast presentation
10 March	San Francisco	Roadmapping review (at OFC)
9 March	San Francisco	Photonics in SDN Workshop (at OFC)