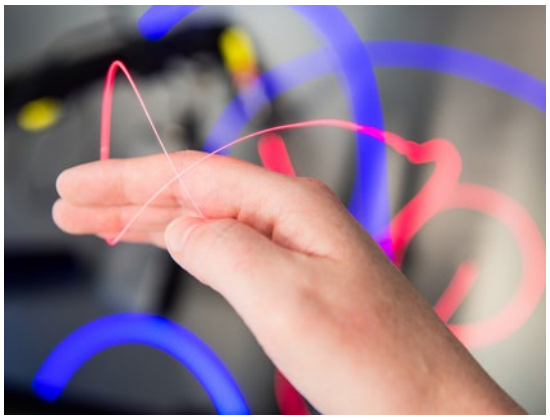
## Markets & Countries

# BRIGHT FUTURE FOR PHOTONICS



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**Researching new laser technologies or developing optical networks - on average, photonics companies are investing 9 percent of their turnover into research and development, with some photonics sectors even investing up to 15 percent. As a result, lighting technologies offer great potential for growth and innovation, as shown by two new studies.**

By Annika Löffler

Photonics is regarded as a key enabling technology in today's world. As with all the technologies that make, use or transform light, it takes advantage of the unique properties of light. In many industries and fields of application, it provides decisive impulses and solutions for the current and future challenges of the economy, science and society.

In Germany and Europe, it has become one of the most important future industries and an indispensable driver for innovation and growth, as demonstrated by two new complementary market studies by the VDMA and the European technology platform Photonics21. The studies examined the current position of the German and European photonics industry and also analyzed the future perspectives for Germany by 2020. The results were presented for the first time at the end of June at the Laser World of Photonics trade fair in Munich.

### The German photonics market is growing

In Germany, over 124,000 employees work for companies in the photonics industries; if suppliers are included this figure rises to 142,000. They manufacture, for example, laser systems, sensors, light sources, optical components such as glasses or prisms, image processing systems, solar cells and measuring devices for industry and medicine. The diverse photonics products and sub-divisions show an enormous range across 10 industries.

In 2016, optical technology companies generated a total of 31 billion euro. The proportion of photonics products for industrial equipment alone is worth mentioning: more than 11 billion euro are attributable to the areas of production technology (laser material processing, lithography) and image processing and measurement technology, which in addition to medical technology and life science are among the strongest sub-sectors of photonics in Germany. With annual growth rates of 6 to 7 percent since 2011, these three core areas have grown more than twice as fast as the gross domestic product in Germany.

This positive development is driven primarily by the increasing automation and flexibility of industrial production, but also by the implementation of digitization concepts as part of Industrie 4.0, quality improvement and miniaturization of products. In the field of medical technology and health, an aging society and the growing prosperity, in particular, provide for increased demand for medical diagnostics and therapy systems.

### High R&D rate underpins innovation potential

The fact that photonics has valuable potential for innovation and growth is reflected in the high research and development (R&D) rate that has been sustained since 2011. The authors of the studies report that German and European companies spend on average 9 to 10 percent of their total turnover on research and development (R&D).

This is well above the average of other research-intensive industries - such as mechanical engineering with just under 4 percent or the manufacturing sector with less than 5 percent.

According to the VDMA study, in some sub-sectors the R&D rate is even more impressive, such as in the division of communication technology with 15 percent. In Europe, the photonics industry invested 10 billion euro in 2015 alone, for direct investments in addition to research and development. Photonics21 reports that the volume of investment in new systems reached 4.7 percent (capex/sales).

The export quota of 70 percent on average is also well above the value for the manufacturing sector with 48 percent and demonstrates the international competitiveness of the photonics industries. Even the export rate has increased slightly since 2011, driven in particular by increased sales in Asia in the field of image processing and measurement technology.

### Positive outlook for the future by 2020

And how does the future look? The VDMA study predicts excellent prospects for development. It is expected that by 2020, German photonic production will increase by an average of 6 percent per year to a total of 39 billion euro.

Particularly strong growth is expected in production technology, with an average of 8.8 percent annually. Above-average growth rates are also expected by 2020 for the important core areas of image processing and measurement technology, as well as medical technology and life science.

### Good job prospects in photonics

The positive prospects for the future can also be transferred to employment: According to the VDMA study, an additional 13,500 employees will be working in the production of photonics products in Germany by 2020; that is 137,500 employees in total. If the supplier sector is also considered, which accounts for a comparatively high proportion in the fields of production technology, image processing and measurement technology as well as medical technology and life science, 158,000 employees will be employed in photonics sectors.

According to Photonics21, the number of employees in the European photonics industry rose to 301,000 employees at the end of 2015 and is set to increase to a total of 313,000 employees by 2020.

### China is becoming the world market leader

The world market for photonics has also had strong growth in recent years. From around 350 billion euro in 2011, the world market has grown by over 6 percent annually to a total of 447 billion euro in 2015, as reported by Photonics21. This means that photonics has also grown globally more than twice as fast as the global gross domestic product.

However, the shares of the world market have shifted considerably in recent years: the long-standing world market leader Japan was replaced by China in 2015, with a production share of 26.6 percent. In 2011, both countries were on a par with 21.3 percent.

With a market share of 15.5 percent and a production volume of 69.7 billion euro, Europe has risen to become the second-largest photonics producer and moved just ahead of Japan (15.4 percent). The strong core areas of production technology (laser material processing, lithography), image processing and measurement technology as well as medical technology and life science, in which both Europe and Germany have strong global market shares, contributed to this development. In production technology, this figure is 50 percent for Europe (about 30 percent of which from Germany), 35 percent (53 percent of which from Germany) for image processing and measurement technology, and for medical technology and life science, the market share realized in Europe is 28 percent (58 percent of which from Germany).

Within Europe, however, the market share positions have only shifted slightly in the last few years, with Germany still holding the top position with a production share of around 41 percent. Germany is followed by the Netherlands, which have developed positively, in particular through lithography, and then France, Great Britain and Italy. ■

## References

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Download study (PDF)

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## Further Information

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