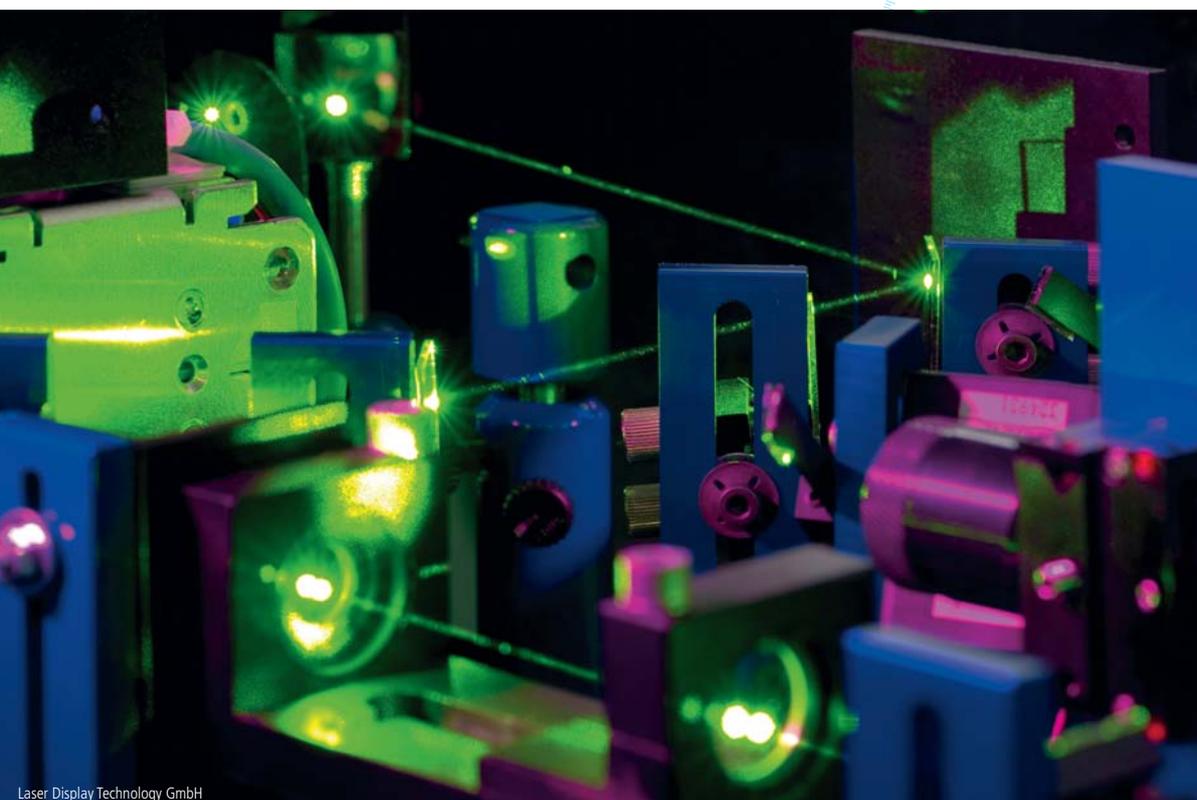


Photonics

SPECTARIS Spotlight
Data and Facts on a Key Technology



The photonics industry in Germany

- Some 1,000 companies with more than 125,000 employees currently generate industry revenue of around €28 billion. The R&D rate is nine per cent.
- In 2013, the industry was able to continue on its path of growth with a slight gain. Forecasts for the upcoming years are mostly positive. Industry revenue of nearly €44 billion is expected for the year 2020.
- International business is of particular importance for the companies: Two-thirds of the revenue are now generated abroad.

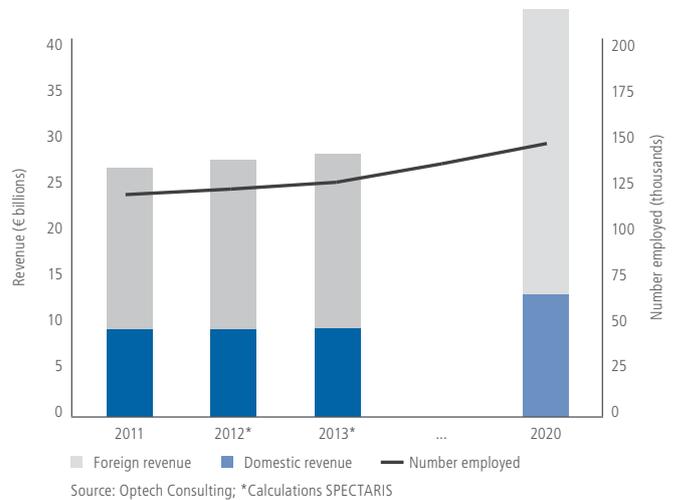
Source: SPECTARIS, Branchenreport Photonik

Photonics top export

- The U.S. and China are the most important non-European consumers of photonics: More than one-quarter of German exports go to these countries.
- In addition to China, the Republic of Korea is gaining in importance as a market.
- Switzerland plays a significant role within Europe both as an importer as well as a manufacturing base.



Development of the German photonics industry

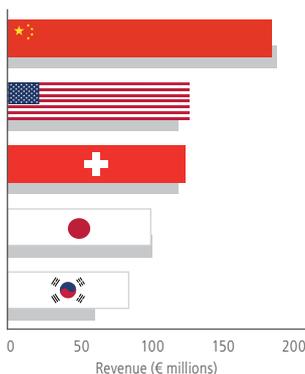


Global market for photonics

- According to forecasts, the global market for photonics is projected to reach €615 billion in 2020. The annual growth rate is around 6.5 per cent.
- Japan and China are among the biggest producers of photonics with market shares of 21 per cent. Experts anticipate that China will expand its global market position.
- The German photonics industry has a global market share of eight per cent and has specialised in a few core segments. Source: Branchenreport Photonik
- The sales trends of 15 international, listed companies in the industry are reflected in the SPECTARIS Photonics World Market Index. Compared to the overall global economy, the photonics industry is growing at a significantly faster rate. Source: SPECTARIS, ifo Institut

TOP 5 countries of destination for German exports

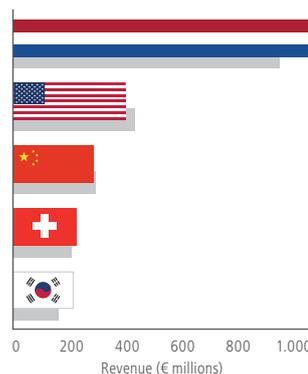
Lasers



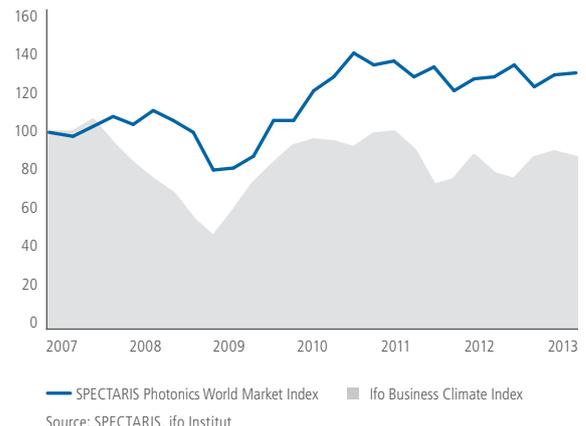
Flags: 2013 ■ 2012

Source: Statistisches Bundesamt, SPECTARIS

Optical components and beam sources



SPECTARIS world market index photonics



Selected growth markets in photonics

OLED growth market

- The market for Organic Light Emitting Diodes (OLEDs) is characterised by phase-like growth. The first phase has been completed which has led to the use of OLEDs in smartphones and other hand-held products and a worldwide revenue with OLED displays of currently more than seven billion euros. Currently, there is a push to introduce the technology with larger displays for tablets and TVs as quickly as possible. This has thus brought about the second phase. Due to the current high prices, only a gradual substitution of classic LED devices is predicted for the upcoming years. According to forecasts, revenue with OLED displays will grow to around €18 billion by 2017. Until the use of OLEDs in other sectors, such as general lighting, becomes widespread, there are still some technical challenges which need to be overcome. Efficiency and cost factors, as well as scaling the illuminated area play a key role.

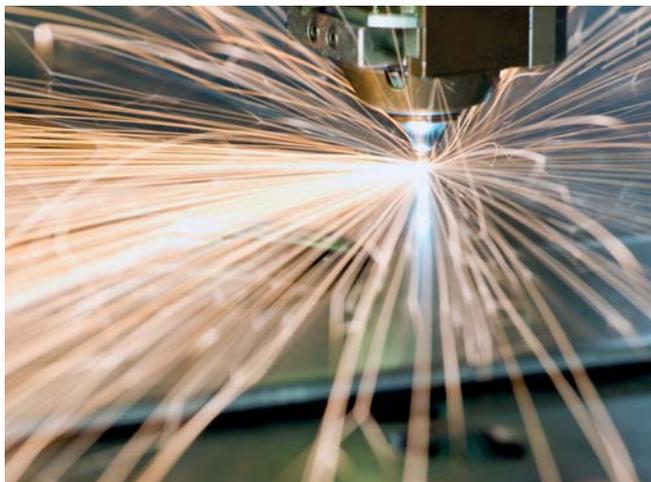
Source: IDTechEx, ElektronikPraxis

- Flexible OLEDs are currently rated as especially promising. In 2014, demand in the display segment is expected to quadruple, thus reaching €73 million. Due to technical challenges which still need to be solved, including in the production process, flexible OLEDs are nevertheless not expected to entirely replace conventional OLEDs in the display segment in the foreseeable future. The exploration of competing technologies is in full swing.

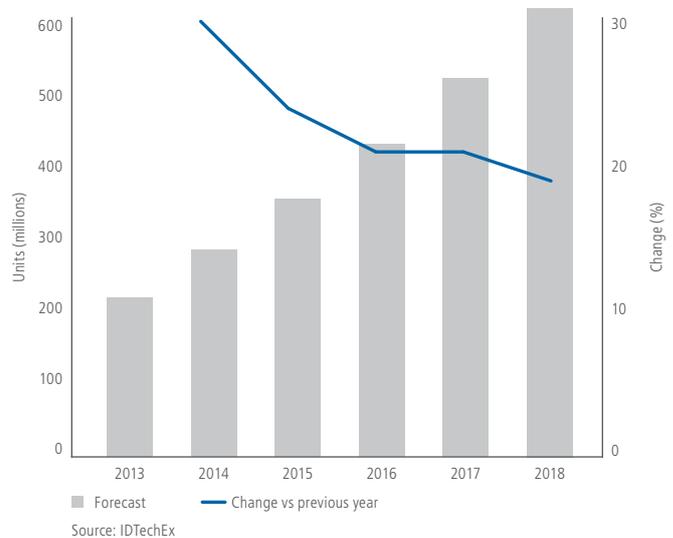
Source: IHS

- Active-matrix OLEDs (AMOLED) are gaining in popularity. Sales figures have been steadily increasing since 2010. In 2013, the sales volume had already surpassed more than 200 million units. With annual growth rates of over 20 per cent, the annual sales volume is expected to reach a level of more than 600 million units by 2018. A key prerequisite is that the AMOLED technology is also able to prevail in other markets beyond high-quality smartphones. Currently, more than half of the sales volume is accounted for by this segment.

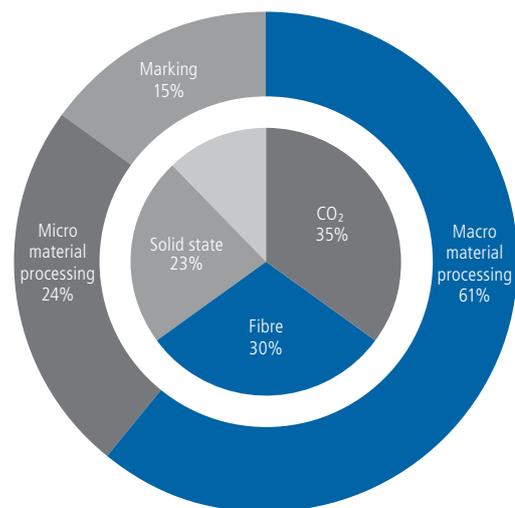
Source: IHS



Forecast for world production by AMOLED



Applications and types of industrial lasers worldwide



Source: Laser Focus World/Strategies Unlimited

Laser growth market

- Worldwide revenue from lasers was €6.5 billion in 2013, roughly two per cent above the previous year's figure. Significant growth by about six per cent to €6.9 billion is expected for 2014. Of this amount, 48 per cent is to be attributed to diode lasers.
- In relation to the application, communication/data storage and material processing/lithography still clearly dominate the segments with shares of 38 and 37 per cent.
- Fibre lasers are gaining market shares in materials processing as well as in other market segments.
- Lasers for medical or cosmetic purposes currently account for 8 per cent of total laser revenue.

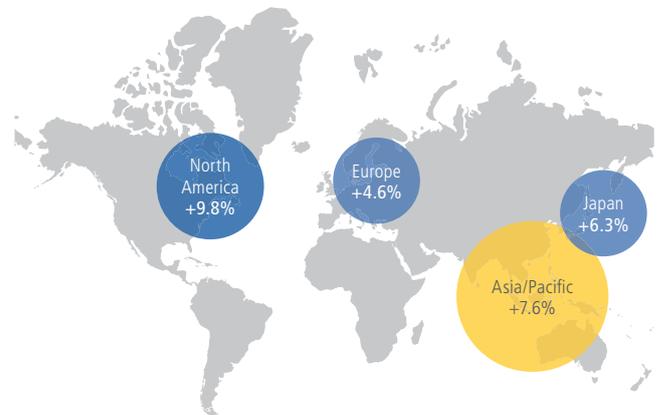
Source: Laser Focus World/Strategies Unlimited

Semiconductor growth market

In 2013, the global market for semiconductors totalled US\$304 billion. This is a surplus of 4.4 per cent compared to 2012. From a geographical perspective, the entire regions, except for Japan recorded growth. Whereas the market fell by 14.5 per cent in Japan, North America grew by over 10 per cent, and Europe grew by just over four per cent. Put into perspective, the global market for semiconductors will experience a growth of 7.6 per cent by 2015. Thus growth in Europe, which will increase by 4.6 per cent, will only be half as much as the figure for North America (increase of 9.8 per cent). The Asia-Pacific region will retain its dominant position with 57 per cent of the global market share.

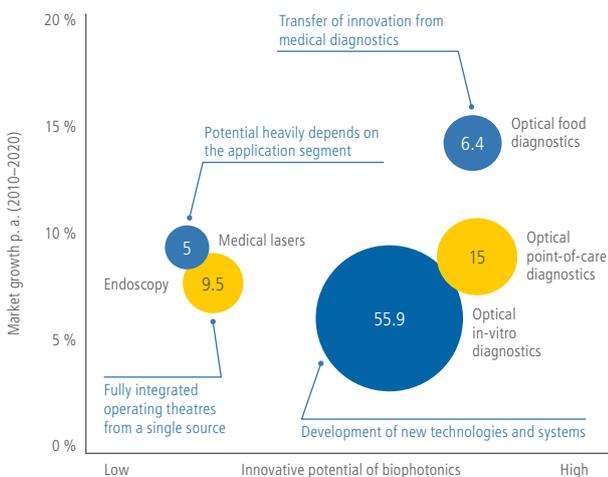
In 2013, the market leader Intel posted a slight decline compared to 2012 (loss of 2.2 per cent). Qualcomm, whose products are primarily used in smart phones and tablets, saw a boost in its sales by about one-third, the memory chip maker Micron by even more than 70 per cent. Source: Gartner

World market for semiconductors
Expected growth rates 2013-2015
Bubble size indicates market share



Source: World Semiconductor Trade Statistics (WSTS)

Potential of the life sciences market segments



Market size 2020 (Overall market in € billions). Source: A.T. Kearney, Biophotonik-Untersuchung 2013

Life sciences growth market

- The global market for medical technology continues to grow. Annual growth rates of six to seven per cent are anticipated for the upcoming years. As a result, global spending is projected to rise to more than €350 billion in 2017. Presently, more than 20 per cent of revenue from products is attributed to minimally invasive surgery and ophthalmology.

Source: Frost & Sullivan

- German medical technology manufacturers also benefit from this growth. Today alone, approximately 1,200 company generated revenue of approximately €23 billion, of which more than two-thirds were generated abroad.

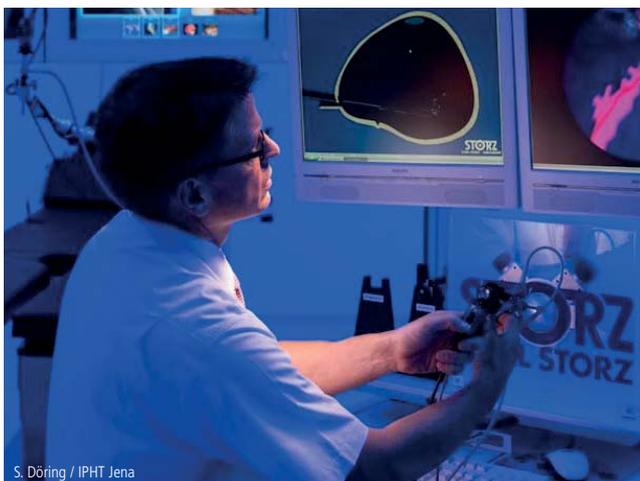
Source: SPECTARIS, Statistisches Bundesamt

- Photonics in the life sciences is increasingly gaining in importance. It is estimated that the global biophotonics market at a CAGR of 6.9 per cent will reach a value of €85.5 billion by 2020. Of which, €49.5 billion is projected to be attributable to the field of medical in-vitro diagnostics. Optical procedures will thus have a market share of approximately 80 per cent. About one-quarter of its revenue is generated with analytical instruments. Medical lasers and endoscopy also represent a high-growth segment. With annual growth rates of eight or nine per cent, these segments will generate an additional €5 billion in revenue in 2020.

Source: A.T. Kearney

- Forecasts until 2016 suggest an annual growth of about six per cent in the worldwide market of analytical instruments for the entire laboratory segment, currently estimated at around €33 billion. A key factor for this growth is the acquisition of systems for conducting molecular analysis by pharmaceutical companies.

Source: Strategic Directions International; Infiniti Research Limited

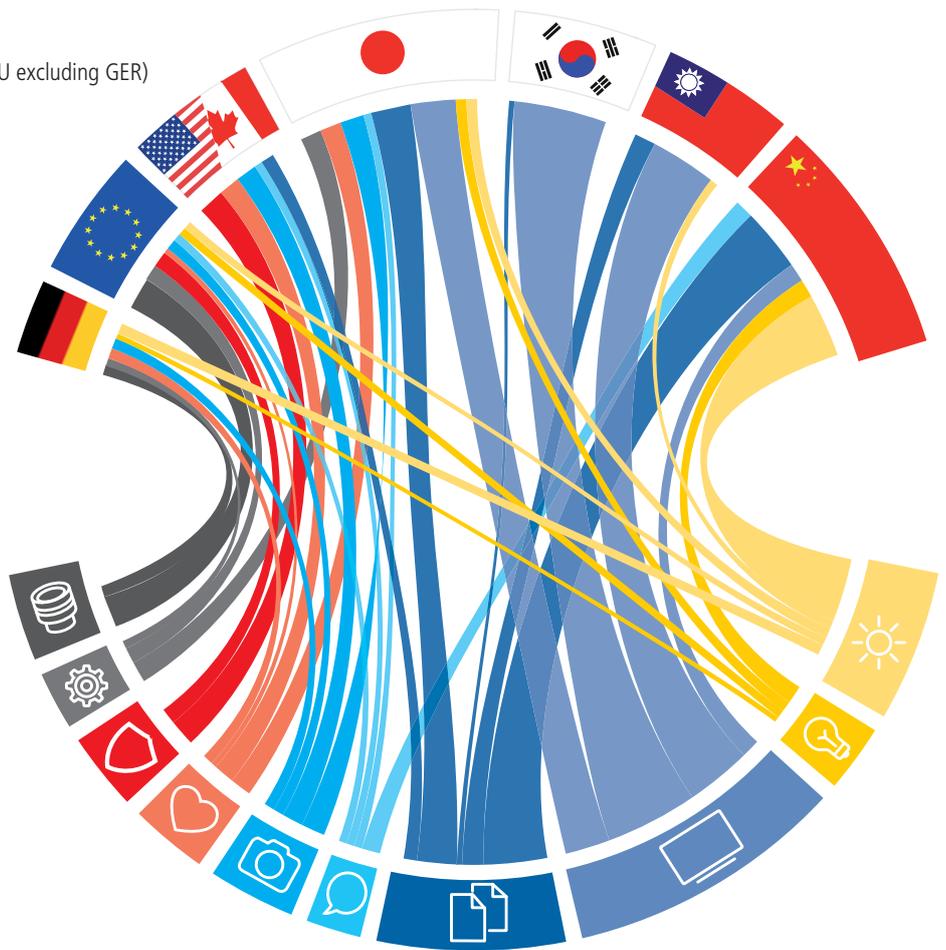


S. Döring / IPHT Jena

Global market shares for photonics – regions and markets

Upper semicircle: Manufacturing regions (EU excluding GER)
 Lower semicircle: Market segments

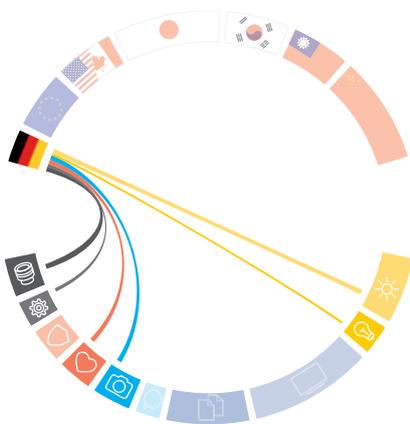
-  Optical Components
-  Production Technology
-  Safety & Defence Technology
-  Medical Technology & Life Sciences
-  Measurement & Imaging Technology
-  Communication Technology
-  Information Technology
-  Displays
-  Light Sources
-  Photovoltaics



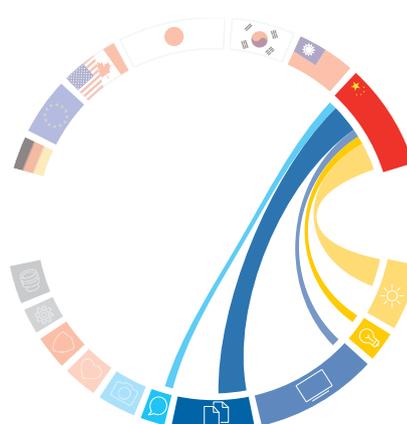
Links indicate the countries' market share
 (only for volumes of goods > €1 bn p.a.)

Source: Photonik Branchenreport 2013

Focus of photonics in Germany: production technology



Focus of photonics in China: information technology and photovoltaics



SPECTARIS – Photonics + Precision Technology industry association

SPECTARIS promotes industry interests across a range of communication channels and is an active liaison body to government agencies, industry, research and the media.

The association’s market reports and industry data create a tangible basis for business decisions. SPECTARIS assists its members in global competition in making business contacts at international trade fairs and business trips. Country-specific seminars provide key information on entering promising international markets. The association aids its members in attracting national and European funding, such as from the EU framework programme Horizon 2020.

SPECTARIS is the voice of the industry even when it comes to queries concerning regulation and legislation of issues related to photonics in Berlin and Brussels. Lastly, SPECTARIS supports its member companies in everyday business by offering numerous industry seminars on marketing, personnel, service, export controls, customs, environmental legislation as well as on additional current topics.

SPECTARIS

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Current topics in Regulatory Affairs



International trade fairs with joint participation by Germany

February	San Francisco	Photonics West
March	Moscow	PHOTONICS. World of Laser and Optics
	Shanghai	Electronica & Productronica China
	Shanghai	LASER World of Photonics China
September	Shenzhen	China Int. Optoelectronics Exposition - CIOE
	Bangalore	LASER World of Photonics India