

INVEST. INNOVATE. INTERNATIONALIZE.

Photonics

Industry Clusters in Eastern Germany

Assessed purely in terms of value add, demand, investment, and technology levels, photonics is Germany's leading sunrise industry.

Photonics in Germany

Germany boasts one of the world's most thriving and innovative photonics sectors. German companies are world leaders in a number of photonics areas including laser technology, lighting, microscopy, and imaging. As the home to market and technology leaders, Germany is a leading light in a global market that is forecast to be worth EUR 615 billion by 2020.

Europe's leading photonics nation (with around 40 percent of continental photonics production), Germany enjoys around eight percent share of the global photonics market. This rises to between 10 and 16 percent in key sectors including production technology, image processing and measurement technology, optical components and systems as well as medical technology and the life sciences. An export quota rate of approximately 68 percent testifies to the international competitiveness of innovative photonics solutions made in Germany.

Annual growth of around eight percent in the country's domestic market in recent years has outstripped GDP and manufacturing growth, with production volume topping the EUR 30 billion mark in 2014. Current market forecasts see Germany's domestic production value rising to around EUR 44 billion by 2020.

Photonics in Eastern Germany – Thuringia

Drawing on more than a century-long optics industry tradition, the new federal state of Thuringia has established itself as one of the world's leading light-technology locations.

Beyond classical optics manufacturers, the region's photonics sector also counts image processing, measuring and sensor technology, laser technology and laser material processing,

optoelectronics device and systems providers and manufacturers among its 175 or so companies and research institutions.

Around ten percent of Germany's photonics companies are located in the free state, bringing research and production together in an industry landscape without peer in Europe. Thuringia's photonics industry is characterized by the predominance of small and medium-sized enterprises (the average number of employees being 80 people). All told, companies big and small helped generate photonics turnover of EUR 2.85 billion in 2014 alone.

The dense concentration of photonics actors within the wider technology region (Jena, Erfurt, Ilmenau, and Gera) acts as a major locational advantage for the sector, and provides a solid platform for knowledge transfer and partnership.

The free state can point to an impressive 66 percent photonics export ratio, further underpinning the strong international character of the sector and its global reach.

Photonics Cluster in Thuringia – Selected Key Data*

Number of Companies	175
Turnover	EUR 2.85 billion
Export Share of Sales	66 %
R&D Investment	10 %
Workforce (industry and research)	ca. 15,200
Workforce (industry)	ca. 13,900
Research Institution Employees	ca. 1,300
Average Company Size	80 employees

* based on 2015 data
Source: OptoNet, GROWTH REPORT PHOTONICS 2015, Economic situation and skills development in the photonics industry in the Free State of Thuringia, 2015.

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OptoNet – Photonics Network Thuringia

OptoNet represents the interests of around 100 members in Thuringia’s photonics cluster, providing a platform for networking, exchange and partnership to all photonics industry players in the state. Research community members include science institutes like the Fraunhofer Institute for Applied Optics and Precision Engineering (IOF) and the Leibniz Institute of Photonic Technology (IPHT) as well as numerous institutions of higher education.

Cluster members benefit from OptoNet’s comprehensive portfolio of technology promotion, communication and partnership, talent development programs, and location marketing activities.

The cluster promotes optical technologies in the region in order to improve competitiveness and optimize cluster visibility – both nationally and internationally. Internationalization is a central pillar of OptoNet activity, with the cluster enjoy-

ing generous Federal Ministry of Education and Research (BMBF) support as part of the ministry’s “Internationalisation of Leading-Edge Clusters, Forward-Looking Projects, and Comparable Networks” measures.

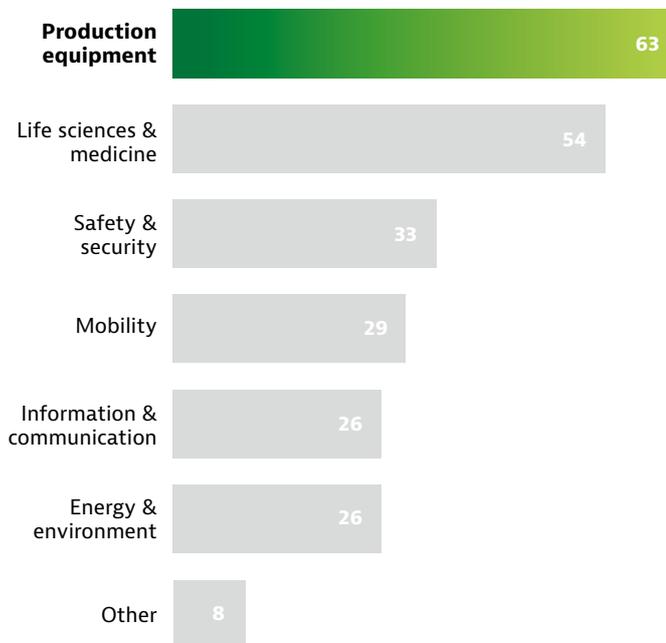
The BMBF-funded gloWIN (“Global Power: Photonics Solutions for Questions for the Future”) project will see OptoNet create a mid- to long-term road map for cluster internationalization activities as well as R&D projects – in the fields of materials, components and systems, optoelectronics, and sensor technology – with partners in North America, Japan and South Korea.

OptoNet is also a partner in the ASPICE (Action to Support Photonic Innovation Clusters in Europe) network project supporting partnership and collaboration between relevant stakeholders across Europe.

 www.optonet-jena.de

Photonics in Thuringia

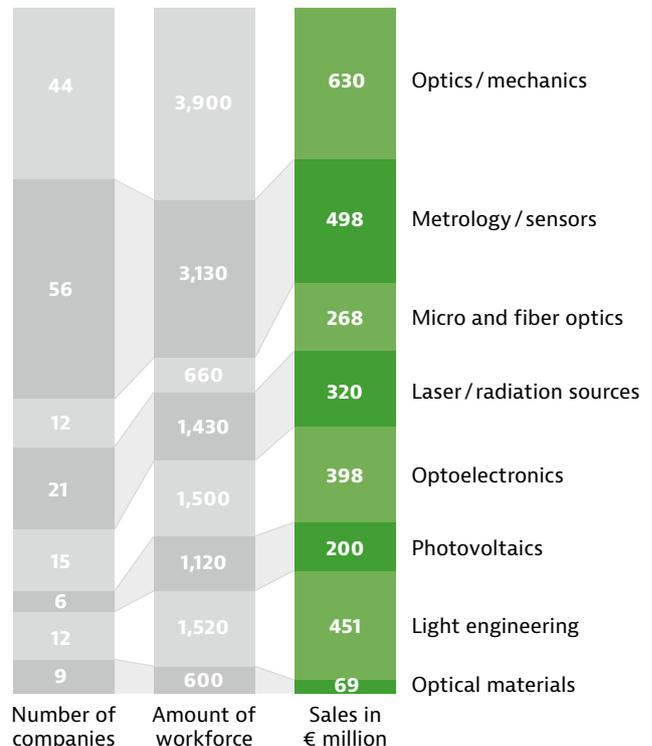
Photonic Products by Area of Application, in percent



Source: OptoNet, GROWTH REPORT PHOTONICS 2015, Economic situation and skills development in the photonics industry in the Free State of Thuringia, 2015

Photonics in Thuringia

Company, Workforce and Sales by Main Product Area*



* including companies who are not members of OptoNet

Source: OptoNet, GROWTH REPORT PHOTONICS 2015, Economic situation and skills development in the photonics industry in the Free State of Thuringia, 2015

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OptoNet – Cluster Voices



Sven Kiontke

Technical Director, asphericon GmbH

What does asphericon do?

asphericon GmbH was founded 15 years ago and, as an independent specialist, has since grown to become the world's technological leader in the production of aspheric optics and systems. The basis for manufacture is a specially developed and patented technology to control CNC grinding and polishing machines. Thanks to this globally unique equipment, asphericon is a leader in the development of a modern production chain for freeform optics.

What are the advantages of cluster membership?

As a medium-sized business, you cannot get everything moving by yourself – you are reliant on good cooperations and networks. We have the good fortune to find the perfect conditions in Jena's optics industry. Here, we have access to ideally qualified specialist staff, a highly efficient research infrastructure with institutions and universities, and, above all, cooperation partners within the industry. Our colleagues support us in various phases of project development, in structuring and coating surfaces, and also in system integration.

What does the future hold for asphericon?

Together with our strong partners, we are well on our way to turning the city of Jena into the European center for freeform optics, with many international relationships. For instance, we regularly find important cooperation partners in Rochester (USA) and in a number of Japanese locations.

Company: asphericon GmbH

Activity: Asphere production

Employees: 130



www.asphericon.com



Jens Kokott

Product Manager, GÖPEL electronic GmbH

Why is Thuringia such an attractive photonics location?

Highly qualified employees are for us, as a medium-sized company, the foundation for success. We have continuous demand for fresh young talent with a strong academic background. We therefore attach great importance to working closely with the universities in Thuringia, and the Friedrich Schiller University Jena and the Ernst Abbe University of Applied Sciences Jena in particular.

What are the advantages of OptoNet cluster membership?

We have been an exclusive partner in OptoNet's MASTER+ young talent development program for the past six years. The initiative is specifically tailored to meet the needs of the region's photonics sector and promotes networking between companies and high-performing students in the relevant study programs. This allows us to present ourselves as an attractive prospective employer to students before they graduate, and to realize joint projects together. The intense level of exchange with the universities is a major gain for the development of skilled personnel in our company and for the region as a whole.

Company: GÖPEL electronic GmbH

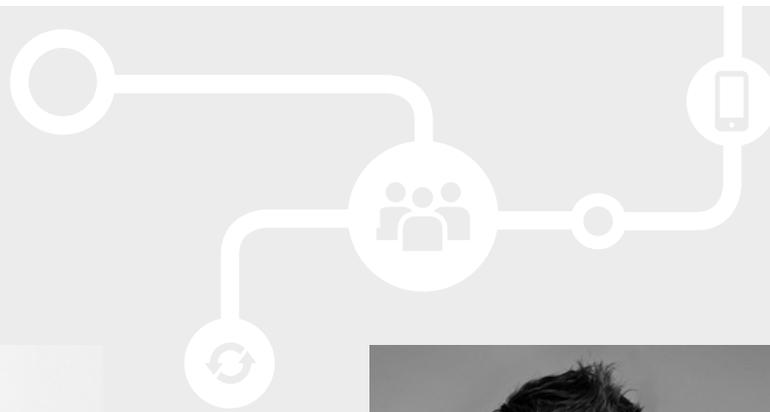
Activity: Inspection solutions and test technologies for electronic components and devices

Employees: 240



www.goepel.com





Inga Conrad

Managing Director, B5-Optics UG

What are the advantages of OptoNet cluster membership?

Thuringia International, Jena Business Development and OptoNet promote international cooperation in numerous projects, maintain contacts and provide advice on matters of market entry, financing and intellectual property rights. While B5-Optics has the technical expertise and experience in the photonics sector, the company benefits from the supporting know-how of the cluster. International R&D cooperation, network meetings and close working with international partner clusters make up the strengths of the region.

How important is internationalization to your activities?

B5-Optics provides design and development services in the precision optics and optical systems sector. Because of the high importance of international activities in the photonics industry, a small company like B5-Optics can only remain competitive and innovative if it cooperates with international partners. Thuringia's photonics cluster is the ideal location for us, linking regional strengths with international expertise.

Company: B5-Optics UG

Activity: Precision optics and optical systems design

Employees: 2



www.b5-optics.com



Dr. Christian Helgert

Management Abbe Center of Photonics & Abbe School of Photonics, Friedrich Schiller University Jena

Why is Thuringia such an attractive photonics location?

Thuringia, especially the Jena region, has long been and remains very much a top location for the training of skilled workers for the photonics industry. The success of the companies and research institutions is based on the excellent study and continued education programs that our university offers. Since 2008, all academic research and education programs in the area of photonics have been brought together under one roof at our Abbe Center of Photonics.

How important is internationalization to your activities?

At the Abbe School of Photonics, the international orientation of research and teaching is given the highest priority. Our global recruitment activities for our Master's degree and PhD students allow us to attract tomorrow's industry professionals and leaders from across the world to Jena and enable them to answer the burning questions of photonics.

What does the future hold for the university's photonic research activities?

The recent opening of our Abbe Center of Photonics building allows for some essential research activities to be more closely interlinked – particularly in the areas of nanooptics, fiber optics, short-pulse laser development, optics design and biophotonics. We expect that this will advance the already strong interdisciplinary cooperation even further.

What are the advantages of OptoNet cluster membership?

Our membership of the OptoNet photonics cluster plays a significant role for us: it allows us to identify important future research questions, establish joint research projects with industry partners, prepare our students for the specific needs in R&D and pave the way for attractive career options.



www.asp.uni-jena.de



Germany Trade & Invest Cluster Marketing Activities

Industry clusters – in which companies, research institutions and universities come together to join a particular industry in a geographical region – provide numerous partnership opportunities and synergy effects for their members. Member companies and organizations also benefit from the cluster umbrella brand when venturing into international markets.

Germany Trade & Invest's cluster marketing activities strengthen the internationalization of the Eastern German economy, and the global visibility of both Eastern Germany as an investment location and the cluster in the region. To this end, GTAI has already published the "INVEST. INNOVATE. INTERNATIONALIZE. Industry Clusters in Eastern Germany" booklet highlighting the innovative capacity and attractiveness of the new federal states as an investment location based on the example of a selection of industry clusters in Eastern Germany.

As part of GTAI's 2016/2017 activities, these clusters are now being individually presented in selected international target markets. GTAI provides the accompanying cluster representatives – companies, research institutions and cluster management – with the opportunity to learn more about their target markets and to expand and intensify their network of contacts.

GTAI Cooperation Forums allow cluster delegation members to enter into "matchmaking" discussions with local companies and institutions about potential partnership. Investor events at the selected locations allow Eastern Germany to be presented to foreign companies in order to generate cluster settlement interest. GTAI works closely with the respective federal state economic development agencies and cluster management.

Powerhouse Eastern Germany

GTAI activities that market Eastern Germany as a business location to the world are bundled together under the "Powerhouse Eastern Germany" umbrella brand. Prospective international investors are advised about market opportunities available in the new federal states.

GTAI's Powerhouse Eastern Germany division promotes the benefits of doing business in the new federal states to international investors as well as seeking to increase the opportunities of Eastern German businesses in the international marketplace. International business delegation and exchange trips play a central role in achieving this dual objective.

Powerhouse Eastern Germany branded conferences and trade fair visits and special events help communicate the message that the regenerated region has established itself as one of Europe's most attractive and innovative production and service locations.

Particular focus is attached to the region's strong and dynamic industry sectors including the renewable energies, chemical, mechanical engineering, automotive, biotechnology, and service sectors. All international companies interested in locating in Eastern Germany are supported by GTAI and the responsible economic development agencies of the respective new federal states.



OUR SERVICES

About Us

Germany Trade & Invest (GTAI) is the economic development agency of the Federal Republic of Germany. The company helps create and secure extra employment opportunities, strengthening Germany as a business location. With more than 50 offices in Germany and abroad and its network of partners throughout the world, GTAI supports German companies setting up in foreign markets, promotes Germany as a business location and assists foreign companies setting up in Germany. All investment services and related publications are free of charge.

Investment Location Services

- Market and industry reports
- Market entry analyses
- Business and tax law information
- Business and labor law information
- Funding and financing information

Business Location Services

- Legal and tax-related project support
- Funding and financing advisory services
- Site visit organization
- Local partner and network matchmaking
- Public and private partner coordination

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