



## THE ECONOMIC IMPERATIVE OF PHOTONICS IN A HIGH-TECH ECONOMY

**SPIE**—The International Society for Optics and Photonics, believes that photonics - the science of light - is a critical technology for a number of national priorities including alternative energy, job creation, and national security. **The U.S. needs a coherent, consistent government R&D policy and better economic impact data collection that supports the development of emerging industries like photonics to keep jobs in the U.S.**

- The world photonics market is predicted to grow at an average annual rate of 7.6% between 2005 and 2015.<sup>1</sup>
- The U.S. Department of Labor predicts that jobs requiring science, engineering, and technical training will increase 24% between 2004 and 2014.
- Scientific & technological innovation has accounted for roughly half of U.S. economic growth over the past 50 years.

Focused technology initiatives like SEMATECH and the National Nanotechnology Initiative have succeeded in fostering advances in high-impact fields. Like nanotechnology, photonics is a pervasive and enabling technology that is advancing many sectors of the high-tech economy. Its applications include:

- Photovoltaic cells
- Solid state lighting (LEDS)
- Sensors for structures, security, and the environment
- Biomedical equipment
- Scanning and X-ray
- Lithography to produce computer chips
- Fiber optics/ communications
- Lasers
- Displays
- Defense technologies

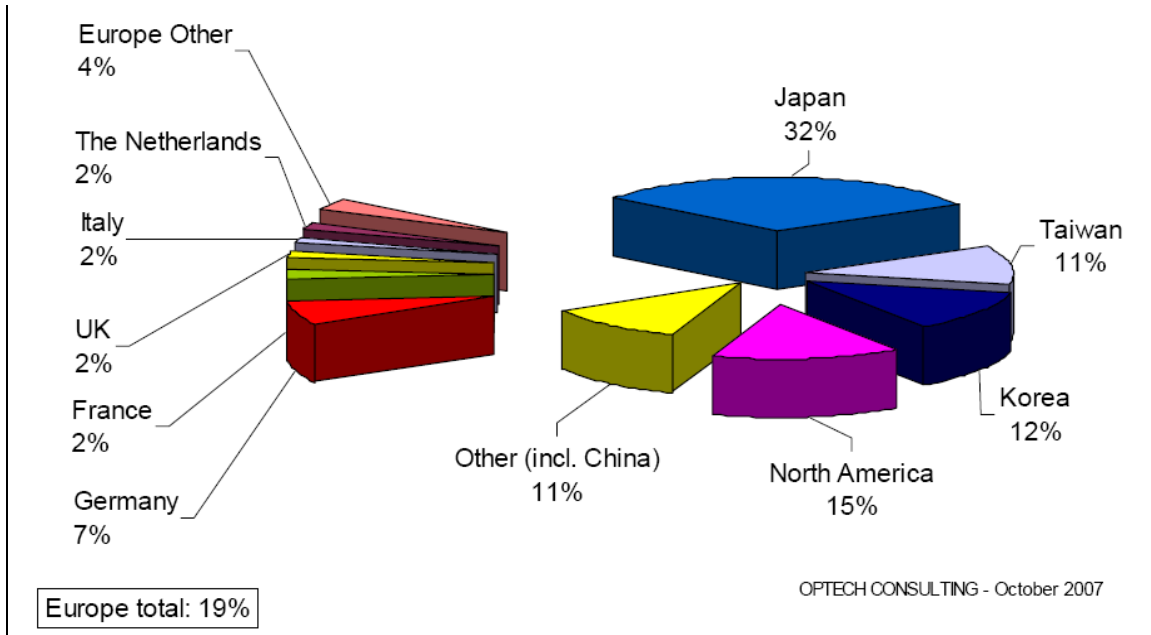
As we reach the limits of the electron, the photon –light –is becoming increasingly critical in innovation, job creation, and ultimately national wealth creation. Although data on photonics in the U.S. is currently limited and segmented, globally the market is estimated at \$710 billion<sup>2</sup>. Regions including the European Union, Japan, Taiwan, Korea and Singapore have established aggressive photonics agendas and economic impact data collection systems while the U.S. lags behind.

<sup>1</sup> See Photonics21.org, OITDA.org, and OIDA.org

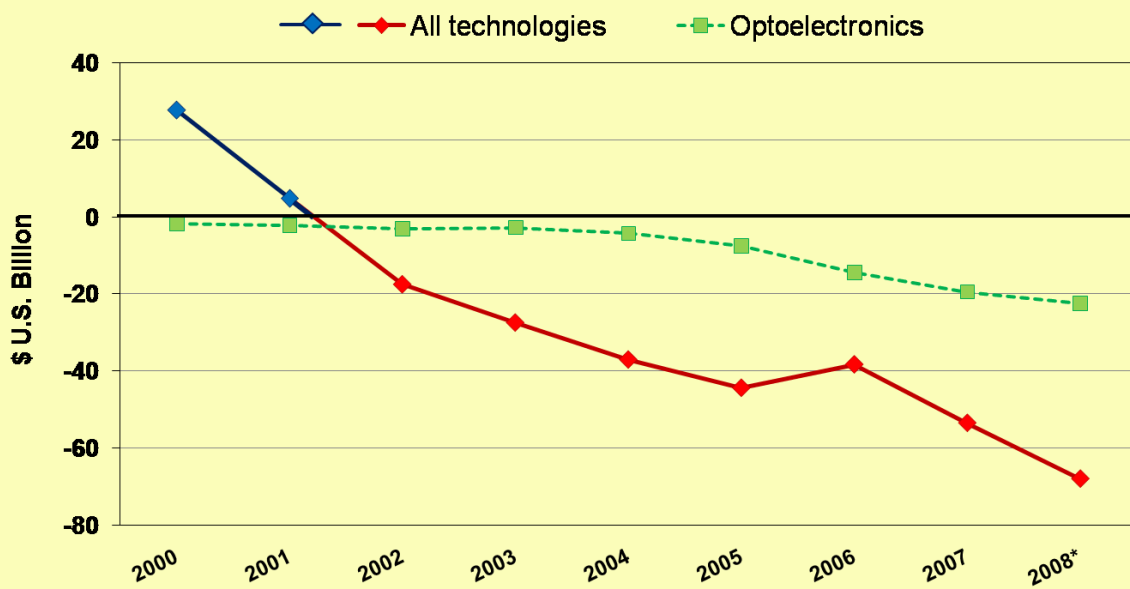
<sup>2</sup> See OITDA.org, OIDA.org, and the CPC's Photonics in Canada report.

SPIE is the largest international not-for-profit society in optics, photonics and imaging. Together with our 17,000 individual members and 450 corporate members, the Society works together with academia, government and industry to support innovation and commercialization of new research. [www.spie.org](http://www.spie.org)

## Photonics Production Volume by Country, 2005



## U.S. balance of trade for "Advanced Technology Products"



source: US Census Bureau  
2008\* = projection

