Create Lithuania Invest Lithuania

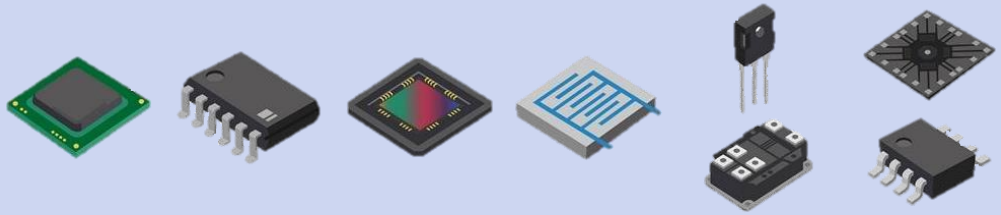
Investigating Lithuania's Potential in Optoelectronics & Semiconductor Sectors

2024 02 29

Understanding semiconductors and optoelectronics sectors

- Semiconductors has a huge market of ~570 billion USD in 2022.
- Semiconductors are used in: phones, cars, TVs and other electric devices for computing and sensor applications.
- Europe is aiming to increase manufacturing capabilities.
- Lithuania wants to take a part in this incentive.

Semiconductor devices



CPU Memory Image Sensor RF Power semicond. Sensor

- Optoelectronics is a branch of technology where light intersects with electricity.
- A lot of optoelectronic devices are made from semiconductor material.
- Photonics was also included in our research.

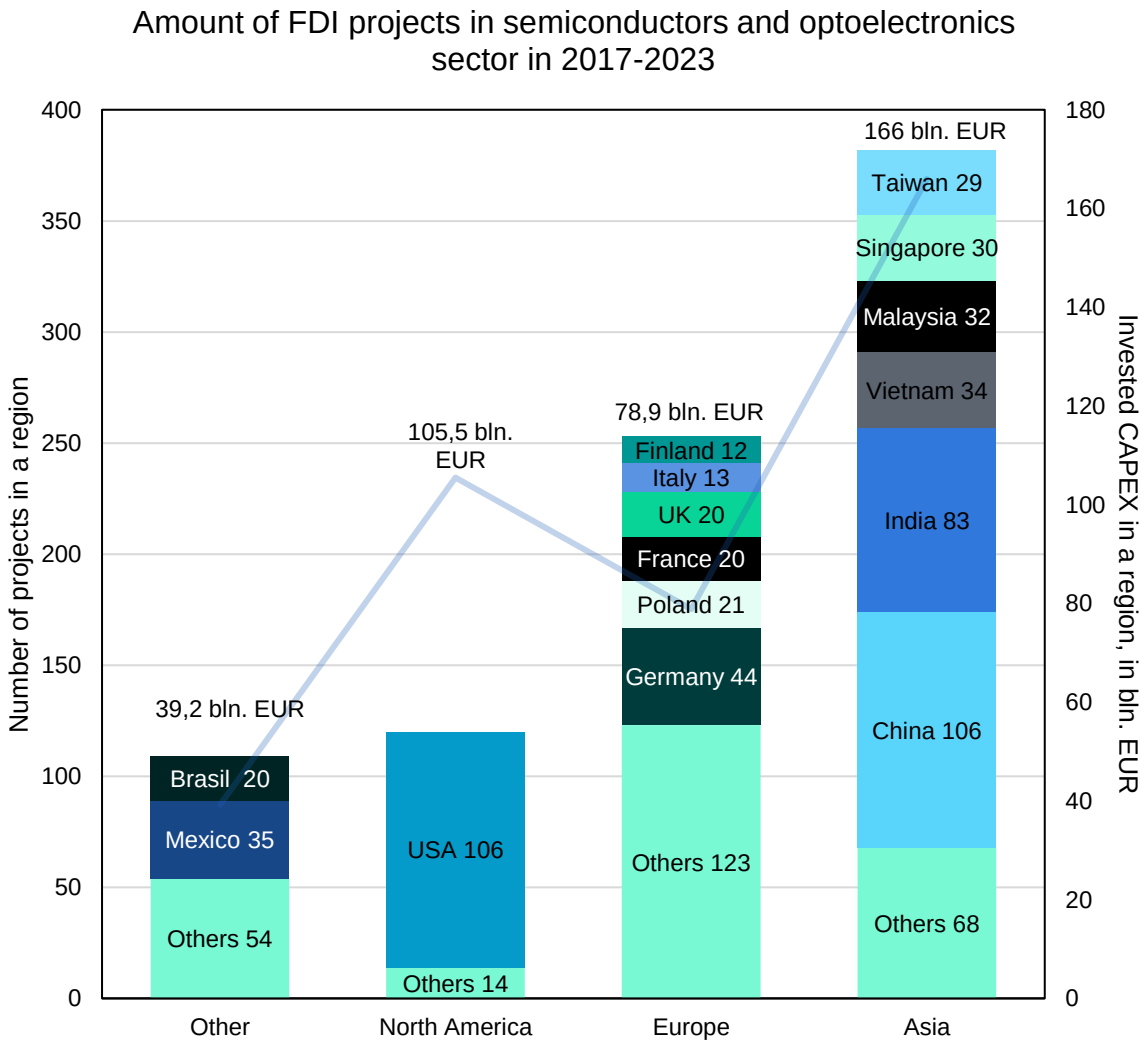
Optoelectronics devices

LEDs Solar panel Display Camera sensor

Analyzed FDI trends

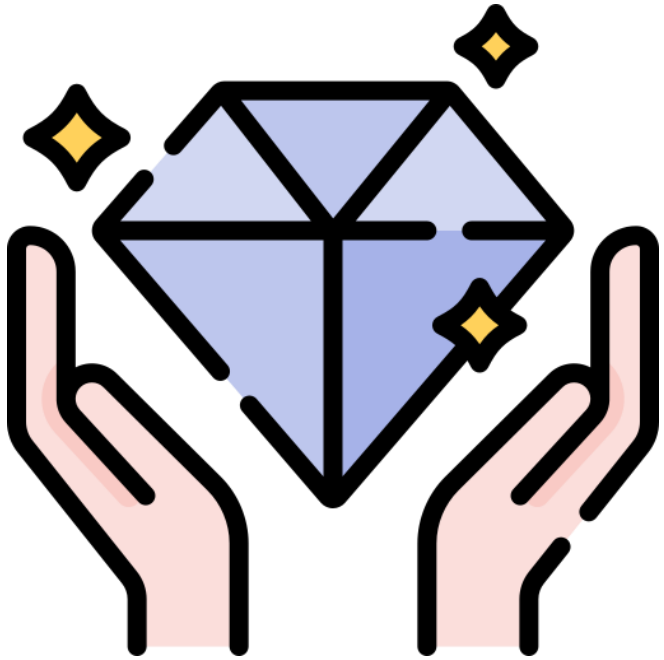
- Analysis was done in 2017-2023 period, it included ~850 projects.
- Projects in Europe are more numerous, but smaller in size.
- Intel invested 56 bln USD in Europe.
- This analysis has also shown us that companies usually start with R&D facilities before building a manufacturing plant.
- A lot of projects in semiconductor sector require a huge financial backing from the government.

Kurk LT



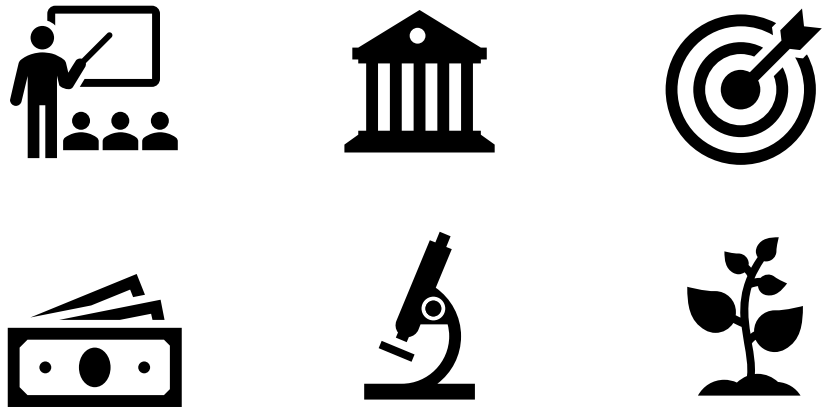
Value proposition

- Around 500 students choose electronics study programs each year.
- Upcoming microelectronics study program in KTU.
- Available applied research facilities at FTMC and M-Lab.
- Teltonika creating semiconductor industry in Lithuania.
- Lithuania’s globally recognized laser sector.
- Existing FDIs in sensor technologies.
- Well positioned to target growing European EV market and address EU green energy goals.
- Optoelectronics and semiconductors have close ties with the Mil-tech sector.

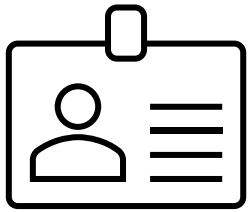


Recommendations

- Grow the popularity of STEM sciences, especially electronics and physics.
- Create new study programs targeting the microelectronics and semiconductors sectors.
- The semiconductor sector needs more political involvement and recognition.
- Specific financial support for FDIs in the microelectronics sector.
- Develop a framework for working with large-scale projects.
- Start with attracting R&D projects in the semiconductors sector.
- Try to attract a smaller or niche project from a global brand (e.g. Intel, Infineon, Jenoptik, SK Hynix).



Feel free to contact us!



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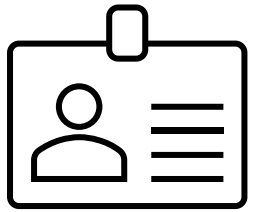

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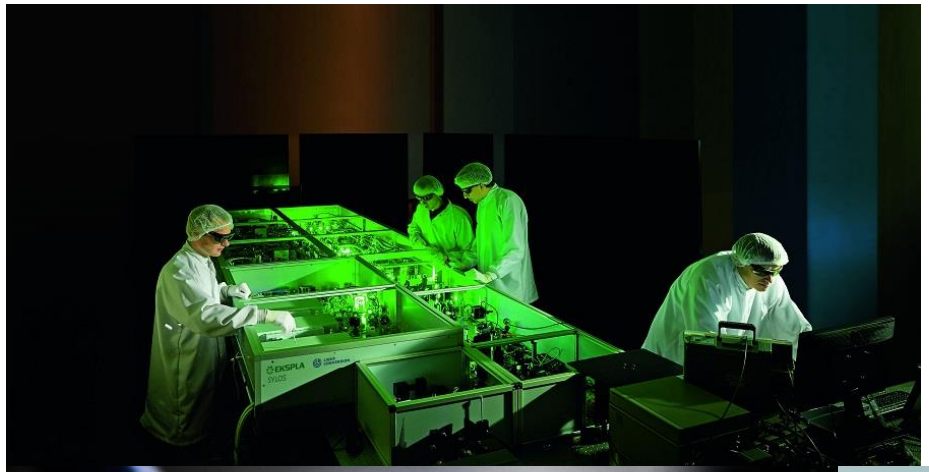
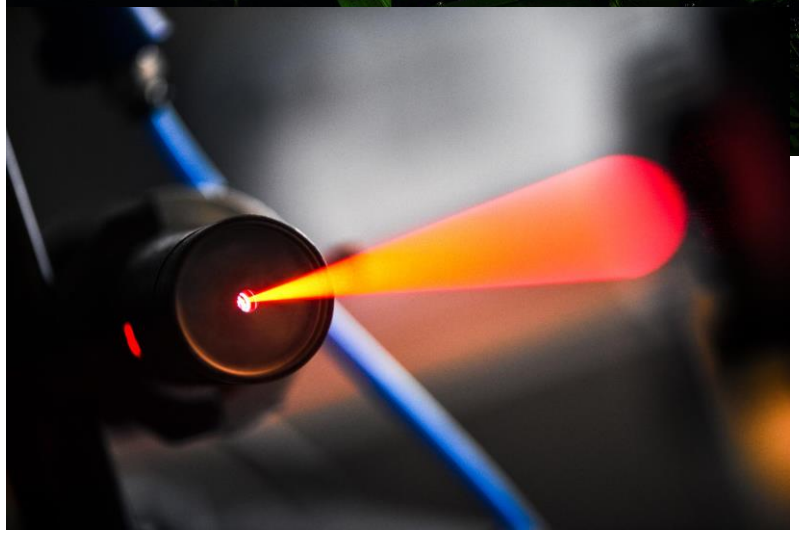
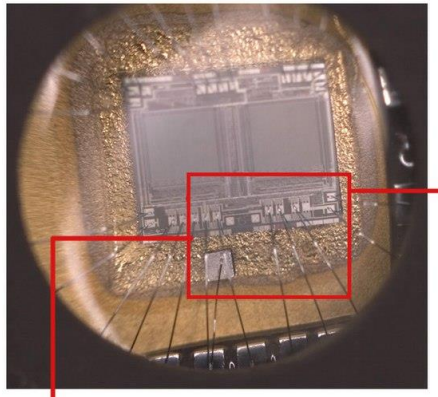
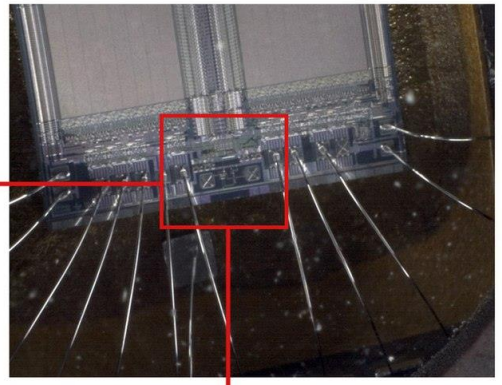
Thank you for your attention

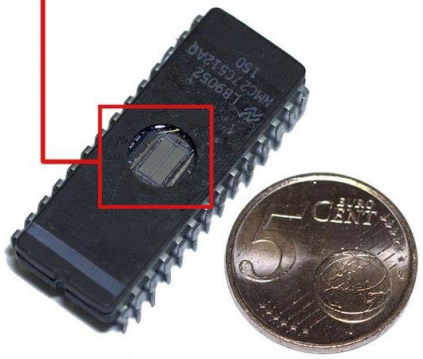


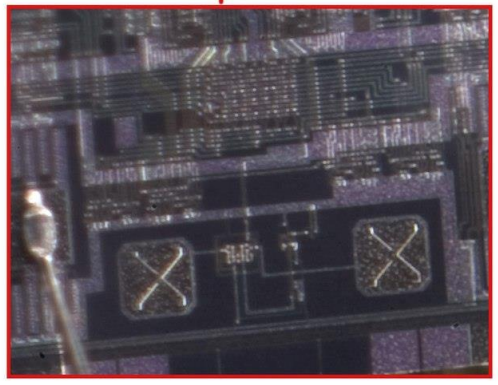


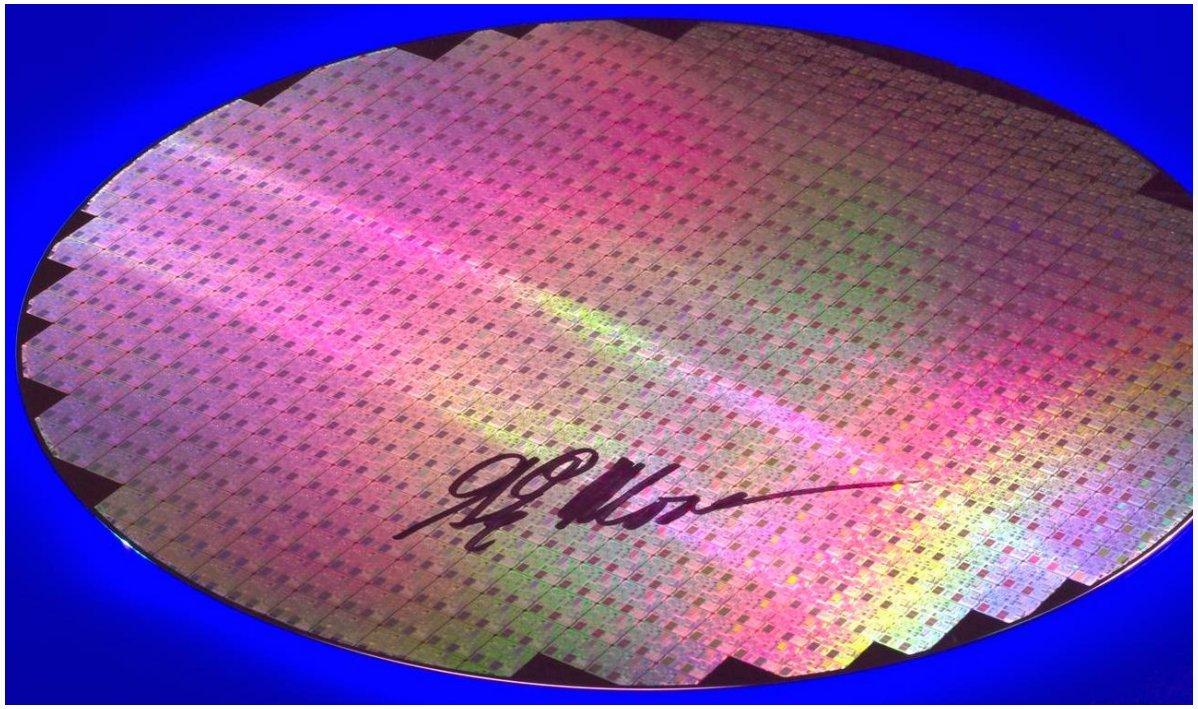
Ekspla Laser from www.lithuania.lt
Red Laser, Solar Panels from Marius Jovaiša, www.lithuania.lt

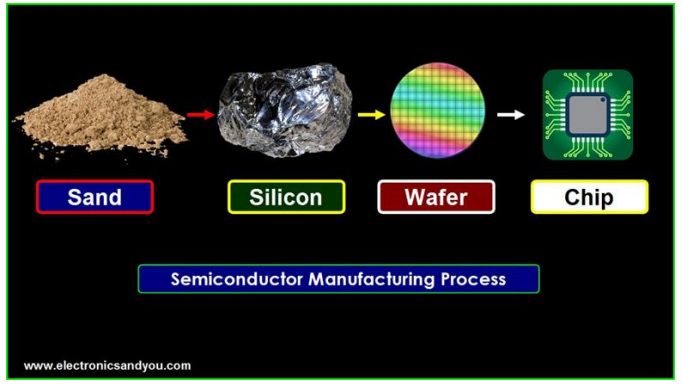






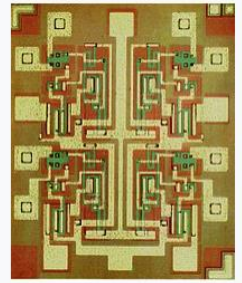






Wikimedia - magnified pic from 2007, not modern tech
Intel wafer signed by Gordon Moore in 2005 (The Science Museum UK) - This specific one was 90nm

Semiconductor device fabrication



MOSFET scaling (process nodes)

- 20 µm – 1968
- 10 µm – 1971
- 6 µm – 1974
- 3 µm – 1977
- 1.5 µm – 1981
- 1 µm – 1984
- 800 nm – 1987
- 600 nm – 1990
- 350 nm – 1993
- 250 nm – 1996
- 180 nm – 1999
- 130 nm – 2001
- 90 nm – 2003
- 65 nm – 2005
- 45 nm – 2007
- 32 nm – 2009
- 22 nm – 2012
- 14 nm – 2014
- 10 nm – 2016
- 7 nm – 2018
- 5 nm – 2020
- 3 nm – 2022

Future

- 2 nm ~ 2024