VIGO PHOTONICS

FINANCIAL RESULTS FOR Q3 2023

November 16, 2023

VIGO IN A NUTSHELL

36 years of experience and operations

Headquarter in Poland
and branch office in USA

200 highly qualified and experienced experts
(1 Professor, 14 PhDs and >60 engineers)

25 distributors in **18** countries supporting sales of solutions

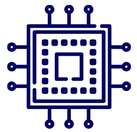
Listed on the WSE since **2014**

Approx. **PLN 320 million** capitalisation

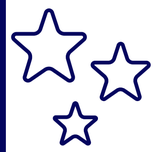
Support for stable long-term **shareholders**

VIGO IS A WORLD LEADER IN HIGH-TECH SOLUTIONS – THE MOST ADVANCED MID-INFRARED PHOTONIC DETECTORS, DETECTION MODULES AND SEMICONDUCTOR MATERIALS

Activity in the global infrared market: infrared sensors (12.3% CAGR 2020-30), semiconductor materials (17.2% CAGR 2020-27), photonic integrated circuits (20.4% CAGR 2021-30).

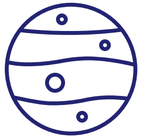


Numerous long-term technological megatrends, e.g. systems miniaturization, Internet of Things (IoT), wearables lab-on-chip, security and defense, development of the semiconductor industry in Europe.



Presence at the global forefront of industrial innovation - using a unique advantage throughout the entire VIGO photonic value chain.

An established market position reinforced by the world-class R&D department and expert technological knowledge of over 60- person team of engineers and scientists.



Addressing market needs thanks to a modern, scalable production facility, providing the most technically advanced solutions.

Implementation of an ambitious development strategy - moving VIGO to a higher utility curve in order to provide long-term value for all stakeholders.

AGENDA

1. EXECUTIVE SUMMARY
2. SUMMARY OF Q3 2023
3. FINANCIAL RESULTS FOR Q3 2023
4. PERSPECTIVES
5. SUMMARY

EXECUTIVE SUMMARY

Q3 2023 SUMMARY

Sale

- PLN 17.2 million of consolidated revenues (+3% y/y) - increases in military (+59% y/y) and industrial applications (+3% y/y), more than 2-fold increase in sales of semiconductor materials; +13% y/y of consolidated revenues in Q1-Q3 2023
- Growing share of revenues in the USA (+64% y/y) and an almost 4-fold increase in revenues in Poland
- In the military segment, a new contract with PGZ and a letter of intent with PCO

Improving operational results

- Operating profit for 9M higher by 77% y/y, EBITDA higher by 61% y/y
- Improved results due to price increases and reduction of overhead and sales costs

Accelerating development activities

- Significant achievements in projects related to the introduction of a new family of cryogenically cooled detectors and projects for the military segment
- New funding in the amount of PLN 9.4 million for the implementation of a research and development project regarding cascade technologies of infrared detectors and modules
- Further development on the wave of long-term megatrends creating a strong drive for the development of operational activities

Infrared detetctors

Infrared detection modules

Epiwafers

VIGO PHOTONICS

SUMMARY OF Q3 2023

GROWING DEMAND FOR VIGO SOLUTIONS IN THE MILITARY SEGMENT – AGREEMENT WITH PGZ AND LETTER OF INTENT WITH PCO

AGREEMENT WITH AN ENTITY OF THE POLISH ARMS GROUP WORTH PLN 15.8 M

PGZ
POLSKA GRUPA ZBROJENIOWA

- Contractor: entity from the Polish Armaments Group (PGZ)
- Subject of the contract: delivery of detectors in quantities specified each time by the customer who declared the purchase of a volume of detectors
- Contract value: PLN 15.8 million (includes indexation clause)
- Delivery time: until December 31, 2035

The infrared detectors covered by the contract are used in automatic fire detection and extinguishing systems in armored vehicles.
VIGO detectors delivered to PGZ are one of the most important components of the explosion suppression and fire extinguishing system developed by Polish entities in tanks, combat vehicles and other vehicles for both military and civilian purposes.

LETTER OF INTENT WITH PCO FOR THE IMPLEMENTATION OF INFRARED MATTERS AND APPLICATIONS IN THE POLISH ARMY

PCO

- Parties of the letter of intent: PCO S.A. and VIGO Photonics S.A.
- Goal of cooperation: development of innovative solutions tailored to the needs of a modern battlefield, in particular infrared matrices based on T2SL supernet technology (Type II Superlattice)
- Scope of cooperation: securing the supply chain, solutions for detecting threats on the battlefield and preparing and implementing the technological strategy of both entities
- Assumed effects of cooperation: implementation of Polish matrix detectors developed by VIGO into production and introduction of them for sale, including distribution by PCO

PCO is a leading manufacturer of high-class optoelectronic equipment, developing competences in the field of new defense technologies, producing, among others: thermal imaging cameras for military applications.

SUPPORT FOR COMMERCIALIZATION OF SOLUTIONS THROUGH MARKETING ACTIVITIES IN Q3 2023

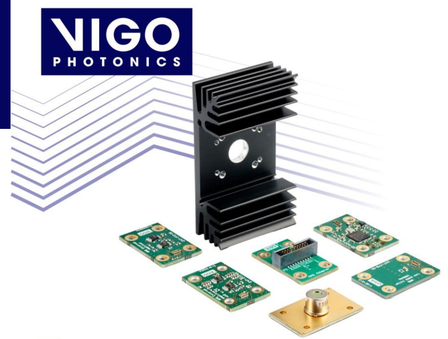
ACTIVITY AT INTERNATIONAL SCIENTIFIC CONFERENCES AND INDUSTRY FAIRS:

- Korea – Poland Business Forum – uczestnictwo w panelu dyskusyjnym i nawiązywanie relacji z przedstawicielami firm Koreańskich.
- SEMICON Taiwan – participation in the Polish economic mission and presentation of VIGO technology at the National Pavilion.
- Poland – Taiwan Business Forum – participation in talks about the potential of the Polish semiconductor industry.
- EPIC Photonics in Defense – presenting the potential of VIGO Photonics in military applications to companies from the defense industry (including MBDA, Rafael, Leonardo, DHIEL).
- MSPO – presentation of the company at the largest defense industry fair in Eastern Europe. Signing a cooperation agreement with PCO.
- RAPID – presentation of VIGO's potential at a conference dedicated to the American defense industry.

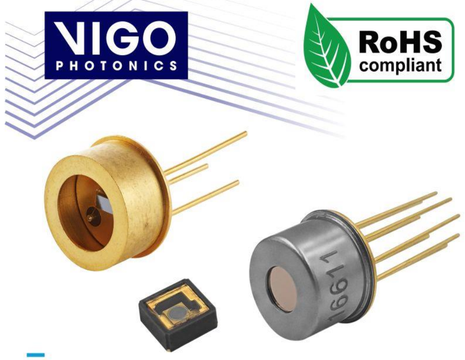
Development of contacts with companies from the security and defense sector. Establishing relationships with companies from the USA and Korea. Close cooperation with companies belonging to PGZ.

SUPPORT FOR PRODUCT COMMERCIALIZATION:

- Premiere of a family of accessories for the AMS module.
- Continuation of the promotional campaign for new products based on III-V materials.
- Conducting a webinar dedicated to infrared detectors for gas analysis applications.



Accessories for the AMS detection module series



InAs/InAsSb Detectors or InAs/InAsSb T2SL

MCT+ DETECTOR INITIATIVE

TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Exploitation of the market in its gradual fading phase by improving the customisation process and exploring uncovered market niches.
- Stabilisation of multi-element detector technology, implementation of digital solutions, development of products for military and space applications.

Achievements in Q3 2023

- Endurance tests including thermeal exposure of LN2 detectors carried out.
  Sales volume potential for >1000 detectors/year (>1 mn EUR).
- Further batches of modules for the semiconductor industry delivered. Potential > 0.5 million euros/year

Plans for Q4 2023 and 2024

- Increasing the diversification of suppliers of key components in the face of the changing geopolitical situation.
- Implementation of LN2 cooled detectors into production.

COMMERCIALISATION - SAMPLE PROJECTS

III-V InAsSb DETECTORS AND DETECTION MODULES INITIATIVE

TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Gaining the No. 1 position in the market for manufacturers of III-V detectors in the MidIR range. Implement T2SL superlattice technology (matching MCT performance), achieving technical performance superior to competitors across the MidIR range.

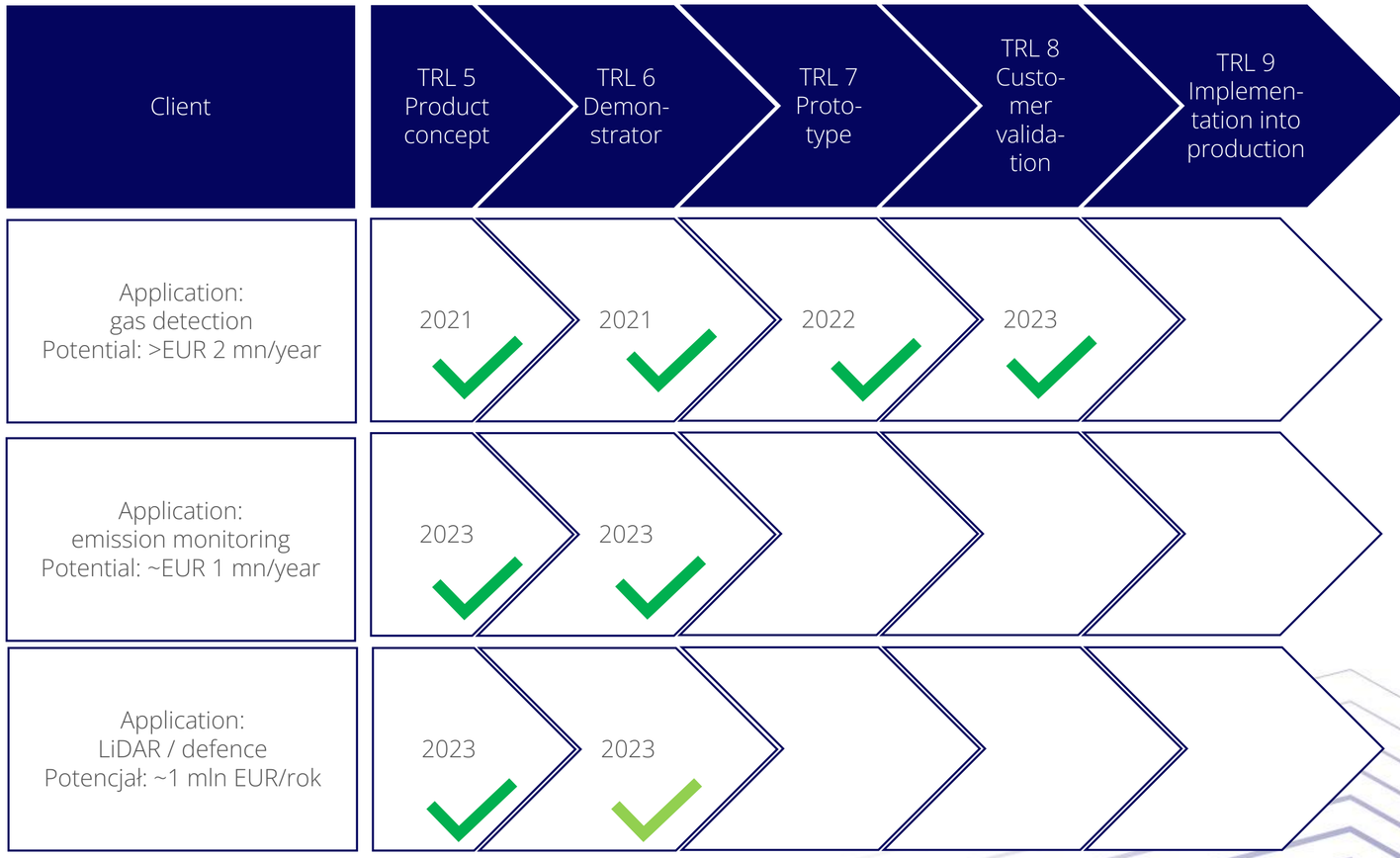
Achievements in Q3 2023

- Succsesful implementation of a Affordable Detector - a cost-effective thermoelectrically cooled product.
- Delivery of the first batch of modules for a new solution used in methane detection.
- Over PLN 9 million funding granted for the development of long wavelength detectors.
- Array demonstrators for high volume military application delivered. Sales potential 3000 pcs/year.

Plans for Q4 2023 and 2024

- Stabilization of the epitaxy and processing process of a new long-wavelength superlattice devices
- Development of passivation improving the stability of detectors at high temperatures.
- Reaching the level of MCT detectors in III-V detectors for the MWIR.

COMMERCIALISATION - SAMPLE PROJECTS



III-V InGaAs DETECTORS AND DETECTION MODULES INITIATIVE

TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Entering the III-V InGaAs detectors' market.

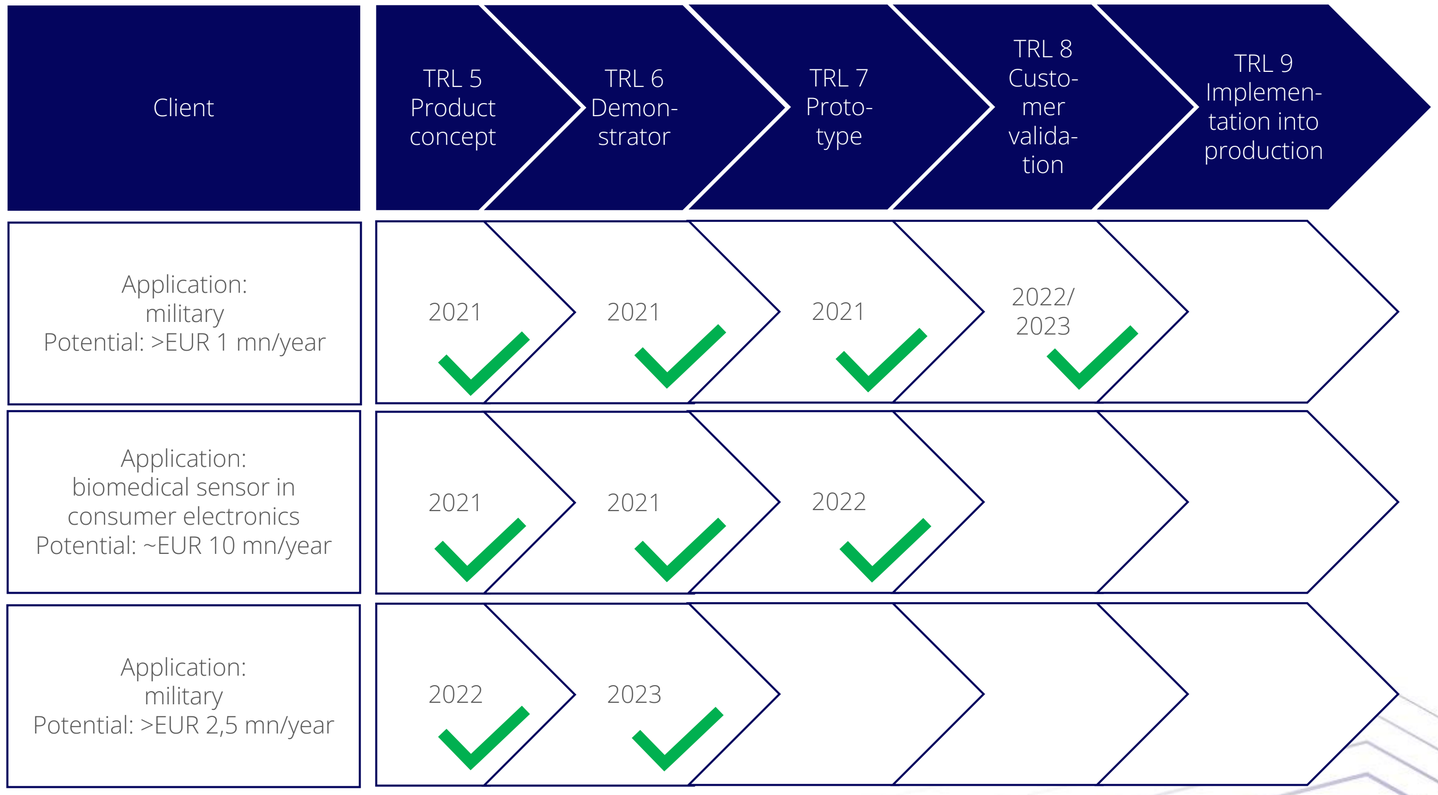
Achievements in Q3 2023

- Confirmed effectiveness of VIGO detectors in military applications.
- Deposition of new epitaxial layers was carried out to optimize the yields of InGaAs detectors.
- Obtaining a two-fold improvement in the level of dark currents in lattice-matched detectors.

Plans for Q4 2023 and 2024

- Extended InGaAs market entry in the "gas detection" area.
- Development of a multi-element detector for industrial applications.
- Collaboration with a large military contractor to develop a balanced Extended InGaAs module.
- Obtaining better parameters for a detector with an area larger than 0.5 mm2

COMMERCIALISATION - SAMPLE PROJECTS



III-V EPITAXY* INITIATIVE – SEMICONDUCTOR MATERIALS

TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Gain visibility in the market for epitaxy services, exploring market niches for photonic instruments (new VCSELs, unusual solutions).
- Refining the technology for the production and characterisation of VCSELs.

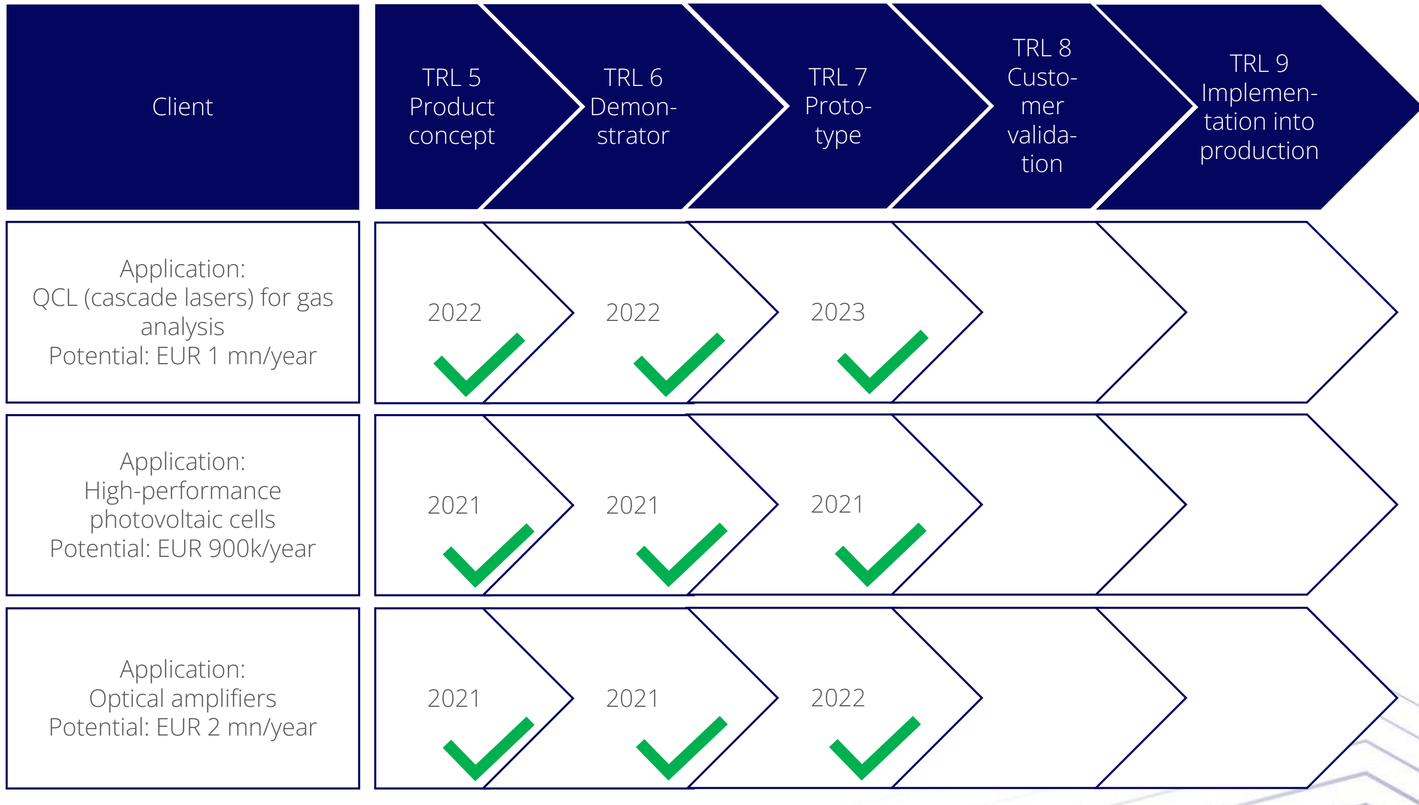
Achievements in Q2 2023

- Structures of Quantum Cascade Lasers (QCLs) - positive implementations at clients, strengthening the position of a manufacturer of high-quality laser structures.
- Photovoltaic Cell Structures - resumption and commencement of the second stage of implementation in the project of high-efficiency photovoltaic cells after restructuring on the client's side.
- Structures of Semiconductor Optical Amplifiers (SOA) - project maintenance, next development stage and preparation for implementation at the customer's site.

Plans for 2023

- Completion of implementation and preparation for serial production of QCL structures.
- Completion of implementation and preparation for serial production of photovoltaic cell structures.
- Completion of implementation and preparation for mass production of SOA structures.

COMMERCIALISATION - SAMPLE PROJECTS



*High-quality epitaxial structures of III-V semiconductor materials (InGaAs, InAsSb) offered directly to customers for in-house production of detectors/chips and VCSEL lasers, as well as production of SWIR (VCSEL) including VIGO VCSEL lasers.

INFRARED ARRAY INITIATIVE

TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Becoming a major supplier of detectors for the Polish army/armament industry, winning customers outside Poland (industry, space).
- Development of cooled array production technology.

Achievements in Q3 2023

- Signing a letter of intent with PCO S.A. regarding cooperation in the development of polish thermal imaging sensors.
- Established cooperation with a leading manufacturer of guidance systems for missiles.

Plans for Q4 2023 and 2024

- Signing a contract for the supplies of cooled FPAs with PCO S.A.

COMMERCIALISATION - SAMPLE PROJECTS

Client	TRL 5 Product concept	TRL 6 Demon-strator	TRL 7 Proto-type	TRL 8 Custo-mer valida-tion	TRL 9 Implemen-tation into production
Application: military technology Potential: > EUR 10 mn/year	2021 ✓	2022 ✓			
Application: aviation, space Potential: ~ EUR 1 mn/year	2021 ✓	2022 ✓	2022 ✓		

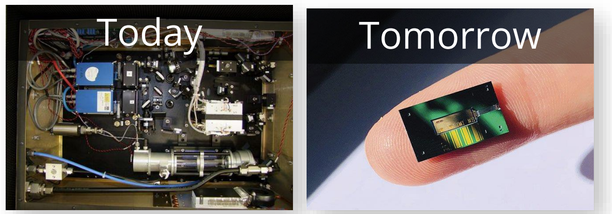
OPTOELECTRONIC SYSTEMS AND PHOTONIC INTEGRATED CIRCUITS (PIC) INITIATIVE

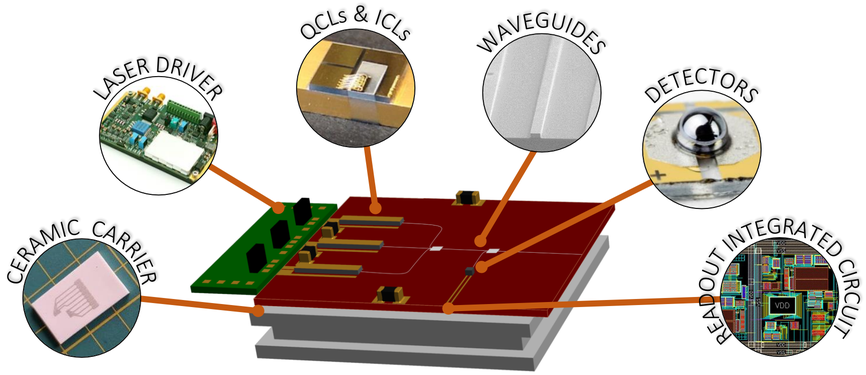
TECHNOLOGY DEVELOPMENT

Objective of the initiative

- Introduction, as the world's first manufacturer, of mid-infrared integrated circuits.
- Complete production line (world's first) for PICs in the MIR range (MIRPIC), complete supply chain for MIRPICs.

Gas detectors



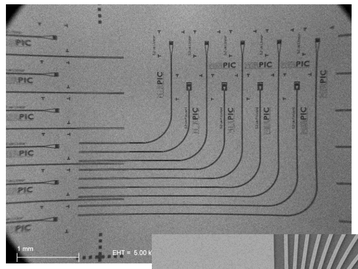


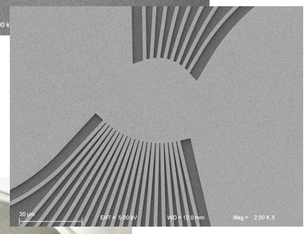
Achievements in Q3 2023

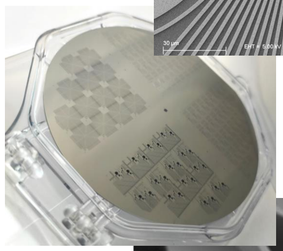
- Designed and manufactured test structures of grating couplers for integration with III-V detectors;
- Designed and manufactured test structures of AWG multiplexers and DBR mirrors;
- Systematic development and optimization of the component library (PDK);
- Initial tests of a scalable technology of the production of passive photonic circuits (SOI and Ge-on-Si platforms);
- Tests of heterogeneous integration of QCL lasers and QCD detection structures with passive PICs;
- Work on a miniature version of the laser driver system.

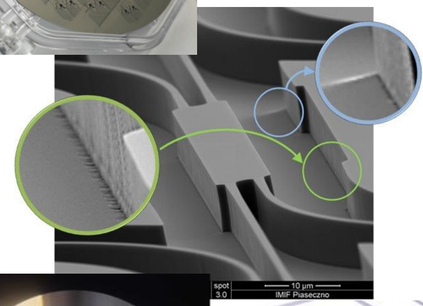
Plans for Q4 2023 and 2023

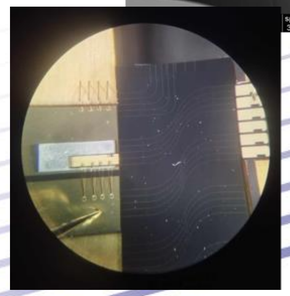
- Design and fabrication of an ASPIC for the demonstrator of a multi-channel transmitter;
- Integration of active and passive components in the demonstrator;
- Packaging of a complete photonic integrated circuit with a miniaturized laser driver and ROIC;
- Evaluation of technological lines for HyperPIC;
- Submission of the HyperPIC application to the NCBR (November 30, 2023);
- Purchase of the first part of R&D equipment.











VIGO PHOTONICS

FINANCIAL RESULTS FOR Q3 2023

CONSTANTLY GROWING ORDER PORTFOLIO

VISIBLE CONTINUOUS DEVELOPMENT OF PHOTONICS AND MIDDLE-IR SOURCES MARKETS AND INCREASING DEMAND FOR VIGO PRODUCTS, CONSTANTLY INCREASE THE ORDER PORTFOLIO DESPITE VARIABLE MARKET ENVIRONMENT

ORDER BOOK

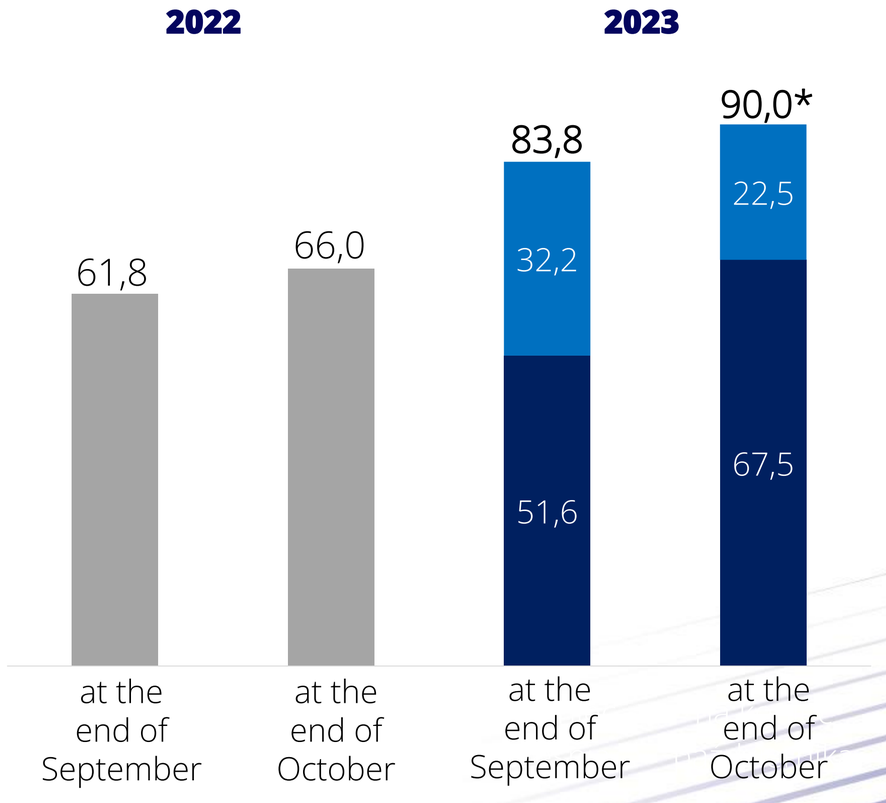
PLN 90.0 mn*

value of VIGO's order portfolio at the end of October 2023
(from the beginning of 2023)

Continuing high demand for VIGO Photonics products proves further dynamic development of the photonics market and its good prospects.

The highest value orders in industrial, transport and scientific applications.

*Value of orders received in 2023 and new contracts signed in 2023, excluding new contract with PGZ of 29.08.2023 (additional PLN 15.8 m)



SALES REVENUES

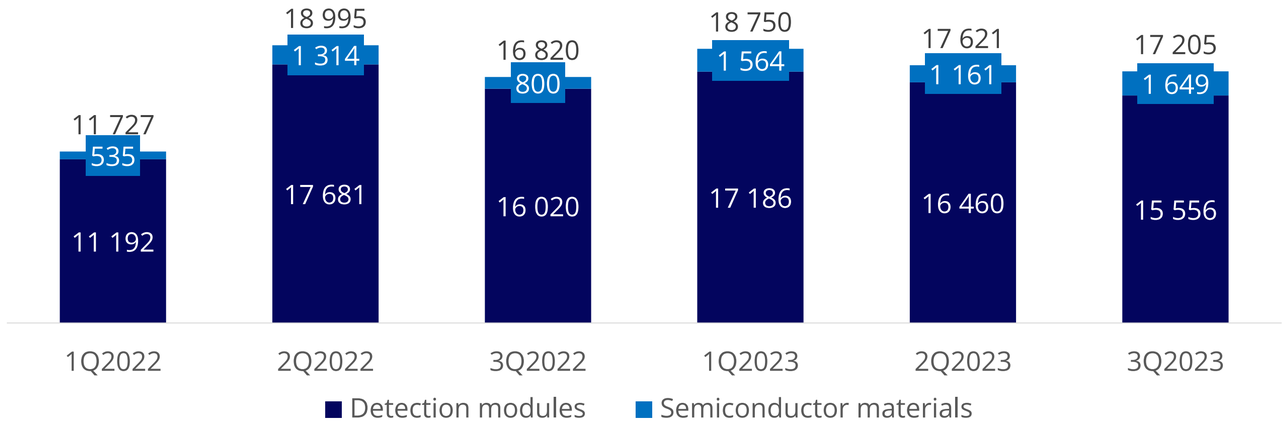
SALES REVENUES IN Q3 2023

- A slight increase in revenues in Q3 2023 (+2.3% y/y) to PLN 17.2 million
- The following factors influenced steady results:
  - Price increased introduced at the beginning of the year
  - Increasing revenues from the military segment (PLN 2.1 million, an increase of 59% y/y), as a result of increased orders from military and defence industry
  - Increasing revenues from semiconductor materials (PLN 1.6 million, an increase of 106% y/y) as a result of successful commercialization of new products (QCL structures)
- A decrease in sales volumes (-15% after 9M) in product categories, detectors, module), as a result of high inventories at some customers from the industrial segment. Nevertheless, acceleration of sales and production is expected in Q4 2023.
- In term geographical split there have been increases:
  - on the North American market (PLN 4.0 million, +61% y/y) as a result of direct access to clients by the VIGO Photonics US team and an increased interest for VIGO's products
  - On the Polish market (PLN 1.7 million, +400% y/y) thanks to an increase of orders among others from the military industry (signing of agreement with PGZ)

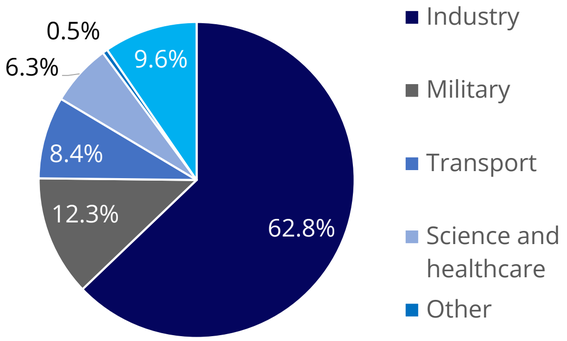
SALES REVENUES IN 1Q-3Q 2023

PLN 53.6 million of consolidated sales revenues (+13% y/y)

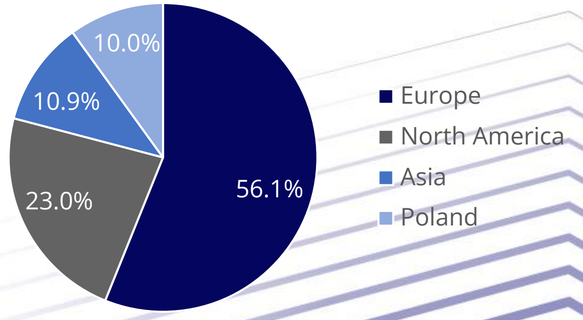
SALES REVENUES PER YEAR (PLN THOUSAND)



SALES REVENUES BY APPLICATION IN Q3 2023



SALES REVENUES BY REGION IN Q3 2023



OPERATING COSTS

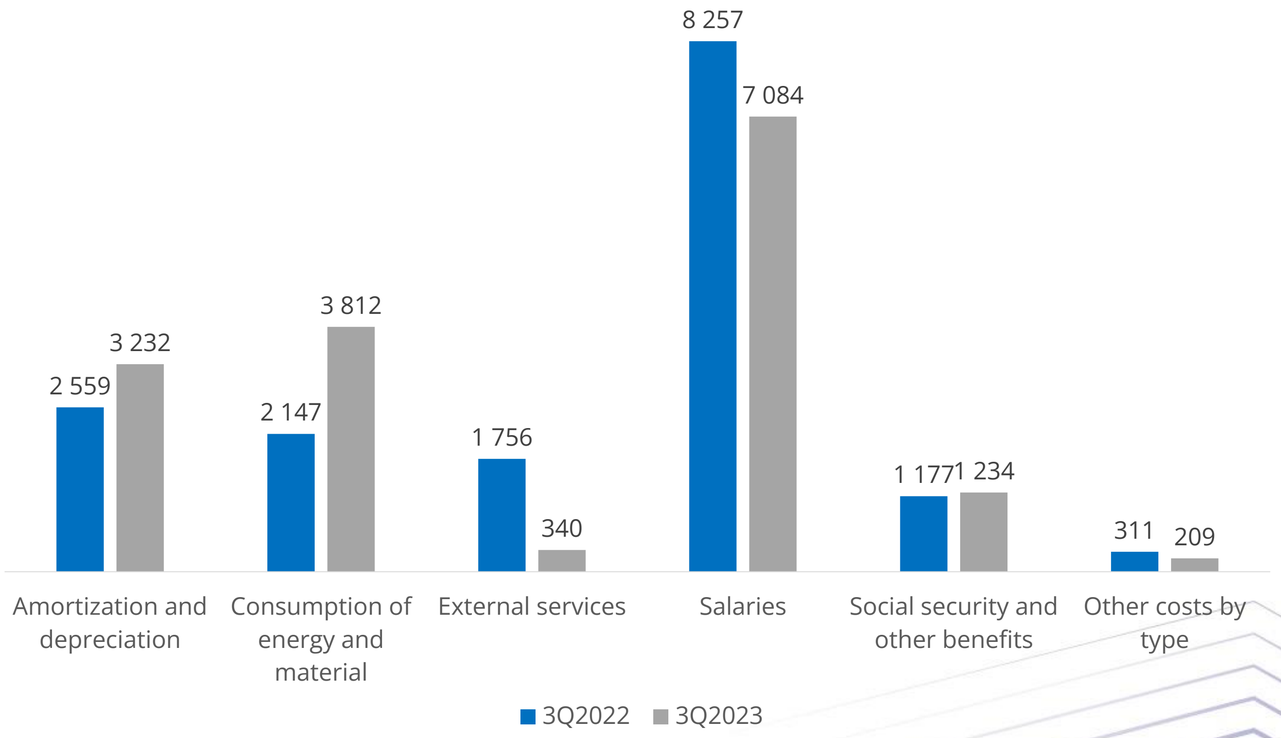
OPEX IN Q3 2023

- The costs of basic operating activities amounted to PLN 15.9 million (-2.0% y/y).
- The greatest impact on costs had:
  - salaries
  - consumption of materials and energy
  - depreciation and amortization
- The pressure on salaries costs is lower than last year due to pay raises granted and lower inflation

OPEX IN Q1-Q3 2023

The costs of basic operating activities amounted to PLN 47.9 million (+3.6% y/y)

OPERATING COSTS IN Q3 2023 (PLN THOUSAND)



FINANCIAL PERFORMANCE

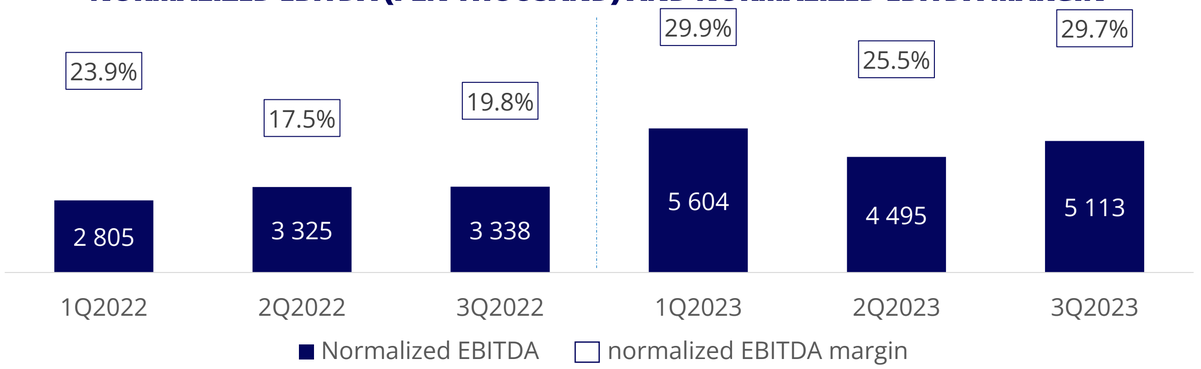
FINANCIAL PERFORMANCE IN Q3 2023

- Normalized EBITDA: PLN 5.1 million (+53% y/y).
- Operating income (EBIT): PLN 2.5 million (+52% y/y)
- Normalized net profit (excluding deferred tax): PLN 0.4 million (+50% y/y).
- The following items had a significant impact on the net result in Q3::
  - recognition of incubator operating costs using the equity method of PLN 0.1 million
  - exchange rate differences resulting from the valuation of foreign currency loans in the amount of PLN 1.8 million

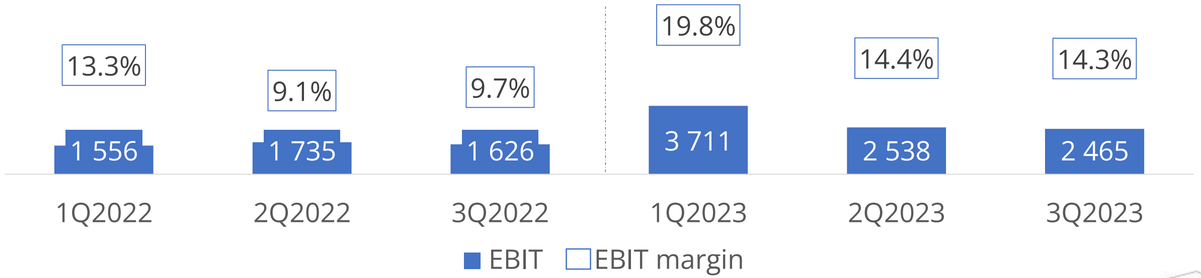
FINANCIAL PERFORMANCE IN Q1-Q3 2023

- EBITDA: PLN 15.2 million (+61% y/y)
- EBIT: PLN 8.7 million (+77% y/y)
- Normalized net profit: PLN 7.6 million (+161%)

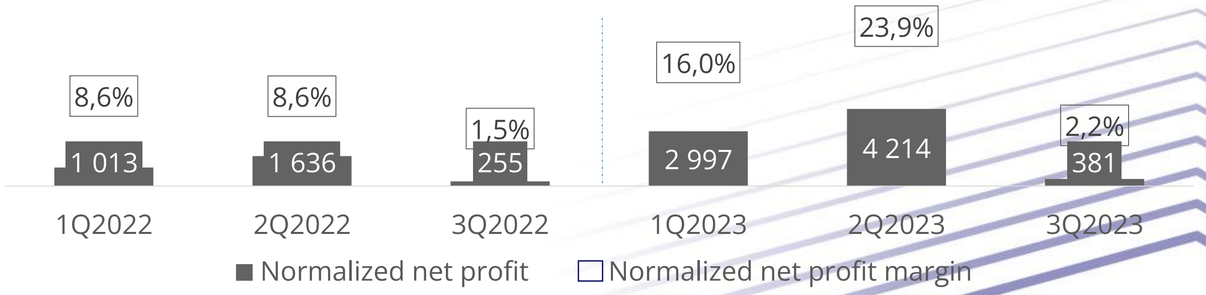
NORMALIZED EBITDA (PLN THOUSAND) AND NORMALIZED EBITDA MARGIN



EBIT (PLN THOUSAND) AND EBIT MARGIN



NORMALIZED NET PROFIT (PLN THOUSAND) AND NORMALIZED NET MARGIN



CASH FLOW

CASH FLOW IN Q1-Q3 2023

- Cash flows from operating activities: reduced level of inventories and increased level of receivables and liabilities
- Cash flows from investing activities: lower revenues from received subsidies (PLN 12.6 million) and lower investment expenses (PLN 21.9 million)
- Cash flows from financial activities: PLN 6.2 million received and PLN 7.9 million of capital installments and PLN 1.7 million of interest repaid

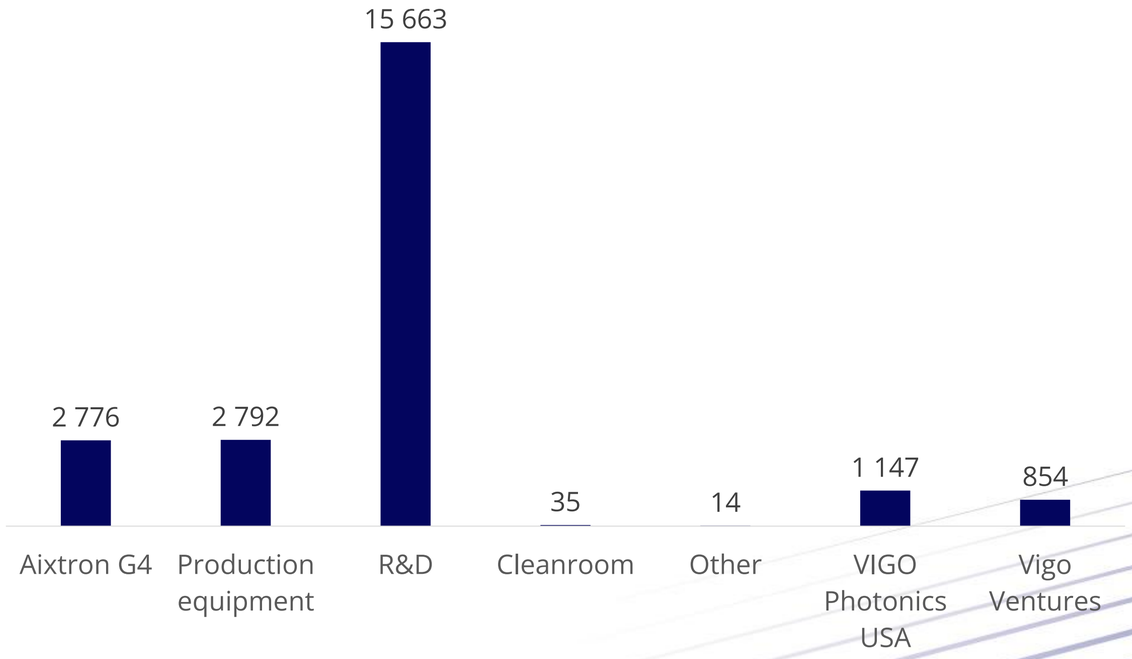
CASH FLOW STATEMENT [PLN THOUSAND]	Period of: 01.01.2023 30.09.2023	Period of: 01.01.2022 30.09.2022
OPERATING ACTIVITY		
Gross profit (loss)	**7 681**	**2 950**
Total adjustments:	**7 201**	**3 094**
Amortization and depreciation	9 054	6 656
Change in provisions	393	19
Change in inventories	-1 660	-7 043
Change in receivables	1 828	5 400
Change in liabilities, excluding loans and borrowings	174	396
Other	-2 590	-2 334
Income tax (paid) / returned	-89	-37
A. Net cash flows from operating activities	**14 793**	**6 007**
INVESTMENT ACTIVITY		
Inflows	**12 616**	**15 645**
Funding received	12 601	15 338
Proceeds from the sale of fixed assets	15	232
Proceeds from the sale of shares		75
Outflows	**-21 853**	**-41 857**
Purchase of intangible assets and tangible fixed assets	-6 451	-23 358
Expenditure on acquisition of shares	-845	-2 136
Outlays on development work in progress	-14 518	-16 397
Loans granted	-40	35
B. Net cash flows from investment activities	**-9 238**	**-26 211**
FINANCIAL ACTIVITIES		
Inflows	**6 223**	**26 957**
Credits and loans	6 223	26 957
Outflows	**-9 612**	**-10 888**
Repayment of credits and loans	-7 850	-9 699
Interest and commissions	-1 736	-1 010
Leasing charges	-27	-180
C. Cash flows from financial activities	**-3 389**	**16 069**
D. Total net cash flows	**2 167**	**-4 136**
G. Cash at the end of period	**4 434**	**2 357**

CAPITAL EXPENDITURE

CAPEX IN Q1-Q3 2023

- CAPEX in Q1-Q3 2023 amounted to PLN 23.3 million (accrual basis), of which the most important expenses concerned:
  - R&D expenses: PLN 15.7 million,
  - new MOCVD Aixtron reactor: PLN 2.8 million,
  - production equipment: PLN 2.8 million,
- Investment expenditure plan in 2023: PLN 33.7 million

CAPITAL EXPENDITURES INCURRED IN 1Q-3Q 2023 (PLN THOUSAND)



NEW FINANCING FOR R&D REGARDING CASCADE TECHNOLOGY OF INFRARED DETECTORS AND MODULES

VIGO ON THE LIST OF PROJECTS TO BE FUNDED IN NEARLY PLN 9.4 MILLION UNDER THE FIRST CALL FOR THE COMPETITION OF THE SMART PATH OF THE EUROPEAN FUNDS FOR A MODERN ECONOMY PROGRAM*

- Project name: Long-wave cascade detectors for spectroscopy and FSO
- VIGO eligible costs: PLN 14.0 million
- Co-financing for VIGO: PLN 9.4 million (67.1% of the total costs eligible for support)Duration of the
- Project and funding: 36 months; implementation will start on January 1, 2024

- Project work
  - implementation of the R&D module which will include industrial research and development work
  - development of technology for cascade infrared detectors and detection modules
- Awaited results
  - new products in the form of a family of sensors: cascade detectors made of III-V materials with an active area made of type II superlattices, optimized for the long-wave infrared range ≥ 10.6 µm, operating without cryogenic cooling, and detection modules based on them
- New products intended mainly for foreign markets for manufacturers of optoelectronic systems. The final result of the project will be the development of all stages of detector technology.

NOWE FUNDUSZE EUROPEJSKIE

ŚCIEŻKA SMART

*A positive assessment of the project does not mean concluding a contract or granting funding. After completing the project evaluation process, PARP has now started verification activities related to granting co-financing for positively assessed projects.

VIGO PHOTONICS

OUTLOOK

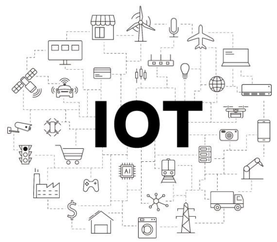
FURTHER DEVELOPMENT ON A WAVE OF LONG-TERM MEGATRENDS CREATING A STRONG DRIVE FOR VIGO OPERATING DEVELOPMENT

TECHNOLOGY TRENDS

SYSTEM MINIATURISATION

Miniaturization and integration are the future of IR in mass applications

INTERNET OF THINGS (IoT)



Explosion of chip applications in the IoT

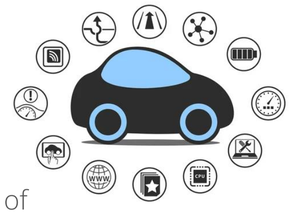
- USD 114 bn - estimated value of the IoT sensor market in 2025
- 15.6% CAGR 2022-2025

CONSUMER ELECTRONICS

IR as the catalyst of *wearable lab-on-chip* development

- USD 186 bn - estimated value of the wearables market in 2030
- 14.6% CAGR 2023-2030

AUTOMOTIVE



The growing importance of IR solutions (LIDAR sensors/ *self driving vehicles*)

- USD 4.5 billion - estimated value of the LIDAR market in 2030
- 28.5% CAGR in 2022-2030

GEOPOLITICAL TRENDS

SECURITY AND DEFENCE

Significant investments as a result of current political tensions - increase in budget spending by Western countries, incl. Poland

- 3% of GDP - planned Polish defense spending in 2024
- EUR 70 bn - planned EU defense spending until 2025

VALUE CHAIN STABILITY IN CHIP PRODUCTION AND DEVELOPMENT OF THE SEMICONDUCTOR INDUSTRY IN EUROPE AND THE USA

Securing chip production in Europe and the US and freeing from the risk of their concentration in Asia, incl. fabless manufacturing. Streams of money from governments in the form of subsidies and tax breaks for the construction of foundations in Europe (EUR 45 bn)* and the USA (USD 280 bn)*.

- USD 1,033 bn - estimated value of the global semiconductor market in 2031
- 20-30% - target of EU share in the global semiconductor market by 2030 (from 9% currently)

ECOLOGICAL TRENDS

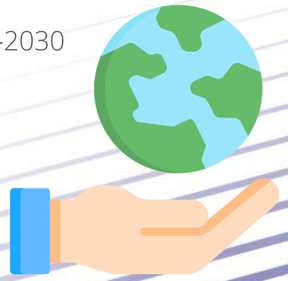
ROHS AND ECOLOGY

RoHS** changes the mid-infrared (MIR) market – introduced i.e. ban on the use of mercury, cadmium, lead in industrial applications. Still a possibility of use in the military, aerospace and large industrial infrastructure.

ENVIRONMENTAL PROTECTION

The growing importance of environmental protection in many industries, incl. air and water quality monitoring, gas analysis, CO_2 emissions.

- USD 33 bn - estimated value of the gas and oil analytics market
- 23.8% CAGR 2022-2030



Sources: Research and Markets, Precedence Research Persistence Market Research * The European Chips Act in UE, the Chips and Science Act in USA, **Restriction of Hazardous Substances

VIGO'S CORE BUSINESS SUPPORTED BY INVESTMENTS INCURRED IN 2019-2022 IS READY FOR DYNAMIC GROWTH

Accelerating the monetization of existing technological achievements thanks to sales support

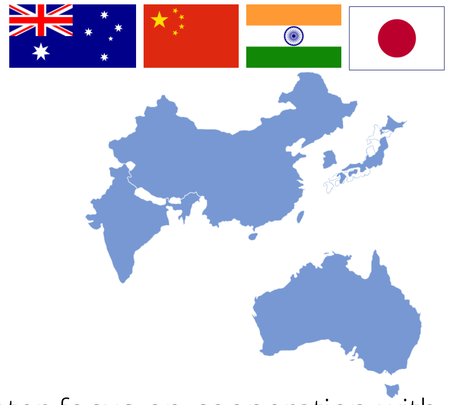
Europe

- Greater focus on growth on key markets through own network of *business development managers*
- Deeper market penetration both *on-premise* and remotely from the office (Poland) to tap more clients

North America

- Acceleration of growth on the North American markets through increased activity of VIGO Photonics US (*technical support* and team expansion)

Asia



- Greater focus on cooperation with distributors and increased emphasis on promoting VIGO's product offering
- Building a tech-suport team for Asian customers

- improve recognition among clients as the leading company in the field of new solutions
- tap more clients and thus expand sales funnel
- effectively converse sales opportunities into sales
- enter into strategic partnerships in key market segments

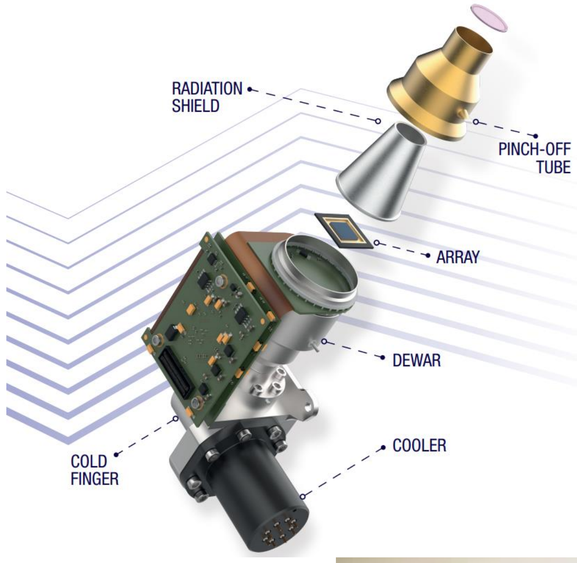
INFRARED ARRAY COVERING THE NEED TO INCREASE SECURITY AND DEFENSE OF COUNTRIES

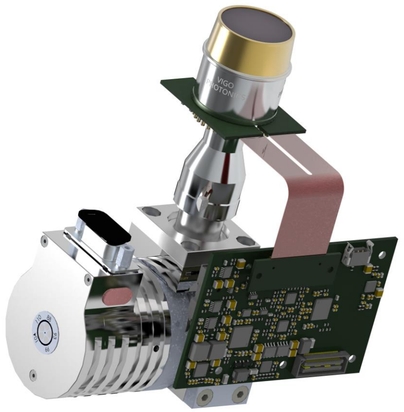
INFRARED ARRAY - GENERAL INFORMATION

- Infrared detector arrays containing hundreds of thousands or millions of active pixels used in the construction of thermal imaging cameras for space and military applications and having a semiconductor layer made of III-V materials (InAsSb - MWIR, LWIR, or InGaAs - SWIR).
- Products based on the same technologies used to manufacture single-element detectors, products tailored to specific customer needs.
- Industries and applications: military, space - detectors for thermal imaging cameras

OBJECTIVES OF THE INITIATIVE

- Developing technology and building competence in the field of manufacturing matrix detectors both cooled (thermal) and uncooled (SWIR InGaAs), epitaxy, high-density processing, ROIC, hybridization, encapsulation.
- Becoming the main supplier of detectors for the Polish army/armament industry, customers outside Poland (industry, space).
- Technology Polonisation and increasing the potential of the Polish army, enabling the export of Polish optoelectronic solutions.





PHOTONIC INTEGRATED CIRCUITS (PIC) ADDRESSING THE NEED FOR SYSTEM MINIATURIZATION IN COMMON DEVICES

PHOTONIC INTEGRATED CIRCUITS (PIC) - GENERAL INFORMATION

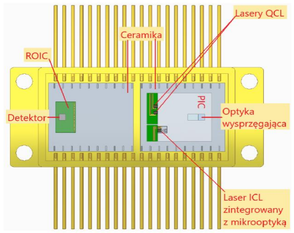
- A miniaturised circuit consisting of multiple optical and electronic components with different functionalities integrated on a common, usually semiconductor, substrate, a single chip.
- A photonic integrated circuit can replace the full functionality of an infrared sensor.

PIC - OBJECTIVES OF THE INITIATIVE

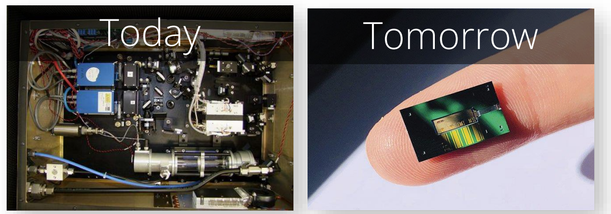
To be the world's first manufacturer of mid-infrared integrated circuits, gain a leading position on the markets for PIC for MWIR and obtain a significant share of the PIC market for SWIR.

- Complete production line (world's first) for PICs in the MIR range (MIRPIC), complete supply chain for MIRPICs.
- Development of optoelectronic systems for infrared photonics - ultimately hybrid PICs.

PIC for MIR scheme



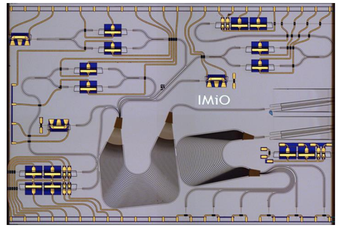
Gas detectors



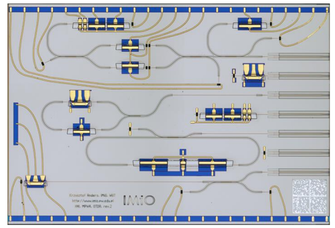
DEVELOPMENT OF THE FIRST MID-INFRARED PHOTONIC INTEGRATED CIRCUIT ON THE MARKET - MIRPIC PROJECT

- Cooperation: Warsaw University of Technology; Łukasiewicz Institute of Microelectronics and Photonics
- Launch: April 2021, lead time: 3 years
- Budget: PLN 29.3 mln, co-financing: PLN 26.6 mln.
- Potential applications: miniature gas sensors (smart cities, intelligent household appliances, automotive); advanced medical devices; wearables (high end)

Over 10 years experience of the new Vigo team in photonic integrated circuit design - over 100 completed PIC projects

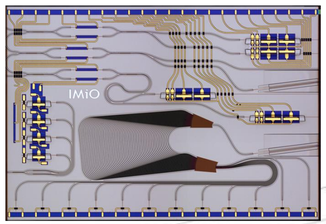


Multi-channel transceiver for free space optics

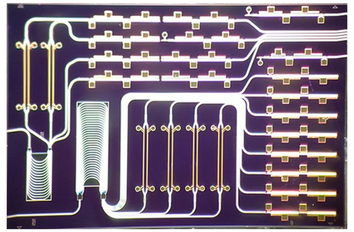


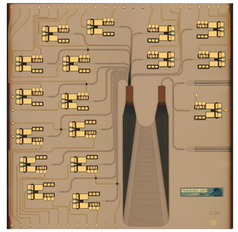
Optical time domain reflectometer

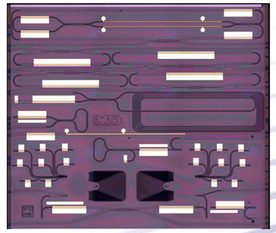

Multi-wavelength laser



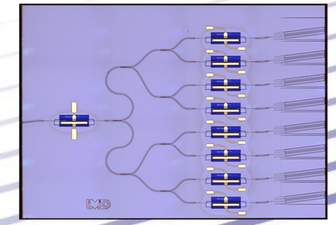
FBG interrogator unit


Multi-channel transmitter for FTTH networks


Spectrometer for FBG sensor interrogator



Discretely tunable laser



Lossless power splitter

VIGO IS AMONG THE EUROPEAN COMPANIES FROM THE ELECTRONICS INDUSTRY TO BE GRANTED FINANCING >EUR 100 MN FOR THE HyperPIC

THE EUROPEAN COMMISSION HAS ACCEPTED AN AMOUNT OF GRANT FOR VIOG PHOTONICS OF UP TO EUR 102.9 MN TO CARRY OUT THE HYPERPIC PROJECT. THE FINAL DECISION ON RELEASING FINANCING AND ITS VALUE WILL BE DETERMINED WITHIN THE FRAMEWORK OF A CONTEST PROCEDURE RELATING TO THE PROGRAMME: FINANCING FOR THE MODERN ECONOMY

GOAL OF HyperPIC PROJECT

- Introduction to the market, as the first company in the world, photonic integrated circuits (PIC) based on mid infrared
- Construction of a complete production line (first in the world) for PIC in the range of mid IR (MIRPiC)
- Building of a complete supply chain for MIRPIC circuits

SCOPE

- Development and implementation of technology allowing for integration of active and passive elements comprising an integrated circuits – a platform to build a various types of integrated circuits to be used in a wide range of applications
- Construction of state-of-the art foundry enabling to commence production of chips working in mid and long infrared in a mass scale

TIMING (2023-2030)

1. Research-Development-Innovation (RDI) Phase – 2023-2027
2. First Industrial Development (FID) Phase – 2023-2026 (construction of a foundry), 2027-2030 (launching of production based on developed technology
3. Mass production phase – since 2031

BUDGET

EUR 253.4 mn – total qualified costs (R&D expenditures, CAPEX on production lines and operating expenses after launching production).

FINANCING

A grant within confines of IPECI Microelectronics II (EUR 102.85 mn) as well as additional financing sources such as: equity and own funds, debt financing and other sources (ie. strategic project joint venture (JV) and off-balance sheet financing including project finance.

EUROPEAN PROJECT - IPCEI

The HyperPIC Project is a part of the European *project Important Projects of Common European Interest in Microelectronics and Communication Technologies* (IPCEI ME/CT) with a goal of strengthening of European microelectronics industry. Apart from VIGO Photonics, the most important semiconductor companies in Europe are participating in IPCEI ME/CT project. The total amount of state aid amounts to 8 bn EUR.

VIGO PHOTONICS IS A PART OF IPCEI, ONE OF THE MOST IMPORTANT ISTRUMENT TO SUPPORT A NEW ECONOMIC AND COMPETITION POLICY OF THE EUROPEAN UNION

IPCEI ME/CE IS ONE OF THE MOST IMPORTANT EUROPEAN INSTRUMENTS THAT SUPPORTS THE WHOLE EUROPEAN MICROELECTRONICS, PHOTONIC AND SEMICONDUCTOR INDUSTRIES

Commission approves up to €8.1 billion support by 14 Member States for an IPCEI in Microelectronics and Communication Technologies ("IPCEI ME/CT")

SENSE — novel sensors to collect data

THINK — chips to process and store data

ACT — microelectronic systems performing actions

COMMUNICATE — systems for fast, secure and reliable transmission of information

- Contributes to key **EU objectives**
- Boosts breakthrough **innovation**
- Generates **positive spill-over effects** across the EU
- Ensures **proportionate public spending**
- Ensures **fair competition**

- **14 Member States:**
- **56 companies** of all sizes
- **68** research, development and first industrial deployment **projects**
- **30+ associated partners**
- Around **600 indirect partners** all over Europe
- Expected to unlock **€13.7 billion** of private investments

Wider IPCEI ME/CT Ecosystem

S SENSE · T THINK · A ACT · C COMMUNICATE · Research Organisation

Direct Participants

ADVA C	Airbus C	Aledia A	Analog Devices A	ASML T
AT&S STAC	AVL STAC	Bizzcom T	Black Semiconductor T	
Bosch STAC	Carl Zeiss T	Codasip CT	Cognitive Innovations C	
Cologne Chip T	Continental Automotive AT	Continium Technologies CT		
EEMCO A	Elmos Semiconductor STA	Ericsson C		
Ferroelectric Memory ST	Freiberger Compound Materials AC			
GlobalFoundries TAC	Infineon SA	Innova IRV Microelectronics C		
KDPOF SC	Lynred S	MEMC A	Menarini Silicon Biosystems S	
mi2-factory A	Mycroft Mind ST	Nearfield Instruments T	Nokia TC	
NXP STAC	Openchip T	Orange C	OSRAM Opto Semiconductors S	
Renault A	Rohde & Schwarz C	Semidynamics Technology Services T		
Semikron Elektronik TA	SGL Carbon A	SIAE Microelettronica C		
Soitec STAC	STMicroelectronics STAC	Sunlight Group T		
Tachyum TC	Teledyne STC	ThermoFisher ST	Trumpf Photonic SC	
United Monolithic Semiconductors C	Valeo A	Vigo Photonics S	Vitesco A	
Wacker Chemie STC	X-FAB STAC	ZF Friedrichshafen A		

Associated Participants

Akronic C	Analog Devices T	Ansys Hellas C	Applied Materials ST	
ATEP-AMKOR STAC	BelGan STAC	Beyond Semiconductor C		
CEA STAC	DAS Photonics C	Derivados del Flúor STC		
Elaphe Propulsion Technologies A	Fondazione Bruno Kessler S			
IMT Bucharest A	iPronics C	Latvijas Mobilais Telefons		
Murata STA	Nanometrisis T	Nordic Semiconductor T		
NXP STAC	OPTOI S	PIC advanced C		
Silicon Austria Labs SAC	SINTEF S	Soitec SAC		
Swissbit Germany	Tungsram	UJP Praha		
VLC-Photonics	Vodafone C	Wooptix		

Around 600 indirect partners

VIGO PHOTONICS

SUMMARY

OUTLOOK

CONTINUE TO EXECUTE THE 2023 AND 2026 STRATEGY WITH A FOCUS ON STRATEGIC INITIATIVES AND PRODUCTION EFFICIENCY BASED ON VIGO'S UNIQUE TECHNOLOGIES AND ACCELERATE COMMERCIALISATION OF NEW SOLUTIONS IN A FAST-GROWING AND FORWARD-LOOKING PHOTONIC MARKET, SUPPORTED BY NUMEROUS MEGATRENDS

MARKET

- ✓ a number of business opportunities enabling further dynamic growth of operations on the global, intensively developing markets of photonics and mid-infrared sources
- ✓ numerous market megatrends supporting dynamic development: system miniaturization, Internet of Things (IoT), consumer electronics, automotive, environmental protection
- ✓ global trends in securing the value chain in chip production and the development of the semiconductor industry in Europe and the USA, as well as significant investments in security and defense

COMPANY

- ✓ presence at the global forefront of industrial innovation - the company has only 3 direct competitors
- ✓ a unique advantage using an integrated value chain and a full range of product applications for customers from numerous industries, including their customization
- ✓ established market position and brand recognition - over 30 years of experience in the production of semiconductor materials, with a world-class R&D department
- ✓ investments made in recent years allow for long-term scaling of production

STRATEGY

- ✓ implementation of an ambitious development strategy addressing market changes and challenges in the long term, using a unique advantage in the value chain that will move VIGO to a higher utility curve (infrared matrices, PIC)
- ✓ active sales development and acquisition of new customers, including a growing portfolio of orders
- ✓ an appropriate level of investment in R&D and infrastructure in order to maintain a strong market position
- ✓ investments in innovative projects through the VIGO Ventures ASI fund

VIGO PHOTONICS

Q&A

VIGO PHOTONICS

THANK YOU FOR YOUR ATTENTION

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