



THE LEADER IN
IR TECHNOLOGY

July 2020



AGENDA

1. About us
2. Mid-IR Market
3. VIGO 2020+ Strategy
4. Operational & financial results

ABOUT US



VIGO System S.A. is a photonics semiconductor company.

We are the global leader in the photon mid infrared detectors market.

Producer of the highest quality epiwafers for photonics and microelectronics applications.



33

years in the
market



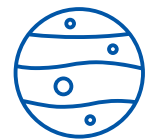
165

employees



6500 m²

of production area



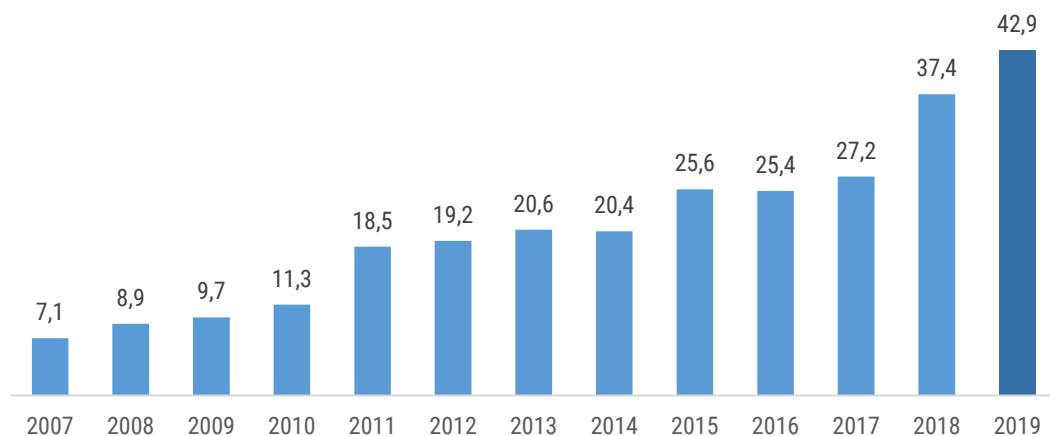
6

detectors
on Mars

ABOUT US



// Revenues [m PLN]



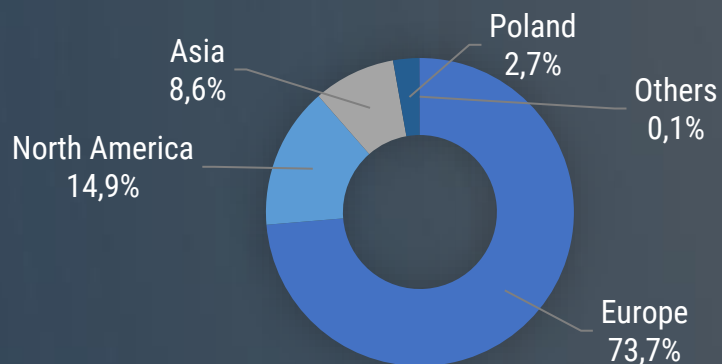
// Development

- › Over **30 years** of continuous technological development and market expansion
- › Supplier of the high-tech components for the most demanding customers (NASA, ESA).

Quality, technology and credibility attracted global corporations:

- › Emerson Electric Co. (industrial gas analysers),
- › Safran (optoelectronics systems),
- › Gasmet Technologies (emissions monitoring),
- › Caterpillar (railway sensor systems)

// Market split 2019



ABOUT US



// Vertically integrated producer of photonics devices (Mid IR detectors)

IN-HOUSE FOUNDRY CAPABILITIES EPITAXY & PROCESSING

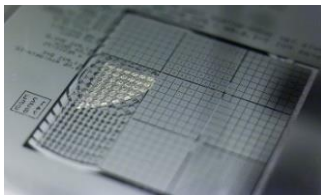
Epi wafers growth
(II-VI – MCT
III-V – InAsSb,
InAs)



Epi wafers III-V
(GaAs, InP)

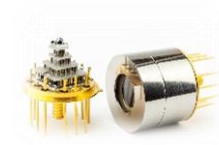


Processing



DETECTORS ASSEMBLY AND PACKAGING

TE cooled
detectors



Uncooled
detectors

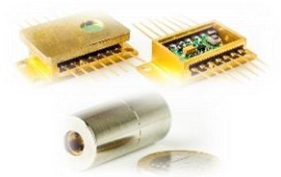


Detection
chips



PHOTONIC MODULES AND SUBSYSTEMS

Integrated
detection
modules



Devices with optics,
digital output and
on-board software



OUR PRODUCTS

// Epitaxial wafers:

We manufacture exceptionally high quality III-V epitaxial structures for use in sophisticated electronics such as lasers, photodetectors, transistors, photovoltaic cells and other devices. As one of the few companies on the market, we offer a broad range of high quality epi-wafers, which can be produced both in large volumes as well as in small test batches.

GaAs
based products

AlGaAs/GaAs	<ul style="list-style-type: none"> • QW edge emitting lasers • VCSELs • FETs, HEMTs, Schottky diodes • varactors
GaAsP/GaAs	<ul style="list-style-type: none"> • strained QW edge emitting lasers
InGaAsP/GaAs	<ul style="list-style-type: none"> • QW lasers 808nm
InGaAs/AlGaAs/GaAs	<ul style="list-style-type: none"> • strained QW lasers
InAs/GaAs	<ul style="list-style-type: none"> • QD lasers
AlGaAs/GaAs	<ul style="list-style-type: none"> • passive waveguides
Manufactured to specification	

// New department of VIGO System:



// Applications:

- > **Transistors:** HEMT, MESFET
- > **Diodes:** Microwave, Schottky, LED
- > **Lasers:** F-P, QCL, VCSEL

InGaAsP/InP	<ul style="list-style-type: none"> • strained or matched QW edge emitting lasers and SOAs 1300 - 1600nm
InGaAs/InP	<ul style="list-style-type: none"> • QW edge emitting lasers
InGaAsP/InP	<ul style="list-style-type: none"> • VCSEL structures
InAlGaAs/InP	<ul style="list-style-type: none"> • edge emitting and VCSEL structures
InGaAsP/InP	<ul style="list-style-type: none"> • passive devices
InGaAs	<ul style="list-style-type: none"> • photodetectors
InAlAs/InGaAs/InP	<ul style="list-style-type: none"> • HEMTs
Manufactured to specification	



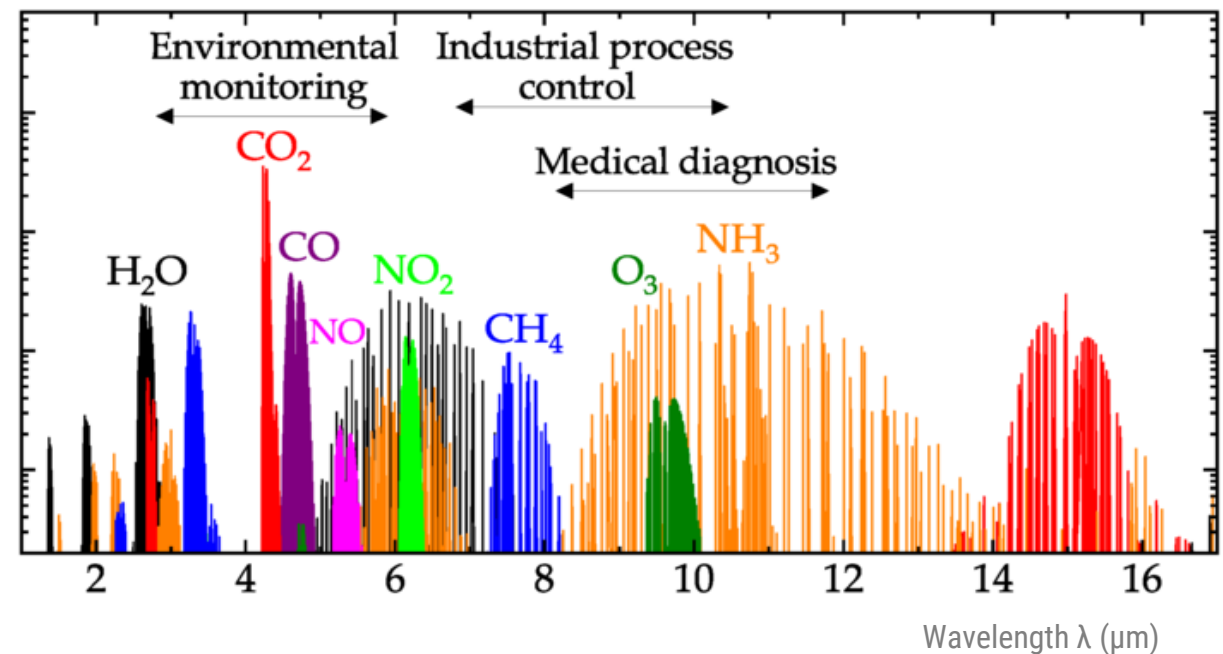
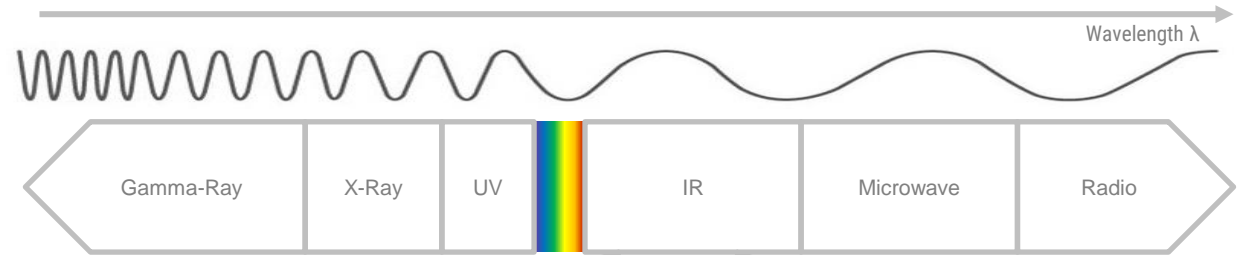
// Mid IR Market

> Main applications

- > Fast temperature measurement (ns) – allowing accurate measurements at high velocities
- > Analysis of gases and liquids

> Markets:

- > **Environmental monitoring** (emission monitoring, detection of hazardous substances, air and water quality measurement)
- > **Industry** (industrial processes control, laser power control, quality inspection, sorting, lacquer thickness measurement)
- > **Railway automation systems** (hotbox detection, fire detection)
- > **Security and defence** (detection of laser range-finders and laser aiming systems, intelligent ammunition, identification of hazardous substances)
- > **Medicine** (non-invasive diagnostics, breath analysis, health monitoring)



// Trends

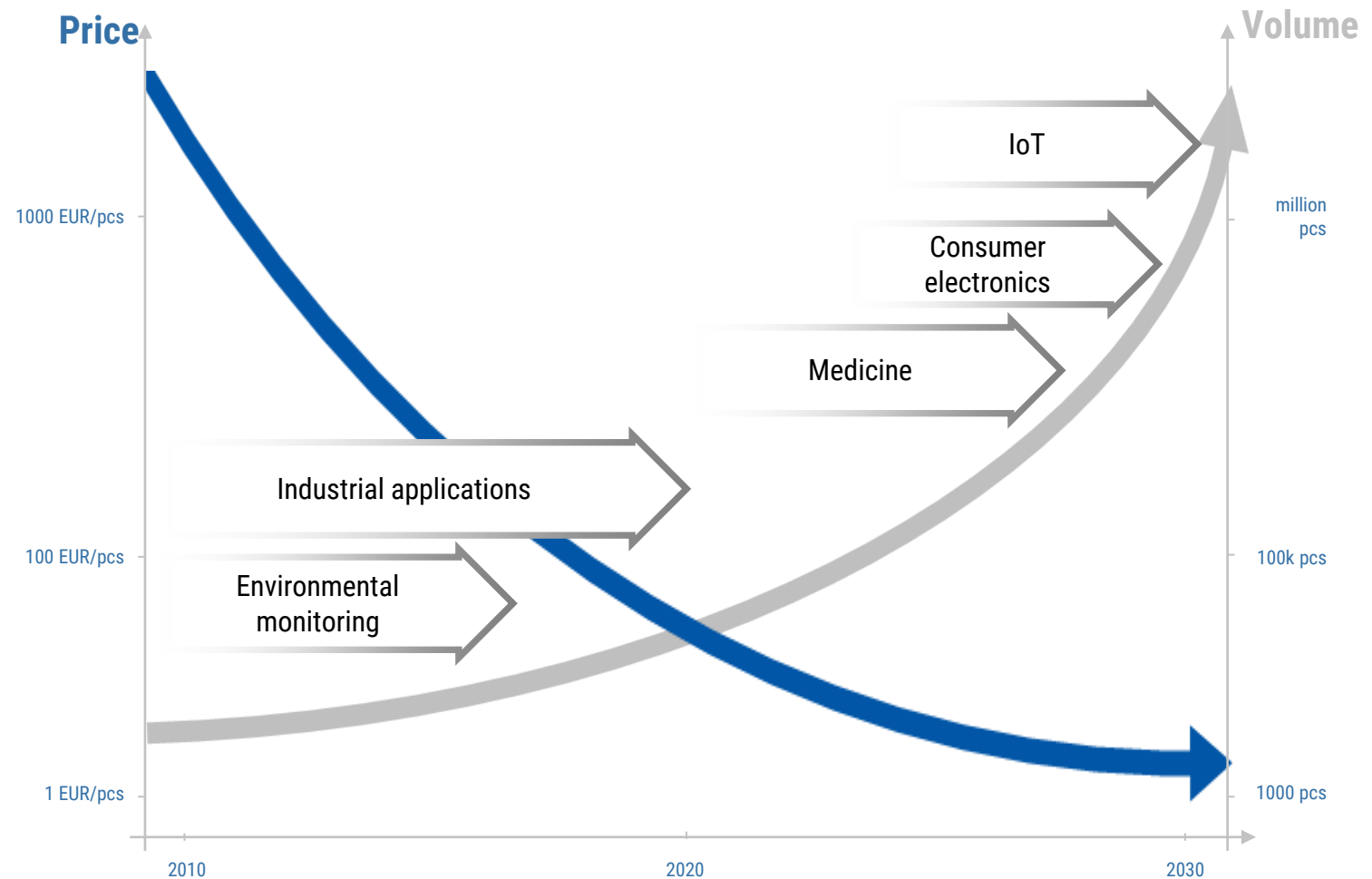
› Prices of components decreasing

- › Prices of mid-IR photon detectors below 100 EUR (without temperature stabilisation) for larger order volumes

› Increasing demand

› Technology development

- › New materials (III-V, T2SL)
- › Integration of various functions in one device
- › First attempts to use mid IR solutions in consumer electronics



Typical user stories



Consumer electronics manufacturer

- High volume production
- Extremely low cost
- Enable to monitor most vital human body signs



Industry 4.0 supplier

- Need for sensitive reliable product
- Sense anything anywhere
- Digital interface
- Easy to calibrate and service



Environmental sensor manufacturer

- Multigas sensors
- Sensitive and reliable
- Small, low power sensor
- Measure air, water and soil
- Working in harsh conditions



HVAC system integrator

- Small, low power, affordable
- Measure indoor air
- Stable and easy to maintain
- Integrated solutions

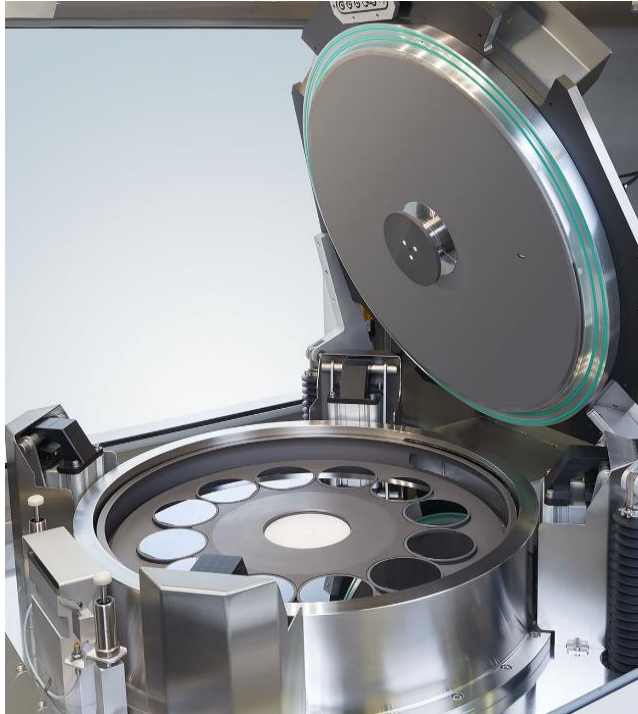


New packaging facility

New assembly and packaging facility.

Capacity of more than 100 ths. detectors a year.

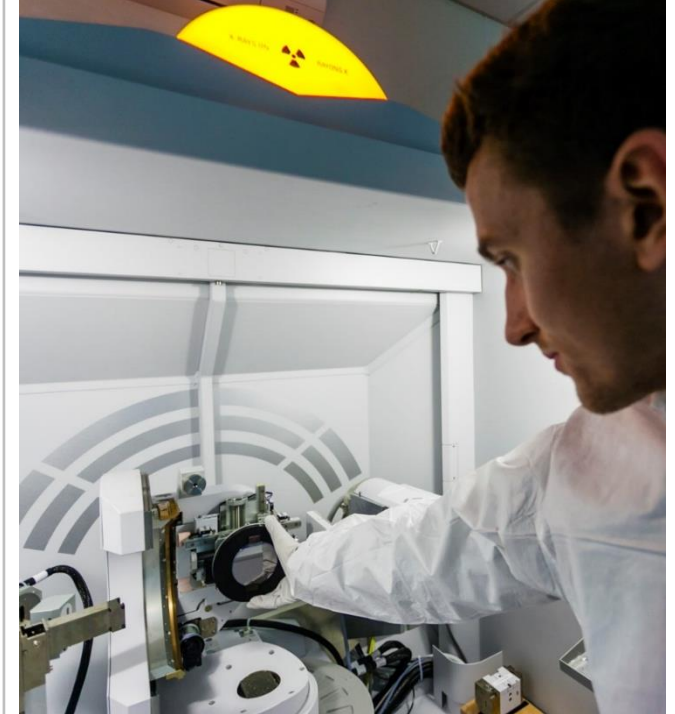
Project completed in 2019.
CAPEX – 9 m EUR.



New epitaxy

New division within VIGO System – high throughput epitaxy. Production of semiconductor materials for photonics and microelectronics applications.

Project completed in 2019.
CAPEX – 4,5 m EUR.



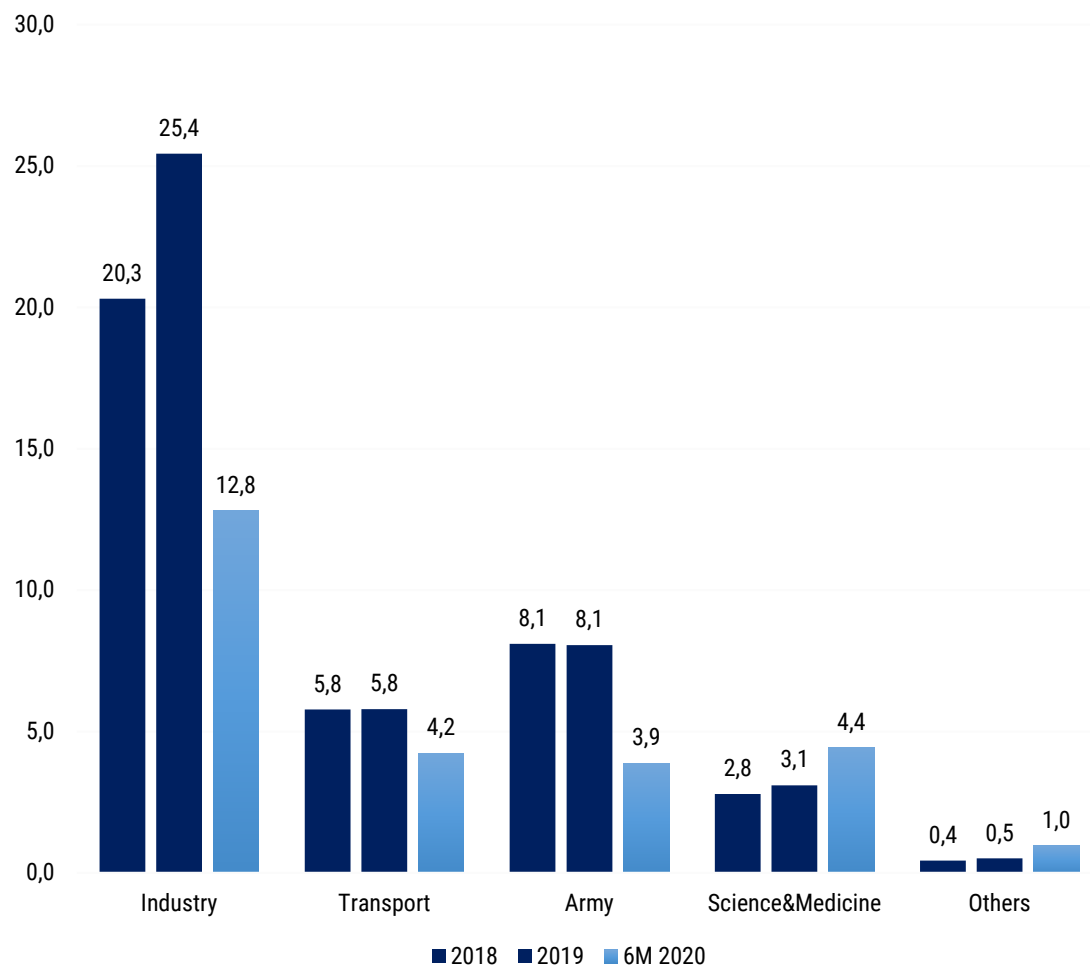
New clean-room facility

New cleanroom facility (700m²) to increase yield and improve production quality.

Project ongoing.
Planned completion in 2021.
CAPEX - 6 m EUR.

FINANCIAL RESULTS

// Revenues by application [mln PLN]

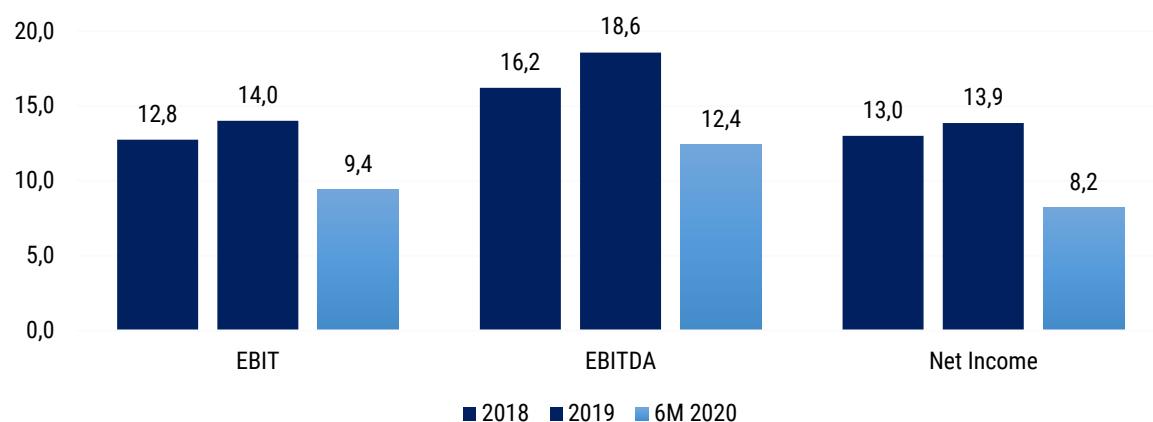


// Comment

- › Significant growth in revenues in all segments (+37% in 2018, +14,6% in 2019, +29% in H12020).
- › Revenues very well diversified among various segments and customers.
- › Significant sales increases in the **industrial segment** (industrial gas analyzers, laser operation control, applications in the semiconductor industry, paint thickness measurements).
- › Sales in the **military** and **rail transport automation expected to increase in 2020**.
- › New prospective customers in the medical segment.

FINANCIAL RESULTS

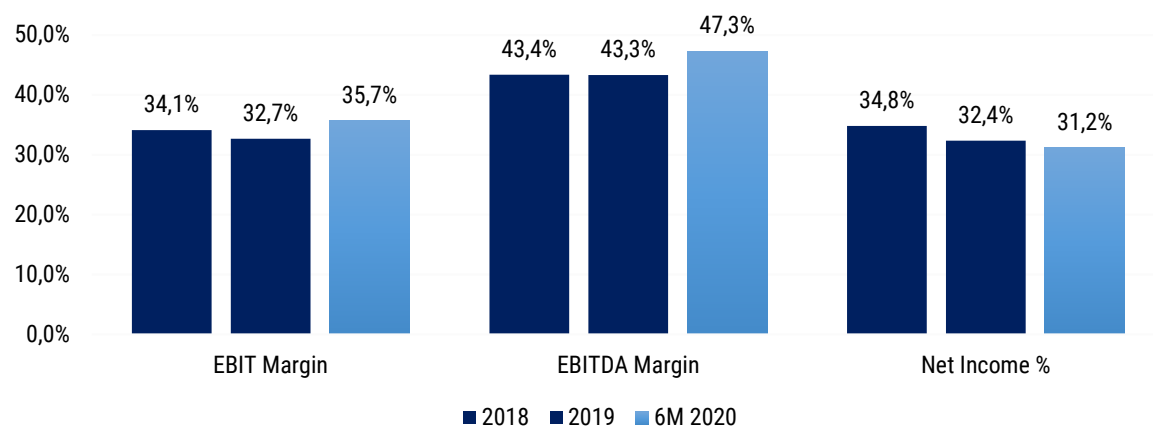
// Financial results [mln PLN]



// Comment

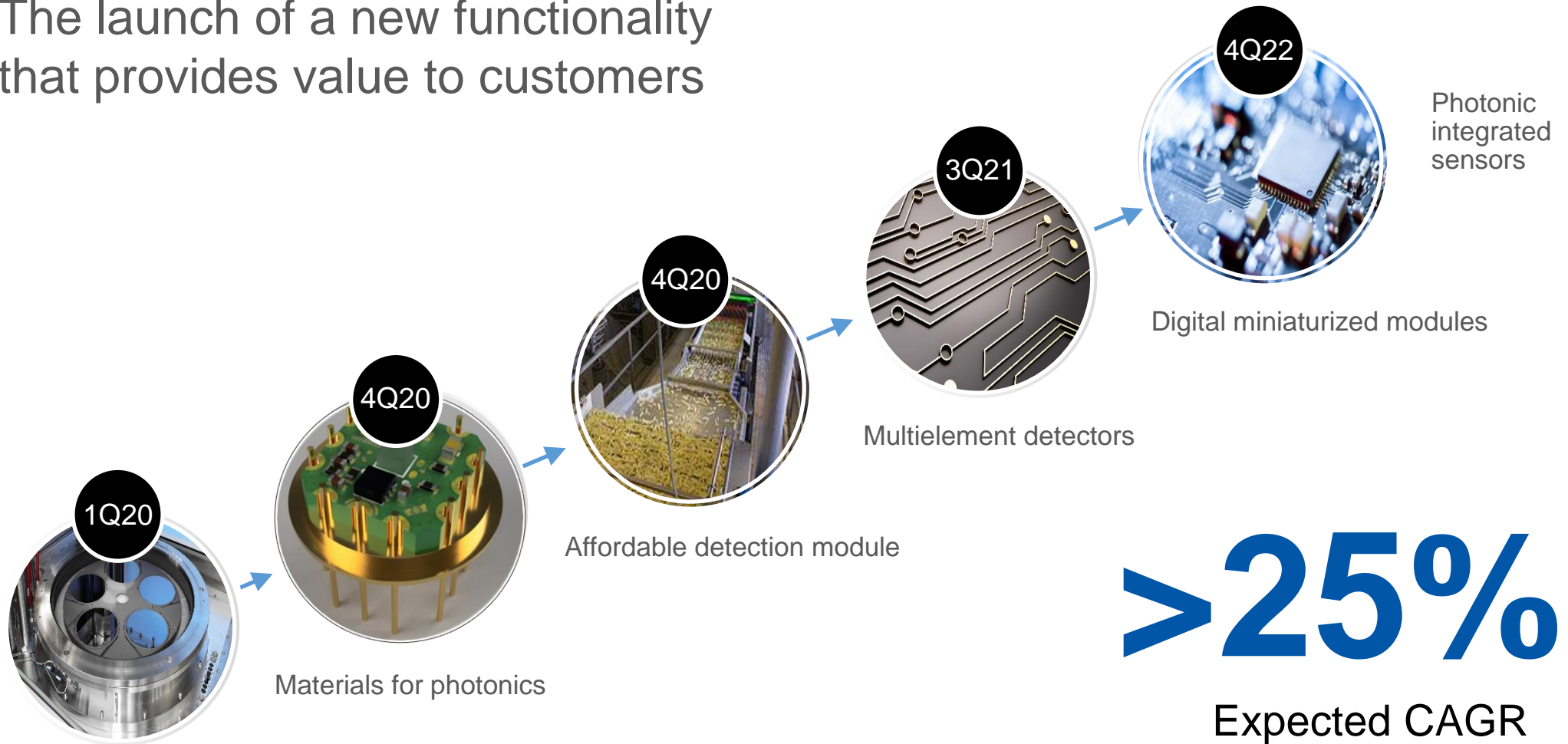
- › Significant increase in operating profit (+ 9.8% in 2019), EBITDA (+ 14.6% in 2019) and net profit (+ 6.6% in 2019). Further growth in 2020.
- › Increasing profit margins (EBIT – 35,7% in H1 2020, EBITDA – 47,3% in H12020).
- › Net profit margin slightly lower due to valuation of EUR credits.

// Margin [%]



New Product Releases

The launch of a new functionality that provides value to customers



>25%
Expected CAGR

>25%

CAGR beyond 2020

50-60%

Gross margin

- Production automation
- Decrease of unit costs
- Optimization of supply chain

<20%

SG&A

- Economies of scale

35-40%

Net profit

- High net profitability through tax exemptions due to operation in Special Economic Zone - at least till 2023.

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Thank you for your attention

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