



<KOMATSU IR-DAY 2022 >

GIGAPHOTON'S GROWTH STRATEGY

December 15, 2022

Gigaphoton Inc.
President and CEO
Katsumi Uranaka

Agenda

- Gigahoton's Business Overview
- Gigahoton's Growth strategy
 - Growth strategy overview
 - (1) DUV Lightsource for Lithography
 - (2) DUV Lightsource for New Business Development
 - (3) Business Development of EUV Lightsource
- Summary



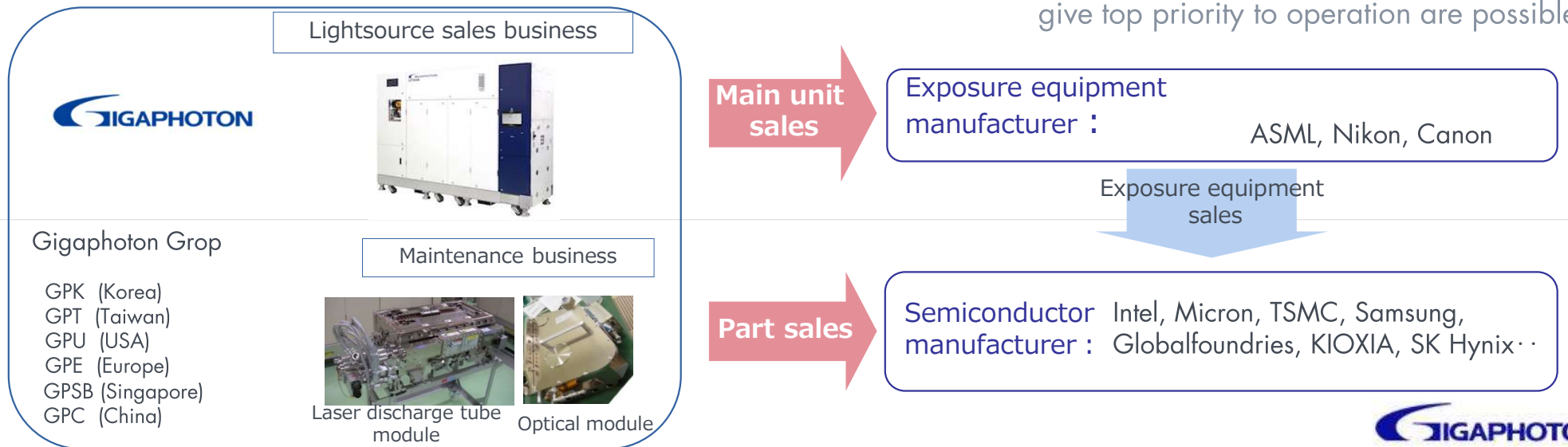
Corporate Overview

Company name	Gigaphoton Inc.
Business	Development, manufacturing, and sale of DUV lightsource used for lithography tools in semiconductor manufacturing and for other uses, and Extreme Ultra-Violet lightsources
Established	2000/8/1
Capital	5 Billion Yen
Stockholders	Komatsu Ltd.
Head Quarters	400 Yokokurashinden, Oyama-shi, Tochigi-ken 323-8558, Japan
President & CEO	Katsumi Uranaka
Employees	1219 (as of April 30,2022)



Business Model of DUV Lightsource For Semiconductor Lithography

- Composite business model of main unit (lightsource sales) and parts (maintenance business).
 - ▶ The main unit is sold to exposure equipment manufactures.
 - ▶ After the main unit is sold, a parts sales (pulse pay-as-you-go) contract is concluded with the semiconductor manufacturer to provide maintenance.
 - What is Pulse Pay-as-you-go? : Billing system based on laser usage(pulse usage x pulse unit price)
 (Gigaphoton Advantage) Stable profits, extended component life directly linked to cost reductions, etc
 (Customer Advantage) Cost management is easy, and maintenance plans that give top priority to operation are possible.



Product Portfolio

Lineup

Semiconductor Lithography

KrF
G60K



ArF dry
GT45A



ArF immersion
GT66A



DUV lightsource for processing
GIGANEX series



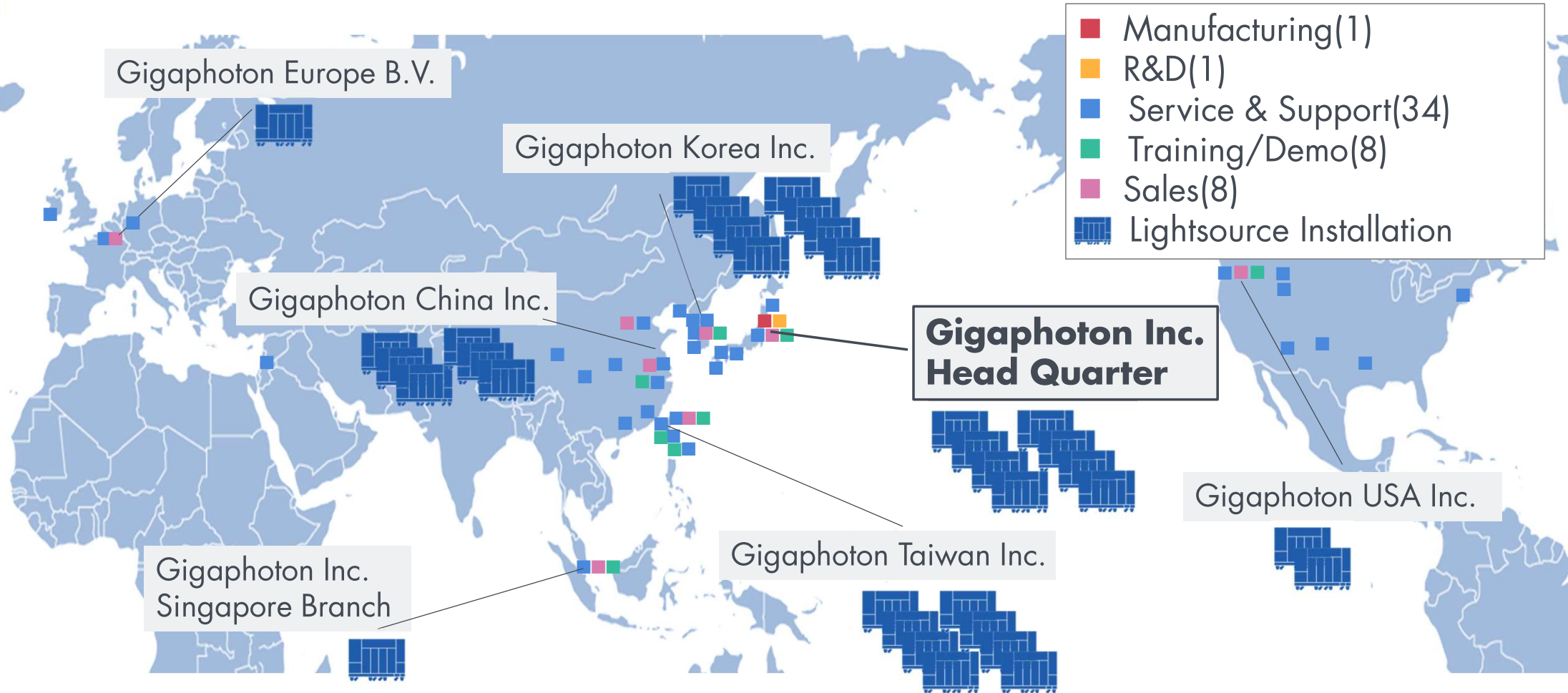
Option
Gas recycling equipment (hTGM)



Gigaphoton's business is maintenance, development, manufacturing, and sales of **lightsource** used in semiconductor manufacturing.

- ✓ DUV lightsource for lithography
- ✓ DUV lightsource for processing (GIGANEX series)
- ✓ Gas recycling equipment (hTGM)

Worldwide Lightsource Installation and Operation



Strategy : Zero Emission Target



Gigaphoton will achieve **Carbon Neutral by 2030**

✓ We are committed to the semiconductor industry's goal of carbon neutral



We will replace a part of fossil-energy to **renewable energy** as using multiple ways (around 30% will be replaced in 2030, and all of them will be replaced in 2050)

- ✓ Hydrogen co-firing power generation,
- ✓ Combined heat and power system,
- ✓ Solar power generation,etc



We will purchase **J-credit** (a kind of Non-fossil Certificate in Japan) to offset greenhouse gas emission (around 70% in 2030 – the rest of replacement of renewable energy)

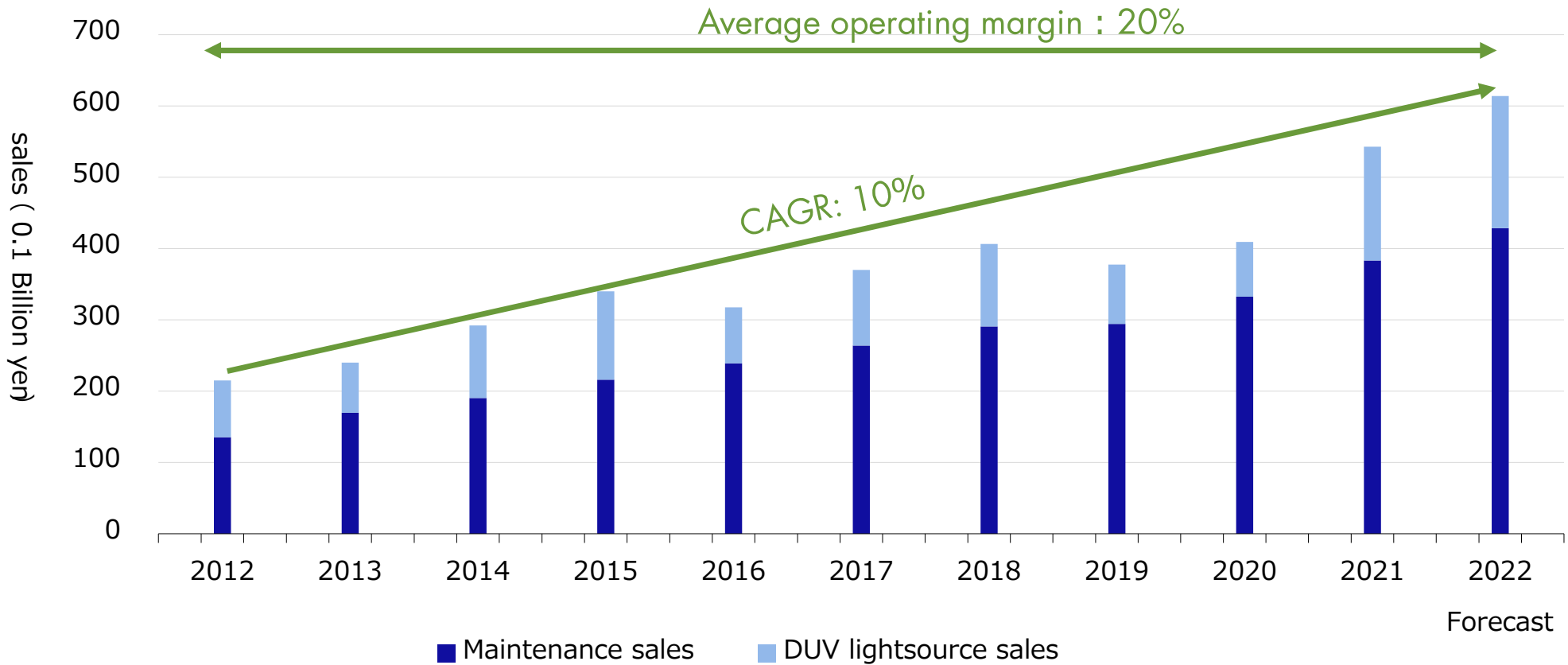


Products to **support customer's Zero Emission activities**

- ✓ Gas recycling equipment (hTGM), electrical power monitors for DUV lightsources and low power consumption lightsource



Sales trends



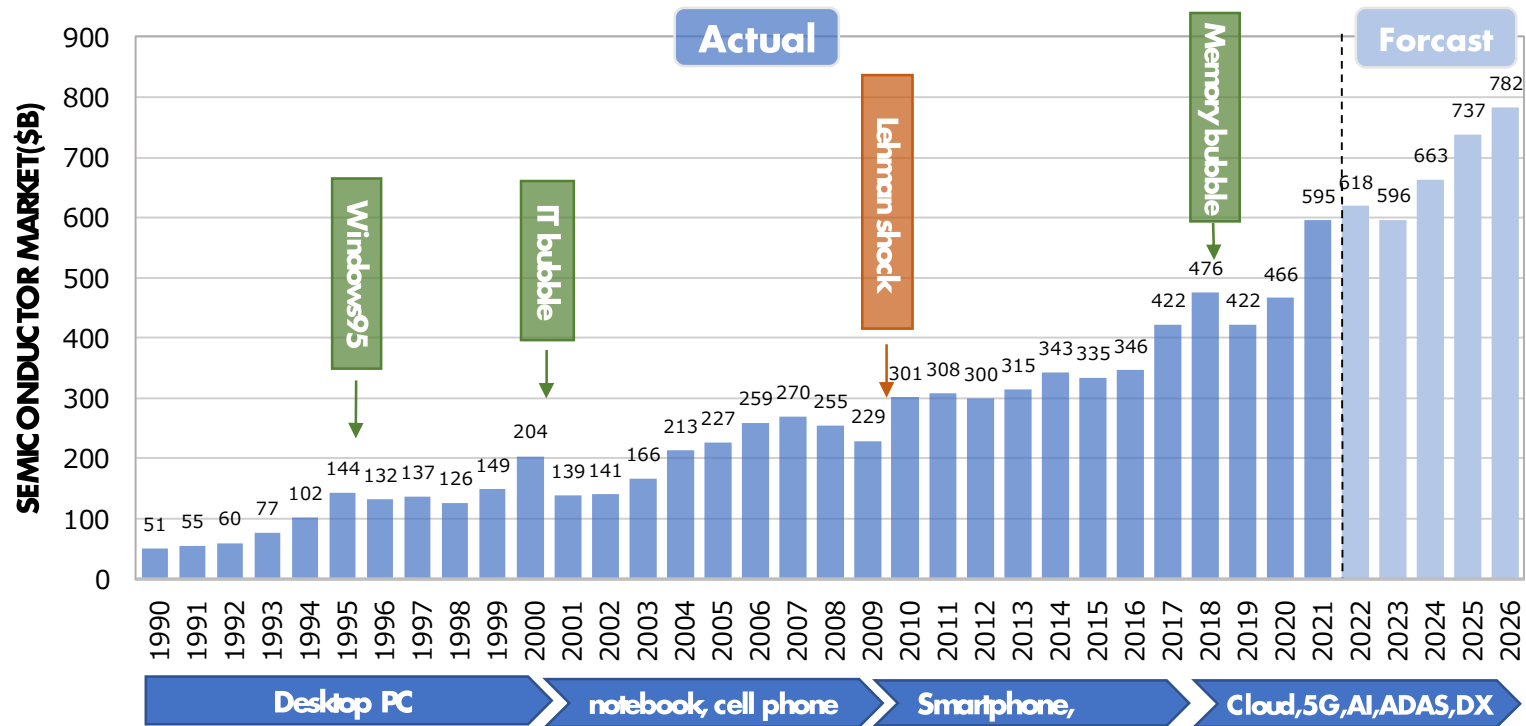
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Semiconductor Market

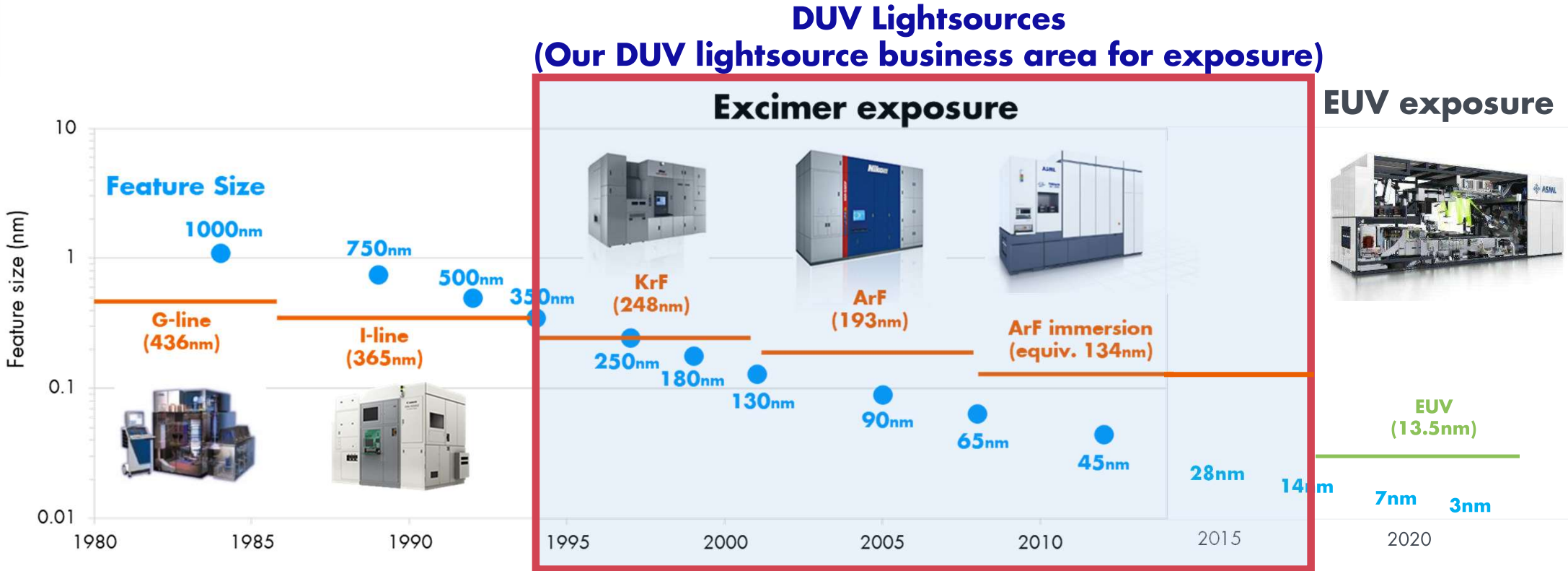
- Demand for semiconductors is currently about \$600 billion and is expected to grow at about 6% per year due to the expansion of IoT and DX.
- In the exposure light source market, in addition to ArF light sources, a significant increase in demand for KrF light sources is expected.



Source : Created by our Company based on Gartner data



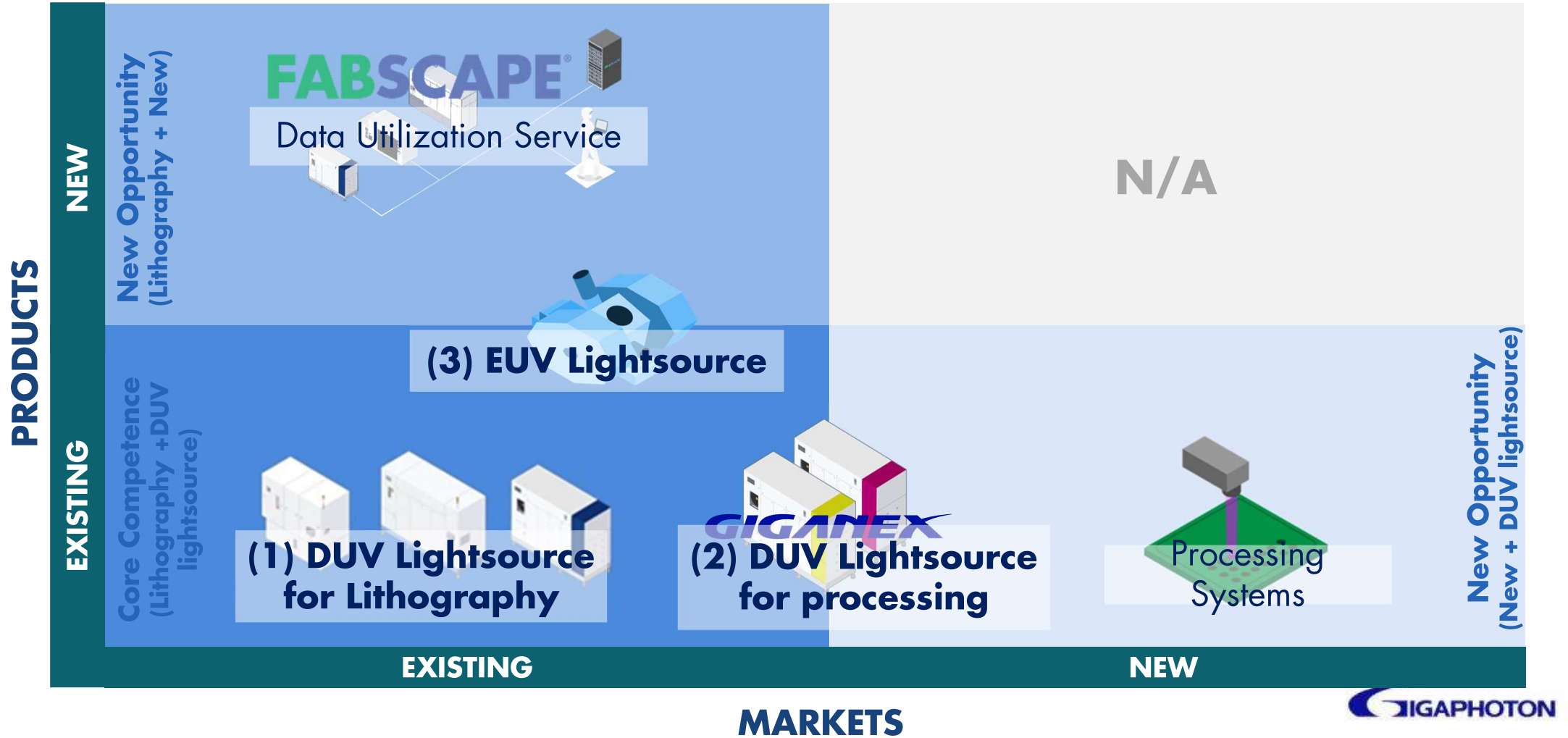
Technological Transition of Lightsources For Exposure



Source: ASML, Nikon, Canon

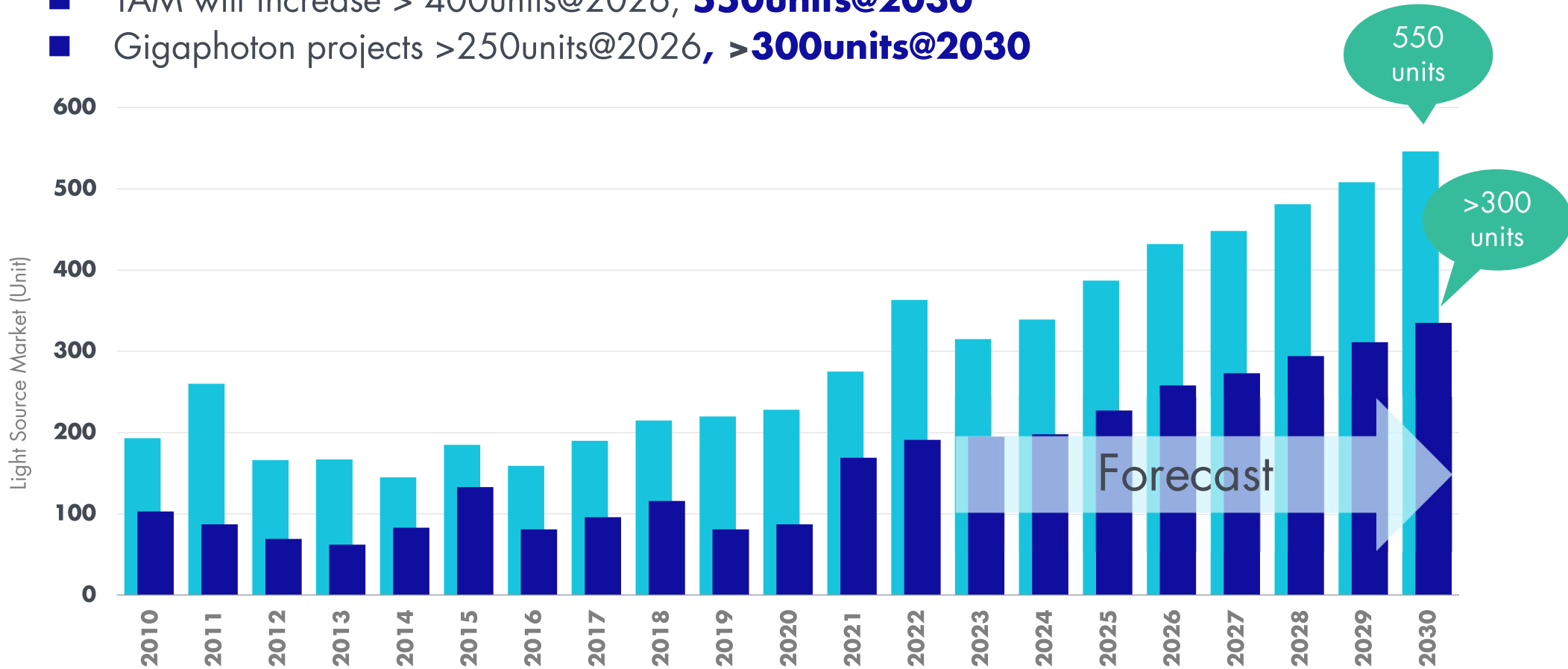


Growth Strategy



(1) DUV Lightsource for Lithography : The Market is Expected to Expand Significantly

- TAM will increase > 400units@2026, **550units@2030**
- Gigaphoton projects >250units@2026, **>300units@2030**

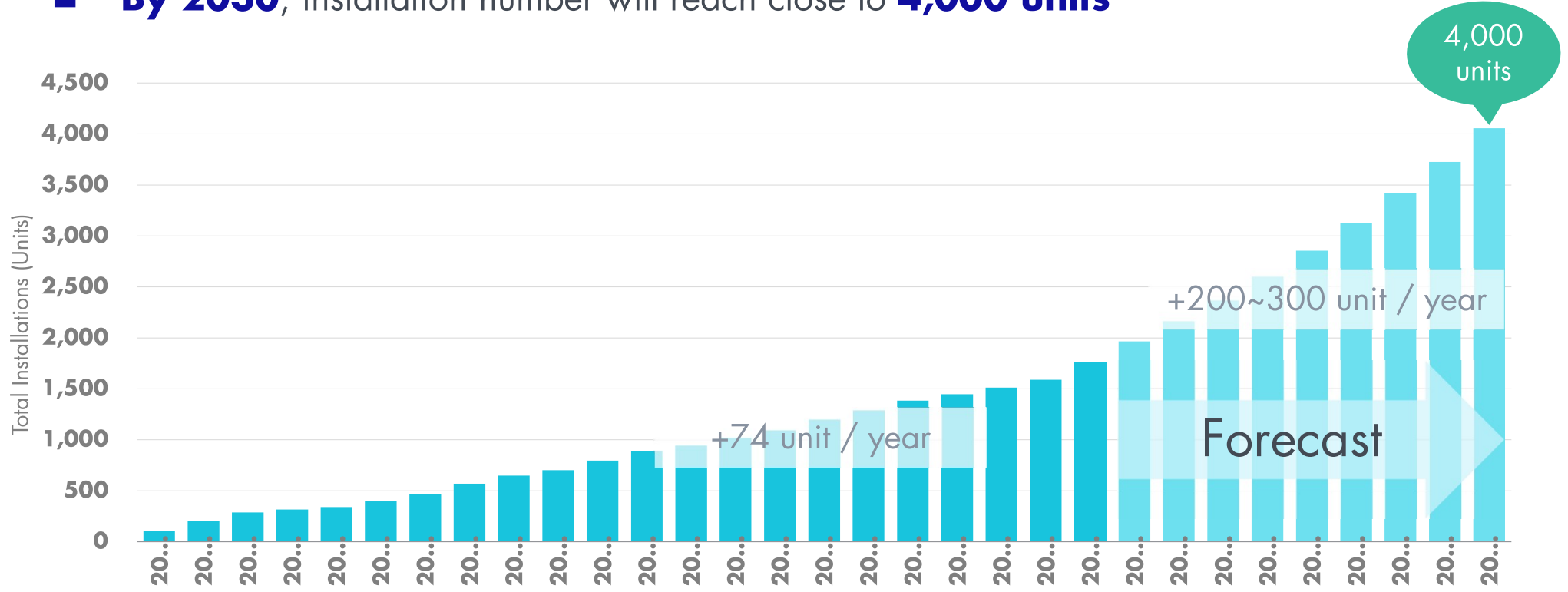


Source: our estimate



(1) DUV Lightsource For Lithography : Installation Status of Gigaphoton's Lighsources

- From 2022, **3x installation growth** is expected
- **By 2030**, installation number will reach close to **4,000 units**



(1) DUV Lightsource For Lithography : ① Competitive products

RAM

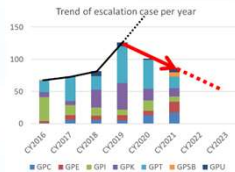
Long Life

Developed long-life consumable parts to extend maintenance intervals and improve availability



AI Preventive Maintenance

Raise uptime to 99.8% by utilizing proactive equipment monitoring/maintenance and AI preventive diagnosis



TECHNOLOGY

High Output

Development of a high-output light source increases equipment throughput and contributes to improved productivity

G60K achieves 1.5 times more output than the previous generation



R&D Investment

High development investment of 10% of sales



SUSTAINABILITY

Gas recycling

Reduction of Neon gas by using together with gas recycling equipment

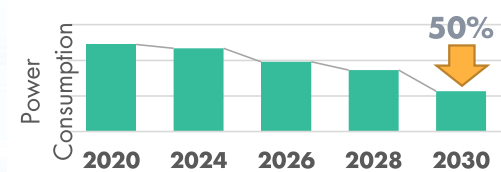


85% recycle ratio

Recycle ratio 85%

Power reduction

Reduce power consumption of DUV light sources



DATA PRODUCT

(1) DUV Lightsource For Lithography : ② Strengthen Production System – Capacity Expansion

Gigaphoton extends production capacity to support semiconductor industry growth.

■ 2021(as of Q3/E)

- ▶ Increased production capacity to **140%**
 - Current facility (full utilization)
 - Optimization of production process
 - Additional capacity
 - Enhancing supply chain management

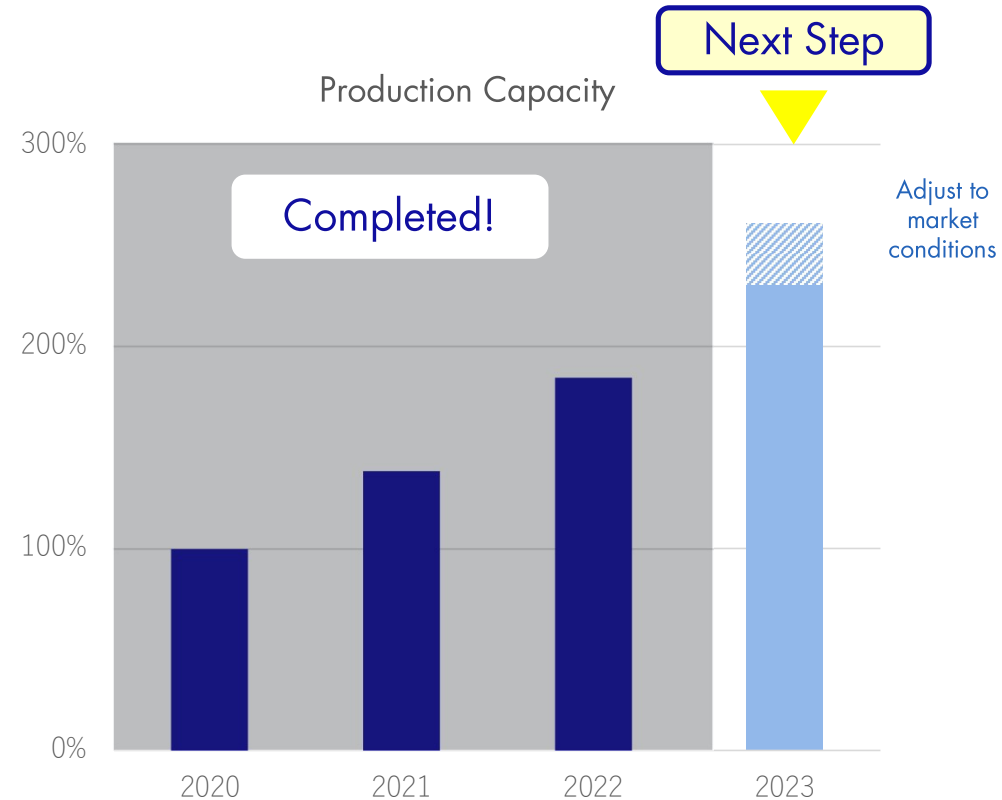
Completed!

■ 2022

- ▶ Increase production capacity to **180%**
 - P3 Annex (on going)

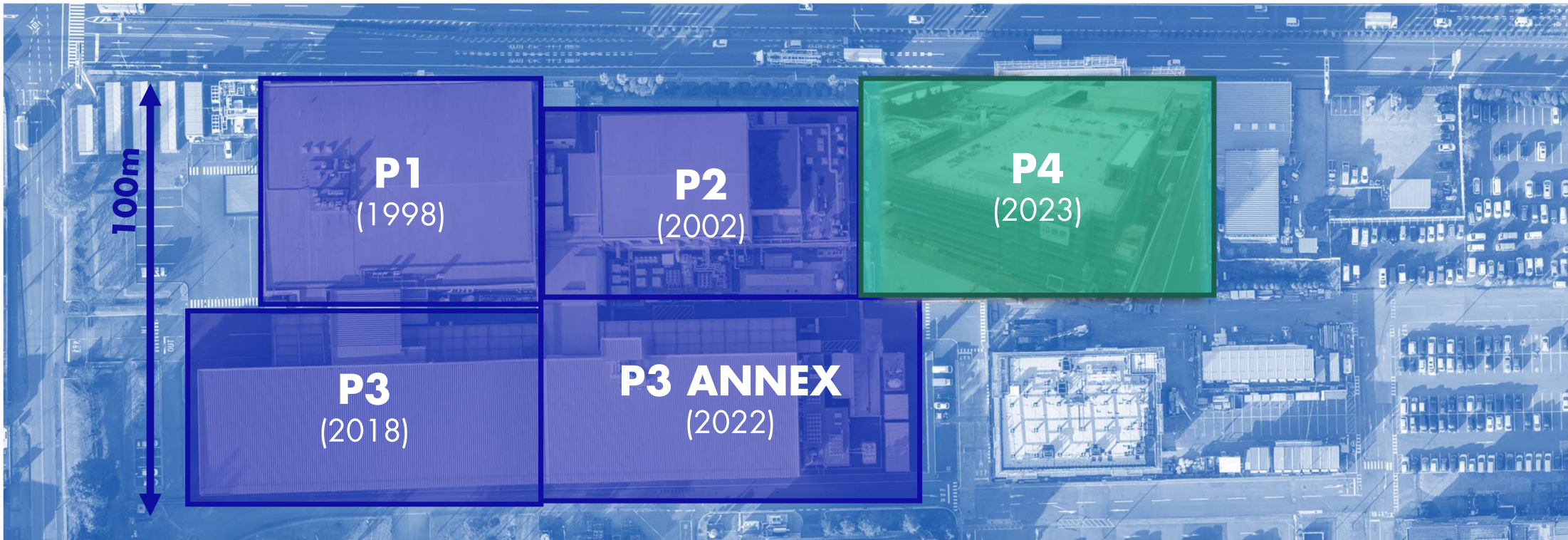
■ 2023

- ▶ Increase production capacity to **230%** to meet market demand.
 - P4 Building



(1) DUV Lightsource For Lithography : ② Strengthen Production System – Building plan

- P4 building will be completed in July, 2023 and Production Capacity will be extended more.



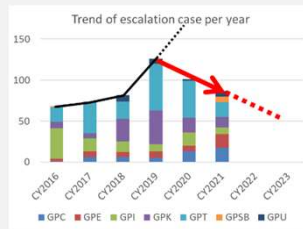
(1) DUV Lightsource For Lithography : ③ Strengthen the service system

Proactive support for higher availability

- Proactive equipment monitoring and maintenance will improve the availability of DUV lightsources.

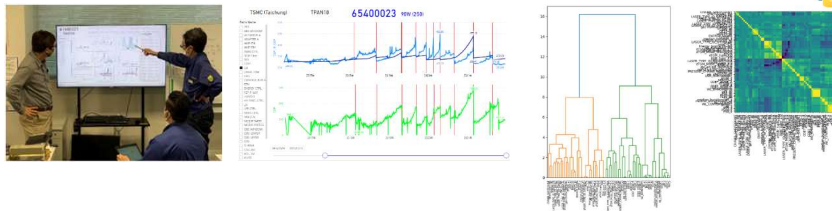
Proactive support overview

- ✓ Proper operation diagnostics
- ✓ Preparation for maintenance based on diagnostic
- ✓ Replace parts at the appropriate time



Health checks for new lightsources

- ✓ Visualization of data enables clear and speedy troubleshooting
- ✓ AI based health checks under development



Improve worldwide FSE's skill

- We are engaged in a variety of initiatives to educate our personnel.

WW trainer's meeting



Skill evaluation for FSE



Video manual

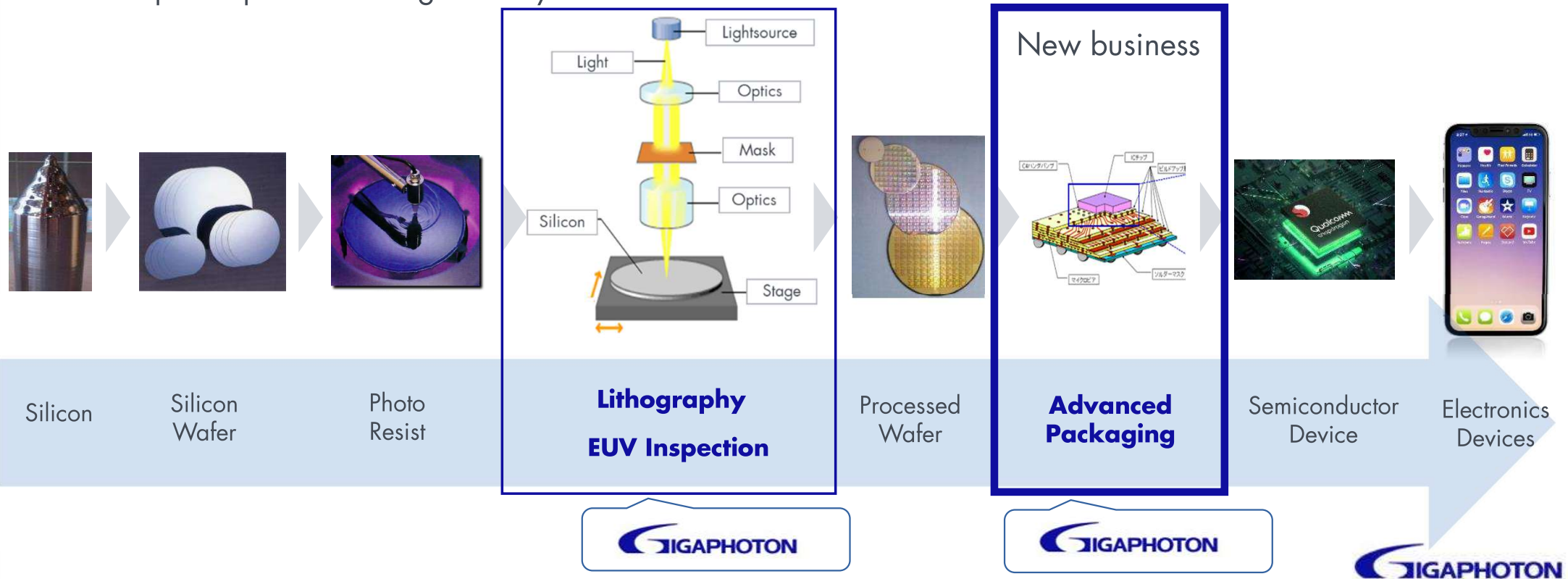


VR/AR training



(2) DUV Lightsource for New Business Development

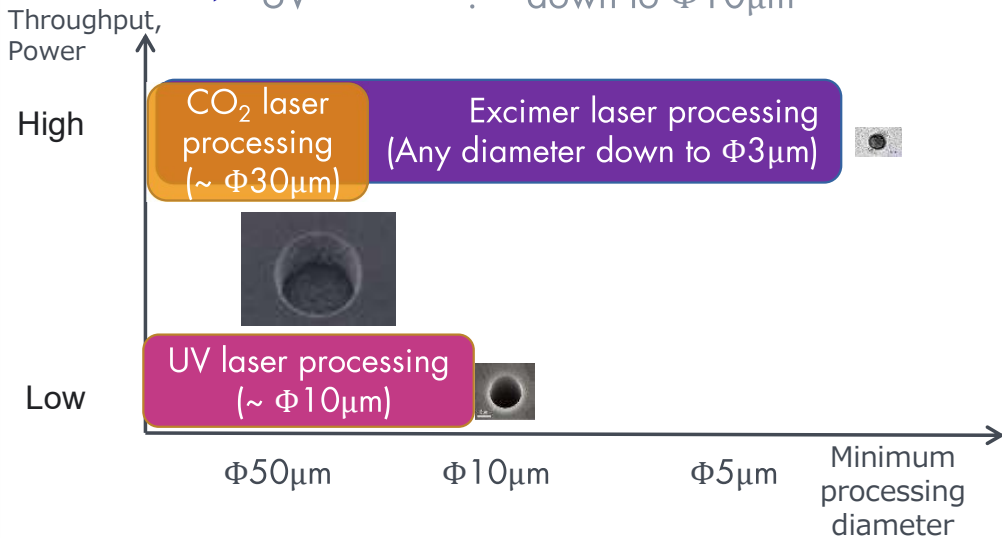
- DUV lightsources have supported semiconductor miniaturization in front-end processes with KrF, ArF, and ArF immersion lightsources.
- Gigaphoton's DUV contribute to semiconductor miniaturization in **advanced packaging processes** where multiple chips are heterogeneously mounted on a substrate.



(2) DUV Lightsource for New Business Development





Advantages of DUV Lightsource

- Excimer laser processing can process any diameter down to $\phi 3\mu\text{m}$ at the same time.
- While CO₂ or UV laser drilling tool can process one diameter in one time.
 - ▶ CO₂ : down to $\phi 30\mu\text{m}$
 - ▶ UV : down to $\phi 10\mu\text{m}$



Target market

- Micro VIA processing is required in the **advanced packaging process** for semiconductors, where multiple chips are heterogeneously mounted on a substrate.
- Based on the processing characteristics of DUV lightsource, we are considering entering a market that will require it around 2024.

Process Name	Intel 7	Intel 4	Intel 3	Intel 20A
Shipment start time	2022	2023	2024 ?	2025 ?
Process node	10nm+	7nm	5nm	2nm
Production name (for data center)				
Required processing diameter (Min.)	$\phi 30\sim 20\mu\text{m}$	$\phi 20\sim 15\mu\text{m}$	$\phi 14\sim 10\mu\text{m}$	

Source: Intel (Xeon Roadmap)



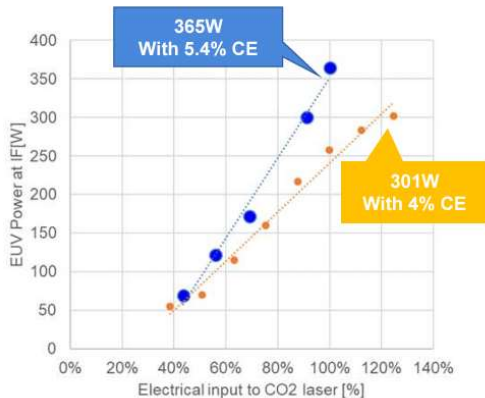
(3) Business Development of EUV Lightsource

Development history

Phase	CY2000	CY2005	CY2010	CY2015	CY2020	CY2025
Original R&D	[Arrow from CY2000 to CY2005]					
National level development project research at EUVA on Hiratsuka site	[Arrow from CY2000 to CY2010]					
Original development at Hiratsuka site	[Arrow from CY2005 to CY2020]					
Original development at Oyama HQ	[Arrow from CY2020 to CY2025]					

- In August 2022, we integrated our EUV R&D sites from Hiratsuka to Oyama. We will accelerate EUV development in the future by achieving synergy effects in EUV and DUV development.

- EUV applications are considered for various possibilities.
 - ▶ Mask inspection system
 - ▶ Lithography (patterning)
 - ▶ Critical processing such as line-and-space processing and hole formation for contacts, vias, and fine wiring



Source : 6th EUV-FEL WORKSHOP 2022.1.18 Gigahoton's report



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Summary

- Gigaphoton provides exposure lightsources, a key component of production equipment in the growing semiconductor industry. **Sales are growing at an annual rate of 10%; the company is a high-growth, highly profitable company with an operating margin of 20%.**
- The market for DUV light sources is expected to grow rapidly, with annual sales doubling and total installed base doubling by 2030.
- Growth strategy
 - ▶ **DUV Lightsource for Lithography**
 - ① Competitive products, ② Strengthen production system, ③ Strengthen the service system
 - ▶ **DUV Lightsource for processing**
 - Entry into micro VIA processing in advanced packaging processes
 - ▶ **EUV Lightsource**
 - Development sites are integrated to accelerate development speed. Currently in business development phase.
- We aim to achieve carbon neutrality in 2030 with respect to our own **ZERO emission**. We are also actively contributing to solving our customers' environmental problems with **our gas recycling equipment**.





THANK YOU FOR
YOUR ATTENTION