

**CMOS Image Sensor
Quarterly Market
Monitor**

Imaging Service 2021

METHODOLOGY

Yole's methodology for building market forecasts is different from other market research companies' methodologies:

- Our approach is to build a coherent model where the five-year historical data from top product shipments, module sales, and bottom sensor production, with players' market share is collectively linked with detailed assumptions
- Forecast are performed by carefully carrying forward the five-year growth rate with the analyst appreciation of each application market dynamics in mind.

We collect data from several sources, including:

- Primary information from direct contacts and surveys with equipment & materials suppliers
- Primary information from cost analysis and teardown reports conducted by *System Plus Consulting*
- Secondary information from Quarterly/Annual report/publications of key players
- Comparisons between publicly-available secondary data from *WSTS, OICA, IFR* etc.

As a result, we can present synthetic market metrics intrinsic to a specific industry:

- Our approach's main advantage is the delivery of homogeneous data, ranging from unit shipments and system sales to players' market share
- We quarterly update the market information presented in this monitor

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CIS MARKET DEMAND FOR END SYSTEM

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- Consumer market demand
- Computing market demand
- Automotive market demand
- Medical market demand
- Security market demand
- Industry market demand
- Aerospace & Defense market demand

CIS TECHNOLOGY

- CIS wafer production per segment
- Per technology (CIS, LOGIC, MEMORY)
- Shipments by CIS technology node (XX nm)
- Shipments by technology (FSI, BSI, Stack BSI, Multi-Stack)

CIS SUPPLY

- 3D sensing camera revenue per player
- Industry wafer production (CIS wafer production, per foundry - Long/near term - VIS and NIR)
- Industry wafer capacity estimation

CIS PLAYERS

- Sony – Revenue per quarter and per application
- Samsung – Market mix
- OVT – Market mix
- ON Semiconductor – Market mix
- STMicroelectronics – Market mix
- SK Hynix – Market mix
- SmartSens – Market mix
- Panasonic – Market mix
- GalaxyCore – Market mix
- Canon – Market mix
- Others – Market mix

ABOUT THE AUTHORS

Biographies & contacts



Pierre Cambou

Pierre Cambou MSc, MBA, is a Principal analyst in the Photonic and Sensor Division at Yole Développement (Yole). Pierre's mission is dedicated to imaging related activities by providing market & technology analyses along with strategy consulting services to semiconductor companies. He is responsible for the CIS Quarterly Market Monitor while he has authored more than 15 Yole Market & Technology reports. Pierre has an Engineering degree from Université de Technologie de Compiègne (France) and a Master of Science from Virginia Tech. (VA, USA), Pierre also graduated with an MBA from Grenoble Ecole de Management (France).

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Chenmeijing Liang works as a Technology & Market Analyst within the Photonics & Sensor division at Yole Développement (Yole). As part of the Imaging team, Chenmeijing contributes daily to analyses of CIS markets, related technologies and market strategies of the leading semiconductor companies, as well as the quarterly Monitor. Prior to Yole, she was engaged in the development of R&D projects: Chenmeijing was a member of Group PSA R&D department where she worked on Vehicle 3D Holography Imaging projects. In addition, she assisted with various technical and commercial projects. Chenmeijing Liang holds a Master's Degree in the field of Applied physics and Optical engineering from Paris-Saclay University and University Pierre and Marie Curie UPMC (Paris, France).

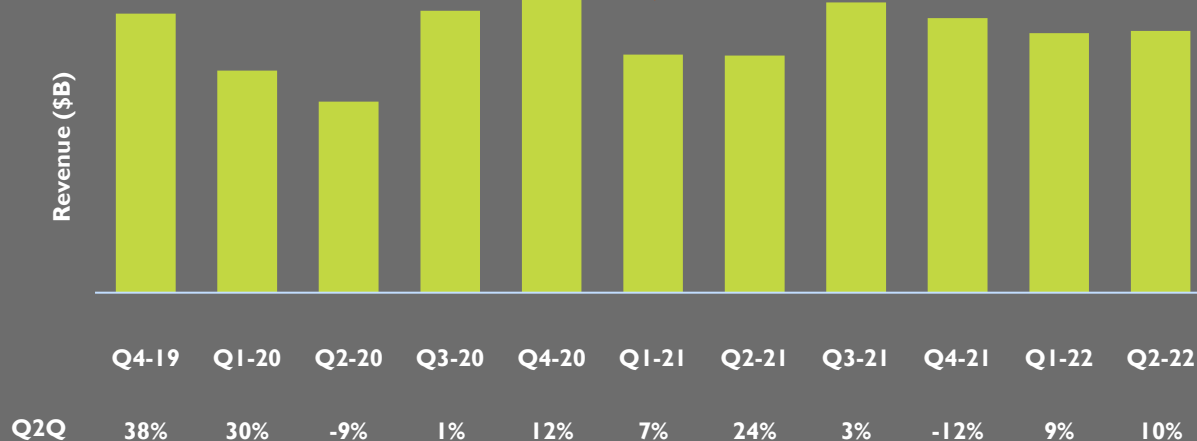
Contact: chenmeijing.liang@yole.fr

QUARTERLY MARKET MONITOR SAMPLE — CMOS IMAGE SENSOR SERVICE

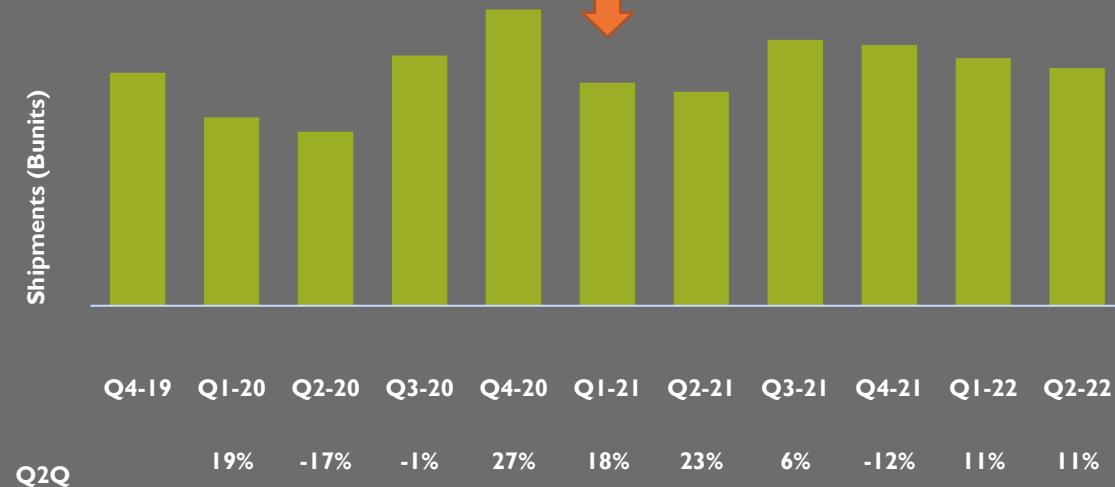
CIS SHORT-TERM DYNAMICS



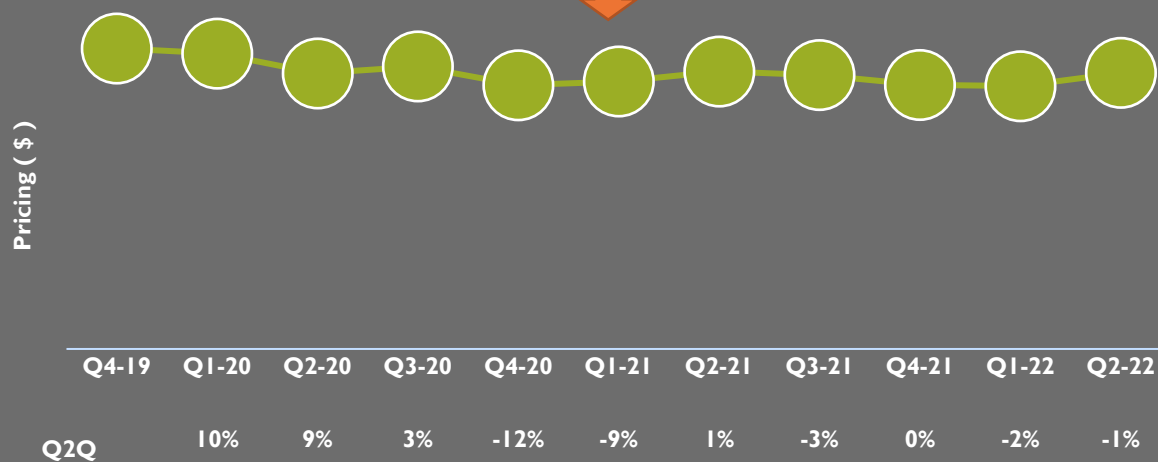
Revenue



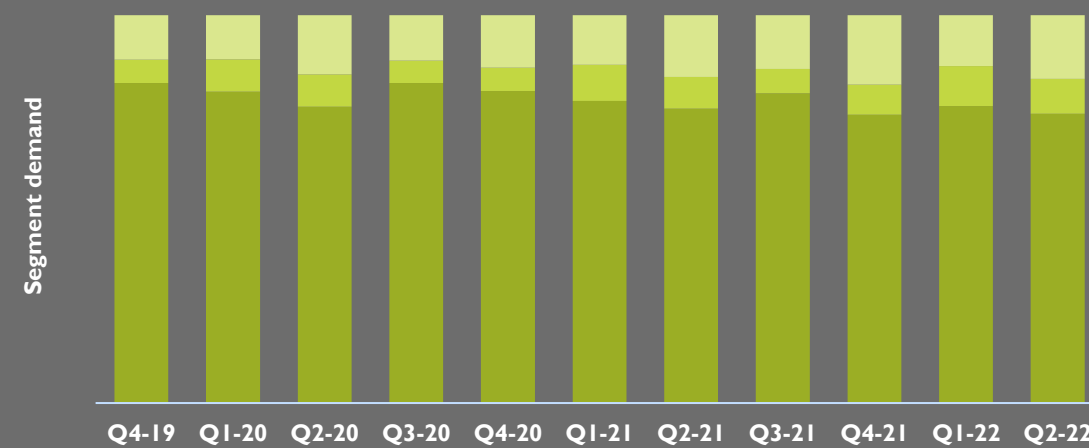
Shipments



Pricing



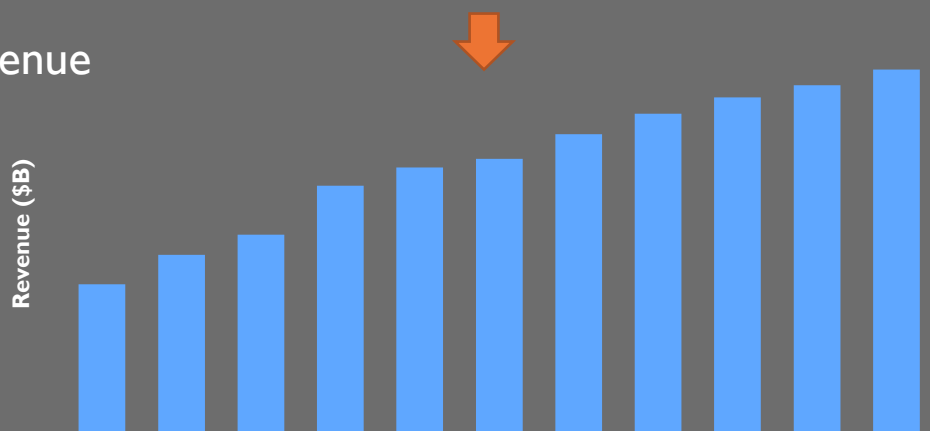
Demand



CIS LONG-TERM DYNAMICS

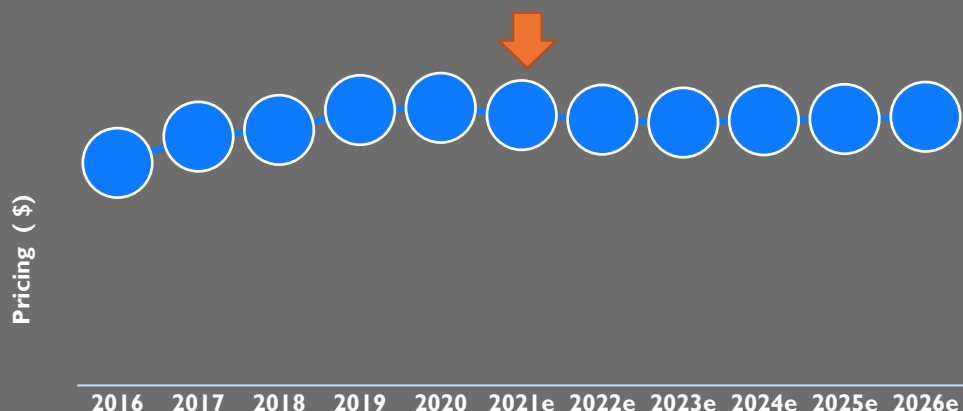


Revenue



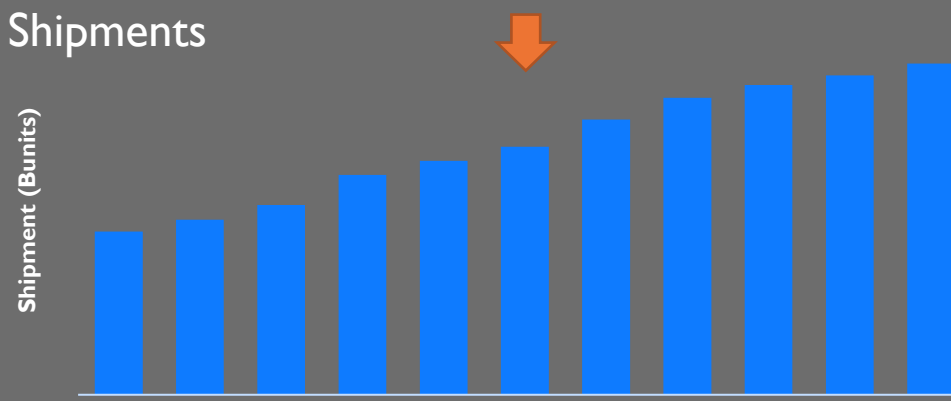
Revenue	\$11,6	\$13,9	\$15,5	\$19,3	\$20,7	\$21,4	\$23,3	\$24,9	\$26,2	\$27,2	\$28,4
YoY	13%	20%	11%	25%	7%	3%	9%	7%	5%	4%	4%

Pricing



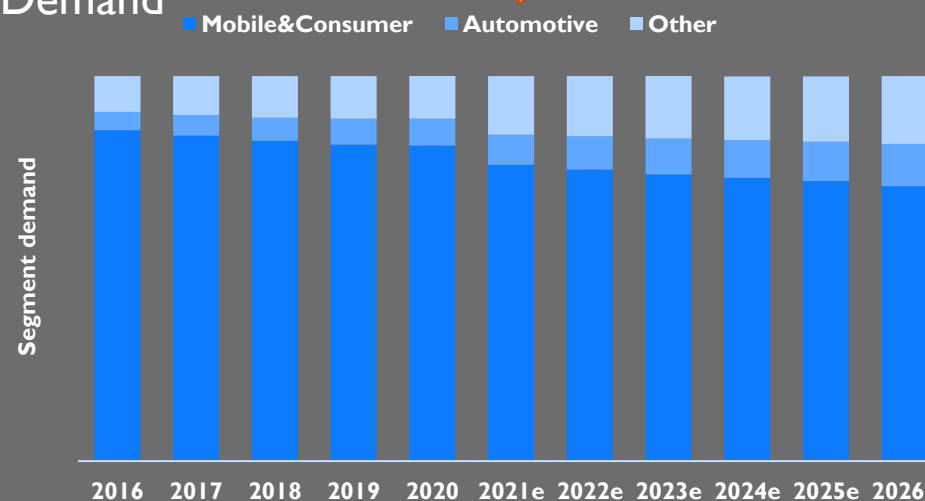
YoY	8%	12%	3%	8%	1%	-3%	-2%	-1%	1%	0%	1%
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Shipments



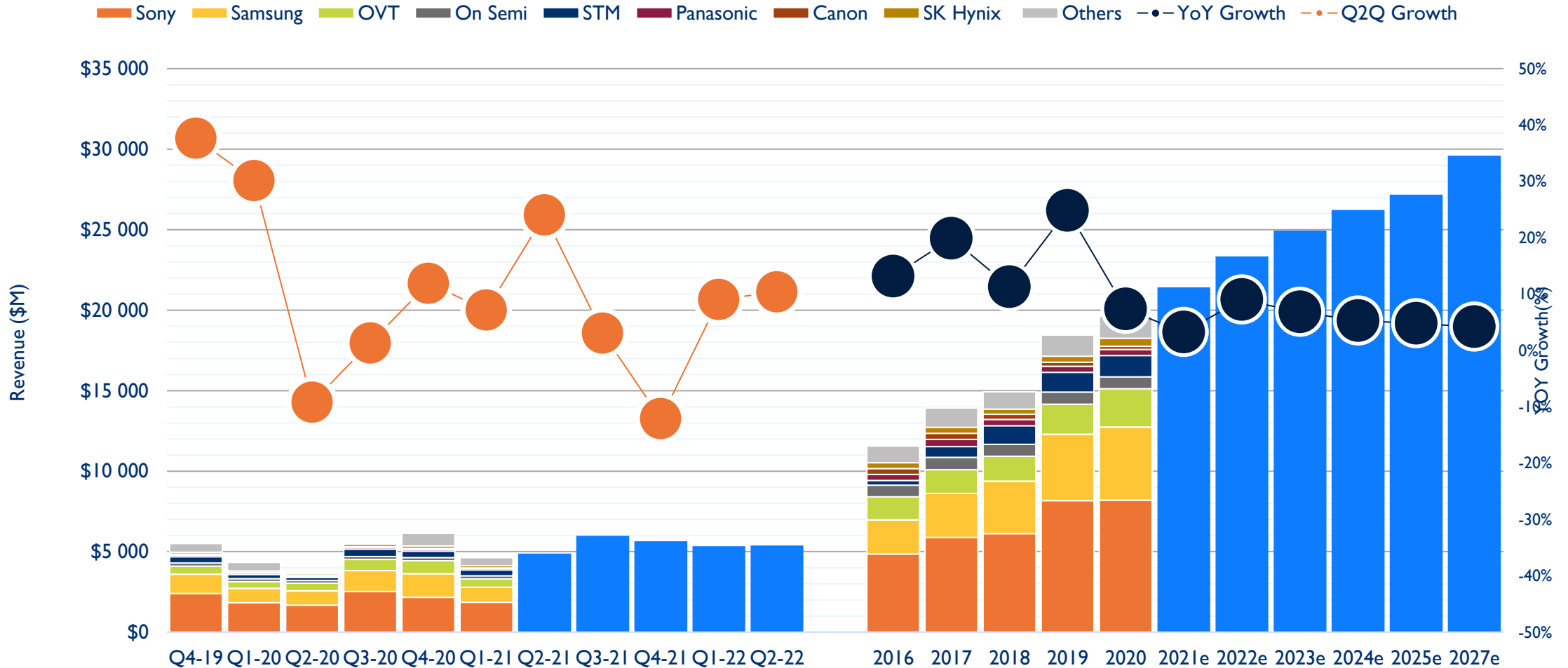
Shipments	4,9	5,2	5,7	6,6	7,0	7,4	8,2	8,9	9,3	9,6	9,9
YoY	5%	7%	8%	16%	6%	6%	11%	8%	4%	3%	4%

Demand



CIS MARKET DYNAMICS

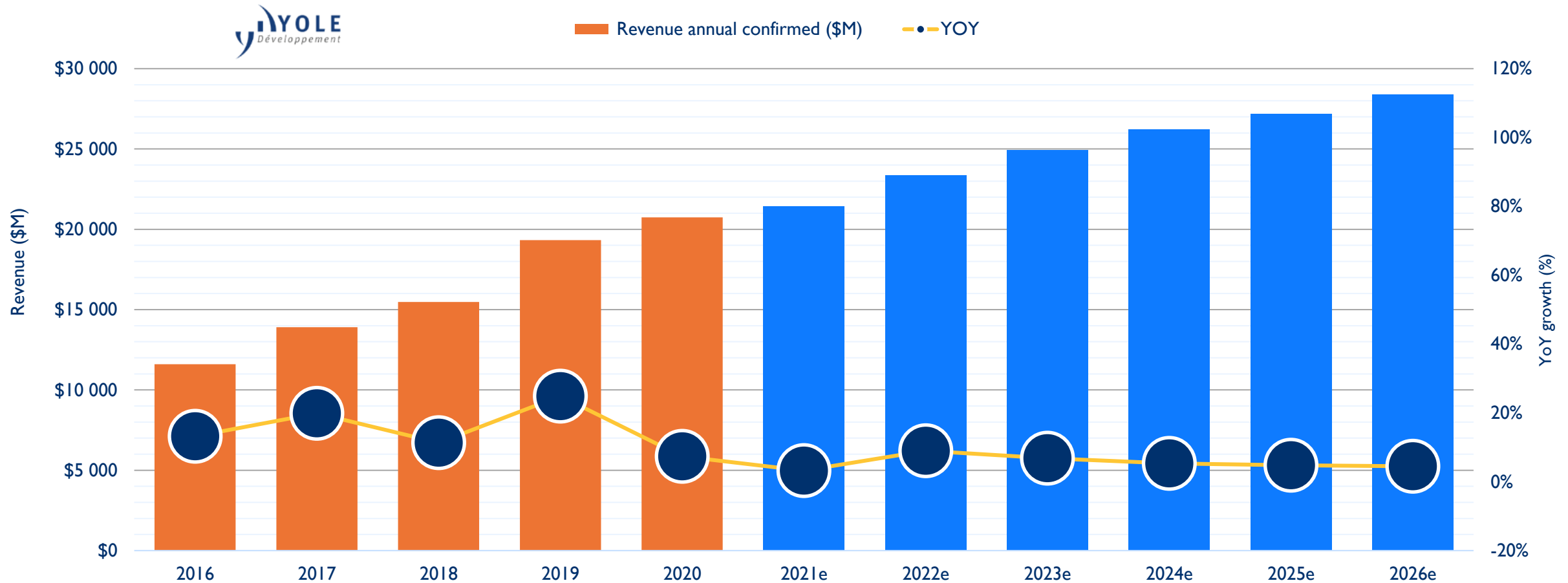
Quarterly and Yearly revenue CIS – Global and By players (in \$M)



- Q1-2020 to Q1-2021 showed 7% Q2Q growth. Still gradually recovering after the pandemic.
- Seasonal patterns will govern Q2Q growth in 2021 with an expected 3% YoY.

CIS ANNUAL REVENUE: LONG TERM

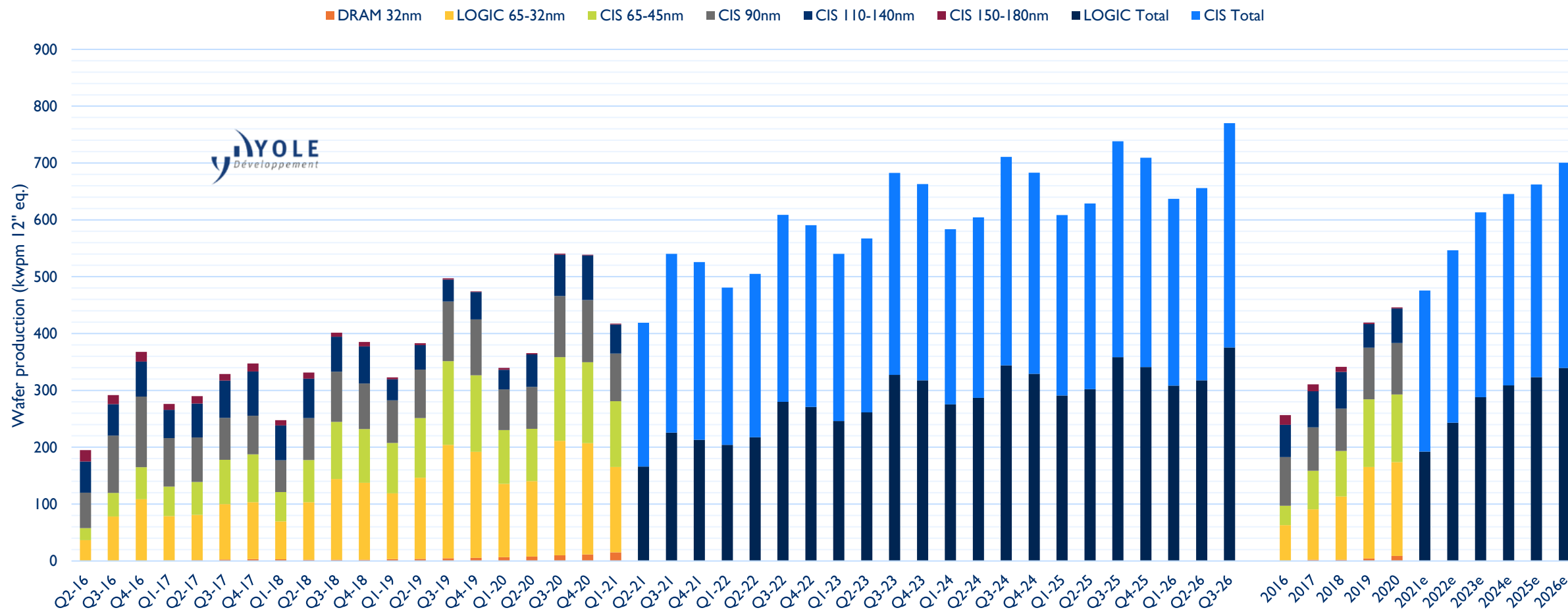
Yearly CIS industry revenue and future growth (in \$M and %)



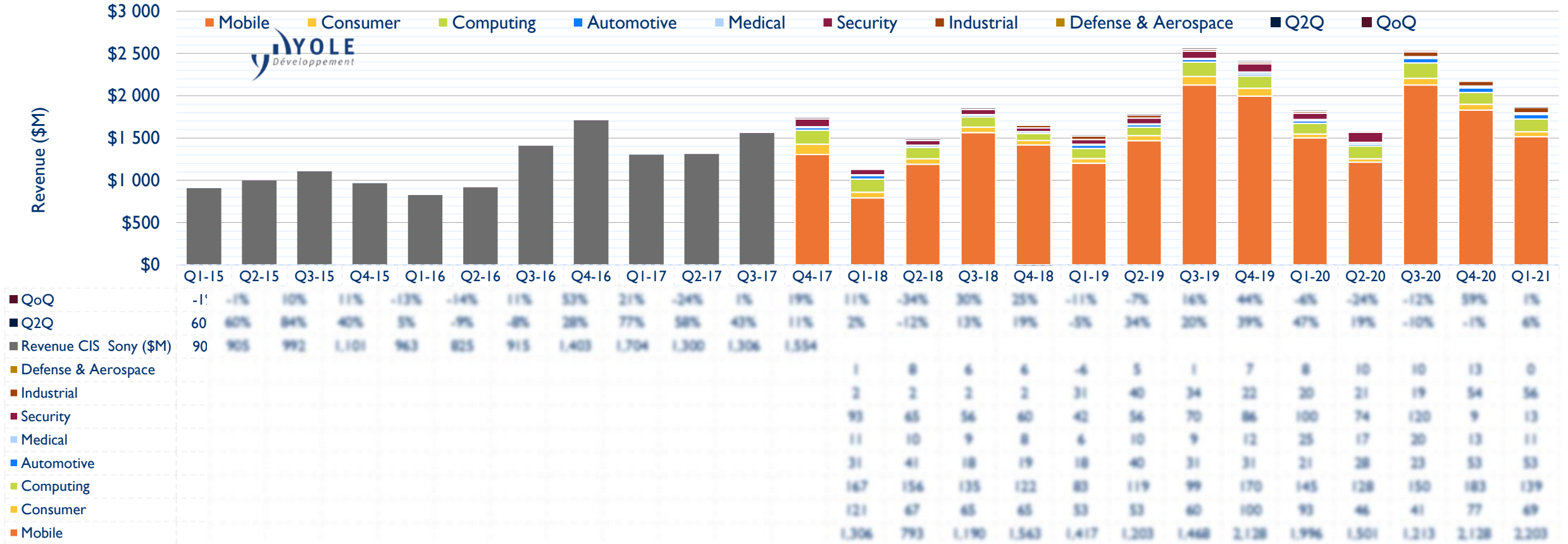
- Upper single-digit growth should resume for the CIS industry in 2022.
- $CAGR_{2020-2026}$ is 5.4% currently, with new applications. We will continue to analyze the situation.

WAFER SHIPMENTS BY TECHNOLOGY

Quarterly CIS & logic and memory wafer production per technology node in kwpm and yearly average



Sony CIS revenue per end-market – (in \$MUSD)



YOLE GROUP OF COMPANIES RELATED ANALYSES

Yole Développement

Status of CMOS Image Sensor Industry 2020



3D Imaging & Sensing 2020



CMOS Camera Module Industry for Consumer & Automotive 2020



Machine Vision for Industry and Automation 2021



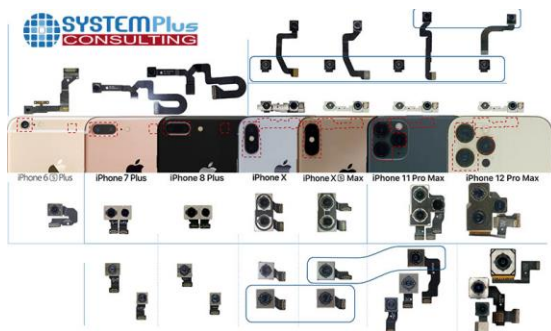
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YOLE GROUP OF COMPANIES RELATED ANALYSES

System Plus Consulting

Camera Module Comparison 2021 Vol. 2 – Apple iPhone Evolution



Smartphone Camera Module Comparison 2020 Vol 3: Focus on Huawei



Camera Module Comparison 2021 – Vol. 1



Smartphone Camera Module Comparison 2020 Vol 2: Focus on Samsung



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