Memory Market Overview
2025 Update

Presenter:

Josephine Lau

Senior Analyst, Memory at Yole Group

the Future of Memory and Storage

YOLE GROUP – KEY FIGURES

26+
Years in the semiconductor industry

900+
Products

10+
Fields of expertise

5,000+
Interactions with the industry

180+
Worldwide collaborators

160+
Worldwide trade shows & conferences

125,000+
Contacts in our database

16,000+
Mentions in Media
(EETIMES, Forbes, Thomson Reuters...)

ACKNOWLEDGEMENTS

Memory and Computing Analysts at Yole Group

John Lorenz

Principal Analyst, Memory (DRAM)

- Experience

15+ years in memory and computing

(Micron Technology)

- At Yole

DRAM, processors

- Education

Bachelor of Science in Mechanical Engineering from the University of Illinois Urbana-Champaign (USA), with a focus on MEMS devices.

Thibaut Grossi

Senior Analyst, Memory (NAND)

- Experience

15+ in Electronic Procurement (Semiconductor, PC BA and software)

- At Yole

NAND

- Education

M.Sc. in Electronic and Computing science

Simone Bertolazzi, PhD

Principal Analyst, Memory

- Experience

15 years in emerging semiconductor devices

- At Yole

Memory

- Education

Ph.D. in Nanoelectronics (EPFL, Switzerland)

M.Sc. in Micro & Nanotechnology

M.Sc. in Engineering Physics

Josephine Lau

Senior Analyst, Memory

- Experience

10+ years in memory and storage industry

- At Yole

Memory

- Education

Bachelor of business marketing

Passed CFA level I

Daniel Niu

Market Researcher

- Experience

3+ years in memory and processor industry

- At Yole

Memory, computing and AI

China Market

- Education

Master's degree in chemical engineering

Tom Hackenberg

Principal Analyst, MCU

- Experience

20+ years in computing and microcontrollers

- At Yole

Computing

- Education

BSEE/BSECE from the University of Texas at Austin specializing in Processors and FPGAs.

Belinda Dube

Senior Analyst, Integrated Circuits

- Experience

5+ years in computing, memory and advanced packaging

- At Yole SystemPlus

Memory, Computing & Advanced Packaging

- Education

M.Sc. in Nanoelectronics and Nanotechnology

M.Sc. Electronics & Instrumentation

Ying-Wu Liu

Analyst, Integrated Circuit

- Experience

8 years in the semiconductor industry

- At Yole SystemPlus

Computing

- Education

M.Sc. in theoretical physics

M.Sc. in Integration, Security and Trust in Embedded systems

the Future of Memory and Storage

OVERVIEW

- Memory & HBM outlook towards 2030

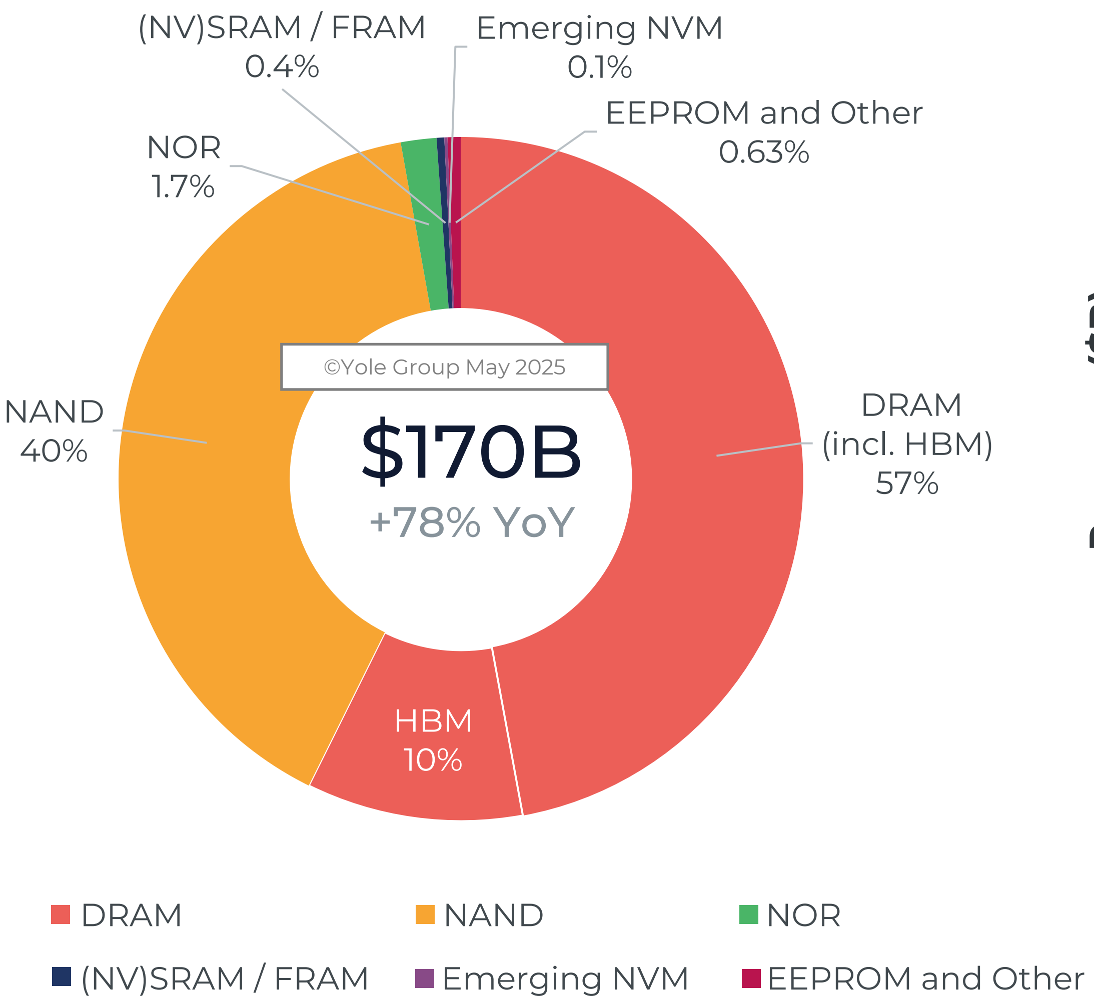
- Demand Outlook

- Growing Memory Revenue & Capex Paradox

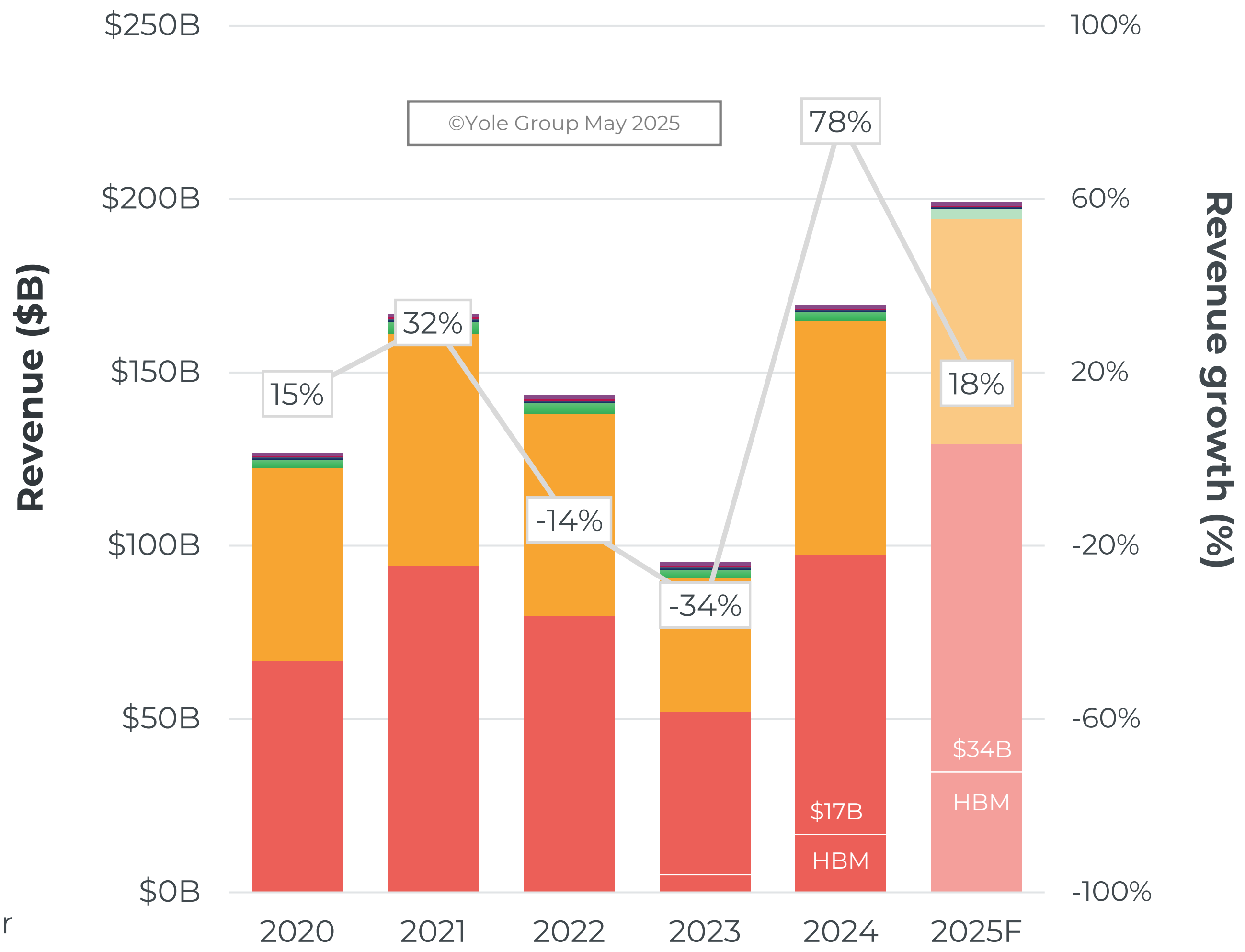
- China Market

STAND-ALONE MEMORY MARKET OVERVIEW

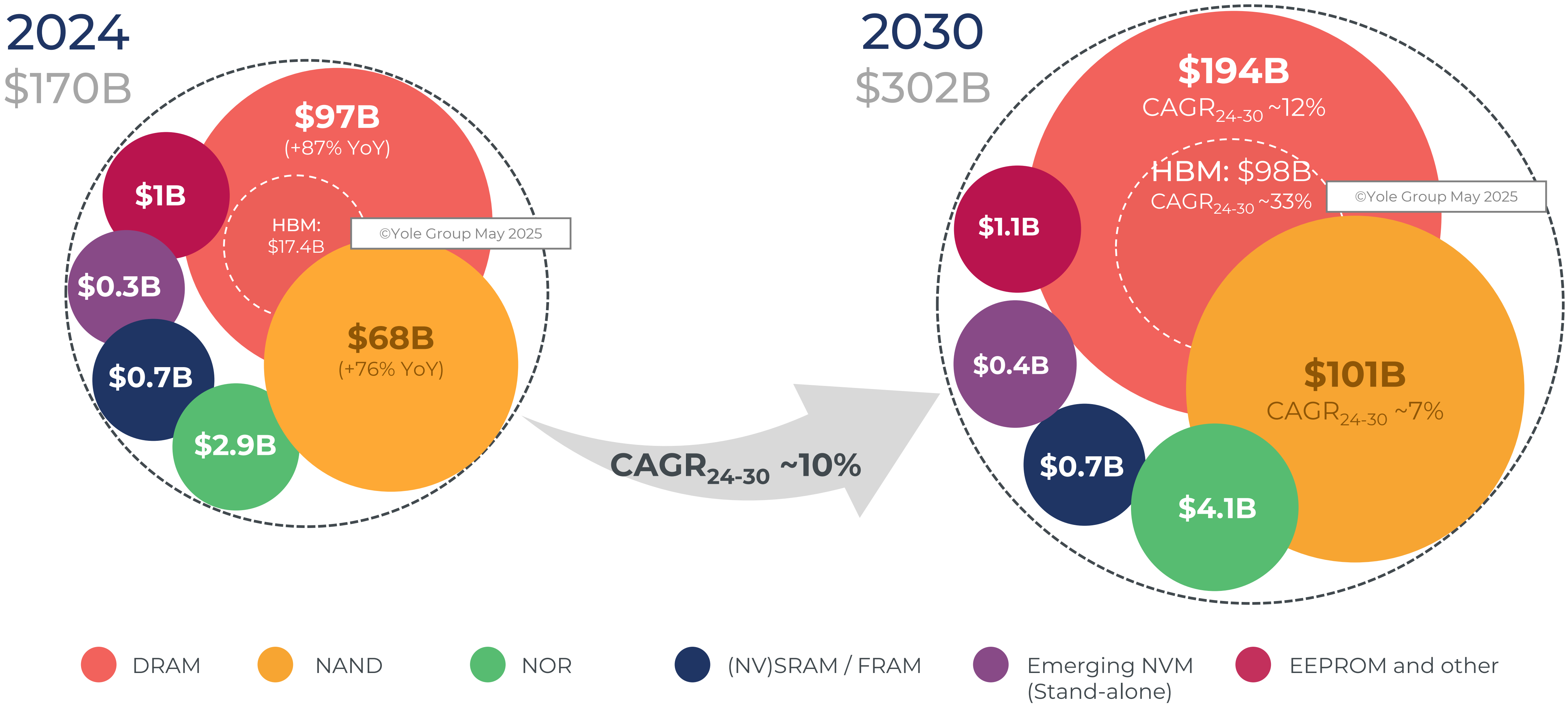
2024 Memory Market – Breakdown by Technology



Memory Market Evolution (2020 – 2025)



MEMORY MARKET FORECAST (2024-2030)



Source: “Status of the Memory Industry 2025” by Yole Group

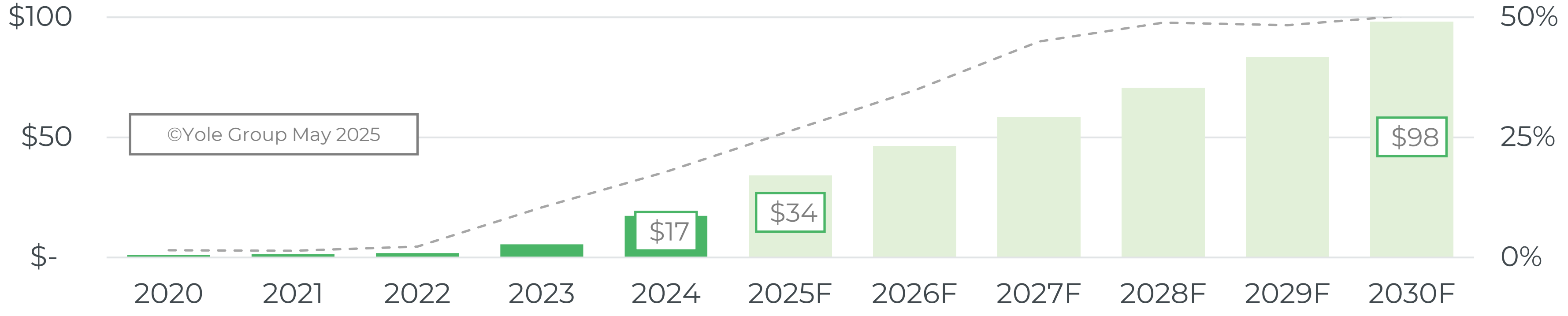
HBM MARKET OUTLOOK – OVERVIEW

Revenue ($B)

🟩 HBM revenue ($B)

CAGR$_{24-30}$ ~33%

- - - - HBM share of DRAM market (%)

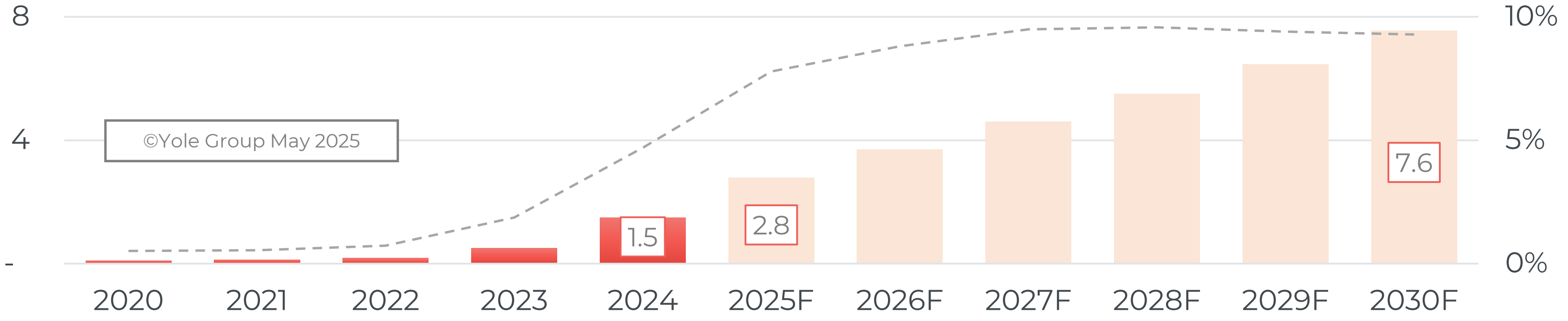


Bit shipments (B GB)

🟥 HBM bit shipments (B GB)

CAGR$_{24-30}$ ~31%

- - - - HBM share of DRAM market (%)

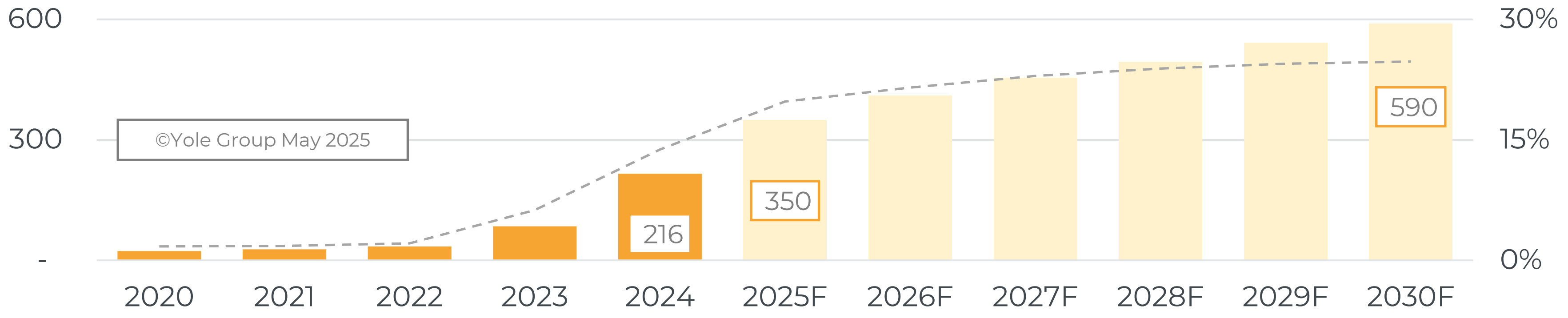


Wafer Production (K WPM)

🟧 HBM wafer production (KWPM)

CAGR$_{24-30}$ ~18%

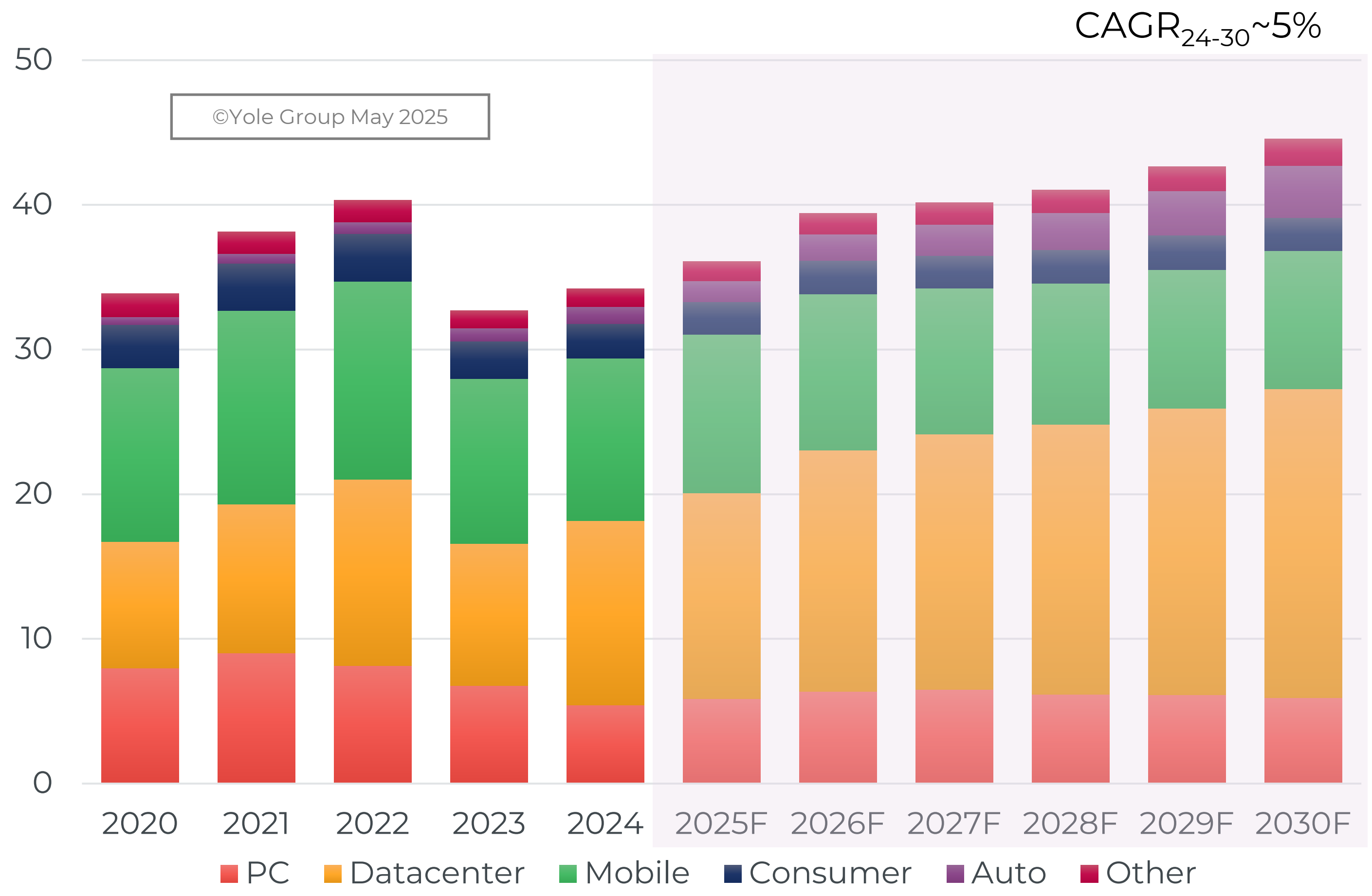
- - - - HBM share of DRAM market (%)



Source: "Next-Generation DRAM 2025" by Yole Group

DEMAND BY END MARKET

NAND and DRAM Demand (Million Wafers per Year)



CAGR$_{24\text{-}30}$~5%

Wafer-Demand Growth Rates (%)

PC / Client
CAGR$_{24\text{-}30}$ ~ 2%

Data Center
CAGR$_{24\text{-}30}$ ~ 9%

Mobile
CAGR$_{24\text{-}30}$ ~ -3%

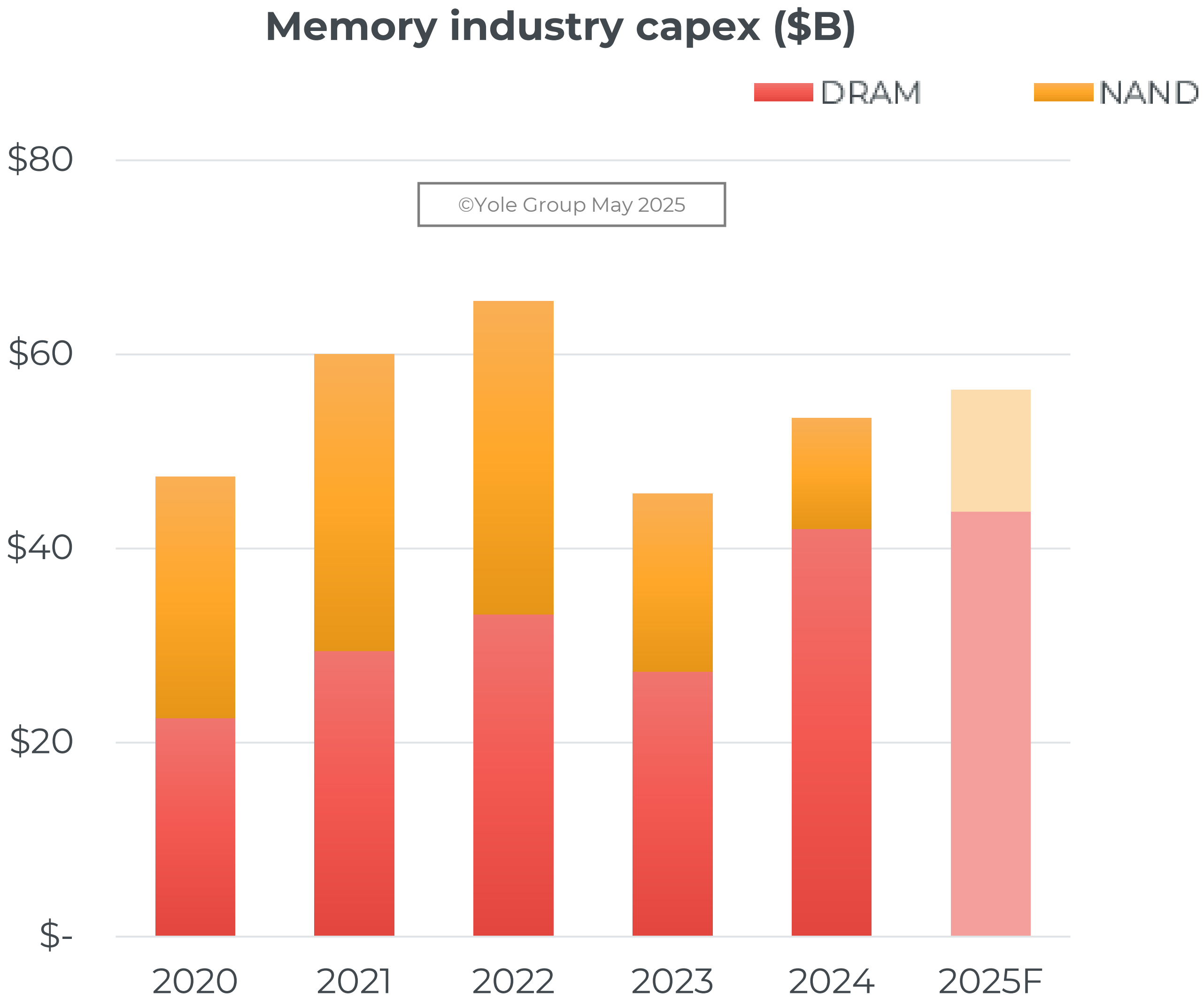
Consumer
CAGR$_{24\text{-}30}$ ~ -1%

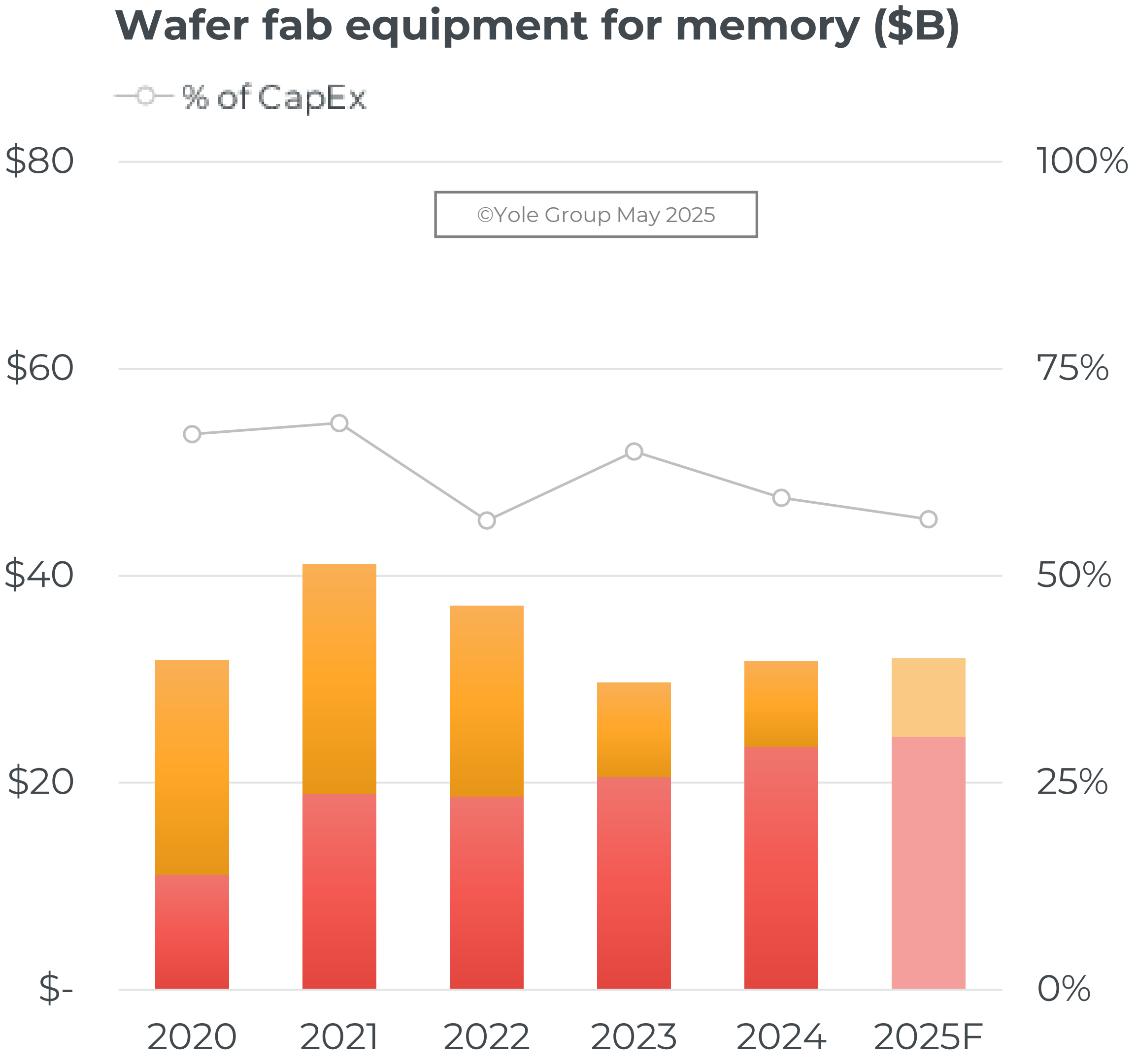
Automotive
CAGR$_{24\text{-}30}$ ~ 21%

Other
CAGR$_{24\text{-}30}$ ~7%

LEADING-EDGE MEMORY

Highly capital-intensive business

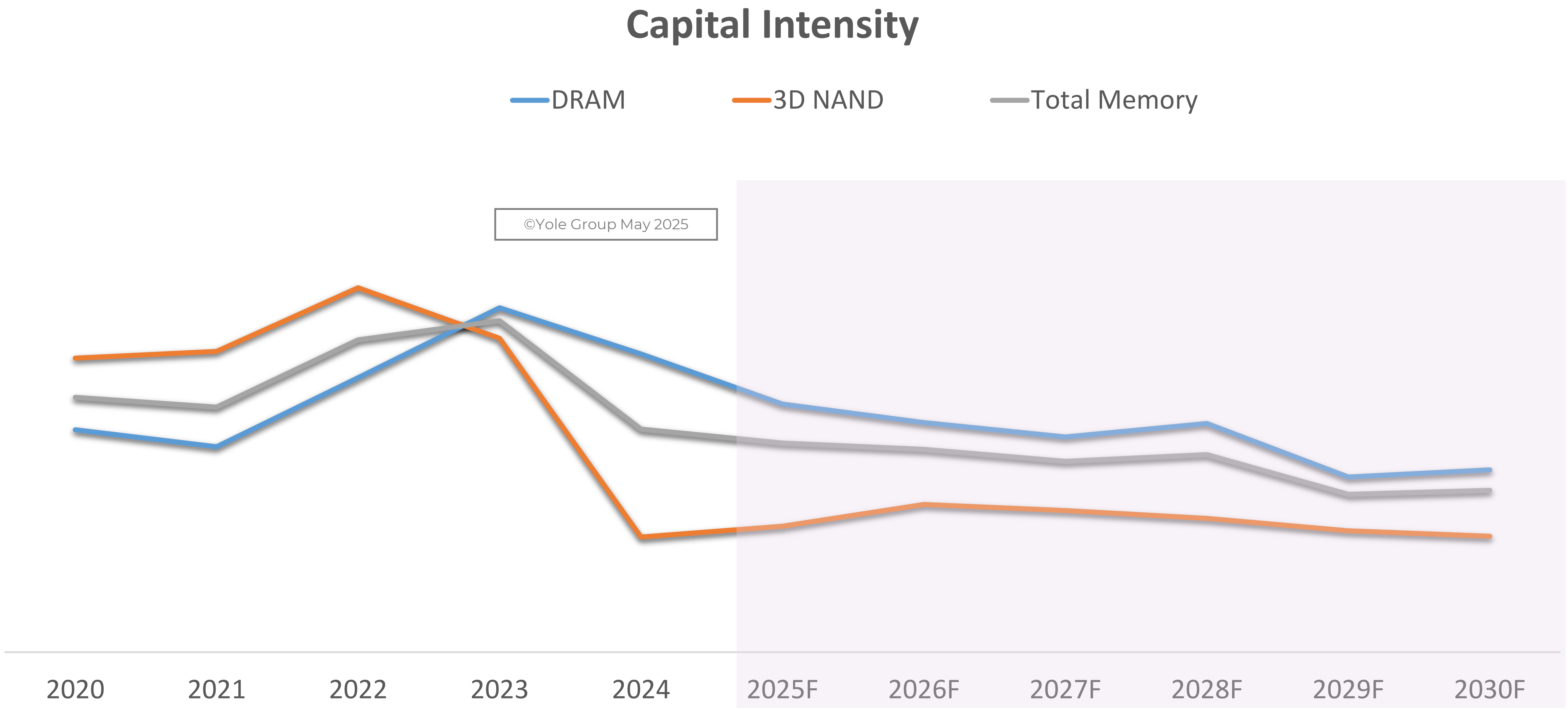




Source: WFE, NAND and DRAM Market Monitors (Q4-2024) by Yole Group

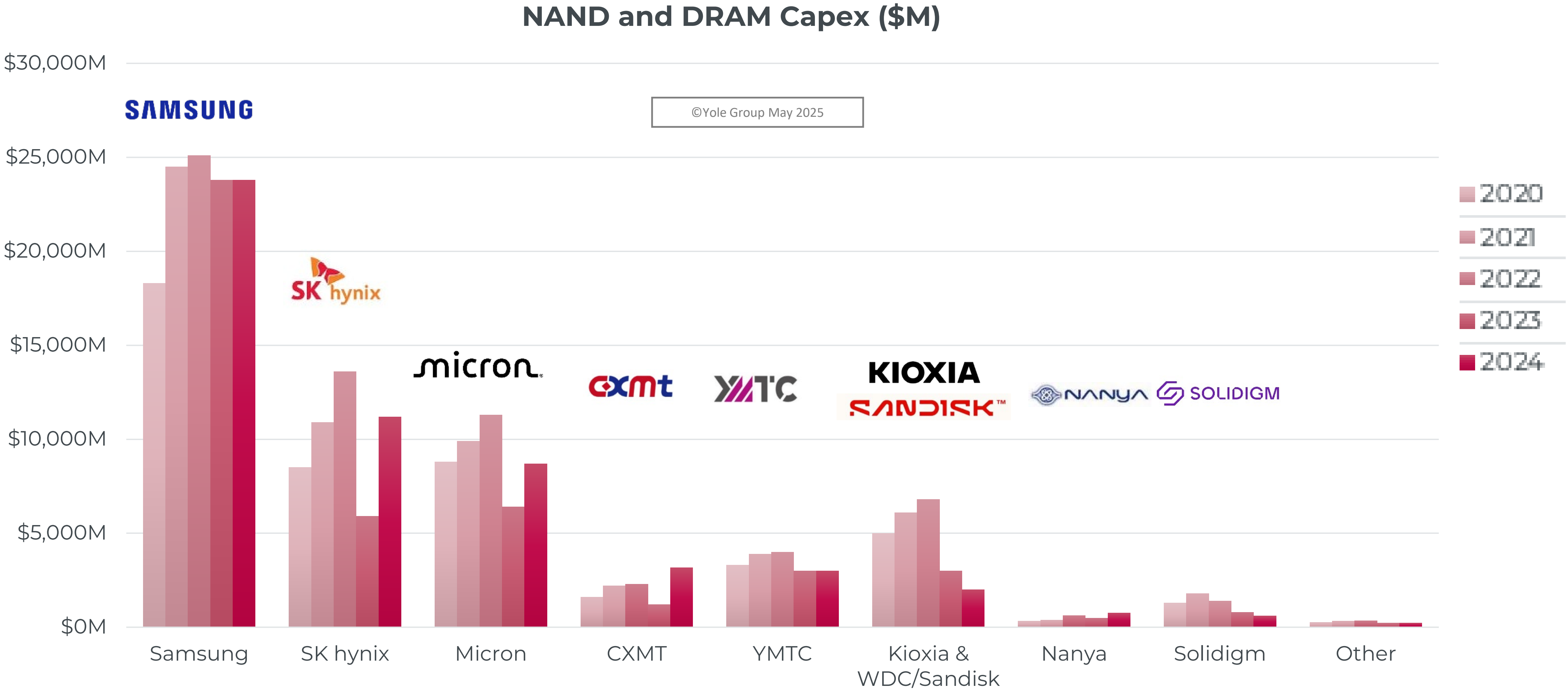
CAPITAL INTENSITY TREND

Revenue growth to outpace Capital Spending growth



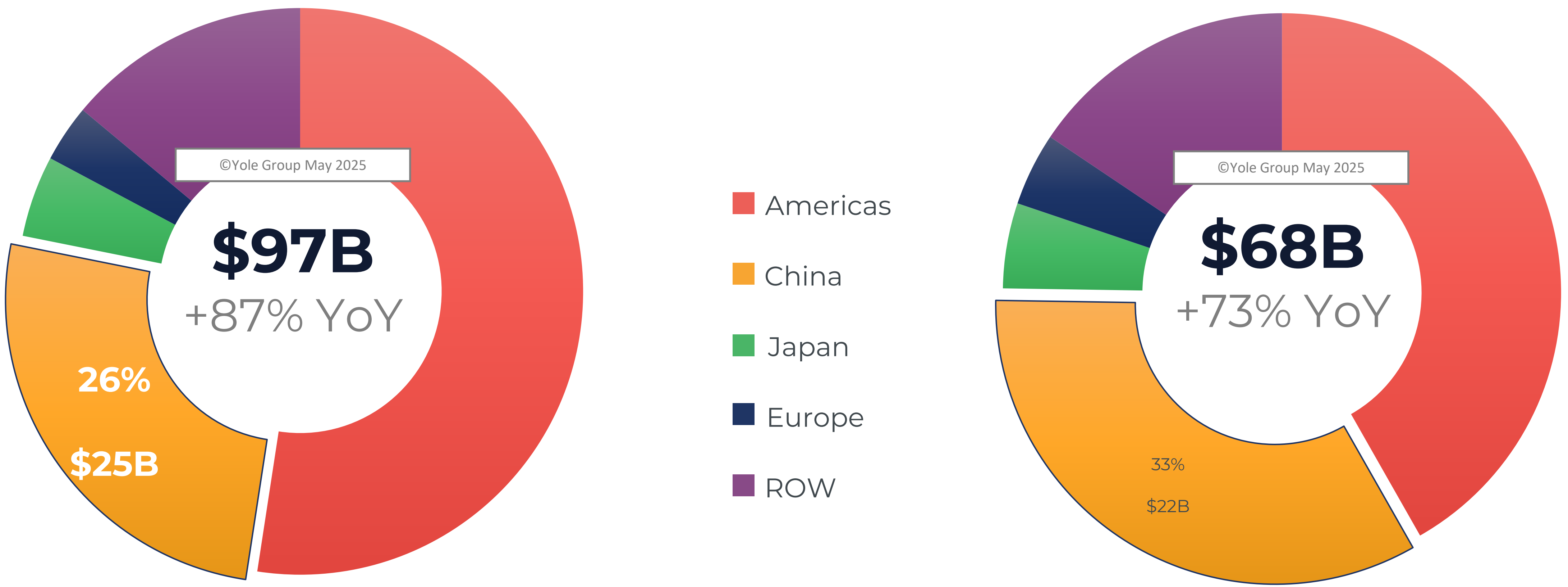
MEMORY CAPEX (2020-2024)

CXMT and YMTC ramped up spending in 2024



2024 GLOBAL MEMORY REVENUE

Mainland China #2 Geographical Region



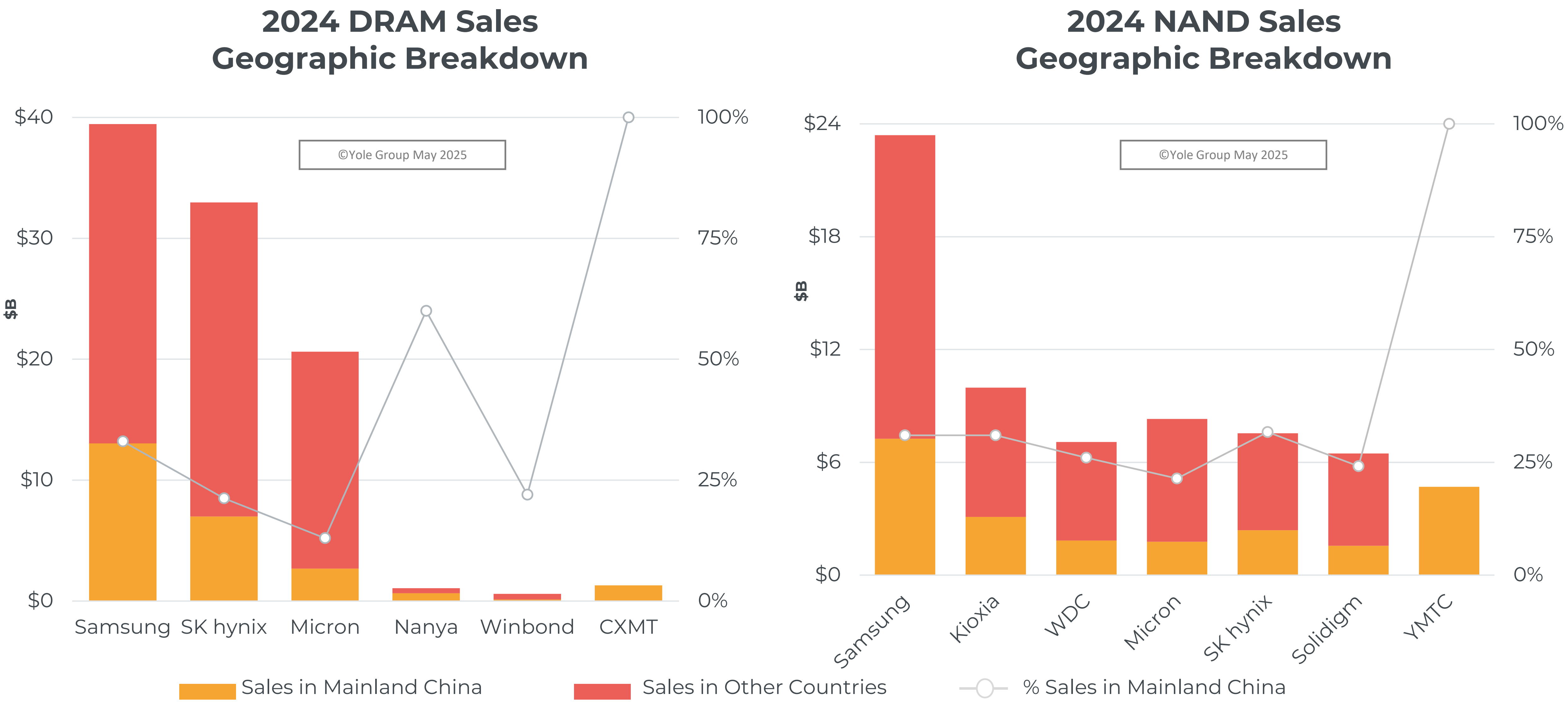
DRAM Market - Geographic Breakdown

NAND Market - Geographic Breakdown

*This geographic breakdown of memory sales is based on the headquarters country of the companies **purchasing** DRAM and NAND products.

Source: DRAM Market Monitor Q1-2025 by Yole Group

MEMORY BUSINESS IN CHINA BY SUPPLER

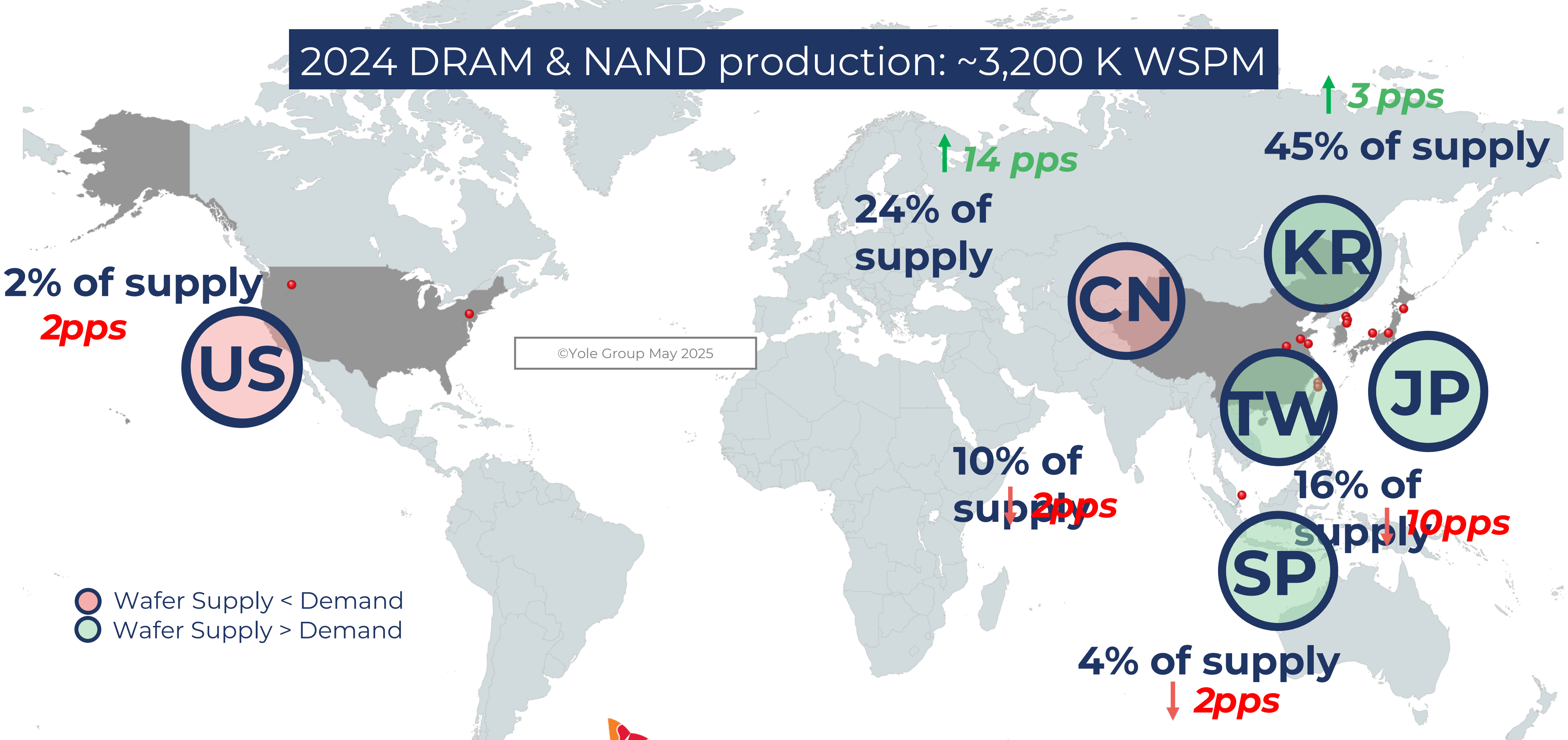


YOLE Group

DRAM AND NAND PRODUCTION

vs pre-2018 (start of trade tension) By Fab location (% share)

2024 DRAM & NAND production: ~3,200 K WSPM



US: 2% of supply, *2pps*

CN: 24% of supply, ↑ *14 pps*

KR: 45% of supply, ↑ *3 pps*

TW: 10% of supply, ↓ *2pps*

JP: 16% of supply, ↓ *10pps*

SP: 4% of supply, ↓ *2pps*

🔴 Wafer Supply < Demand
🟢 Wafer Supply > Demand

SAMSUNG SK hynix Micron KIOXIA SanDisk
SOLIDIGM YMTC winbond CXMT NANYA

FMS the Future of Memory and Storage

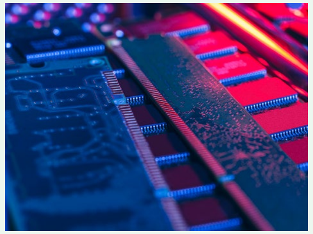
SUMMARY & OUTLOOK

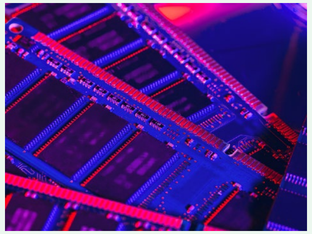
- Memory market on track for $300B in 2030
- HBM mix ~50% of DRAM revenue by 2030
- Main Demand Driver = Cloud & AI → From Data Center into Edge End Devices
- Down-trending Capital Intensity into 2030
- "China for China” is operational imperative for multinational businesses

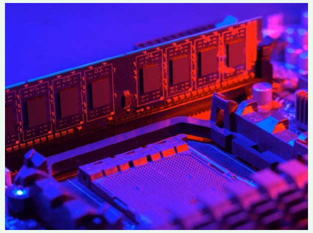
Thank You!

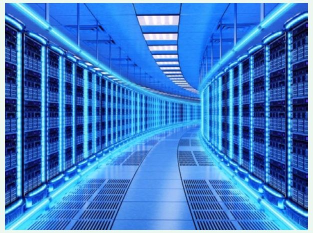
YOLE GROUP MEMORY PRODUCTS

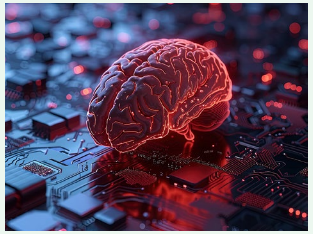
Market Monitors and Reports

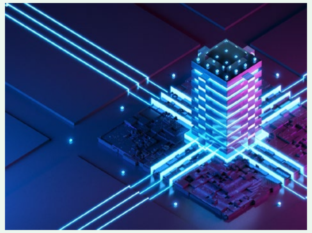

NAND Market Monitor


DRAM Market Monitor

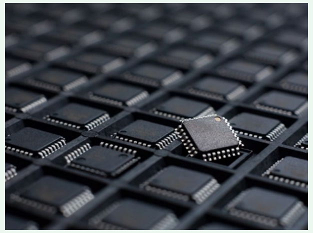

Next-generation DRAM 2025 – Focus on HBM and 3D DRAM


Status of the Memory Industry 2025

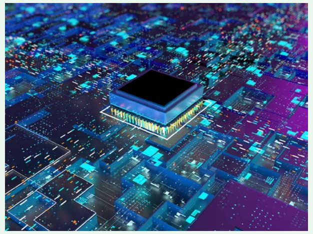

Neuromorphic Computing, Memory and Sensing 2024


Emerging Non-Volatile Memory 2024

2025 edition coming soon

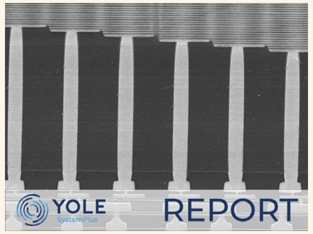

Status of the Microcontroller Industry 2024

2025 edition coming soon


Status of the Processor Industry 2024

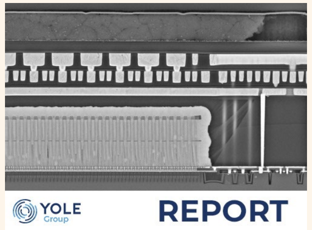
2025 edition coming soon

Technology, Process and Cost Reports



YMTC 232-layer 3D NAND

YMTC 294-layer 3D NAND coming soon



CXMT G4 DDR5 DRAM

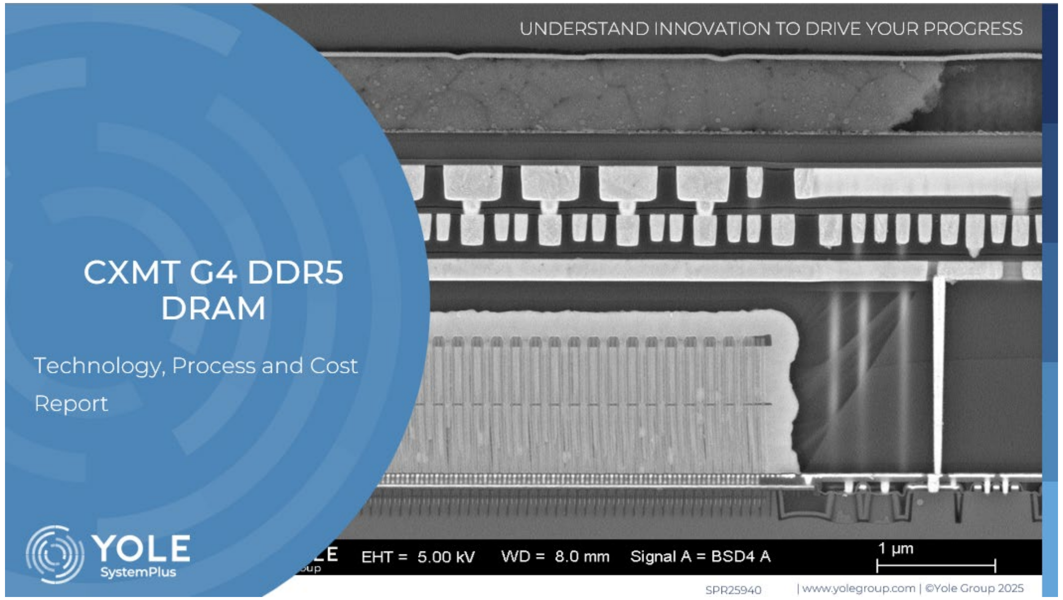
SK hynix HBM3

MCU - Nuvoton M2L31 512 KB RRAM

Non-exhaustive lists

CXMT – BEST PERFORMING DDR5 DRAM IN CHINA

Nationally supported, CXMT steps up to challenge global DRAM giants


UNDERSTAND INNOVATION TO DRIVE YOUR PROGRESS

CXMT G4 DDR5 DRAM

Technology, Process and Cost Report

YOLE SystemPlus

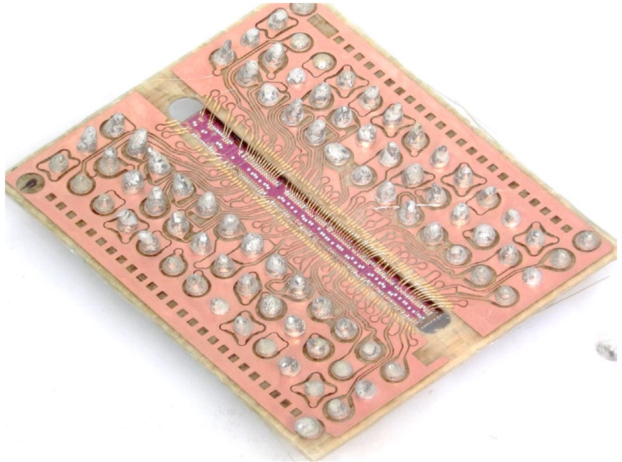
©Yole Group - Reference: SPR25940

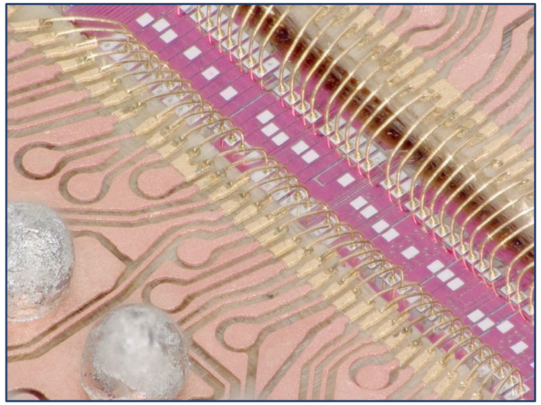
Yole Group provides a detailed analysis of the technology and cost of this DRAM

- Advanced physical characterization techniques

  (e.g., STEM analysis, EDX spectroscopy)
- Detailed manufacturing process flow

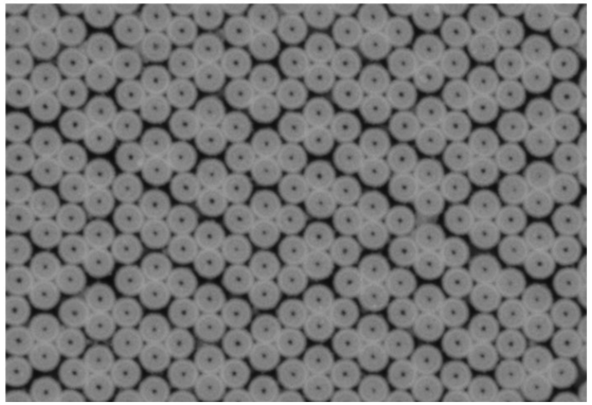
  (e.g., CXMT's patent analysis)
- Detailed cost analysis





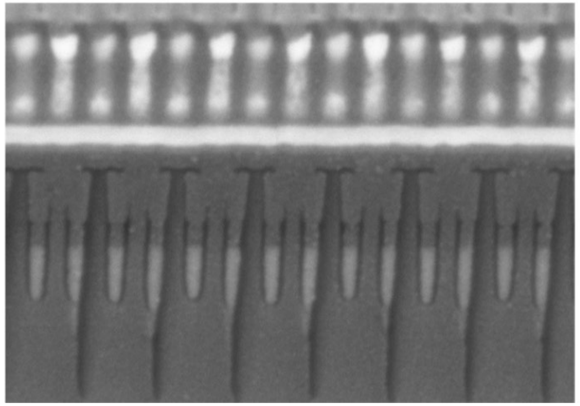
Cross-section capacitors

(Source: CXMT G4 DDR5 DRAM - Yole Group, 2025)



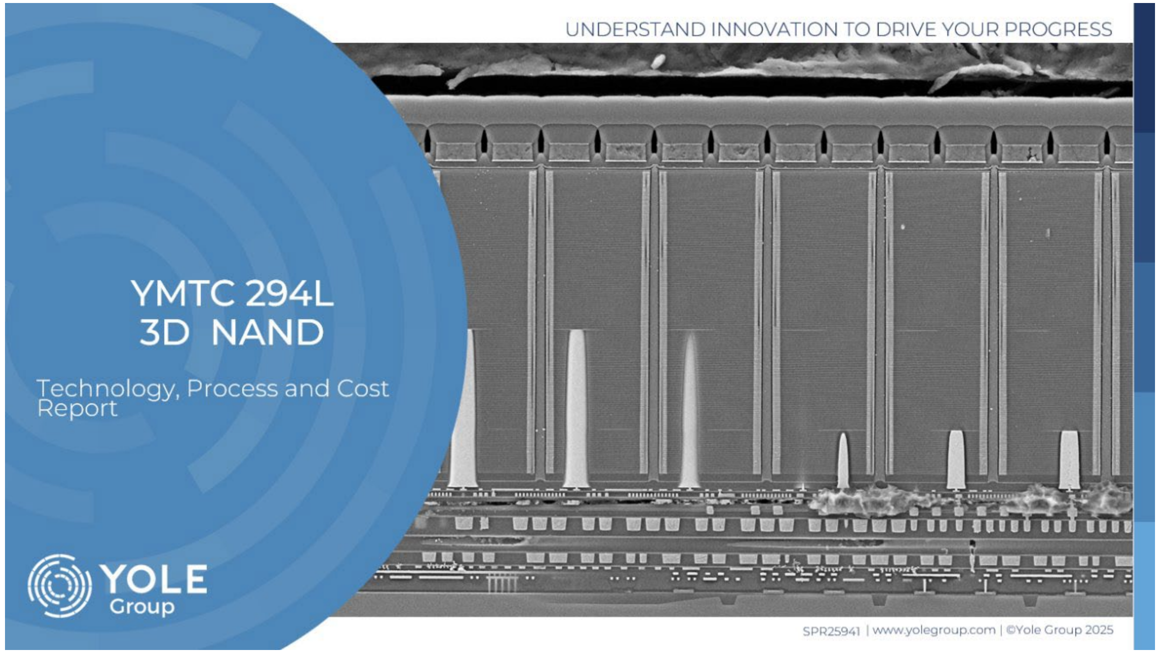
Cross-section bitline/wordline

(Source: CXMT G4 DDR5 DRAM - Yole Group, 2025)



YMTC – THE 294-LAYER 3D NAND BREAKTHROUGH

Forefront of 3D NAND innovation, built on Xtacking 4.0 architecture



UNDERSTAND INNOVATION TO DRIVE YOUR PROGRESS

YMTC 294L
3D NAND

Technology, Process and Cost Report

YOLE Group

SPR25941 | www.yolegroup.com | ©Yole Group 2025

©Yole Group – Reference: SPR25941

Yole Group provides a detailed analysis of the technology and cost of this NAND

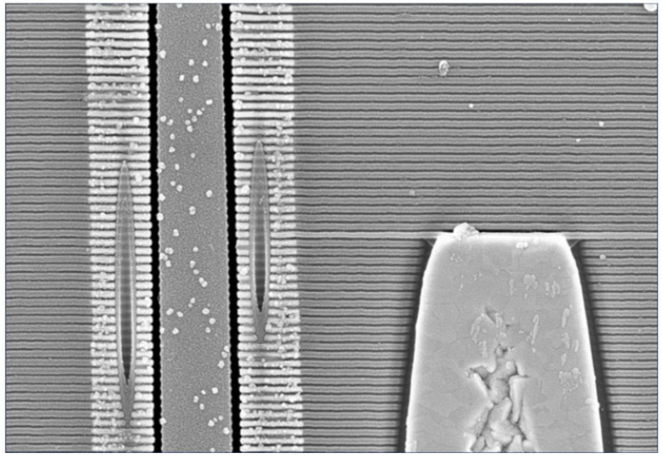
- Advanced physical characterization techniques

  (e.g., STEM analysis, EDX spectroscopy)
- Detailed manufacturing process flow of interlayer connectors

  (e.g., YMTC's patent analysis, expert insight)
- Detailed cost analysis

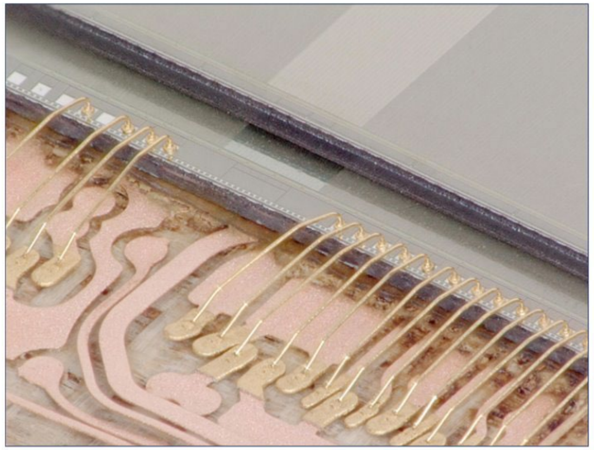
Cross-section interlayer connector/wordlines

(Source: YMTC 294L 3D NAND - Yole Group, 2025)



Stacked dies

(Source: YMTC 294L 3D NAND - Yole Group, 2025)



Cross-section CMOS area

(Source: YMTC 294L 3D NAND - Yole Group, 2025)