

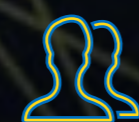


M A L A Y S I A N P A C I F I C I N D U S T R I E S B E R H A D

I N V E S T O R P R E S E N T A T I O N

Q 2 F Y 2 0 2 3 ( O c t - D e c ' 2 2 )

**INVESTOR RELATIONS CONTACT**



Rohit Kumar



+605 5262333 extn 8497



rohitkumar@carsem.com

## DISCLAIMER

Malaysian Pacific Industries (MPI) provides access to this presentation for general reference only. This presentation is strictly confidential solely intended for communicating financials and may not be reproduced or circulated without MPI's prior consent.

If you are the recipient of this file, you are notified that disclosing, copying, distributing the entire presentation or some content of this presentation is strictly prohibited.

Please notify MPI's Investor Relations immediately by email if you have received this presentation by mistake and delete this file from your system.

# TABLE OF CONTENT

---

1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Business overview

MPI – A MEMBER OF THE HONG LEONG GROUP

## Hong Leong Group and MPI

- The Hong Leong Group was established over 50 years ago and is one of the largest conglomerates in Asia
- Carsem and Dynacraft are operating companies within Malaysian Pacific Industries, which is a part of the Manufacturing & Distribution Services segment of Hong Leong Group
- Carsem was acquired by Hong Leong over 30 years ago
- Carsem has 49 years experience in semiconductor assembly and testing
- Today, Carsem is one the most trusted and recognized names in the Outsourced Semiconductor Assembly & Test (OSAT) Industry

## Hong Leong Group Holdings

- Banking & Financial Services segment (2) is the largest segment with over 300 banks in Asia including insurance services
- Property Development & Investment segment (3) builds and manages commercial and residential real estate around the world
- Hospitality & Leisure segment (4) is comprised of hotel and casino operators in Macau and Las Vegas
- Hong Leong continues to grow by acquisition and owns more than 50% stake in each of their group companies

### The Hong Leong Group One of the Largest Conglomerates in Malaysia





# Financial performance snapshot

STRONG FUNDAMENTALS CREATE BUSINESS RESILIENCE IN TOUGH TIMES

Revenue (US\$ million)

116

Q2 FY23

PAT (RM million)

32

Q2 FY23

Net cash (RM million)

816

as of Q2 FY23

CAPEX (RM million)

62

Q2 FY23

- Focused growth & transformation strategy with execution capabilities
- Cost prudence
- Productivity, innovation & sustainability focus with continued investments
- Customer focused business model
- Strong & experienced leadership
- Functional & strong company culture

Note: FY23 = July 2022 – June 2023





# Business outlook

## Semiconductor industry growth is hampered



- Covid-related supply chain constraints especially in China, inflation concerns;
- Uncertain impact of China's reopening; ongoing war and geopolitical tensions
- 1/3 advanced economies heading for recession (IMF, Jan 2023);
- Excess inventory still not purged from the supply chain, low utilization rates

- rapid transition into electric cars, autonomous driving, vehicle connectivity;
  - adoption of 5G, artificial intelligence, and sensing devices

## Long term growth drivers



## Challenges to MPI's business



- Industrywide talent scarcity;
- Cost surges – utility, transportation, material and equipment costs;
- End market demand drop or postponement; and
- Long delivery timelines for critical equipment, components, and materials

- Prudent cost management measures to navigate the uncertain market conditions;
  - Close collaboration with customers to ensure a healthy overall sales pipeline – short & long term;
  - Capacity expansions at China and Malaysia - a reliable supply centre based out of Malaysia and China;
- Strong cash position to pursue technology/ company acquisitions to move further into advanced packaging space;
- Continued Capex allocation for technology development (power management, SiC, GaN, 5G, sensors), automation, talent development, and employee health & safety

## MPI's responsive strategy



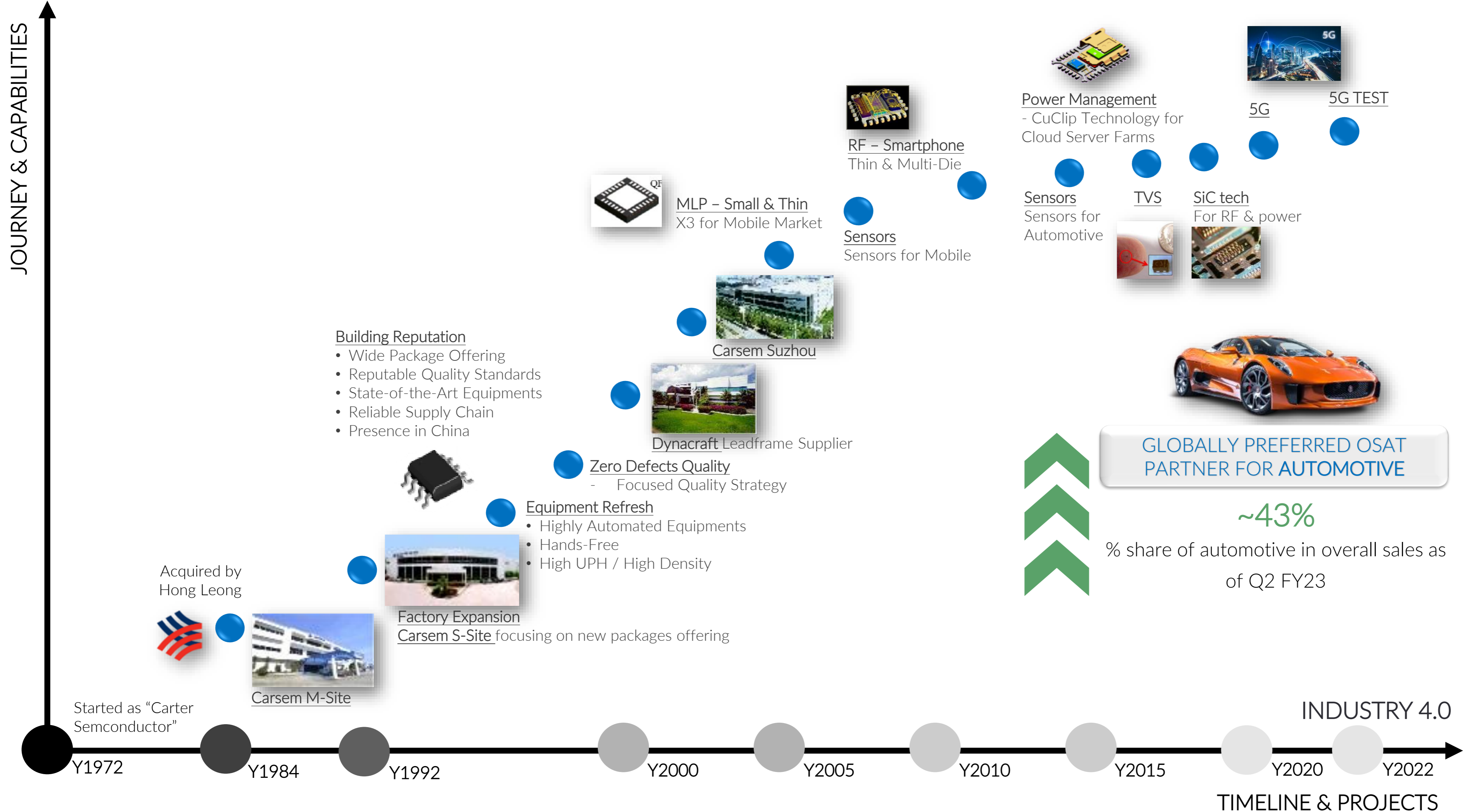
# TABLE OF CONTENT

---

1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Our journey



- Building Reputation**
- Wide Package Offering
  - Reputable Quality Standards
  - State-of-the-Art Equipments
  - Reliable Supply Chain
  - Presence in China

**GLOBALLY PREFERRED OSAT PARTNER FOR AUTOMOTIVE**

**~43%**  
% share of automotive in overall sales as of Q2 FY23

**Carsem**  
One of the most trusted OSAT partners globally

**100% Malaysian**

**Healthy Balance Sheet (Equity to debt 100:0)**

**Semiconductor Experience - 50 years**





# Board of Directors

## YBHG DATUK KWEK LENG SAN

### CHAIRMAN; Non-Executive/ Non-Independent

- Appointed to BoD of MPI in Jul 1990, and as GMD of MPI from Sept 1990-Aug 1993; Member of the nominating committee
- Chairman of Hong Leong Industries Bhd., Hume Industries Bhd., and Southern Steel Bhd.; Director of Hong Leong Company (Malaysia) Bhd

## YBHG DATO' MOHAMAD KAMARUDIN BIN HASSAN

### Non-Executive Director/ Independent

- Mar 2015: Appointed to board of MPI, and is a member of the Board Audit & Risk Management Committee of MPI
- Is a Director of Duopharma Biotech Bhd and Muhibbah Engineering (M) Bhd, and ManagePay Systems Bhd

## MANUEL ZARAUZA

### GROUP MANAGING DIRECTOR/ Non-Independent

- Over 25 years of experience across various manufacturing sectors
- April 2015-Aug 2016: Joined HLMG Management as its Managing Director
- Aug 2016-Present: Group Managing Director of MPI

## DR TUNKU ALINA BINTI RAJA MUHD ALIAS

### Non-Executive Director/ Independent

- Jan 2018: Appointed to board of MPI, and is a member of Nominating Committee of MPI
- Is a Director of IJM Corporation Bhd, Batu Kawan Bhd, MBSB Bank Bhd and Raja Alias Foundation
- 1992: Set-up legal firm (Wong Lu Peen & Tunku Alina); Managing Partner till 2011, Consultant now

## IR. DENNIS ONG LEE KHIAN

### Non-Executive Director/ Independent

- Nov 2014: Appointed to board of MPI; is the Chairman of the Nominating Committee and a member of the Board Audit & Risk Management Committee of MPI
- Held directorships in Shell Malaysia Trading Sdn Bhd, Champ Distributors Sdn Bhd, Lubetech Sdn Bhd, Assar Chemical Dua Sdn Bhd and was the Chairman of the Board for UMW Pennzoil Distributors Sdn Bhd.

## MS FOO AI LI

### Non-Executive Director/ Independent

- Appointed as an Independent Non-Executive Director of the Company on 1 September 2021.
- She is presently attached to CDC Consulting Sdn Bhd providing advisory work.
- Her last position in the energy industry was as the Chief Financial Officer of Hengyuan Refining Company Berhad (formerly Shell Refining Company (FOM) Berhad) from 2016 to 2019.



# Management team

MANY YEARS OF CONSOLIDATED EXPERIENCE IN THE INDUSTRY



**MANUEL ZARAUZA, GROUP MANAGING DIRECTOR, MPI**

Over 25 years of manufacturing sector experience; Previously with Siemens, Osram Opto Semiconductors, and Seoul Semiconductor



**ERIC CHEAH**  
CFO, MPI

Extensive experience across large-scale semiconductor manufacturing & in KPMG



**INDERJEET SINGH**  
GM, CARSEM S-SITE, MY

Started his career at Carsem & went on to hold various management positions



**MURALITHARAN**  
GM, CARSEM M-SITE, MY

Previously held senior leadership positions at NXP semiconductors



**RAYMOND SHI**  
GM, CARSEM SZ-SITE, CHINA

More than 20 years of experience with Carsem SZ handling operations



**CK LEE**  
HEAD, CARSEM CHINA

Started his career at Carsem & went on to hold various management positions

# TABLE OF CONTENT

---

1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Supply chain & business model

CARSEM'S PACKAGING & TESTING SERVICES FORM A VITAL PART OF SEMICONDUCTOR VALUE CHAIN



Growth opportunities exist among margin pressures - *Advanced packaging (SiP, 3D), Industry 4.0 and downstream niches present upsides*

OSAT

Carsem provides turnkey packaging & test services

EMS

EMS expanding into engineering services and IC backend

Foundries expected to further offer broader set of services, incl. packaging & testing

Foundry

IDM

IDMs applying selective 'make-and-buy' strategy

Semi Engineering service provider

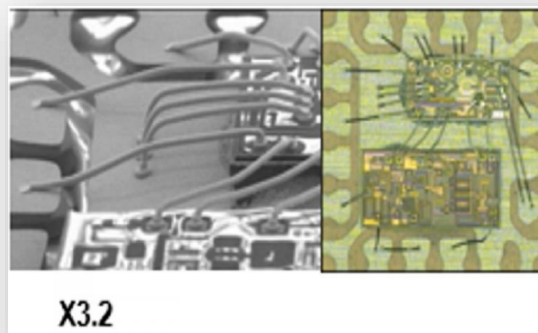
Engineering service providers covering wide range of value chain steps without own packaging & testing facilities



# Wide portfolio

COMPREHENSIVE TURNKEY PACKAGING & TEST SERVICES

ACROSS KEY APPLICATIONS

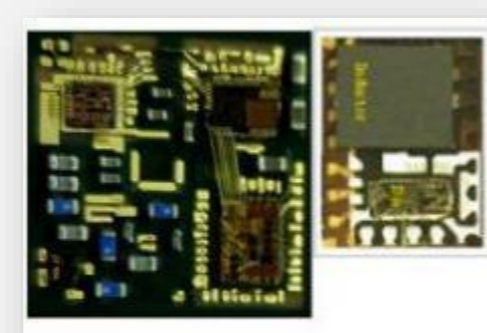


X3.2


MLP



Small Outline IC



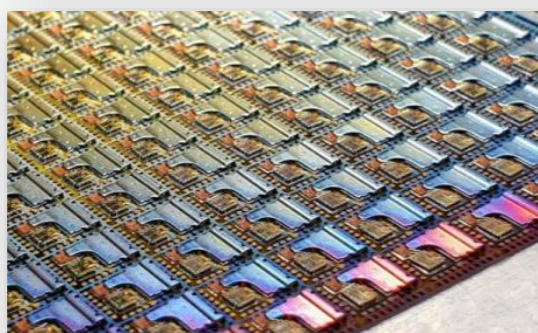
System in Package (SiP)



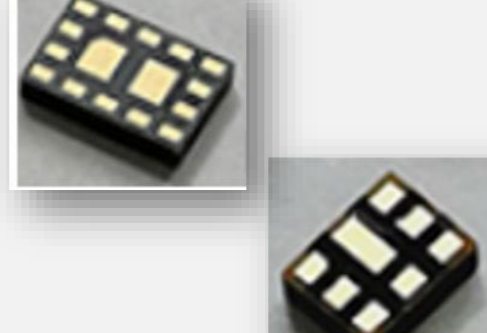
Quad Flat Package (QFP)




MEMS & Sensors



Copper Clip



Flip Chip



Transient Voltage Suppressor (TVS)



Power Management (SiC, GaN, GaN on SiC)



MICRO



Land Grid Array (LGA)



IC - PDIP, SOP packages



Test



*Automotive*

*Industrial*



*Consumer & Communications*

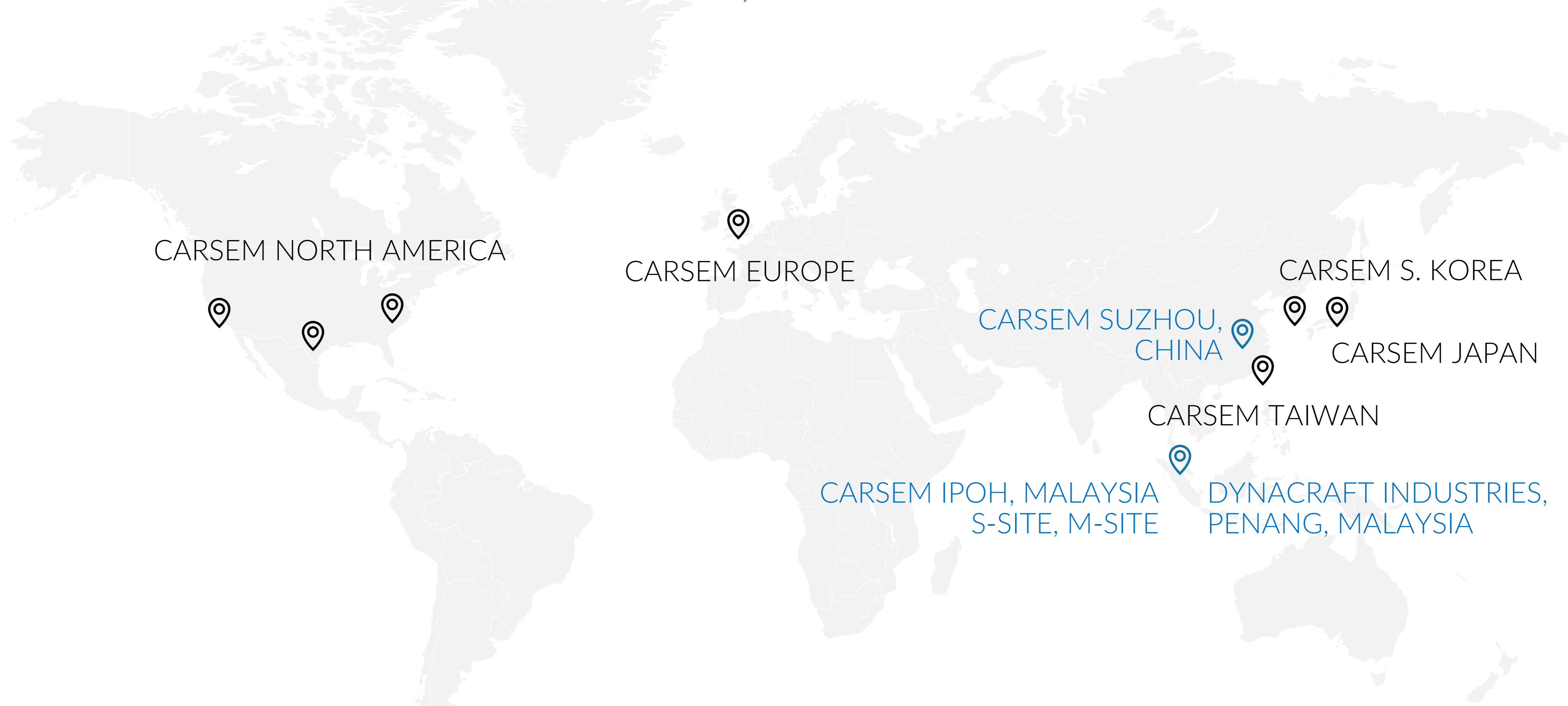
*PC/ Notebook*





# Geographic footprint

BROAD GEOGRAPHIC PRESENCE, SERVING A GLOBAL CUSTOMER BASE



LEGEND

Manufacturing plants & Sales offices

Sales offices



# Production facilities

## CARSEM MANUFACTURING SITES & BUSINESS UNITS



### Carsem (M-Site, Ipoh)

- Floor Space: 436K sq. ft. (40,500 sq. m.)
- Workforce: 2,256 employees
- GM: Muralitharan



Automotive & Consumer

SOIC

MICRO

MSU



### Carsem (S-Site, Ipoh)

- Floor Space: 640K sq. ft. (60,000 sq. m.)
- Workforce: 3,284 employees
- GM: Inderjeet Singh



Automotive & Industrial

PMG

MLP

TEST



### Carsem Suzhou, China

- Floor Space: 600K sq. ft. (56,000 sq. m.)
- Workforce: 2,000 employees
- GM: Raymond Shi



Consumer

RF

MLP

LGA

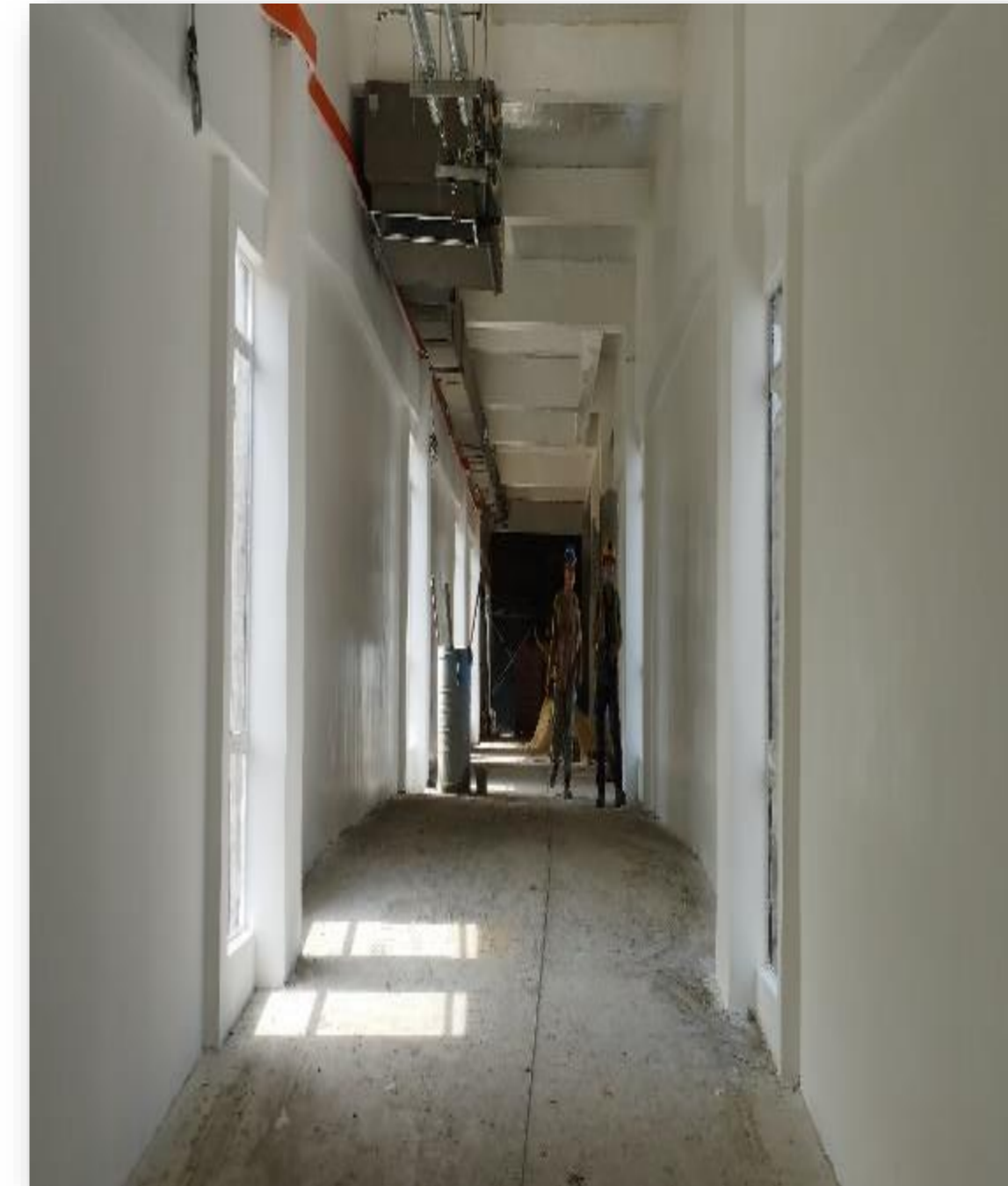
FC



# Production facilities

DESPITE NEAR TERM CHALLENGES, OUR FACTORY EXPANSION PLANS CONTINUE TO CAPTURE LONG TERM OPPORTUNITIES

Expansion for pipeline, commitments and business growth



Production starting in August 2024\*

**SUXIANG, CHINA**

Production starting in July 2023\*

**MALAYSIA (IN FRONT OF CARSEM M SITE)**

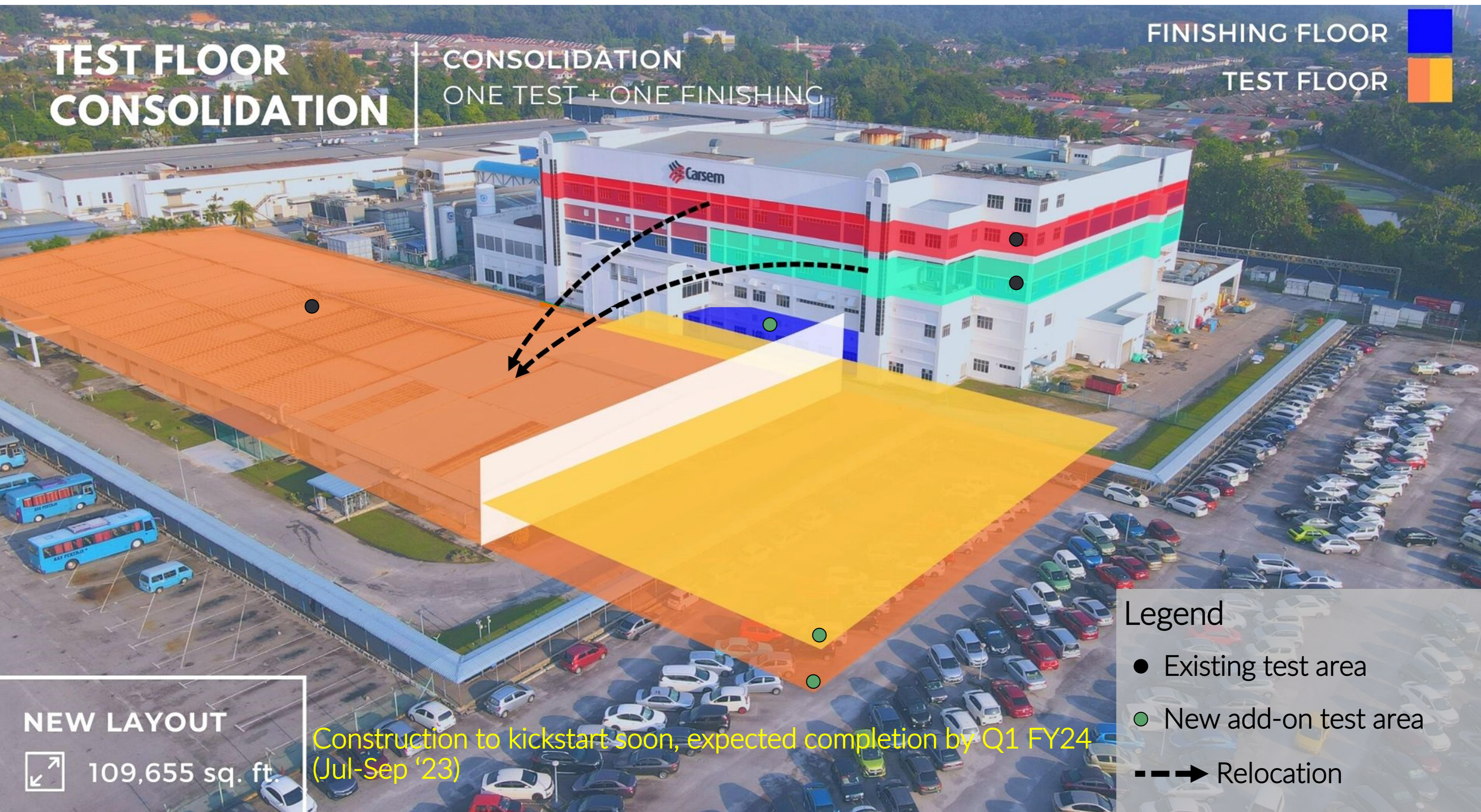
\*Depending on the covid situation & global externalities





# Production facilities

INVESTING AT S-SITE TO STRENGTHEN CAPABILITIES FOR THE GROWING AUTOMOTIVE & INDUSTRIAL SEGMENTS



- 1 **Equipment standardization**  
Replacing current legacy handlers with newer high efficiency test handlers
- 2 **One floor consolidation**  
Expanding test floor to support the additional machines
- 3 **Test automation**  
Overhead tunnel

### Benefits

- ✓ Achieve world class OEE
- ✓ Eliminate variance of test machines
- ✓ Consolidate floor space
- ✓ Automate test operations (Industry4.0, AI)
- ✓ Develop 5G capabilities

**NEW LAYOUT**  
109,655 sq. ft.

Construction to kickstart soon, expected completion by Q1 FY24 (Jul-Sep '23)

### Legend

- Existing test area
- New add-on test area
- > Relocation

# TABLE OF CONTENT

---

1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Sustainability performance

## FY22 PERFORMANCE SNAPSHOT

Included in  
**FTSE4Good Bursa Malaysia Index**  
 and in  
**top-quartile of ESG ratings**  
 amongst all PLCs assessed by FTSE Russell on Bursa Malaysia



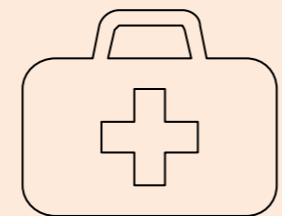
Women in workforce  
**48%**




Training  
**4 hours** on average  
 per employee



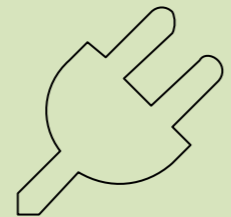
Health and safety  
**Zero occupational fatality, Vaccination** of employees




GHG emissions intensity (vs. FY15 baseline)  
**43% lower**



Energy index (vs. FY15 baseline)  
**43% lower**



Water consumption index (vs. FY15 baseline)  
**46% lower**




**CERTIFICATE OF MEMBERSHIP**

This is to certify that  
**Malaysian Pacific Industries**  
 is a constituent company in the FTSE4Good Index Series



**FTSE4Good**

June 2021

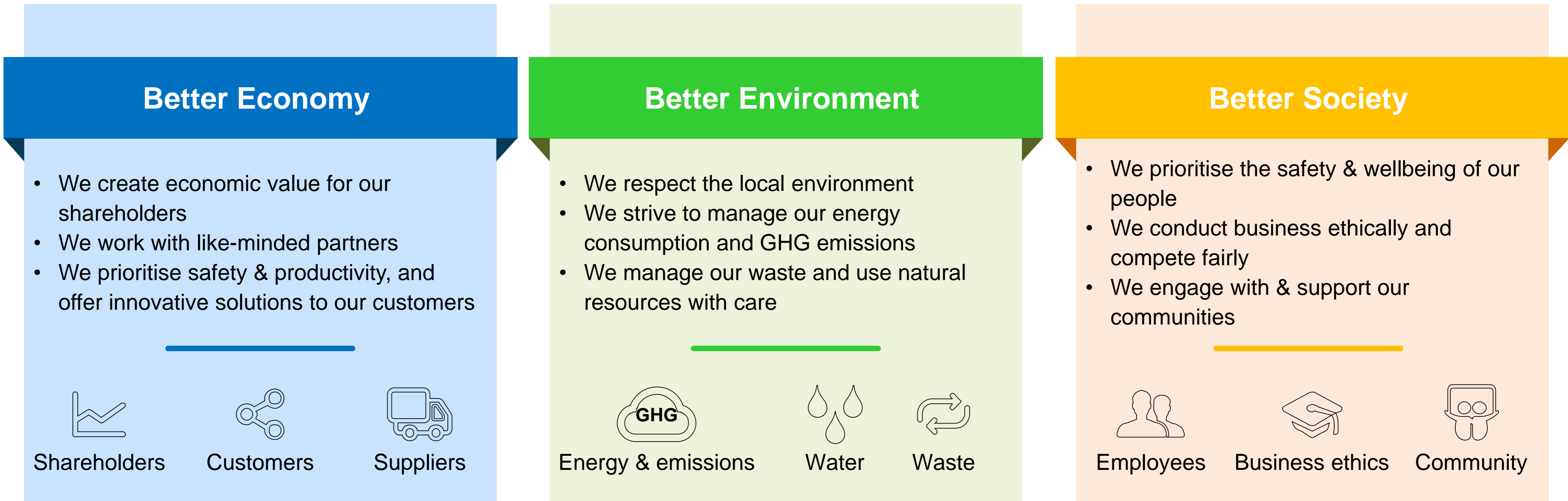
**Celebrating 20 years of the FTSE4Good in 2021**

The FTSE4Good Index Series is designed to identify companies that demonstrate strong environmental, social and governance practices measured against globally recognised standards.



# Sustainability at MPI

OUR APPROACH IS RESPONSIBLE & RESPONSIVE, DRIVEN BY 3 THEMES





# UN Sustainable Development Goals

6 PRIORITY SDGs MOST ALIGNED WITH OUR BUSINESS

Innovation, technology & related infrastructure development is a key focus area for MPI

**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE

**13** CLIMATE ACTION

MPI has a role to play in energy efficiency, emissions control and waste management



As a responsible business, safeguarding employee health & safety is a priority for MPI

**3** GOOD HEALTH AND WELL-BEING

**5** GENDER EQUALITY

**6** CLEAN WATER AND SANITATION

**8** DECENT WORK AND ECONOMIC GROWTH

MPI makes a significant contribution to employment and economic growth

As a global employer, MPI can help to ensure workforce diversity and address inequality

MPI's manufacturing processes can take active steps towards water conservation and wastewater management



# Health & safety

CONTINUED COVID-19 MEASURES TAKEN, ESPECIALLY AT SUZHOU, CHINA FACILITY

*Temperature measurements for all visitors and employees*



*health code checks at the entrance*



*disinfection in all public areas, and of incoming shipments*





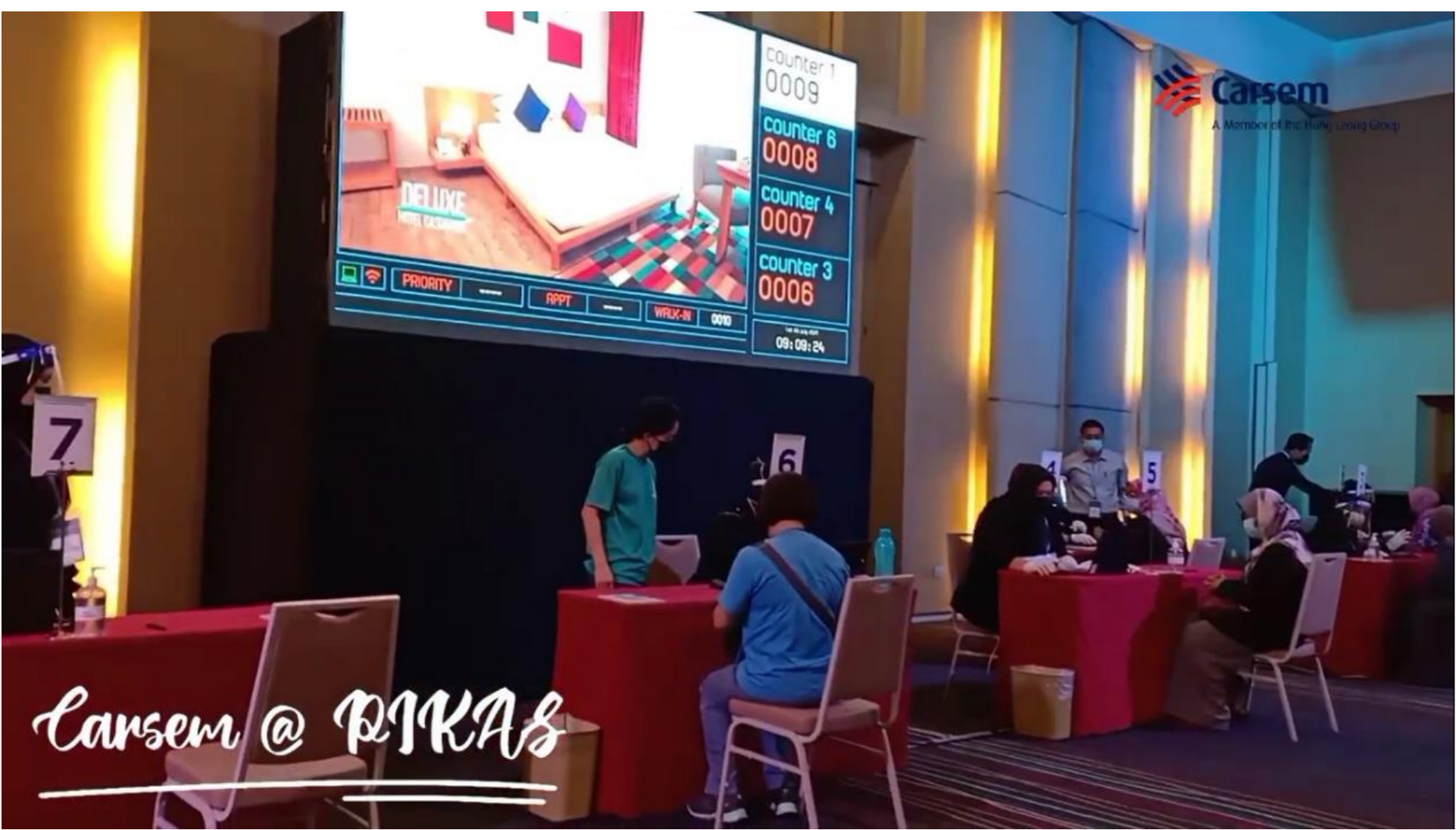
# Health & safety

99% OF OUR EMPLOYEES HAVE BEEN VACCINATED WITH TWO DOSES

## EMPLOYEE CARE

BUSINESS CONTINUITY PLAN

- Active fulfillment of our social responsibility – we organized vaccination & guidance for employees
- Aim is to ensure safety, and good health & wellbeing of our employees



Carsem M organized vaccination in collaboration with Perak government (PIKAS)



Nucleic acid tests (NAT) were arranged for shift employees at Carsem SZ



Promoting Covid-19 prevention awareness via visual and digital mediums



# Environment

## IMPROVING PREPAREDNESS AND RECEIVING RECOGNITION

Incident Commander Training for ERT members



3 training sessions were held to assess their level of preparedness for any emergency circumstance

Recognition from Malaysian Society For Occupational Safety and Health



MSOSH OSH GOLD CLASS 2 AWARD WINNER FOR 2022 under the category of MANUFACTURING & CHEMICAL SECTORS, ELECTRONICS AND ELECTRICAL SECTORS

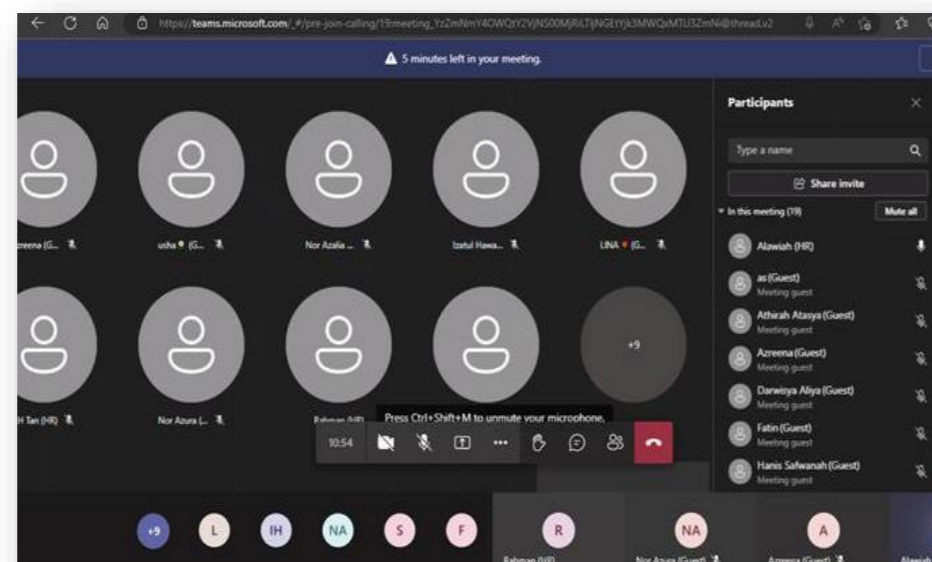




# Training & education

TRAINING & UPSKILLING IS AMONG OUR TOPMOST STRATEGIC PRIORITIES

Online & offline training programs - Supervisor series training, SLDN Apprenticeship Program, Engineer mandatory training, Audit & Compliance Training, ERT Training





# Training & education

TRAINING & UPSKILLING IS AMONG OUR TOPMOST STRATEGIC PRIORITIES

Online & offline training programs - Graduate development program, Supervisor series training, Production specialist training, Engineer core competency development





# Anti-bribery & anti-corruption

LEADING ETHICALLY & TRANSPARENTLY



Renewed SIRIM certification for implementing Anti-Bribery Management Systems complying with ISO 37001:2016.





# Audit & Compliance

DRIVING SUSTAINABLE VALUE FOR WORKERS, ENVIRONMENT & BUSINESS PERFORMANCE VIA LEADING STANDARDS & PRACTICES

Responsible Business Alliance (RBA) VAP Audit



ISO140001 and ISO 45001 Surveillance Audit



# TABLE OF CONTENT

---

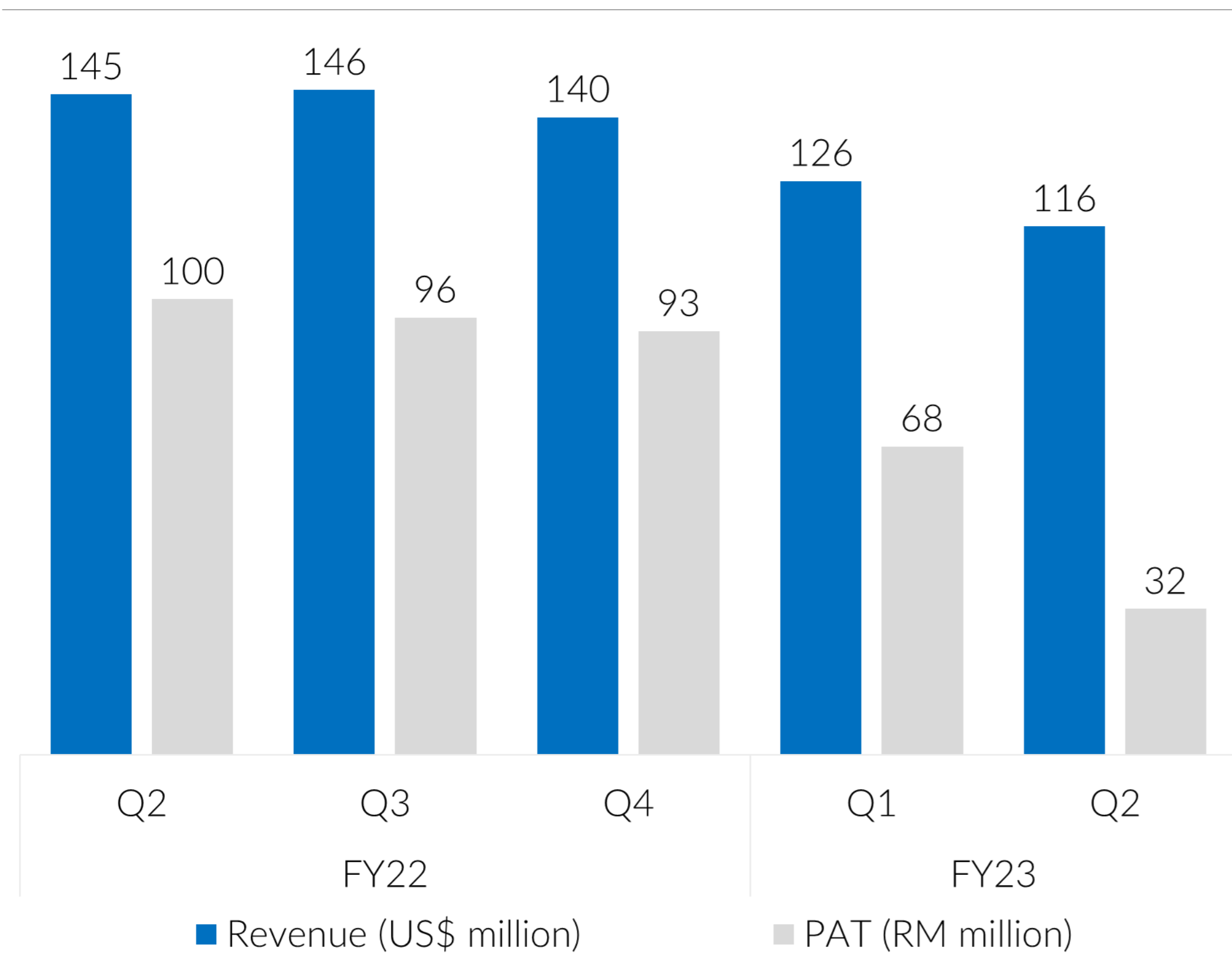
1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Industry dynamics

## MPI OPERATING IN A CHALLENGING ENVIRONMENT

MPI Revenue and PAT



Short term growth is hampered by economic and market headwinds

- ✓ Electric vehicles remain a bright spot despite marginal year on year drop in overall automotive sales by 0.1%
- ✓ Global PC shipments fell drastically by 29% - expenditure hit by rising costs in key markets
- ✓ Smartphone shipments down by 20% - communications market's worst performance in 10 years



Covid related supply chain disruptions, inflation, war, geopolitical tensions, end market demand drops/postponements are impacting near term industry growth

Source: Statista; Canalsys



# Industry dynamics

## CHINA'S STRUGGLING ECONOMY

The S&P China 500 declined 24.4% in 2022

### Pandemic threat. China economic activity worsens in Dec 2022 as Covid spreads

**TECHCRUNCH**  
Join TechCrunch+  
**China smartphone market slumps to 10-year low in 2022**

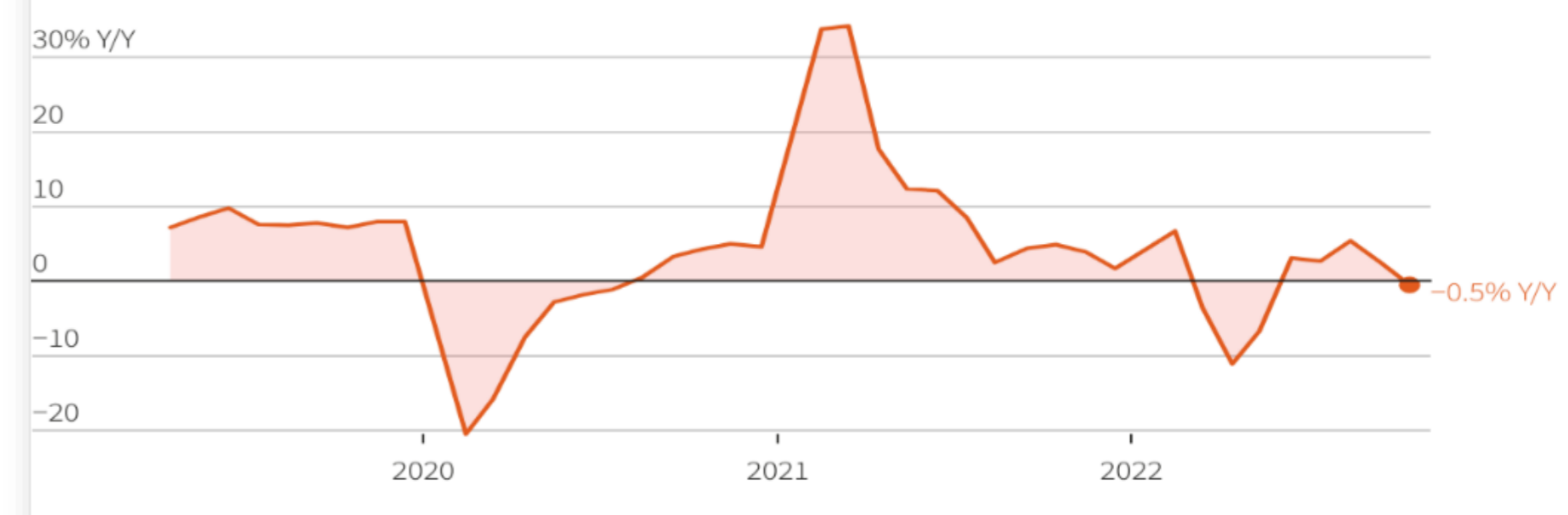
**DIGITIMES asia** | TECH | EV | ASIA | OPINIONS | RESEARCH | BIZ FOCUS | EVENT+  
China-based Will Semiconductor (WillSemi), the parent company of OmniVision, has warned of an enormous inventory impairment loss **resulting in a profit decline of as much as 80% in 2022.**

### SMIC expects revenues to fall more than 13% in Q4

2 minute read - December 24, 2022 11:08 PM GMT+8 - Last Updated a month ago  
**Tesla suspends production at Shanghai plant**  
Reuters

### China's consumption recovery dragged by COVID curbs

Retail sales fell 0.5% in October from a year earlier, the first fall since May, as COVID-19 curbs and the weak property market hit consumer sentiment.



Source: Refinitiv Datastream | Reuters, Nov. 15, 2022 | By Kripa Jayaram

### U.S. stops granting export licenses for China's Huawei - sources

**TECHWIRE ASIA** | Insights | Latest | Popular  
**The slump in the PC and smartphone market drags Samsung to its lowest quarterly profit in 8 years**

Source: SeekingAlpha



# Industry dynamics

## OTHER CHALLENGES IN SHORT TERM AFFECTING TOPLINE & BOTTOMLINE

### Electricity rates

#### Commercial electricity tariff hike

- Upgrading to efficient facility equipment, digital sensors to track electricity consumption and installing solar panels.
- It will cost a lot of money in implementation.



### Employee wages & working hours

#### Wage increase & 45 hour working week

- Driving plantwide digitalization & floor space consolidation.
- Optimizing each resource to increase plant wide productivity.



### Increase in machine cost

#### Machine & delivery cost up

- Deployed teams to plan in advance & monitor material as well as machine deliveries.
- Carsem to avoid shipment by air as much as possible and prefer vessel to save costs.



### Steep inflation

#### Rise in prices of raw materials

- R&D team is investing time in value engineering to optimize cost.
- In some cases, Carsem passes on the cost to the customers depending on the volume of business.



### Talent crunch

#### Hard to get good semiconductor talent

- Carsem is working with specialized agencies to get good talent from worldwide.
- Carsem is also investing in technical learnings for existing employees to upskill.



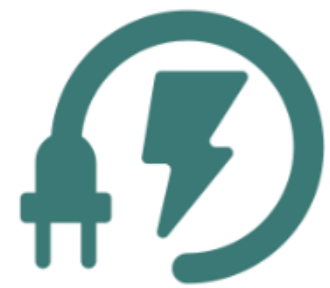




# MPI's response

## COST PRUDENCE MEASURES – IMMEDIATE RESPONSE TO MARKET CONDITIONS

*Continuous measures are taken to make a positive impact on costs, make processes efficient and proliferate it to all the sites*



Smart Sense to monitor Electricity on each machine



Digital Transformation & Automation for better OEE



Freight Cost Reduction by consolidating shipments bi-weekly



Alternative Energy – Solar (Reviewing for machines)

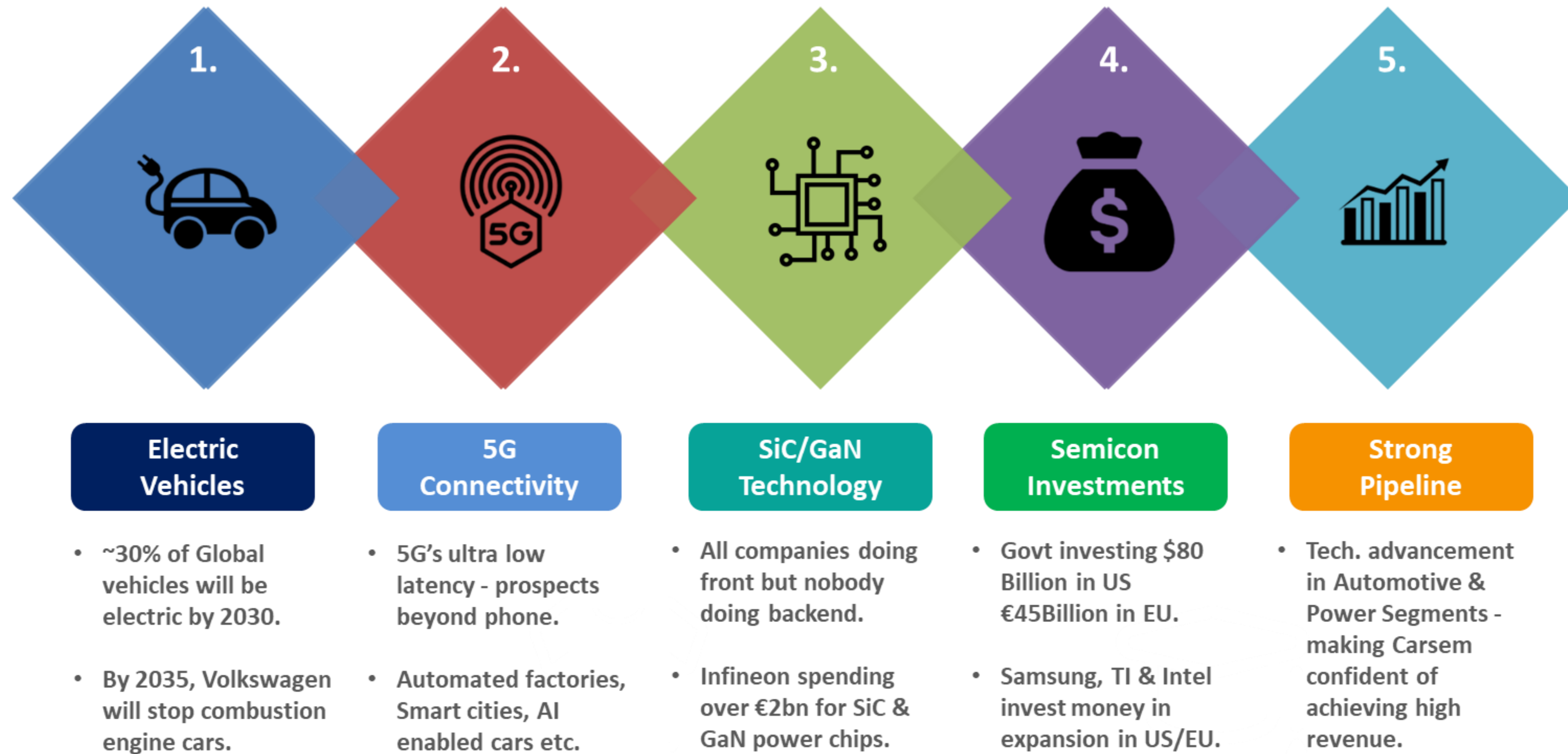


*Ongoing discussions with 4 vendors & awaiting their quotes to install solar panels on the terrace*



# Industry dynamics

LONG TERM OUTLOOK IS POSITIVE CONSIDERING THE WAVE OF OPPORTUNITIES IN THE COMING YEARS





# Growth strategy

OUR LONG TERM VISION IS TO BE THE LEADING OSAT FOR AUTOMOTIVE, DRIVEN BY 4 STRATEGY TENETS



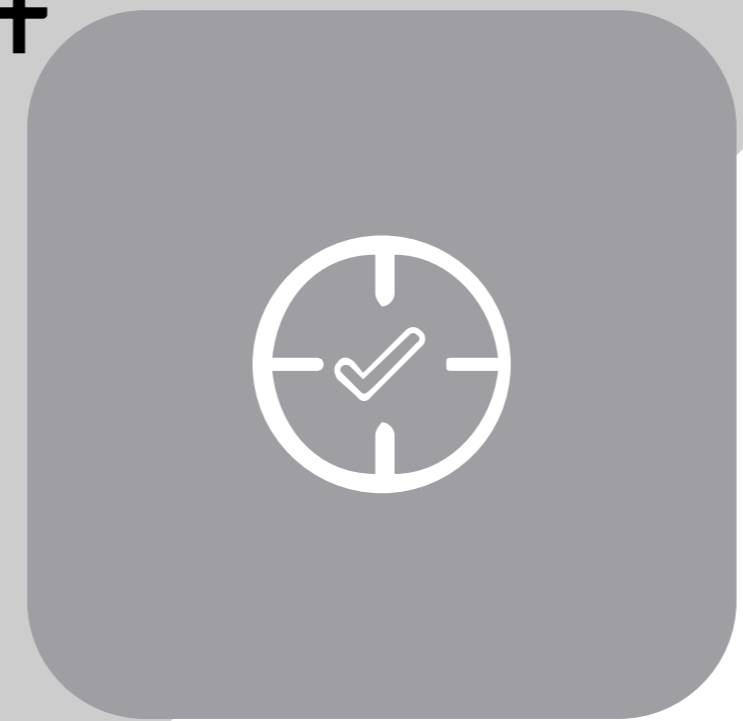
## Sales

- Strategic sales across application & geography segments
  - Sharp sales pipeline management



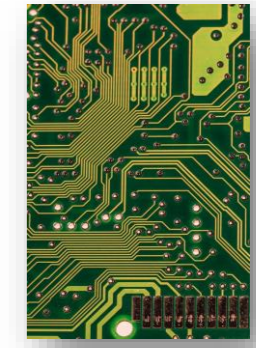
## People

- Strategic workforce – restructuring & hiring
  - Upskilling, training
- Covid mitigation, Employee engagement



4

## Technology



- Investing in SiC, MEMS sensors, GaN, 5G testing
- Advanced packaging – inorganic options for modules/ 3D printing/ design house
- Robust R&D; own product (TVS)



## Quality

- Zero Defects Culture
- Automation, high productivity
- State-of-the-Art Equipments



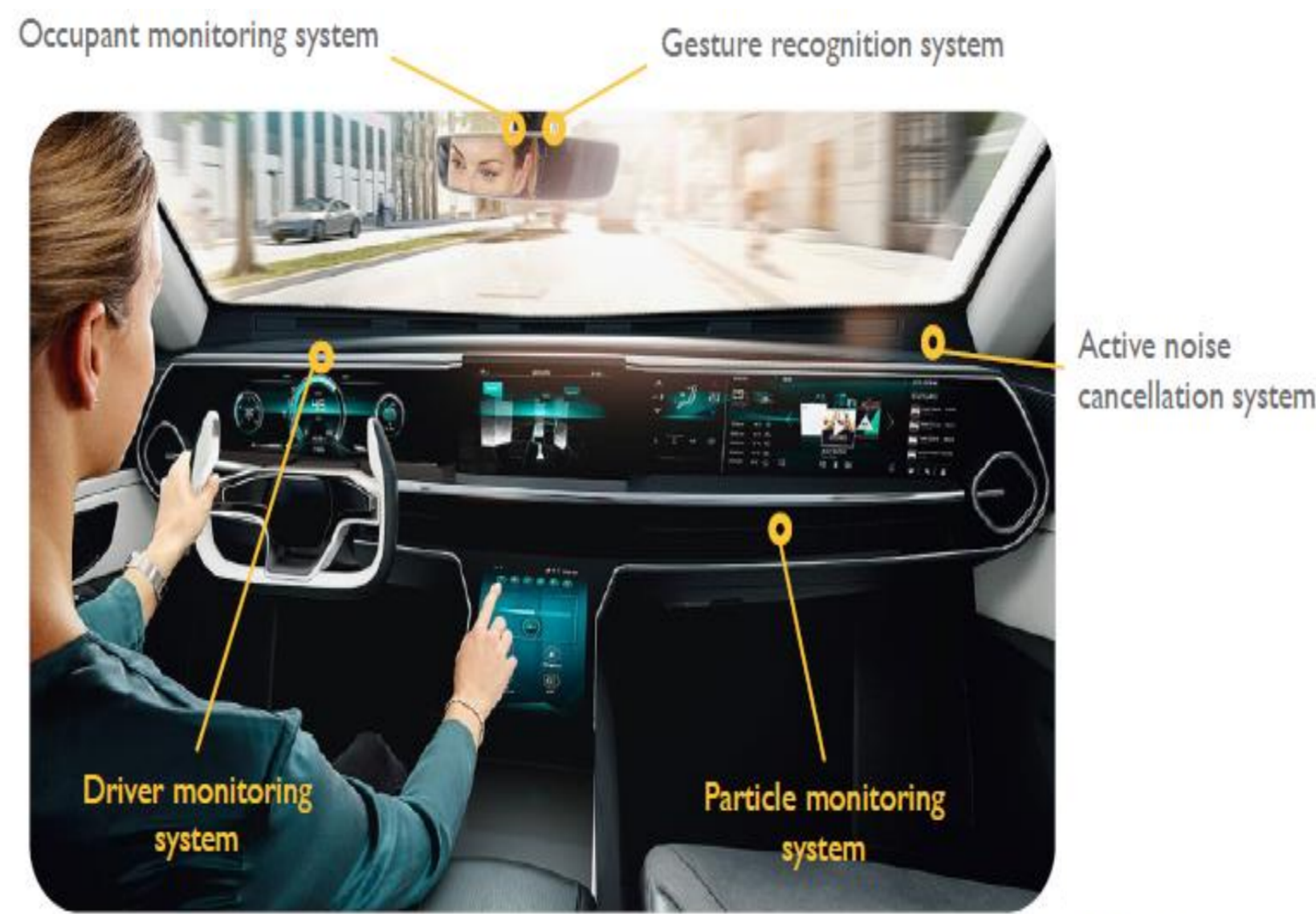
# Sales – Target segments to play in

MPI MADE A STRATEGIC MOVE TOWARDS UPCOMING TECHNOLOGIES

Continued investments in complex packaging technologies



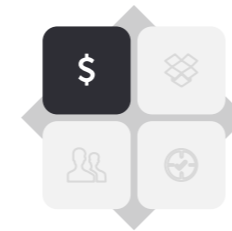
SiC adoption in EVs is gaining momentum – Experience of handling SiC packaging will lead the way



Customized sensors used for monitoring several data points – multi-functionality in small, cost-competitive, customized packages

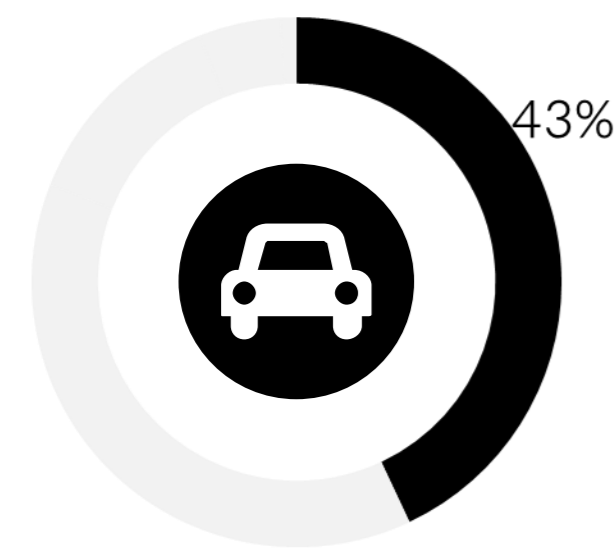


5G technology has a bright future – it is small for Carsem right now but in the next few years it will ramp up



# Sales – Revenue composition

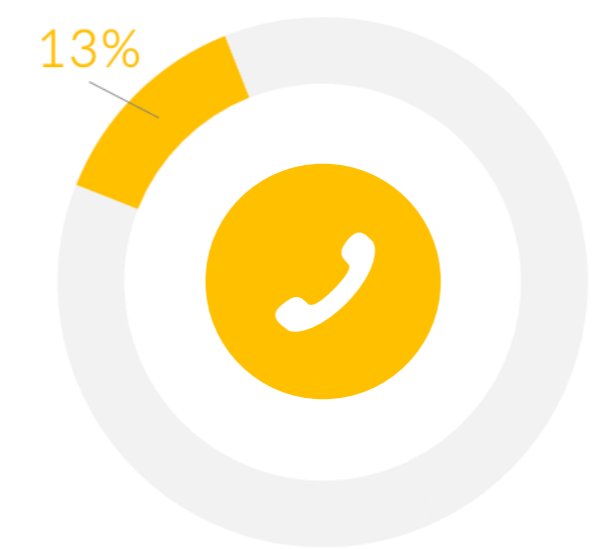
AUTO REMAINS STRATEGIC – GROWN FROM ~29% IN FY18 TO 43% OF OUR SALES NOW



% Revenue share

### AUTOMOTIVE

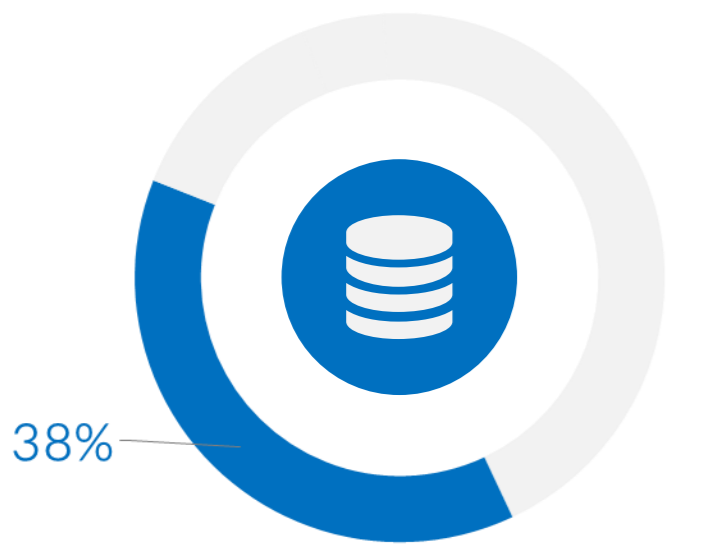
- Long term growth is driven by **electrification, ADAS/ AD, safety, and connectivity** trends



% Revenue share

### CONSUMER & COMMUNICATIONS

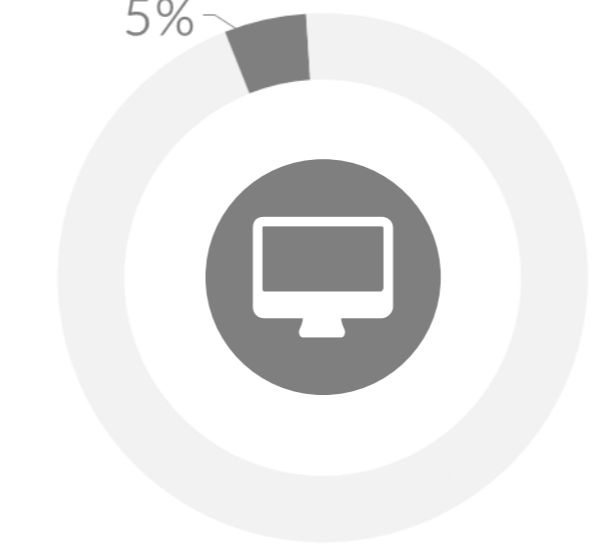
- **5G and IoT** are unlocking multitude of use cases – smart cities, healthcare, etc.
- Semiconductor demand is likely to ride this wave with need for **advanced packaging solutions**



% Revenue share

### INDUSTRIAL

- With **Big Data and Industry4.0** gaining further momentum, need to power data centers & servers is growing
- This **high power & high efficiency** requirement is fueling new innovations

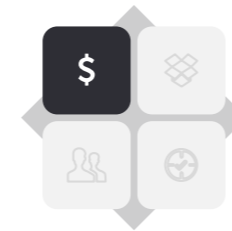


% Revenue share

### PC/ NOTEBOOK

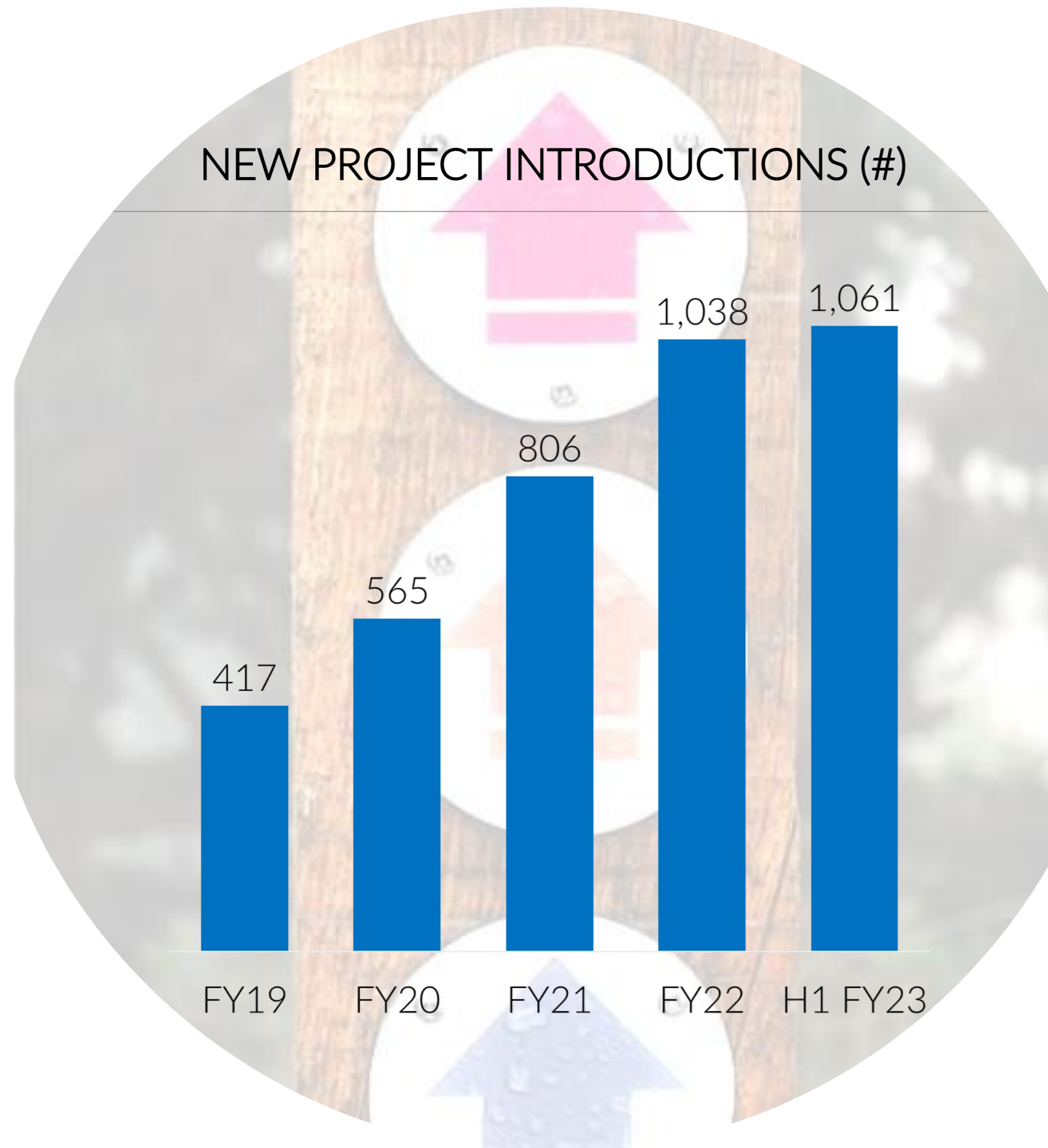
- Consumer electronics industry sales witnessing significant downward trend as the demand induced from trends such as WFH, online education, etc. normalizes with opening up of offices/ schools across economies

NOTE: Remaining 1% share of revenue is towards Miscellaneous applications



# Sales – Pipeline

HEALTHY PIPELINE BUT RECESSIONARY RISKS HAVE PUSHED PROJECTS TO FUTURE QUARTERS



- Carsem has a healthy order book with major projects coming from the Automotive segment

- Pipeline is full but the recent wafer shortage & end customer demand drop/ postponement has pushed projects to future quarters

- Ease of travel has helped Carsem team & customers engage in on-site physical meetings, driving closer collaboration on new pipeline projects in the last 6 months



# Technology – Automotive segment

INNOVATING IN LINE WITH STRATEGY TO BE GLOBALLY PREFERRED OSAT PARTNER FOR AUTOMOTIVE

## Major trends impacting semiconductor demand (Mobility disruptions)



### Electrification

Novel battery technologies, growth of electrical powertrain, demand for power electronics



### Autonomy

Surge in autonomous driving platforms & advanced safety features



### Connectivity

New use cases (V2X, V2V, OTA) - progression in connectivity technology (5G, WIFI-6)

>20 years as a certified automotive supplier

## Carsem Technology Value Propositions & Activities

### MEMS & Sensors – riding ‘Electrification’ and ‘Sensorization’ wave

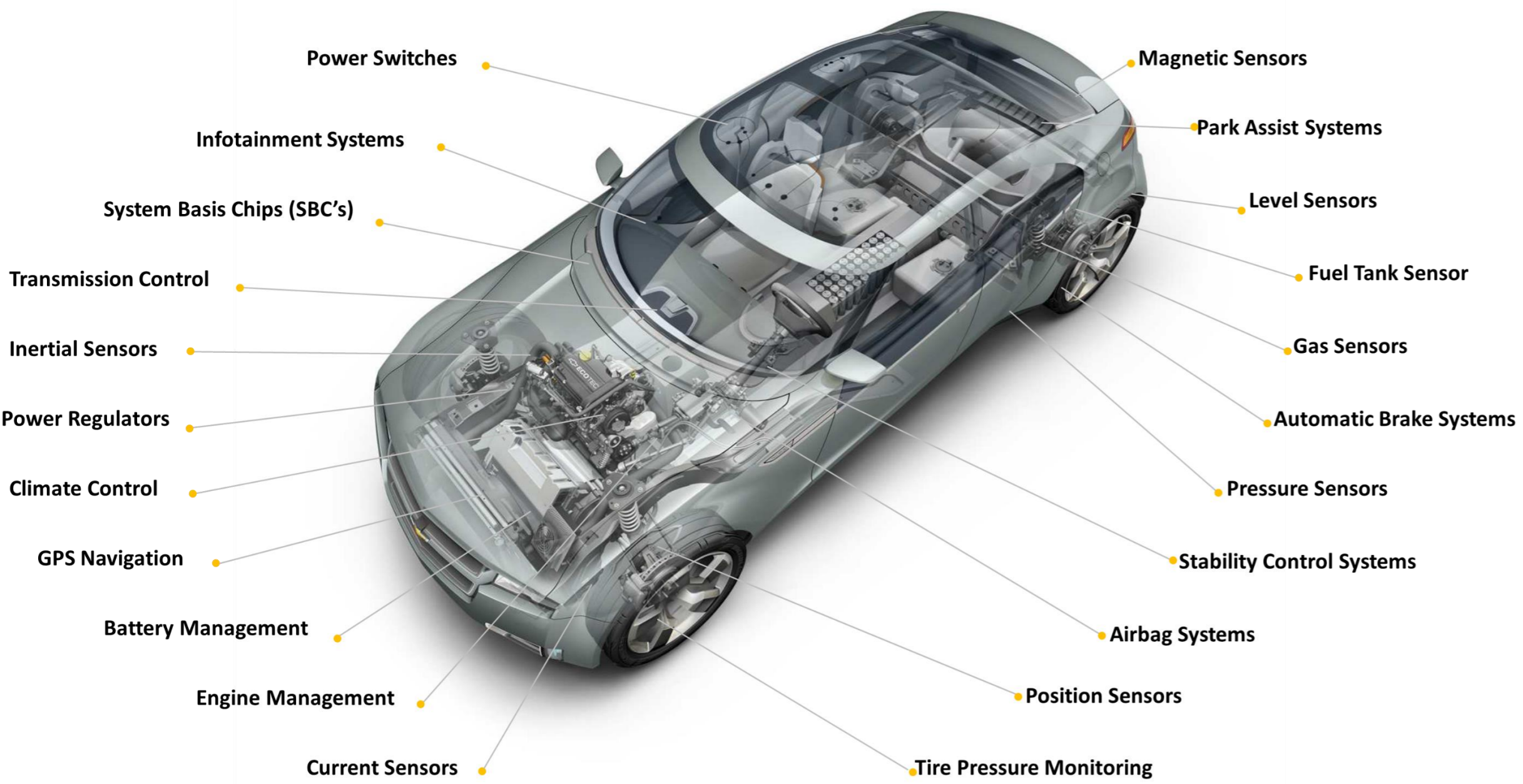
- ✓ SiP Pressure sensors for ICE and Safety are ramping up for Automotive,, Gas & Flow sensors – safe launch production stage
- ✓ Expanding in temperature/ humidity sensor applications with qual, in parallel with ramp up phase
- ✓ New focused development - current sensor for EV with wettable flank technology

### Power Packaging

- ✓ MIS solution Automotive PMIC Module, pass qualification, under safe launch
- ✓ Completed process assessment for Vibrating bowl test handler with triple temperature for automotive, co-work with customer for customized requirements
- ✓ Module development with SiC for automotive

### RF for Connectivity

- ✓ Differentiated support on diverse applications using Gallium Nitride (GaN) technology

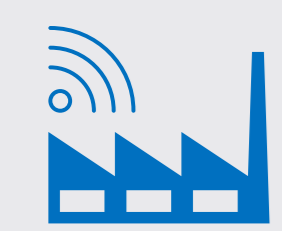




# Technology – Industrial segment

EXPANDING PORTFOLIO ALIGNED WITH TRENDS IN ADVANCED PACKAGING & TESTING FOR POWER

## Major trends impacting semiconductor demand



### Industry 4.0

Higher performing devices with greater functionality driving models that enable increased flexibility, higher productivity & lower costs



### Big Data

More servers with high power & high efficiency to support large volumes of data

>30 years in power packaging

## Carsem Technology Value Propositions & Activities



### Power Packaging

- ✓ Awarded the next generation of Power stage products for servers and workstation (Cu Clip). In qualification will be ready for HVM in Q3 FY23
- ✓ Development on chip embedding package, expected HVM in FY22/23
- ✓ More new customers, engagement on Cu Clip
- ✓ Setup Taiko Ring Removal process for ultrathin die application, in pre-production
- ✓ Vacuum reflow under HVM, thick LF(20 mil) completed qualification
- ✓ High power (2KV/100A) Test solution under development, with applications in base station/industry power supply/big data center

### MEMS & Sensors

- ✓ Ramping gas sensing applications & flow sensor under R&D, target production in Q4 FY23; also, ramping current sensor and magnetic sensor applications
- ✓ Hermetical & Non hermetical Ceramic Packages (Gyroscopes & Accelerometers) with safe launch





# Technology – Consumer/ communications segment

TAPPING INTO THE 5G REVOLUTION THROUGH ROBUST CUSTOM OFFERINGS

## Major trends impacting semiconductor demand



### 5G

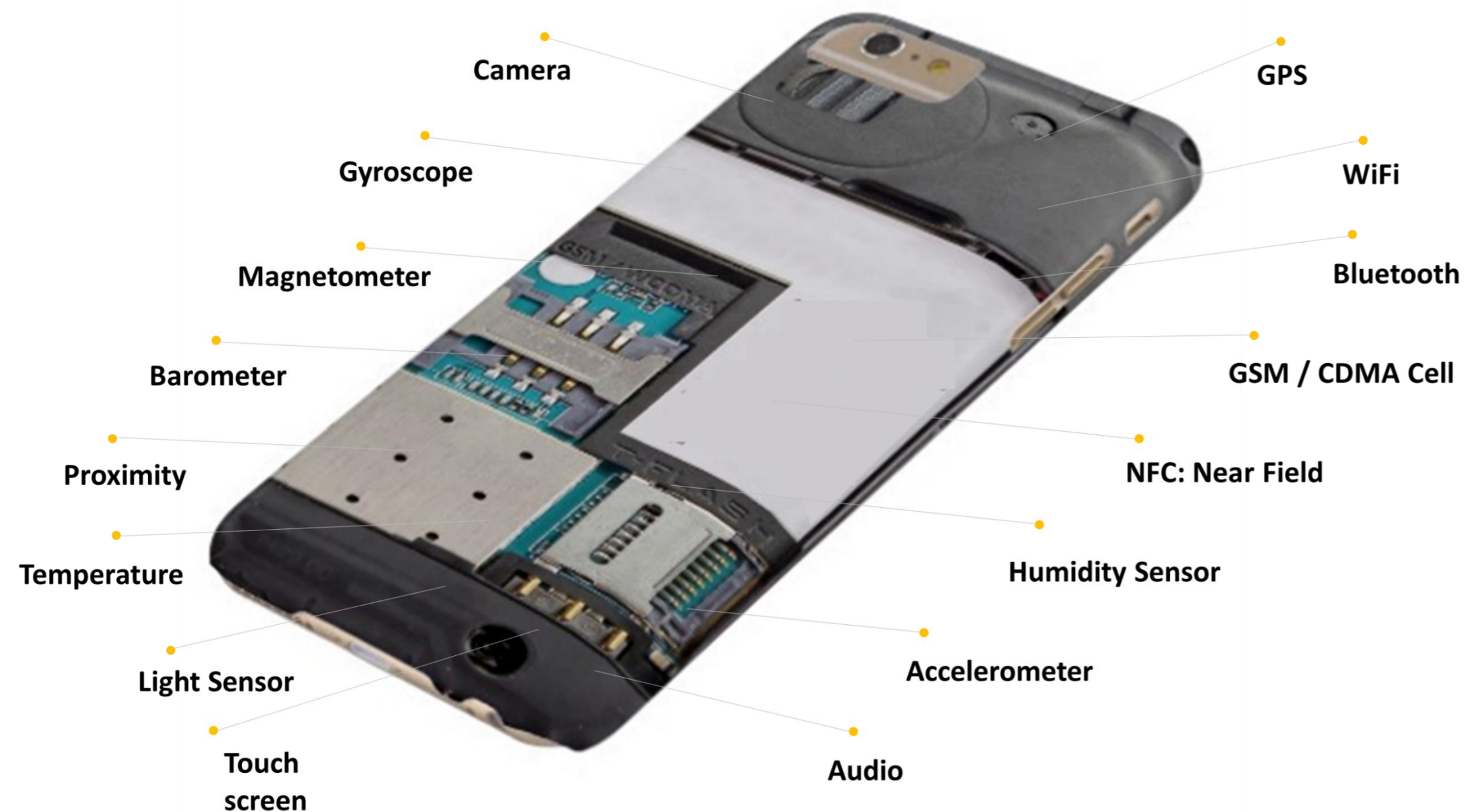
High data rates, massive connectivity and ultra-low latency, catalyzing remote health care, autonomous driving, AR/ VR experiences



### IoT

Need for combining functionalities – security, connectivity & microprocessors - stimulating usage of sensors, actuators & computing power

## Carsem in Communication



## Carsem Technology Value Propositions & Activities

### RF (5G mobile, WiFi6)

- ✓ RF FEM (SiP) module on DiFEM (Filter+Switch) started initial production
- ✓ Completed RF test capability development, for WiFi7 7.125GHz
- ✓ FC LGA with underfill process began production
- ✓ FC power management in production, mainly on high end PMIC wireless charging, fast charge , Li-Ion battery management

### Power Packaging

- ✓ RF Power (mid-high) packaging expertise for handphones/ 5G base stations; high volume manufacturing experience of handling GaN
- ✓ RF module/ high power switch for 5G base stations remains focus

### MEMS & Sensors

- ✓ Optical sensor using clear compound under volume production (for VR, wearables, etc.); and IMU for hand held devices
- ✓ Expanding into high grade BOM for RF segment

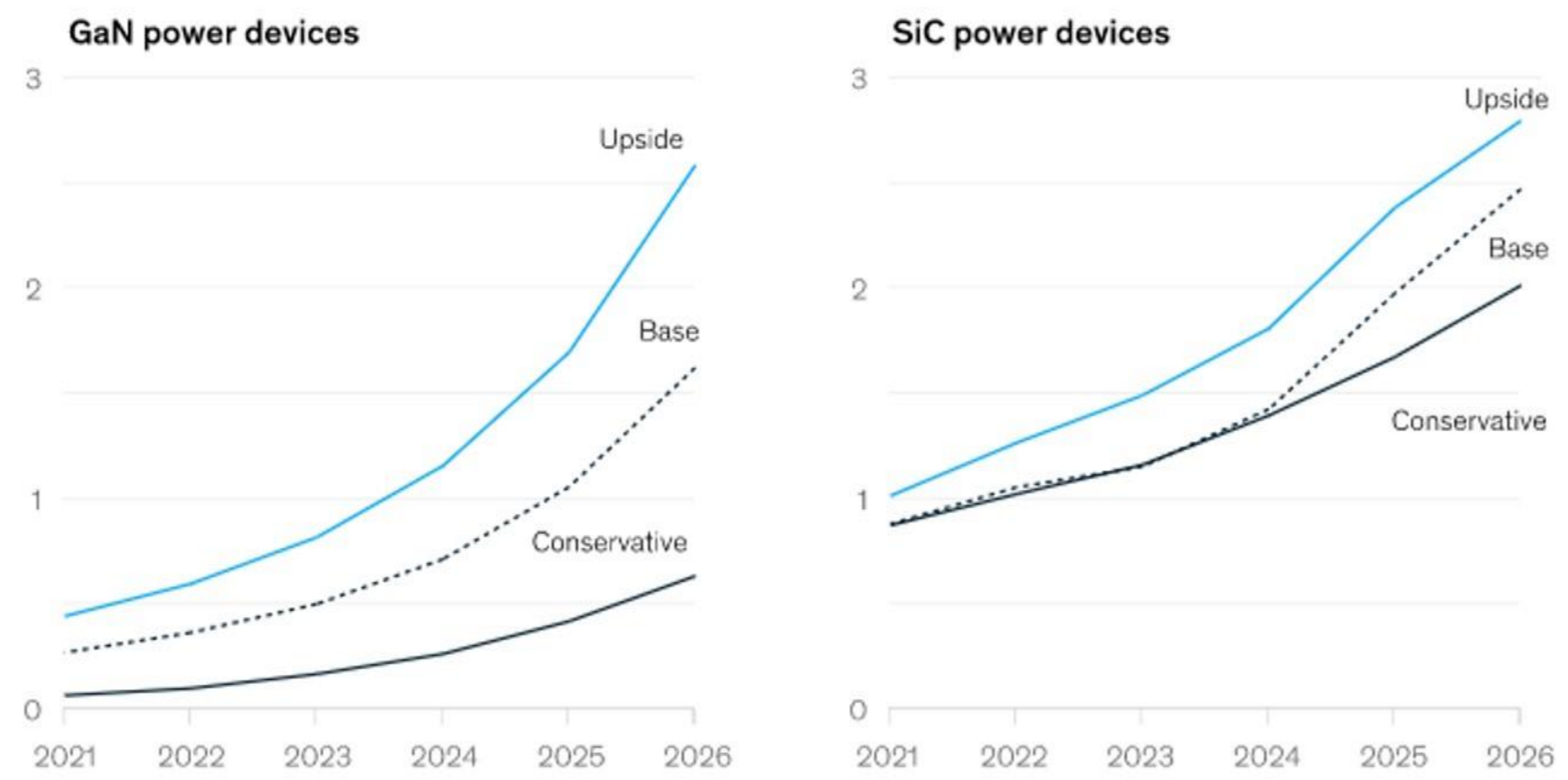


# Technology-Immediate focus

## SiC and GaN TECHNOLOGIES

**Semiconductor industry experts expect high growth rates for both gallium nitride and silicon carbide power devices.**

Projected revenue for gallium nitride (GaN) and silicon carbide (SiC) power devices,<sup>1</sup> \$ billion



Source: Expert interviews; Kevin Anderson and Richard Eden, SiC & GaN power semiconductors report, Omdia, June 19, 2020; GaN power transistor sales development, Omdia, December 2020; Yole Power Devices Summary – 2019-25; Yole Total Power semi-market – 2019

Source: McKinsey

- Rapid growth is projected on the back of a surging adoption for SiC and GaN power devices in line with the global drive for electrification and sustainability

- SiC and GaN are fit for applications that require high power and frequency as they enable better energy conversion efficiency and reduced form factors

*For wider market adoption, it's crucial to reduce costs further & new packaging solutions have a great role to play*

### *Carsem's involvement in unlocking these innovations*

- test & develop new high thermal conductivity materials (pressure & pressure-less Ag sintered paste, Cu nano paste)

- customize packaging design – using thermal & stress simulation; produce parts with best thermal dissipation via new manufacturing solutions – vacuum reflow



# Technology-Immediate focus

SiC - UNLOCKING RF & POWER APPLICATIONS



- ✓ Module packaging development with SiC for automotive
- ✓ Custom packaging design - using thermal & stress simulation
- ✓ New manufacturing solutions to produce parts with best thermal dissipation
- ✓ Focus on enablers die attach material, high current interconnect, high temperature mold compound and cost effective wafer dicing

## CARSEM INNOVATION TO REALIZE SiC's FULL POTENTIAL

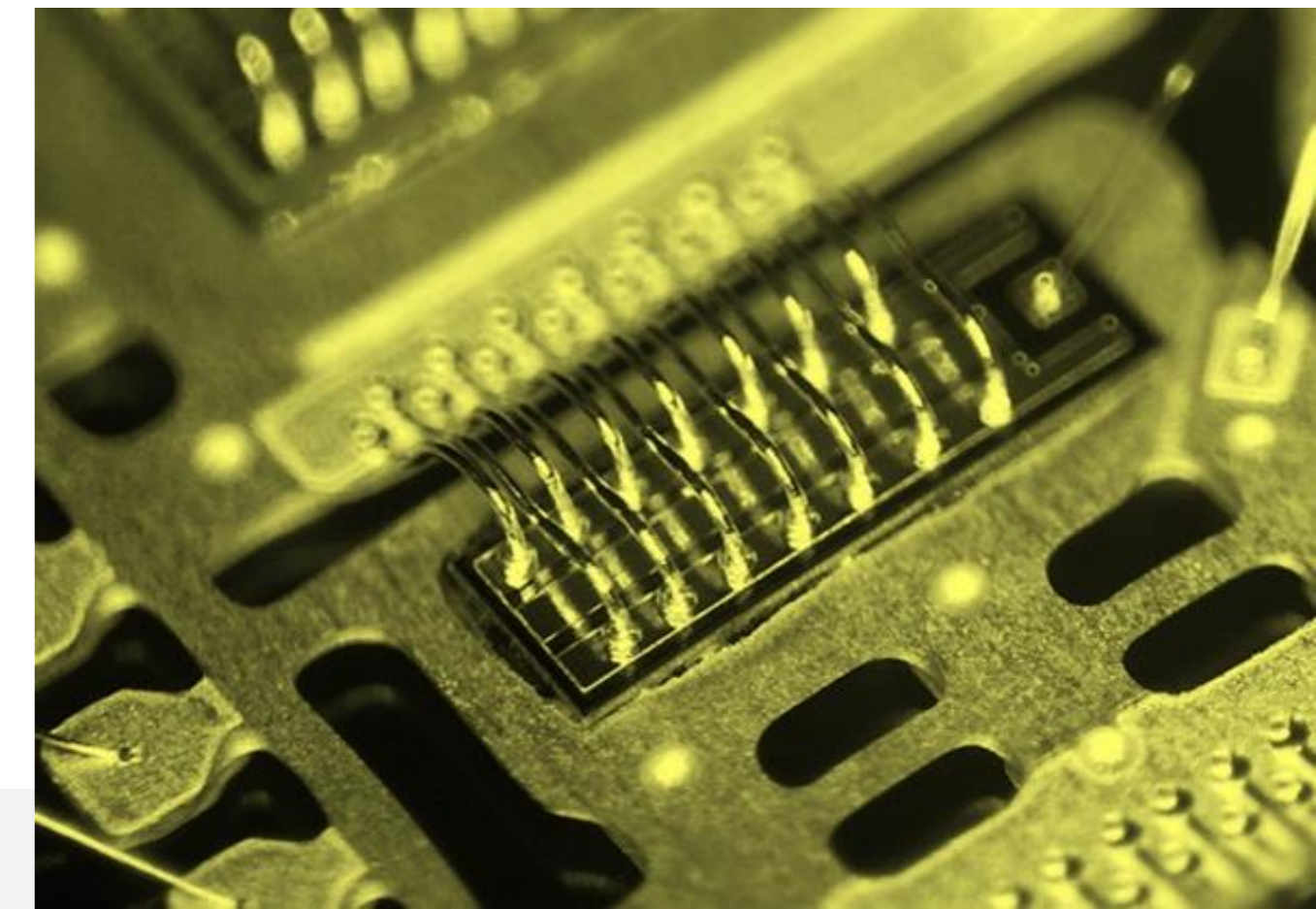


Benefits of SiC over previous gen materials

- ✓ Wider bandgap,
- ✓ improved energy conversion efficiency & power density,
- ✓ higher thermal conductivity (3-4X Si/GaAs/GaN),
- ✓ higher switching frequencies, and reduced system size

### CARSEM ADVANTAGE

- ✓ Our experience in running RF & high power devices using SiC



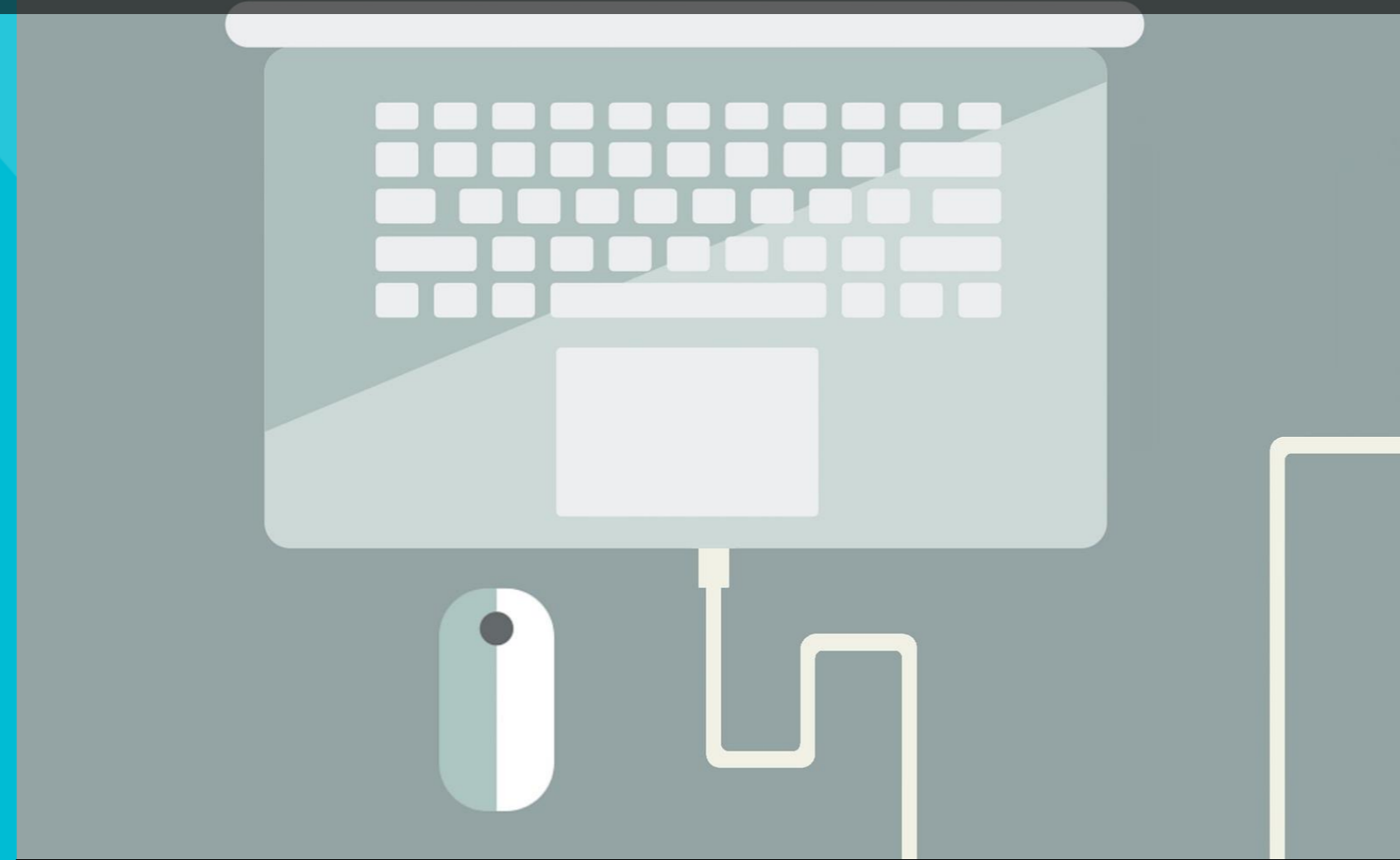
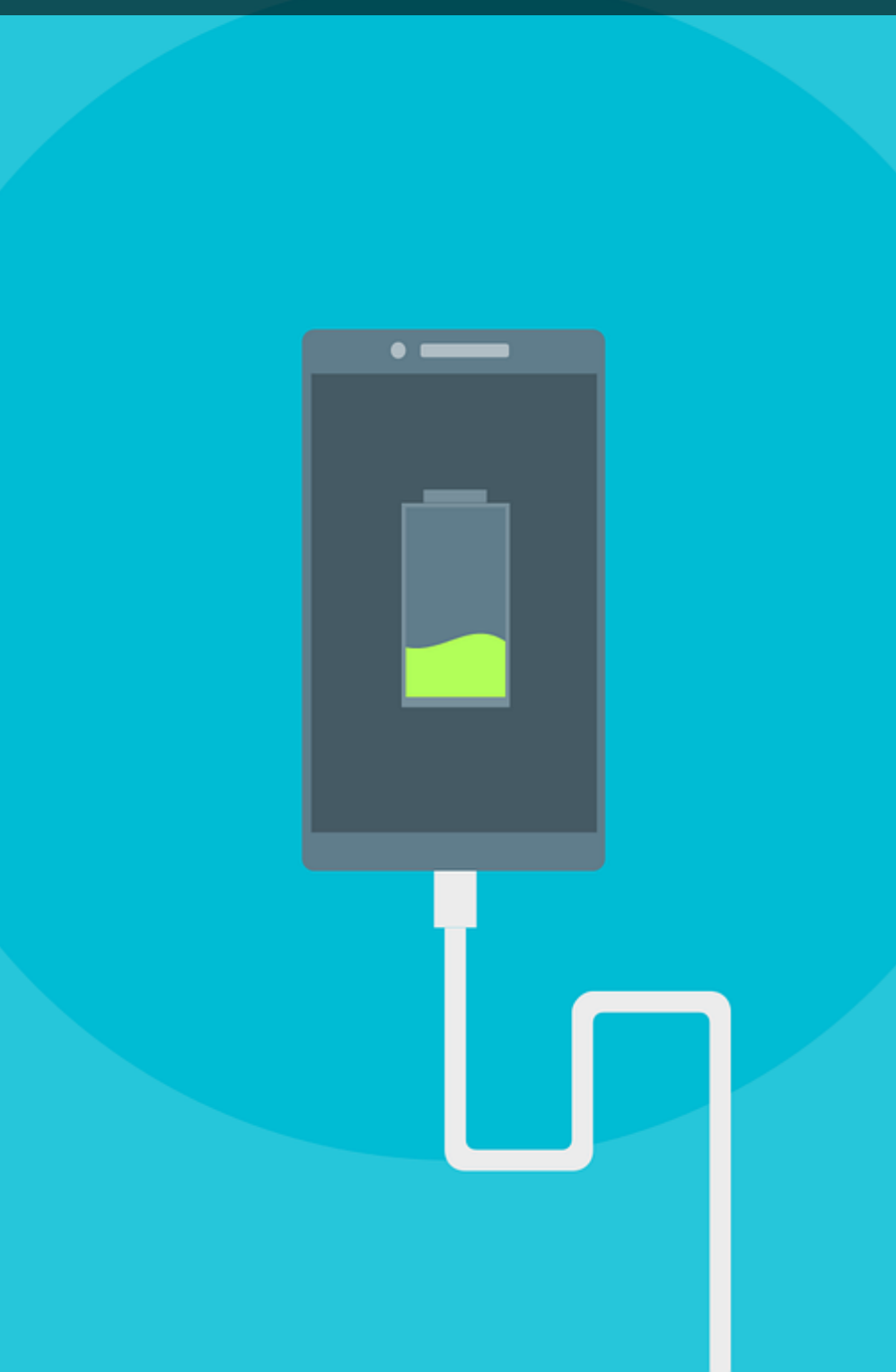


# Technology – Immediate focus

## GaN – CATALYSING CHANGE IN POWER ELECTRONICS

GaN is a wide bandgap material that is becoming essential in some applications where Silicon has hit its physical limits as a power conversion platform

GaN power ICs can enable 3X faster charging in adaptors that are half the size and weight of silicon-based designs, making mobile fastcharging as the largest market for power GaN currently



GaN benefits: efficiency, switching speed, size, high-temperature operation, cost effective (GaN retail launch pricing is 0.5X of previous best-in-class Silicon chargers and ~3X lower in the case of multi-output chargers)

Amidst the global chip shortage, more companies are turning to GaN as it's easier and faster to produce than Silicon chips, further helping the industry reduce its decades long reliance on Silicon.

Carsem R&D focuses on power management solutions across the spectrum (low-high), including GaN packages

### Key learnings on GaN handling

GaN's brittle nature makes wafer vulnerable to breakage during transportation

Important to define wafer packing SOPs and clear the drop tests

GaN wafer die crack & chip issue between GaN & Si layer

Prevent by optimizing the laser grooving process & parameters

Manage the large length to width ratio ( $\geq 1:3$ ) for the die

Optimize put up tool based on the design characteristics of GaN chip

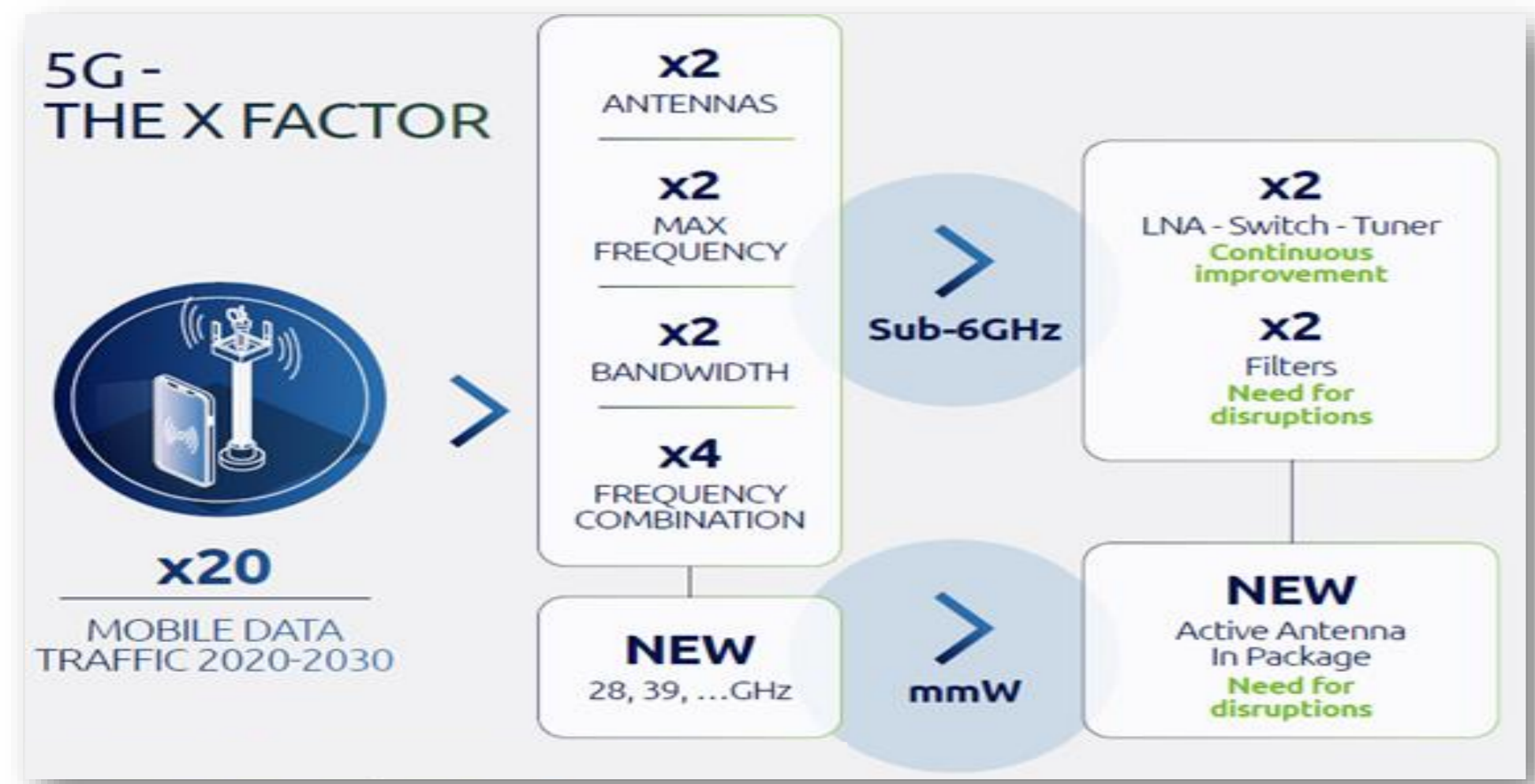
Enable power GaN (high current 100A, fast switching time, dynamic RDSon, low current leakage nA level), and RF GaN (high power upto 300W, high voltage upto 40V, high frequency sub 6G)

Build capabilities by qualifying new instruments and test methods



# Technology – Immediate focus

## GaN FOR RADIO FREQUENCY (RF) APPLICATIONS – 5G BASE STATIONS



ANTENNAS

FRONT-END MODULES  
Power amplifiers, switches, antenna tuners, filters

Sub-6GHz mmWave

WIFI 2.4GHz UWB

WIFI 5 & 6GHz

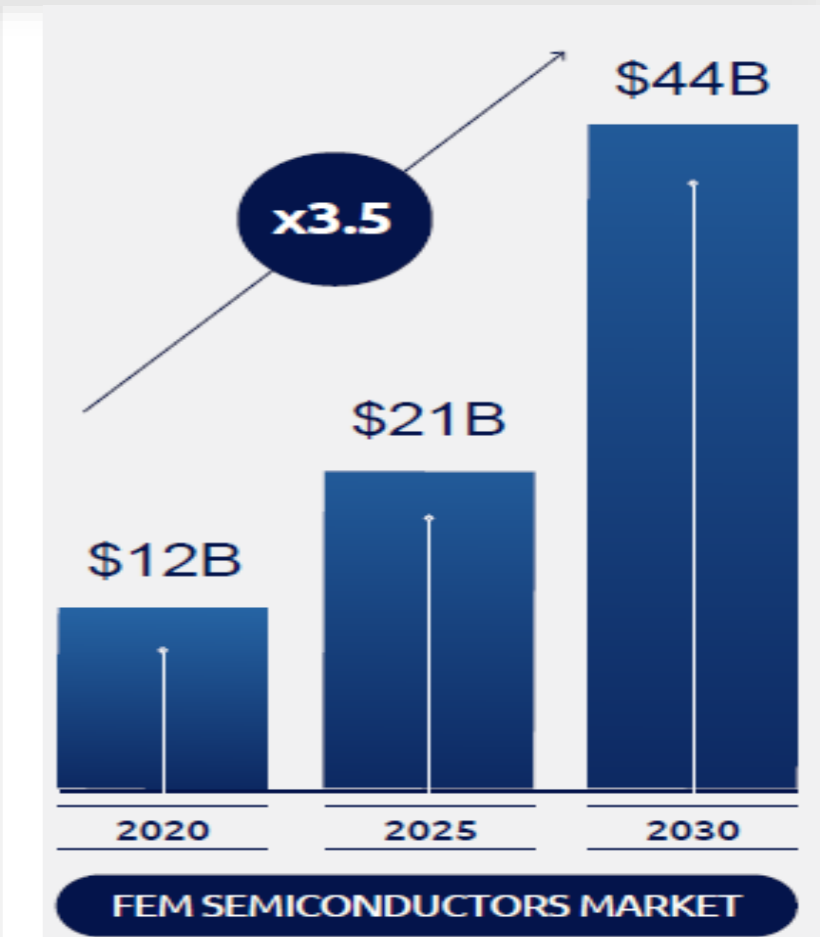
TRANSCEIVERS

Others Apps processor Baseband processor Memory Power mgnt

	POWER AMPLIFIER (PA)	LOW NOISE AMPLIFIER (LNA)	SWITCH	ANTENNA TUNER (AT)	FILTER	ENVELOPE TRACKER (ET)	PHASE SHIFTER	SYSTEM ON CHIP (SoC)
4G / 5G SUB-6GHZ FEM KEY BLOCKS	RF-SOI	■	■	■	□	□	□	□
	POI	□	□	□	■	□	□	□
	FD-SOI	□	□	□	□	■	□	□
	GaN	■	□	□	□	□	□	□
5G MMW FEM KEY BLOCKS	RF-SOI	■	■	□	□	□	■	□
	FD-SOI	□	□	□	□	□	■	■
	GaN	■	■	□	□	□	□	□
WIFI & UWB FEM KEY BLOCKS	RF-SOI	■	■	□	□	□	□	□
	POI	□	□	□	■	□	□	□
	FD-SOI	□	□	□	□	□	■	■

Significant growth is projected for front end modules (FEM) in the next 8 years

- ✓ Carsem spent US\$ 12Mil for 5G RF FEM. Carsem Suzhou already has experience in FEM for 4G and now progressing with extensive R&D on 5G FEM
- ✓ Industry technology trend suggests that the business of GaN related FEM will be much more than 4G
- ✓ Carsem Suzhou is already engaging with main 5G players of China for 5G base stations FEM

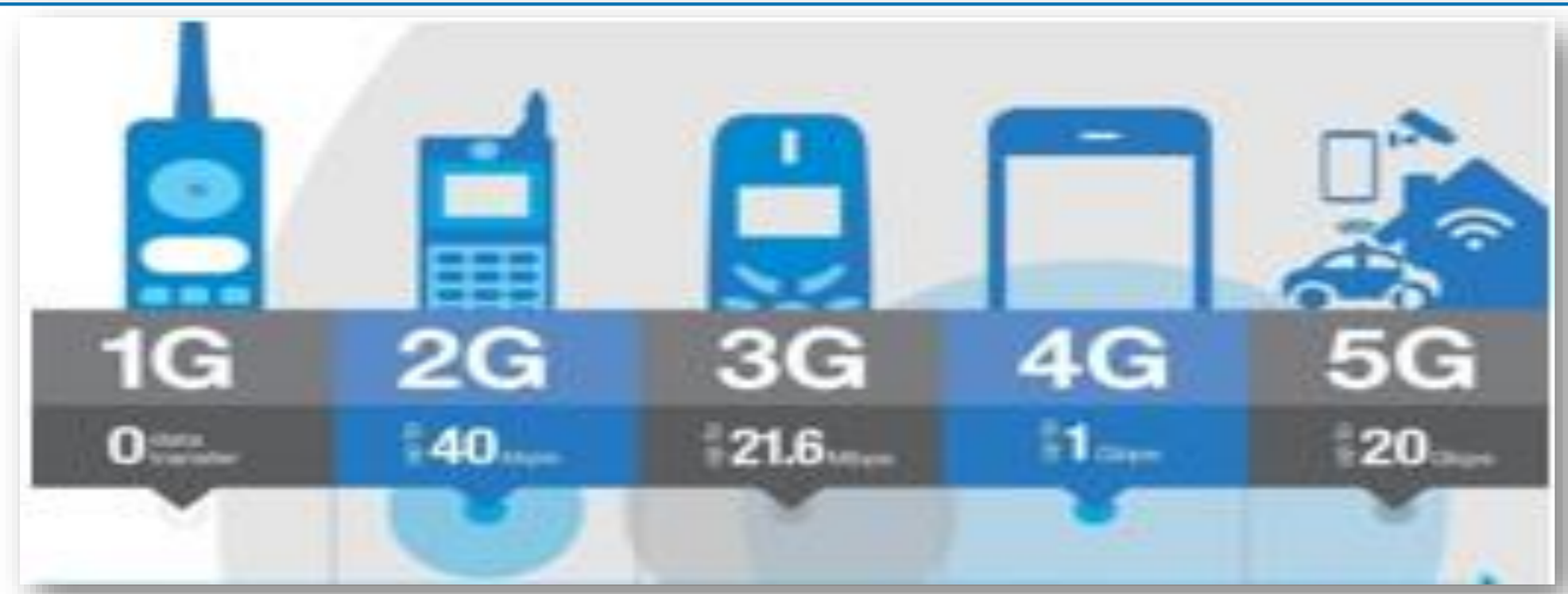


Source: Yole, Ericsson, Soltec, Qualcomm



# Technology – Future focus

## 5G – Next Generation of mobile broadband



- ✓ Exponentially faster download & upload speed
- ✓ Drastically decreased latency
- ✓ Implementation of IOT, Autonomous Cars, Artificial intelligence.
- ✓ High frequency signals on shorter wavelengths will require more base stations than usual 4G

### 5G use cases



## 5G TESTING

Carsem Suzhou has been working extensively on 5G test technology development

- ✓ CSZ is working with 10+ customers for 5G device testing
- ✓ Over US\$ 5Mil investment in 2021 in buying testing machines as they are completely different for 5G testing
- ✓ Building an exclusive 5G RF domain specific test development team to be the best in this field

### CSZ R&D capability - able to support 5G sub 6GZ, but not ready for 5G mmWave yet

Product	2G	3G	4G LTE	5G (Sub-6GHz)	5G (mmWave)
	800MHz~2GHz	2GHz~2.2GHz	1.7G~2.7G	3.3GHz~6.0GHz (Sub-6GHz)	>28GHz (mmWave)
Bandwidth	6MHz~24MHz	15MHz	15MHz~130MHz	<1G Hz	>1G Hz
Switch	✓	✓	✓	✓	Under development
Filter (SAW/BAW)	✓	✓	✓	✓	Under development
Diplexer/Multiplexer	✓	✓	✓	✓	Under development
PA (Power Amplifier)	✓	✓	✓	✓	Under development
LNA (Low Noise Amplifier)	✓	✓	✓	✓	Under development
Antenna Tuner	✓	✓	✓	✓	Under development
SiP (include 2 or more components into a package)	✓	✓	✓	✓	Under development



# Technology – Future focus

## MODULES

Entirely new SMT Line



3D X - Ray



C - Mold



### CARSEM SUZHOU

- ✓ Invested in dedicated machines for FEM module line. Machines have come in and finished setting up
- ✓ Design is under R&D and getting evaluated by customers
- ✓ Production began at small scale, amidst the relative slowdown in China's smartphone market

### CARSEM MALAYSIA

- ✓ Assembling advanced packages with complete flexibility for customization
- ✓ Major portfolio of advanced packages is with big semiconductor companies in NA & EU
- ✓ Investing in superior machines and skilled manpower to handle advanced packaging

#### BENEFITS OVER STANDARD PACKAGES

RELIABILITY COST SAVING PERFORMANCE ROBUST REDUCED SIZE CUSTOMIZABLE





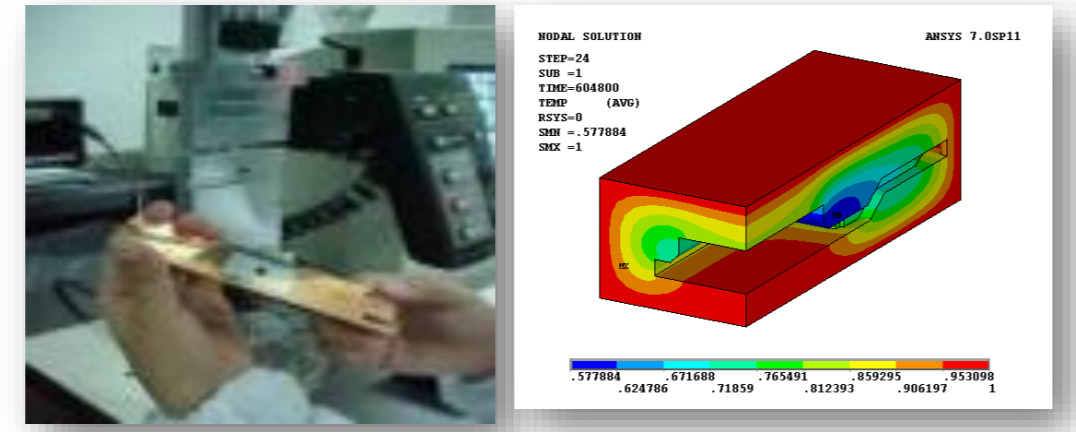
# Technology – Carsem technology center

DEDICATED TECHNOLOGY CENTER TO DRIVE INNOVATION & TECHNOLOGY DEVELOPMENT

CARSEM TECHNOLOGY CENTER (CTC) – 4M APPROACH TO R&D

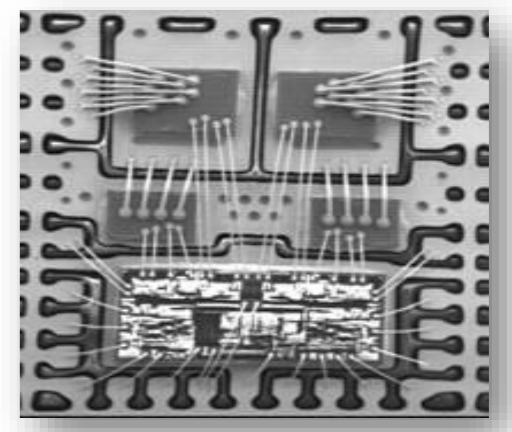
## MATERIAL

- Materials lab,
- Design & Simulation



## METHODOLOGY

- Process development
- Total 75 active patents



## MACHINE



- Dedicated to package/process/materials development

## MAN (HUMAN CAPITAL/ EXPERTISE)

- Total headcount: 74 (Technical Management ~8%, Project Management ~34%, Engineering ~58%)







# Quality & productivity focus

INVESTING IN AUTOMATION & INDUSTRY4.0 TO ACHIEVE ZERO DEFECTS & HIGH PRODUCTIVITY GOALS

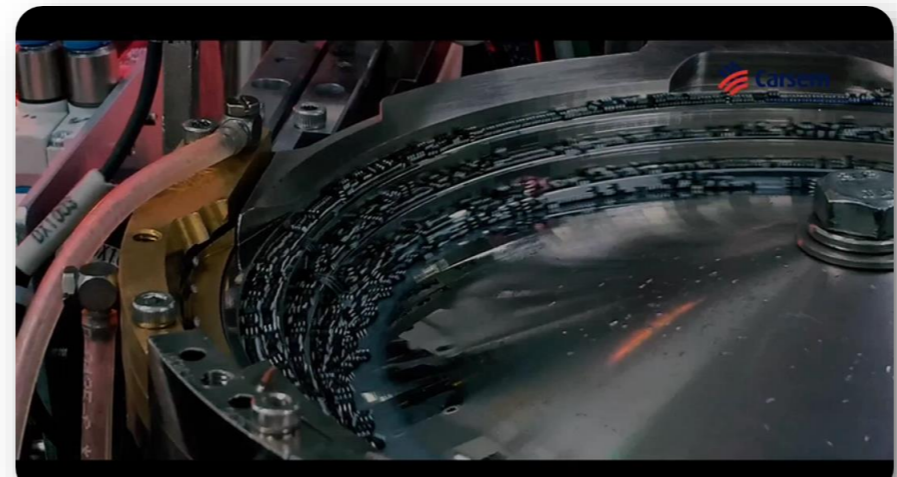


## End Game – Smart factory



### Highlights

- > Highly automated line with minimal dependence on people
- > **15%** drop in # of VOC cases per mil units (FY17-Q2 FY23)  
– Quality improvement
- > Productivity improvement
- > Connecting shop floor & processes

### State of the art advanced facilities, towards lean manufacturing

<p>5G testing</p>	<p>Lights-off factory</p>
	 <p>Automated guided vehicle</p>
<p>Rack &amp; stack with Pentamaster handler</p>	<p>Zero defects quality</p>  <p>Robotic arm</p>

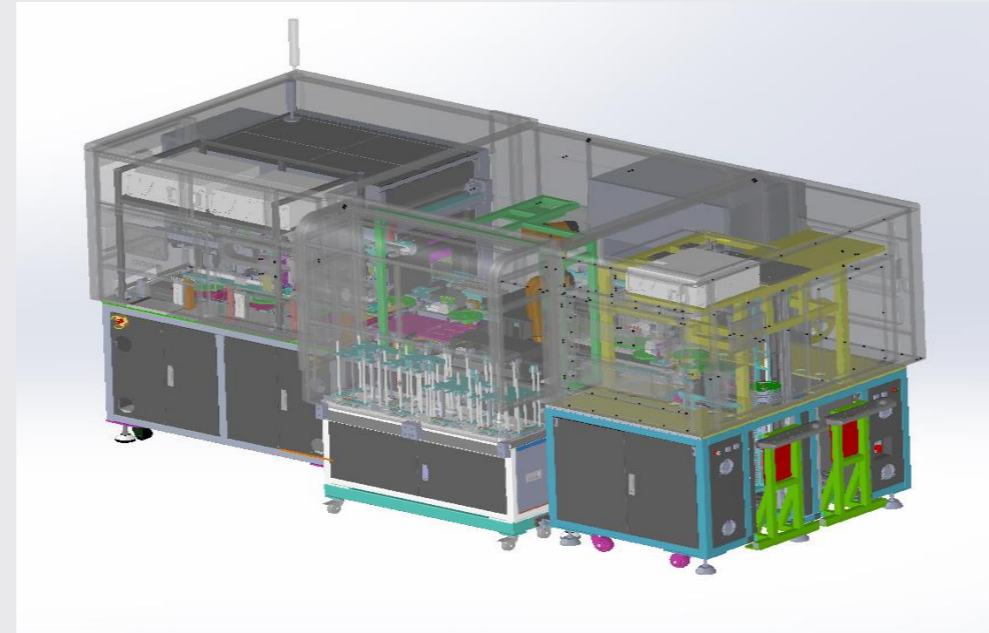


# Quality & productivity focus

## AUTOMATION: AUTO PACKING OF REEL AT CARSEM SUZHOU

### Auto Packing Presentation

Reel auto packing instead of manual packing to improve quality and efficiency

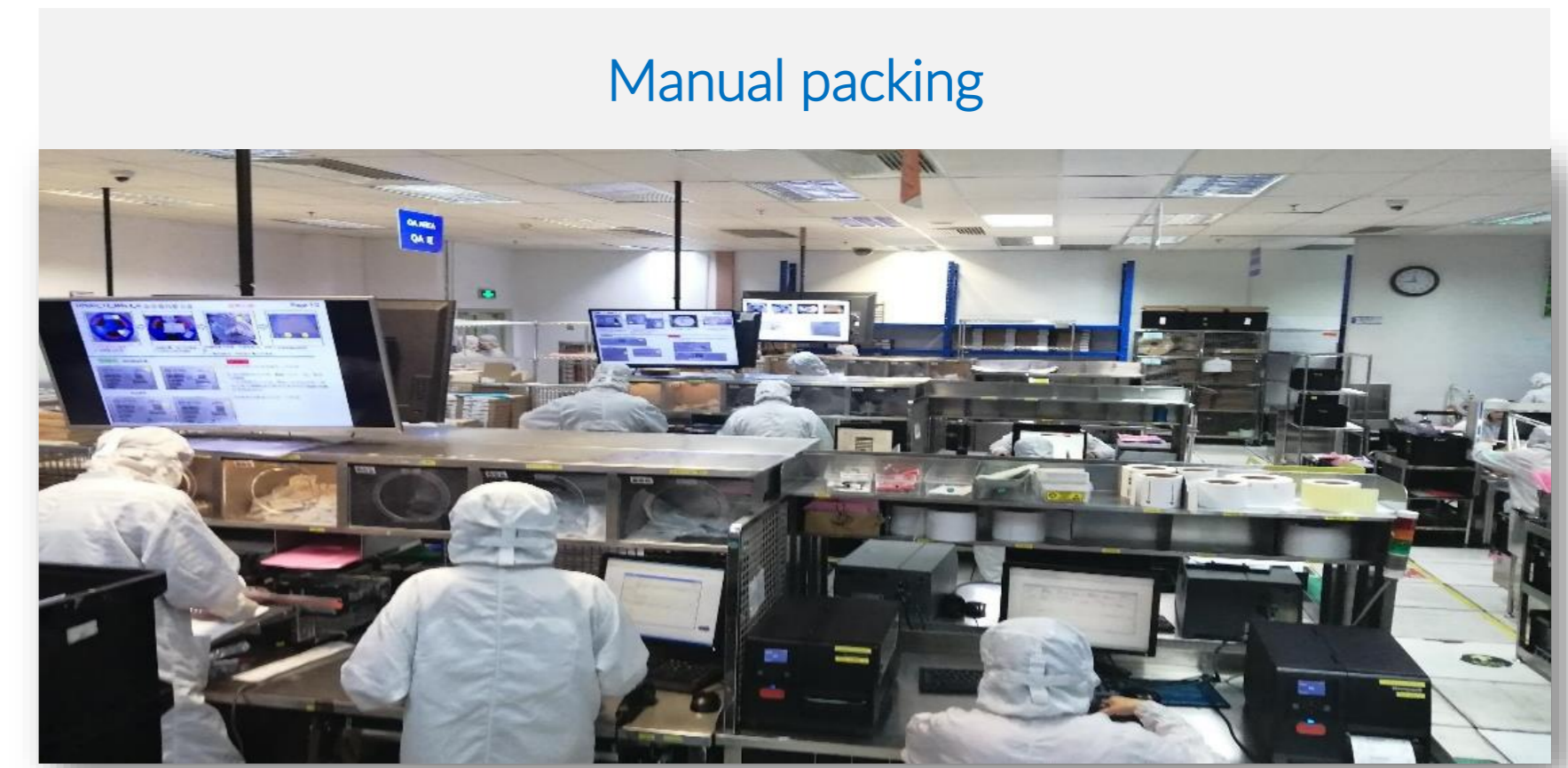
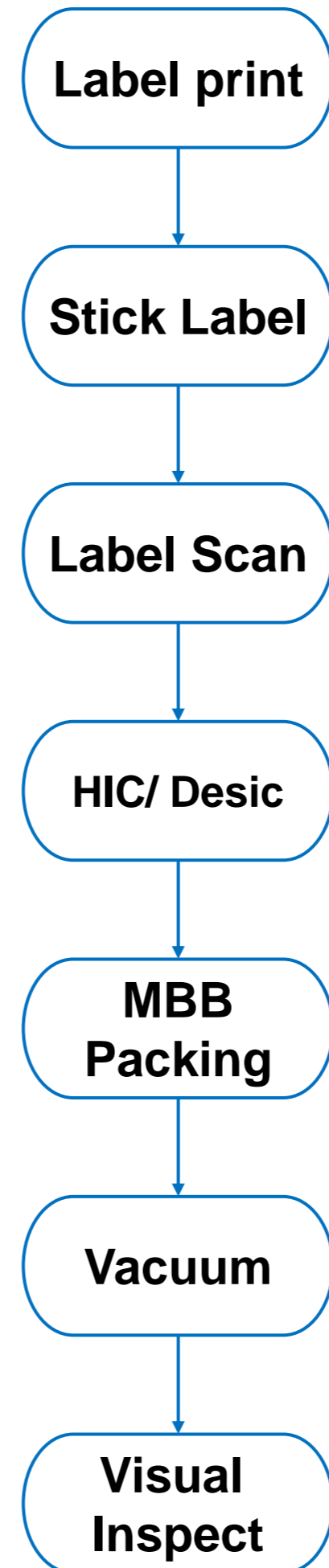


### Quality improvement

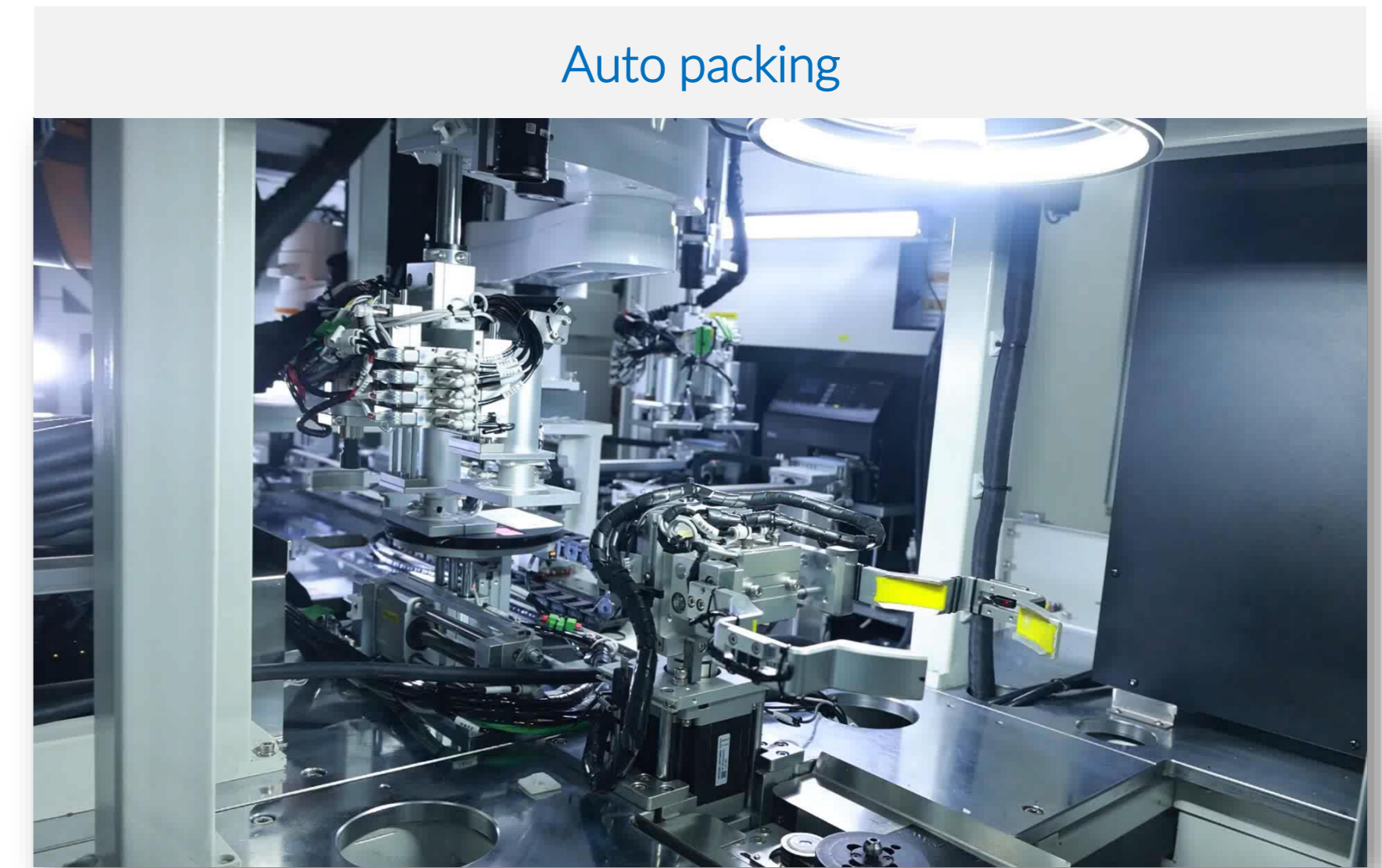
Auto implement the complex packaging methods by Recipe control in System;  
Avoid quality risks in packing process such as wrong labels, wrong pack material etc.

### The 1st line status and plan

Mass Production began in Oct. 2022



Manual packing



Auto packing




# Quality & productivity focus

## CERTIFIED ON INDUSTRY'S LEADING PERFORMANCE PARAMETERS



**ESD Control**

Applicable to Design, Assembly, Testing & Finishing of semiconductor component



**IATF 16949:2016**

Design & manufacturing of semiconductor components



**ISO 45001:2018**

Occupational Health & Safety Management System implemented in compliance




**ISO 14001:2015**

Environmental Management System implemented in compliance



**Sony Green Partner Program**

Environmental quality assurance activities



**ISO 9001:2015**

Design & manufacturing of semiconductor components





# People – Our employees

## EMPLOYEE ENGAGEMENT ACTIVITIES



Team building activities @ Carsem Suzhou



Strategy meeting @ Carsem Suzhou





# Awards and recognitions

## QUALITY & PEOPLE

### BEST SUPPLIER AWARDS received



Continuously Increasing Output for 4 Consecutive Quarters

Wolfspeed



Achieving Output Target for FY2022

Wolfspeed



Excellent strategic supplier, 2022 - RF Switch/LNA/FEM Module in 5G phones

Maxscend



RF Module 5G Saw Filter Radar Sensor

EPIC MEMS

# TABLE OF CONTENT

---

1	INTRODUCTION
2	CORPORATE OVERVIEW
3	BUSINESS OVERVIEW
4	SUSTAINABILITY
5	GROWTH DRIVERS
6	FINANCIALS & SUMMARY



# Financial highlights

## Q2 FY23 SNAPSHOT

### REVENUE

With the challenges faced in China & worldwide consumer demand drop, MPI closed Q2 FY23 at US\$ 116M

### PAT

Continued necessary investments in machines, manpower & floor space. Q2 FY23 Profit after tax – RM 32M

### CAPEX

Good or Bad times, Carsem invests in replacing old machines & getting new technology in. Q2 FY23 – RM 62M

### CASH

MPI is backed by strong cash position even in these unpredictable times – Q2 FY23 Net Cash – RM 816M

### CHALLENGES

Covid-19 Pandemic in China, Inflation leading to end market demand drop, Rise in costs & Manpower constraints

### SEGMENTS

Automotive segment is strengthening; Automotive (43%); Industrial (38%); Consumer (13%)



# Key financials

## MPI GROUP RESULTS AT A GLANCE

	Q2 FY23	Q1 FY23	Q2 FY22	Q2 vs Q1	Q2 vs Q2	YTD FY23	YTD FY22	YoY
	RM mil	RM mil	RM mil	%	%	RM mil	RM mil	%
Revenue	526.4	564.0	608.0	-7%	-13%	1,090.4	1,192.5	-9%
PAT	31.8	67.7	100.0	-53%	-68%	99.5	196.0	-49%
PATAMI	18.3	52.7	85.3	-65%	-79%	71.0	167.0	-57%
EPS (sen)	9.22	26.50	43.00	-65%	-79%	35.72	84.17	-58%
EBITDA %	23%	28%	31%			26%	31%	
Capex	62.0	86.5	310.2	-28%	-80%	148.5	464.7	-68%
Dividend	20	0	20			20	20	
Net Cash	815.9	840.4	889.6			815.9	889.6	
EDR	100:0	100:0	100:0			100:0	100:0	
ROSF	0.9%	2.6%	5.0%			3.6%	9.8%	

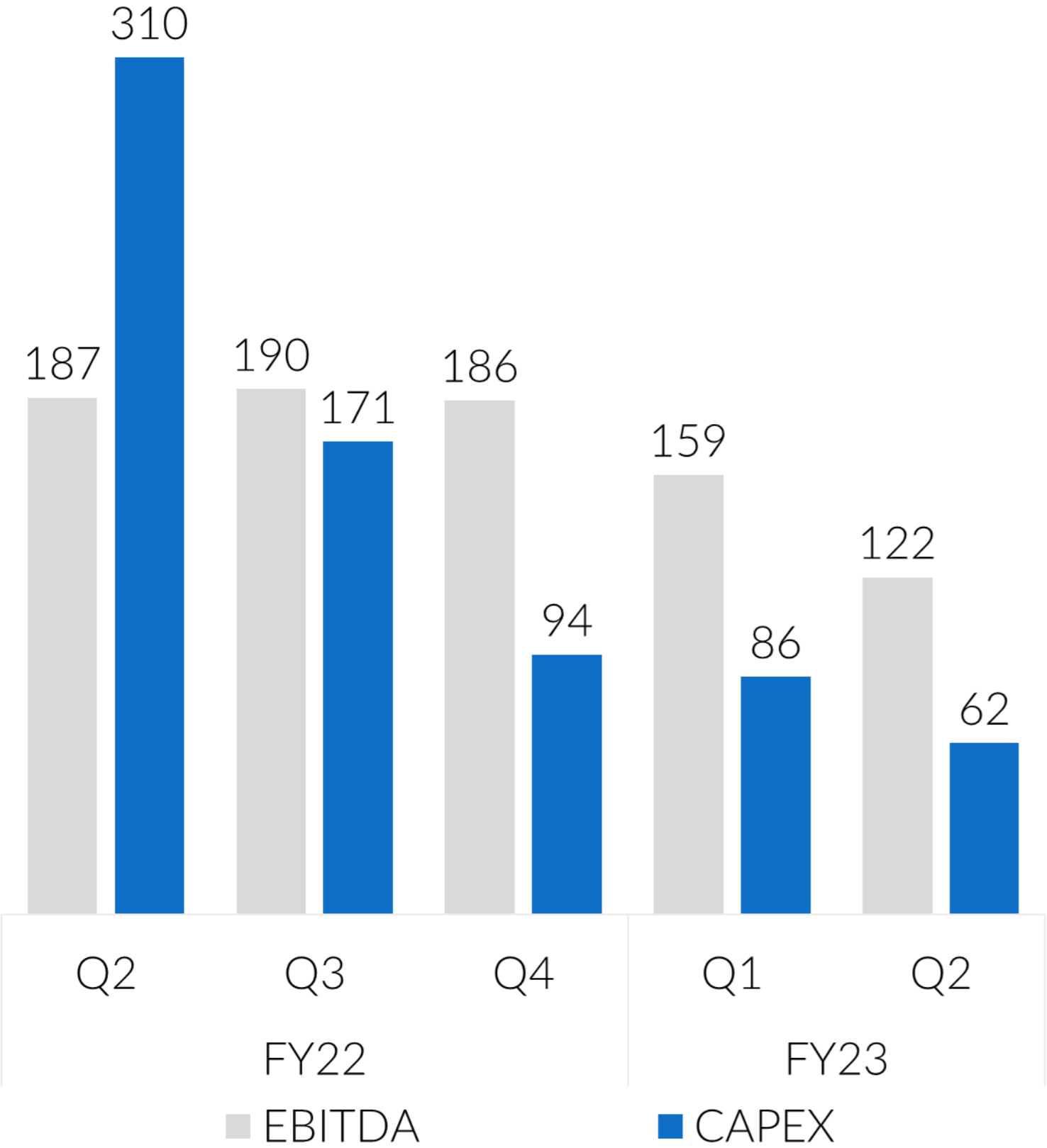




# Investments

SUSTAINED INVESTMENTS TO REALIZE LONG TERM BUSINESS ASPIRATIONS

MPI EBITDA VS CAPEX (RM million)



- Continuing to invest in strategic capacity expansions at our operations in China and Malaysia

- Also, investing in growing future technologies such as power management (inc. SiC, GaN), 5G testing, modules & miniaturization, equipment upgrade, automation, and productivity enhancements



# Investments

CONTINUING STRATEGIC INVESTMENTS FOCUSING ON SENSORS, 5G TESTING & SiC/ GaN

CARSEM SITES

SZ

5G TESTING



S

SILICON CARBIDE

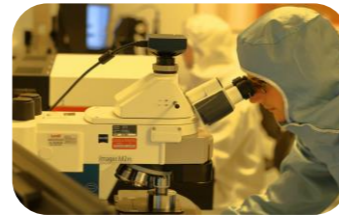


M

MEMS SENSORS



• Hiring more people across the globe to support business operations & sales



• Investing in research & development to deliver latest technology solutions to our customers



• Expanding capacity to meet increasing business demands from existing & new customers



• Continuing Industry 4.0 via automation in each factory to have zero defects quality



• Upskilling existing operational & technical manpower to be able to perform better with latest technology



• Looking for more anchor customers to secure more guaranteed business in future



# Cash

STRONG NET CASH POSITION MEANS GREAT STABILITY IN UNCERTAIN TIMES

NET CASH (RM million) position remained healthy



MPI is cash rich despite significant capital expenditure and expenses towards managing externalities



# Statement of Profit or Loss

	Q2FY23 RM '000	Q2FY22 RM '000	Changes %
Revenue	526,419	608,006	-13%
Cost of sales	(455,645)	(470,204)	-3%
<b>Gross profit</b>	<b>70,774</b>	<b>137,802</b>	<b>-49%</b>
Operating expenses	(33,128)	(32,337)	2%
Other operating (expenses)/income	(4,181)	11,228	-137%
<b>Profit from operation</b>	<b>33,465</b>	<b>116,693</b>	<b>-71%</b>
Interest income	6,167	486	1169%
Interest expenses	(2,360)	(1,751)	35%
<b>Profit before taxation</b>	<b>37,272</b>	<b>115,428</b>	<b>-68%</b>
Taxation	(5,450)	(15,393)	-65%
<b>Profit for the period</b>	<b>31,822</b>	<b>100,035</b>	<b>-68%</b>
<b>Profit attributable to:</b>			
Owners of the Company	18,330	85,320	-79%
Non-controlling interests	13,492	14,715	-8%
<b>Profit for the period</b>	<b>31,822</b>	<b>100,035</b>	<b>-68%</b>
<b>Earnings per ordinary share (sen)</b>			
Basic	9.22	43.00	-79%
<b>Ratio</b>			
GP %	13%	23%	
PBT %	7%	19%	
PAT %	6%	16%	
EBITDA%	23%	31%	



# Statement of Financial Position

	31/12/2022 RM'000	30/06/2022 RM'000
<b>Equity</b>		
Share Capital	352,373	352,373
Reserves	1,854,402	1,811,656
Treasury shares	(163,816)	(163,816)
	2,042,959	2,000,213
<b>Non-controlling interests</b>	341,191	321,568
	2,384,150	2,321,781
<b>Non-current liabilities</b>		
Borrowings (unsecured)	84,715	180,100
Lease liabilities	22,461	23,566
Deferred tax liabilities	5,496	2,269
	112,672	205,935
<b>Current liabilities</b>		
Trade and other payables, including derivatives	399,383	543,813
Borrowings (unsecured)	154,889	13,170
Lease liabilities	3,841	2,781
Current tax liabilities	24,488	31,377
	582,601	591,141
<b>TOTAL LIABILITIES</b>	695,273	797,076
<b>TOTAL EQUITY AND LIABILITIES</b>	3,079,423	3,118,857
Net Assets per share attributable to owners of the Company (RM)	10.27	10.06
Net Cash	815,939	771,556
EDR	100 : 0	100 : 0



# Summary

---



MPI held ground at US\$ 116M for Q2 FY23 despite China lockdowns & severe end customer demand drop

---



MPI has a healthy order book for future quarters despite the ongoing market uncertainty

---



Carsem continues to invest in SiC & GaN Technology, 5G Testing, MEMS Sensors to grab the next wave of opportunities

---



Investing in expansion - new factory in Ipoh, additional floor in Carsem S – Site (Ipoh) & a new site in China

---



Net Cash (RM 816M for investment & M&A), No debts



Thank You