2D Generation

Enabling the Future of Semiconductors

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AI1:ASX

Investor Presentation

JANUARY 2025

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Vision

2D Generation is now 100% owned by Adisyn Ltd (AI1:ASX)

2D Generation
Enabling the Future of Semiconductors

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2D Generation develops novel technologies and methods to produce high quality Graphene, in a low temperature process, improving the performance of semiconductor interconnects and other high technology applications.

What's New?

Non-Executive Director to be Appointed: **Kevin Crofton**

Kevin Crofton has 3 decades of Semiconductor industry experience. He has held significant management and leadership positions at Lam Research Corporation (Nasdaq:LRCX, US$96B market cap), KLA Corporation (Nasdaq:KLAC, US$91B market cap), Comet Holdings AG (SIX: COTN, CHF1.9B market cap), Newport Corporation (acquired for US$980M), NEXX Systems (acquired by Tokyo Electron) and Aviza Technology.

- **In 2006, Mr. Crofton led a P/E backed buyout of Aviza Technology UK to create what became SPTS Technologies, where he was President and Managing Director from 2006 to 2020, and created a US$500M turnover, highly profitable, market leading company. SPTS was bought by Orbotech, which was later acquired by KLA for $3.4B.**
- **From 2020 through 2022, Kevin was CEO of Comet AG, a listed company on the Swiss SIX exchange. Achieved 60% revenue growth to CHF$600m (A$1.06B), nearly doubling EBITDA performance, and delivered Market Cap growth from 0.8B to 2.2B CHF (~US$2.4 B).**
- Mr Crofton served on the board of SEMI, the international industry association, for 8 years including as Vice Chair and Chair. He was advisor to Senator Mark Warner on US CHIPS Act and Gov. Glen Youngkin on Virginia's Semiconductor Initiative.
- Throughout his career, Kevin Crofton has been recognized for his contributions to the semiconductor industry. He is a published author of numerous technical papers, a sought-after Semiconductor industry speaker, and winner of numerous awards including the MEMS Industry CEO of the year (2013) and the Queens Award for innovation, technology and export in 2008, 2014 and 2018.
- Mr. Crofton holds an MBA in International Business from American University and a BS Degree in Aerospace Engineering from Virginia Tech.

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What's New?

M&T Semiconductor Partnership

2D Generation Secures Semiconductor Industry Heavy Weights to Guide Business Development and Commercial Initiatives.

- M&T is incentivised to deliver strategic partnerships with equipment vendors, semiconductor fabricators, fabless chipmakers and end users with the aim of securing licencing transactions and/or a buyout.
- M&T specialises in managing technological and commercial initiatives in the semiconductor sector
- M&T is led by industry leaders Dr. Itzhak Edrei, former President of Tower Semiconductors (the world's 6th largest semiconductor pureplay foundry) and Zmira Shterenfeld Lavie, former SVP R&D at Tower Semiconductor
- Tower Semiconductor's largest shareholder with ~7.5% or ~US$430M in holdings, Senvest Management LLC, is also a Substantial Shareholder in AI1. Senvest is a New York based fund with almost US$4B in assets under management.

What's New?

Latest Beneq ALD Machine

New Generation Atomic Layer Deposition Machine Procured

- 2D Generation has ordered a highly specialised Atomic Layer Deposition ("ALD") machine from Beneq. The cutting-edge technology will enable 2DG to accelerate technological development
- Beneq is a global leader in ALD equipment with customers spanning the semiconductor and electronics industries
- An ALD machine is utilised in the semiconductor industry to deposit extremely thin layers (down to the atomic layer) of material on to chips. They are found in most semiconductor fabs around the globe
- Complements ongoing work on 2D Generation's existing ALD. Installation expected Q2CY25

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beneq.com

What's New?

Graphene applications in Photonics

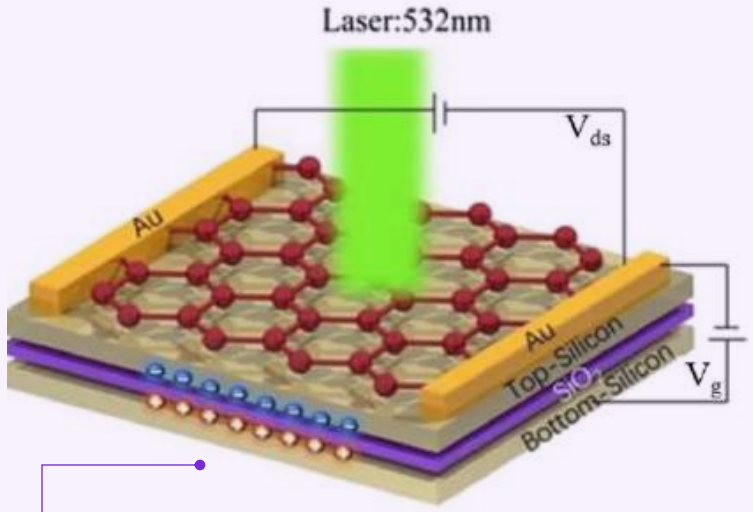
Key Features of Graphene for Photonics:
- Nonlinear Optical Response: Strong third-order nonlinearities.
- Ultrafast Dynamics: Carrier relaxation in femtoseconds.
- Broadband Absorption: Effective across the visible to terahertz spectrum.

Nonlinear Optical Applications:
- Saturable Absorption: Enables mode-locked lasers for ultrafast pulse generation.
- Third-Harmonic Generation (THG): Frequency tripling for novel light sources.
- Four-Wave Mixing (FWM): Optical signal processing and wavelength conversion.

Photonic Devices:
- Optical Modulators
- Photodetectors - High sensitivity and broad spectral range (visible to IR).

Emerging Fields:
- Quantum Photonics
- All-Optical Switching

The future of semiconductors



Graphene Heterostructures – Photogating and Charge Transfer (Optical Modulator)

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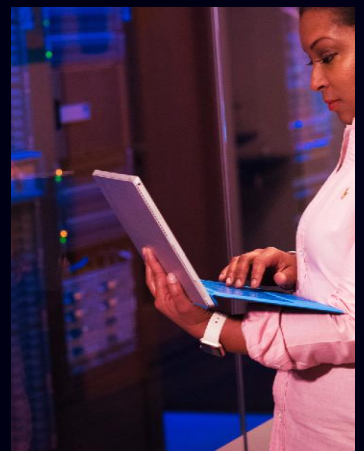
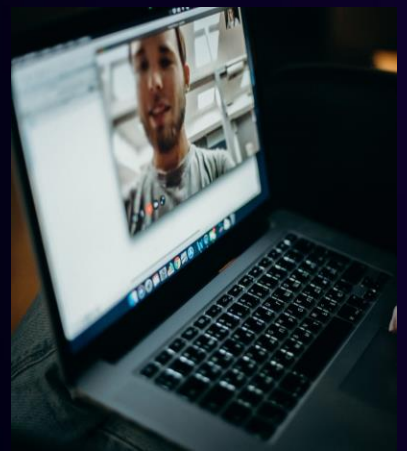
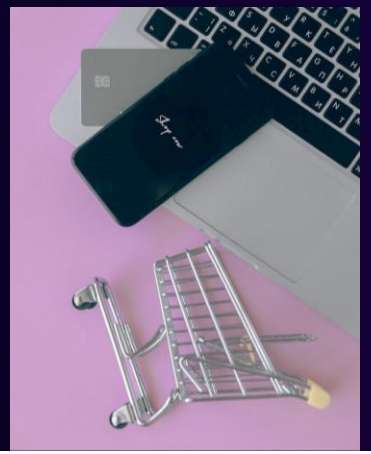
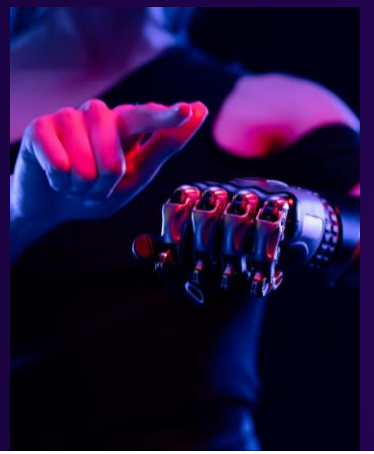
We are in an era driven by data, Artificial Intelligence and Connectivity




1990 — Internet Era

2005 — Social Media Age

2020 — Collaborative Economy Age

2025 — Autonomous Age

TODAY

2030+ — Integrated World

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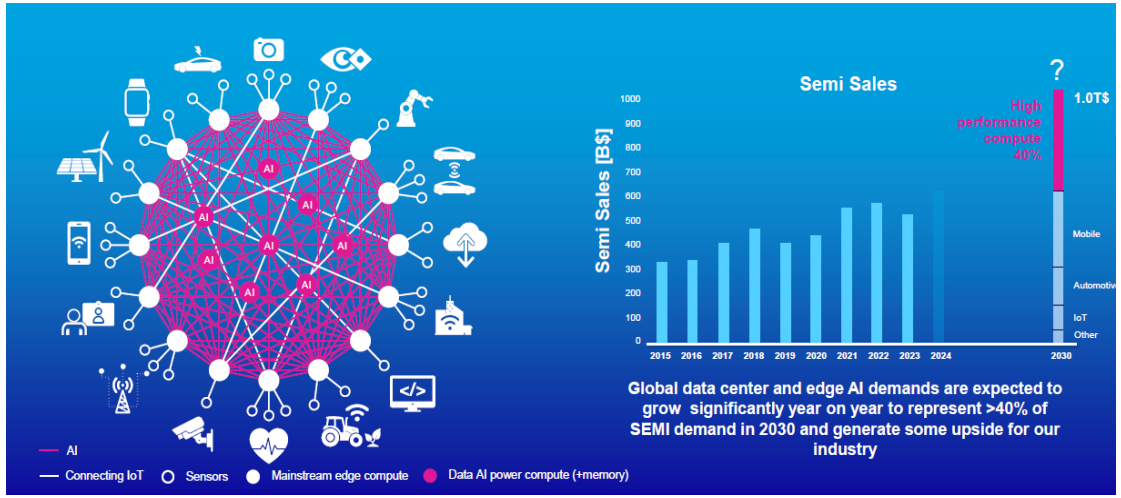
High Performance Computing's Primary Need (e.g., AI) Is The Quest for Speed…

…But limited by the ability to "shrink" design rules

From chips everywhere to artificial intelligence everywhere

AI opens endless opportunities, expected to generate >6T$ value by 2030 across several industries



ASML

*Source: Kevin Zhang, TSMC, Semiconductor Industry: Present and Future, IEEE solid state Circuit Conference, Feb 2024
*Source: WSTS and Gartner

Page 3
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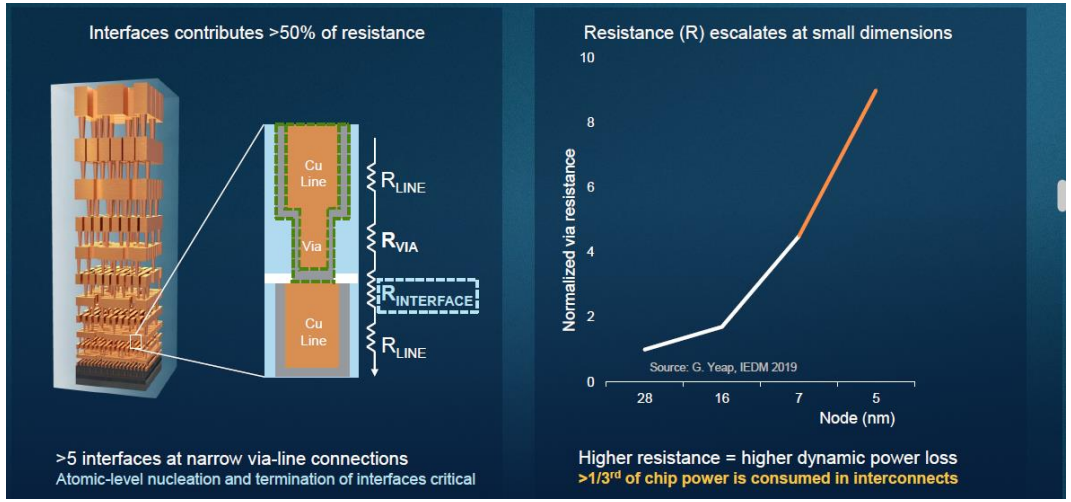

AMAT ITPC November 2024

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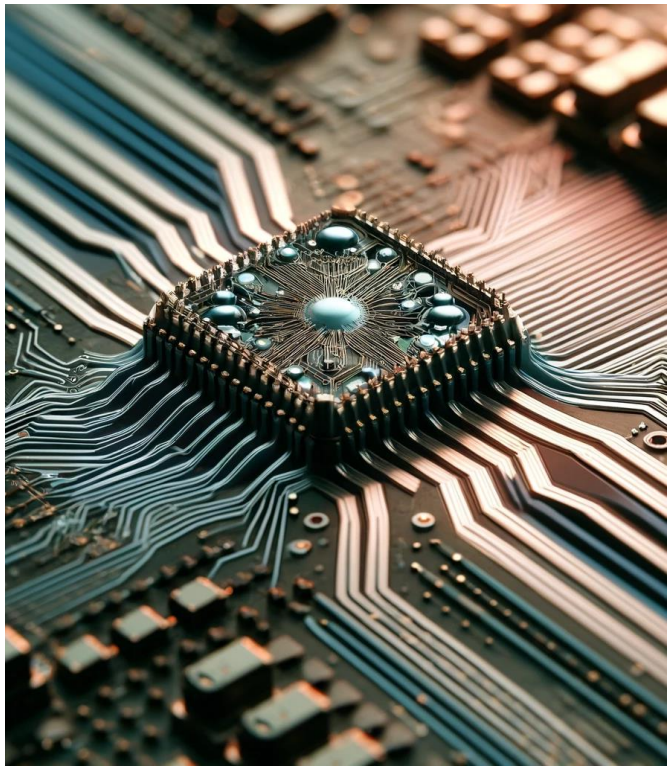
The Industry “Must-Have” Solutions to Support The Coming Demands

Semiconductor in AI

Requirements for high performance, low power AI semiconductors.

1. **High Performance:** Increasing Speed of device
2. Low Power: Reducing Power Consumption
3. High Density: Smaller Chips of Stacked Chips to Process More data
4. High Bandwidth: Transmission of Large Amount Data at Once
5. Low Latency: Connection Pathway pf Data Transmission without Delay

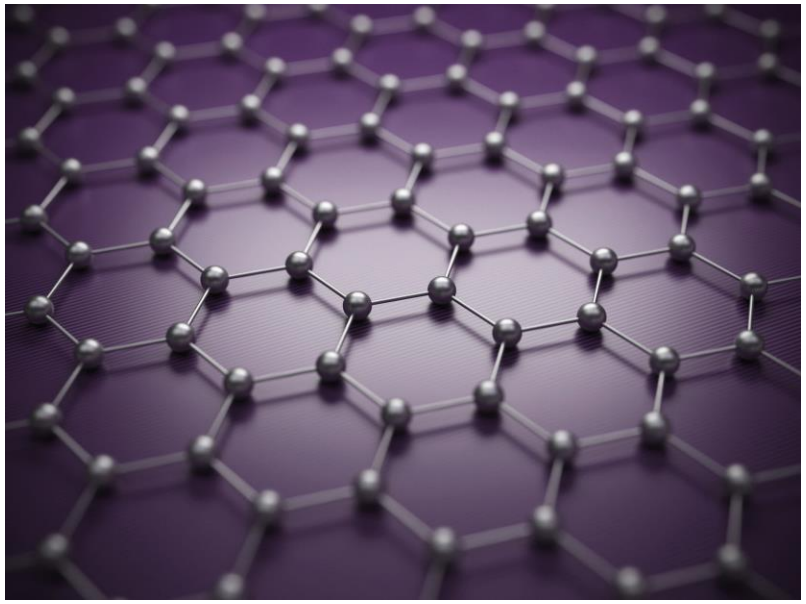
What is an Interconnect?



2D Generation's innovative technology centres around the aim of improving the performance and capabilities of the interconnect.

- An interconnect in a semiconductor refers to the conductive pathways that connect different components or regions within an integrated circuit (IC).
- These interconnects are crucial for the functionality of the IC as they facilitate the flow of electrical signals between transistors, capacitors, resistors, and other elements on the chip.
- Interconnects can be made of various materials, typically metals like aluminium or copper, and they can be implemented in different layers within the semiconductor structure.
- As ICs have become more complex, with smaller and more densely packed features, the design and materials used for interconnects have evolved to address issues such as resistance, capacitance, and signal integrity but have reached scalability limitations.

Why Graphene



Graphene is a unique carbon structure. It consists of a single atom layer of carbon atoms arranged in a honeycomb lattice and is the world's first two-dimensional (2D) material. Graphene boasts exceptional properties, highly valuable to the semiconductor industry, including:

- ✓ **Superior Electrical Conductivity**: outperforms copper and other traditional materials - ideal for high-speed interconnects
- ✓ **Remarkable Thermal Conductivity**: dissipates heat more efficiently than any other known material, making it essential for managing heat in high-performance electronic devices.
- ✓ **Exceptional Strength and Flexibility**: stronger than steel and incredibly flexible, opening possibilities for new types of flexible electronics, wearable devices, and other innovative products.
- ✓ **High Transparency**: is nearly transparent, making it suitable for applications like displays, touchscreens, and solar cells.

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2D Generation's Process

- Unique and patented process
- ALD based
- Forming graphene directly on the wafer
- Use of patented precursors
- Low-temperature process – below 280°C.
- Compatible with current manufacturing limitations
- An addition of a tethering group is designed to increase adhesion to silicon oxide, metals, and other optional surfaces
- Can be applied using existing industrial processes and equipment

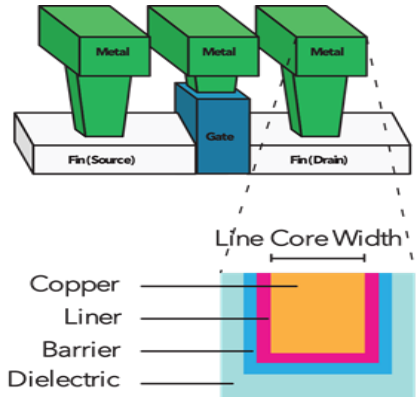
Our process advantages

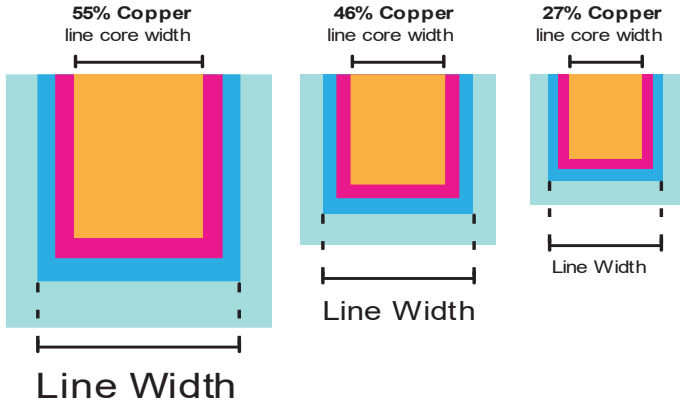
Revolutionizes the semiconductor industry with our patented, low-temperature ALD process for producing high-quality graphene interconnects for the next generation chip:

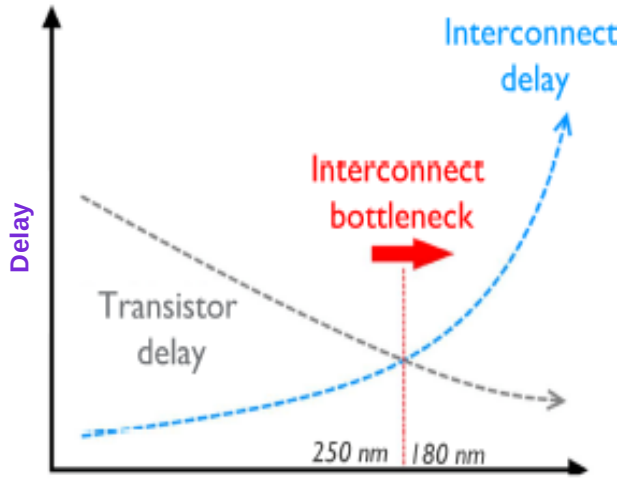
- Our innovative Atomic Layer Deposition (ALD) based process enabling graphene **growth directly on silicon chips** at significantly lower temperatures, compatible with chip fabrication.
- Our unique process allows for **selective graphene deposition** on surface and within vias.
- This process can be applied to surfaces with a **high aspect ratio.**

The Copper Interconnect Dilema…

- Smaller and smaller design rules equals more transistors per chip – which means faster performance
- But the inherent resistance increases to the point that processing speed is ultimately limited by physics







Process technology scale down

* Yosi Shacham-diamand, Tetsuya Osaka, Madhav Datta, and Takayuki Ohba. (Book) "Advanced Nanoscale ULSI Interconnects". 2009.

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2DG – Enabling the future of semiconductors

- 2D Gen's tech harnesses graphene's unique properties to boost chip performance. Our graphene-based solution accelerates the development of new advanced computing tech, including artificial intelligence (AI), photonics, spintronics, and autonomous vehicles.
- We unlock a new era of semiconductor and electronics magnitude, paving the way for faster, more energy-efficient chips across various industries.

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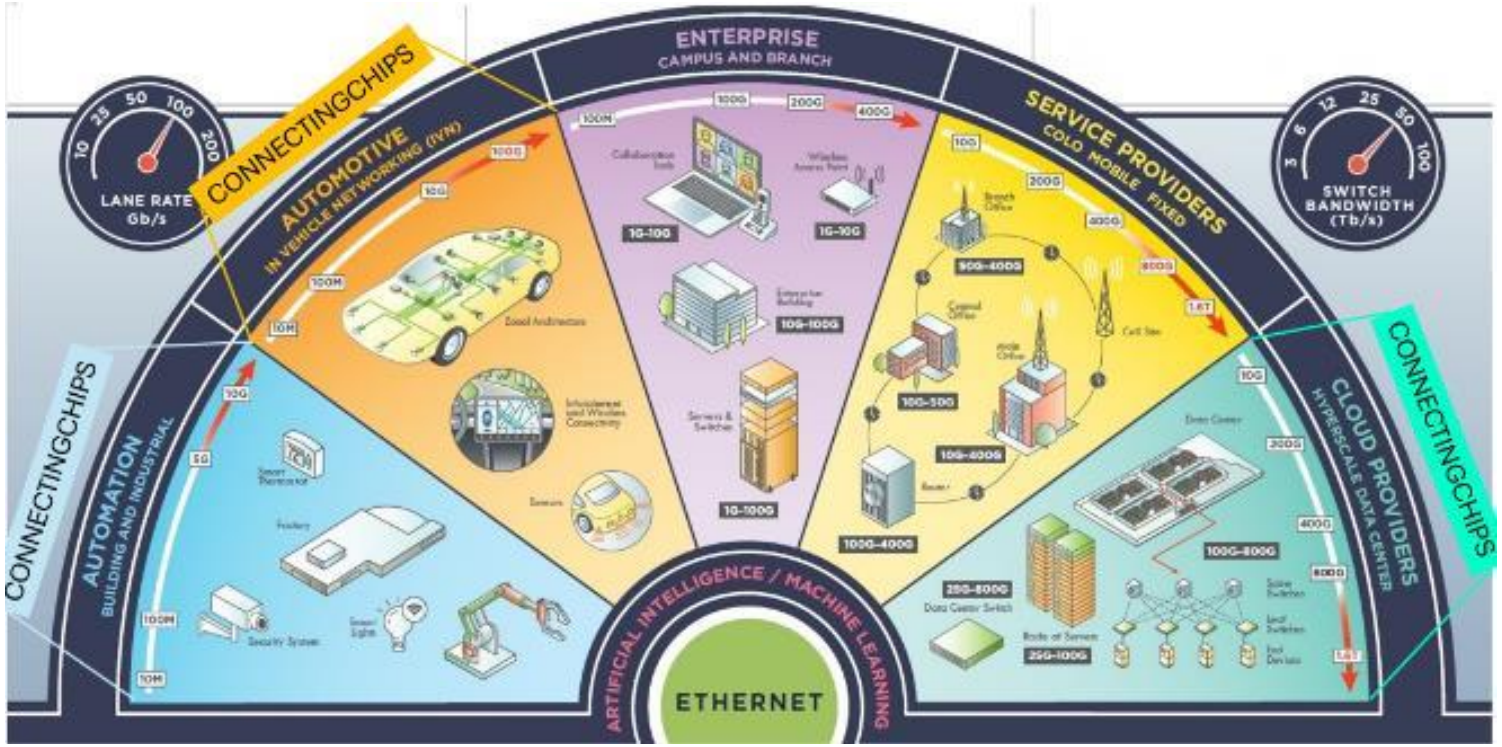
Building the Future Together: Partnership Opportunities

imec



Connecting Chips

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Connecting Chips – EU Undertaking

Connecting Chips

Why is the Project significant?

- The Project is focused on developing and integrating electronic, photonic, power, and RF devices within System in Package (SiP) modules for applications in **data centers, high-performance computing, Artificial Intelligence, autonomous vehicles and digital industries.**
- The Project aims to improve heat dissipation, optimize data transmission, implement thermal control for dense SiP modules and advance integration enhance device performance and efficiency.

2DG's role in the Project

Leveraging graphene's exceptional properties through pioneering low-temperature ALD techniques, this technology improves semiconductor performance in interconnects, coatings, capping layers by addressing impedance, resistivity, and heat dissipation challenges.

What will it mean for 2DG to be part of the project?

- **The industry largest players validate 2DG's innovative approach and establishes its role in the semiconductor industry.**
- Provides a platform for collaboration and technological advancement.

Disclaimer: "ConnectingChips" hasn't been granted yet.

NVIDIA, KLA, unity SC, TNO, ThermoFisher Scientific, AT&S, Valeo, orbotech, NXP, Fraunhofer, infineon, Technische Universität Braunschweig, FBH Ferdinand Braun Institut

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2DG Intellectual Property

Four patent families are directed to the technology of the Company and each patent is composed of our unique production methods and materials:

1. **GRAPHENE COATED NON-METALLIC SURFACES, DEVICES AND METHOD THEREOF –** directed to the technologies used for conductive diffusion barrier, and other applications

2. **GRAPHENE COATED METALLIC SURFACES, DEVICES AND METHOD OF MANUFACTURE THEREOF –** directed to the technologies used for conductive capping layer, and other applications

3. **METHOD OF MANUFACTURE OF GRAPHENE COATED SURFACES BY ATOMIC OR MOLECULAR LAYER DEPOSITION –** directed to graphene manufacture by ALD

4. **GRAPHENE METAL COMPOSITE** – directed to graphene layers interlayered with metal layers including coatings of patterned surfaces

2D Generation's Strong Management Team

ARYE KOHAVI Founder, CEO

Arye is an Israeli entrepreneur and innovator. He was the founder, president & Co-CEO of Water-Gen, which develops water-from-air and air dehumidification technologies. Kohavi holds a MBA (Finance) and a BA in Economics and Accounting, both from the Hebrew University in Jerusalem.

- Arye has been chosen as one of the world's 100 Leading Global Thinkers, and one of the world's top innovators of 2014, by "Foreign Policy" magazine.
- Water-Gen, founded by Arye, was chosen as one of the World's 50 Most Innovative Companies, by "Fast Company" magazine.
- As part of Israel's 70th anniversary celebrations, the Israeli Ministry of Economy and Ynet readers chose Water-Gen as one of the "Nine Greatest Israeli Inventions of All Times".
- Water-Gen's Genny was chosen as one of the world's 100 Best Inventions of year 2019,by TIME magazine.

MIRI KISH DAGAN VP R&D

Miri Kish - Dagan was the VP R&D and the CTO of Raicol crystals that specializes in the manufacture of high-quality nonlinear optical crystals and electro-optic devices. Miri led the development from inception to prototype in semiconductors, medical, military, and space applications.

Miri has over 19 years of experience with engineering processing, technologies and R&D management in fabrication and tool installation. Prior to Raicol, Miri served at Suron as VP of R&D engineering, and in various positions at Tower semiconductors.

Winner of the Pioneering Women Award for groundbreaking achievements in the high-tech sector given to her by the Israeli Hi-Tech Association and the Manufacturers Association of Israel.

Miri received her MSc and BSc in Material Engineering from Ben-Gurion University in Israel.

PAUL RICH Technology Leader

Paul Rich has more than 35 years of experience in the semiconductor industry.

Paul was the Vice President for Technology and Engineering at SPTS Technologies, where he managed the product development team until December 2022. SPTS develops and manufactures advanced wafer processing solutions for the world's leading semiconductor and microelectronic device manufacturers.

Mr. Rich graduated from Bath University in 1987 with a B.Sc in Physics. He has published numerous technical articles and has several patents relating to plasma processing.

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Thank you

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